Effectiveness of Mindfulness Program on Stress Reduction and Well-Being in Students in Northern Iraq High Scholars

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Abstract

This study investigates the effectiveness of a mindfulness training program as a strategy for alleviating academic and social pressures faced by high school students in Northern Iraq. Recognizing the detrimental effects of stress on student well-being, the research employs a quantitative approach and an experimental research design to assess outcomes. High school students often grapple with intense academic and social pressures, leading to significant stress and negative impacts on their overall well-being. Previous literature underscores the importance of addressing these stressors to enhance student health and academic performance. This study aims to evaluate the efficacy of a mindfulness training program in promoting well-being and mitigating stress among high school students in Northern Iraq. The research utilized an experimental design involving two groups of students: an intervention group that participated in a six-week mindfulness training program and a control group that did not receive any intervention. Data were collected through standardized questionnaires administered before and after the training. The quantitative nature of this study allowed for the assessment of changes in well-being and stress levels across both groups. The findings indicated a positive correlation between mindfulness and well-being within the experimental group, demonstrating significant improvements post-intervention. Conversely, the control group exhibited a decline in well-being over the same period. While mindfulness training appeared to reduce stress levels in both groups, these changes were statistically insignificant, suggesting that while mindfulness has potential benefits, further exploration is necessary to understand its impact on stress reduction. These results align with existing literature that highlights the positive effects of mindfulness on well-being among students. The study corroborates the notion that mindfulness practices can foster greater awareness and attention, contributing to enhanced student well-being. However, the lack of significant changes in stress levels prompts a recommendation for further investigation into the nuances of mindfulness and its varying effects across different populations and contexts. This study underscores the potential of mindfulness as an effective tool for enhancing student well-being in Northern Iraq. Given the limitations of a solely quantitative approach, future research should consider employing mixed methods to gain deeper insights into the subjective experiences of students and the broader implications of mindfulness training. To expand on these findings, it is essential for subsequent studies to incorporate qualitative methodologies. This would facilitate a more comprehensive understanding of how mindfulness influences students' mental health and academic performance, thus enriching the existing body of literature.

Keywords: Mindfulness Training Program, Perceived Stress, Well-Being, Mindfulness Awareness Attention.

Introduction

Academic stress has emerged as a predominant concern among adolescents, significantly impacting their overall well-being. According to Barbayannis et al. (2022), academic stress ranks as the leading cause of stress in this demographic. The American Psychological Association (2020) highlights the urgency of this issue, revealing that 87% of students in the United States attribute their stress to educational demands. This trend is increasingly observable in Northern Iraq, where the pressure on students continues to escalate. Given that students represent the future of society, it is crucial to enhance their well-being. High school students, particularly those preparing for examinations, experience heightened academic stress, which often leads to adverse effects on their mental health (Matud et al., 2020). The pressures are compounded by familial expectations, as parents strive for their children to excel academically and gain admission to prestigious tertiary programs. As Pascoe, Hetrick and Parker (2020) note, students often find themselves in competition with peers, adding to their stress levels. Such

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conditions have been linked to a range of negative outcomes, including mental health disorders, decreased motivation, poor academic performance, and even risky behaviours such as substance abuse and suicidal ideation (Karyotaki et al., 2020; Linden, Stuart, & Ecclestone, 2023). Mindfulness practices may offer a viable solution to mitigate stress and improve well-being.

Research suggests that mindfulness meditation reduces activation in the amygdala an area of the brain associated with anxiety leading to lower baseline anxiety levels. Techniques aimed at unwinding stress, building relationships, ensuring adequate rest, and fostering physical health are essential components of a holistic approach to student well-being. While findings on the effectiveness of mindfulness programs are mixed, several studies indicate significant benefits. For instance, Maynard et al. (2017), Mohammed, Pappous and Sharma (2018), and Arveson (2019) all report substantial improvements in stress reduction and overall well-being attributable to mindfulness training. Conversely, some research, such as O'Driscoll et al. (2019), suggests that these benefits are less definitive. This inconsistency highlights the need for further investigation, particularly within educational contexts, where only a small percentage of mindfulness research has focused on student populations. Baminiwatta and Solangaarachchi (2021) found that merely 6.1% of mindfulness studies published from 2016 to 2021 addressed its application in education, with even fewer conducted in Northern Iraq. This study aims to address this gap by examining the impact of a mindfulness training program on stress reduction and well-being among high school students in Northern Iraq. The following research questions will guide this investigation:

1. What is the impact of mindfulness training on the reduction of stress in high school students in Northern Iraq?
2. How does mindfulness affect the well-being of high school students in Northern Iraq?
3. What are the implications of implementing mindfulness training programs in the educational sector in Northern Iraq?

The findings of this study could significantly impact academia in Northern Iraq by contributing to the existing literature on mindfulness in education. Additionally, the results may provide valuable insights for school authorities, informing resource allocation and potentially advocating for the incorporation of mindfulness programs within the educational framework. If the study demonstrates a significant relationship between mindfulness training and improved student well-being as well as reduced stress, it could serve as a validated approach to addressing academic stress. Long-term, this could lead to improved student performance and resilience, fostering a healthier academic environment that benefits future generations. In summary, this research seeks to illuminate the role of mindfulness in enhancing the well-being of high school students in Northern Iraq, providing a foundation for future interventions aimed at mitigating academic stress.

Literature Review

Mindfulness

The concept of mindfulness, as introduced to the social sciences and psychology, is largely attributed to Kabat-Zinn (1991), who integrated techniques derived from Buddhism into his stress reduction clinic. Mindfulness is characterized by the deliberate and conscious awareness of the present moment (Moreno-Gómez et al., 2023). It is understood that health is closely linked to both social and mental well-being, with deficiencies in these areas contributing to the emergence of mental health issues (Sadooghiasl et al., 2022). Sharkey (2015) highlights the ongoing debates within the literature regarding the definition and components of mindfulness, which have fuelled further research into the subject. Kabat-Zinn (1991) defines mindfulness as an awareness cultivated by intentionally focusing on the current moment without judgment. Haydon et al. (2019) expand on this definition, emphasizing that mindfulness aims to transform individuals' relationships with stressful thoughts and events. Furthermore, Alberts and Hülsheger (2015) note that while mindfulness is often equated with meditation, it encompasses a range of meditative exercises designed to enhance awareness. Mindfulness techniques encourage individuals to confront their experiences directly rather than avoiding those (Marciniak et al., 2020). These practices facilitate emotional processing, allowing individuals to acknowledge and analyse their feelings without becoming overwhelmed by them (Frostadottir & Dorjee, 2019; Schanche et al., 2021; Skolzkov, 2024). However, Flynn, Kells and Joyce (2021) points out that there is resistance among some practitioners to adopt evolving methodologies, leading to reliance on traditional approaches. Mindfulness programs have been employed to mitigate mental health issues (Bokk & Forster, 2022) and enhance overall well-being (Fisher, Li, & Malabu, 2023). These programs can vary in duration and format, including both online and offline delivery, and typically involve various meditation techniques aimed at fostering present-moment awareness (Borjalilu, Mazaheri, & Talebpour, 2019). The core principle of mindfulness is to cultivate greater consciousness and acceptance of one's current circumstances (Pan et al., 2024). During mindfulness

meditation, individuals focus on sensory experiences, including breath awareness, and are encouraged to accept emotions as they arise without reacting impulsively (Galante et al., 2021; Huberty et al., 2019).

Stress

Stress is defined by Janssen et al. (2018) as a physiological response to perceived loss of control in challenging circumstances. Lazarus (1966), a prominent figure in stress research, characterizes stress as a mismatch between available resources and perceived demands during interactions with one's environment. Rudland, Golding and Wilkinson (2020) further describe stress as a form of illness, indicating its detrimental effects on health. Acosta-Gómez et al. (2018) identifies various sources of stress, including marriage, work, school, and family, noting that the consequences remain consistent across these contexts (Reddy, Menon, & Thattil, 2018). The transactional model of stress, proposed by Lazarus (1966), is widely recognized and posits that an individual's perception influences their experience of stress. This perspective is supported by Rudland et al. (2020), who elaborate on transformative and constructivist theories of stress, suggesting that coping strategies developed by individuals significantly impact their stress levels. These strategies may include avoidance, seeking support, mind-set adjustments, personality traits, and the perception of stressors as challenges rather than hindrances. Numerous studies highlight that students, particularly in academic settings, encounter significant levels of stress (Aherne et al., 2016; Pascoe et al., 2020; Xu et al., 2021). Academic stress has been identified as the primary source of stress among college students (Barbayannis et al., 2022).

Factors contributing to academic stress include anxiety surrounding examinations, pressure to achieve specific grades, and familial expectations regarding academic performance. Arab Ghaeni et al. (2017) note that students often lack the assertiveness to contest decisions imposed by parents regarding their educational paths. Moreover, high school students face additional stressors as they navigate the transition into young adulthood (Liu et al., 2019). Martinez and Zhao (2018) identify various sources of stress for students, including adaptation to new environments, academic performance, and behavioural issues. Broderick and Jennings (2012) also cite social media pressures, romantic relationships, and parental expectations as significant stressors. The rise of academic stress is particularly pronounced during examination periods, which often represent critical transitions, such as from high school to college. The increasing prevalence of online learning has also introduced new stressors, as many students face challenges related to limited access to resources (D'Amato, 2020; Son et al., 2020). The adverse effects of academic stress can include poor academic performance (Pascoe et al., 2020), increased dropout rates (Pascoe et al., 2020), and severe mental health outcomes, including depression and suicidal ideation (Liu et al., 2019; Reddy et al., 2018). It can also diminish motivation, hinder educational achievement (Fauzi et al., 2021), and elevate the likelihood of students disengaging from their studies (González-Valero et al., 2019).

The interplay of stressors from various aspects of students' lives including family, peers, and educational environments contributes to significant psychological distress (Pan et al., 2024). Individual characteristics such as age, gender, personality, and overall health also influence how students respond to stress (Uchil, 2017). Students may experience a lack of motivation, leading to disengagement or failure in their studies (Uchil, 2017). To address these challenges, educators should implement alternative teaching methods to maintain student engagement and foster a positive school environment (Clabaugh, Duque, & Fields, 2021; Reddy et al., 2018). Coping strategies for managing stress can be broadly categorized into emotionally focused and problem-focused approaches. Emotionally focused strategies often involve avoidance and minimization of the stressor (Lomas et al., 2017), while problem-focused strategies aim to address the stressor through external support, therapeutic interventions, and lifestyle changes (Holman, Johnson, & O'Connor, 2018). Bazzano et al. (2018) emphasize the importance of developing effective coping mechanisms to counteract the multitude of stressors faced by students. Mindfulness techniques, in particular, are continually evolving and remain a crucial area of research (Dawson et al., 2020). Addressing academic stress at its root is essential, as unmitigated stress can lead to serious issues such as substance abuse (McConville, McAleer, & Hahne, 2017) and a range of mental health disorders, including depression and anxiety (Flowers & Bernard, 2020; Gao et al., 2022). It is crucial for students to engage in healthy behaviors, such as maintaining a balanced diet, exercising regularly, and managing their time effectively. Avoiding substances like narcotics and excessive caffeine can also help mitigate anxiety and promote overall well-being (Lampe & Müller-Hilke, 2021).

Well-Being

Well-being is a multifaceted concept encompassing optimal functioning and subjective experiences of pleasure, enjoyment, meaning, and fulfilment (Tang, Tang, & Gross, 2019). Xu et al. (2021) reiterate the complexity of well-being, which incorporates physical, mental, and psychological dimensions. Ruggeri et al. (2020) define well-being as a state of contentment, while Feller et al. (2018) suggest it reflects a balance across various aspects of life, including relationships and emotions. Particularly during the

transition from adolescence to adulthood, well-being is crucial for young individuals, as it significantly influences cognitive processes and behaviours. Psychological well-being has been shown to correlate with stress levels, indicating that these two constructs are often interrelated in psychological research. Theories of well-being generally categorize it into two distinct approaches: eudemonic and hedonic. Eudemonic well-being focuses on holistic fulfilment and meaning, whereas hedonic well-being emphasizes pleasure and enjoyment (Tang, Castle, & Choong, 2015; Tang et al., 2019). The hedonic perspective posits that an abundance of pleasure relative to pain signifies higher well-being (Moorhouse, Lee, & Herd, 2021). Chaves (2021) adds that well-being does not necessitate the absence of pain but rather suggests a minimization of its impact, with increased desires also contributing to perceptions of well-being.

The Flourishing Theory integrates both eudemonic and hedonic perspectives, asserting that well-being involves positive experiences related to emotions, relationships, and meaning in life. Seligman (2011), the theory's proponent, emphasizes the importance of flourishing as a central aspect of well-being, a notion supported by Chaves (2021), who highlights the role of social relationships in enhancing well-being. Recent studies have increasingly focused on mindfulness as a means of promoting well-being. Janssen et al. (2018) notes that mindfulness practices have gained popularity in addressing rising mental health issues. The psychological field recognizes mindfulness as a promising approach to mitigating mental health problems and enhancing quality of life (Melis et al., 2022; Moreno-Gómez et al., 2023). Arab Ghaeni et al. (2017) assert that mindfulness fosters greater awareness among students regarding their abilities and surroundings, leading to improved psychological functioning (Mestre et al., 2019). This heightened awareness may reduce feelings of pressure and anxiety, contributing to an enhanced sense of control over one's future (van der Schans et al., 2022).

Various studies have demonstrated the positive effects of mindfulness on well-being. For example, Huberty et al. (2019) conducted an eight-week randomized trial utilizing the mobile application Calm, which yielded significant reductions in stress among participants. However, the study's limitations included a homogeneous sample comprising only English-speaking participants. The authors recommended the inclusion of more diverse populations in future research. Galante et al. (2021) conducted a longitudinal study involving university students and reported improvements in stress and well-being, although no significant differences in workload management were observed between groups. While the findings indicated lasting benefits up to a year after the intervention, the authors acknowledged potential biases related to participants' expectations. Conversely, Fisher et al. (2023) found that while mindfulness reduced stress immediately post-intervention, effects diminished over time. Borjalilu et al. (2019) employed a mixed-methods approach utilizing the Amgar app and face-to-face therapy. Results indicated that the combined intervention was more effective in reducing stress, depression, and anxiety compared to either method alone, although limitations regarding sample size and generalizability were noted. Choe, Jorgensen and Sheffield (2020) examined the moderating role of environmental factors in the effectiveness of mindfulness programs.

Their study revealed that participants in natural environments experienced greater stress reduction and well-being enhancement compared to those in non-natural settings. Other studies further support the positive correlation between mindfulness and psychological well-being. Jazaieri and Shapiro (2017) found that mindfulness significantly enhanced psychological well-being, while Bazzano et al. (2018) reported notable improvements in quality of life among elementary students participating in mindfulness programs. Tang et al. (2019) emphasized that mindfulness fosters synergy between mind and body, leading to enhanced psychological well-being. Recent interventions have demonstrated the efficacy of mindfulness training in various populations. For instance, Walsh, Saab and Farb (2019) reported that a three-week mindfulness program using the Wildflowers app significantly increased subjective well-being among participants. Additionally, Dinesh et al. (2022) noted that mindfulness practices supported employees in achieving wellness. Mostafazadeh et al. (2019) conducted an experiment with high school female students, demonstrating a significant reduction in stress and improvement in coping skills following an eight-session mindfulness program.

However, the lack of follow-up limited the ability to assess long-term efficacy. Alomari (2023) explored the impact of mindfulness on student achievement by gender and found a weak correlation, with no significant differences between genders. O'Driscoll et al. (2019) reviewed mindfulness-based programs and found that only four out of nine studies reported significant stress reduction, indicating variability in outcomes. Özdemir and Kavak Budak (2022) observed positive effects of mindfulness training on hope and well-being among schizophrenic patients. Similarly, Mohammed et al. (2018) highlighted the benefits of mindfulness for athletes, demonstrating reductions in stress and increased mindfulness awareness. Lo, Ngai and Yam (2021) studied postgraduate healthcare students experiencing high stress levels and reported that mindfulness programs alleviated stress and improved mood and client interactions compared to a control group. Lothes et al. (2021) integrated yoga and dialectical behaviour therapy techniques with mindfulness

training for elementary students, yielding significant reductions in stress and anxiety compared to controls. Overall, the evidence suggests that mindfulness has a substantial and positive impact on stress reduction and well-being across various populations.

Research Methodology

Research Design

This study utilized an experimental research design, specifically an explanatory approach. This design is particularly effective for determining cause-and-effect relationships in a controlled environment. The primary aim was to assess the impact of mindfulness practices on stress reduction and overall well-being among high school students. Research indicates that mindfulness can lead to indirect benefits, such as reducing oxidative stress through enhanced awareness. Psychological studies suggest that meditation influences two distinct stress channels in the brain, affecting areas related to focus and emotional regulation. Mindfulness-based stress reduction programs include techniques such as seated meditation, breathing exercises, and Hatha yoga, which help participants concentrate on internal sensations and emotions. To evaluate these effects, a control group was established alongside the treatment group, allowing for meaningful comparisons. Engaging in mindfulness practices may enhance mood regulation and decrease stress, tension, and negative emotions. Students participated in therapy sessions with a psychotherapist, who guided discussions about personal challenges, education, and overall well-being. A quantitative approach was adopted for its replicability and verifiability in future studies (Rose, McKinley, & Baffoe-Djan, 2019). Data analysis aimed to deepen understanding of societal impacts, utilizing empirical models to investigate relevant circumstances.

Population and Sampling

Given the impracticality of approaching the entire population, a sample of high school students was selected for this study. A total of 40 students formed the experimental group, while another 40 students constituted the control group. Stratified random sampling was employed to ensure adequate representation of all demographic segments. This method enhances the reliability of the sample, as it guarantees inclusion from various divisions based on key characteristics. For this study, participants were grouped by gender, creating two strata: male and female. Stratified random sampling involves segmenting a population into subgroups defined by common traits, such as socioeconomic status or educational background (Mishra & Alok, 2017). Random selection within these strata ensured balance and validity. Data was recorded promptly, and an expert facilitated the mindfulness interventions to enhance research authenticity. Participants were unaware of their group assignments to mitigate the influence of expectation on results. Established, reliable measurement tools were employed to further ensure the validity of the findings.

Demographic Profile

Table 1 presents the distribution of descriptive statistics for the study. Each group comprised 40 students, ensuring comparability between the experimental and control units. Both groups were matched in terms of demographic characteristics to facilitate accurate comparisons of outcomes. All participants attended the sessions, and the questionnaires were fully completed and valid. Gender representation was equal, with 10 boys and 10 girls in each group. The majority of participants fell within the 16-18 age range, as depicted in Figures 1 and 2.

Table 1

Distribution of the Descriptive Statistics for the Study

Participants		Study Group	Control Group
Gender	Male	20	20
	Female	20	20
Age	14-16	16	15
	17-18	24	25 [1]

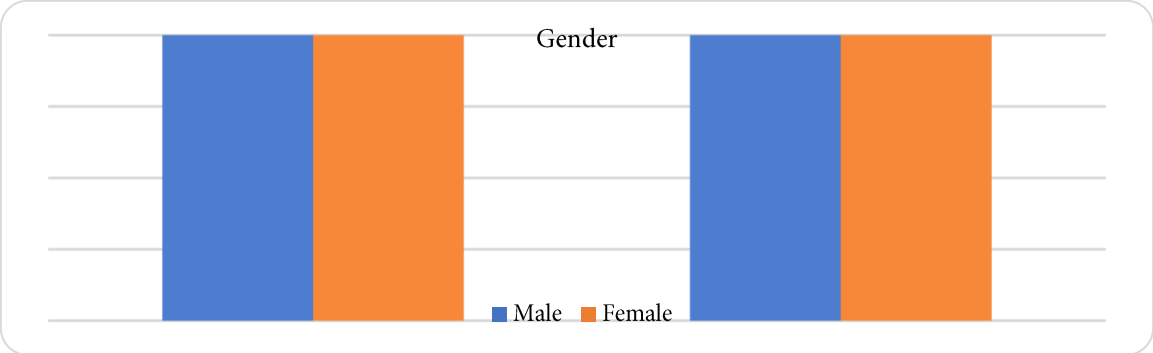

Figure 1: Illustration for the Gender Distribution.

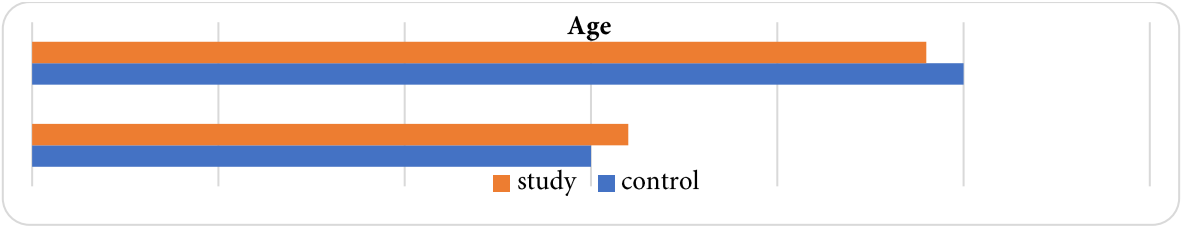

Figure 2: Age Group 16-18 of the students.

Data Collection

Selecting an effective data collection method is crucial for ensuring valid and reliable findings (Zhang, 2021). This study gathered both primary and secondary data. Primary data, collected specifically for this research, came from participants over a six-week period during which they underwent mindfulness therapy. Assessments were conducted both before and after this intervention. The theorized benefits of mindfulness included improved self-control, emotional resilience, flexibility, serenity, cognitive clarity, interpersonal skills, and enhanced empathy. These benefits were compared to establish the impact of mindfulness on stress reduction and overall well-being. Secondary data, utilized primarily for the literature review, facilitated a comparative analysis to identify similarities and differences in findings.

Research Instrument and Measurement

A structured questionnaire served as the primary research instrument (Gao & Liu, 2021). The development of this instrument involved several steps: determining necessary data, identifying potential respondents, selecting contact techniques, finalizing question topics and wording, estimating survey duration, pre-testing, and producing the final version. The study adopted established scales for measuring key variables, Mindfulness Awareness Scale (MAAS) Adapted from Brown and Ryan (2003) and Carlson and Brown (2005), this scale includes 15 items rated on a 1-6 Likert scale to assess trait mindfulness. Perceived Stress Scale (Cohen, 1988) this scale quantifies the level of stress individuals perceive in their current circumstances, focusing on the balance between perceived demands and coping abilities. Psychological Well-Being Scale (Ryff & Singer, 2006). This scale measures six dimensions of well-being, including independence, competence, self-development, quality relationships, a sense of purpose, and personal growth. Responses were measured on a five-point Likert scale, ranging from "extremely satisfied" to "very dissatisfied."

Analysis

To evaluate the internal consistency of the research instruments, the researcher applied the Cronbach Alpha method, yielding a high value above 0.50, indicating reliability. Descriptive statistics, particularly mean values, were also computed. T-tests were employed to compare pre-test and post-test results for the study and control groups regarding perceived stress and well-being. Paired t-tests facilitated comparisons within the same group before and after mindfulness training, allowing insights into the impact of the intervention. This method was particularly useful for analysing changes in individual participants over time. The results were compared against the control group, which did not undergo any intervention, to assess the effectiveness of the mindfulness training.

Results

Pre-Test and Post-Test Results for the Control Group by Gender

Table 2 illustrates paired sample statistics reflecting changes in perceived stress, well-being, and mindfulness for the control group before and after the experiment. The ability to manage thoughts and emotions effectively is crucial for students, and fostering this skill can encourage more intentional behaviour. The results show a decrease in perceived stress for both males and females in the control group, with mean values dropping from 62.45 to 58.95 for females and from 35.05 to 34.7 for males. In contrast, both groups exhibited a decline in well-being, with females' scores decreasing from 101.55 to 96.3 and males' scores from 61.85 to 55.7. Additionally, mindfulness awareness also diminished: females' mean dropped from 53.45 to 46.45, while males' awareness decreased from 51.15 to 45.00. Table 3 indicates that only mindfulness awareness showed significant changes by gender, with a p-value of 0.023 for females, below the alpha threshold of 0.05, suggesting gender influences the impact of mindfulness. Table 4 presents pre- and post-test results for the study group differentiated by gender. Notably, there was a slight increase in perceived stress for females (from 32.45 to 33.75) while males experienced a reduction (from 34.70 to 32.05). Both genders exhibited increased well-being, with females rising from 58.95 to 62.45 and males from 55.70 to 60.05. Furthermore, mindfulness awareness showed significant improvements for both genders, with females increasing from 39.80 to 53.25 and males from 43.15 to 51.40.

Table 2

Pre-Test and Post-Test Results Control Group

Paired Samples Statistics Control Group					
		Mean	**N**	**Std. Deviation**	**Std. Error Mean**
Pair 1	Pre-Test Female Perceived Stress	62.4500	20	8.87026	1.98345
	Post-Test Female Perceived Stress	58.9500	20	6.33682	1.41696
Pair 2	Pre-Test Male Perceived Stress	35.0500	20	9.56130	2.13797
	Post-Test Male Perceived Stress	34.7000	20	4.64645	1.03898
Pair 3	Pre-Test Female Well-Being	101.5500	20	13.14084	2.93838
	Post-Test Female Well-Being	96.3000	20	14.33472	3.20534
Pair 4	Pre-Test Male Well-Being	61.8500	20	15.13892	3.38517
	Post-Test Male Well-Being	55.7000	20	9.57024	2.13997
Pair 5	Pre-Test Female Mindfulness	53.4500	20	9.97088	2.22956
	Post-Test Female Mindfulness	46.4500	20	7.94372	1.77627
Pair 6	Pre-Test Male Mindfulness	51.1500	20	7.98864	1.78631
	Post-Test Male Mindfulness	45.0000	20	11.65287	2.60566

Table 3

Paired Samples Test Control

		Paired Differences					**T**	**df**	**Sig. (2-Tailed)**
		Mean	**Std. Deviation**	**Std. Error Mean**	**95% Confidence Interval of the Difference**				
					Lower	**Upper**			
Pair 1	Pre-Control Female Stress – Post Control Female Stress	3.50000	9.93399	2.22131	-1.14925	8.14925	1.576	19	.132
Pair 2	Pre-Control Male Stress- Post Control Male Stress	-1.73684	7.89404	1.81102	-5.54165	2.06796	-.959	18	.350
Pair 3	Pre-Control Female Well-Being – Post Control Female Well-Being	5.25000	15.49151	3.46401	-2.00025	12.50025	1.516	19	.146
Pair 4	Pre-Control Male Well-Being – Post Control Male Well-Being	6.15000	16.63628	3.71999	-1.63602	13.93602	1.653	19	.115
Pair 5	Pre-Control Female Mindfulness – Post Control Female Mindfulness	7.00000	12.70309	2.84050	1.05477	12.94523	2.464	19	.023
Pair 6	Pre-Control Male Mindfulness – Post Control Male Mindfulness	6.15000	16.20031	3.62250	-1.43198	13.73198	1.698	19	.106

Table 4

Pre-Test and Post-Test Results Study Group for Study Group by Gender

Paired Samples Statistics Study Group					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-Test Female Perceived Stress	32.4500	20	4.50117	1.00649
	Post-Test Female Perceived Stress	33.7500	20	5.56185	1.24367
Pair 2	Pre-Test Male Perceived Stress	34.7000	20	5.56185	1.24367
	Post-Test Male Perceived Stress	32.0500	20	6.32018	1.41324
Pair 3	Pre-Test Female Well-Being	58.9500	20	6.33682	1.41696
	Post-Test Female Well-Being	62.4500	20	8.87026	1.98345
Pair 4	Pre-Test Male Well-being	55.7000	20	9.57024	2.13997
	Post-Test Male Well-Being	60.0500	20	7.72879	1.72821
Pair 5	Pre-Test Female Mindfulness	39.8000	20	10.46599	2.34027
	Post-Test Female Mindfulness	53.2500	20	6.93485	1.55068
Pair 6	Pre-Test Male Mindfulness	43.1500	20	11.18869	2.50187
	Post-Test Male Mindfulness	51.4000	20	7.01427	1.56844

Paired Samples Test

The test conducted aimed to assess the significance of changes in mindfulness awareness before and after the mindfulness training program, specifically focusing on gender differences within the study group. Research indicates that many transgender individuals report enhanced life satisfaction following transition, often linked to improved social adjustment, stronger relationships, and greater overall well-being. The results presented in Table 5 reveal significant changes in mindfulness for both female and male participants, with p-values of 0.000 and 0.011, respectively, both falling below the alpha threshold of 0.05. This indicates a statistically significant impact of the mindfulness training. Notably, the change in mindfulness awareness was greater among female participants compared to their male counterparts, suggesting that the mindfulness intervention was particularly effective for females in this study group.

Table 5

Paired Samples Test Study Group

		Paired Differences					T	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre-Female Stress – Post female Stress	1.30000	6.58627	1.47273	-1.78247	4.38247	.883	19	.388
Pair 2	Pre-Male Stress – Post Male Stress	-1.70000	8.04657	1.79927	-5.46591	2.06591	-.945	19	.357
Pair 3	Pre-Female Well-Being – Post Female Well-Being	3.50000	11.43632	2.55724	-1.85236	8.85236	1.369	19	.187
Pair 4	Pre-Male Well-Being – Post Male Well-Being	4.35000	12.43626	2.78083	-1.47035	10.17035	1.564	19	.134
Pair 5	Pre-Female Mindfulness – Post Female Mindfulness	13.45000	13.36718	2.98899	7.19397	19.70603	4.500	19	.000
Pair 6	Pre-Male Mindfulness – Post Male Mindfulness	8.25000	13.10635	2.93067	2.11604	14.38396	2.815	19	.011

Pre-Test and Post-Test Results for Control and Study Group

The table below presents the paired sample statistics for perceived stress, well-being, and mindfulness for both the study and control groups before and after the mindfulness training program. As indicated in Table 6, the perceived stress level in the control group decreased slightly, with mean scores moving from 47.60 to 46.80. In contrast, the study group showed a more pronounced reduction in perceived stress, dropping from 33.57 to 22.90. Regarding well-being, the control group experienced a decline, with scores falling from 81.70 to 76.06. Conversely, the study group demonstrated an increase in well-being, rising from 57.32 to 61.25. A similar trend was noted in mindfulness awareness, where the control group's scores decreased from 52.30 to 45.72. In stark contrast, the study group saw an increase in mindfulness awareness, moving from 41.47 to 52.32. These results collectively highlight the positive impact of the mindfulness training on stress reduction, enhanced well-being, and increased mindfulness awareness among participants in the study group.

Table 6

Paired Samples Statistics Pre-Test and Post-Test Results

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-Control Group Perceived Stress	47.6000	40	16.60676	2.62576
	Post Control Stress	46.8250	40	13.44864	2.12642
Pair 2	Pre-Study Perceived Stress	33.5750	40	4.65688	.73632
	Post Study Perceived Stress	32.9000	40	5.93901	.93904
Pair 3	Pre-Control Well-Being	81.7000	40	24.49301	3.87269
	Post Control Well-Being	76.0000	40	23.81984	3.76625
Pair 4	Pre-Study Well-Being	57.3250	40	8.17873	1.29317
	Post Study Well Being	61.2500	40	8.30122	1.31254
Pair 5	Pre-Control Mindfulness	52.3000	40	8.99344	1.42199
	Post Control Mindfulness	45.7250	40	9.87093	1.56073
Pair 6	Pre-Study Mindfulness	41.4750	40	10.82729	1.71194
	Post Study Mindfulness	52.3250	40	6.94811	1.09859

Paired Samples Test

The aim of the analysis presented in Table 7 is to assess the significance of the results before and after the mindfulness training period for both the control and study groups, further corroborating the earlier findings. The data indicate that changes in perceived stress for both groups were not statistically significant, as their p-values exceeded the alpha threshold of 0.05. This suggests that although there was a positive decrease in stress levels, it was not statistically meaningful. In contrast, the changes observed in well-being and mindfulness awareness were significant. For the control group, the p-value for well-being was 0.029, indicating significant change, as it is below the alpha level. The study group also showed significant improvement in well-being with a p-value of 0.042, again below 0.05. Moreover, the changes in mindfulness awareness were significant as well, with p-values of 0.006 and 0.000 before and after the training, respectively. Table 8 further illustrates that the differences observed between the control and study groups after the mindfulness intervention were substantial and statistically significant. This supports the conclusion that the mindfulness training program led to meaningful changes in well-being and mindfulness awareness among participants in the intervention group compared to those who did not undergo the training.

Table 7

Paired Samples Test Pre and Post Study

		Paired Differences					T	df	Sig. (2-Tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre-Control Stress -Post Control Stress	.77500	9.21395	1.45685	-2.17176	3.72176	.532	39	.598
Pair 2	Pre-Study Stress – Post Study Stress	.67500	6.53742	1.03366	-1.41577	2.76577	.653	39	.518
Pair 3	Pre-Well-Being Control – Post Well-Being Control	5.70000	15.87322	2.50978	.62350	10.77650	2.271	39	.029
Pair 4	Pre-Study Well-Being – Post Study Well-Being	-3.92500	11.80045	1.86582	-7.69897	-.15103	-2.104	39	.042
Pair 5	Pre-Control Mindfulness – Post Control Mindfulness	6.57500	14.37571	2.27300	1.97743	11.17257	2.893	39	.006
Pair 6	Pre study Mindfulness – Post Study Mindfulness	-10.85000	13.32926	2.10754	-15.11290	-6.58710	-5.148	39	.000

Table 8

Independent T-Test and Independent Samples Test

		Levene's Test for Equality of Variances		T-Test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-Tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Pre-Stress	Equal Variances Assumed	3.482	.070	9.640	38	.000	31.30000	3.24694	24.72691	37.87309
	Equal Variances Not Assumed			9.640	30.420	.000	31.30000	3.24694	24.67270	37.92730
Post-Stress	Equal Variances Assumed	.295	.590	10.685	38	.000	27.85000	2.60655	22.57332	33.12668
	Equal Variances Not Assumed			10.685	35.530	.000	27.85000	2.60655	22.56125	33.13875
Pre Well-Being	Equal Variances Assumed	.141	.709	10.176	38	.000	48.75000	4.79071	39.05171	58.44829
	Equal Variances Not Assumed			10.176	35.849	.000	48.75000	4.79071	39.03257	58.46743
Post Well-Being	Equal Variances Assumed	3.119	.085	5.631	38	.000	29.50000	5.23877	18.89466	40.10534
	Equal Variances Not Assumed			5.631	32.384	.000	29.50000	5.23877	18.83393	40.16607
Pre Mindfulness	Equal Variances assumed	3.129	.085	4.117	38	.000	21.65000	5.25901	11.00368	32.29632
	Equal Variances Not Assumed			4.117	32.611	.000	21.65000	5.25901	10.94561	32.35439
Post Mindfulness	Equal Variances Assumed	3.496	.069	-3.043	38	.004	-13.90000	4.56805	-23.14754	-4.65246
	Equal Variances Not Assumed			-3.043	30.241	.005	-13.90000	4.56805	-23.22609	-4.57391

Discussion

The findings from the mindfulness training program indicate a nuanced relationship between perceived stress, well-being, and mindfulness awareness among high school students. While the study group experienced a positive yet statistically insignificant decrease in perceived stress, they did show significant increases in well-being and mindfulness awareness. This aligns with Bokk and Forster's (2022) research, which demonstrated that mindfulness training enhances somatosensory attention and impacts brain functions associated with tactile behaviour. The results also highlighted minimal differences between male and female participants, though females exhibited greater changes and reported higher stress levels. This observation supports previous studies (Barbayannis et al., 2022; Lee, Jeong, & Kim, 2021; Matud et al., 2020; Tumminia et al., 2022) that found females generally experience more stress than males. Interestingly, the control group demonstrated declines in stress, well-being, and mindfulness awareness, possibly influenced by the timing of data collection, which coincided with the students' examination preparations. This finding corroborates existing literature suggesting that examination periods are associated with heightened stress and reduced well-being (Karyotaki et al., 2020; Yousif, Arbab, & Yousef, 2022). Given the significant differences observed between the study and control groups, integrating mindfulness practices in educational settings could be beneficial for stress reduction. As McBride et al. (2022) noted, mindfulness contributes to decreased stress and promotes better health outcomes. Students who participated in the mindfulness program may develop a more positive outlook towards examinations, which Uchil (2017) suggests is crucial for academic success. The study underscores the potential of mindfulness training to enhance attention and coping mechanisms in stressful situations, particularly in the lead-up to exams. Williams et al. (2022) and Melis et al. (2022) support this, highlighting that mindfulness training fosters emotional regulation and improves overall meditation experiences. Incorporating mindfulness programs into school curricula, especially during high-stress periods like national examinations, could help alleviate student anxiety and improve academic performance. The significant changes observed suggest that mindfulness training is a valuable tool for supporting students' mental health and academic success. While the current results reflect short-term effects, further research is warranted to explore the long-term benefits of mindfulness training on student well-being and academic outcomes. Understanding how these practices influence students over time could provide deeper insights into their efficacy and integration within educational frameworks.

Conclusion

The study's findings support existing literature that emphasizes the positive effects of mindfulness on reducing stress and enhancing well-being and mindfulness awareness. However, it also revealed an unexpected result: both the study and control groups exhibited insignificant decreases in perceived stress. A significant contribution of this research is the highlighted role of gender in mindfulness awareness, with females reporting higher stress levels than males. This indicates the need for tailored mindfulness interventions that address the specific stressors faced by female students. The results underscore the importance of incorporating mindfulness training into school curricula, particularly during high-stress periods like examinations. The significant differences between the study and control groups demonstrate the potential of mindfulness programs to enhance students' academic performance and overall well-being. This research adds valuable insights to the literature, particularly in Northern Iraq, where mindfulness studies are still emerging. Moreover, the findings emphasize the necessity of addressing students' emotional needs alongside their educational requirements. Given that this study utilized a quantitative approach and focused on a small sample of senior high school students, future research should consider employing a mixed-methods approach. Incorporating qualitative elements could provide a deeper understanding of participants' experiences and perceptions of mindfulness training. Additionally, conducting studies with freshmen in college would be beneficial, as these students face a range of new challenges and stressors. The current study's short follow-up period limits insights into the longevity of the mindfulness training's effects, so future research should focus on longitudinal studies to assess the lasting impact of mindfulness interventions over time. In summary, this study highlights the critical need for mindfulness programs in educational settings and suggests a path forward for future research to build upon these findings.

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There is no conflict of interest among the authors.

Data Availability

All data generated or analysed during this study are included in the manuscript.

Code Availability

Not applicable.

Author's Contributions

All author is contributed to the design and methodology of this study, the assessment of the outcomes and the writing of the manuscript

References

Acosta-Gómez, M. G., De la Roca-Chiapas, J. M., Zavala-Bervena, A., Cisneros, A. E. R., Pérez, V. R., Rodrigues, C. D. S., et al. (2018). Stress in high school students: A descriptive study. *Journal of Cognitive Behavioral Therapy, 1*(1), 1-10. https://oap-journals.com/jcbt/article/706

Aherne, D., Farrant, K., Hickey, L., Hickey, E., McGrath, L., & McGrath, D. (2016). Mindfulness based stress reduction for medical students: optimising student satisfaction and engagement. *BMC Medical Education, 16*(1), 209. https://doi.org/10.1186/s12909-016-0728-8

Alberts, H. J. E. M., & Hülsheger, U. R. (2015). Applying Mindfulness in the Context of Work: Mindfulness-Based Interventions. In J. Reb & P. W. B. Atkins (Eds.), *Mindfulness in Organizations: Foundations, Research, and Applications* (pp. 100-132). Cambridge University Press. https://doi.org/10.1017/CBO9781107587793.007

Alomari, H. (2023). Mindfulness and its relationship to academic achievement among university students. *Frontiers in Education, 8*, 1179584. https://doi.org/10.3389/feduc.2023.1179584

American Psychological Association. (2020). *Stress in America 2020: A National Mental Health Crisis*. https://www.apa.org/news/press/releases/stress/2020/report-october

Arab Ghaeni, M., Hashemian, k., Mojtabaei, M., majd ara, E., & Aghabeiki, A. (2017). The effect of mindfulness training (MBSR) on the increasing assertiveness among anxious students. *Studies in Medical Sciences, 28*(2), 119-129. http://umj.umsu.ac.ir/article-1-3741-en.html

Arveson, J. L. (2019). Reduction of Stress in High School Freshman Through Mindfulness Practice. *Capstone Projects and Master's Theses*, 648. https://digitalcommons.csumb.edu/caps_thes_all/648

Baminiwatta, A., & Solangaarachchi, I. (2021). Trends and Developments in Mindfulness Research over 55 Years: A Bibliometric Analysis of Publications Indexed in Web of Science. *Mindfulness, 12*(9), 2099-2116. https://doi.org/10.1007/s12671-021-01681-x

Barbayannis, G., Bandari, M., Zheng, X., Baquerizo, H., Pecor, K. W., & Ming, X. (2022). Academic Stress and Mental Well-Being in College Students: Correlations, Affected Groups, and COVID-19. *Frontiers in Psychology, 13*, 886344. https://doi.org/10.3389/fpsyg.2022.886344

Bazzano, A. N., Anderson, C. E., Hylton, C., & Gustat, J. (2018). Effect of mindfulness and yoga on quality of life for elementary school students and teachers: results of a randomized controlled school-based study. *Psychology Research and Behavior Management, 11*(null), 81-89. https://doi.org/10.2147/PRBM.S157503

Bokk, O., & Forster, B. (2022). The Effect of a Short Mindfulness Meditation on Somatosensory Attention. *Mindfulness, 13*(8), 2022-2030. https://doi.org/10.1007/s12671-022-01938-z

Borjalilu, S., Mazaheri, M. A., & Talebpour, A. (2019). Effectiveness of Mindfulness-Based Stress Management in The Mental Health of Iranian University Students: A Comparison of Blended Therapy, Face-to-Face Sessions, and mHealth App (Aramgar). *Iranian Journal of Psychiatry and Behavioral Sciences, 13*(2), e84726. https://doi.org/10.5812/ijpbs.84726

Broderick, P. C., & Jennings, P. A. (2012). Mindfulness for adolescents: A promising approach to supporting emotion regulation and preventing risky behavior. *New Directions for Youth Development, 2012*(136), 111-126. https://doi.org/10.1002/yd.20042

Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology, 84*(4), 822-848. https://doi.org/10.1037/0022-3514.84.4.822

Carlson, L. E., & Brown, K. W. (2005). Validation of the Mindful Attention Awareness Scale in a cancer population. *Journal of Psychosomatic Research, 58*(1), 29-33. https://doi.org/10.1016/j.jpsychores.2004.04.366

Chaves, C. (2021). Wellbeing and flourishing. In M. L. Kern & M. L. Wehmeyer (Eds.), *The Palgrave Handbook of Positive Education* (pp. 273-295). Springer International Publishing Cham. https://doi.org/10.1007/978-3-030-64537-3_11

Choe, E. Y., Jorgensen, A., & Sheffield, D. (2020). Does a natural environment enhance the effectiveness of Mindfulness-Based Stress Reduction (MBSR)? Examining the mental health and wellbeing, and nature connectedness benefits. *Landscape and Urban Planning, 202*, 103886. https://doi.org/10.1016/j.landurbplan.2020.103886

Clabaugh, A., Duque, J. F., & Fields, L. J. (2021). Academic Stress and Emotional Well-Being in United States College Students Following Onset of the COVID-19 Pandemic. *Frontiers in Psychology, 12*, 628787. https://doi.org/10.3389/fpsyg.2021.628787

Cohen, S. (1988). Perceived Stress in a Probability Sample of the United States. In S. Spacapan & S. Oskamp (Eds.), *The Social Psychology of Health* (pp. 31-67). Sage Publications.

D'Amato, A. (2020). Capital structure, debt maturity, and financial crisis: empirical evidence from SMEs. *Small Business Economics, 55*(4), 919-941. https://doi.org/10.1007/s11187-019-00165-6

Dawson, A. F., Brown, W. W., Anderson, J., Datta, B., Donald, J. N., Hong, K., et al. (2020). Mindfulness-Based Interventions for University Students: A Systematic Review and Meta-Analysis of Randomised Controlled Trials. *Applied Psychology: Health and Well-Being, 12*(2), 384-410. https://doi.org/10.1111/aphw.12188

Dinesh, T. K., Shetty, A., Dhyani, V. S., T.S, S., & Dsouza, K. J. (2022). Effectiveness of mindfulness-based interventions on well-being and work-related stress in the financial sector: a systematic review and meta-analysis protocol. *Systematic Reviews, 11*(1), 79. https://doi.org/10.1186/s13643-022-01956-x

Fauzi, M. F., Anuar, T. S., Teh, L. K., Lim, W. F., James, R. J., Ahmad, R., et al. (2021). Stress, Anxiety and Depression among a Cohort of Health Sciences Undergraduate Students: The Prevalence and Risk Factors. *International Journal of Environmental Research and Public Health, 18*(6), 3269. https://doi.org/10.3390/ijerph18063269

Feller, S. C., Castillo, E. G., Greenberg, J. M., Abascal, P., Van Horn, R., & Wells, K. B. (2018). Emotional Well-Being and Public Health: Proposal for a Model National Initiative. *Public Health Rep, 133*(2), 136-141. https://doi.org/10.1177/0033354918754540

Fisher, V., Li, W. W., & Malabu, U. (2023). The effectiveness of mindfulness-based stress reduction (MBSR) on the mental health, HbA1C, and mindfulness of diabetes patients: A systematic review and meta-analysis of randomised controlled trials. *Applied Psychology: Health and Well-Being, 15*(4), 1733-1749. https://doi.org/10.1111/aphw.12441

Flowers, D. W., & Bernard, A. (2020). Make Changes Early! High Stress Levels Predict Lower Academic Performance in First-Year Physical Therapy Students: A Pilot Study. *Internet Journal of Allied Health Sciences and Practice, 18*(4), 15. https://doi.org/10.46743/1540-580X/2020.1895

Flynn, D., Kells, M., & Joyce, M. (2021). Dialectical behaviour therapy: Implementation of an evidence-based intervention for borderline personality disorder in public health systems. *Current Opinion in Psychology, 37*, 152-157. https://doi.org/10.1016/j.copsyc.2021.01.002

Frostadottir, A. D., & Dorjee, D. (2019). Effects of Mindfulness Based Cognitive Therapy (MBCT) and Compassion Focused Therapy (CFT) on Symptom Change, Mindfulness, Self-Compassion, and Rumination in Clients With Depression, Anxiety, and Stress. *Frontiers in Psychology, 10*, 1099. https://doi.org/10.3389/fpsyg.2019.01099

Galante, J., Stochl, J., Dufour, G., Vainre, M., Wagner, A. P., & Jones, P. B. (2021). Effectiveness of providing university students with a mindfulness-based intervention to increase resilience to stress: 1-year follow-up of a pragmatic randomised controlled trial. *Journal of Epidemiology and Community Health, 75*(2), 151. https://doi.org/10.1136/jech-2020-214390

Gao, H., Wang, X., Huang, M., & Qi, M. (2022). Chronic academic stress facilitates response inhibition: Behavioral and electrophysiological evidence. *Cognitive, Affective, & Behavioral Neuroscience, 22*(3), 533-541. https://doi.org/10.3758/s13415-021-00974-x

Gao, L., & Liu, H. (2021). Data collection research methods in applied linguistics. Heath Rose, Jim McKinley, and Jessica Briggs Baffoe-Djan. London:Bloomsbury, (2020). x+ 296 pp. *International Journal of Applied Linguistics, 31*(1), 164-166. https://doi.org/10.1111/ijal.12329

González-Valero, G., Zurita-Ortega, F., Ubago-Jiménez, J. L., & Puertas-Molero, P. (2019). Use of Meditation and Cognitive Behavioral Therapies for the Treatment of Stress, Depression and Anxiety in Students. A Systematic Review and Meta-Analysis. *International Journal of Environmental Research and Public Health, 16*(22), 4394. https://doi.org/10.3390/ijerph16224394

Haydon, T., Alter, P., Hawkins, R., & Kendall Theado, C. (2019). "Check Yourself": Mindfulness-Based Stress Reduction for Teachers of Students With Challenging Behaviors. *Beyond Behavior, 28*(1), 55-60. https://doi.org/10.1177/1074295619831620

Holman, D., Johnson, S., & O'Connor, E. (2018). Stress Management Interventions: Improving Subjective Psychological Well-being in the Workplace. In E. Diener, S. Oishi, & L. Tay (Eds.), *Handbook of Well-being* (pp. 754-766). Salt Lake City, UT: DEF Publishers. https://research.manchester.ac.uk/files/64354486/Holman_2018_Stress_Management_Interventions.pdf

Huberty, J., Green, J., Glissmann, C., Larkey, L., Puzia, M., & Lee, C. (2019). Efficacy of the Mindfulness Meditation Mobile App "Calm" to Reduce Stress Among College Students: Randomized Controlled Trial. *JMIR Mhealth Uhealth, 7*(6), e14273. https://doi.org/10.2196/14273

Janssen, M., Heerkens, Y., Kuijer, W., van der Heijden, B., & Engels, J. (2018). Effects of Mindfulness-Based Stress Reduction on employees' mental health: A systematic review. *PloS One, 13*(1), e0191332. https://doi.org/10.1371/journal.pone.0191332

Jazaieri, H., & Shapiro, S. (2017). Mindfulness and Well-Being. In M. D. Robinson & M. Eid (Eds.), *The Happy Mind: Cognitive Contributions to Well-Being* (pp. 41-58). Springer International Publishing. https://doi.org/10.1007/978-3-319-58763-9_3

Kabat-Zinn, J. (1991). *Full Catastrophe Living: Using the Wisdom of Your Body and Mind to Face Stress, Pain, and Illness*. New York: Delacorte.

Karyotaki, E., Cuijpers, P., Albor, Y., Alonso, J., Auerbach, R. P., Bantjes, J., et al. (2020). Sources of Stress and Their Associations With Mental Disorders Among College Students: Results of the World Health Organization World Mental Health Surveys International College Student Initiative. *Frontiers in Psychology, 11*, 1759. https://doi.org/10.3389/fpsyg.2020.01759

Lampe, L. C., & Müller-Hilke, B. (2021). Mindfulness-based intervention helps preclinical medical students to contain stress, maintain mindfulness and improve academic success. *BMC Medical Education, 21*(1), 145. https://doi.org/10.1186/s12909-021-02578-y

Lazarus, R. S. (1966). *Psychological Stress and the Coping Process*. New York: McGraw-Hill.

Lee, J., Jeong, H. J., & Kim, S. (2021). Stress, Anxiety, and Depression Among Undergraduate Students during the COVID-19 Pandemic and their Use of Mental Health Services. *Innovative Higher Education, 46*(5), 519-538. https://doi.org/10.1007/s10755-021-09552-y

Linden, B., Stuart, H., & Ecclestone, A. (2023). Trends in Post-Secondary Student Stress: A Pan-Canadian Study. *The Canadian Journal of Psychiatry, 68*(7), 521-530. https://doi.org/10.1177/07067437221111365

Liu, C. H., Stevens, C., Wong, S. H. M., Yasui, M., & Chen, J. A. (2019). The prevalence and predictors of mental health diagnoses and suicide among U.S. college students: Implications for addressing disparities in service use. *Depression and Anxiety, 36*(1), 8-17. https://doi.org/10.1002/da.22830

Lo, H. H. M., Ngai, S., & Yam, K. (2021). Effects of Mindfulness-Based Stress Reduction on Health and Social Care Education: a Cohort-Controlled Study. *Mindfulness, 12*(8), 2050-2058. https://doi.org/10.1007/s12671-021-01663-z

Lomas, T., Medina, J. C., Ivtzan, I., Rupprecht, S., Hart, R., & Eiroa-Orosa, F. J. (2017). The impact of mindfulness on well-being and performance in the workplace: an inclusive systematic review of the empirical literature. *European Journal of Work and Organizational Psychology, 26*(4), 492-513. https://doi.org/10.1080/1359432X.2017.1308924

Lothes, J. E., McCool, M. W., Mochrie, K. D., Guendner, E., & St. John, J. (2021). Applying adherent DBT Principles to treatment in a partial hospital setting: An analysis over 5-years of outcomes from intake to discharge. *Journal of Clinical Psychology, 77*(11), 2431-2441. https://doi.org/10.1002/jclp.23188

Marciniak, R., Šumec, R., Vyhnálek, M., Bendíčková, K., Lázničková, P., Forte, G., et al. (2020). The Effect of Mindfulness-Based Stress Reduction (MBSR) on Depression, Cognition, and Immunity in Mild Cognitive Impairment: A Pilot Feasibility Study. *Clinical Interventions in Aging, 15*(null), 1365-1381. https://doi.org/10.2147/CIA.S249196

Martinez, T., & Zhao, Y. (2018). The Impact of Mindfulness Training on Middle Grades Students' Office Discipline Referrals. *RMLE Online, 41*(3), 1-8. https://doi.org/10.1080/19404476.2018.1435840

Matud, M. P., Díaz, A., Bethencourt, J. M., & Ibáñez, I. (2020). Stress and Psychological Distress in Emerging Adulthood: A Gender Analysis. *Journal of Clinical Medicine, 9*(9), 2859. https://doi.org/10.3390/jcm9092859

Maynard, B. R., Solis, M. R., Miller, V. L., & Brendel, K. E. (2017). Mindfulness-based interventions for improving cognition, academic achievement, behavior, and socioemotional functioning of primary and secondary school students. *Campbell Systematic Reviews, 13*(1), 1-144. https://doi.org/10.4073/CSR.2017.5

McBride, E. E., Chin, G. R., Clauser, K. S., & Greeson, J. M. (2022). Perceived Stress Mediates the Relationship Between Trait Mindfulness and Physical Symptoms of Stress: a Replication Study Using Structural Equation Modeling. *Mindfulness, 13*(8), 1923-1930. https://doi.org/10.1007/s12671-022-01928-1

McConville, J., McAleer, R., & Hahne, A. (2017). Mindfulness Training for Health Profession Students—The Effect of Mindfulness Training on Psychological Well-Being, Learning and Clinical Performance of Health Professional Students: A Systematic Review of Randomized and Non-randomized Controlled Trials. *EXPLORE, 13*(1), 26-45. https://doi.org/10.1016/j.explore.2016.10.002

Melis, M., Schroyen, G., Pollefeyt, J., Raes, F., Smeets, A., Sunaert, S., et al. (2022). The Impact of Mindfulness-Based Interventions on Brain Functional Connectivity: a Systematic Review. *Mindfulness, 13*(8), 1857-1875. https://doi.org/10.1007/s12671-022-01919-2

Mestre, J. M., Turanzas, J., García-Gómez, M., Guerra, J., Cordon, J. R., De La Torre, G. G., et al. (2019). Do Trait Emotional Intelligence and Dispositional Mindfulness Have a Complementary Effect on the Children's and Adolescents' Emotional States? *Frontiers in Psychology, 10*, 2817. https://doi.org/10.3389/fpsyg.2019.02817

Mishra, S. B., & Alok, S. (2017). *Handbook of Research Methodology: A Compendium for Scholars & Researchers*. Edu-Creation Publishing. https://www.researchgate.net/publication/319207471

Mohammed, W. A., Pappous, A., & Sharma, D. (2018). Effect of Mindfulness Based Stress Reduction (MBSR) in Increasing Pain Tolerance and Improving the Mental Health of Injured Athletes. *Frontiers in Psychology, 9*, 722. https://doi.org/10.3389/fpsyg.2018.00722

Moorhouse, B. L., Lee, J., & Herd, S. (2021). Providing remote school-based professional support to teachers during school closures caused by the COVID-19 pandemic. *Learning: Research and Practice, 7*(1), 5-19. https://doi.org/10.1080/23735082.2020.1825777

Moreno-Gómez, A., Luna, P., García-Diego, C., Rodríguez-Donaire, A., & Cejudo, J. (2023). Exploring the effects of a mindfulness-based intervention in university students: MindKinder adult version program (MK-A). *Evaluation and Program Planning, 97*, 102252. https://doi.org/10.1016/j.evalprogplan.2023.102252

Mostafazadeh, P., Ebadi, Z., Mousavi, S., & Nouroozi, N. (2019). Effectiveness of School-Based Mindfulness Training as a Program to Prevent Stress, Anxiety, and Depression in High School Students. *Health Education and Health Promotion, 7*(3), 111-117. https://doi.org/10.29252/HEHP.7.3.111

O'Driscoll, M., Byrne, S., Byrne, H., Lambert, S., & Sahm, L. J. (2019). An online mindfulness-based intervention for undergraduate pharmacy students: Results of a mixed-methods feasibility study. *Currents in Pharmacy Teaching and Learning, 11*(9), 858-875. https://doi.org/10.1016/j.cptl.2019.05.013

Özdemir, A. A., & Kavak Budak, F. (2022). The Effects of Mindfulness-Based Stress Reduction Training on Hope, Psychological Well-Being, and Functional Recovery in Patients with Schizophrenia. *Clinical Nursing Research, 31*(2), 183-193. https://doi.org/10.1177/10547738211039069

Pan, Y., Li, F., Liang, H., Shen, X., Bing, Z., Cheng, L., et al. (2024). Effectiveness of Mindfulness-Based Stress Reduction on Mental Health and Psychological Quality of Life among University Students: A GRADE-Assessed Systematic Review. *Evidence-Based Complementary and Alternative Medicine, 2024*(1), 8872685. https://doi.org/10.1155/2024/8872685

Pascoe, M. C., Hetrick, S. E., & Parker, A. G. (2020). The Impact of Stress on Students in Secondary School and Higher Education. *International Journal of Adolescence and Youth, 25*(1), 104-112. https://doi.org/10.1080/02673843.2019.1596823

Reddy, K. J., Menon, K. R., & Thattil, A. (2018). Academic Stress and Its Sources Among University Students. *Biomedical and Pharmacology Journal, 11*(1), 531-537. https://doi.org/10.13005/bpj/1404

Rose, H., McKinley, J., & Baffoe-Djan, J. B. (2019). Questionnaires. In H. Rose, J. McKinley, & J. B. Baffoe-Djan (Eds.), *Data Collection Research Methods in Applied Linguistics* (pp. 153-174). London: Bloomsbury Academic.

Rudland, J. R., Golding, C., & Wilkinson, T. J. (2020). The Stress Paradox: How Stress Can Be Good for Learning. *Medical Education, 54*(1), 40-45. https://doi.org/10.1111/medu.13830

Ruggeri, K., Garcia-Garzon, E., Maguire, Á., Matz, S., & Huppert, F. A. (2020). Well-being is more than happiness and life satisfaction: a multidimensional analysis of 21 countries. *Health and Quality of Life Outcomes, 18*(1), 192. https://doi.org/10.1186/s12955-020-01423-y

Ryff, C. D., & Singer, B. H. (2006). Best news yet on the six-factor model of well-being. *Social Science Research, 35*(4), 1103-1119. https://doi.org/10.1016/j.ssresearch.2006.01.002

Sadooghiasl, A., Ghalenow, H. R., Mahinfar, K., & Hashemi, S. S. (2022). Effectiveness of Mindfulness-based Stress Reduction Program in Improving Mental Well-being of Patients with COVID-19: A Randomized Controlled Trial. *Indian Journal of Critical Care Medicine, 26*(4), 439-445. https://doi.org/10.5005/jp-journals-10071-24164

Schanche, E., Vøllestad, J., Visted, E., Lillebostad Svendsen, J., Binder, P.-E., Osnes, B., et al. (2021). Self-criticism and self-reassurance in individuals with recurrent depression: Effects of mindfulness-based cognitive therapy and relationship to relapse. *Counselling and Psychotherapy Research, 21*(3), 621-632. https://doi.org/10.1002/capr.12381

Seligman, M. E. P. (2011). *Flourish: A Visionary New Understanding of Happiness and Well-being.* Simon and Schuster. https://www.simonandschuster.com/books/Flourish/Martin-E-P-Seligman/9781439190760

Sharkey, A. (2015). The Mindfulness Phenomenon: A Brief History. *Irish Journal of Counselling and Psychotherapy, 15*(2), 9-13. https://iacp.ie/files/UserFiles/IJCP-Articles/2015/The-Mindfulness-Phenomenon-A-Brief-History-by-Dr-Antony-Sharkey.pdf

Skolzkov, A. (2024). Impact of mindfulness-based cognitive therapy (MBCT) on the levels of anxiety, depression, and subjective happiness in Russian first-year students of the Psychology Department. *Authorea Preprints.* https://doi.org/10.31124/advance.12319667.v1

Son, C., Hegde, S., Smith, A., Wang, X., & Sasangohar, F. (2020). Effects of COVID-19 on College Students' Mental Health in the United States: Interview Survey Study. *Journal of Medical Internet Research, 22*(9), e21279. https://doi.org/10.2196/21279

Tang, M. H., Castle, D. J., & Choong, P. F. M. (2015). Identifying the Prevalence, Trajectory, and Determinants of Psychological Distress in Extremity Sarcoma. *Sarcoma, 2015*(1), 745163. https://doi.org/10.1155/2015/745163

Tang, Y.-Y., Tang, R., & Gross, J. J. (2019). Promoting Psychological Well-Being Through an Evidence-Based Mindfulness Training Program. *Frontiers in Human Neuroscience, 13*, 237. https://doi.org/10.3389/fnhum.2019.00237

Tumminia, M. J., DeVlieger, S. E., Colvin, S., Akiva, T., & Galla, B. M. (2022). Adolescents' Experiences of Distress and Well-being During Intensive Mindfulness Practice: A Mixed-Methods Study. *Mindfulness, 13*(8), 1971-1983. https://doi.org/10.1007/s12671-022-01932-5

Uchil, H. B. (2017). The Effect of Stress on Students' Performance. *Stress Management Professional International Journal, 5*(1), 17-21.

van der Schans, K. L., Kiggen, M. H. H., Tziafetas, K., Holland, R. W., & Karremans, J. C. (2022). Exploring the Links Between Trait Mindfulness and Emotional and Behavioral Responses in the Ultimatum Game. *Mindfulness, 13*(8), 2047-2058. https://doi.org/10.1007/s12671-022-01940-5

Walsh, K. M., Saab, B. J., & Farb, N. A. S. (2019). Effects of a Mindfulness Meditation App on Subjective Well-Being: Active Randomized Controlled Trial and Experience Sampling Study. *JMIR Ment Health, 6*(1), e10844. https://doi.org/10.2196/10844

Williams, J. M. G., Baer, R., Batchelor, M., Crane, R. S., Cullen, C., De Wilde, K., et al. (2022). What Next After MBSR/MBCT? An Open Trial of an 8-Week Follow-on Program Exploring Mindfulness of Feeling Tone (vedanā). *Mindfulness, 13*(8), 1931-1944. https://doi.org/10.1007/s12671-022-01929-0

Xu, J., Jo, H., Noorbhai, L., Patel, A., & Li, A. (2021). Virtual mindfulness interventions to promote well-being in young adults: A mixed-methods systematic review. *medRxiv.* https://doi.org/10.1101/2021.04.24.21256035

Yousif, M. A., Arbab, A. H., & Yousef, B. A. (2022). Perceived Academic Stress, Causes, and Coping Strategies Among Undergraduate Pharmacy Students During the COVID-19 Pandemic. *Advances in Medical Education and Practice, 13*(null), 189-197. https://doi.org/10.2147/AMEP.S350562

Zhang, Y. (2021). Book Review: Data Collection Research Methods in Applied Linguistics. *Frontiers in Psychology, 12*, 668712. https://doi.org/10.3389/fpsyg.2021.668712