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Enhancing academic achievement through yoga and meditation: A study on stress management in students

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Abstract
Yoga, an ancient practice rooted in Indian philosophy, integrates physical postures, breathing techniques, and meditation to promote mental and physical well-being. This study explores the impact of yoga and meditation on academic performance and stress levels among adolescents. Empirical evidence suggests that yoga mitigates stress, improves mood, and enhances concentration, thereby positively influencing academic outcomes. Data collected from a sample of 9th-grade students revealed significant improvements in academic performance and reductions in stress indicators such as anxiety, frustration, and pressure after a yoga and meditation intervention. The findings support integrating yoga-based programs in educational settings to foster students' holistic development.

Keywords: Yoga, stress, academic performance, meditation, positively influencing, enhancing academic

1. Introduction
Yoga has long been recognized as a holistic practice for cultivating physical health, mental clarity, and emotional balance. The Patanjali Yoga Sutras and related yogic traditions emphasize a lifestyle that fosters peace, moderation, and self-awareness through various paths including Karma, Jnana, Bhakti, and Raja Yoga. Modern research confirms that yoga and meditation reduce psychological stress and enhance cognitive functions. Schools and workplaces increasingly adopt yoga programs to improve well-being and performance. This study focuses on adolescents, a group vulnerable to stress and academic pressures, to evaluate the benefits of yoga and meditation on their academic outcomes and stress levels.

Numerous yoga-based stress-reduction solutions that have been well researched are being developed and tailored to meet business requirements. The mindfulness-based stress reduction program consists of individual training, group discussions, home assignments, inquiry exercises to increase awareness, yoga and mild stretching, and guided instruction in mindfulness meditation techniques. The yoga lessons will include guided relaxation, meditation, and breathing exercises for strength, energy, and flexibility. Stress reduction and mental renewal have been shown to be greatly aided by meditation. Once or twice a day, after 10 to 20 minutes of meditation, stress seemed to go away with good vibes. Stress, anxiety, despair, and other negative emotions can be effectively reduced by mindfulness-based meditation. Stress management, workplace productivity, emotional and spiritual fulfillment, and life enhancement are all aided by meditation. It promotes mental alertness, focus, and body-mind balance, all of which lead to clear decision-making. According to a recent poll, 28% of general practitioners seeking education were under a lot of stress, and 60% of them desired training materials to assist them manage their stress. Research has demonstrated that meditators are better at maintaining psychological balance under pressure than non-meditators. One of the greatest strategies for lowering workplace stress is meditation, which has found its way into the business world. Nowadays, the majority of businesses, including IBM Corp., Infosys, and others, provide their staff with on-site meditation programs to assist them cope with stress. Because meditation has so many real-world uses, meditation workshops have grown in importance as a training tool in the workplace. It is a skill that is simple to master and may be used anywhere and at any moment when tension arises, such as in a tough meeting, at a worker's desk, or when strolling down the hallway.

A worker's attitude, efficacy, and productivity can all be significantly improved by even a short period of meditation throughout the day. Managing and senior directors, personnel and training managers, occupational health professionals, departmental managers, and supervisors are among the most qualified individuals to address stress, but they frequently overlook or disregard it. Employers and employees have the chance to work together to implement improvements that will lessen illnesses linked to stress. Breathing is thought to play a significant role in the relaxation response, according to numerous clinical relaxation studies carried out by psychologists all over the world. According to the author, some meditation techniques cause the body to undergo biochemical and physical changes that can be collectively referred to as the "relaxation response" and include alterations in blood pressure, respiration, metabolism, heart rate, and brain chemistry. Top executives have the power to inspire companies to investigate the causes of stress in their workplaces and take action to prevent and lessen it while maintaining workers' health and wellness. The current study set out to directly evaluate the immediate effects on students' moods of taking a single yoga class to a single regular physical education (PE) class. Before and after taking one yoga class and one physical education class a week later, 47 high school students filled out self-report questionnaires measuring mood and affect.

2. Objectives of the study

- To assess the impact of yoga and meditation on academic performance among 9th-grade students.
- To evaluate changes in stress levels, including anxiety, frustration, and pressure, following yoga intervention.
- To compare the differences in academic and stress-related outcomes between students practicing yoga and those who do not.
- To provide recommendations for incorporating yoga into school curricula for stress management and academic enhancement.

3. Scope of the study

The study targets adolescents in the 9th grade, exploring the effects of a structured yoga and meditation program on academic performance and stress. It encompasses psychological and physiological measures of stress and evaluates changes in students' academic scores. The scope includes both experimental and control groups to establish the comparative efficacy of the intervention.

4. Need for The Study

Adolescents face increasing academic demands that often lead to elevated stress levels, adversely affecting their mental health and academic success. Conventional educational environments may not address these stressors adequately. Yoga and meditation offer accessible, low-cost methods to support mental resilience and improve cognitive function. This study addresses the gap in systematic evaluation of yoga's impact on adolescent academic and psychological well-being.

5. Significance of the study

This research contributes to the growing evidence base supporting yoga as an effective tool for stress reduction and academic improvement. The findings can guide educators, policymakers, and mental health professionals in designing holistic interventions that address student well-being and performance.

6. Review of Literature

Barnes *et al*. (2020) [5] demonstrated that meditation reduces blood pressure and heart rate in youth, indicating stress reduction benefits. Bhavanani *et al*. (2019) [6] reported improved reaction times following yogic breathing exercises, suggesting enhanced cognitive function. Srinivas (2014) [10] emphasized yoga's role in organizational development and stress management through autonomic regulation. Davidson *et al*. (2012) [11] outlined how contemplative practices strengthen cognitive and emotional neural processes improving psychological functioning in educational settings. Previous studies indicate yoga's positive effects on attention, mood, resilience, and self-esteem among adolescents, though methodological limitations persist.

7. Methodology

- **Design:** Quasi-experimental design with pre-test, post-test, and control group.
- **Intervention:** Yoga and meditation sessions incorporating asanas, pranayama, guided relaxation, and mindfulness meditation conducted over a fixed period.
- **Data Collection:** Academic performance scores and stress indicators (frustration, conflict, pressure, anxiety) measured before and after intervention.
- **Analysis:** Statistical tests including paired t-tests, Wilcoxon signed-rank tests, and t-ratio comparisons to determine significance of changes.

8. Results

Wilcoxon-signed ranks tests, paired-samples t tests, and a comparison of effect sizes between the two conditions were used to examine the data. Compared to PE, participants reported much larger reductions in anger, despair, and weariness before and after yoga. Negative affect greatly decreased after yoga but not after physical education, while there was no discernible difference between the two treatments. Additionally, participants reported considerable reductions in tension and perplexity following both yoga and physical education, with no significant difference across groups. The findings imply that students may benefit from school-based yoga in ways that go beyond their involvement in physical education. Future studies should keep clarifying the different physiological and psychological impacts of yoga as opposed to physical education. Studies examining the impact of yoga treatments on young people in educational environments have shown potential advantages in a number of areas. Twelve studies that used yoga interventions for kids in various educational contexts including regular school programs, after-school programs, and residential treatment schools were assessed in a recent review of the literature. Two thirds of these research involved usually developing or high-risk kids, and one third involved students receiving special education assistance. This review found that while the yoga interventions reviewed seemed to help students, the majority of the studies had serious methodological flaws, such as small sample sizes, quasi-experimental study designs, and conflicting quantitative findings. Further research on school-

based yoga interventions indicates that these programs have beneficial benefits on a number of variables, including focus, attention, anxiety, stress, mood, resilience, emotional arousal, self-esteem, and frequency of coping. There are solid theoretical justifications for integrating contemplative practices, like yoga, into educational contexts, even if this area of study is still in its infancy. According to a recent review by Davidson and colleagues (2012) [11], contemplative meditation improves psychological and behavioral functioning in the classroom by strengthening fundamental cognitive and emotional brain processes. According to this concept, a frequent feature of contemplative practices is the daily practice of focusing attention on a specific sensory experience, like breathing or a physical experience, like yoga. Maintaining this state of awareness helps people develop the skills necessary to divert their attentional resources from stimuli that cause undesirable outcomes (such as negative affective states and behavioral patterns) while also fostering desirable dispositions. This strengthens cognitive abilities to regulate attention and emotion. Improvements in these fundamental self-regulation abilities subsequently result in improvements in other facets of functioning, including academic performance and student behavior. The purpose of this study was to add to the body of literature by resolving methodological issues raised in earlier studies and by showcasing the positive effects of yoga on students' emotional health and mood. In order to overcome methodological limitations, this study examined within-group changes in students' psychosocial well-being in relation to the class they were participating in by comparing student outcomes before and after a single class using an active control condition to assess the effects of yoga as opposed to PE. In keeping with theoretical conceptualizations of contemplative practices with youth in educational settings, this work also attempts to expand the literature supporting the advantages of contemplative practices to emotional health by experimentally examining effects to mood and affect. This is the only study that we are aware of that compares the immediate benefits on students' psychosocial well-being of taking a single yoga class against a single physical education class. Nowadays, more and more people in the West are becoming aware of their health. While we see our incredible capacity to affect the outside world, we also experience a growing appetite for internal transformation. This renewed awareness of health may reflect our sense of unevenness with accelerated mechanical growth. We must lead fulfilling, healthy, and meaningful lives that provide us inner joy. The health industry has flourished by following the current trend toward improving personal satisfaction. Yoga has also been introduced to the market, along with other packed, summarized, and quick healthy initiatives. Because yoga's norms and rational approach are impartial, they can be applied regardless of a person's race, religion, or creed. In order to facilitate all the good things in life and much more, it permeates convictions. This is a remarkable and beneficial development. However, it is crucial that the deeper, more practical importance of yoga not be overlooked in the middle of this evolution, and that we do not overlook the essential principles concealed by this important convention with an eye toward the commercial center. As people, we are a complex of interconnected frameworks (counting the various components of our physiology, brain science, and life structures) that live inside a larger complex of interconnected frameworks, including our situation and our relationships. These several fundamental components and the body's overall metabolic processes are complimentary. The inherent wholeness of the body is a characteristic, and the path to health is found in the logical integration of each of these frameworks. We've all seen that some people consistently seem healthy, while others have persistent problems. In general, we may consider these differences to be heavily influenced, especially now that we are learning more and more about the role that genetic heritage plays in an individual's health. Even while the facts show that each of us is born with specific genetically predetermined traits that affect our health, our identity and emotions are clearly influenced by the way we move on a daily basis. This suggests that we can achieve enormous improvements in our well-being by changing the things we do. Regardless of our genetic predisposition, if we understand who we are, we can improve and hone our emotions. However, the way that our daily actions are influenced by our molding what the yoga convention refers to as samskara entangles the path toward achieving wellbeing. This sculpting has been shaping each of us from early adolescence. When all is said and done, it is the result of our unique relationship to our social and relational circumstances. Many of our changes after labor are normal; we experience fear or longing and weep in response. As we grow, our changes become more dynamic and intentional, and the mind begins to design the functioning brain and body in this way. Learning how to walk, talk while playing, and interact with other people while securing these skills requires us to impose a request on our intramuscular structure that eventually becomes adjusted, through redundancy, into our pre-engine brain as progressively adapted reflexes. We are gradually made to move automatically and unconsciously, whereas previously we had to focus all of our attention on a development as seemingly simple as walking. Whether we want to admit it or not, this learning process is the beginning of our shaping and the reason we tend to walk, talk, and behave like our parents or the general public who reared us.

Table 1: Mean, median, mode, standard deviation, skewness, and kurtosis of the group that engaged in yoga and meditation on the academic performance and stress variable on the pre-test, post-test, and gain score (N=125)

Variable		Mean	Median	Mode	SD	Skewness	Kurtosis
Academic Performance	Pre- Test	26.71	25.00	21.58	17.00	0.109	-0.929
	Post-Test	37.01	37.00	36.99	13.31	-0.286	-0.825
	Gain Score	10.30	9.00	6.41	10.19	0.364	-0.708
Frustration		67.21	66.00	63.58	16.85	0.185	-0.841
Conflict		36.28	38.00	41.44	13.71	-0.329	-0.914
Pressure		53.02	55.00	58.95	22.20	-0.128	-0.731
Anxiety		35.35	35.00	34.30	13.48	-0.187	-0.973
Total Stress		191.86	190.00	186.27	28.70	0.040	-0.818

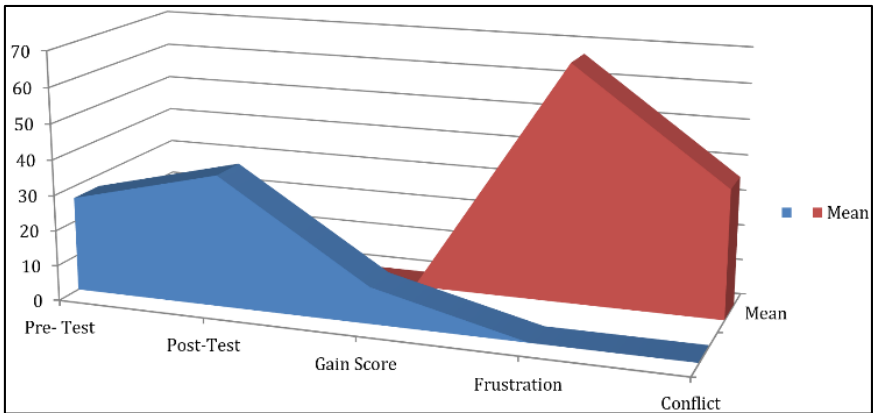

Fig 1: Mean, median, mode, standard deviation, skewness, and kurtosis of the group that engaged in yoga and meditation on the academic performance and stress variable on the pre-test, post-test, and gain score (N=125)

The academic performance variable of the group of ninth-grade students who practiced yoga and meditation in the pre-test had mean, median, and mode values of 26.71, 25.00, and 21.58, respectively, which are fairly close to one another. The pre-test skewness and kurtosis values are 0.109 and -0.929, respectively, indicating that the curve is platykurtic and positively skewed. The mean, median, and mode values for the academic performance variable of the group of ninth-grade students who practiced yoga and meditation in the post-test are 37.01, 37.00, and 36.99, respectively, and are fairly close to one another. The post-test skewness and kurtosis values are -0.286 and -0.825, respectively, indicating that the curve is platykurtic and negatively skewed. The Gain score of the group of ninth-grade students who practiced yoga and meditation has mean, median, and mode values of 10.30, 9.00, and 6.41, respectively. The Gain score's skewness and kurtosis values are 0.364 and -0.708, respectively, indicating that the curve is favorably skewed and platykurtic. An assessment of the aforementioned findings shows that the experimental group's ninth-grade students' scores on the variables of academic performance in the Pre-test, Post-test, and Gain scores, as well as interest in science, were distributed almost normally. The skewness and kurtosis values deviated very little from the usual values (0.00 for skewness and 0.000 for kurtosis). As a result, the distribution can be considered close to normal.

Table 2: t-ratio between the mean scores of students who practiced yoga and meditation and those who did not in terms of academic performance in stress and pre-test (n=250)

Variable	Groups	N	Mean	S.D.	SE_D	t-ratio
Academic Performance (Pre-test)	EG	125	26.71	17.00	1.28	1.10 (NS)
	CG	125	28.63	15.61	1.18	
Frustration	EG	125	69.11	16.69	1.26	0.09 (NS)
	CG	125	69.28	17.56	1.33	
Conflict	EG	125	33.03	13.46	1.02	1.32 (NS)
	CG	125	34.94	13.66	1.03	
Pressure	EG	125	49.96	20.76	1.57	0.49 (NS)
	CG	125	48.86	21.26	1.61	
Anxiety	EG	125	33.27	14.15	1.07	0.46 (NS)
	CG	125	33.97	14.22	1.07	
Overall Stress	EG	125	185.37	35.66	2.70	0.45 (NS)
	CG	125	187.05	34.00	2.57	

NS means non-significant. EG=Experimental Group, CG=Control Group

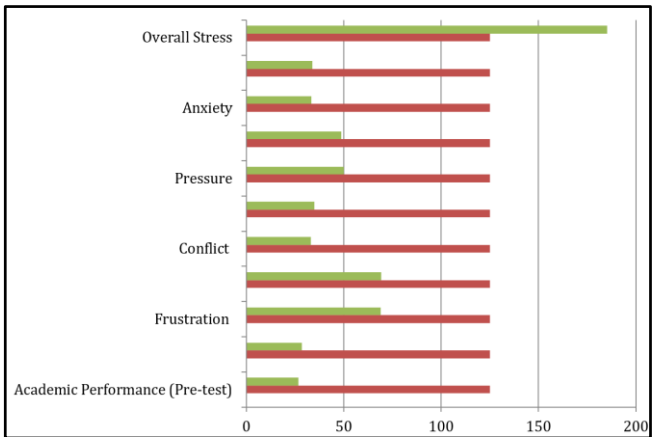

Fig 2: t-ratio between the mean scores of students who practiced yoga and meditation and those who did not in terms of academic performance in stress and pre-test (n=250)

In terms of academic performance on the pre-test, the mean scores for the groups of students who practiced yoga and meditation were 26.71 and 28.63, respectively, with corresponding standard deviations of 17.00 and 15.61. There is no discernible difference in the two groups' academic performance on the pre-test, as indicated by the t-ratio value of 1.10, which is not significant at the.05 level. Similarly, the conflict component of stress scores for the groups of students who practiced yoga and meditation and those who did not were found to be 33.03 and 34.94, respectively, with corresponding standard deviations of 13.46 and 13.66. There is no discernible change in the conflict component of stress between the experimental and control groups, as indicated by the insignificant t-ratio value of 1.32. These two processes of intramuscular association and socialization continue to shape our body and mind as we grow, even after puberty. In the meantime, even though they allow us to work, those particular examples that each of us obtains and produces are continuously defective in some way with regard to wellbeing. In actuality, they impede our ideal progress because they allow us to work and are therefore strengthened. The result of this sculpting is imbalance in many aspects of our structure, pressure buildup, and ultimately illness. When we behave normally, our attention is mostly focused on the outside environment. As a result, we are frequently unaware of how monotonous and mechanical our mental and physical tasks are. In this sense, the initial phase of ending these cycles and altering the character of our existence must conceal our thought. This is

how the yoga process is done. The yoga convention refers to this process as "asana practice," which begins with the sequence of body, breath, and mind. The most fundamental aspect of this training is the deliberate movement of the body into explicit postures and asanas, the prolonged maintenance of these poses, and the grouping of these stances, particularly successions. Since ancient times, the asanas have been described as quite precise structures. By mastering these structures, a person demonstrated their mastery of some crucial developmental norms. However, it was also widely understood that the practical application of these principles needed to be based on each person's actual situation. Thus, the educator and understudy worked up a folks approach for performing each stance. In this way, a stance's change estimation was consistently identified in relation to its capacity rather than its frame. Unfortunately, one of the most common misconceptions about yoga is that each stance's value is determined by how effectively it is executed. As a result, emphasis has repeatedly been placed on superficial details of positioning and improving the body toward skewed, external standards of perfection, and the structures have been fixed into rigid, static positions that lose the asana's dynamic quality. In any event, we risk upholding pointless instances and completely missing the more profound estimation of asana practice if we attempt along these lines to fulfill external principles without first recognizing our true state and building up our training in a similar manner.

9. Conclusion

This study reinforces yoga and meditation as effective interventions for enhancing academic performance and reducing stress among adolescents. By improving emotional regulation and physiological relaxation, yoga fosters a conducive environment for learning and personal growth. Schools should consider incorporating yoga programs to support students' mental health and academic success as part of a holistic educational approach. The majority of yoga practitioners strive to achieve a frame through a stubborn exertion of solid constriction; however, achieving a shape through static withdrawal results in inflexibility and, eventually, various problems, such as joint pressure and blood stream confinement. The body resists, gets trapped in vulnerable areas, and problems inevitably worsen, either immediately or over time. At that point, our attempts to perform the precise kind of asana become an extremely dangerous nuisance to the body, a request unrelated to the body's actual needs. In any case, we can regard the conventional asanas as an effective documentation of the human body's auxiliary capabilities if we examine their potential and interrelationships. According to this perspective, the benefits that can be achieved from these positions are determined by the dimension of capacity rather than the frame.

10. Limitations

- Short duration of intervention may limit observation of sustained effects.
- Self-reported stress measures could be subject to bias.
- Study limited to one grade and geographic area, potentially restricting generalizability.
- Lack of random assignment may introduce selection bias.

11. Future Scope

- Longitudinal studies to evaluate long-term effects of yoga on academic performance and mental health.
- Expansion to diverse demographic groups and different educational levels.
- Integration of physiological stress markers (e.g., cortisol levels) for comprehensive assessment.
- Development of standardized yoga-based curricula tailored for academic settings.

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