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The Effectiveness of Yogasanas in Alleviating Exam Anxiety in Medical Students

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Abstract

Background: Medical education is associated with significant stress and anxiety, which can adversely affect students' mental health. Yoga, including practices such as Surya Namaskar (Sun Salutation), has been increasingly recognized for its potential to alleviate stress and anxiety. This study aimed to assess the short-term effects of a two-week yogasana intervention on anxiety levels among final year BSMS students.

Methods: Sixty final year BSMS students, aged between 22 and 25 years, participated voluntarily in the study. The intervention consisted of daily sessions of Surya Namaskar, lasting 40 minutes each, over a period of two weeks. Anxiety levels were measured using the Spielberger State-Trait Anxiety Inventory (STAI) and the Perceived Stress Scale (PSS) before and after the intervention. Statistical analysis was performed using paired t-tests to assess changes in anxiety scores.

Results: The intervention resulted in a significant reduction in perceived stress levels, with mean Perceived Stress Scale (PSS) scores decreasing from 32.5 ± 4.6 to 22.45 ± 3.9 ($p < 0.001$). State anxiety levels, as measured by the State Anxiety (STAI-S) scores, also showed a significant decrease from 55 ± 6.3 to 45 ± 5.7 ($p < 0.001$). However, there was no statistically significant change in Trait Anxiety (STAI-T) scores (74 ± 7.1 to 71 ± 6.8, $p > 0.05$).

Discussion: The findings suggest that short-term practice of Surya Namaskar can effectively reduce perceived stress and state anxiety among medical students. These results are consistent with existing literature highlighting the therapeutic benefits of yoga for mental health. Future studies should explore the long-term effects of regular yogasana practice on trait anxiety and overall well-being in academic settings.

Conclusion: Incorporating yogasana sessions into medical education programs could be a promising strategy to promote mental health and resilience among students facing high levels of academic stress.

Keywords: Yogasanas, Surya Namaskar, Mental Health, Anxiety, Medical Students, Stress Management

Introduction

Medical students are frequently exposed to high levels of stress and anxiety due to the demanding nature of their academic and clinical training. The rigors of medical education, including extensive studying, clinical responsibilities, and high-stakes examinations, often lead to significant mental health challenges such as anxiety, depression, and burnout (1). These mental health issues not only affect students' academic performance but also their overall well-being and future professional practice. Therefore, it is crucial to explore effective strategies to mitigate stress and promote mental health among medical students.

Yoga, an ancient practice originating from India, has gained global recognition for its physical, mental, and spiritual benefits. The practice of yoga involves a combination of physical postures (asanas), breath control (pranayama), and meditation (dhyana) aimed at promoting overall health and well-being. Among these components, yogasanas are physical postures designed to improve flexibility, strength, and balance while also fostering relaxation and mental clarity. Research has shown that yoga can have a significant positive impact on mental health, including reductions in symptoms of anxiety and depression, and improvements in overall psychological well-being (2).

The mechanisms through which yogasanas exert their beneficial effects on mental health are multifaceted. Regular practice of yogasanas has been shown to enhance the regulation of the autonomic nervous system, reducing sympathetic activity (stress response) and increasing parasympathetic activity (relaxation response) (3). This physiological shift can help lower levels of cortisol, a stress hormone, thereby reducing the overall stress burden on the body. Additionally, yogasanas promote mindfulness and body awareness, which can lead to improved emotional regulation and reduced rumination (4).

Several studies have demonstrated the positive effects of yoga on mental health across various populations, including medical students. For instance, a study conducted among medical students in India found that participants who engaged in regular yoga practice reported significant reductions in stress and anxiety levels compared to those who did not practice yoga (5). Another study reported that yoga practitioners experienced improvements in mood, resilience, and overall quality of life (6). These findings suggest that incorporating yogasanas into the daily routine of medical students could be an effective strategy to enhance their mental health and well-being.

The benefits of yogasanas extend beyond stress reduction and anxiety management. Yoga practice has been associated with improvements in cognitive function, including enhanced attention, memory, and executive function (7). These cognitive benefits can be particularly advantageous for medical students, who are required to assimilate vast amounts of information and perform complex clinical tasks. Furthermore, yogasanas have been shown to improve sleep quality, which is often compromised in medical students due to irregular schedules and high stress levels (8). Improved sleep can further contribute to better mental health and academic performance.

In addition to the individual benefits, promoting yoga practice among medical students can have broader implications for the healthcare system. Medical professionals who practice yoga may be better equipped to handle the stress and demands of their profession, potentially leading to improved patient care and reduced burnout rates. Moreover, physicians who experience the benefits of yoga firsthand may be more likely to recommend it to their patients, thus promoting a holistic approach to healthcare that encompasses physical, mental, and emotional well-being (9).

This study aims to explore the specific benefits of yogasanas for mental health among medical students. By examining changes in anxiety, stress, and overall mental well-being before and after a structured yogasana intervention, we hope to provide evidence for the efficacy of yogasanas as a practical tool for improving mental health in this population. Understanding the potential benefits of yogasanas can help inform the development

of wellness programs tailored to the needs of medical students, ultimately fostering a healthier and more resilient future workforce.

Materials and Methods

This study aimed to assess the short-term effects of yogasanas on mental health among final year BSMS students at Nandha Siddha Medical College. Sixty students, aged between 22 and 25 years, voluntarily participated in the study. The participants underwent a structured two-week intervention program comprising daily sessions of yogasanas. Each session lasted 40 minutes and focused on the practice of Surya Namaskar (Sun Salutation), which consists of 12 specific steps performed in sequence.

1. **Pranamasana (Prayer Pose)**: Participants began by standing upright with their feet together and hands in a prayer position in front of their chest. This step promotes relaxation and mental focus.
2. **Hasta Uttanasana (Raised Arms Pose)**: From Pranamasana, participants inhaled deeply and raised their arms overhead, arching their back slightly. This step helps to improve lung capacity and stretches the body.
3. **Padahastasana (Hand to Foot Pose)**: On exhalation, participants bent forward from the hips, bringing their hands to the floor beside their feet. This step enhances flexibility and calms the mind.
4. **Ashwa Sanchalanasana (Equestrian Pose)**: Participants inhaled and stepped their right leg back, placing the knee on the floor, and looked up, keeping their hands on the floor. This step strengthens the leg muscles and opens the chest.
5. **Dandasana (Stick Pose)**: On exhalation, participants stepped the left leg back to align the body in a straight line, balancing on hands and toes. This step builds core strength and improves posture.
6. **Ashtanga Namaskara (Eight Limbed Pose)**: Participants lowered their knees, chest, and chin to the floor while keeping their hips slightly raised. This step engages multiple muscle groups and promotes mindfulness.
7. **Bhujangasana (Cobra Pose)**: On inhalation, participants slid forward and lifted their chest into a gentle backbend, keeping their elbows close to their body. This step strengthens the spine and alleviates stress.
8. **Adho Mukha Svanasana (Downward Facing Dog Pose)**: Participants exhaled and lifted their hips, forming an inverted V shape with their body. This step stretches the entire back, relieves tension, and calms the mind.
9. **Ashwa Sanchalanasana (Equestrian Pose)**: Participants inhaled and stepped their right leg forward between their hands, looking up, similar to step 4. This step maintains balance and flexibility.
10. **Padahastasana (Hand to Foot Pose)**: On exhalation, participants brought the left leg forward and bent down to touch their feet, similar to step 3. This step continues to improve flexibility and reduce anxiety.
11. **Hasta Uttanasana (Raised Arms Pose)**: Participants inhaled and raised their arms overhead, arching their back slightly, similar to step 2. This step enhances lung function and energy levels.
12. **Pranamasana (Prayer Pose)**: Finally, participants exhaled and returned to the initial standing position with hands in prayer position. This step promotes a sense of inner peace and mental clarity.

Data collection involved a structured questionnaire to gather sociodemographic information such as name, age, religion, level of education, and address. Additionally, two self-reported questionnaires were used to measure anxiety and stress levels: the Spielberger State-Trait Anxiety Inventory (STAI) and the Perceived Stress Scale (PSS). These tools were administered before and after the intervention to evaluate changes in anxiety and stress levels.

The feedback collected aimed to gauge participants' attitudes towards yoga and understand the perceived benefits of the practice. The intervention's effectiveness was determined by comparing the mean scores of STAI and PSS before and after the two-week program, with statistical significance being assessed to validate the results.

The findings from this study are expected to provide valuable insights into the role of yogasanas as a stress management tool, particularly in high-stress academic environments such as medical schools. This

understanding could help educational institutions implement targeted interventions to support the mental health and well-being of their students, especially during critical periods like examinations.

Results:

Results

This study evaluated the impact of a two-week yogasana intervention on the anxiety levels of final year BSMS students using the Spielberger State-Trait Anxiety Inventory (STAI) and the Perceived Stress Scale (PSS). The data were scored and group mean values ± standard deviation (SD) were calculated before and after the intervention. The paired t-test was employed to analyze the statistical significance of the changes in scores.

Perceived Stress Scale (PSS) Scores

The mean PSS scores of the participants significantly decreased from 32.5 ± 4.6 to 22.45 ± 3.9 following the intervention. The reduction in PSS scores was statistically significant, indicating a notable decrease in perceived stress among the students.

State Anxiety (STAI-S) Scores

The mean State Anxiety scores (STAI-S) showed a significant reduction from 55 ± 6.3 to 45 ± 5.7 after the intervention. This statistically significant decrease demonstrates the effectiveness of the yogasana sessions in reducing state anxiety levels.

Trait Anxiety (STAI-T) Scores

The mean Trait Anxiety scores (STAI-T) changed from 74 ± 7.1 to 71 ± 6.8 post-intervention. However, this reduction was not statistically significant, suggesting that the short-term intervention had a more immediate impact on state anxiety rather than trait anxiety.

Statistical Analysis

The paired t-test results for PSS, STAI-S, and STAI-T scores are summarized in the following table:

Measure	Before Intervention (Mean ± SD)	After Intervention (Mean ± SD)	t-value	p-value	Statistical Significance
PSS	32.5 ± 4.6	22.45 ± 3.9	15.78	$p < 0.001$	Significant
STAI-S	55 ± 6.3	45 ± 5.7	10.65	$p < 0.001$	Significant
STAI-T	74 ± 7.1	71 ± 6.8	1.98	$p > 0.05$	Not Significant

These results suggest that the short-term yogasana intervention effectively reduced perceived stress and state anxiety among the medical students, though it did not significantly impact trait anxiety within the short duration of the study.

Discussion

Discussion

The findings of this study indicate that a two-week yogasana intervention, specifically the practice of Surya Namaskar, can significantly reduce perceived stress and state anxiety levels among final year BSMS students. These results align with existing literature that highlights the mental health benefits of yoga practices.

The significant reduction in Perceived Stress Scale (PSS) scores from 32.5 ± 4.6 to 22.45 ± 3.9 underscores the effectiveness of Surya Namaskar in alleviating perceived stress. This finding is consistent with the study

by Sharma et al., which reported significant decreases in stress levels among medical students following a yoga intervention (10). Similarly, a study by Smith and Pukall observed reductions in stress and improvements in overall well-being among participants who engaged in regular yoga sessions (11). The physiological mechanisms underlying these benefits may include the modulation of the autonomic nervous system and the reduction of cortisol levels, as suggested by Khalsa et al. (12).

The decrease in State Anxiety (STAI-S) scores from 55 ± 6.3 to 45 ± 5.7 further demonstrates the immediate impact of yogasanas on reducing acute anxiety symptoms. This result supports findings from Gothe et al., who found that yoga practice can lead to significant reductions in state anxiety levels in college students (13). The calming effect of yoga may be attributed to its focus on breath control, mindfulness, and the physical release of tension through poses, as discussed by Streeter et al. (14). These components collectively contribute to the reduction of state anxiety.

However, the non-significant change in Trait Anxiety (STAI-T) scores from 74 ± 7.1 to 71 ± 6.8 suggests that the short-term intervention was insufficient to produce lasting changes in long-term anxiety traits. This finding is consistent with the work of Woodyard, who noted that while short-term yoga interventions can reduce immediate stress and anxiety, longer durations are typically required to effect significant changes in trait anxiety (15). Trait anxiety, which is more stable and ingrained, may require extended and consistent practice to be effectively managed, as indicated by Brown and Gerbarg (16).

The feedback collected from participants also highlighted their positive attitudes towards yoga and the perceived mental health benefits. Many students reported feeling more relaxed, focused, and better equipped to handle academic pressures after the intervention. These subjective benefits align with qualitative findings from Park et al., who documented similar improvements in mental health and coping skills among yoga practitioners (17).

Conclusion

In conclusion, this study provides evidence supporting the short-term efficacy of Surya Namaskar in reducing perceived stress and state anxiety among medical students. The results suggest that incorporating regular yogasana sessions into academic curricula could be a valuable strategy for promoting mental health and well-being in high-stress educational environments. Future research should explore the long-term effects of sustained yoga practice on trait anxiety and other aspects of mental health to further substantiate these findings.

Limitations

The study's small sample size limits the generalizability of the findings.

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