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Effect of yoga on academic performance in relation to stress

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Abstract

Background: Academic performance refers to the quantity and quality of knowledge acquired in a subject or group of subjects after a significant amount of instruction. The performance of students suffers from excessive stress. Numerous yogic studies have noted improvements in academic performance and alertness.

Aims and Objectives: The primary purpose of the research was to investigate the impact that practising yoga has on academic performance in relation to the effects of stress.

Materials and Methods: 800 adolescent students were initially enrolled in the study. Based on their Stress Battery scores, 159 high-stress students and 142 low-stress students were chosen. Pre-tests in the subjects of mathematics, science, and social studies were given to both the experimental group and the control group. On the experimental group, a yoga module containing asanas, pranayama, meditation, and a value orientation programme was given for 7 weeks. Performance on the three subjects mentioned above was post-tested for the experimental and control groups.

Results: The outcomes demonstrate that the students who practised yoga outperformed their peers in the classroom. The study also demonstrates that low-stress students outperformed high-stress students, proving that stress has an impact on students' performance.

Keywords: Academic performance, stress, yoga, yoga module

Introduction

Academic achievement is a skill or level of proficiency in schoolwork that has been attained. It is typically assessed through standardised tests and expressed in grades or units based on norms derived from a representative sample of students' performance. Studies show that stress can affect task performance even at low or moderate levels. Stress-related cognitive reactions make it difficult to focus. Balance, health, harmony, and bliss are characteristics of yoga as a way of life.

According to Maharishi Mahesh, meditation, which is a form of yoga and the seventh limb of Ashtanga Yoga, is a state of alert rest. Yogi who developed the widely used form of meditation known as transcendental meditation. Yoga is meant to help people achieve a state of mental tranquilly where they can respond to both positive and negative external events with responses that are moderate in intensity and well under their control. The science of yoga is a potent stream of knowledge that gives practitioners the ability to live in harmony with others while also achieving radiant physical health and mental peace.

Asanas (physical postures), pranayama (breathing techniques intended to influence vital forces), kriyas (cleansing techniques), mudras (certain interval attitudes), and bandhans (neuromuscular locks) are some of the practises of hatha yoga that are primarily taught as physical exercises. While different types of meditation work on the mental level, all of these exercises aim to cultivate a particular kind of awareness within oneself, which in turn affects one's emotional and visceral functions and, through them, one's intellectual and somatic functions.

After six months of yogic practises (meditation, asanas, and pranayama), one feels more relaxed, loses weight, has more vital capacity, their endocrine functions speed up, and their memory gets better. 86 patients with headache, insomnia, and anxiety issues have shown improvement after practising Savasana for three months.

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Yoga has the potential to affect stress disorder and aids the sufferer in achieving physical and metabolic stability, according to research by Udupa *et al.* Yoga techniques have been shown to be effective in managing anxiety, and Sahasi *et al.* also noted improvements in attention and concentration.

According to one study, a 4-week programme of yoga poses and meditation reduces students' aggressive behaviour. According to a different study, meditation (a) reduced problems caused by unhelpful behaviours, (b) improved psychological and physical health, (c) decreased thought frequency, (d) decreased substance abuse, and (e) generally enhanced quality of life.

The current study investigates whether yoga has an impact on adolescent students' stress-related academic performance. With this context, the following results of the current study were sought after: (1) Does yoga have any impact on stress-related academic performance in Mathematics, Science, and Social Studies? (2) Does yoga have any impact on stress-related academic performance across the combined three subjects?

Materials and Methods

Subjects

In Mathura, Uttar Pradesh, eight public schools participated in the study. 600 Class 8th and 9th students took the Bisht Battery of Stress Scale (BBSS). 300 boys and 300 girls between the ages of 14 and 16 made up the participants. The purpose of the BBSS was to categorise the students' stress levels into two categories: high stress and low stress. This test was created to measure 13 different types of stress. Two scales—the scale of academic stress and the scale of achievement stress—were chosen from a total of thirteen scales. There were 132 items total on these scales, divided between 52 and 80 items, respectively. Each question is of the statement type (closed), and students were instructed to respond by checking the appropriate box on the answer sheet. The pupils were brought together in a hallway and forced to sit in rows. Each student received a booklet containing statement questions and answer sheets. It was the investigator who gave the instructions. Statements were penned in Hindi and English. The definition of challenging words was also provided. The students were given an hour to complete their test.

The manual's instructions for scoring were followed. The top 30% of subjects (or 180 students) were classified as having low stress, while the bottom 30% of subjects (or 180 students) were classified as having high stress based on their stress scores, which were arranged in ascending order. Of these students, 50% were kept in the experimental group and 50% were kept in the control group. After careful consideration, (high stress (exp) = 75, low stress (exp) = 65, high stress (control): 60, and low stress (control) = 50) were chosen. For both groups, a pretest in three subjects—mathematics, science, and social studies—was administered. In the end, 250 participants (100 girls and 150 boys) were chosen for the study.

Ethics

The students were given a code to use during the pretest in order to protect their privacy. Their academic performance evaluations were kept a secret from their educational institutions and only used for research. The Institutional Ethics Committee gave its blessing to the project, and the principal of the school provided a signed statement of informed consent.

Assessments

The Bisht Battery of Stress Scale was utilised to categorise the students' levels of stress into high stress and low stress. This was carried out before the experiment began. Its administration is covered in more detail under the "Subjects" heading above. For seven weeks, a morning hour of yoga was offered as an intervention therapy to the experimental group.

To evaluate the impact of the yoga module on the academic performance of the experimental group and to compare it with the control group, which did not participate in the yoga module, an academic performance test was used as a pretest and posttest for both the experimental and control groups.

Intervention

The experimental group participated in a yoga module (yogasana + pranayama + meditation + prayer + value orientation programme) every day for an hour in the morning for seven weeks. As a posttest, the same academic performance test was given to both groups.

Statistical analysis

A 2 x 2 factorial design (ANOVA) was used on the gain scores of academic performance to study the impact of yoga and stress on academic performance. Stress is a classificatory variable that is studied at two levels, i.e., students with high stress and students with low stress. The experimental group received the yoga module, which was considered a treatment variable.

Results

Table 1 shows that F-ratio for the difference between means of high stress group and low stress group on the gain scores of combined academic performance was found to be significant at the 0.05 level of confidence, indicating that academic performance differs among students with high stress and students with low stress.

Table 1: Summary of ANOVA on the academic performance gain scores of three subjects combined in relation to stress and yoga intervention

Source of variance	df	SS	MSS	F-ratio
Yoga "A"	1	7559.77	7559.77	23.39**
Stress "B"	1	1702.3	1702.3	5.50*
Interaction	1	565.68	565.68	1.75
Within	244	89802.53	368.04	
Total		99630.28	-	

*Significant at the 0.05 level of confidence;

**Significant at the 0.01 level of confidence

Thus, this study reveals that the high stress affects students' performance negatively, and this result is in tune with the inverted U-shaped model of stress of learning. Table 1 further depicts no interaction between yoga intervention treatment and stress on the gain scores of academic performance in three subjects combined. After seeing the positive effect of yoga on the three subjects combined, we thought to have a deeper analysis to study the effect of yoga on different subjects separately. In this context, the data are presented in Tables 2. shows that F-ratio for the difference between means of high stress group and low stress group on the gain scores of academic performance in Mathematics, Science, and Social Studies (separately) is found to be significant at 0.01 level of confidence, which indicates that students of the experimental group and the control group differ on the gain scores of academic performance in the three subjects.

Table 2: Summary of Anova on the academic performance scores of social studies, mathematics and science in relation to stress and yoga intervention

Source of Variance	Df	S.S.			M.S.S.			F-ratio		
		Social studies	Maths	Science	Social studies	Maths	Science	Social studies	Maths	Science
Yoga 'A'	1	385.65	516.34	257.04	408.65	556.34	277.04	17.13*	37.02*	18.58*
Stress 'B'	1	35.08	0.242	4.20	39.08	0.247	4.28	1.63	0.016	0.28
Interaction	1	29.95	12.92	5.04	25.95	14.92	6.04	1.08	0.99	0.40
Within	244	6708.37	4175.14	4243.06	27.49	17.11	17.38	-	-	-
Total		7159.05	4704.64	4509.34	-	-	-	-	-	-

*Significant at the 0.01 level of confidence

Further, Table 2 shows that F-ratio for the difference between means of high stress group and low stress group on the gain scores of academic performance in all three subjects (separately) is not found to be significant even at the 0.05 level of confidence.

Discussion

The results of this study show that students who participated in the yoga module outperformed students who did not participate in the module in both their overall academic performance and in each of their individual subjects. The findings are consistent with earlier research that discovered long-term meditation practise causes noticeable changes in perception, attention, and cognition. Another study found that practising yoga can help with anxiety management and concentration enhancement. Transcendental meditation enhances problem-solving skills and academic performance, according to other researchers. According to Table 1, students who experienced high levels of stress performed better in the subjects of science and social studies. The inverted U-shape model of stress and learning, which explains that performance initially improves as stress increases, possibly because the stress is arousing or energising, is consistent with this result. Additionally, the results show that excessive stress has a negative impact on students' overall academic performance. This finding is consistent with earlier research, which found that excessive stress has a negative impact on students' academic performance and may even cause them to drop out. According to research, high levels of stress can cause hypervigilance (inability to concentrate attention) as well as coming up with a solution too quickly (premature closure). Higher levels of stress caused more psychological and physical symptoms, which decreased grade point average (GPA) among 146 college men. Students are physically and psychologically harmed when stress is excessive or perceived negatively. Stress exhausts our physical and mental capacities, prevents us from using our skills effectively, and has a negative impact on performance.

Additionally, when academic performance in specific subjects was examined, it was found that both high and low stress groups performed similarly, with values very nearly reaching significant levels.

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 feature in schools.

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