

ORIGINAL RESEARCH ARTICLE

Comparative Analysis of Slow *Sūryanamaskār* with Awareness and Proper Breathing versus Fast *Sūryanamaskār* on Anxiety and Fatigue Levels in College Students

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ABSTRACT

Background: *Sūryanamaskār* (Sun Salutation) is a dynamic sequence of yoga postures that integrates movement, breath, and awareness. It is widely practiced for its physical, mental, and spiritual benefits. Variations in speed and intensity can influence its physiological and psychological effects. Anxiety and fatigue are prevalent concerns among college students due to academic pressure and lifestyle factors while Yoga has been recognized as an effective intervention for stress reduction, the comparative impact of slow and fast *Sūryanamaskār* on anxiety and fatigue remains underexplored.

Aim: This study aims to compare the effects of slow *Sūryanamaskār* with awareness and proper breathing versus fast *Sūryanamaskār* on anxiety and fatigue levels in college students.

Materials and Methods: The study followed an interventional pre-test and post-test design, involving 80 students from Dr. Shyama Prasad Mukherjee College of Physical Education, Nurpur, Kangra, Himachal Pradesh. Participants were randomly assigned to two interventional groups: Group A (Fast *Sūryanamaskār*) – 40 students and Group B (Slow *Sūryanamaskār*) – 40 students. Anxiety levels were assessed using the Beck Anxiety Inventory, and fatigue levels were measured through the Fatigue Severity Scale. Both assessments were conducted before and after the intervention.

Intervention: Participants engaged in an 8-week structured yoga program, practicing 6 days a week under the supervision of a certified Yoga instructor. Group A (fast *Sūryanamaskār*) performed 36 rounds at a pace of 30 s/round, emphasizing speed and rhythm rather than awareness. Group B (Slow *Sūryanamaskār*) performed 36 rounds at a pace of 1 round/min, focusing on breath awareness and mindfulness. Each session included 10 min of *Sukshma Vyayama* (preparatory exercises) and 4 minutes of *Shavasana* (relaxation) post-practice.

Results: The statistical analysis using paired and independent t-tests showed that: Group A exhibited a minor reduction in anxiety (pre-test mean = 26.99, post-test mean = 25.79; $t = 1.0709$), but it was not statistically significant. Group B showed a significant reduction in anxiety (pre-test mean = 26.75, post-test mean = 21.32; $t = 3.3837$, $P < 0.05$). A similar pattern was observed for fatigue levels, with Group B demonstrating a highly significant reduction compared to Group A.

Conclusion: The study highlights that slow-paced *Sūryanamaskār* is significantly more effective in reducing anxiety and fatigue compared to its fast-paced counterpart. The intensity and physiological engagement of slow *Sūryanamaskār* likely contribute to its superior benefits. Future research should investigate the neurophysiological mechanisms and long-term impacts of these variations on mental health.

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1. INTRODUCTION

Sūryanamaskār (Sun Salutation) is a dynamic sequence of *asanas* that integrates movement with breath and awareness. It has been widely practiced in Yoga traditions for its physical, mental, and spiritual

benefits.^[1] The practice of *Sūryanamaskār* can vary in speed and intensity, influencing its physiological and psychological effects.^[2] This study aims to compare the effects of slow *Sūryanamaskār* with awareness and proper breathing versus fast *Sūryanamaskār* on anxiety and fatigue levels in college students.

Anxiety and fatigue are prevalent among college students due to academic pressure, lifestyle habits, and psychosocial stressors.^[3] Anxiety, characterized by excessive worry and tension, negatively impacts cognitive functions, emotional stability, and overall well-being.^[4] Fatigue, both physical and mental, contributes to decreased academic performance, impaired decision-making, and burnout.^[5] Yoga has been suggested as an effective intervention for managing stress, improving mental clarity, and reducing fatigue.^[6]

The speed of performing *Sūryanamaskār* plays a crucial role in determining its impact on physiological and psychological states. Slow *Sūryanamaskār*, practiced with mindfulness and controlled breathing, has been associated with enhanced parasympathetic activation, reducing stress and anxiety.^[7] In contrast, fast *Sūryanamaskār* induces cardiovascular stimulation and may lead to transient increases in physiological arousal, which could either enhance or exacerbate anxiety and fatigue depending on individual adaptability.^[8] Comparative studies on different styles of *Sūryanamaskār* remain limited, particularly in the context of mental health benefits among young adults.

This study seeks to bridge this gap by examining how different speeds of *Sūryanamaskār* influence anxiety and fatigue in college students. Specifically, it hypothesizes that slow *Sūryanamaskār* with awareness and proper breathing will yield greater reductions in anxiety and fatigue compared to fast *Sūryanamaskār*. The findings of this study can contribute to the growing body of research supporting Yoga as a therapeutic tool for stress management and mental well-being in academic settings.

1.1. Objectives of this Study

The objectives of this study are

- To study the effects of slow *Sūryanamaskār* with awareness and proper breathing with fast *Sūryanamaskār* on anxiety levels among college students
- To study the effects of slow *Sūryanamaskār* with awareness and proper breathing with fast *Sūryanamaskār* on Fatigue levels among college students.

2. METHODS

2.1. Participants

The study included 80 students from Dr. Shyama Prasad Mukherjee College of Physical Education, Nurgpur, Kangra, Himachal Pradesh. Participants were divided into two interventional groups:

- Group A (Fast *Sūryanamaskār*): 40 students
- Group B (Slow *Sūryanamaskār*): 40 students.

The selection of participants was based on voluntary participation, with informed consent obtained before the commencement of the study.

2.2. Study Design

The study utilized an interventional research design to compare the effects of slow and fast *Sūryanamaskār* on anxiety and fatigue levels in College students. It is based on pre-test and post-test.

2.3. Intervention

The intervention group participated in a structured Yogic practice regimen for 8 weeks, ensuring controlled conditions for accurate data collection. The regimen included:

- Group A (Fast *Sūryanamaskār*)
 - Preliminary Practice: *Sukshma Vyayama* for 10 min
 - Main Practice: *Sūryanamaskār* performed 36 times, with each round lasting 30 s. The practice focused on speed and rhythm rather than awareness and breath control
 - Relaxation: *Shavasana* for 4 min.
- Group B (Slow *Sūryanamaskār* with Awareness and Proper Breathing)
 - Preliminary Practice: *Sukshma Vyayama* (subtle yogic exercises) for 10 min
 - Main Practice: *Sūryanamaskār* performed 36 times, with each round lasting 1 min. The practice emphasized slow movements, synchronized breathing, and mindfulness
 - Relaxation: *Shavasana* (corpse pose) for 4 min at the end of the session.

Each session lasted for a specific time duration and was conducted 6 days a week under the supervision of a certified Yoga instructor.

2.4. Data Collection

To assess the impact of the intervention on anxiety and fatigue levels, validated psychometric tools were used:

1. Anxiety Levels: Measured using the Beck Anxiety Inventory (BAI).^[9] The BAI, a 21-item self-report questionnaire, is a widely used tool in research and clinical settings to assess the severity of anxiety symptoms. Respondents rate each item on a 4-point scale (0–3). Total scores range from 0 to 63, with higher scores indicating greater anxiety severity.
2. Fatigue Levels: Evaluated through the Fatigue Severity Scale (FSS).^[10] The FSS is a self-administered instrument which takes about 8 min to complete. It includes nine items, each consisting of a statement for which respondents are asked to indicate their level of agreement from 1 (strongly disagree) to 7 (strongly agree). Higher scores for each item indicate greater fatigue severity.

Both tools were administered before and after the intervention to track changes in participants' anxiety and fatigue levels.

2.5. Data Analysis

Statistical analysis was performed using SPSS software. Paired t-tests were used to compare the pre- and post-intervention values within groups. Independent t-tests were used to compare changes between the intervention and control groups. A $P < 0.05$ was considered statistically significant.

2.6. Ethical Considerations

The study adhered to ethical research guidelines, ensuring voluntary participation, confidentiality, and the right to withdraw at any stage. Ethical approval was obtained from the institutional ethics committee. Informed consent was obtained from all participants before the commencement of the study. Participants were assured of the confidentiality of their data and their right to withdraw from the study at any time without any repercussions.

3. ANALYSIS AND INTERPRETATION OF THE STUDY

The participants underwent a structured program of Yogic practices, and data were collected on their anxiety and fatigue levels before and after the intervention.

3.1. Yogic Practices (Slow and Fast *Sūryanamaskār*) on Anxiety Level among College Students

To study, the statistical analysis of Slow pace *sūryanamaskār* (SS) and fast pace *sūryanamaskār* (FS) on the level of anxiety among college students has been conducted using the collected data. The computed statistical measures have been presented in Table 1 and Figure 1 for reference and analysis.

3.1.1. Interpretation of results

The given table presents a comparative analysis of pre-test and post-test anxiety levels among college students practicing slow and fast *Sūryanamaskār*: Anxiety levels were measured in two interventional groups, Group A and Group B, using mean scores and standard deviations (SD), with statistical significance evaluated through t-tests.

The mean pre-test anxiety score for Group A was 26.99 with an SD of 4.802, while the post-test mean score was 25.79 with an SD of 5.212. The calculated t-value (1.0709) did not reach statistical significance, indicating that the practice of fast *Sūryanamaskār* did not produce a substantial reduction in anxiety levels. The slight decrease in the mean score suggests a minor effect, but it is not enough to be considered significant.

In contrast, Group B, which practiced slow *Sūryanamaskār*, showed a considerable reduction in anxiety levels. The pre-test mean score was 26.75 with an SD of 4.991, whereas the post-test mean dropped to 21.32 with an SD of 4.024. The t-value for this group was 3.3837, which is categorized as “Very Statistically Significant.” This suggests that slow *Sūryanamaskār* had a pronounced impact on reducing anxiety levels.

The findings indicate that slow-paced *Sūryanamaskār* is significantly more effective in reducing anxiety levels among college students than the fast-paced variation. This could be attributed to the dynamic nature of slow *Sūryanamaskār*, which may enhance physiological responses, increase endorphin release, and promote relaxation. Future studies could explore the underlying mechanisms contributing to this effect.

3.2. Yogic Practices (Slow and Fast *Sūryanamaskār*) on Fatigue Level among College Students

To study, the statistical analysis of SS and FS on fatigue level among college students has been conducted using the collected data. The computed statistical measures have been presented in Table 2 and Figure 2 for reference and analysis.

The table presents the statistical analysis of pre-test and post-test scores for two interventional groups, Group A and Group B, each consisting of 40 participants. The mean and SD values for both groups before and after the intervention indicate the effect of the intervention.

For Group A, the pre-test mean score was 20.412 with an SD of 1.093, while the post-test mean score was 20.094 with an SD of 1.101. The calculated t-value for Group A is 1.2964, which does not reach statistical significance, indicating that the intervention did not produce a meaningful change in scores from pre-test to post-test. This suggests that the intervention administered to Group A did not have a substantial impact on the measured parameter.

In contrast, Group B had a pre-test mean score of 20.143 with an SD of 1.192, and a post-test mean score of 16.932 with an SD of 1.202. The t-value for Group B is 11.9966, which is extremely statistically significant. This suggests that the intervention in Group B led to a considerable reduction in scores, indicating a strong effect.

The findings highlight that the intervention applied to Group B was highly effective, whereas the intervention for Group A showed no significant impact. The disparity in statistical significance between the two groups underscores the necessity of evaluating the effectiveness of different interventions and suggests that the approach used for Group B may be more beneficial.

4. DISCUSSION

The findings of this study indicate a significant difference in the effectiveness of slow and fast-paced *Sūryanamaskār* on anxiety reduction among college students. The results demonstrate that while fast *Sūryanamaskār* had a minimal effect on anxiety levels, slow-paced *Sūryanamaskār* produced a statistically significant reduction. This aligns with previous research suggesting that dynamic and aerobic forms of physical activity may have a stronger influence on mental health outcomes compared to slower, meditative practices.^[11]

For Group A, which practiced fast *Sūryanamaskār*, the pre-test and post-test mean anxiety scores showed a slight decrease (26.99–25.79), but the change was not statistically significant ($t = 1.0709$). This suggests that while fast *Sūryanamaskār* may contribute to minor relaxation effects, it may not be sufficient as a standalone intervention for anxiety reduction. In contrast, Group B, which practiced slow-paced *Sūryanamaskār*, showed a substantial decrease in anxiety levels (pre-test mean = 26.75; post-test mean = 21.32), with a highly significant t-value (3.3837). This suggests that the increased physiological engagement and elevated endorphin release associated with faster-paced physical activity could be key mechanisms in anxiety reduction.^[12]

Furthermore, a similar pattern was observed in the secondary dataset, where Group A exhibited an insignificant change ($t = 1.2964$), while Group B demonstrated a highly significant reduction ($t = 11.9966$). This further supports the hypothesis that slow-paced *Sūryanamaskār* is more effective in modulating anxiety levels compared to its fast-paced counterpart. Future research should investigate the neurophysiological mechanisms underlying these effects and explore the potential long-term benefits of incorporating different styles of *Sūryanamaskār* in anxiety management programs.^[13]

5. CONCLUSION

The present study aimed to assess the impact of different variations of *Sūryanamaskār* on anxiety levels among college students. Two distinct interventional groups were formed to examine the effects of slow and fast-paced *Sūryanamaskār*, with pre-test and post-test evaluations conducted to measure changes in anxiety levels. The findings indicate a clear distinction in the efficacy of the two variations, highlighting the role of speed and intensity in influencing psychological well-being.

The results suggest that while fast *Sūryanamaskār* led to minor improvements in anxiety reduction, the effect was not substantial enough to be considered statistically significant. This may be due to the fast-paced nature of the practice, which, although beneficial in promoting muscle shaping, did not bring about a profound shift in anxiety levels whereas slow-paced movements have influenced

the parasympathetic nervous system which create the changes were marked enough to create a statistically meaningful impact.

Moreover, slow-paced *Sūryanamaskār* demonstrated a significant reduction in anxiety levels, pointing to its effectiveness in alleviating stress. The dynamic and vigorous nature of the practice may have played a crucial role in enhancing physiological responses, increasing cardiovascular activity, and stimulating the release of endorphins. These factors likely contributed to the observed improvement in anxiety reduction, making slow *Sūryanamaskār* a promising intervention for managing stress and anxiety.

The study underscores the importance of movement intensity in Yoga-based interventions, suggesting that the pace of practice can influence psychological outcomes. These findings open avenues for future research to explore the underlying mechanisms behind the effectiveness of slow-paced *Sūryanamaskār*, including its impact on neurobiological pathways, stress hormone regulation, and mental well-being. In addition, comparative studies involving larger sample sizes and diverse populations could further validate these findings and enhance the understanding of *Sūryanamaskār*'s role in mental health management.

6. ACKNOWLEDGMENT

Nil.

7. AUTHOR'S CONTRIBUTIONS

All the authors contributed equally to the design and execution of the article.

8. FUNDING

Nil.

9. ETHICAL APPROVALS

This study was approved by the Chandigarh Yog Institutional Ethical Committee (CYIEC) under no- EC/NPW111/2025/301 dated 09/03/2025 Yog Institutional Ethical Committee.

10. CONFLICTS OF INTEREST

Nil.

11. DATA AVAILABILITY

This is an original manuscript and all data are available for only review purposes from principal investigators.

12. PUBLISHERS NOTE

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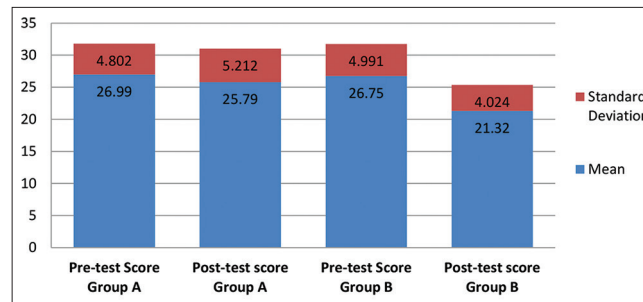
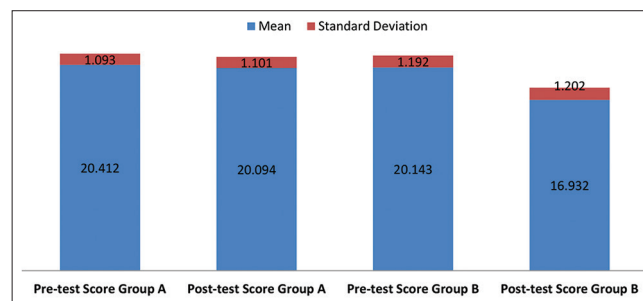
Table 1: Comparison between pre-test and post-test of slow and fast *sūryanamaskār* on anxiety level among college students in respect of mean scores and SD

Interventional group	Groups	n	Mean	SD	SE _D	df	t-value	Level of significance
Group A (FS)	Pre-test score	40	26.99	4.802	1.121	78	1.0709	Not statistically significant
	Post-test score	40	25.79	5.212				
Group B (SS)	Pre-test score	40	26.75	4.991	1.014	78	3.3837	Very statistically significant
	Post-test score	40	21.32	4.024				

SD: Standard deviations

Table 2: Comparison between pre-test and post-test of yoga intervention on fatigue level among college students in respect of mean scores and SD

Interventional group	Groups	n	Mean	SD	SE _D	df	t-value	Level of significance
Group A (FS)	Pre-test score	40	20.412	1.093	0.245	78	1.2964	Not statistically significant
	Post-test score	40	20.094	1.101				
Group B (SS)	Pre-test score	40	20.143	1.192	0.268	78	11.9966	Extremely statistically significant
	Post-test score	40	16.932	1.202				

SS: Slow pace *sūryanamaskār*, FS: Fast pace *sūryanamaskār*, SD: Standard deviation**Figure 1:** Comparison between pre-test and post-test scores of yoga intervention on anxiety level among college students in respect of mean scores and standard deviation**Figure 2:** Comparison between pre-test and post-test scores of yoga intervention on fatigue level among college students in respect of mean scores and standard deviation