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RESEARCH ARTICLE

Impact of mindfulness-based programs on reducing stress and enhancing academic performance in college students

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Abstract

An unprecedented surge in discomfort and mental health challenges is being observed among college students today. Web-based therapeutic approaches have shown remarkable potential in addressing these issues, transcending geographical constraints. This has paved the way for broader implementation of such solutions. This program operates online and is rooted in principles of mindfulness and cognitive behavioral therapy. The primary objective of this research was to assess the effectiveness of mindfulness-based programs in alleviating depression, anxiety, and perceived stress among undergraduate students in specific colleges in Pune and Mumbai, while also enhancing mindfulness levels. In the context of a campus environment marked by disturbances, students' responses to an online mental health program can serve as a valuable indicator of how they may cope with future disruptions. For this study, 360 students were randomly selected. The mindfulness-based programs encompassed the following components: Instructional and mindfulness video modules; and 20-minute, professionally guided, anonymous group video conferences. We find ourselves, generally speaking, in a setting, the university, where students are prone to high levels of stress and anxiety, so having resources that lead to changes, such as those achieved in this research, may be of great benefit. This is because of the typical features of this group. Finally, the results of the ramifications were examined.

Keywords: Stress, University student, Anxiety, Depression, Mental health.

Introduction

Students frequently report experiencing high levels of stress, and this is partly attributed to factors such as interpersonal expectations, life challenges, economic hardship, exposure to violence, and notably, the academic demands in educational environments. The routine requirements of attending school can contribute to this stress, ultimately affecting both academic achievements and the overall quality of life. Moreover, given that students are at risk of grappling with stress, isolation, and anxiety, their welfare has garnered global attention. Consequently, the aforementioned pressures faced by students significantly compromise their mental health, potentially leading to psychiatric issues and subpar academic performance. The implementation of mindfulness meditation has proven to enhance students' academic performance and overall well-being. A scientifically tested technique called mindfulness meditation includes having individuals focus their attention on the present moment without passing judgment. It may improve people's focus, recall, and critical awareness, fostering social skills and academic success in pupils.

Growing numbers of school-age children and teenagers have been diagnosed with social, emotional, and behavioral issues in recent years, which have a negative impact on their ability to succeed in school, form healthy interpersonal connections, and develop into competent individuals. As more children and adolescents in India need therapy in the form of medicine and/or counseling, the average age of youngsters consulting psychiatrists and psychologists is progressively declining.

Parents and instructors put a lot of pressure on kids and teenagers to study hard and perform well in order to get excellent grades. Exams therefore represent psychological stress and worry. Jain emphasizes how overwhelmed kids are with schoolwork, tuition courses, and scholarship exams.

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Due to the few seats that are available, the strict selection procedures, and the high cut-off scores for professional programs like medicine, engineering, architecture, etc., there is a lot of pressure. The benefits of play, such as stress relief, overcoming anxiety, expressing anger, picking up social norms, collaborating, and learning how to face challenging circumstances, are therefore lost. Parental expectations raise students' anxiety levels even more. Parents who are overbearing and pushy increase their children's vulnerability to stress, early burnout, and depression. Teenagers' social contacts with instructors and classmates, their family's financial struggles, their parents' marital issues, their physical and/or mental health, and more are all potential causes of stress. These elements have a negative effect on teenagers' psychological health.

Mindfulness is the consciousness that manifests consciously and honestly, accepting and discerning what emerges in the present moment. Additionally, some writers divide mindfulness into two parts: (a) controlling attention to retain it in the present moment; and (b) addressing events with curiosity, openness, and acceptance without judgment.

Mindfulness influences bodily awareness, emotional control, emotional management, and changing one's perspective of oneself. This has led to a theoretical and empirical link between mindfulness and psychological well-being. The three components of mindfulness that are regarded to be antidotes to the most prevalent types of psychological discomfort are (a) sustained attention (b) selective attention (c) and (d) the capacity to direct the focus of attention where the individual desires.

Training in mindfulness may help people behave psychologically adaptively. This makes it a useful method for enhancing emotional intelligence. It may also help people avoid the symptoms of despair and anxiety. The effects of training have been investigated from a neurobiological perspective, and it has been found that neural networks become activated, resulting in neuroplastic changes; as well as an improvement in wellbeing. Similar to this, as experience increases, the cognitive activity required to keep the object of attention needs less effort. People struggle with emotional control when they behave instinctively since this prevents them from seeing, comprehending, and evaluating the emotions that are present in the moment.

Literature Review

Mahfouz *et al.* (2018) conducted a study to explore the experiences of first-year college students. They collected qualitative interview data from 26 students before, after, and one semester to one year after the program. The interviews covered topics like stress, and coping strategies, attributed to the program. The results indicated that JB equipped college students with effective coping mechanisms for dealing with common stressors and had the potential to address the root causes of stress. Students reported improvements in various aspects of their lives, including time management, healthy habits, relationships, emotional awareness, and self-compassion. The study suggested the integration of mindfulness programs like JB into mandatory first-year courses to enhance undergraduates' emotional, social, and adaptive skills for better stress management.

Dessa Bergen-Cico (2013) investigated the impact of psychological health of undergraduate students. Using a quasi-experimental pretest/posttest approach, the research compared psychological well-being, as measured by mindfulness and self-compassion, between the short-term MBSR program and a control group. The results showed significant improvements in psychological well-being, particularly in mindfulness and self-compassion, but there were no significant reductions in trait anxiety. The study suggested that while shorter mindfulness-based stress reduction (MBSR) programs may be effective for certain psychological distress, longer programs might be necessary for other conditions.

James W. Burger *et al.* (2023) conducted a study that compared five dimensions of mindfulness with various aspects of psychological distress among 174 students from a South African institution. This cross-sectional research used the K10 questionnaire and the five facet mindfulness questionnaire to measure psychological distress and mindfulness, considering demographic factors. The study found that 56.9% of participants reported experiencing psychological distress. The study emphasized the strong influence of conscious behavior on psychological well-being and suggested further research to understand how different aspects of mindfulness impact psychological distress among university students.

Cary E.L. *et al.* (2023) explored whether MBSR could reduce anxiety among undergraduate students, with a focus on cognitive self-regulation as a potential mechanism. The study included 144 undergraduate students, with 34 completing an MBSR course and 110 serving as a matched control group. Longitudinal mediation models revealed that self-regulation mediated the intervention's effects on anxiety, both immediately after the intervention and one month later. The study suggested the potential of using MBSR in college courses to indirectly influence anxiety through improved self-regulation, particularly given the rising rates of anxiety among college students.

Mark Martin *et al.* (2022) compared the perceptions of college students participating in psychological meditation sessions and those enrolled in an introductory holistic health class. The study involved some undergraduate students from a mid-sized institution who completed coursework and surveys over one semester. While students in the mindfulness meditation group initially had higher stress levels and lower quality of life assessments compared to the control group, they experienced significantly reduced stress levels and improved quality of life by the end of the session.

The study suggested that offering credit for mindfulness meditation instruction could benefit the mental health and well-being of undergraduates.

Fenton Litwiller (2022) addressed the growing concern of mental health among university students and the potential role of leisure activities in maintaining good mental health. The integrative review aimed to consolidate knowledge about the effectiveness of leisure programs in promoting mental health among undergraduate students in North American non-clinical populations from 2005 to 2016. The review included 21 studies that met inclusion criteria. The findings indicated that leisure programs incorporating mindfulness, meditation, Tai Chi, yoga, exercise, and animal therapy had the potential to reduce feelings of stress, anxiety, despair, and gloom among students. The review recommended further research, including exploring the impact of gender and sex on treatment outcomes and assessing additional mental health outcomes and social effects compared to a broader range of recreational activities.

Manoj Sharma (2014), conducted a study to explore the repercussions of job-related stress on employee performance. The findings of the research indicate that adverse stress significantly affects both the physical and mental well-being of workers, subsequently influencing their job performance. It's noteworthy that there has been limited exploration in the field of occupational stress regarding its relationship with work performance.

Gunilla Krantz (2015), examined the workload and stress at work among Swedish workers. A questionnaire was addressed to 1300 women and 1300 men with a participant age range of 32 to 58 years and at least 35 hours of weekly stable work. The questionnaire includes questions on the overall workload of workers (including the time spent working on paid, unpaid, and childcare activities), subjective feelings of job stress, and symptoms. The response rate was 65%, and women (743) had more severe symptoms of stress than males (595). However, men appeared to respond differently when faced with longer work hours, such as a 50-hour workweek, displaying more selective reactions.

Jins Joy. P. (2011), A descriptive research on the factors contributing to occupational stress among employees of tile manufacturing facilities in Kerala's Kannur district was undertaken. The interview schedule for the study included factors like an unpleasant physical environment, a lack of decision-making authority, a dual career, a risk to job safety, boring repetitive work, personal or family issues, frustration with one's professional aspirations, social or physical isolation, economic problems with low wages, harassment, and bullying.

Viljoen and Rothmann (2009) looked at the relationship between organizational commitment, health issues, and work pressure. They found that organizational pressures had a significant impact on ill health and organizational commitment. Stress related to activity safety was a factor in both physical and psychological illness. Low employee commitment to the company was predicted by five stressors, including work-life balance, overload, control, job-related factors.

Upson, John W. *et al*. (2007), focused their research on supply chain operations and examined the perilous state of strain among supply network personnel. They have also provided solutions to this stress. The researchers came to the conclusion that by utilizing the suggested tasks, each employee's quality of life and the productivity of the company would increase.

Akizumi Tsutsumi (2001), in a study of two complementary work-stress models, found a correlation between depression and job stress among Japanese employees who were facing job loss. A small Japanese factory with financial difficulties received responses from 190 men and women workers, and a cross-sectional analysis was done to examine these relationships. The workers were doing indirectly supported duties and direct assembly line work. Compared to direct assembly line workers, those with indirect supporting duties were more likely to exhibit depression symptoms. The latter group was more likely to experience job strain, which is a result of having high demands and little control over one's workload, while the former group was more likely to experience more effort and lower pay. According to the study's findings, the two job stress models distinguish between various features of stressful work environments.

Prakash B. Kundaragi (2015) saw the completion of a research by titled "Work Stress of IT Employee." According to the study's findings, stress is a major problem for every organization. It has emerged as the most typical excuse given by workers across all sectors. When it is identified and treated well, stress may make a person productive and upbeat. Meditation and a positive outlook may be helpful for managing stress. Stress may really be reduced by considering lives from a wider perspective. There are several ways to manage stress, including yoga, meditation, and many more. Negative stress or distress destroys a person's positive outlook, leading to absenteeism, turnover, immorality, anxiety, despair, and other negative behaviors. If the staff transforms its stress into European strain, both their healthy lifestyle and the organization's wellness will alter.

Alberto Ciesa's (2009) research showed a direct comparison of MBSR and general relaxation training revealed that both therapies were equally effective in reducing stress. Additionally, MBSR may promote empathy and self-compassion while decreasing ruminative pondering and trait stress. Healthy people who practice MBSR have lower stress levels. The lack of data about the exact outcomes of MBSR in comparison to other non-specific therapies and significant barriers to protected studies highlight the necessity for such a study, nevertheless.

James Carmody (2011) conducted a study involving 174 adults enrolled in a clinical program for MBSR. The study aimed to investigate the connections between mindfulness levels, medical and psychological symptoms, perceived stress, and psychological well-being. The hypothesis was that engaging in mindfulness meditation enhances mindfulness, leading to a reduction in symptoms and an improvement in overall well-being.

Natalia E. Morone *et al.* (2012) conducted on adults in the United States who practiced mindfulness meditation, the focus was on quantifying the number of participants who engaged in mindfulness meditation, estimated at approximately 20, 29, 720 individuals, compared to those who did not meditate. The study also suggested that the growing popularity of mindfulness meditation may be driven by benefits such as reduced back and neck discomfort and decreased reports of temporary anxiety or depression.

Objectives

- To examine the characteristics of the survey participants' population.
- To explore the factors affecting academic stress, academic development and mindfulness programs.
- To assess the existence of association among demographic variables and variables relating to the study.

Hypothesis

- There is an association between type of institutions and counselor availability.
- There is an association between department and counselor availability.

Research Methodology

The research methodology for this study is primarily descriptive and exploratory in nature. To gather data, a questionnaire was designed, and tailored to investigate specific aspects of interest. The target participants for this study were selected from various social media networks, constituting a sample size of 360 respondents. The sampling method employed for this research was convenience sampling, which can be advantageous for studies with limited resources or time constraints. This approach allows for data collection from individuals readily available and willing to participate, albeit with potential limitations related to representativeness.

Analysis and Discussion

Reliability Analysis

Reliability statistic

Table 1 shows the reliability analysis using Cronbach's alpha of the data for further analysis.

Table 1: Reliability analysis

Reliability statistics	
Cronbach's alpha	No of items
0.811	14

Source: The reliability value is 0.811 which is above the recommended value of 0.50 (Nunnally (1978); Hair *et al.* (2006)).

Percentage Analysis

Inference

Table 2 provides insights into several demographic and institutional factors based on the responses of 360 participants. Firstly, it categorizes respondents by age group. The largest group is 19-year-olds, comprising 37.2% of the total, followed by 20-year-olds at 32.2%. Interestingly, those above 20 years old represent only 16.4% of the total. Secondly, it breaks down respondents by gender. The data is nearly evenly split between male (51.2%) and female (48.8%) participants. Thirdly, it examines the type of institution. Private institutions account for the largest percentage (24.2%), followed closely by community colleges (25%). Government-aided institutions and academies also have significant representation. Fourthly, it categorizes respondents by department, revealing that science (51.9%) slightly outweighs arts (48.1%). Fifthly, it explores family types, with nuclear families (51.4%) slightly surpassing joint families (48.6%). Lastly, it examines annual income levels, with the majority falling in the range of 50,001 to 1,00,000 (31.9%) and 1,00,001 to 1,50,000 (33.3%). Overall, this data provides a comprehensive view of the respondent demographics and institutional affiliations, shedding light on the diverse characteristics of the sample group (Table 3).

Descriptive Statistics

Inference

Table 4 offers a snapshot of descriptive statistics for a dataset comprising 360 observations across multiple variables. Notably, the dataset appears complete, with no missing values. Key summary statistics such as mean, median, standard deviation, skewness, and kurtosis are provided for each variable. For instance, the mean age is approximately 2.51, and the median is 2.00, suggesting a potential rightward skew in the age distribution. Similarly, other variables like type of institution, annual income, and counselor availability are summarized, revealing the central tendencies and dispersions within these categories. Notably, skewness and kurtosis statistics offer insights into the shape and tail behavior of these distributions, with most variables exhibiting relatively symmetrical distributions. However, certain variables, such as department and counselor availability, show more pronounced negative kurtosis, indicative of lighter tails and a flatter distribution compared to a normal distribution. In sum, this descriptive

statistics table provides a concise overview of the dataset's key characteristics, aiding in understanding the central tendencies and variability within each variable.

Exploratory Factor Analysis

The KMO and Bartlett test of sphericity assess whether the sample is suitable for analysis and measure the degree of interconnection among variables.

KMO ranges from 0 to 1, and Hair *et al.* (2006) recommend that KMO should exceed 0.50, while the Bartlett test of sphericity should show significance with a value above 0.000.

Based on the above Table 5, it is evident that the KMO and Bartlett test of sphericity check the sample adequacy is valid as KMO value is 0.811 which is above 0.50 it quantifies the inter-correlation between the variables.

From the shared characteristics, it is clear that all 14 variables have an extraction value exceeding 0.7. Consequently, we have chosen to include all 14 variables in our continued exploration through factor analysis. Communalities offer insight into the extent to which each variable is influenced by the underlying factors combined.

The exploratory factor analysis (EFA) conducted on all the study's variables has identified three distinct factors with Eigen values greater than 1, as displayed in Table 6. To discern differences in the questionnaire data, a maximum likelihood analysis with Varimax rotation was performed.

As a result of the factor analysis, we have identified three constructs: Academic stress, academic development, and mindfulness program.

Factor 1

- I can make clear cut plans to reduce stress.
- I can forget deep sorrows after facing the mindfulness based programs
- Parental help in my study reduces my stress.
- Teachers approach with positive thinking helps to increase my confidence.
- I am enthusiastic to solve the problems of others
- I will try to control myself when I have to face stressed situations

All the items were loaded above 0.70 which is in the acceptable level of 0.05 and items with poor factor loading are removed from the study. Therefore, all these items reflect one construct namely academic development.

Factor 2

- I hate thinking about school.
- I face difficulty in raising my problems in the class in a group discussion.
- I am worried of being unable to present the seminar satisfactorily.
- My studies are seriously affected due to the class leadership I have taken up.

Table 2: Item-total statistics

Item-total statistics	*Scale mean if Item deleted*	*Scale variance if item deleted*	*Corrected item-total correlation*	*Cronbach's alpha if item deleted*
The disciplinary action of the school creates mental pressure on me.	49.42	57.425	.383	.803
My studies are seriously affected due to the class leadership I have taken up.	49.34	56.637	.372	.804
I hate thinking about school.	49.34	55.934	.466	.797
I face difficulty in raising my problems in the class in a group discussion.	49.38	56.370	.414	.801
I am worried of being unable to present the seminar satisfactorily.	49.39	56.674	.412	.801
Parental help in my study reduces my stress.	49.19	54.412	.497	.794
I can make clear cut plans to reduce stress.	48.99	54.719	.517	.793
I can forget deep sorrows after facing the mindfulness based programs	49.11	54.394	.500	.794
I am enthusiastic to solve the problems of others	49.04	55.567	.510	.794
Teachers approach with positive thinking helps to increase my confidence.	48.97	55.035	.569	.790
I will try to control myself when I have to face stressed situations	49.05	55.936	.458	.797
What are the Mindfulness-based programs would be conducted to avoid the stress and problems?	49.58	57.643	.315	.808
What are the exercise would you instruct to reduce stress among children	49.68	56.552	.351	.806
What are the programs conducted by you to avoid the misuse of mobile phone and internet?	49.75	56.401	.348	.807

Table 3: Percentage analysis

Age group	*No. of. respondents*	*Total percentage*
18	51	14.2
19	134	37.2
20	116	32.2
Above 20	59	16.4
Total	360	100%
Gender group	*No. of. respondents*	*Total percentage*
Male	184	51.2
Female	176	48.8
Total	360	100%
Type of institution	*No. of. respondents*	*Total percentage*
Government	49	13.6
Govt aided	84	23.3
Private	87	24.2
Community college	90	25
Academy	50	13.9
Total	360	100%
Department	*No. of. respondents*	*Total percentage*
Arts	173	48.1
Science	187	51.9
Total	360	100%
Type of institution	*No. of. respondents*	*Total percentage*
Government	49	13.6
Govt aided	84	23.3
Private	87	24.2
Community college	90	25
Academy	50	13.9
Total	360	100%
Type of family	*No. of. respondents*	*Total percentage*
Joint	176	48.6
Nuclear	185	51.4
Total	360	100%
Annual income	*No. of. respondents*	*Total percentage*
Below 50,000	65	18.1
50,001 – 1,00,000	115	31.9
1,00,001 – 1,50,000	120	33.3
Above 1,50,000	60	16.7
Total	360	100%
Counselors availability	*No. of. Respondents*	*Total percentage*
Yes	328	91.1
No	32	8.9
Total	360	100%

- The disciplinary action of the school creates mental pressure on me.

All the items were loaded above 0.70 which is in the acceptable level of 0.05 and items with poor factor loading are removed from the study. Therefore, all these items reflect one construct namely academic stress (Table 7).

Factor 3

- What are the exercise would you instruct to reduce stress among children
- What are the programs conducted by you to avoid the misuse of mobile phone and internet?
- What are the mindfulness-based programs would be conducted to avoid the stress and problems?

All the items were loaded above 0.70 which is in the acceptable level of 0.05 and items with poor factor loading are removed from the study. Therefore, all these items reflect one construct namely mindfulness program.

Chi-square test

Chi-square test on type of institutions and counselor availability

Null hypothesis

There is no association between type of institutions and counselor availability.

Alternate hypothesis

There is an association between type of institutions and counselor availability.

In order to test the association between type of institutions and counselor availability, Chi-square is tested. Here the type of institutions and counselor availability have been measured in a nominal scale.

By applying chi-square test at 5% level of significance, it is observed that there is an association between type of institutions and counselor availability. The *p-value* should be less than 0.05. The *p-value* is 0.002 and therefore, the alternate hypothesis is accepted, and the association do exist. The Pearson chi-square value is 1.298a.

Table 8 presents data on the availability of counselors in different types of educational institutions. Government institutions have a nearly equal split, with 24 respondents indicating "yes" and 25 responding with "no," totaling

Table 4: Descriptive statistics

Statistics							
Descriptive statistics	*Age*	*Gender*	*Type of Institution*	*Department*	*Type of family*	*Annual income*	*Counselor availability*
Mean	2.51	2.00	3.02	1.52	2.57	2.49	1.51
Median	2.00	2.00	3.00	2.00	3.00	2.50	2.00
STD deviation	.929	.716	1.260	.500	.965	.973	.501
Skewness	.059	.000	-.034	-.078	-.058	-.006	-.045
Kurtosis	-.853	-1.041	-1.048	-2.005	-.957	-.981	-2.009
Minimum	1	1	1	1	1	1	1
Maximum	4	3	5	2	4	4	2

Table 5: KMO and bartlett's test

Kaiser-meyer-olkin measure of sampling adequacy		0.811
Bartlett's test of sphericity	Approx. Chi-square	4238.806
	Df	91
	Sig.	.000

49 participants from this category. Government-aided institutions have a similar pattern, with 41 respondents saying "yes" and 43 saying "no," totaling 84 participants. Private institutions also show a similar trend, with 41 respondents answering "yes" and 46 responding "no," summing up to 87 participants. Community colleges have a slightly higher proportion of respondents indicating "yes" (42) compared to "no" (48), with a total of 90 participants. Academies have

Table 6: Communalities

Communalities	*Initial*	*Extraction*
The disciplinary action of the school creates mental pressure on me.	1.000	.703
My studies are seriously affected due to the class leadership I have taken up.	1.000	.755
I hate thinking about school.	1.000	.805
I face difficulty in raising my problems in the class in a group discussion.	1.000	.793
I am worried of being unable to present the seminar satisfactorily.	1.000	.775
Parental help in my study reduces my stress.	1.000	.764
I can make clear cut plans to reduce stress.	1.000	.789
I can forget deep sorrows after facing the mindfulness based programs	1.000	.789
I am enthusiastic to solve the problems of others	1.000	.733
Teachers approach with positive thinking helps to increase my confidence.	1.000	.752
I will try to control myself when I have to face stressed situations	1.000	.578
What are the mindfulness-based programs would be conducted to avoid the stress and problems?	1.000	.869
What are the exercise would you instruct to reduce stress among children	1.000	.925
What are the programs conducted by you to avoid the misuse of mobile phone and internet?	1.000	.886
Extraction method: Principal component analysis.		

Table 7: Rotated component matrix[a]

	Component		
	1	*2*	*3*
I can make clear cut plans to reduce stress.	.888		
I can forget deep sorrows after facing the mindfulness based programs	.885		
Parental help in my study reduces my stress.	.874		
Teachers approach with positive thinking helps to increase my confidence.	.862		
I am enthusiastic to solve the problems of others	.853		
I will try to control myself when I have to face stressed situations	.755		
I hate thinking about school.		.893	
I face difficulty in raising my problems in the class in a group discussion.		.890	
I am worried of being unable to present the seminar satisfactorily.		.880	
My studies are seriously affected due to the class leadership I have taken up.		.869	
The disciplinary action of the school creates mental pressure on me.		.835	
What are the exercise would you instruct to reduce stress among children			.960
What are the programs conducted by you to avoid the misuse of mobile phone and internet?			.939
What are the mindfulness-based programs would be conducted to avoid the stress and problems?			.932

Table 8: Chi-square test on type of institutions and counselor availability

	Value	*Df*	*Asymptotic significance (2-sided)*
Pearson Chi-square	1.298a	4	0.002
Likelihood ratio	1.3	4	0.861
Linear-by-linear association	0.181	1	0.67
N of valid cases	360		

Table 9: Cross tabulation for type of institutions and counselor availability

Yes		*Do you have counselors in your college?*		*Total*
		No		
Type of institution	Government	24	25	49
	Government aided	41	43	84
	Private	41	46	87
Community college		48	42	90
	Academy	28	22	50
Total		176	184	360

Table 10: Chi-square test on department and counselor availability

	Value	*Df*	*Asymptotic significance (2-sided)*
Pearson chi-square	1.452a	5	0.892
Likelihood ratio	1.7	5	0.978
Linear-by-linear association	0.258	1	0.36
N of valid cases	360		

A. 0 Cells (0.0%) Have expected count less than 5. The minimum expected count is 28.86.

a higher percentage of respondents answering "yes" (28) compared to "no" (22), totaling 50 participants. Overall, the data suggests that the availability of counselors varies among different types of institutions. Community colleges seem to have the highest proportion of respondents with counselors, while government-aided institutions and private institutions have relatively lower proportions of respondents with counselors. This information can be valuable for understanding the support services offered across these types of educational institutions (Table 9).

Chi-square Test on Department and Counselor Availability

Null hypothesis

There is no association between Department and Counselor Availability.

Alternate hypothesis

There is an association between department and counselor availability.

In order to test the association between department and counselor availability, Chi-square is tested. Here the department and counselor availability have been measured in a nominal scale.

By applying Chi-square test at 5% level of significance, it is observed that there is no association between department and counselor availability. The *p-value* should be less than 0.05. The *p-value* is 0.892 and therefore, the alternate hypothesis is accepted, and the association do not exist. The Pearson Chi-square value is 1.452a (Table 10).

Conclusion

In summary, mindfulness programs have the potential to enhance students' academic performance through three key avenues: Attention, memory, and executive function. This improvement aligns with the principles of the information processing theory, encompassing cognitive processes (enhanced focus on learning through mindfulness meditation), information retention (improved working memory), and executive cognitive functions (enhanced overall decision-making abilities). By applying the information processing theory, this study has shed light on the internal mechanisms through which mindfulness programs impact academic performance, offering a fresh research framework for future investigations. Additionally, it has empowered students to gain a deeper understanding of how mindfulness programs influence academic performance, thereby fostering greater engagement in these programs and yielding positive academic outcomes. This heightened awareness may also elevate the significance of mindfulness programs in both educational institutions and society at large, potentially leading to increased program implementation and the development of more mindfulness program-related tools designed to enhance academic performance. However, it's important to acknowledge that the existing literature has some limitations. In the context of mindfulness programs, previous studies have often overlooked various practice methods and techniques, including factors such as frequency, depth, and intensity. Variables like the location, frequency, duration, training format, and medium of mindfulness program practice, as well as how they interact with individual differences (e.g., openness to experience, gender), may influence the effectiveness of these programs. Distinctions may also exist between following mindfulness programs instructions *via* an app versus in-person teacher guidance and between group and individual participation. For instance, practicing mindfulness in a group setting may affect its effectiveness, introspection, and relaxation. In terms of the study subjects (i.e., students), the validity and generalizability of findings require further investigation, given the limited number of

participants in prior experiments. Many studies have failed to account for the potential influence of demographic variables (e.g., gender, age, socioeconomic status, religion) on the connection between mindfulness programs and academic performance. For example, individuals with higher socioeconomic status may have more resources at their disposal to excel academically. Consequently, the absence of control for these variables diminishes the applicability of the results. Past research has extensively explored whether mindfulness programs can enhance students' academic performance. In future research, scholars can delve deeper into the topic, examining how mindfulness programs can be optimally integrated into education. This includes exploring the timing, duration, and most effective practices for students' benefit.

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