# International Journal of Indian Medicine

www.ijim.co.in
ISSN: 2582-7634
Volume - 6, Issue - 09
September 2025

IJIM

INDEXED

Review Article

eISSN : 2582 - 7634

*International Journal of Indian Medicine, 2025; 6(09):71 -77* *ISSN: 2582-7634*

International Journal of Indian Medicine

International Category Code (ICC): ICC-1702 International Journal Address (IJA): IJA.ZONE/258276217634

# Evaluating the Impact of Yoga and Pranayama on Academic Performance in College Students

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**ABSTRACT:**

Academic stress is one of the most common challenges faced by college students, often manifesting as anxiety, poor concentration, memory impairment, and a decline in academic performance. Prolonged stress not only affects mental health but also influences physical well-being and overall quality of life. Traditional Indian practices such as **Yoga and Pranayama** are holistic approaches that integrate physical postures, breath regulation, and mindfulness, thereby offering benefits at both physiological and psychological levels. The present study was undertaken to evaluate the impact of a **structured Yoga and Pranayama intervention** on the academic performance of college students. The intervention program included daily sessions consisting of selected asanas, breathing practices, and relaxation techniques, conducted over a specified period. Assessment was made through subjective parameters (self-reported stress levels, concentration, and memory recall) and objective parameters (academic performance indicators and memory retention tests). Findings suggest that students who practiced Yoga and Pranayama regularly showed **improved memory, better concentration, reduced stress levels, and enhanced cognitive efficiency**, which directly contributed to improved academic performance. The results reinforce the view that adopting such traditional practices in modern educational settings can serve as an effective, non-pharmacological strategy to manage academic stress and promote overall well-being among students.

**KEYWORDS:** Yoga, Pranayama, Academic Performance, Stress Reduction, College Students, Mind-Body Practices

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**How to cite this article:** Varti J., Bandwal P. Evaluating the Impact of Yoga and Pranayama on Academic Performance in College Students.Int J Ind Med 2025;6(09):71 -77 DOI: http://doi.org/10.55552/IJIM.2025.60913

eISSN : 2582 - 7634
International Journal of Indian Medicine, 2025; 6(09):71 -77 ISSN: 2582-7634

## INTRODUCTION:

The academic journey of college students is often marked by high expectations, competitive environments, and continuous performance pressure. With the rapidly changing educational system, students face long study hours, irregular sleep patterns, unhealthy dietary habits, and limited physical activity. These lifestyle challenges contribute to stress, anxiety, fatigue, and poor concentration—all of which hinder learning and academic performance. The demand for enhanced productivity and intellectual efficiency has made it crucial to explore non-pharmacological, holistic approaches that support both mental and physical well-being. Yoga, an ancient discipline originating from Indian philosophy, integrates physical postures (asanas), breathing techniques (pranayama), meditation (dhyana), and lifestyle modifications to promote balance in body, mind, and spirit. Modern scientific studies have recognized yoga as a complementary therapy that improves physiological functioning, emotional resilience, and cognitive abilities. Asanas help in relieving muscular tension and improving circulation, while pranayama regulates the autonomic nervous system, enhancing mental clarity and reducing stress. Meditation practices included in yoga further stabilize emotions, improve focus, and encourage self-awareness. Pranayama, in particular, plays a vital role in regulating breathing patterns, increasing oxygen supply to the brain, and calming the nervous system. Techniques such as Anulom-Vilom (alternate nostril breathing) enhance concentration, Bhramari (humming breath) reduces anxiety, and Kapalabhati (cleansing breath) stimulates mental alertness. These physiological changes directly influence learning abilities, attention span, and memory consolidation, making pranayama highly relevant for students engaged in rigorous academic pursuits. Recent years have witnessed an increasing interest in integrating yoga into school and college curricula, with evidence highlighting its positive effects on reducing stress, improving classroom performance, and enhancing overall student well-being. However, while several studies focus on psychological outcomes, fewer have examined the direct academic benefits, particularly in terms of measurable performance indicators such as memory, attention, and examination results. Therefore, this research aims to bridge that gap by systematically evaluating the impact of yoga and pranayama on the academic performance of college students. The study not only seeks to measure improvements in academic outcomes but also explores how stress reduction and better cognitive functioning contribute to learning efficiency. By assessing both psychological and academic parameters, the research underscores yoga and pranayama as effective, low-cost, and sustainable interventions for enhancing the quality of higher education.

**Aim:** To study the impact of Yoga and Pranayama on Academic Performance in College Students.

**Objectives :**

1. To evaluate improvements in cognitive functions such as attention, concentration, and memory recall.
2. To measure changes in psychological well-being, including mood, sleep quality, and overall life satisfaction.

To explore the relationship between reduced stress levels (as a mediator) and improved academic performance (as an outcome)

**Review of Literature**

- Previous research has shown that yoga reduces stress levels, leading to

improved classroom performance (Sharma et al., 2020).

- Pranayama has been linked with better memory scores and attention span among medical students (Kuppusamy et al., 2019).
- A comparative study by Telles & Singh (2018) indicated that yoga practitioners demonstrated better academic outcomes compared to non-practitioners.
- Mind-body interventions have also been recommended as effective tools for reducing exam-related anxiety (Brown & Gerbarg, 2017).

**Conceptual Model**

Yoga/Pranayama (asanas + slow/alternate-nostril breathing + relaxation) → ↓Stress / ↑Sleep quality / ↑HRV → ↑Attention & Working Memory / ↑Study Self-Efficacy → ↑Exam Scores & GPA.

**Methodology**

**Research Design**

The study followed an **open randomized control trial (RCT)** design to assess the effectiveness of yoga and pranayama practices on the academic performance of college students. RCTs are considered the gold standard in intervention studies as they minimize bias and allow for reliable comparisons between experimental and control groups.

**Population and Sample**

- **Population:** Undergraduate students aged 18–24 years enrolled in a college.
- **Sample Size:** 100 students were recruited, with 50 randomly assigned to the **experimental group** (yoga-pranayama practice) and 50 to the **control group** (no intervention).
- **Inclusion Criteria:**
  - Students willing to participate and provide informed consent.
  - Those not suffering from any chronic physical or psychological illness.
  - Students not engaged in prior structured yoga practice.
- **Exclusion Criteria:**
  - Students with medical contraindications to physical activity.
  - Individuals already practicing yoga or meditation regularly.

**Intervention**

The intervention was structured into **daily 45-minute sessions for 8 weeks**, conducted under the supervision of a certified yoga instructor.

- **Warm-up (5 minutes):** Light stretching and breathing awareness.
- **Yoga Asanas (20 minutes):** Surya Namaskar, Tadasana, Bhujangasana, Vajrasana, Padmasana, and Shavasana (chosen for their benefits on flexibility, posture, and relaxation).
- **Pranayama (15 minutes):**
  - *Anulom-Vilom* (alternate nostril breathing) – improves concentration and balances the nervous system.
  - *Bhramari* (humming breath) – reduces anxiety and promotes calmness.
  - *Kapalabhati* (cleansing breath) – enhances alertness and oxygenation.
- **Meditation/Relaxation (5 minutes):** Guided mindfulness meditation or Om chanting for stress relief.

The **control group** did not participate in yoga sessions and continued their normal academic routine.

**Duration**

- Total Intervention: 8 weeks
- Frequency: 5 days per week
- Session Length: 45 minutes per session

**Tools for Data Collection**

1. **Academic Performance Measures**
   - Pre-test and post-test scores from internal college assessments.
   - Attendance and participation records.
   - Subjective reports of study efficiency.
2. **Psychological Assessments**
   - **DASS-21 (Depression Anxiety Stress Scale)** to measure changes in stress levels.
   - **Perceived Stress Scale (PSS)** for academic stress.
3. **Cognitive Function Tests**
   - **Digit Span Test** (forward and backward) for attention and working memory.
   - **Word Recall Test** for short-term memory.
   - **Stroop Test** for concentration and cognitive flexibility.

**Data Collection Procedure**

1. Baseline measurements were taken before starting the intervention (academic scores, stress levels, memory tests).
2. The experimental group underwent the 8-week yoga-pranayama program, while the control group continued routine college activities.
3. At the end of 8 weeks, post-intervention assessments were conducted using the same tools.
4. Data were recorded, tabulated, and prepared for statistical analysis.

**Data Analysis**

- **Paired t-test** was used to compare pre- and post-test results within each group.
- **Independent t-test/ANOVA** was used to compare differences between experimental and control groups.
- **Effect size (Cohen's d)** was calculated to measure the magnitude of improvement.
- **p-value < 0.05** was considered statistically significant.

**Ethical Considerations**

- Approval was obtained from the Institutional Ethics Committee.
- Written informed consent was collected from all participants.
- Participation was voluntary, with the right to withdraw at any stage.
- Confidentiality of participants' data was maintained throughout.

**Result:** The results of the study revealed significant differences between the experimental group (students practicing yoga and pranayama) and the control group (students without intervention).

1. **Academic Performance:**
   - The experimental group showed an average increase of 15–20% in academic scores after 12 weeks of yoga and pranayama practice.
   - In contrast, the control group showed only a marginal improvement of 2–3%, likely due to regular academic progression rather than intervention.
2. **Memory and Concentration:**
   - The digit span test and memory recall tests indicated a marked improvement in short-term memory and attention span among students in the experimental group.
   - Students reported better ability to concentrate during lectures and improved recall during examinations.
3. **Stress Reduction:**
   - The Perceived Stress Scale (PSS) scores decreased significantly in the experimental group, showing lower anxiety and stress levels after the intervention.
   - The control group showed no noticeable reduction in stress, with some students reporting increased exam-related anxiety.

4. **Qualitative Feedback:**
   - Students practicing yoga and pranayama reported improved sleep quality, reduced fatigue, and better emotional control.

Many participants expressed that the daily practice helped them manage exam pressure more effectively and improved their overall confidence.

## DISCUSSION:

The findings support the hypothesis that yoga and pranayama have a positive effect on academic performance. Several mechanisms can explain these improvements:

1. **Physiological Benefits:**
   - Yoga asanas improve blood circulation and physical flexibility, reducing physical discomfort and fatigue, which allows students to focus better on academic tasks.
   - Pranayama increases oxygen supply to the brain, enhancing cognitive processes such as memory, problem-solving, and logical reasoning.
2. **Psychological Benefits:**
   - Stress reduction is a key factor. By lowering cortisol levels and balancing the autonomic nervous system, yoga and pranayama reduce exam-related anxiety, allowing students to concentrate better.
   - Meditation and mindfulness aspects of yoga enhance emotional regulation, improving resilience in stressful situations.
3. **Academic Relevance:**
   - Improved memory, attention span, and reduced stress directly translate into **better learning outcomes** and **higher academic scores**.
   - These benefits are not short-term but can create long-lasting improvements in students' learning habits and lifestyle.
4. **Comparison with Previous Studies:**
   - Similar results were observed in studies conducted by Sharma et al. (2019) and Telles et al. (2020), where yoga interventions led to improved academic scores and reduced stress among college students.

The present study strengthens the evidence by demonstrating measurable improvements in both academic performance and psychological well-being.

## CONCLUSION:

This study concludes that regular practice of **yoga and pranayama significantly improves academic performance** in college students by enhancing concentration, memory, and stress management. Students in the experimental group not only achieved higher academic scores but also demonstrated better emotional stability and confidence compared to the control group. The holistic benefits of yoga extend beyond academics, promoting healthier lifestyle habits, better sleep quality, and improved mental health. Therefore, it is strongly recommended that educational institutions integrate structured yoga and pranayama sessions into the daily or weekly routine of students. Such integration can serve as a preventive and promotive health strategy, reducing stress-related disorders while simultaneously enhancing academic productivity. Future research may include larger sample sizes, longitudinal studies, and comparisons between different yoga modules to determine the most effective practices for students.

**Recommendations**

- Colleges should integrate yoga modules into daily schedules.

- Workshops and seminars on pranayama techniques should be organized for students.
- Future research can focus on larger sample sizes, diverse student groups, and long-term effects.

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**Source of Support: None declared**
**Conflict of interest: Nil**