

ORIGINAL RESEARCH

Efficacy of Mindfulness Based Stress Reduction [MBSR] on Academic Test Anxiety and Self-confidence among Indian Undergraduates

Eficacia de la meditación en el aumento de la autoconfianza, y de la reducción del estrés y la ansiedad asociados a los exámenes escolares en estudiantes de la India

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Abstract

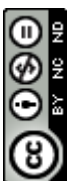
The time of examination and evaluation is a stressful period where anxiety is at its highest levels. To some extent, a low level of stress can help motivate the students; however, more stress can be discouraging. It will make students exhausted, overwhelmed, and confused. High self-esteem promotes physical health and enhances coping with threat; on the other hand, low self-esteem is associated with mental health difficulties like anxiety, depression, and personality disorder. Hence, the present study focuses on assessing the academic test anxiety and self-confidence and finding out the efficacy of practicing mindfulness meditation to relieve test anxiety, thereby improving the self-confidence and self-esteem in their life. Objectives: Determine the pre-interventional academic test anxiety and self-confidence among undergraduates in experimental and control groups and determine the effectiveness of MBSR on academic test anxiety and self-confidence.

Keywords: Mindfulness Based Stress Reduction, Academic Test Anxiety, Self Confidence, Undergraduate Students.

Resumen

El momento de los exámenes y evaluaciones es un período estresante en el que la ansiedad alcanza sus niveles más altos. Hasta cierto punto, un nivel bajo de estrés puede ayudar a motivar a los estudiantes; sin embargo, un mayor nivel de estrés puede ser desalentador. Hará que los estudiantes se sientan exhaustos, abrumados y confundidos. Una autoestima alta promueve la salud física y mejora la capacidad de afrontar las amenazas; por otro lado, una autoestima baja se asocia con dificultades de salud mental como la ansiedad, la depresión y el trastorno de la personalidad. Por lo tanto, el presente estudio se centra en evaluar la ansiedad ante los exámenes académicos y la confianza en uno mismo y en descubrir la eficacia de la práctica de la meditación consciente para aliviar la ansiedad ante los exámenes, mejorando así la confianza en uno mismo y la autoestima en su vida. Objetivos. Determinar la ansiedad ante los exámenes académicos y la confianza en uno mismo antes de la intervención entre los estudiantes universitarios en grupos experimentales y de control y determinar la eficacia de MBSR en la ansiedad ante los exámenes académicos y la confianza en uno mismo.

Palabras clave: reducción del estrés basada en meditación, Prueba Académica de Ansiedad, auto confianza, estudiantes de licenciatura



Introduction

There is growing concern about the impact of stress and mental health problems among students in higher education¹. The 2019 Annual Report of the Centre for Collegiate Mental Health reported that anxiety continues to be the most common problem and diagnosis among students who seek psycho-therapy services at university counselling centres². International studies describe an increase in stress and symptoms of mental disorders among undergraduate and graduate students³. The increased psychosocial stress reported by university populations may negatively affect the quality of life, mental health, academic performance, self-esteem, and self-confidence⁴. The most significant source of stress among students is a formative and summative assessment, evaluations, examinations, and the subsequent wait for results⁵. Scott suggests that on average, 30% of students show debilitating signs of stress during exams⁶. Exam stress can cause nausea, changes in eating and sleeping patterns, and stomach pains in some students. In addition, most students experience a reduction in stress once they had started their first examination. Stress interventions can be conceptualised in several ways⁷ and interventions like meditation, mindfulness techniques, and yoga have been found to be more effective, and mindfulness training can influence the emotional component of evaluation anxiety. A key role for educational institutions in relation to stress is the provision of appropriate resources to enable individuals to deal with stress⁸ and academic anxiety, particularly among novice students who are more vulnerable from suffering stress. So, the present study focuses on identifying the academic test anxiety and level of self-confidence and practicing mindfulness meditation to relieve test anxiety, thereby improving the self-confidence and self-esteem in the students' lives.

Methods

Study design and participants

A quantitative research approach was adopted in the study. The study involves two phases: In Phase I, a cross-sectional descriptive survey design was used to assess the test anxiety and self-confidence

among students, and in Phase II, quasi-experimental non-equivalent control group design was used with Mindfulness Based Stress Reduction [MBSR] as the intervention. Considering the literatures the sample size was calculated using the formula of mean difference and standard deviation, with α = Level of significance (5%) P = Anticipated prevalence (25%) d = Relative precision (5%) and the estimated sample size was hundred nursing students. The participants were selected using convenient sampling technique. Inclusion criteria for study participants were: 1) students who were identified with test anxiety, willing to participate and be committed to perform the eight sessions of MBSR intervention for eight weeks and are mentally and physically fit at the time of the study. After the survey, the students were divided into experimental and control groups based on the pre-interventional test anxiety score. The intervention followed the 8-week course designed for the MBSR program and consisted of eight sessions. The investigator demonstrated each session, and the group had practiced the same for 25 – 30 minutes per day for a week with the help of audio clips developed by the investigator. The data was collected from 01/12/2020- 23/01/2021.

Data collection instruments

The data was collected using the socio-demographic proforma, Standardized Westside Test Anxiety Scale, and self-confidence scale. Demographic proforma of the student consists of Age in years, Gender, Religion, Entry level percentage of marks (PUC/+2), Type of family, Number of siblings, Father's and Mother's education, Father's and Mother's occupation. The academic test anxiety scale is a standardised tool, and it is a 5-point scale consists of 10 statements and rating is done in sequence from Always true (5), Usually true (4), Sometimes true (3), Seldom true (2) and never true (1). The academic test anxiety tool is categorized as follows: 1.0-2.4 [Normal], 2.5–2.9 [Mild], 3.0-3.4 [Moderate], 3.5-3.9 [Severe] and 4.0-5.0 [Extremely high anxiety]. Similarly, the self-confidence scale is also a standardized tool, and it is a 5-point scale consists of 18 statements and rating is done in sequence from Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly agree (5). The self-

confidence tool is categorized as follows: <52 less confident and ≥ 52 confident based on the mean score. The validity of the data collection instruments and the module on Mindfulness Based Stress Reduction were validated by the experts in the field of behavioural science. The reliability of the Westside Test Anxiety Scale and Self Confidence Scale was done, and the internal consistency was measured with Cronbach's Alpha using SPSS statistics 23 version and it was found to be 0.942 and 0.78, respectively. Pretesting of the tool was done to identify problems with the data collection instruments and to find possible solutions. Pretesting was carried out on 15/11/2020 at Nitte Usha Institute of Nursing Sciences and it helped the investigator to identify the inadequacies of the data collection instruments and to make modifications as required.

Ethical considerations

The present study fits into the principles defined in the Declaration of Helsinki (World Medical Association, 2013). The study was reviewed and approved by the Institutional Ethics Committee of the Nitte Usha Institute of Nursing Sciences, NITTE (Deemed to be University) and the Reference number was: NUINS/CON/NU/IEC/2018-19.

Data collection procedure

Before the data collection, an informed written consent and participant information sheet was administered to the participants to assure confidentiality of data among the participants. Followed this, the participants' pre-interventional test anxiety and self-confidence level was assessed with the help of standardized tools. Once the participants were allotted to the study group, the investigator demonstrated the practice of mindfulness meditation. The participants in the study group [50 participants] received eight sessions of Mindfulness meditation (mind-body approach) i.e., Count 10 breaths and brief breathing meditation, Raisin meditation, Sitting meditation, Hatha yoga, Body scan meditation, Loving-kindness meditation, Mindful walking meditation, and Silent meditation. Mindfulness meditation intervention comprised eight sessions,

and each session lasted about 25 – 30 minutes per day. The data was collected from 01/12/2020-23/01/2021. The investigator demonstrated each meditation session; the same had been practiced by the group for a duration of 25 – 30 minutes per day for a week with the help of audio clips developed by the investigator. Also, the investigator created a WhatsApp group, and all the participants from the experimental group were added to the group. The investigator uploaded each week's meditation chronologically for a week and the recorded audio clips. Once the demonstration was completed, the experimental group participants utilised the same for practice. Once session I was completed, the investigator started with session II, up until session VIII. The investigator had training on Mindfulness meditation and yoga. For mindfulness meditation, the investigator had been to Behavioural Medicine Unit, National Institute of Mental Health and Neurosciences (NIMHANS), Bangalore from 01/08/2019-14/08/2019 and yoga at Pranava Yoga and Naturopathy centre, Mangalore. After eight weeks, the post-test was taken, and the data analysis was done using SPSS. 23.

Results

Baseline information

The majority (76%) of the participants in the experimental group were between 18-20 years, with a mean age of 20.18 ± 1.6 . Similarly, all the control group participants were 18-20 with a mean age of 18.98 ± 0.51 . In the control group, 94% of the participants were females whereas, in the experimental group, it was 64%. Regarding the entry-level percentage of marks (PUC/+2), only 15% of the participants secured 70 - 79% in the experimental group, whereas in the control group, it was 21%. The majority, 74% of participants (experimental) and 92% (Control) were from the nuclear family, and most participants had one sibling. Regarding father's education, 36% of the participants' parents had only secondary or higher secondary education in experimental and control groups. The common occupation (50%) of the participant's parents was farming, and 84.3% were housewives (Table I).

Table 1. Frequency (f) and percentage (%) distribution of demographic variables of participants

Demographic characteristics (n=100)	Experimental group		Control group	
	f	%	f	%
Age in years				
18-20	38	76	50	100
21-23	11	22	-	
>23	1	2	-	
Gender				
Male	18	36.0	3	6.0
Female	32	64.0	47	94.0
Religion				
Hindu	21	42.0	9	18
Christian	12	24.0	41	82
Muslim	5	10.0	-	-
Any other	12	24.0	-	-
Entry level percentage of marks (PUC/+2)				
45-59%	18	36	1	2
60-69%	16	32	13	26
70 -79%	15	30	21	42
> 80% and above	1	2	15	30
Type of family				
Nuclear family	37	74	46	92
Joint family	13	26	4	8
Extended family	-	-	-	-
Number of Siblings				
Nil	11	22	3	6
One	21	42	26	52
Two	6	12	15	30
< 2	12	24	6	12
Father's education				
>SSLC	15	30	1	2
SSLC	17	34	16	32
PUC	5	10	18	36
Diploma	12	24	6	12
Graduate	1	2	8	16
Masters	-	-	1	2
Mother's education				
SSLC	16	32	12	24
PUC	21	42	25	50
Diploma	3	6	12	24
Graduate	9	18	1	2
Masters	1	2	-	-
Father's Occupation				
Professional	9	18	8	16
Semi Professional	9	18	6	12
Clerical/ Shop owner/ Farmer	23	46	30	60
Skilled worker	9	18	6	12
Mother's Occupation				
Professional	3	6	6	12
Semi Professional	5	10	-	-
Clerical/ Shop owner/ HW	42	84	44	88

Table 2. Distribution of pre-interventional classification of academic test anxiety and level of self-confidence in the experimental and control group

Academic test anxiety score (n=100)		Experimental Group				Control Group			
		f	%	Mean	SD	f	%	Mean	SD
Normal	(1 - 2.4)	7	14	33.44	7.58	16	32	30.70	9.01
Mild	(2.5 - 2.9)	7	14			14	28		
Moderate	(3 - 3.4)	17	34			13	26		
Severe	(3.5 - 3.9)	14	10			4	8		
Extremely high anxiety	(4 - 5)	5	28			2	4		
Level of Self-confidence									
Confident	(≥52)	17	34	56.04	8.79	30	60	52.36	4.76
Less confidence	(<52)	33	66			20	40		

The noticeable fact from the above table is that 36 participants were experiencing moderate to extremely high anxiety in the experimental group, which may require attention, whereas, in the control group, it was about 19 participants. Regarding the level of self-confidence, 66% of the participants in the experimental group had less confidence in their academic performance, whereas in the control group, it was only 40%. Besides this, academic test anxiety score among participants from the experimental group was with mean ± SD (33.44 ± 7.58) wherein the control group, the participants with mean ± SD (30.70 ± 9.01) however, the level of self-confidence score among participants from the experimental group were with mean ± SD (56.04 ± 8.79) and in the control group, the participants with mean ± SD (52.36 ± 4.76).

<0.05 for few variables, hence, to analyse effectiveness, the researchers decided to use Wilcoxon Signed rank test. The calculated Z [Wilcoxon signed-rank test] value between pre-experimental anxiety and post-experimental anxiety was -5.243 with p=<0.001. This indicates that mindfulness on academic test anxiety was significantly effective and reduced the students' test anxiety. Similarly, the Z value for Self-confidence was -3.639 with p= <0.001, which shows the significance of mindfulness-based stress reduction in the improvement of self-confidence.

Table 4. Compare the effectiveness of Mindfulness-Based Stress Reduction on academic test anxiety and self-confidence between the experimental and control group using Mann- Whitney U test.

Table 3. Effectiveness of Mindfulness Based Stress Reduction on academic test anxiety within the experimental group.

Variables	Median	IQR	Z value	p-value
Pre interventional anxiety	33	29-40	-5.243	<0.001
Post interventional anxiety	31	26.75-33		
Pre interventional self confidence	59.50	50-63	-3.639	<0.001
Post interventional self confidence	61	52- 63		

Academic test anxiety (n=100)	Median	IQR	Mann Whitney U value	p-value
Experimental group	31	26.75-33	1103.5	0.312
Control group	32	20 - 38.25		
Self-confidence (n=100)				
Experimental group	61	52 – 63	703.5	0.000
Control group	51	49 – 56.25		

The normality of the data was computed using Shapiro – Wilk test, and the p values were found

As the p-value of the Mann Whitney U test for Academic test anxiety was more than 0.05 (0.312), it indicates that there were significant differences in academic test anxiety between the experimental

and control group. This finding may be attributed to the characteristics of control group participants.

Table 4 depicts that the Mindfulness-Based Stress Reduction is effective in improving the self-confidence among the experimental group participants as the p-value of Mann Whitney U test between the experimental and control group was <0.05

In short, the study concluded that, Mindfulness-Based Stress Reduction is found to be more effective in improving self-confidence rather than reducing academic test anxiety between the control and experimental group. However, self-confidence can be a key factor in reducing anxiety among people.

Discussion

University and college students live in a social context that expects efficiency, productivity, competitiveness, and individual accomplishments that measure and provide grades/ awards for these achievements⁹. Since stress and anxiety can negatively affect the graduate's quality of life in terms of physical and mental health, the investigators were confident in assessing the plausibility and effectiveness of practising mindfulness in educational settings to reduce academic test anxiety, stress and improve self-confidence¹⁰. The present study is strongly supported by a study conducted by Husam Al Khatib at Al-Ahliyya Amman University¹¹ in Jordan, which reveals that the majority (64%) of the study participants were between the ages group of 18-21 years. With regards to gender classification in the present study, in the control group, 94% of the participants were females whereas, in the experimental group, it was 64%, and the findings were consistent with the results by Husam Al Khatib, which depicts a majority (60%) of the participants, as females. The present study was supported by another study conducted by Sarah Gouda¹² et al. Which shows that the mean age of the participant in the study was 20.18 ± 1.6 and the majority of them are females, and Vaz CJ¹³ et al., reveals that the majority (90.3%) of the samples were females and the mean age was 20.

The study findings are consistent with findings of the study conducted by Husam Al Khatib¹¹ which shows that 54% of the study participants had medium (76-104) levels of exam anxiety.

The present study findings were also in line with another study conducted among pharmacy students which reveals that 30% had mild anxiety, 56% had moderate anxiety, and 14% had a high degree of test anxiety. The present study findings are inconsistent with the study conducted by Dodson and Jaime¹⁴ among nursing students to explore the relationship between test anxiety level and academic achievement. The study findings reported that students with low test anxiety were only 3.8% and severe test anxiety 33.1%. Moderate test anxiety was observed among 63.1% of students.

In the present study, the calculated Z [Wilcoxon signed-rank test] value between pre-experimental anxiety and post-experimental anxiety was -5.243 with $p < 0.001$. This indicates that the MBSR on academic test anxiety was significantly effective and reduced the students' test anxiety. Similarly, Z value for Self-confidence was -3.639 with $p < 0.001$, which shows the significance of mindfulness-based stress reduction in the improvement of self-confidence. The study findings are consistent with another study conducted by K Bennett and D Dorjee on the impact of the Mindfulness Based Reduction course on test anxiety and academic attainment among students¹⁵. The study result demonstrates that there was a medium-size effect difference between the training and control group. The anxiety score was reduced in training group at T_2 ($d=0.57$, $p=0.09$, one-tailed) and T_3 ($d=0.57$, $p=0.08$, one-tailed). In addition, the result also revealed a medium-size effect difference in academic attainment in the training group T_3 ($d=0.65$, $p=0.08$, one-tailed).

The study findings are supported by the study conducted by Shokooh and Hossein on the effectiveness of mindfulness-based stress reduction on emotion regulation and test anxiety in female high school students shows that, the MBSR program has had continuous significant effects on test anxiety ($F = 70.74$, $P = 0.000$). It has also had significant effects on emotion regulation ($F = 70.74$, $P = 0.000$). However, only for on the self-blame subscale ($F = 2.335$, $P = 0.126$) the MBSR program was not significant¹⁶.

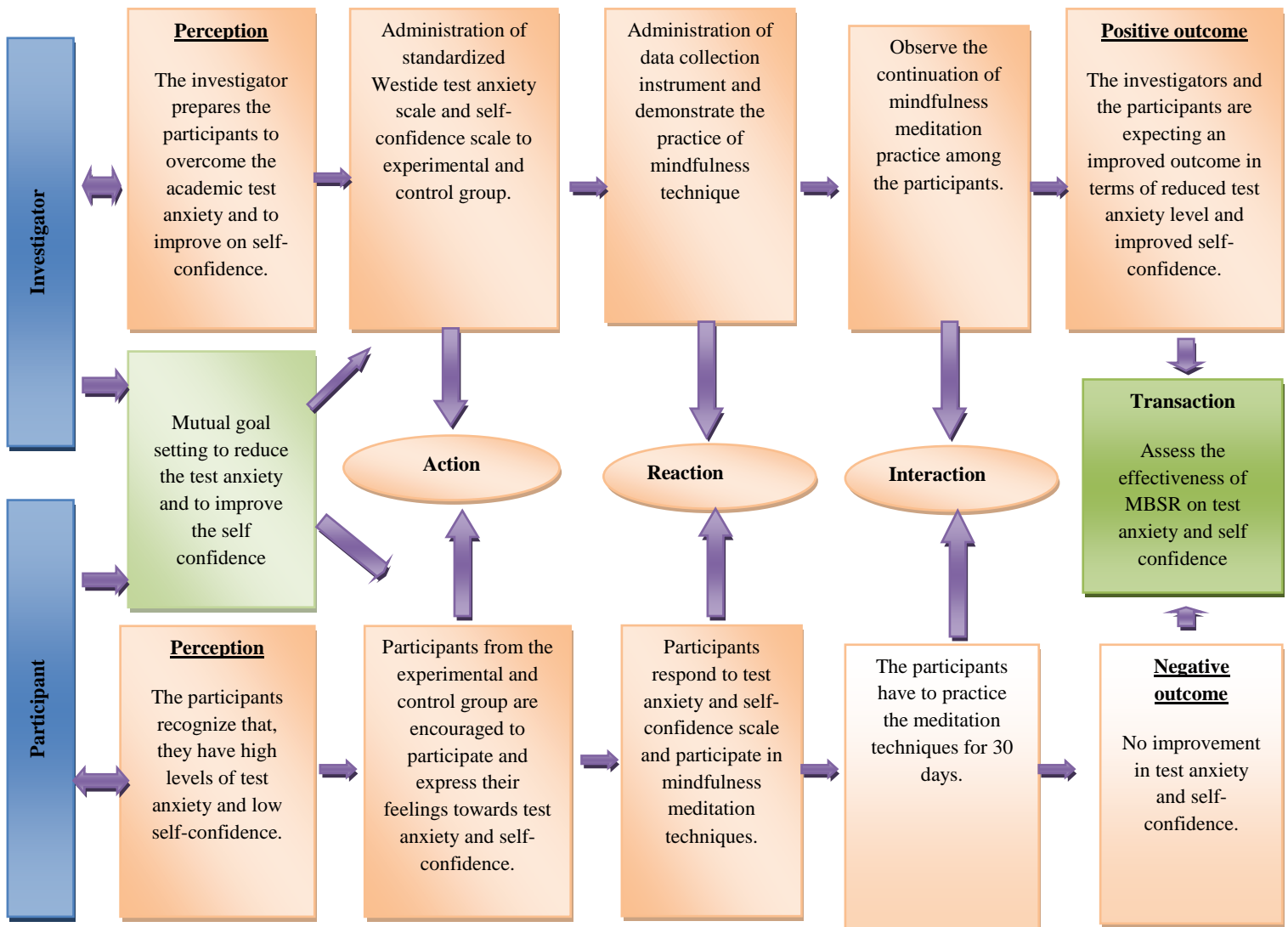


Figure 1: Conceptual framework based on Imogene King's Goal attainment theory

The study findings are in line with the other study conducted by Dundas I et al.⁹ showed that the favourable change for the intervention group was largest for evaluation anxiety ($\eta^2 = .27$); a little less for trait anxiety ($\eta^2 = .25$), self-esteem ($\eta^2 = .21$), and academic self-esteem ($\eta^2 = .18$); and least for state anxiety ($\eta^2 = .001$). Overall, the findings indicated that the MBSR group changed favourably both in anxiety and self-confidence.

The results of some other studies are also in line with the present study results regarding the positive effects of MBSR on reducing anxiety and anxiety disorders in general. Van der Riet *et al.*¹⁷, Frank *et al.*,¹⁸ Poulin, Zenner *et al.*,¹⁹ Bamber *et al.*,²⁰

showed the effectiveness of mindfulness interventions on test anxiety among students. Vollestad *et al.*²¹ also found mindfulness-based stress reduction useful in keeping anxiety symptoms at a balanced level in people with anxiety disorders.

The present study shows that the Mindfulness-Based Stress Reduction is effective on self-confidence between the experimental and control group as the p-value was <0.05 at a 5% level of significance.

The finding of the current study denotes that, Mindfulness-Based Stress Reduction is more

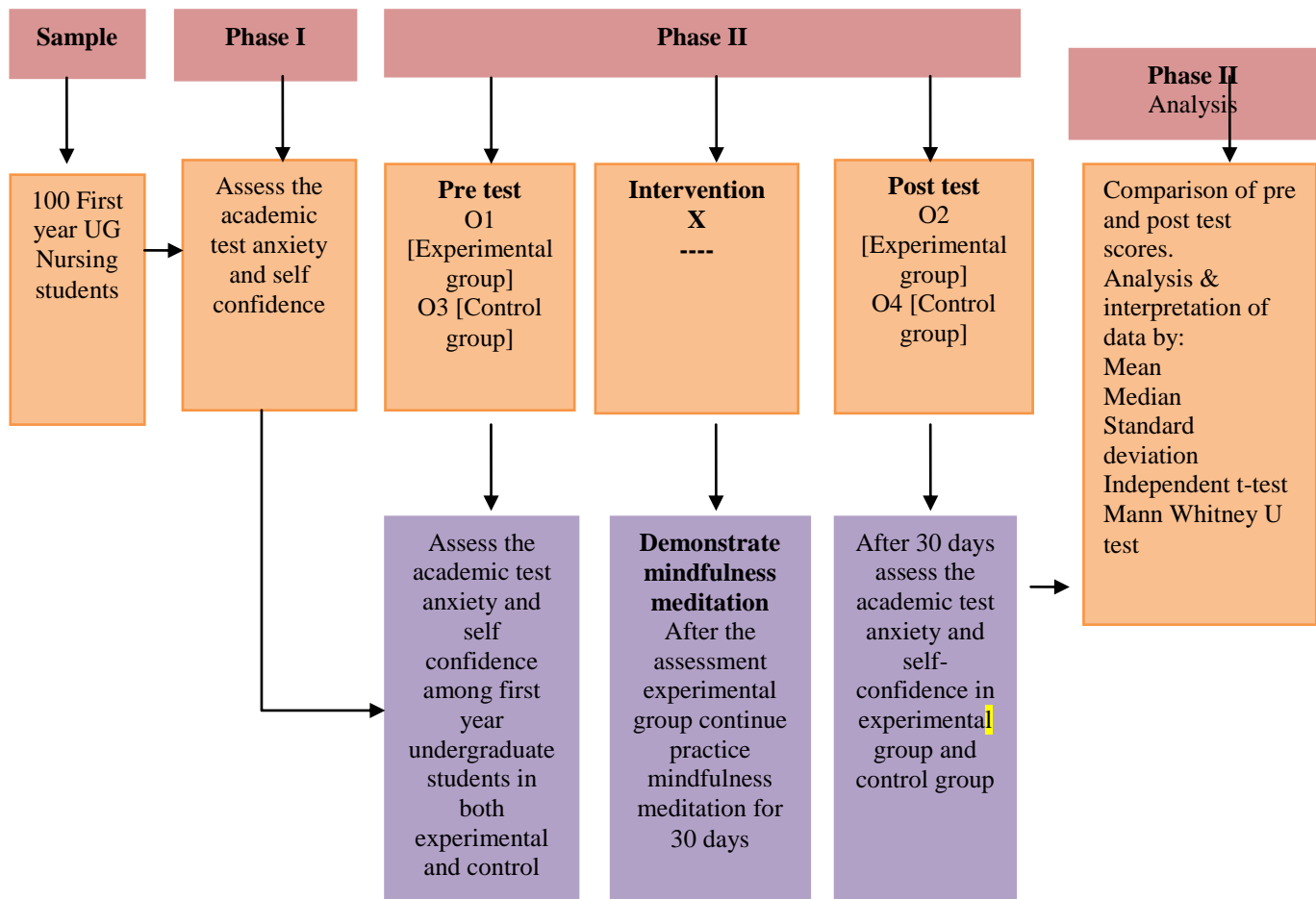
effective in improving self-confidence than reducing the academic test anxiety between the control and experimental groups. Most studies measured dispositional mindfulness using Biegel et al²³, conducted a study to investigate the change in self-esteem following an adapted version of MBSR for children and adolescents and found significant improvements in self-esteem, as measured using the RSE (Biegel et al. 2009; $d=.59$; Tan and Martin 2012; $\eta^2 =.50$). In contrast, White (2012), using a controlled trial, found no significant differences between groups in self-esteem among the undergraduate students.

The researchers believe that integrating mindfulness-based stress reduction measures in

students' lifestyles will impact their self-esteem and confidence; hence, it will reduce anxiety and other related problems. As the program is cost-effective, it will be affordable in any settings and improve the quality of life of a student.

The investigator identified a few limitations, which are as follows: The sample representation and number of students included was less in the current study and data collection was conducted in a single setting. Generalization of this findings should be done with caution as it was a single setting study. It must be noted that the assessment of test anxiety and self-confidence was self-reported by the students.

Figure 2. Schematic Representation of Research Design



Conclusion

The study concludes that MBSR, due to its positive effects on developing a conscious and non-judgemental attitude, can significantly improve emotion regulation and thus, test anxiety and self-confidence. In fact, mindfulness, through a moment to moment, non-judgemental, and step by step control of awareness, can improve one's self-control, self-regulation, and self-monitoring on their behaviours and guide them toward recovery. Hence, educational institutions could offer stress interventions / psychological interventions or mind-body therapies such as MBSR, Meditation or Yoga therapy in school to improve student's quality of life and ensure their physical and psychological health at the pivotal age of adolescence.

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