Original Article

Impact of AUM Kara Meditation on Sleep Disturbances Among Medical Students: A Pre-Post Study

B.V.Thenmozhi[1], Sathya Joicy.M[2], Logeshwaran.S[2], Jyoti Nair[3]

From, [1]Bnys, [2]Associate Professor and Medical Officer, [3]Principal and Medical Superintendent, Swamy Vivekanandha Naturopathy and Yoga Medical College and Hospital, Sankagiri, Salem.

ABSTRACT

Background: Sleep disturbances are prevalent among medical students due to academic stress, irregular schedules, and high cognitive demands. Chronic sleep deprivation not only impairs cognitive function but also disrupts emotional regulation and autonomic stability, increasing the risk of anxiety, depression, and reduced academic performance. AUM Kara meditation, a well-established yogic practice, has been shown to regulate autonomic function by enhancing parasympathetic activity and reducing sympathetic overdrive. This study evaluates its effectiveness as a non-pharmacological intervention for improving sleep quality. **Materials and Methods:** This pre-post interventional study included 247 medical students aged 17-23 years with self-reported sleep disturbances. Over 10 days, participants practiced a nightly 30-minute AUM Kara meditation session before sleep. Intervention effects were evaluated using the Insomnia Severity Index (ISI) and validated sleep questionnaires assessing sleep quality, sleep latency, and night-time awakenings. **Results:** AUM Kara meditation produced a highly significant improvement in sleep quality. Pre-intervention ISI scores, initially elevated and indicative of substantial sleep disturbance, showed a marked reduction following the 10-day practice ($t = 30.74$, $p = 4.504 \times 10^{-82}$). Subjective sleep questionnaires further confirmed decreased sleep latency and nocturnal awakenings, along with improved sleep efficiency and restorative sleep. **Conclusion:** AUM Kara meditation significantly improved sleep in medical students, enhancing subjective sleep, supporting its use as a non-pharmacological intervention, warranting further research.

Key words: Meditation; Sleep-Wake Disorders, Medical, Sleep.

Insomnia affects over one-third of individuals, and sleep issues are highly prevalent in the general population worldwide [2]. Insomnia was shown to be 32.6% common among primary care patients in ten countries, and statistics from other nations generally support this finding [3]. Medical students experience a higher incidence of sleep disturbances compared to the general population, due to the nature of their work [1]. They are a distinct subgroup often vulnerable to poor sleep, likely due to the long, intense nature of their studies, overnight clinical duties, emotionally demanding tasks, and lifestyle choices [4]. The study of sleep disturbances among undergraduate medical students is particularly significant due to the established connection between sleep and mental health [5]. It is also established that the academic requirements of medical education lead to considerable stress [6]. Extensive evidence highlights that high-quality sleep is crucial for the proper neurocognitive and psychomotor performance, as well as for maintaining overall physical and mental health [7]. The sleep duration and quality, consistency in sleep patterns, and the timing of sleep phases influence academic performance [8].

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Numerous studies have shown that factors such as age, gender, socioeconomic status, lifestyle habits, excessive smartphone use, and psychological conditions contribute to sleep disturbances [9]. Sleep disturbances can impair cognitive and psychomotor functions vital for medical students, potentially endangering patients' lives and affecting the overall efficiency of the healthcare system [10]. Understanding the prevalence of these conditions and the associated factors is crucial for the identification and management of such issues among medical students [11]. Managing this condition with medication has many side effects to the health of the individual. So complementary and integrative approach will be helpful. Yoga, the ancient Indian science, philosophy, and way of life, has become increasingly Pranayama is the first step in refining and improving mind-body functions by learning to control and use the breath effectively [13]. Swami Swatmarama asserted that the Sheetali and Sheetkari pranayamas induce a cooling effect, which is popular worldwide. The yoga practice is an adjunct effective for stress, sleep, and associated disorders [12].

Correspondence to: Thenmozhi. B, Swamy Vivekanandha Naturopathy and Yoga Medical College and Hospital, Sankagiri, Salem.

Email: thenmozhi.bv06@gmail.com

Pranayama is the first step in refining and improving mind-body functions by learning to control and use the breath effectively [13]. Swami Swatmarama asserted that the Sheetali and Sheetkari pranayamas induce a cooling effect, which is facilitated by heightened parasympathetic activity. The reduction in respiratory rate (RR) and blood pressure (BP) is ascribed to the dominant vagal tone that results from the application of slow-breathing techniques [14]. Dharana or 'concentration' is an essential stage to avoid uncharted flights of awareness. It gives training and direction to the mind and awareness [15]. Dhyana is an act of sustained contemplation that involves focusing the mind on its object without interruption, leading to a seamless flow of thoughts that culminates in tranquility and improved concentration of the mind [16].

The importance of this study lies in the growing scientific support for AUM, a key element of Vedic philosophy and yoga, for its benefits in psychosomatic and mental health. The Mandukya Upanishad describes AUM as encompassing all existence, past, present, and future, reflecting its profound significance. This traditional and emerging scientific basis confirms the relevance of examining AUM Kara meditation as a non-pharmacological method to improve sleep and well-being [17]. The present study was done to show the effectiveness of AUM Kara meditation and pranayama on sleep disturbances among medical students.

MATERIALS AND METHODS

A pre-post study was conducted among 247 medical students aged 17–23 with complaints of sleep disturbances from Swamy Vivekanandha Naturopathy and Yoga Medical College, Salem, Tamil Nadu. Ethical approval was obtained from the Institutional Ethical Committee (Ref. No: EC/NEW/INST/2024/TN/0529), and informed consent was secured from each participant after explaining the study objectives, methods, intervention, and their rights.

After screening, randomization, the participants who met the inclusion criteria were included. The inclusion criteria were medical students aged 17-23 years, with complaints of sleep disturbance, and not on any other medication. Those who were willing to do a 30-minute Ardha Padmasana practice, and pre- and post-assessments, were only included. Subjects with any surgery done in the spinal cord, psychiatric issues, or having severe sleep disorders were excluded from the study.

Intervention: The subjects were asked to switch off their mobile phones and to practice AUM Kara meditation in a quiet, dimly lit hall from 9:30 to 10:00 pm before sleep. The subjects were asked for a follow-up after 10 days. The steps of AUM Kara meditation were explained to the study participants, and the steps are shown in Table 1.

Table 1. Steps in AUM Kara meditation

S.NO	AUM KARA PRACTICE
1.	Starting Prayer
2.	Kapalbhati Pranayama
3.	Nadi Shodhana Pranayama
4.	Sheetkari Pranayama
5.	Bhramari Pranayama
6.	Dharana
7.	Dhyana
8.	Ending Prayer

To evaluate the effect of the intervention on sleep disturbances, the Insomnia Severity Index (ISI) was used both before and after the meditation practice. The ISI scores are depicted in Table 2.

Table 2. ISI scores

Scores	Interpretation
0-7	No clinical insomnia
8-14	Subthreshold
15-21	Moderate
22-28	Severe

Validated sleep questionnaires assessing sleep quality, sleep latency, and night-time awakenings were administered to each participant before and after 10 days of follow-up.

Statistical analysis: The pre- and post-intervention ISI scores were compared using a paired t-test. Additionally, independent t-tests were applied to compare baseline characteristics between groups, ensuring that any initial differences were identified before the intervention. A p-value less than 0.05 was considered statistically significant for all analyses.

RESULTS

The ISI scores before and after 10 days of intervention are shown in Table 3.

Table 3. Comparison of pre-post group

	Pre-intervention		Post-intervention after 10 days	
ISI Scores	Scores	Number of subjects	Scores	Number of subjects
	0-7	-	0-7	247
	8-14	199	8-14	-
	15-21	45	15-21	-
	22-28	3	22-28	-

After the 10-day AUM Kara meditation intervention, participants demonstrated a substantial improvement in multiple dimensions of sleep quality. ISI scores, which were elevated at baseline, showed a highly significant reduction following the practice ($t = 30.74$, $p = 4.504 \times 10^{-82}$ for the one-tailed test; $p = 9.0085 \times 10^{-82}$ for the two-tailed test), indicating a marked decrease in insomnia severity. Subjective

sleep assessments further supported these findings, revealing shortened sleep latency, fewer night-time awakenings, and enhanced overall sleep continuity.

DISCUSSION

The findings of the present study suggest that AUM Kara meditation significantly enhances sleep quality by regulating autonomic function and mitigating stress-related hyperarousal. The physiological mechanism behind sleep-related issues is the activation of the parasympathetic nervous system (PNS), leading to reduced heart rate variability (HRV) and increased vagal tone [18]. Attenuation of hypothalamic-pituitary-adrenal (HPA) axis hyperactivity, which reduces cortisol levels, also contributes to sleep disturbances [19].

A study done by Chetry D et al. reported Bhramari pranayama enhances psychological, cardiovascular, and pulmonary health; attention; sleep quality; parasympathetic activity; and lung function and lowers stress, anxiety, depression, sympathetic activity, and blood pressure [20]. Studies show that Bhramari Pranayama stimulates the vagus nerve via auditory/vibratory effects, increasing alpha waves and reducing cortical excitability [21]. Elsheikh S et al. found that Sheetali lowers systolic blood pressure, diastolic blood pressure, and cortisol and raises nitric oxide, while Bhramari improves mental health [22]. Pranayama also promotes relaxation, rational consciousness, and emotional stability; reduces anxiety, depression, and stress with deep breathing, lowering heart rate and BP [23, 24].

However, chronic yoga interventions on sleep quality conducted across 57 studies reported no significant change in sleep quality. The authors emphasized considerable heterogeneity in the type of yoga practiced, frequency and duration of interventions, study populations, and outcome measures, making it difficult to generalize the overall effectiveness of yoga-based practices on sleep [25]. Another study found that although mindfulness meditation produced modest improvements in certain sleep parameters like total wake time, it did not significantly improve other core sleep indicators, including total sleep time**,** sleep efficiency**,** or insomnia severity, as measured by ISI and Pittsburgh Sleep Quality Index (PSQI) scores [26]. A randomized controlled trial reported improvements in sleep, stress, cognitive function, and overall quality of life by combining yoga with Ayurvedic practices. So, the specific effects attributable solely to yoga, pranayama, or meditation practices such as AUM Kara couldn't be isolated [27].

The current study can be considered the pioneer study done on the effectiveness of AUM Kara meditation for sleep disturbances in medical students. Thus, supports integrating meditation-based interventions into student wellness programs and offers a sustainable, cost-effective, and evidence-based approach for managing sleep disturbances without any pharmacological treatments. Yet, the prolonged effect of AUM Kara meditation cannot be predicted with the present study results, recommending future randomized controlled trials with longer follow-up periods.

CONCLUSION

AUM Kara meditation significantly improved sleep quality among medical students, proving its effectiveness as a scientifically supported, non-pharmacological intervention for sleep disturbances.

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