

Impact of Yoga on High School Students' Academic Performance

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Abstract: *The present study examined the impact of yoga on the academic performance of high school students and related psychological functioning. A quantitative, intervention-based pre-test-post-test control-group design was used with 100 high school students, comprising 50 students in an Experimental Group and 50 in a Control Group. The Experimental Group received a structured yoga programme for five days, with sessions lasting approximately 30–40 minutes, while the Control Group continued routine school activities. The programme included prayer/Om chanting, warm-up exercises, selected yoga asanas, pranayama, meditation and relaxation. Academic performance was assessed using a 12-item objective test. Stress, concentration and psychological well-being were also assessed using 15-item scales. Academic performance in the Experimental Group increased from $M=6.22$ ($SD=1.66$) at pre-test to $M=9.20$ ($SD=1.56$) at post-test, compared with an increase from $M=5.86$ ($SD=1.62$) to $M=6.38$ ($SD=1.60$) in the Control Group. The Experimental Group showed significant pre-post improvement in academic performance, $t(49)=12.512$, $p<.001$, and the improvement was significantly greater than that of the Control Group, $t(98)=9.354$, $p<.001$. The findings suggest that structured yoga may be a useful complementary school-based practice for supporting academic and psychological functioning, although the brief intervention and quasi-experimental design require cautious interpretation.*

Keywords: Yoga, academic performance, high school students, concentration, stress, psychological well-being

1. Introduction

Adolescence is a period of substantial physical, cognitive, emotional and social development. During high school, students face increasing academic responsibilities, examinations, competition and expectations regarding future education. Academic performance is therefore influenced by multiple factors, including attention, motivation, emotional regulation, stress and general psychological well-being. When students experience excessive stress or difficulty sustaining concentration, their ability to engage effectively with learning may be affected.

Yoga is a structured mind-body practice involving physical postures, breathing regulation, focused attention, meditation and relaxation. In educational settings, yoga has been investigated as a supportive practice for stress management, concentration, psychological well-being and academic functioning. The present study was undertaken to examine whether a structured yoga intervention was associated with measurable changes in academic performance among high school students, while also considering stress-related functioning, concentration and psychological well-being.

2. Objectives of the Study

The objectives were to assess academic performance before and after the intervention; to administer a structured yoga programme to the Experimental Group; to compare pre-test and post-test academic performance within the Experimental Group; to compare academic performance between the Experimental and Control Groups; and to examine changes in selected psychological variables associated with learning.

3. Hypotheses

H1: There will be a significant difference between pre-test and post-test academic performance scores of students in the Experimental Group following the yoga intervention.
H2: There will be a significant difference in post-test academic performance between the Experimental and Control Groups.
H0: There will be no significant difference in academic performance attributable to the yoga intervention.

4. Methodology

4.1 Research Design

A quantitative, intervention-based pre-test-post-test control-group design was used. Both groups were assessed before and after the intervention. The Experimental Group received the structured yoga programme and the Control Group continued routine school activities.

4.2 Participants and Sample

The sample consisted of 100 high school students. Fifty students were included in the Experimental Group and 50 in the Control Group. The dissertation identifies the sampling procedure as school-based purposive sampling. Participants were high school students who met the study criteria and were able to understand the instructions and participate safely in the planned activities.

4.3 Variables

Independent variable: Structured yoga intervention.

Dependent variable: Academic performance score obtained from the objective academic performance test.

Related measured outcomes: stress-related functioning, concentration and psychological well-being.

4.4 Tools Used

A student information/demographic sheet was used to collect participant characteristics. Academic performance was assessed using a 12-item objective multiple-choice test, with one mark for each correct answer and a total possible score of 0–12. The study also used a 45-item Likert-type questionnaire comprising 15 items each for stress, concentration and well-being. Each scale had a possible range of 15–75. Stress items were reverse-scored so that a higher final score represented a more favourable, less-stressed state.

4.5 Yoga Intervention

The Experimental Group received the yoga intervention for one week, five days per week, with each session lasting approximately 30–40 minutes. The structured module consisted of prayer/Om chanting (2 minutes), warm-up exercises (5 minutes), Tadasana, Vrikshasana, Padmasana, Vajrasana and Bhujangasana, followed by Anulom-Vilom and Bhramari pranayama, and meditation/relaxation through Shavasana for approximately 5–7 minutes.

4.6 Procedure

After obtaining the necessary institutional permission and consent/assent procedures, baseline assessment was conducted. Participants completed the pre-test under standardised conditions. The Experimental Group then

received the yoga programme while the Control Group continued routine activities. At the end of the intervention period, both groups completed the post-test under conditions comparable to the pre-test. Scores were coded and organised for statistical analysis.

4.7 Ethical Considerations

Participation was voluntary and confidentiality was maintained through participant coding. Appropriate consent/assent procedures were followed, and students had the right to withdraw. The yoga activities were age-appropriate and conducted with attention to safety. The study materials also specify the need for institutional permission and applicable ethical clearance.

4.8 Statistical Analysis

Mean and standard deviation were used to describe scores. Paired-samples t-tests were used to examine pre-test to post-test changes within groups, and independent-samples t-tests were used for comparisons between groups. Statistical significance was interpreted at the .05 level, with results reported using t values, degrees of freedom and p values.

5. Results

The two groups were comparable at the pre-test stage on the major outcomes. Following the intervention, the Experimental Group demonstrated substantially greater improvement in stress-related functioning, concentration, psychological well-being and academic performance.

Table 1: Descriptive Statistics of Pre-test and Post-test Scores

Outcome	Experimental	Experimental	Change	Control	Control	Change
	Pre M (SD)	Post M (SD)		Pre M (SD)	Post M (SD)	
Stress	45.20 (4.88)	57.06 (4.06)	11.86	44.70 (4.02)	45.00 (3.73)	0.30
Concentration	44.72 (4.57)	55.90 (4.04)	11.18	44.52 (4.92)	44.78 (4.75)	0.26
Well-being	44.94 (5.43)	56.90 (4.94)	11.96	44.16 (5.84)	45.02 (5.65)	0.86
Academic performance	6.22 (1.66)	9.20 (1.56)	2.98	5.86 (1.62)	6.38 (1.60)	0.52

5.1 Academic Performance

Academic performance was the primary outcome. The Experimental Group improved from a mean of 6.22 (SD=1.66), equivalent to 51.83% of the maximum score, to 9.20 (SD=1.56), equivalent to 76.67%. The Control Group improved from 5.86 (SD=1.62; 48.83%) to 6.38 (SD=1.60; 53.17%). According to the scoring criteria, the Experimental Group moved from the average category to the good category.

The pre-test difference between groups was not significant, $t(98)=1.100$, $p=.274$, indicating comparable baseline academic performance. The post-test difference was significant, $t(98)=8.903$, $p<.001$. Within the Experimental Group, the pre-post improvement was significant, $t(49)=12.512$, $p<.001$. The Control Group also showed a smaller significant change, $t(49)=4.662$, $p<.001$. Most importantly, the difference in improvement scores was significant, $t(98)=9.354$, $p<.001$.

5.2 Stress-related Functioning

Because the stress scale was reverse-scored, an increase in score indicates a more favourable, less-stressed state. The Experimental Group increased from $M=45.20$ (SD=4.88) to $M=57.06$ (SD=4.06), a change of 11.86 points. The Control Group changed by only 0.30 points. The Experimental Group showed significant pre-post improvement, $t(49)=35.992$, $p<.001$, whereas the Control Group did not, $t(49)=1.227$, $p=.226$. The post-test difference between groups was significant, $t(98)=15.481$, $p<.001$.

5.3 Concentration

The Experimental Group's concentration score increased from $M=44.72$ (SD=4.57) to $M=55.90$ (SD=4.04), a gain of 11.18 points. The Control Group changed from 44.52 to 44.78. The pre-test comparison was not significant, $t(98)=0.210$, $p=.834$, while the post-test comparison was significant, $t(98)=12.604$, $p<.001$. Within the Experimental Group, improvement was significant, $t(49)=37.533$, $p<.001$; the Control Group did not show significant change,

$t(49)=1.130, p=.264$.

5.4 Psychological Well-being

Well-being increased from $M=44.94$ ($SD=5.43$) to $M=56.90$ ($SD=4.94$) in the Experimental Group, a gain of 11.96 points. The Control Group increased from 44.16 to 45.02. The post-test difference was significant, $t(98)=11.194, p<.001$, and the Experimental Group showed significant pre-post improvement, $t(49)=31.291, p<.001$.

6. Discussion

The present study examined the impact of a structured yoga intervention on academic performance among high school students, together with stress-related functioning, concentration and psychological well-being. The overall pattern of findings showed substantially greater improvement in the Experimental Group than in the Control Group. The groups were comparable at baseline, while the Experimental Group demonstrated marked post-test gains across all four measured outcomes.

The academic performance finding is particularly important. The Experimental Group improved by 2.98 points compared with 0.52 points in the Control Group, and the between-group difference in improvement was statistically significant. This finding suggests that participation in the structured yoga programme was associated with better performance on the study's academic measure. However, academic achievement is influenced by multiple factors, including study habits, motivation, previous achievement, sleep, parental and teacher support and the learning environment. Yoga should therefore be interpreted as a complementary factor rather than the sole determinant of academic success.

The improvement in stress-related functioning provides a possible psychological context for the academic result. High school students may experience examination pressure, workload, competition and expectations. The yoga module combined movement, breathing regulation, meditation and relaxation, which may have provided opportunities for students to regulate tension and develop a more favourable psychological state. The large difference between the Experimental and Control Groups is consistent with the literature reviewed in the dissertation concerning yoga and adolescent stress.

Concentration also improved substantially following the intervention. Yoga requires attention to posture, movement, breathing and focused activity. Pranayama and meditation may encourage sustained attention and reduce distraction. Improved concentration may facilitate classroom engagement, information processing and retention, providing one possible pathway linking yoga participation with academic functioning. Nevertheless, the present design does not establish that improved concentration directly caused the academic improvement.

Psychological well-being increased by 11.96 points in the Experimental Group compared with 0.86 points in the Control Group. The holistic nature of the intervention may have contributed to this pattern. The findings are broadly

consistent with previous work reviewed in the dissertation, including studies examining yoga in relation to adolescent psychological or psychosocial well-being.

7. Comparison with Previous Literature

The present findings are broadly consistent with earlier research examining yoga in school and adolescent populations. The dissertation literature review includes studies addressing stress and anxiety among secondary school students, academic stress, attention and cognition, psychological well-being, and academic achievement. Research by Bhatia and Singh (2019) and Gupta and Kaur (2014) is relevant to the stress-related findings, while Anand (2011) and Noggle et al. (2012) provide a context for interpreting the improvement in psychological well-being. Agarwal and Sharma (2018) and Rao and Nagendra (2015) are relevant to the academic-performance findings.

An important difference is the brevity of the present intervention. The yoga programme was conducted for only five days, whereas many previous studies have involved longer interventions. Consequently, the present findings provide preliminary evidence of measurable short-term change but cannot establish whether benefits would be sustained over weeks or months. Differences in sample characteristics, measurement instruments and research designs also require cautious comparison with previous studies.

8. Implications

Schools may consider appropriately structured yoga as a complementary component of student wellness, physical education or morning activities. Teachers may use brief breathing or relaxation practices when suitable, particularly during periods of academic pressure. School counsellors and psychologists may consider yoga alongside, but not as a replacement for, counselling and other professional support. Students may benefit from regular, age-appropriate practice combined with adequate sleep, effective study routines, nutrition and time management.

9. Strengths

The study included both Experimental and Control Groups, used pre-test and post-test assessment, included 100 participants with equal group sizes, examined multiple academic and psychological outcomes, and used a structured intervention with consistent components. Quantitative statistical analysis provided an objective basis for examining changes.

10. Limitations

The intervention lasted only one week, limiting conclusions about long-term effectiveness. The sample was limited to 100 students from a restricted setting and was obtained through purposive sampling, which limits generalisability. Extraneous influences such as study habits, sleep, motivation, home environment and teacher support could not be completely controlled. The study did not include

long-term follow-up or detailed subject-wise analysis. Finally, the quasi-experimental design provides less control over selection bias than a fully randomized controlled trial.

11. Scope for Further Research

Future studies should examine longer yoga interventions with larger and more diverse samples from multiple schools and geographical settings. Randomized controlled designs and follow-up assessments would strengthen evidence regarding effectiveness and sustainability. Researchers may compare different frequencies and durations of yoga, examine subject-specific academic outcomes, investigate gender and developmental differences, and use mixed-methods approaches to capture students' experiences. Studies may also separate the effects of asanas, pranayama, meditation and relaxation to identify which components contribute most strongly to academic and psychological outcomes.

12. Conclusion

The present study provides empirical support for the potential beneficial role of structured yoga in the academic and psychological functioning of high school students. The Experimental Group demonstrated a substantial improvement in academic performance, increasing from a mean of 6.22 to 9.20, compared with an increase from 5.86 to 6.38 in the Control Group. Significant improvements were also observed in stress-related functioning, concentration and psychological well-being. Taken together, the findings suggest that yoga may support learning by creating more favourable psychological conditions, including improved stress regulation, attention and emotional balance. Because the intervention was brief and the design was quasi-experimental, the results should not be interpreted as definitive proof of long-term causality. Further research using larger samples, longer interventions, randomized allocation and follow-up assessment is recommended.

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