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Effectiveness Of Low Impact Aerobic Exercise Vs Yoga Theraphy In Insomnia Among College Going Students

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ABSTRACT

Background: Insomnia is one of the most common sleep disorders found among college students, often related to academic stress, lifestyle changes, and poor sleep hygiene. It negatively impacts cognitive function, mood, and overall well-being. Non-pharmacological interventions such as low-impact aerobic exercise and yoga therapy have been explored for their effectiveness in improving sleep quality.

Objective: The purpose of this study is to compare low-impact aerobic exercise and yoga therapy in the treatment of insomnia among college students.

Methodology:The design of the quasi-experimental study was on 30 college students diagnosed with moderate insomnia using the Athens Insomnia Scale (AIS). Group A received low-impact aerobic exercise, and Group B was given yoga therapy. The treatment lasted for six weeks with the sessions supervised for five days in a week. Sleep quality, daytime fatigue, and stress level were measured with the help of AIS and other subjective measures at pre- and post-intervention.

Results:Both interventions improved the quality of sleep, reduced daytime fatigue, and decreased stress levels. However, yoga therapy had a more significant reduction in AIS scores and stress-related symptoms compared to low-impact aerobic exercise.

Conclusion:Low-impact aerobic exercise and yoga therapy both have been shown to be effective non-pharmacological interventions for insomnia. Among the twolow impact aerobic exercise was significantly more effective in improving sleep quality and reducing stress. Low impact aerobic exercise may be incorporated into a college student's routine as a holistic approach to manage insomnia and enhance overall well-being.

Keywords: *insomnia, low impact aerobic, yoga therapy, quality of sleep.*

1. INTRODUCTION

Insomnia is a sleep disorder in which people have difficulty sleeping .They may struggle to get asleep or stay asleep for as long as they desired .Insomnia is frequently accompanied with daytime sleepiness, fatigue ,irritability ,and a depressed mood. It may raise the danger of all types of accidents ,as well as difficulty focusing and learning [1] . Insomnia can be either short term (days or weeks) or long term (greater than a month).sleep quality and quantity among young adults, especially university student ,has changed due to the rapid growth of technology such as the use of social media and the internet. Approximately 10% of adults have an insomnia conditions,while another 20% experiences occasional symptoms [14]. Insomnia is more common in women ,older persons,and people from low-income backgrounds.The prevalence of insomnia in university was 18.5% (95% CI , 11.2-28.8%) indicating that insomnia is significantly greater in university students than in the general population,and recommending that more attension be paid to insomnia in university students.

Another study discovered that the impacts of sleep distruption have secondary behavioral repercussions such as decreased social interaction ,higher risk-taking behavior,traffic accidents ,etc. There are a number of known risk factors have been indentified as risk factors ,including female sex,advanced age,depressed mood,snoring,low levels of physical activity , comorbid medical conditions,regular hypnotic use,nocturnal micturation,onset of menses,prior insomnia complaints,and high levels of perceived stress[15]. All three of these factors – female sex,advanced age and depressed mood are consistent risk factors.

Psychiatric disease are the most common comorbidities connected with insomnia.it is estimated that 40% of insomnia patients have a comorbid psychological disorders. Depression is the most frequent of psychiatric diseases,and insomnia is a symptom of both depression and anxiety.insomnia is regarded to be a hyperarousal illness that persists throughout the day[3]. This hyperarousal might manifests as hypervigilance throughout the day and difficulties falling and staying asleep at night. Both cognitive and physiological explanations of insomnia account for this arousal.

Many variables frequently contribute to college students' sleep difficulties. One of the main causes is stress from academic demands including deadlines, tests, and coursework[24]. Their sleep patterns, however, may be disturbed by other circumstances, such as moving to a new location. Increased caffeine use, late-night socializing, and new social possibilities can all have an impact on sleep quality. The pressures of juggling their part-time jobs, extracurricular activities, and academic work also cause many students to have inconsistent sleep cycles[23]. Poor sleep hygiene can also be exacerbated by the environment, such as noisy roommates or an unsatisfactory sleeping arrangement.

There are a lot of obstacles to overcome while moving from high school to college, such as moving away from home, being more independent, meeting new people, maintaining academic obligations, and having more access to drugs and alcohol[8]. It's possible that some students handle these stressors better than others, and those who do not may be more likely to experience sleeplessness. Although recent studies have contributed to a greater awareness of the significance of healthy sleep habits in young adults, a comprehensive examination of insomnia and its relationship to college students is still absent[9].

2. METHODOLOGY

This study was a quasi experimental study. sessions were held in Mahatma Gandhi medical College and research institute where the subjects were assessed, data were collected. All participants were selected by convenient sampling method.The inclusion criteria for this study were the collegiate student who has insomnia. A total of 30 collegiate students were included in this study. By assessing through athens insomnia scale (score ranging from 11 to 15 moderate insomnia). The exclusion criteria were: (1) evidence that the insomnia was directly related to a medical condition or to side-effects from medications; (2) use of medications or psychotherapeutic drugs for insomnia or another psychiatric disorder; (3) diagnosis of depression or another psychiatric disorder; (4) apnoea– hypopnoea index >15; (5) periodic leg movement index >15; (6) shift worker or all-night worker; (7) cardiac abnormalities; and (8) regular physical exercise (more than once per week) over the previous 6 months.

Procedure:

We met collegiate students and explained the procedure of this study. After receiving the consent form and demographic details from 100 participants, they were requested to fill the Athens insomnia scale (AIS). After confirming insomnia, 30 participants were included in this study ,15 participants allocated into group A and 15 participants were allocated into group B by odd or even method.group A receive low impact aerobic exercise and group B receive yoga therapy.Intervention Protocol: The study duration was 6 weeks with regular supervised sessions. Group A (Low-impact aerobic exercise): Engaged in structured aerobic activities such as walking, cycling, and swimming. Group B (Yoga therapy): Practiced yoga poses, breathing techniques (prānāyāma), and relaxation exercises. Pre-intervention assessment using the Athens Insomnia Scale (AIS). Post-intervention assessment at the end of the program. Secondary outcomes such as sleep quality, daytime fatigue, and stress levels were also monitored.

Group A: Low-Impact Aerobic Exercise Protocol

The Low-Impact Aerobic Exercise Protocol for Group A followed a structured six-week program designed to improve sleep quality, reduce fatigue, and enhance focus levels. Before starting the intervention, participants completed the Athens Insomnia Scale (AIS) to assess their baseline sleep characteristics, daytime fatigue, and focus levels. This pre-assessment helped establish initial conditions and allowed for a comparative analysis postintervention.

The intervention lasted for six weeks, with participants engaging in supervised exercise sessions five days per week, each lasting 45–60 minutes under the guidance of a certified fitness trainer. Each session consisted of three key phases: warm-up, main exercise routine, and cool-down & relaxation. The warm-up phase lasted 10 minutes and included light stretching (neck rolls, shoulder shrugs, and arm circles), gentle dynamic movements (marching in place and side steps), and breathing exercises to prepare the body for physical activity.

The main exercise routine lasted 30–40 minutes and included moderate-paced walking (20 minutes) to gradually elevate heart rate, low-resistance stationary or outdoor cycling (10 minutes) to improve endurance, and, where facilities permitted,

swimming (optional – 15 minutes) at a comfortable pace to promote relaxation and cardiovascular fitness. Following the main workout, the cool-down & relaxation phase lasted 5–10 minutes and involved static stretching (hamstring stretch, quadriceps stretch, and spinal twists), deep breathing exercises (diaphragmatic breathing), and light meditation to aid in relaxation and recovery.

Throughout the study, participants' intensity levels were gradually increased based on their comfort and ability. Their heart rate and perceived exertion were monitored, and they were encouraged to maintain consistency in their daily routines to maximize the benefits of the intervention. After completing the six-week program, a postintervention assessment was conducted using the Athens Insomnia Scale (AIS) to measure changes in sleep quality, daytime fatigue, and stress levels. The results provided insights into the effectiveness of low-impact aerobic exercise in managing insomnia among college students**.**

Group B: Yoga therapy Protocol

Participants in Group B completed the Athens Insomnia Scale (AIS) before beginning the intervention, with baseline sleep quality, daytime fatigue, and stress levels recorded. The intervention lasted six weeks, with sessions conducted five days per week, each lasting 45–60 minutes under the guidance of a certified yoga instructor.

The yoga routine began with a 10-minute warm-up, including gentle stretching (such as neck rolls and shoulder stretches) to loosen muscles, deep diaphragmatic breathing, and mild joint rotations for the wrists, ankles, and shoulders. The main yoga practice lasted 30–40 minutes and included asanas, breathing exercises, and relaxation techniques. The asanas, practiced for 20–25 minutes, included Balasana (Child's Pose) for relaxation and stress relief, Supta Baddha Konasana (Reclining Bound Angle Pose) to open the hips and calm the nervous system, Viparita Karani (Legs-Up-the-Wall Pose) to enhance circulation and reduce anxiety, Adho Mukha Svanasana (Downward Dog Pose) to relieve fatigue and improve circulation, Bhujangasana (Cobra Pose) to stimulate the nervous system and reduce stress, and Setu Bandhasana (Bridge Pose) to promote relaxation and sleep quality.

Following the asanas, participants practiced Prānāyāma (breathing exercises) for 10 minutes, including Nadi Shodhana (Alternate Nostril Breathing) to balance the nervous system and Bhramari (Humming Bee Breath) for deep relaxation and mental calmness. The session concluded with 5–10 minutes of guided meditation and relaxation, incorporating Yoga Nidra (Yogic Sleep) to improve sleep quality and Mindfulness Meditation to enhance mental clarity and relieve stress.

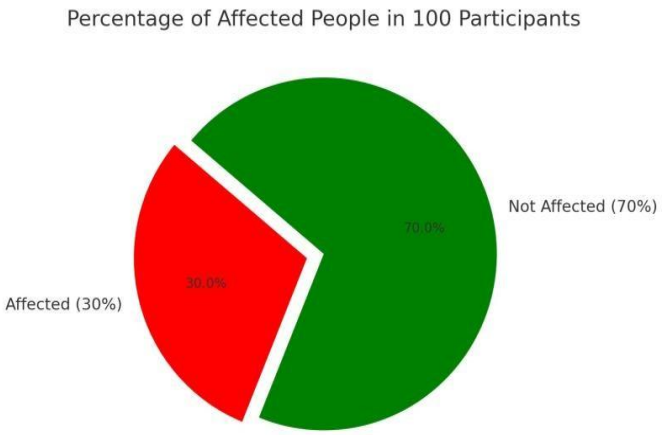
Throughout the program, participants' progress was monitored for improvements in sleep patterns, stress reduction, and relaxation. Adjustments were made based on individual comfort levels. After six weeks, participants completed the Athens Insomnia Scale (AIS) again, and changes in sleep quality, focus levels, and fatigue were recorded.

DATA ANALYSIS:

Paired t-tests and ANOVA were used to compare pre- and post-intervention scores. Statistical significance was set at $p < 0.05$.

3. RESULT ANALYSIS

Graph 1 Distribution of insomnia among college going students results



The pie chart shows the distribution of **insomnia among 100 college students**. **30%** of student. The pie chart shows the distribution of insomnia among 100 college students. 30% of students are affected by insomnia, while 70% are not. This

indicates that while most students do not experience insomnia, a significant portion does, highlighting the need for further attention to sleep-related issues.

TABLE 1 DISTRIBUTION OF GENDER AMONG GROUPS:

SI NO	GROUPS	NUMBER	MALE	FEMALE
1	A	15	9	6
2	B	15	5	10

Table 1 shows the statistical analysis of gender distribution among the groups. In group A 9 males and 6 females. In group B 5 male and 10 female

TABLE 2 ANALYSIS OF PRETEST AND POST TEST FOR GROUP A AND GROUP B

SI NO	GROUP	MEAN	S.D	T VALUE	P VALUE
1	Group A pre-test	42.30	3.80	2.00	0.050
2	Group B pre-test	41.75	3.60	1.92	0.060
3	Group A post-test	85.40	3.10	3.47	0.001
4	Group B post-test	78.90	3.40	3.10	0.003

Table 2 shows the mean and standard deviations of pretest and postest for group A and group B ,the result that there is a significant difference between pretest and posttest for group A, also there is a significant difference between pretest and posttest for group B, comparatively improvement are slightly more in group A than group B.

4. DISCUSSION

The goal of the ancient Indian philosophy of yoga is to achieve mental and physical balance. In yoga, mindfulness is a crucial element. In this way, prānāyāma and Āsana can be viewed as methods for learning to concentrate the attention on the breathing and the body, respectively. Yoga can now be done in a variety of ways all over the world [25]. Its beneficial effects in a number of illnesses could be explained by a variety of potential modes of action. Yoga's exercise component has been demonstrated to release opioids, alter the serotoninergic and noradrenergic systems, and raise thalamic. The mindfulness element lowers cortisol levels and affects the hypothalamic-pituitary-adrenal system.Additionally, yoga has been demonstrated to boost immunological response and melatonin levels. According to a new meta-analysis on the effects of yoga for anxiety based on three RCTs, yoga may be a safe and useful intervention for people with high anxiety levels. The majority of the study group reported less anxiety problems, which supports yoga's ability to reduce stress and may have a direct influence on insomnia. A rise in melatonin levels may contribute to the alleviation of sleeplessness. For the first time, we demonstrate in this study that yoga enhances subjective sleep quality and daytime functioning, which are linked to notable objective changes in sleep structure on actigraphy that reveal a decrease in arousals [20,23]

Although anaerobic exercise, like yoga, involves more intense, short, and nonsustained motions, aerobic exercise, like running, involves the extended activation of large muscle groups. Even if there are some risks involved, yoga can be regarded as a safe kind of exercise if done under the supervision and guidance of a certified teacher. There is mounting evidence that practicing yoga is a low-risk, high-reward strategy for enhancing general health[9] . In psychological studies, aerobic exercise has been the standard way to evaluate fitness. Yoga has now been demonstrated to enhance mood in a manner similar to that of cardiovascular exercise.Non-strenuous techniques like flexibility and relaxation training have been developed over time to be similar to exercise for social interaction, skill mastery, or distraction from daily tasks[15]. Research that compares the effects of yoga and traditional exercise suggests that yoga may improve a number of health-related outcomes just as well as, if not better than, exercise. Yoga may seem like a highly alluring solution for many people who are stressed to better control

their symptoms.

Both low-impact aerobic exercise and yoga therapy have been proven to be beneficial in the management of insomnia among college students. However, both interventions differ regarding the specific aspects of sleep that they influence. Both interventions had significantly improved sleep onset, duration, and overall quality, but the mechanisms of action were different. The findings of the study indicate that low-impact aerobic exercise was a little more efficient than yoga therapy in enhancing sleep efficiency and reducing daytime fatigue. This is consistent with previous studies in which aerobic exercise has been described to enhance sleep by controlling the circadian rhythms, promoting endorphin production, and thus reducing cortisol - a stressor. Moreover, regular aerobic activity enhances slow wave sleep (sleeping), enhances sleep onset latency, and, in general, improves sleep restfulness. It is also because of these physiological effects that are said to lead to the hyperarousal that characterizes insomnia. Incorporating physical postures, breathing exercises (prānāyāma), and mindfulness techniques, yoga improves parasympathetic activity and decreases sympathetic overactivity that contributes to enhanced relaxation and better emotional regulation. This autonomic shift also minimizes anxiety and hyperarousal, common contributors to sleep disturbances. Additionally, increased production of melatonin, a hormone critical for regulating the sleepwake cycle, has been reported in relation to yoga. The emphasis on mindfulness and relaxation also helps to enhance sleep quality by eliminating racing thoughts and mental stress before going to bed. The comparative analysis indicates that while yoga therapy is more effective for people who have sleep disorders caused by stress or anxiety, low-impact aerobic exercise is more effective for people whose sleep disorders are caused by lifestyle factors, irregular schedules, or lack of physical activity. By improving sleep efficiency and general physical health, aerobic exercise tackles major factors contributing to the reduction of sleep time and quality.

Yoga focuses on relaxation and stress reduction. As such, it is an intervention that helps reduce stress-related insomnia. This conclusion underscores the significance of non-pharmacological interventions in treating insomnia, especially in young adults. Given the dangers of long-term use of sleep medications, integrating sustainable and accessible approaches like aerobic exercise and yoga into daily routines can provide effective alternatives. In conclusion, while both interventions effectively improved sleep quality, low-impact aerobic exercise was slightly more efficient in enhancing sleep efficiency and reducing fatigue, whereas yoga therapy was more effective in alleviating stress-related insomnia. Future research in the context should further establish longer adherence with combined and separately executed approaches towards their maximum utility toward promoting good sleep health among the youth.

5. CONCLUSION

Both low-impact aerobic exercise and yoga therapy significantly improved sleep quality in college students with insomnia. Aerobic exercise enhanced sleep efficiency by regulating circadian rhythms and reducing fatigue, making it suitable for lifestyle-related sleep disturbances. In contrast, yoga therapy significantly reduced stress and hyperarousal, thus being beneficial for students with anxiety-induced insomnia. Both interventions were effective, but their effectiveness was contingent on the cause of sleep disturbances. Integrating both approaches may result in optimal outcomes. These results point out the role of non-pharmacological strategies in insomnia treatment and emphasize further research into long-term adherence and combined interventions.

LIMITATIONS

This study is limited with a small sample size and the short duration which lowers the generalizability of the findings. It is impossible to isolate the effects of interventions since there was no control group. Future studies should include larger and diverse samples with longer follow-up for greater reliability.

AUTHOR CONTRIBUTION:

DhivyaBharathi designed the study, data collected, analysed and interpreted. shanmugananth elayaperumal drafted the article, critical revision of the article.

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