Research Article

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Impact of Integrated Yoga on Learning, Academic Stress, and Anxiety in Village Children Aged 6-12 Years: A Pilot Study

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Abstract: This pilot study report was to determine the effectiveness of yoga in reducing stress and anxiety and improving ability among school children. A quantitative Research design was used. Fourteen school Children who fulfilled the inclusion criteria were selected and assigned into control (n=7) and experimental (n=7) groups. By using the Ravens colored progressive matrix, the school children's IQ level was assessed. The academic stress and State-Trait Anxiety scales were used to assess the pre-test of academic stress and anxiety used to analyze the results. The experimental group received integrated yoga for 1 month, whereas the control group received routine care. Outcomes were tested at baseline, after 2nd week, and 4th week. No improvement was seen in the Control group from Pre-test to Post-test 2, while in the Experimental group, a 10.6 score decrease was observed. The fear of failure in the experimental group decreased by 10.7. Interpersonal difficulties in the Experimental group showed a 5.4 score decrease was observed. Teacher-pupil relationship / Teaching methods in Experimental group 7.2 score decrease was observed, showing the effectiveness of the intervention. In the State-Trait Anxiety Inventory, no significant difference in the groups (Control and Experimental), the test (Pre-test, Post-test 1, and Post-test 2), and the interactions (group X test) showed significant differences (P < 0.001 and < 0.001, respectively). A decrease in the experimental group's 18.54 score was observed, showing the effectiveness of the intervention. The integrated yoga used in this study for school children may be a beneficial intervention for reducing academic stress and anxiety.

Keywords: Effectiveness, biomarker, integrated yoga, learning ability, academic stress, and anxiety, school children

1.   INTRODUCTION

Humans are prepared to engage with their skills in the outside world through learning.[1] The artwork of gaining knowledge might also contribute to diverse talents or gaining knowledge of styles required for higher overall performance and utility. Learning is a characteristic of improvement, and so are adapting and changing. The pace and pattern of development range from one infant to another. Some kids develop from "chick to hen," a few others develop from "caterpillar to butterfly," a few develop like" fish in water," and others warfare like" fish out of water." The children below average have problems with cognitive abilities and struggle to cope with the traditional demands of the regular classroom. [2] The human abilities concerned with enhancing overall performance are memory, learning, attention, perception, intelligence, and motor functions. Learning capabilities are related to one's perceptual motor skills and autonomic arousal[2], creativity, intelligence, personality, and educational achievement. Academic stress has extended during the last few years; a pupil has to shuffle through examinations, assignments, and many different activities. The instructors and parents also burden the scholars with the stress of having good grades. These expectations cause the students to work tirelessly and increase their stress levels.[3] The parents and the institutions need the students to participate in extracurricular activities in addition to their academics because the modern expectation of the student is to be well-rounded. Intelligence is the capacity for reasoning, understanding, mindfulness, planning, and inventiveness, as well as the ability to take care of problems and adapt to new situations. The ability to recognize information and apply it as knowledge towards changing conduct within an environment is how it is generally described. The foundation of a future educated society will be students. Academic success is a major life objective for them, and it can be negatively impacted if students fall into depression. There could be several causes for this: Family problems, exposure to a different way of life in colleges and universities, poor academic performance, teacher favoritism, constant anxiety, or academic pressure.[4] Never-ending stress or academic pressure of studies can also be a chief reason leading to depression in students. 63.5% of students reported stress in India due to academic pressure (Times of India April 2022). Various research accomplished after the year 2000 found that the prevalence of stress among Indian adolescents ranged from 13% to 45%. Another study in thiruvananthapuram, India, found that between 93% and 100% of schoolchildren experienced moderate to high-stress levels, while 1.9% showed severe stress.[5] Nearly two-thirds (63.5%) of Indian students in a study by Deb et al., 2015, reported stress related to academic pressure. Therefore, conducting additional research to safeguard the expanding population is worthwhile. In the Indian educational system, getting excellent grades is more crucial than learning new things. This results in students being overworked academically, which causes significant academic stress among Indian students. Additionally, it demonstrates how stress impairs academic performance by causing students to have a poor attitude towards learning, strained relationships with their teachers, fail classes, and lack confidence in their academic work.[6] These, in turn, encourage students to use coping mechanisms, such as problem- or emotion-focused strategies, to deal with stress. Academic stress is a form of stress directly tied to academics and occurs when a person finds it difficult to manage the responsibilities

of moving forward in the field of education while maintaining integrity. According to Ghatol et al., (2017), several factors might contribute to stress during adolescence, including dysfunctional or disordered family relationships, peer pressure, an inability to handle schoolwork, drug use, and a lack of competence.[7] Negative behaviors seen in the classroom included sleeping off, arriving late, repeatedly asking to leave, often skipping class, and verbally interrupting the teacher. Although almost every high school student exhibits these behaviors occasionally, those with negative attitudes are more likely to do so.[8] Always refer to these actions as "problem" behaviors since they show a student's (nonconformity) to the changing norm in regulated environments like schools. Academic stress can lower motivation, hinder academic success, and raise the likelihood that students will drop out of college.[9] Students' mental health has been proven to suffer from academic stress. According to research, high levels of academic stress can lead to an "increased prevalence of psychological and physical problems like depression, anxiety, nervousness, and stress-related disorders," which can then have a negative impact on academic performance. According to Aafreen et al., students constantly experience pressure from various sources during their academic careers, ultimately leading to stress in students. For students to manage their stress levels responsibly, parents or guardians, teachers, students, and the entire country must work together to ensure that supporting information is conveyed.[10] The easiest way to understand how anemia affects children is to examine school dropout rates. Children's cognitive function is significantly impacted by iron deficiency anemia, according to a September 2016 research from India Spend. Additionally, it affects language development, motor development, coordination, and a five to ten-point IQ deficit in infants and young children. According to estimates from 2011, there are 800 million children who suffer from anemia. This review discusses the most recent research on the key chemical categories that disrupt thyroid hormones and how they affect brain development. We also highlight current research demonstrating the impact of maternal thyroid hormone transmission during early pregnancy on offspring IQ and risk for neurodevelopmental diseases. The critical role of iodine and thyroid hormone in promoting healthy brain development is now better understood mainly due to these recent discoveries. We suggest that a possible biological explanation underlying the recent rise in the prevalence of neurodevelopmental disorders and IQ loss is prenatal exposure to combinations of thyroid hormone-disrupting substances. In India, yoga has been used for generations as a method of reducing anxiety. Balance, health, harmony, and happiness are characteristics of yoga as a way of life. The seventh aspect of Ashtanga Yoga is meditation, a component of yoga. Based on the study's findings, it can be inferred that yoga helps students perform better in class by reducing their stress levels. As a result, it is recommended that yoga instruction become a regular element in schools. Low academic achievement may prevent pupils from enrolling in recognized higher education institutions. The university entrance exam is significantly impacted by poor academic achievement. It restricts students' job options as well. Depression may result from persistently poor academic achievement in primary and secondary schools. Numerous factors, including internal motivation, learning prowess, and external stressors like family situation, educational standards, and learning environment, impact students' academic

performance. Because of this, educators looking to improve students' academic performance should concentrate on helping students learn how to manage stress in addition to how to transmit knowledge. One way to provide this support is to incorporate yoga exercises into the classroom because they help students develop their abilities in self-control, focus, and mind-body awareness. Many reviews of the literature indicate that a variety of factors, most of which are outside of the student, contribute to the level of academic anxiety that students in India experience at the primary, secondary, and higher secondary school levels. Practicing yoga and meditation has a beneficial effect on raising academic accomplishment since it helps students focus their attention span, intelligence, and learning process. Though yoga has been proven to have many beneficial effects among various age groups, using yoga for training a specific component is a challenge, and prescribing it for a special population like children is a big challenge. The issue is one should know how much is too much. Hence, in this study, efforts were taken to test the effect of an integrated yoga program for children, which contained a feasible practice component, on learning ability, academic stress, and anxiety among school-going children of 6-12 years.

2. MATERIALS AND METHODS

2.1 Study design

The present pilot study is a prospective and nonrandomized design study.

2.2 Ethical statement

The Institutional Ethics Committee of Saveetha Medical College and Hospital approved the study dated 003/09/2021. An information sheet was provided to the children about the study in English and the local language (Tamil), and their signed consent for participation in the study was obtained from the parents. Confidentiality was maintained.

2.3 Participants

This study analyzed the effectiveness of integrated yoga in reducing academic anxiety and stress. It was conducted in Kuthambakkam village, under Kancheepuram district, in Tamil Nadu state. The village has a population of 5047 and an area of about 8.33 square kilometers. Of this, 2567 are males, whereas the females count 2480.

2.4 Inclusion and exclusion criteria

Inclusion criteria
➢ Age group 6-12 years
➢ All children studying in public and private schools
➢ Both male and female children
➢ Children attend regularly.
➢ Parents are willing to sign informed consent.

Exclusion criteria
➢ Children with hearing or visual impairments and physical illnesses.
➢ Children who do not want to participate
➢ Children with low physiological markers (haemoglobin, thyroid profile-T3, T4, TSH level).

2.5 Sampling design

This village has 547 children in the age of 6-12 years. Out of this, 287 are boys, and 260 are girls. The samples were conveniently selected from the population based on their enthusiasm for participating and assurance of good adherence to the intervention. The samples were randomly allotted to the groups using the simple random sampling method (lottery method) in a 1:1 ratio. Fourteen school Children who fulfilled the inclusion criteria were selected and assigned into control (n=7) and experimental (n=7) groups. By using the Ravens colored progressive matrix, the school children's IQ level was assessed. The academic stress scale and State-Trait Anxiety scale are used to assess the pre-test of academic stress and anxiety and to analyze the results. The experimental group received integrated yoga for 1 month, whereas the control group received routine care.

2.6 Intervention - Integrated Yoga[16-18]

The yoga program used for the study is divided into four parts: Pranayama (breathing techniques), asana (body posture), kriya (cleansing activity), and dhyana (meditation).
a) The pranayama part had three techniques practiced 6 days a week as follows
● Naadi shudhi pranayama – alternate nostril breathing (for 8+8+8 cycles).
● Bhramari Pranayama (Bee Breath): Bee Breath involves gentle humming sounds produced during exhalation (4+4+4 long exhalations)
● Bhasthrika – Rapid and forceful inspiration and expiration in the ratio of 1:1 (16+16+16)
b) Asana - Balasana (Child's Pose), Vrikshasana (Tree Pose), Pashimothasana (seated forward bent pose), vibareethakarani (Inverted Lake Pose or Legs Up the Wall Pose). [17]
c) Kriya - Kapalbhati: is a powerful breathing technique that involves forceful exhalations and passive inhalations.
Trataka: Trataka is the practice of steady gazing or focusing on a specific object. It can be done by gazing at a candle flame, a dot on the wall, or a picture.
d) Dhyana – mindfulness meditation is done by chanting any repeated words of the child's choice or listening to any chant based on the child's ability to concentrate. (for 5-10 minutes) a relation technique followed the Yoga session in the savasana pose.

2.7 Data collection

The outcomes were analyzed at the baseline for reference before the intervention started (Pre-test). They were periodically assessed after the intervention to determine the effect of the independent variable (intervention) on the dependent variable (outcomes). Post-test 1 was assessed following [th] week of intervention, and post-test 2 was used at 8th week.

2.8 Assessments

i) Learning ability was assessed by
1. Children's performance is assessed using the Cumulative Record Card or school marks.
2. Parents' opinions about the child's progress and difficulties in learning various subjects, doing homework, language difficulties, emotional problems, illness, injuries, and physical defects.
3. Measures of learning ability by assessing the

- Intellectual Ability by Raven- Colored Progressive Matrix
- Anxiety level by State-Trait Anxiety Inventory

ii) Raven -Colored Progressive Matrix

It is a reliable test for cognitive abilities and is frequently used to determine whether the brain functions normally. It has 36 problems, classified into three categories: A, A:b, and B. Some nonverbal test questions were left out, and the rest were organized in a geometric style. Students were given a test form and asked to complete it, selecting the missing cell from the six options provided and responding to each question on the specially designed answer sheet. Additionally, they were given 30 minutes to finish the test according to the instructions in the test manual. The collected information was converted to percentiles, and the overall score was graded using the Raven's Coloured Progressive Scale. Above 95%Grade I-Intellectually Superior, Grade II-75%-95% - Above the average,25%-75% - Grade III- Intellectually average, Grade III + Greater Than the Median or 50th Percentile, Grade III (-) Lesser Than Median, less than 25% - Grade IV Below average and 5% - Grade V-Intellectually defective.

iii) Academic Stress Scale

The academic stress scale comprises 40 items. Each item has five alternatives, varying from 'No Stress' to 'Extreme Stress'. Each response carries a score of '0', '1', '2', '3', and '4', respectively. The items are classified into five areas, each containing 8 items.
a. Personal Inadequacy … (F1)
b. Fear of Failure … (F2)
c. Interpersonal difficulties with teachers … (F3)
d. Teacher-pupil relationship / Teaching methods (F4)
e. Inadequate study facilities … (F5)

The total number of items was 40. Therefore, 160 (4 x 40) is the maximum possible score, and the highest score on each factor would be 32 (4 x 8). Each factor has an equal number of items. The higher the value of the score, the more academic stress there is, and vice versa. If you feel No Stress, put a '✓' mark in the 1st bracket (NS), Slight Stress in the 2nd (SS), Moderate Stress in the 3rd (MS), High Stress in the 4th (HS), and you feel Extreme Stress put a '✓' mark in the 5th bracket (ES).

iv) State-Trait Anxiety Inventory Directions

Several statements that people have used to describe themselves are given below. Read each statement and then tick the appropriate column at the end of the statement that indicates how you feel right now, that is, at this moment. There are no right or wrong answers. The lowest and highest average scores are Less than 20 and 80, respectively, with a higher average score indicating severe level of anxiety. Numerous studies have been conducted to assess the reliability and validity of the State-Trait Anxiety Inventory.

3. STATISTICAL ANALYSIS

The data are represented as mean $\pm$ SEM and analyzed by two-way repeated measures analysis of variance (RM ANOVA) for one-factor repetition and Bonferroni 't' test for post hoc multiple comparisons. Factor A was groups (between-group comparison – Control and Experimental), Factor B tested (within-group comparison, i.e., repetition factor – Pre-test, Post-test 1, and Post-test 2), and the group X test interaction. A probability of 0.05 or less was considered statistically significant. SigmaPlot 14.5 version (Systat Software Inc., San Jose, USA) was used for statistical analysis.

4. RESULTS

The academic stress scale means personal inadequacy score of the Control Pre-test, Post-test 1, and Post-test 2 are 21.0, 21.0, and 21.0, respectively. The mean personal inadequacy scores of Experimental Pre-test, Post-test 1, and Post-test 2 are 25.6, 21.4, and 15.0, respectively. No improvement was seen in the Control group from Pre-test to Post-test 2, while in the Experimental group, a 10.6 score decrease was observed. The mean fear of failure scores of the Control Pre-test, Post-test 1, and Post-test 2 are 21.4, 21.4, and 21.4, respectively. In the Control group from Pre-test to Post-test 2, no improvement was seen, while in the Experimental group, a 10.7 score decrease was observed; the mean inadequate study facilities scores of Control Pre-test, Post-test 1, and Post-test 2 are 22.1, 22.6, and 22.6, respectively. The mean inadequate study facilities scores of Experimental Pre-test, Post-test 1, and Post-test 2 are 23.6, 20.0, and 15.4, respectively. No improvement was seen in the Control group from Pre-test to Post-test 2, while in the Experimental group, a 7.2 score decrease was observed. The mean Interpersonal difficulties with teachers' Control Pre-test, Post-test 1, and Post-test 2 scores are 20.4, 20.4, and 20.4, respectively. The mean Interpersonal difficulties with teacher scores of Experimental Pre-test, Post-test 1, and Post-test 2 are 23.7, 19.3, and 15.0, respectively. No improvement was seen in the Control group from Pre-test to Post-test 2, while in the Experimental group, a 5.4 score decrease was observed. The mean Teacher-pupil relationship / Teaching methods score of the Control Pre-test, Post-test 1, and Post-test 2 are 22.3, 22.3, and 22.3, respectively. The mean Teacher-pupil relationship / Teaching methods score of Experimental Pre-test, Post-test 1 and Post-test 2 are 24.6, 20.9 and 15.1, respectively. In the Control group from Pre-test to Post-test 2, no improvement was seen, while in the Experimental group, a 7.2 score decrease was observed, showing the effectiveness of the intervention. The mean State-Trait Anxiety Inventory scores of Control Pre-test, Post-test 1, and Post-test 2 are 53.14, 53.14and 53.14. respectively. The mean State-Trait Anxiety Inventory scores of Experimental Pre-test, Post-test 1, and Post-test 2 are 63.6, 47.0, and 34.0, respectively. Two-way RM ANOVA revealed no significant difference in the groups (Control and Experimental) (P =0.390). The test (Pre-test, Post-test 1, and Post-test 2) and the interactions (group X test) showed significant differences (P < 0.001 and < 0.001, respectively). Multiple comparisons revealed significant differences between the Control and Experimental Pre-tests (between groups) (P = 0.079), no significant difference in Post-test 1 (P = 0.283), and no significant difference in Post-test 2 (P < 0.005). No significant change was observed among Control Pre-Test and Post-test 1 (within the group), Pre-test and Post-test 2, and Post-test 1 and Post-test 2 (P = 1.0, 1.0, 1.0 and respectively). The experimental group showed significant change in Pre-test and Post-test 1 (within the group), Pre-test and Post-test 2, and Post-test 1 and Post-test (P < 0.001, < 0.001 and < 0.001, respectively). In the Control group from Pre-test to Post-test 2, no improvement was seen, while in the Experimental group, an 18.54 score decrease was observed, showing the effectiveness of the intervention.
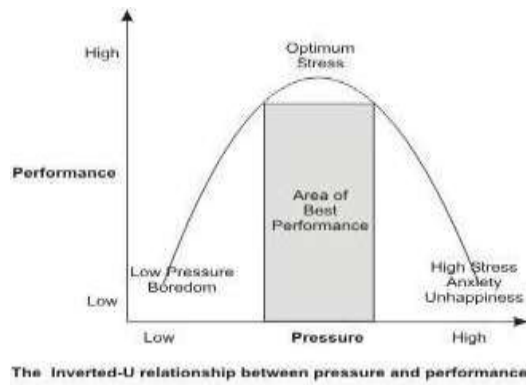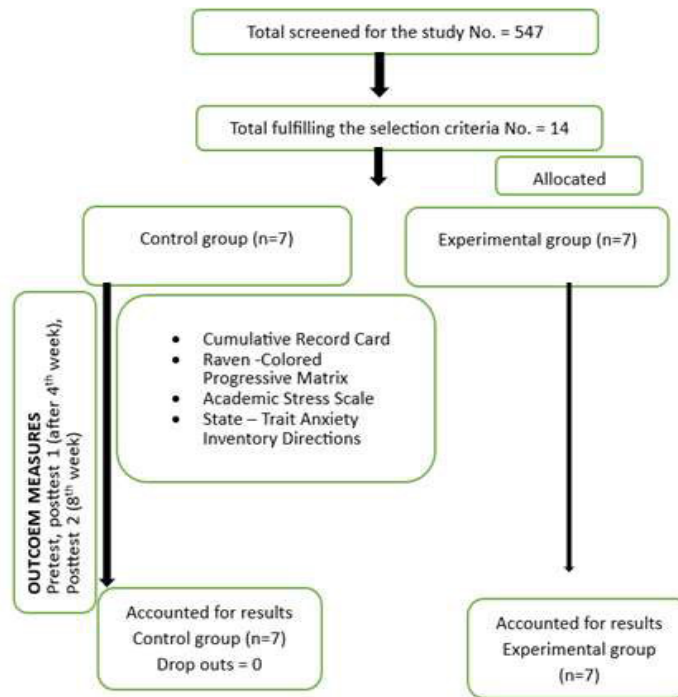
Fig 1: Relationship between stress and performance

Fig 2: Flow chart of the study

S.No	Groups and comparisons	Tests	A	B	C
	Table 1: Academic Stress Scale Analysis				
1	Control	Pre-test	21.0 ± 1.1	21.4 ± 0.8	22.1 ± 0.9
	Control	Post-test 1	21.0 ± 1.1	21.4 ± 0.8	22.6 ± 0.6
	Control	Post-test 2	21.0 ± 1.1	21.4 ± 0.8	22.6 ± 0.6
	Experimental	Pre-test	25.6 ± 1.2	25.0. ± 0.8	23.6. ± 1.5
	Experimental	Post-test 1	21.4 ± 1.4	19.9.± 0.4	20.0.± 1.4
	Experimental	Post-test 2	15.0 ± 0.8	14.3 ± 0.7	15.4 ± 1.1
2	Significance among groups (Control and Experimental)		F = 0.0563 P = 0.816	F = 3.083 P = 0.105	F = 3.767 P = 0.076
	Significance among tests (Pre-test, Post-test 1 and Post-test 2)		F = 34.662 P < 0.001	F = 76.979 P < 0.001	F = 34.563 P < 0.001
	Significance in the interaction (groups X tests)		F = 34.662 P < 0.001	F = 76.979 P < 0.001	F = 42.250 P < 0.001
3	Significance between Pre-test (Control and Experimental)		t = 2.880 P = 0.010	t = 3.258 P = 0.004	t = 0.939 P = 0.362
	Significance between Post-test 1 (Control and Experimental)		t = 0.270 P = 0.790	t = 1.433 P =0.168	t = 1.690 P =0.111
	Significance between Post-test 2 (Control and Experimental)		t = 3.780 P < 0.001	t = 6.516 P =< 0.001	t = 4.694 P =< 0.001
4	Significance within Control		t = 0	t = 0	t = 0.650

	A	B	C
(Pre-test and Post-test 1)	P = 1.0	P = 1.0	P =1.0
Significance within Control (Pre-test and Post-test 2)	t = 0 P = 1.0	t = 0 P = 1.0	t = 0.650 P =1.0
Significance within Control (Post-test 1 and Post-test 2)	t = 0 P = 1.0	t = 0 P = 1.0	t = 0 P = 1.0
5 Significance within Experimental (Pre-test and Post-test 1)	t = 4.579 P < 0.001	t = 8.421 P < 0.001	t = 5.413 P < 0.001
Significance within Experimental (Pre-test and Post-test 2)	t = 11.684 P < 0.001	t = 17.543 P < 0.001	t = 12.341 P < 0.001
Significance within Experimental (Post-test 1 and Post-test 2)	t = 7.105 P < 0.001	t = 9.122 P < 0.001	t = 6.928 P < 0.001

A = Personal Inadequacy, B = Fear of Failure, C = Inadequate study facilities
Values are mean $\pm$ SE, n = 7 each in control and experimental groups

Comparison of control and experimental groups on student-related variables by two-way RM ANOVA with Bonferroni 't' test. Two-way RM ANOVA revealed no significant difference in the groups (Control and Experimental). The test (Pre-test, Post-test 1, and Post-test 2) and the interactions (group X test) showed significant differences ($P < 0.001$ and < 0.001, respectively). Multiple comparisons revealed significant differences between the Control and Experimental Pre-tests (between groups) ($P = 0.362$), no significant difference in Post-test 1 ($P = 0.111$), and no significant difference in Post-test 2 ($P < 0.001$). No significant change was observed among Control Pre-Test and Post-test 1 (within the group), Pre-test and Post-test 2, and Post-test 1 and Post-test 2 ($P = 1.0$, 1.0, 1.0 and respectively). The experimental group showed significant change in Pre-test and Post-test 1 (within the group), Pre-test and Post-test 2, and Post-test 1 and Post-test ($P < 0.001$, < 0.001 and < 0.001, respectively). In the Control group from Pre-test to Post-test 2, no improvement was seen, while in the Experimental group, a 7.2 score decrease was observed, showing the effectiveness of the intervention.

S.No	Groups and comparisons	Tests	D	E
1	Control	Pre-test	20.4 $\pm$ 0.7	22.3 $\pm$ 0.9
	Control	Post-test 1	20.4 $\pm$ 0.7	22.3 $\pm$ 0.9
	Control	Post-test 2	20.4 $\pm$ 0.7	22.3 $\pm$ 0.9
	Experimental	Pre-test	23.7 $\pm$ 1.1	24.6 $\pm$ 1.1
	Experimental	Post-test 1	19.3 $\pm$ 0.8	20.9 $\pm$ 1.2
	Experimental	Post-test 2	15.0 $\pm$ 0.9	15.1 $\pm$ 0.9
2	Significance among groups (Control and Experimental)		F = 1.086 P = 0.318	F = 2.615 P = 0.132
	Significance among tests (Pre-test, Post-test 1 and Post-test 2)		F = 29.073 P < 0.001	F = 41.0 23 P < 0.001
	Significance in the interaction (groups X tests)		F = 29.073 P < 0.001	F = 41.023 P < 0.001
3	Significance between Pre-test (Control and Experimental)		t = 2.648 P = 0.015	t = 1,598 P = 0.128
	Significance between Post-test 1 (Control and Experimental)		t = 0.921 P =0.367	t = 0.999 P =0.332
	Significance between Post-test 2 (Control and Experimental)		t = 4.375 P =< 0.001	t = 4.994 P < 0.001
4	Significance within Control (Pre-test and Post-test 1)		t = 0 P = 1.0	t = 0 P = 1.0
	Significance within Control (Pre-test and Post-test 2)		t = 0 P = 1.0	t = 0 P = 1.0
	Significance within Control (Post-test 1 and Post-test 2)		t = 0 P = 1.0	t = 0 P = 1.0
5	Significance within Experimental (Pre-test and Post-test 1)		t = 5.480 P < 0.001	t = 5.009 P < 0.001
	Significance within Experimental (Pre-test and Post-test 2)		t = 10.783 P < 0.001	t = 12.715 P < 0.001
	Significance within Experimental (Post-test 1 and Post-test 2)		t = 5.303 P < 0.001	t = 7.706 P < 0.001

Table 2: Comparison of control and experimental groups on student-related variables by two-way RM ANOVA with Bonferroni 't' test.

D = Interpersonal difficulties with teachers, E = Teacher-pupil relationship / Teaching methods,
Values are mean $\pm$ SE, n = 7 each in control and experimental groups

Two-way RM ANOVA revealed no significant difference in the groups (Control and Experimental). The test (Pre-test, Post-test 1, and Post-test 2) and the interactions (group X test) showed significant differences (P < 0.001 and < 0.001, respectively). Multiple comparisons revealed significant differences between the Control and Experimental Pre-tests (between groups) (P = 0.015), no significant difference in Post-test 1 (P = 0.367), and no significant difference in Post-test 2 (P < 0.001). No significant change was observed among Control Pre-Test and Post-test 1 (within the group), Pre-test and Post-test 2, and Post-test 1 and Post-test 2 (P = 1.0, 1.0, 1.0 and respectively). The experimental group showed significant change in Pre-test and Post-test 1 (within the group), Pre-test and Post-test 2, and Post-test 1 and Post-test (P < 0.001, < 0.001 and < 0.001, respectively). In the Control group from Pre-test to Post-test 2, no improvement was seen, while in the Experimental group, a 5.4 score decrease was observed, showing the effectiveness of the intervention.

Table 3 - State-Trait Anxiety Inventory			
S.No	**Groups And Comparisons**	**Tests**	**Anxiety Level**
1	Control	Pre-test	53.14 $\pm$ 4.4
	Control	Post-test 1	53.14 $\pm$ 4.4
	Control	Post-test 2	53.14 $\pm$ 4.4
	Experimental	Pre-test	63.6 $\pm$ 2.7
	Experimental	Post-test 1	47.0 $\pm$ 2.6
	Experimental	Post-test 2	34.6 $\pm$ 4.1
2	Significance among groups (Control and Experimental)		F = 0.0797 P = 0.390
	Significance among tests (Pre-test, Post-test 1 and Post-test 2)		F = 79.924 P < 0.001
	Significance in the interaction (groups X tests)		F = 79.924 P < 0.001
3	Significance between Pre-test (Control and Experimental)		t = 1.897 P = 0.079
	Significance between Post-test 1 (Control and Experimental)		t = 1.117 P = 0.283
	Significance between Post-test 2 (Control and Experimental)		t = 3.378 P < 0.005
4	Significance within Control (Pre-test and Post-test 1)		t = 0 P = 1.0
	Significance within Control (Pre-test and Post-test 2)		t = 0 P = 1.0
	Significance within Control (Post-test 1 and Post-test 2)		t = 0 P = 1.0
5	Significance within Experimental (Pre-test and Post-test 1)		t = 10.183 P < 0.001
	Significance within Experimental (Pre-test and Post-test 2)		t = 17.820 P < 0.001
	Significance within Experimental (Post-test 1 and Post-test 2)		t = 7.637 P < 0.001

Two-way RM ANOVA revealed no significant difference in the groups (Control and Experimental). The test (Pre-test, Post-test 1, and Post-test 2) and the interactions (group X test) showed significant differences (P < 0.001 and < 0.001, respectively). Multiple comparisons revealed significant differences between the Control and Experimental Pre-tests (between groups) (P = 0.079), no significant difference in Post-test 1 (P = 0.283), and no significant difference in Post-test 2 (P < 0.005). No significant change was observed among Control Pre-Test and Post-test 1 (within the group), Pre-test and Post-test 2, and Post-test 1 and Post-test 2 (P = 1.0, 1.0, 1.0 and respectively). The experimental group showed significant change in Pre-test and Post-test 1 (within the group), Pre-test and Post-test 2, and Post-test 1 and Post-test (P < 0.001, < 0.001 and < 0.001, respectively). In the Control group from Pre-test to Post-test 2, no improvement was seen, while in the Experimental group, an 18.54 score decrease was observed, showing the effectiveness of the intervention.

5.   DISCUSSION

The study assessed yoga's efficacy in lowering academic stress and anxiety and enhancing learning capacity. The research shows that yoga reduces psychological issues in school-aged children and enhances focus, memory, and learning capacity. As a result, secondary/high school students (defined here as junior/lower secondary education and senior/upper secondary education) and tertiary students (defined here as post-secondary education) frequently self-report experiencing ongoing stress related to their education, which we refer to as academic-related stress. Examples of this stress include pressure to achieve high marks and worries about receiving poor grades. For instance, the Organisation for Economic Co-operation and Development (OECD) recently surveyed 72 nations and 540,000 participants.[9-11,16,17] Numerous studies have shown that academic stress is a significant issue for secondary and tertiary students. The persistent stress associated with school has a detrimental effect on children's ability to learn, academic performance, attainment of education and employment, sleep quantity and quality, physical and mental health, and drug use outcomes. Increasing student's capacity for stress management is a key area for

improvement.[12] A study on the role of yoga in psychological correlates of academic learning ability was undertaken by Manasi Bera et al. in 2017. In this experiment, 60 male students (n = 60), aged between 12 and 14, were randomly divided into two identical groups (Group A: the experiment group, and Group B: the control group), and a parallel group study design was considered. [13] The pretest, yoga training, mid-test, detraining, and posttest are all included in the research design. Three times (pre-, mid-, and post) using established techniques, the variables of learning capacities (namely, attention fluctuation, sentence completion, and general intelligence) were assessed. The yoga training intervention, which included prayer recitation, yoga asanas, anuloma viloma (Pranayama), and omkar chanting, was given for 45 minutes every morning for 45 days (except on Sundays and holidays), while the control group of students was occupied with extracurricular activities and library readings. The mid-test was then administered. After 45 days, the detraining phase (Phase II) was considered, and a posttest was carried out. Consequently, the experiment lasted a total of 90 days. The results showed that Hatha Yogic practices reduce attention fluctuation, which suggests an improvement in students' capacity to pay attention. Improvement in sentence completion ability and general intelligence was visible after the yoga training intervention. In addition, a 6-week detraining phase could keep outcomes moving in the same direction as they did for the controlled patients. [18-20] Among parents, teachers, and students, there is an academic anxiety. On the other hand, in this age of applied science, cross-disciplinary psychology is expanding quickly. The impact of yogic intervention on students' levels of academic anxiety is neded. [14] The Gayatri Vidyapeeth in Haridwar City provided 40 grade VIII subjects for the current study. Every subject in the single-group design that was used received a yogic intervention. A.K. Singh and Alpana Sen Gupta's (2005) "Academic Anxiety Scale for Children" questionnaire was administered to participants.[14] Wilcoxon sign rank test, median, effect size, and reduction of pre- and post-scores are utilized, as well as calculating the extent of the intervention's impact.[15] The rank test results showed that the yoga interventional program reduced academic anxiety by 40% from the 15 pre-test levels. High levels of academic anxiety are decreased by yoga.

6. CONCLUSION

The current study proves that integrating yoga practices into the academic environment significantly reduces academic stress and anxiety levels while enhancing students' overall learning experiences. Academic stress, which often results from heavy workloads, tight deadlines, and performance expectations, has negatively affected students' mental and physical health and ability to focus and retain information. Yoga, combined with physical postures, breathing exercises, and meditation techniques, is a holistic approach to managing stress. By incorporating regular yoga practice into daily routines, students experience a reduction in physiological stress responses, such as elevated heart rate and cortisol levels, while improving their mental clarity, concentration, and emotional regulation. This combination of physical and mental benefits creates a positive environment conducive to better learning outcomes, allowing students to approach their academic challenges with a greater sense of calm, focus, and resilience. Overall, yoga integration not only alleviates the pressures of academic life but also promotes a healthier and more balanced approach to education.

7. ACKNOWLEDGEMENT

8. AUTHOR CONTRIBUTION STATEMENT

P. Meena collected Data for the study. Jayashree supervised the research, and R. Vijayaraghavan did the analysis and guided me in drafting the manuscript.

9. CONFLICT OF INTEREST

Conflict of interest declared none.

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