

Effect of Mandala Art Therapy on Academic Stress Level of High School Students

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Abstract

Academic stress is a common issue among high school students, affecting both their well-being and academic performance. This study aimed to assess the effectiveness of Mandala art therapy in reducing academic stress among high school students in Anand District, Gujarat. A pre-experimental one-group pre-test post-test design was used, with 60 students selected through non-probability convenient sampling. Data collection included socio-demographic characteristics and the Scale for Assessing Academic Stress (SAAS) developed by Dr Uday K Sinha. After a pre-test students received six sessions of Mandala art therapy over two weeks on alternate days, followed by a post-test. The results showed that before the intervention, 32 (52.33%) students had moderate stress, 23 (38.33%) had low stress, and 5 (8.33%) had high stress. Post-intervention, the majority 38 (63.33%) shifted to low stress. Paired sample t-test revealed a significant mean difference of 3.16 ± 4.56 ($t = 5.376$, $p < 0.05$), indicating a statistically significant reduction in academic stress levels after the intervention of Mandala art therapy. Furthermore, demographic factors such as age, gender, and year of education were significantly associated with academic stress ($p < 0.05$). The findings conclude that Mandala art therapy effectively reduces academic stress and is influenced by demographic variables. Thus, Mandala art therapy can be considered a beneficial intervention for managing academic stress among high school students.

Key words: Academic stress, Mandala art therapy, High school students

Academic stress is a prevalent issue among high school students, negatively affecting their psychological well-being and academic performance. Studies indicate that the stress can lead to anxiety, depression, and diminished school outcomes (Deb et al, 2015). A recent research highlights the effectiveness of therapeutic interventions, such as Mandala art therapy, in promoting relaxation and reducing stress (Dagli et al, 2024; Rappaport, 2021). Mandala art therapy encourages mindfulness and emotional regulation through structured creative expression, allowing students to explore their thoughts and feelings in a non-threatening environment (Babouchkina & Robbins, 2015). Engaging in this therapy can enhance students' emotional resilience.

Given the increasing academic pressures, it is essential to investigate Mandala art therapy's effectiveness in alleviating stress within high school settings, as previous findings suggest that art-based therapies positively impact mental health and coping mechanisms (Hussain & Kumar, 2022).

Objectives

This study was conducted with the three objectives, namely:

1. To assess the effectiveness of Mandala art therapy on academic stress level of high school students,
2. To find out the significant difference between pre-test score and post-test score on academic stress of high school students, and
3. To find out the association between socio demographic variable and pre-test score on academic stress of high school students

Hypotheses

H1: The Mandala art therapy is effective in reducing the academic stress of high school students.

H2: There is significant difference between pre-test score and post test score of academic stress level of high school students.

H3: There is significant association between socio-demographic variables and pre-test score of academic stress level of high school students.

Review of Literature

Recent studies have highlighted the effectiveness of Mandala art therapy in reducing stress levels in various populations, including students.

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Bhardwaj et al (2023) conducted a quasi-experimental study to assess the effectiveness of Mandala art therapy in reducing academic stress among 120 high school students (aged 14-18) in Delhi, India. Using a pre-test and post-test design, the researchers measured stress levels with the Academic Stress Questionnaire (ASQ) developed by Singh Kumar (2022). Participants were divided into an experimental group that received eight sessions of Mandala art therapy over four weeks and a control group without intervention. Results showed a significant reduction in academic stress for the experimental group, with pre-test scores averaging 65.4 (SD 12.3) and post-test scores averaging 48.1 (SD 10.5). Statistical analysis revealed a significant difference between groups ($t [118] 8.24, p < 0.001$). The study concluded that Mandala art therapy is an effective intervention for reducing academic stress, recommending its inclusion in school mental health programmes (Bhardwaj et al, 2023).

Verma et al (2024) conducted a randomised controlled trial to assess the impact of Mandala art therapy on academic stress among 80 high school students in Gujarat, India. Participants, selected through simple random sampling from two secondary schools were assigned to either an intervention group receiving six weeks of mandala art therapy or a control group receiving traditional academic counselling. The Student Stress Inventory (SSI) was used to assess stress levels before and after the intervention. Results showed a significant decrease in academic stress in the intervention group, with pre-intervention scores averaging 72.3 (SD = 11.8) and post-intervention scores averaging 53.7 (SD = 9.2). In contrast, the control group showed no significant change (pre-scores: 70.5, SD = 10.1; post-scores: 69.8, SD = 9.7). Statistical analysis indicated a significant difference between groups ($F [1,78] = 12.45, p < 0.001$). The study concluded that Mandala art therapy is an effective method for reducing academic stress and recommended its integration into school curricula as a therapeutic tool.

Methodology

The study was reviewed and approved by the Institutional Ethical Committee of Shri Krishna Hospital, Karamsad. After undertaking comprehensive assessment of the study procedure, a patient information sheet showing potential risks and benefits of participation was developed, and the consent of students was elicited. This research study employed a quantitative research approach, utilising a one-group pre-test post-test design. The study was conducted in three schools located in the Anand District of Gujarat, selected based on ease of accessibility and convenience. The schools included were: P Chandra Vidhyavihar in Borsad, IB Patel

English Medium School in Vallabh Vidyanagar, and The New Tulip International School in Anand. Data collection occurred between 11 February 2023 and 22 February 2023.

Participants were recruited based on the following inclusion criteria: (a) students who were willing to participate, (b) students studying in the 8 to 12 standard, and (c) students residing in the Anand District. Exclusion criteria were: (a) students who were absent on the day of data collection, (b) students who did not understand English, (c) students identified with psychiatric illnesses or behavioural disorders, and (d) students involved in other art forms.

For this study, a non-probability convenience sampling technique was employed due to the easy accessibility of the study samples allowing the researcher to gather data from the immediate environment. The total population of high school students in Anand was estimated to be 1,500. The sample size was calculated using G*Power version 3.3, which determined a necessary sample size of 54; thus, 60 participants were selected. Each selected participant received a detailed explanation of the research, along with a participant information sheet outlining the purpose of study, risks involved, benefits, withdrawal options, and contact information for the primary investigator. Consent was obtained from both the participants and their parents prior to conducting the study.

Initially, 70 students were recruited to account for potential attrition due to absenteeism during the intervention; however, the participation rate for the pre-test was 94.2 percent. Ultimately, 60 students were included in the final analysis, yielding an 85.7 percent retention rate.

After finalising the inclusion and exclusion criteria, a classroom was reserved for the data collection, which took place during free periods or after school hours. Data was collected using a two-part questionnaire. The first part collected demographic information about the participants, including age, gender, religion, year of education, family type, number of siblings, parental occupation, study hours, tuition classes, extracurricular activities, previous knowledge of mandalas, and prior participation in mandala art therapy. The second part of the questionnaire utilised the Scale for Assessing Academic Stress (SAAS) developed by Dr Uday K Sinha, which was used with permission. This scale consisted of 30 dichotomous items, where participants indicated the presence of an item with 'Yes' (scored as 1) or 'No' (scored as 0). A pre-test was conducted prior to the intervention using this tool.

For the intervention, a total of 10 varieties of Mandalas were prepared according to established

guidelines. Six Mandalas were selected for use following validation by experts in the arts field. These Mandalas were numbered from 1 to 6, corresponding to the six days of intervention scheduled over a two-week period. Each intervention session was conducted on alternate days, with every participating student receiving the mandalas in the same sequence as the other participants. Before each session, students were instructed to colour the mandalas according to their preferred colours. While the researcher provided a selection of colours, students were encouraged to bring their own if they so wished. Each Mandala had a maximum completion time of two hours. At the end of each session, participants received instructions for the subsequent session, emphasising the importance of colour choice and selection. A post-test was conducted on day following the completion of the intervention to assess the effects of mandala art therapy.

Data analysis was performed using both descriptive and inferential statistics. Demographic variables were expressed as frequency and percentage to summarise the characteristics of the participants. The association between demographic variables and academic stress levels was analysed using the Chi-square test. Additionally, the difference in academic stress levels between the pre-test and post-test was determined by calculating the mean and standard deviation, followed by the application of the t-test to assess the significance of the differences observed.

Results

The socio-demographic data of the 60 participants revealed that 60 percent were aged 12-14 years, with a majority being female (68.3%) and Hindu (88.3%) (Table 1). Most students studied in grades 8-11 (33.3% each), were living in nuclear families (51.6%), and spent 1-2 hours studying daily (53.3%). A significant number lacked prior experience with Mandala art.

Level of Stress among High School Students before and after Intervention

Fig 1 depicts that in pre-test, the majority (n=32, 53.33%) of the students were having moderate academic stress; and 23 (38.33%) students were suffering from low academic stress. Whereas, only 5 (8.33%) students had high academic stress.

After administration of Mandala art therapy for 2 weeks, 3 sessions per week on alternate days, post-test results indicated that majority (n=38, 63.33%) students had low academic stress. Number of students having moderate academic stress changed from 32 to 20 (33.33%) while, only 2 (3.33%) students were found to be having high academic stress.

Table: 1 Participants' Demographic Characteristics

Socio demographic variable	Frequency N=60	Percentage (%)
<i>Age (in years)</i>		
12-14	36	60
15-17	24	40
<i>Gender</i>		
Male	19	31.6
Female	41	68.3
<i>Religion</i>		
Hindu	53	88.3
Muslim	7	11.7
<i>Year of education</i>		
8	20	33.3
9	20	33.3
11	20	33.3
<i>Family type</i>		
Nuclear	31	51.6
Joint	29	48.3
<i>Number of siblings</i>		
1	29	48.3
2	19	31.7
More than 3	3	5
Single child	9	15
<i>Father's occupation</i>		
Self-employed	7	11.6
Government job	3	5
Private job	13	21.6
Business	25	41.6
Farmer	12	20
<i>Mother's occupation</i>		
Self-employed	2	3.3
Government job	5	8.3
Private job	3	5
Business	3	5
House maker	47	78.3
<i>Average number of hours spent per day to study at home</i>		
<1	2	3.3
1-2	32	53.3
3-4	23	38.3
>4	3	5
<i>Going for tuition classes</i>		
Yes	29	48.3
No	31	51.6
<i>Currently involved in extra-curricular activity</i>		
Dancing	22	36.6
Music	2	3.3
Swimming	2	3.3
Other	11	18.3
None	23	38.3
<i>Previous knowledge of Mandala art</i>		
Yes	17	28.3
No	43	71.6
<i>Previous participation in Mandala art therapy</i>		
Yes	5	8.3
No	55	91.6

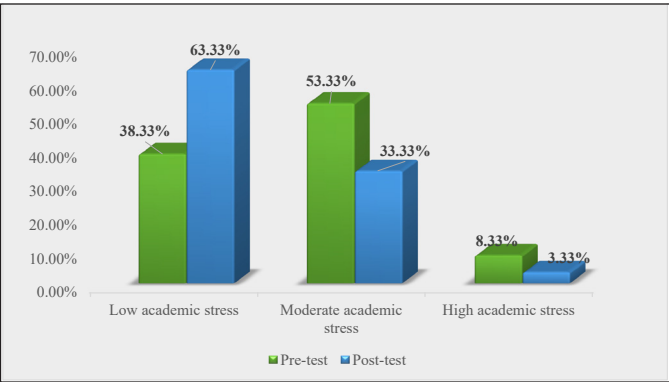


Fig 1: Level of academic stress is depicted in percentage.

Table 2 depicts that the paired sample t-test for the pre-test and post-test scores (N=60) revealed a mean difference of 3.16 ± 4.56 , with a standard error mean of 0.58. The 95 percent confidence interval for the difference ranged from 1.98 to 4.34. The calculated t-value was 5.376, exceeding the tabulated t-value of 2.001 at 59 degrees of freedom, with a p value of less than 0.05. This indicates a statistically significant difference between the pre-test and post-test scores, supporting the acceptance of the hypothesis H1.

Table 3 depicts that the academic stress levels of high school students were assessed with a pre-test mean score of 12.65 ± 6.70 and a post-test mean score of 9.48 ± 6.62 . The difference between pre-test and post-test scores was 3.17 ± 0.08 , with a significant p-value of $p < 0.05$, indicating a statistically significant reduction in academic stress following the intervention. Therefore, hypothesis H2 is the accepted. Hence, it signifies that mandala art therapy was effective to reduce the academic stress level of the students.

Table 4 presents the association between demographic variables and academic stress levels in high school students. Significant differences were found across age, gender, grade, and number of siblings, with varying distributions of low, moderate, and high stress levels, indicating these factors influence students' academic stress experiences at significance level $p < 0.05$. Hence, hypothesis H3 is accepted that there is a significant association between demographic variables and academic stress level of high school students.

Table 2: Comparison of mean and standard deviation of pre-test and post-test score of academic stress level to assess the effectiveness of Mandala art therapy

Dimension N=60	Paired differences				t cal	t tab	df	p value
	Mean ± standard deviation	Standard error mean	95% Confidence Interval of the difference					
			Lower	Upper				
Paired Sample t test of pre-test and post-test score	3.16 ± 4.56	0.58	1.98	4.34	5.376	2.001	59	0.000 p<0.05

*Df is calculated by values of row-1, column-1.

Table 3: Reduction in academic stress after the intervention

Academic stress level of high school students	Pre-test N=60	Post-test N=60	Difference between pre-test and post-test	p value
	12.65 $\pm$ 6.70	9.48 $\pm$ 6.62	3.17 $\pm$ 0.08	0.000 $p < 0.05$

Values are presented as Mean $\pm$ Standard deviation.

Discussion

This study demonstrated that mandala art therapy significantly reduces academic stress levels among high school students, highlighting its effectiveness as an intervention. Previous research supports these findings, indicating that engaging in creative activities can foster relaxation and enhance emotional regulation, ultimately mitigating stress (Benson et al, 2022). This study is also consistent with the findings of another quasi-experimental study (Bhardwaj et al, 2023), which demonstrated that Mandala art therapy significantly reduced academic stress levels in high school students after six sessions.

Demographic factors, including age, gender, grade, and number of siblings, were associated with varying academic stress levels. Younger students aged 12-14 years reported lower stress levels compared to their older peers, aligning with studies that suggest adolescents face heightened academic pressures as they progress through high school (Gonzalez & Rodriguez, 2021). Furthermore, female students exhibited higher levels of moderate and high stress, which corroborates findings that indicate girls often experience more anxiety and stress due to social expectations and academic demands (Tackett & Jansen, 2021).

Moreover, students in different grades exhibited distinct stress levels, emphasising the need for targeted interventions at specific educational stages. The influence of the number of siblings on academic stress is also notable; students from larger families may experience increased competition for

Table 4: Association of demographic variable with pre-test score of academic stress

Demographic variables			Academic stress level of high school students			Significance	
			Low academic stress	Moderate academic stress	High academic stress	χ^2	df ^(a)
1	Age of students	12-14	19	16	1	9.56	2
		15-17	4	16	4		
2	Gender	Male	13	6	0	11.35	2
		Female	10	26	5		
3	Grade	8	13	6	1	14.27	4
		9	6	14	0		
		11	4	12	4		
4	Number of siblings	1	11	17	1	13.42	6
		2	3	13	3		
		More than 3	2	1	0		
		Single child	7	1	1		
		No	21	29	5		

(a) df is calculated by row-1, column-1.

resources and attention, contributing to higher stress levels (Smith & McKenzie, 2022).

Recommendations: The study outlines the significance of mandala art therapy in school mental health programmes, as it addresses academic stress effectively while considering demographic influences. Future research should explore the long-term benefits of this therapeutic approach and its broader applicability in educational settings.

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Conclusion

Mandala art therapy significantly reduces academic stress among high school students, as demonstrated by the positive outcomes of this study. Tailored interventions in the schools can enhance student engagement and resilience, ultimately improving their academic performance and overall well-being. Future research should focus on longitudinal studies to assess the sustained impact of Mandala art therapy on academic stress and overall mental health among students.

Additionally, exploring its integration into various educational settings, including diverse cultural contexts, will provide valuable insights into its adaptability and effectiveness. This approach will help refine therapeutic interventions, ensuring they meet the unique needs of students across

different backgrounds eventually promoting a more supportive learning environment.

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