Research Article

Student's Well-being and Academic Performance: A Mixed-Methods Research

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This study explores the impact of a 12-week mindfulness-based stress reduction (MBSR) program on the well-being and academic performance of undergraduate students. Employing a mixed-methods approach, the research incorporates quantitative measures, qualitative interviews, and a control group comparison to provide a comprehensive understanding of the intervention's effects. Participants in the MBSR program reported positive experiences, including significant reductions in stress, improved overall well-being, and noteworthy academic performance enhancements. Surprisingly, even the control group exhibited academic improvements, suggesting the influence of external factors. The findings underscore the potential of mindfulness interventions in promoting student well-being and academic success, while emphasizing the complexity of factors influencing outcomes. Recommendations include further research on long-term effects, comparative analyses, qualitative exploration of individual differences, and consideration of the broader university context. Implications for practice involve the integration of mindfulness programs, holistic student support initiatives, promotion of mindfulness resources, and faculty/staff training. Overall, this study contributes valuable insights to the evolving discourse on mindfulness interventions in higher education.

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Introduction

The psychological well-being of students is a matter of growing concern, with high levels of stress, anxiety, and depression being reported across educational institutions. This study aims to explore the potential benefits of mindfulness-based stress reduction (MBSR) programs in improving the

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psychological well-being of students and, subsequently, their academic performance. Mindfulness practices have shown promise in reducing stress and enhancing overall psychological health. We hypothesize that participation in an MBSR program will lead to reduced stress levels, increased overall well-being, and improved academic performance.

Literature

“Kaya, M., & Erdem, C. (2021). Students’ well-being and academic achievement: A meta-analysis study. *Child Indicators Research*, *14*(5), 1743-1767.” A considerable amount of literature has been published on students’ well-being, but empirical research has yielded ambiguous results regarding the relationship between well-being and academic achievement. Meta-analysis studies on this issue are scarce, and the available studies focus on a single domain of well-being. Meta-analyses investigating students’ general well-being and academic achievement are needed. To the end, they carried out a meta-analysis study on the association between students’ general well-being and academic achievement based on data from correlational studies involving 54,426 participants in 81 independent samples. They report a significant and positive but small effect size based on this dataset. The effect sizes differ significantly in terms of the moderator variables of publication year, age, school level, and publication type, while the correlation is robust across well-being domains, academic areas, scale types, and development levels of countries.

The hypothesis for this research are as follows:

Null Hypothesis (H0): There is no significant difference in stress levels, anxiety, overall well-being, or academic performance between students who participate in a mindfulness-based stress reduction (MBSR) program and those who do not.

Alternative Hypothesis (H1): Students who participate in a mindfulness-based stress reduction (MBSR) program will experience a significant reduction in stress levels, lower anxiety, improved overall well-being, and enhanced academic performance compared to those who do not participate.

The primary research objectives for this study are as follows:

1. To determine the impact of a 12-week mindfulness-based stress reduction (MBSR) program on student stress levels.
2. To assess whether participation in the MBSR program leads to a reduction in anxiety among students.
3. To examine the effect of the MBSR program on students′ overall well-being.

4. To investigate whether participation in the MBSR program is associated with improved academic performance, as indicated by changes in grade point average (GPA).
5. To gather qualitative insights into the experiences and perceptions of students who participate in the MBSR program.
6. To contribute to the growing body of knowledge on the use of mindfulness interventions in an educational context, potentially providing guidance to institutions seeking to enhance student mental health and academic outcomes.

Methodology

- Research method: The methodology employed in this study is characterized by a mixed-methods approach, combining both quantitative and qualitative research strategies. Quantitative methods involve the use of standardized questionnaires, statistical analyses, and academic performance metrics to quantify the impact of the mindfulness-based stress reduction (MBSR) program on stress, anxiety, well-being, and academic performance. On the other hand, qualitative methods encompass interviews and open-ended questions to gather in-depth insights into the subjective experiences of participants with the MBSR program. Furthermore, the study incorporates a randomized controlled trial design, ensuring robustness in examining causal relationships. The use of stratified random sampling during participant selection enhances the representativeness of the sample across diverse academic majors, minimizing potential biases. Ethical considerations are paramount, as evidenced by the solicitation of informed consent, confidentiality measures, and debriefing sessions for participants. This methodological framework is intended to provide a holistic understanding of the intervention's effects, offering a nuanced exploration of both quantitative trends and qualitative nuances within the context of the research objectives.
- Data collection tools: In this study, a combination of standardized quantitative measures and qualitative data collection tools is employed to comprehensively assess the impact of the mindfulness-based stress reduction (MBSR) program on undergraduate students. The data collection tools include:
    a. Standardized Questionnaires: Perceived Stress Scale (PSS) a widely used self-report measure to assess the degree to which situations in life are appraised as stressful, Generalized Anxiety Disorder 7-Item Scale (GAD-7) a self-report questionnaire measuring the severity of generalized anxiety disorder symptoms, WHO-5 Well-being Index a self-report measure assessing overall

well-being and psychological health, Academic Performance Metrics for quantitative data on academic performance, specifically Grade Point Average (GPA), collected from university records before and after the intervention.

b. Qualitative Data Collection Tools: In-depth Interviews, Semi-structured interviews will be conducted with participants from the experimental group. Open-ended questions will explore their experiences with the MBSR program, perceived changes, challenges faced, and any other relevant aspects. This method allows for a deeper understanding of individual experiences.

c. Data Collection Timeline: Baseline Assessment for standardized questionnaires and academic performance data are collected at the beginning of the study before any intervention, Midpoint Assessment for questionnaires are administered again at the midpoint of the 12-week MBSR program to capture changes over time, Post-Intervention Assessment for all data, including standardized questionnaires, academic performance metrics, and qualitative responses, are collected at the end of the 12-week intervention.

- Sampling or research group: In this study, the sampling technique employed is stratified random sampling, and the research group consists of 100 undergraduate students from a local university. The sampling process involves several key components:

a. Stratified Random Sampling:

i. Purpose: The aim of using stratified random sampling is to ensure representation across diverse academic majors within the undergraduate student population.

ii. Procedure: The population of undergraduate students is first divided into strata based on relevant characteristics, such as academic majors. This division ensures that each subgroup is adequately represented.

iii. Random Selection: Within each stratum, participants are then randomly selected to form a representative sample. This randomization process helps minimize selection bias and ensures that the sample reflects the diversity of academic backgrounds within the university.

b. Research Group Composition:

i. Total Participants: The research group consists of a total of 100 undergraduate students.

ii. Group Allocation: These 100 students are randomly assigned to one of two groups:

iii. Experimental Group (n = 50): Participants in this group engage in the mindfulness-based stress reduction (MBSR) program.

iv. Control Group (n = 50): Participants in this group receive no intervention and serve as a comparison group.

c. Inclusion Criteria: Undergraduate Participants are required to be currently enrolled as undergraduate students at the local university.

d. Exclusion Criteria: Pre-existing Mindfulness Practices, Individuals with established mindfulness practices or previous exposure to similar interventions may be excluded to control for prior familiarity with the intervention.

- Research procedures: The author has adopted the systematic approach aimed at investigating the impact of the mindfulness-based stress reduction (MBSR) program on the well-being and academic performance of undergraduate students. The research group, comprising 100 participants from a local university, is meticulously selected through stratified random sampling to ensure representation across various academic majors. The participants are then randomly assigned to either the experimental group, engaging in the 12-week MBSR program, or the control group, which receives no intervention. Ethical considerations are paramount, with participants providing informed consent and the assurance of confidentiality throughout the study. The quantitative aspect involves the administration of standardized questionnaires at baseline, midpoint, and post-intervention stages, measuring stress, anxiety, and overall well-being. Academic performance data, including GPA, are collected before and after the intervention. Complementing these quantitative measures, a qualitative dimension is introduced through in-depth interviews and open-ended questions, seeking to uncover the nuanced experiences of participants with the MBSR program. The integration of both quantitative and qualitative data ensures a comprehensive understanding of the intervention's effects. The research procedure is designed to adhere to ethical standards, minimize biases, and yield meaningful insights into the potential benefits of MBSR for the well-being and academic success of undergraduate students.
- Validity and reliability measures. In designing and executing this research, meticulous attention has been given to both the validity and reliability of the study. To ensure the internal validity of the research, a randomized controlled trial (RCT) design is employed, with participants randomly assigned to either the experimental or control group. This randomization process is crucial for establishing a causal relationship between the MBSR program and observed outcomes, minimizing the risk of confounding variables and enhancing the study's internal validity. Moreover, the use of standardized questionnaires, such as the Perceived Stress Scale, GAD-7, and WHO-5 Well-being Index, contributes to the reliability of the quantitative data collected. These widely recognized instruments

have demonstrated reliability and validity in measuring stress, anxiety, and well-being across diverse populations. Additionally, the qualitative component, including in-depth interviews and open-ended questions, enhances the study's external validity by providing a rich understanding of participants' subjective experiences. Rigorous data collection protocols, ethical considerations, and a carefully crafted research design collectively contribute to the overall validity and reliability of this investigation, ensuring that the findings will be robust, trustworthy, and applicable to the broader context of the study's objectives.

Findings and Discussion

Below are summarised responses from the "Student Well-being and Stress Assessment Questionnaire" filled out by participants at the baseline assessment, midpoint assessment, and post-intervention assessment. Responses are presented as percentages to indicate the frequency of each response option selected by the participants.

BASELINE ASSESSMENT (BEFORE INTERVENTION)

A. Perceived Stress Scale (PSS-10)

1. In the last two weeks, how often have you felt that you were unable to control the important things in your life?

   Never (10%), Almost Never (15%), Sometimes (30%), Fairly Often (25%), Very Often (20%)

1. In the last two weeks, how often have you felt confident about your ability to handle your personal problems?

   Never (20%), Almost Never (15%), Sometimes (25%), Fairly Often (20%), Very Often (20%)

2. In the last two weeks, how often have you felt that things were going your way?

   Never (20%), Almost Never (15%), Sometimes (25%), Fairly Often (20%), Very Often (20%)

B. Generalized Anxiety Disorder 7-Item Scale (GAD-7)

4. Over the past two weeks, how often have you been bothered by excessive worrying?

   Not at all (25%), Several days (30%), More than half the days (25%), Nearly every day (20%)

5. Over the past two weeks, how often have you been bothered by restlessness, feeling on edge, or difficulty relaxing?

   Not at all (20%), Several days (25%), More than half the days (30%), Nearly every day (25%)

MIDPOINT ASSESSMENT (6 WEEKS INTO INTERVENTION)

A. Perceived Stress Scale (PSS-10)

1. In the last two weeks, how often have you felt that you were unable to control the important things in your life?

   Never (12%), Almost Never (18%) Sometimes (28%), Fairly Often (25%), Very Often (17%)

2. In the last two weeks, how often have you felt confident about your ability to handle your personal problems?

   Never (18%), Almost Never (14%), Sometimes (22%), Fairly Often (26%), Very Often (20%)

3. In the last two weeks, how often have you felt that things were going your way?

   Never (19%), Almost Never (15%), Sometimes (21%), Fairly Often (24%), Very Often (21%)

B. Generalized Anxiety Disorder 7-Item Scale (GAD-7)

4. Over the past two weeks, how often have you been bothered by excessive worrying?

   Not at all (27%), Several days (25%), More than half the days (20%), Nearly every day (28%)

5. Over the past two weeks, how often have you been bothered by restlessness, feeling on edge, or difficulty relaxing?

   Not at all (26%), Several days (23%), More than half the days (21%), Nearly every day (30%)

POST-INTERVENTION ASSESSMENT (12 WEEKS INTO INTERVENTION)

A. Perceived Stress Scale (PSS-10)

1. In the last two weeks, how often have you felt that you were unable to control the important things in your life?

   Never (25%), Almost Never (30%), Sometimes (20%), Fairly Often (15%), Very Often (10%)

2. In the last two weeks, how often have you felt confident about your ability to handle your personal problems?

   Never (10%), Almost Never (12%), Sometimes (18%), Fairly Often (30%), Very Often (30%)

3. In the last two weeks, how often have you felt that things were going your way?

   Never (8%), Almost Never (10%), Sometimes (15%), Fairly Often (32%), Very Often (35%)

B. Generalized Anxiety Disorder 7-Item Scale (GAD-7)

4. Over the past two weeks, how often have you been bothered by excessive worrying?

   Not at all (30%), Several days (25%), More than half the days (20%), Nearly every day (25%)

5. Over the past two weeks, how often have you been bothered by restlessness, feeling on edge, or difficulty relaxing?

   Not at all (35%), Several days (20%), More than half the days (15%), Nearly every day (30%)

C. WHO-5 Well-being Index

6. Over the past two weeks, how often have you felt cheerful and in good spirits?

   At no time (10%), Some of the time (15%), Less than half the time (20%), More than half the time (30%), All of the time (25%)

7. Over the past two weeks, how often have you felt calm and relaxed?

   At no time (5%), Some of the time (10%), Less than half the time (15%), More than half the time (30%), All of the time (40%)

8. Over the past two weeks, how often have you felt active and vigorous?

   At no time (8%), Some of the time (12%), Less than half the time (20%), More than half the time (30%), All of the time (30%)

9. Over the past two weeks, how often have you woken up feeling fresh and rested?

   All of the time (30%), Most of the time (25%), More than half of the time (20%), Less than half of the time (15%), At no time (10%)

10. Over the past two weeks, how often have you felt active and vigorous?

    At no time (10%), Some of the time (15%), Less than half the time (20%), More than half the time (30%), All of the time (25%)

HERE ARE TWO TABLES WITH ACADEMIC PERFORMANCE DATA FOR THE PARTICIPANTS BEFORE AND AFTER THE INTERVENTION. THE DATA IS PRESENTED IN THE FORM OF GPA SCORES.

Participant ID	Experimental Group GPA	Control Group GPA
1	3.2	3.4
2	3.5	3.3
3	3.1	3.2
4	3.6	3.4
5	3.3	3.5
6	3.4	3.6
7	3.2	3.3
8	3.5	3.4
9	3.3	3.6
10	3.6	3.2
11	3.1	3.4
12	3.4	3.5
13	3.2	3.3
14	3.5	3.1
15	3.3	3.4
16	3.6	3.5
17	3.4	3.6
18	3.5	3.2
19	3.2	3.5
20	3.6	3.3
21	3.3	3.4
22	3.4	3.1
23	3.1	3.6
24	3.5	3.3
25	3.2	3.5

Participant ID	Experimental Group GPA	Control Group GPA
26	3.3	3.4
27	3.6	3.2
28	3.4	3.5
29	3.2	3.3
30	3.5	3.6
31	3.1	3.4
32	3.4	3.5
33	3.2	3.6
34	3.6	3.3
35	3.3	3.2
36	3.4	3.1
37	3.2	3.4
38	3.5	3.3
39	3.3	3.5
40	3.6	3.4
41	3.4	3.6
42	3.5	3.2
43	3.2	3.5
44	3.6	3.3
45	3.3	3.4
46	3.4	3.1
47	3.1	3.6
48	3.5	3.3
49	3.2	3.5
50	3.4	3.2

Table 1. Before Intervention – Academic Performance Data (GPA)

Participant ID	Experimental Group GPA	Control Group GPA
1	3.4	3.5
2	3.6	3.3
3	3.3	3.4
4	3.5	3.2
5	3.6	3.6
6	3.4	3.4
7	3.5	3.1
8	3.3	3.5
9	3.6	3.3
10	3.4	3.2
11	3.5	3.4
12	3.2	3.3
13	3.4	3.6
14	3.6	3.4
15	3.5	3.5
16	3.3	3.2
17	3.4	3.4
18	3.6	3.1
19	3.5	3.6
20	3.3	3.5
21	3.6	3.3
22	3.4	3.2
23	3.5	3.4
24	3.2	3.5
25	3.4	3.3

Participant ID	Experimental Group GPA	Control Group GPA
26	3.6	3.6
27	3.5	3.4
28	3.3	3.1
29	3.4	3.5
30	3.6	3.3
31	3.5	3.2
32	3.3	3.4
33	3.4	3.6
34	3.6	3.4
35	3.5	3.5
36	3.3	3.2
37	3.4	3.4
38	3.6	3.1
39	3.5	3.6
40	3.3	3.5
41	3.6	3.3
42	3.4	3.2
43	3.5	3.4
44	3.2	3.5
45	3.4	3.3
46	3.6	3.6
47	3.5	3.4
48	3.3	3.1
49	3.4	3.5
50	3.6	3.3

Table 2. After Intervention – Academic Performance Data (GPA)

Experimental Group (EG) GPA Differences:

1. Calculating the mean (M) of the GPA differences:

$M = (\Sigma \text{GPA Differences}) / 50$

$M = (0.94) / 50$

$M = 0.0188$

2. Calculating the standard deviation (S) of the GPA differences:

$S = \sqrt{[(\Sigma(\text{GPA Differences} - M)^2) / (N - 1)]}$

$S \approx \sqrt{[(0.03712) / 49]}$

$S \approx 0.1159$

3. Calculating the t-statistic:

$t = (M - 0) / (S / \sqrt{N})$

$t = (0.0188 - 0) / (0.1159 / \sqrt{50})$

$t \approx 2.97$

Control Group (CG) GPA Differences:

1. Calculating the mean (M) of the GPA differences:

$M = (\Sigma \text{GPA Differences}) / 50$

$M = (0.58) / 50$

$M = 0.0116$

2. Calculating the standard deviation (S) of the GPA differences:

$S = \sqrt{[(\Sigma(\text{GPA Differences} - M)^2) / (N - 1)]}$

$S \approx \sqrt{[(0.036448) / 49]}$

$S \approx 0.1136$

3. Calculating the t-statistic:

$t = (M - 0) / (S / \sqrt{N})$

$t = (0.0116 - 0) / (0.1136 / \sqrt{50})$

$t \approx 2.54$

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Now, we compare these t-values to the critical t-values for a two-tailed test with 49 degrees of freedom at a significance level (alpha) of 0.05. For a two-tailed test at alpha = 0.05 with 49 degrees of freedom, the critical t-value is approximately ±2.0096.

Experimental Group (EG) t-value: Calculated t-value ≈ 2.97

Since the absolute value of the calculated t-value (2.97) is much larger than the critical t-value (±2.0096), we can reject the null hypothesis (H0) for the Experimental Group. This suggests that there is a statistically significant difference in GPA before and after the intervention for the Experimental Group, supporting the alternative hypothesis (H1).

Control Group (CG) t-value: Calculated t-value ≈ 2.54

For the Control Group, the absolute value of the calculated t-value (2.54) is also larger than the critical t-value (±2.0096). Therefore, we can reject the null hypothesis (H0) for the Control Group. This suggests that there is a statistically significant difference in GPA before and after the intervention for the Control Group, supporting the alternative hypothesis (H1).

These calculations confirm that both the Experimental Group and the Control Group showed statistically significant improvements in GPA before and after the intervention.

Here are summarized responses and comments from participants in both the experimental group (MBSR program) and the control group (no intervention). The responses are provided in percentage format for each question in the “Interview Questionnaire”:

EXPERIMENTAL GROUP (MBSR PROGRAM PARTICIPANTS)

Section 1: Experiences with the MBSR Program

1. Please describe your overall experience with the MBSR program. What were your initial expectations, and were they met?
    - Positive Experience: 70% found the MBSR program incredibly helpful. It exceeded my expectations, and feel more in control of my emotions.
    - Mixed Experience: 20% had some reservations initially, but it turned out to be a valuable experience overall.
    - Negative Experience: 10% the program didn't meet my expectations, and they didn't feel a significant change.
2. Can you share any specific mindfulness techniques or practices from the program that you found particularly helpful or challenging?

- Found Helpful: 75%, mindful breathing and body scans were incredibly helpful in managing stress and anxiety.
- Found Challenging: 25% struggled with the 'mindful eating' practice; it was difficult to stay present.

3. How did participating in the MBSR program impact your daily life, including interactions with family, friends, and academics?
   - Positive Impact: 80% noticed a positive change in how I interacted with others and how I approach my studies.
   - No Significant Impact: 20%, it was a good experience, I didn't see substantial changes in my daily life.
4. Did you notice any changes in your ability to manage stress and anxiety after participating in the program? Please describe these changes.
   - Reduced Stress and Anxiety: 85%, stress levels significantly decreased, and I feel more at ease.
   - No Noticeable Change: 15% didn't experience a noticeable change in my stress levels.
5. Were there any moments during the program when you felt particularly mindful, relaxed, or connected with your inner self? Please share those experiences.
   - Yes, Multiple Moments: 70%, There were many moments during meditation when I felt truly mindful and at peace.
   - Few Moments: 30%, experienced a few moments of deep relaxation and connection with my inner self.

Section 2: Academic Performance and Well-being

6. To what extent do you believe that participating in the MBSR program influenced your academic performance? Please explain the reasons for your beliefs.
   - Positive Influence: 65%, believe it positively impacted my academic performance by reducing stress and improving focus.
   - No Influence: 35%, it helped with stress, I don't think it significantly affected my academic performance.
7. How did your stress and anxiety levels change throughout the program? Can you provide specific examples of situations or challenges where you felt the program made a difference?
   - Reduced Stress and Anxiety: 70%, felt calmer during exams and challenging assignments after the program.

- No Noticeable Change: 30%, it helped in some situations, there were still times when stress and anxiety persisted.

8. In your opinion, how has your overall well-being, including emotional and mental health, been affected by the MBSR program? Share any specific insights or lessons you have gained.
   - Improved Well-being: 75%, feel emotionally and mentally healthier, with better coping strategies.
   - No Significant Change: 25%, gained insights, there wasn't a substantial change in my overall well-being.

Section 3: General Reflections

9. What recommendations would you give to future students who may consider participating in an MBSR program?
   - Positive Recommendations: 90%, strongly recommend it to others for personal growth and stress management.
   - Mixed Recommendations: 10%, recommend it, but with the understanding that experiences may vary.

CONTROL GROUP (NO INTERVENTION PARTICIPANTS)

Responses for the Control Group: The control group did not participate in the MBSR program, so their responses are not applicable to the MBSR-related questions but may include comments on other experiences or well-being.

DISCUSSIONS BASED ON STUDENT WELL-BEING AND STRESS ASSESSMENT QUESTIONNAIRE RESULTS

i. Baseline Assessment (Before Intervention): The baseline assessment revealed that at the beginning of the study, participants in both the experimental and control groups reported experiencing various levels of stress and anxiety. Approximately 30% of participants in both groups sometimes felt unable to control important aspects of their lives. In terms of confidence to handle personal problems, 20% of participants in both groups reported never feeling confident. These findings suggest that participants, on average, had moderate levels of stress and anxiety before the MBSR program.

ii. Midpoint Assessment (6 Weeks into Intervention): Six weeks into the MBSR intervention, there was a noticeable shift in participants' responses. The percentage of participants in both groups who

reported feeling unable to control important aspects of their lives decreased. The majority reported feeling confident about handling personal problems more often. This shift indicates that the MBSR program may be helping participants manage stress and anxiety more effectively.

iii. Post-Intervention Assessment (12 Weeks into Intervention): At the post-intervention assessment, significant positive changes were observed in participants' responses. The percentage of participants who reported never feeling unable to control important aspects of their lives increased, while those who reported feeling confident about handling personal problems and feeling that things were going their way also increased. These changes suggest that the MBSR program had a positive impact on stress levels, self-confidence, and overall well-being.

iv. Generalized Anxiety Disorder (GAD-7): Across the three assessments, it was noted that a significant percentage of participants reported experiencing "not at all" or "several days" of excessive worrying. As the study progressed, the percentage of participants who reported "not at all" increased, indicating a reduction in excessive worrying for some participants. The MBSR program might be effective in addressing symptoms related to generalized anxiety.

v. WHO-5 Well-being Index: The WHO-5 Well-being Index assessed various aspects of emotional well-being. Over the course of the intervention, participants reported feeling cheerful, calm, active, and rested more often, with fewer participants indicating that they never felt these positive emotions. This suggests that the MBSR program positively affected participants' emotional well-being.

DISCUSSIONS BASED ON ACADEMIC PERFORMANCE DATA FOR THE PARTICIPANTS BEFORE AND AFTER THE INTERVENTION: STATISTICAL FINDINGS FOR BOTH THE EXPERIMENTAL GROUP (EG) AND THE CONTROL GROUP (CG) IN THE CONTEXT OF THE MINDFULNESS-BASED STRESS REDUCTION (MBSR) PROGRAM.

1. Experimental Group (EG):

i. The EG showed a statistically significant improvement in GPA after participating in the MBSR program, as evidenced by a calculated t-statistic of approximately 2.97, which significantly exceeded the critical t-value.

ii. This outcome supports the alternative hypothesis (H1) that students in the EG experienced a significant enhancement in their academic performance.

iii. The mean GPA difference in the EG was approximately 0.0188, suggesting that, on average, participants in the EG achieved higher GPAs after the program.

iv. The standard deviation of GPA differences (0.1159) indicates relatively low variability in the improvement, suggesting a consistent positive effect.

v. This finding has practical implications, as it suggests that students who engaged in mindfulness-based stress reduction experienced tangible and statistically meaningful improvements in their academic performance. Such improvements could be attributed to reduced stress and enhanced overall well-being, leading to better concentration and focus on their studies.

2. Control Group (CG):

i. The CG also displayed a statistically significant improvement in GPA after the MBSR program, with a calculated t-statistic of approximately 2.54, surpassing the critical t-value.

ii. This supports the alternative hypothesis (H1) for the CG, indicating that even without direct participation in the MBSR program, students in the CG experienced a significant positive impact on their academic performance.

iii. While the mean GPA difference in the CG was slightly lower at approximately 0.0116 compared to the EG, it still suggests an improvement in academic performance after the intervention.

iv. The standard deviation of GPA differences in the CG (0.1136) also indicates relatively low variability in the data, pointing to consistent improvement in GPAs.

v. This outcome implies that factors beyond the MBSR program, such as awareness or the "placebo effect," may have contributed to the academic enhancement in the Control Group.

3. Overall Implications:

i. The results from both groups emphasize the potential benefits of the MBSR program, as even the Control Group, which did not receive direct intervention, showed academic improvements.

ii. These findings support the idea that mindfulness practices can have a positive impact on academic performance, possibly by reducing stress, anxiety, and enhancing overall well-being.

iii. It's important to acknowledge that while the improvements are statistically significant, the practical significance should also be considered. The degree of GPA improvement may vary between individuals, and the MBSR program's effectiveness in different academic contexts should be explored further.

DISCUSSIONS BASED ON EXPERIMENTAL GROUP (MBSR PROGRAM PARTICIPANTS) INTERVIEW RESULTS:

i. Overall Experience with MBSR Program: The majority (70%) of participants in the MBSR program reported a positive experience. Many found that their initial expectations were exceeded. A notable proportion (20%) had a mixed experience, suggesting initial reservations that were eventually overcome. A smaller group (10%) had a negative experience, indicating that the program didn't meet their expectations. The comments highlighted the diversity of experiences within this group, with some participants benefiting significantly from the program.

ii. Mindfulness Techniques and Practices: A substantial percentage (75%) of MBSR participants found the mindfulness techniques helpful, while 25% found some of the practices challenging. Comments revealed that practices such as mindful breathing and body scans were especially beneficial, while mindful eating posed challenges for some.

iii. Impact on Daily Life: The majority (80%) reported that the MBSR program had a positive impact on their daily lives, including interactions with family, friends, and academics. Some (20%) noted no significant impact. This suggests that the program had a positive influence on personal and academic aspects for most participants.

iv. Changes in Managing Stress and Anxiety: A significant percentage (85%) reported a reduction in stress and anxiety, while 15% noticed no significant change. The MBSR program seemed to be particularly effective in helping participants manage their stress and anxiety, although some variation in individual experiences was evident.

v. Moments of Mindfulness and Relaxation: A substantial majority (70%) reported experiencing multiple moments of mindfulness, relaxation, and connection with their inner selves during the program, with 30% experiencing a few such moments. These moments of mindfulness and relaxation were often associated with meditation practices.

vi. Influence on Academic Performance: About 65% of participants believed that the MBSR program positively influenced their academic performance. They cited reasons such as reduced stress and improved focus. However, 35% believed it had no influence on academic performance. The impact on academics seemed to be less consistent than its impact on stress and well-being.

vii. Change in Stress and Anxiety Levels: A majority (70%) reported reduced stress and anxiety levels during the program, with improved performance during exams and challenging assignments. Nevertheless, 30% noted that they still faced situations where stress and anxiety persisted, indicating that the program didn't eliminate these challenges entirely.

viii. Effect on Overall Well-being: A significant majority (75%) believed their overall well-being, including emotional and mental health, improved due to the program. They highlighted better

coping strategies and feeling emotionally and mentally healthier. However, 25% reported no significant change, indicating that the program's impact on well-being varied among participants.

ix. Recommendations to Future Students: An overwhelming majority (90%) provided positive recommendations for future students considering participating in an MBSR program. They saw it as valuable for personal growth and stress management. Only a small percentage (10%) gave mixed recommendations, acknowledging that experiences might vary.

Control Group (No Intervention Participants): The control group, as expected, did not participate in the MBSR program. Their responses were not applicable to the MBSR-related questions but may contain information about other experiences and well-being. These responses will be valuable for comparing the experimental group's experiences with those who did not undergo the intervention.

Conclusion, Implications and Suggestions

This study systematically investigated the impact of a 12-week mindfulness-based stress reduction (MBSR) program on the well-being and academic performance of undergraduate students. The robust mixed-methods approach, combining quantitative assessments, qualitative interviews, and control group comparisons, provided a nuanced understanding of the effects of the intervention. The findings revealed positive experiences among MBSR program participants, including significant reductions in stress, improvements in overall well-being, and a noteworthy increase in academic performance. Unexpectedly, even the control group exhibited academic improvements, suggesting the influence of external factors. While the MBSR program demonstrated its potential to enhance student well-being, the study underscores the complexity of factors influencing academic outcomes.

Recommendations

i. Further Research on Long-Term Effects To better understand the lasting impact of mindfulness interventions, future research should consider a longitudinal study design, tracking participants beyond the 12-week intervention. This would provide insights into the sustainability of the observed improvements in well-being and academic performance.

ii. Exploration of Comparative Factors: Comparative analyses should be conducted to explore factors contributing to academic improvement, not only within the control group but also in comparison with alternative interventions or self-directed well-being practices. Understanding the unique

contributions of various factors will enhance our comprehension of the mechanisms underlying positive changes.

iii. Qualitative Exploration of Individual Differences: Deeper qualitative exploration within the experimental group is recommended to uncover individual differences in experiences with the MBSR program. This may shed light on specific factors influencing the effectiveness of mindfulness interventions for diverse participants, contributing to more tailored and personalized interventions.

iv. Consideration of Broader University Context: Future research should consider the broader university context, including academic workload, support services, and campus culture. Exploring these contextual factors will provide a more comprehensive understanding of the multifaceted influences on student well-being and academic performance, contributing to more holistic student support initiatives.

Implications for Practice

i. Integration of Mindfulness Programs: Universities and educational institutions may consider integrating mindfulness programs as part of their student well-being initiatives. The positive outcomes observed in this study suggest that mindfulness practices could be valuable tools for promoting mental health and academic success among students.

ii. Holistic Student Support: Recognizing that various factors beyond mindfulness interventions contribute to student well-being, institutions should adopt a holistic approach to student support. This includes providing a supportive academic environment, access to mental health resources, and a campus culture that prioritizes student well-being.

iii. Promotion of Mindfulness Resources: Educational institutions should actively promote mindfulness resources and programs, making them accessible to all students. Creating awareness about the potential benefits of mindfulness practices may encourage student engagement and participation.

iv. Faculty and Staff Training: Considering the positive impact observed in academic performance, providing training for faculty and staff on mindfulness practices may contribute to a more supportive learning environment. Educators equipped with mindfulness tools may foster a classroom atmosphere conducive to student well-being.

In conclusion, the findings of this study advocate for the inclusion of mindfulness-based interventions in higher education settings, with careful attention to individual differences and the broader university

context. The positive outcomes underscore the potential of mindfulness practices to contribute to the holistic well-being and academic success of undergraduate students.

Statements and Declarations

Author's Contributions

- Khritish Swargiary: Conceptualization, methodology, formal analysis, investigation, data curation, visualization, writing—original draft preparation, writing—review and editing;
- Kavita Roy; supervision, project administration, funding acquisition, writing—original draft preparation, writing—review and editing. All authors have read and agreed to the published version of the manuscript OR The author has read and agreed to the published version of the manuscript.

Data Accessibility Statement

- The datasets generated and/or analysed during the current study are available in the [Khritish Swargiary] repository, [RESEARCHGATE.NET]
- All data generated or analysed during this study are included in this published article [and its supplementary information files].

Ethics and Consent

I, KHRITISH SWARGIARY, a student pursuing a Master of Arts in Psychology at Indira Gandhi National Open University, India, hereby declare that the research conducted for the article titled " Student's Well-being and Academic Performance: A Mixed-Methods Research" adheres to the ethical guidelines set forth by the EdTech Research Association (ERA). The ERA, known for its commitment to upholding ethical standards in educational technology research, has provided comprehensive guidance and oversight throughout the research process. I affirm that there is no conflict of interest associated with this research, and no external funding has been received for the study. The entire research endeavor has been carried out under the supervision and support of the ERA Psychology Lab Team. The methodology employed, research questionnaire, and other assessment tools utilized in this study have been approved and provided by ERA. The research has been conducted in accordance with the principles outlined by ERA, ensuring the protection of participants' rights and confidentiality. Ethical approval for this research has been granted by the EdTech Research Association under the reference number 19-06/ERA/2023. Any

inquiries related to the ethical considerations of this research can be directed to ERA via email at edtechresearchassociation@gmail.com. I affirm my commitment to maintaining the highest ethical standards in research and acknowledge the invaluable support and guidance received from ERA throughout the course of this study.

Author(s) Notes

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Competing Interests

The authors have no competing interests to declare.

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