

# Integrating Pilates and myofunctional therapy for better sleep and psychosocial outcomes in obesity-associated obstructive sleep apnea

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## Summary

**Background:** Obstructive Sleep Apnea (OSA) is a common sleep-related breathing disorder characterized by repeated upper airway obstruction during sleep, leading to poor sleep quality, excessive daytime sleepiness, and reduced psychosocial functioning. Obesity is a major risk factor that increases both the likelihood and severity of OSA, further affecting physical and mental health. Although continuous positive airway pressure (CPAP) is the standard treatment, alternative non-pharmacological approaches such as Pilates and myofunctional therapy may provide additional benefits.

**Aim:** This study aimed to evaluate the effectiveness of combining Pilates and myofunctional therapy in improving sleep quality and psychosocial well-being in an individual with obesity-associated OSA.

**Methods:** A case study was conducted in a clinical rehabilitation setting involving a 45-year-old male diagnosed with moderate OSA (Apnea-Hypopnea Index = 25) and obesity (BMI = 34 kg/m<sup>2</sup>). The participant completed an 8-week intervention program consisting of Pilates and myofunctional therapy, each performed for 30 minutes, three times per week. Outcome measures included the Pittsburgh Sleep Quality Index (PSQI) and the Short Form-36 (SF-36), which assessed physical health, mental health, and vitality. Pre- and post-intervention scores were compared.

**Results:** Post-intervention results demonstrated improvements in both sleep quality and quality of life. The PSQI score decreased from 7 to 4. SF-36 scores improved in physical health (55 to 68), mental health (48 to 62), and vitality (60 to 68). The participant also reported reduced daytime sleepiness, better mood, enhanced social interaction, and increased confidence.

**Conclusion:** The findings suggest that combining Pilates and myofunctional therapy may be a useful non-pharmacological strategy to improve sleep and psychosocial outcomes in individuals with obesity-associated OSA.

**Keywords:** obstructive sleep apnea, obesity, exercise therapy, oropharyngeal exercises, sleep quality, psychosocial factors

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## INTRODUCTION

Obstructive Sleep Apnea (OSA) is a condition that results in periodic hypopnea or apnea in airflow caused by upper airway restriction during sleep. Individuals who are affected typically experience excessive sleepiness during the day, fragmented sleep, and drowsiness, as well as diminished energy and generally cognitive problems (Jehan et al., 2017). Importantly, these symptoms have an adverse effect on people's ability to function in daily tasks and socializing and they raise the likelihood of catastrophes. People with OSA condition have a less effective psychological wellbeing, either because of inadequate sleep or cognitive issues that come with it (Scarpina et al., 2021).

In India, the prevalence of obstructive sleep apnoea (OSA) is estimated to be 13.7%. OSA can significantly affect patients' quality of life and neurocognitive

functioning. Along with its physical complications, individuals with OSA frequently experience various psychiatric disorders, which may arise from the biological and psychosocial impacts of the condition (Shoib et al., 2022). Some mental health conditions may present symptoms similar to OSA and lead to long-term issues such as anxiety, depression, and cognitive impairment. Obesity is an increased risk for the occurrence and advancement of sleep apnea, and OSA syndrome is common. However, the processes connecting obesity to the onset and progression of OSA condition are yet unknown. Obesity is an issue that is caused by the combination of genetic, physiological, social, behavioural, and cultural variables (Scarpina et al., 2021). As a result, it is reasonable to predict that OSA syndrome has a negative impact on people's health when combined with obesity. This present study aimed to improve sleep quality and psychosocial

**Table 1.** Intervention

<b>Intervention component</b>	<b>Exercise</b>	<b>Repetitions</b>	<b>Duration</b>
Pilates (30 minutes of duration)	Balance and Proprioceptive Exercises	15 repetitions each	10 minutes
	Body Weight and Alternative Equipment Exercises (e.g., squats, lunges, etc.)	15 repetitions each	10 minutes
	Full-body Stretching	Hold for 10 secs repetition for 3 times	10 minutes
Myofunctional Therapy (30 minutes of duration)	Nasal Lavage (Airway Clearance)	20 repetitions each	5 minutes with 1 minutes of rest between each exercise
	Oropharyngeal Exercises	20 repetitions each	5 minutes with 1 minutes of rest between each exercise
	Exercises for Tongue Movements (e.g., tip against hard palate, sucking tongue upwards, etc.)	20 repetitions each	5 minutes with 1 minutes of rest between each exercise
	Soft Palate Elevation (Vocalizing vowel “A” intermittently)	20 repetitions each	5 minutes with 1 minutes of rest between each exercise
	Buccinator Muscle Pressing & Chewing/Deglutition with Tongue against Palate	20 repetitions each	5 minutes with 1 minutes of rest between each exercise

**Table 2.** Pre and post-test outcome measure

<b>Outcome measure</b>	<b>Pre-test</b>	<b>Post test</b>
PSQI (Pittsburgh Sleep Quality Index)	7 (Moderate sleep disturbance)	4 (Minimal to no sleep disturbances)
SF-36 Physical Health	55/100	68/100
SF-36 Mental Health	48/100	62/100
SF-36 Vitality	60/100	68/100

functioning among obesity associated OSA individual through non-pharmaceutical intervention.

## CASE PRESENTATION

A 45-year-old male with a BMI of 34 kg/m<sup>2</sup>, mild hypertension, and a history of moderate obstructive sleep apnoea (OSA) with an Apnoea-Hypopnoea Index (AHI) of 25, presented with complaints of shortness of breath during functional activities and while lying flat, frequent snoring, interrupted sleep, and excessive daytime sleepiness. He reported difficulty concentrating, which significantly impacted his workplace performance and caused increased irritability during interactions with colleagues. Additionally, psychosocial symptoms such as low self-esteem, social withdrawal, and mood swings further affected his personal life, reducing his engagement in family

activities and responsibilities. Vital signs revealed an increased respiratory rate of 22 breaths/min, heart rate of 75 beats/min, blood pressure of 140/90 mmHg, and SpO<sub>2</sub> levels of 95%-96%. Respiratory assessments showed shallow breathing patterns with nasal flaring, pursed lip breathing, audible breathing sounds, and visible intercostal retractions, along with the use of accessory muscles. Anxiety was noted during evaluation, and auscultation findings revealed wheezing. Pre-intervention assessments were measured using Pittsburgh Sleep Quality Index (PSQI) and quality of life measured in SF-36 which includes physical functioning, mental health and vitality health. The primary goals of intervention include reducing shortness of breath, enhancing sleep quality, and improving the patient’s overall quality of life, including addressing psychosocial challenges. We obtained informed consent and explained the intervention procedures before initiating our therapeutic approach. The patient was participated in an 8 weeks of structured intervention program

comprising of Pilates and myofunctional therapy (Table 1). Sessions held thrice a week, the Pilates component last for 30 minutes per session with moderate intensity, Following Pilates, the myofunctional therapy session for 30 minutes, involved oropharyngeal exercises and nasal lavage techniques.

After 8 weeks of intervention, evaluations showed considerable improvement, represented in (Table 2). The patient reported reduced daytime sleepiness, increased motivation for lifestyle changes, and alleviated psychosocial symptoms, including improved mood, better social engagement, and increased confidence. This case underscores the benefits of a holistic approach that integrates physical and psychological components in managing sleep and quality of life in patients with OSA and obesity.

## DISCUSSION

Our study demonstrated that integrating Pilates and myofunctional therapy has a positive effects on improving sleep quality and psychosocial well-being among OSA individual. Sheikh Shoib et al., (2022) highlighted the increased prevalence of anxiety and depression in patients with OSA, our study focused on addressing these mental health challenges through targeted interventions. By incorporating Pilates and myofunctional therapy into the management plan, we observed notable improvements in both physical and mental health outcomes. These therapies not only enhanced the patients' quality of life but also reduced the severity of anxiety and depression associated with OSA (Gałuszko-Węgielnik et al., 2012). Pilates had a beneficial effect on both insomnia and daytime sleepiness, essential factors for achieving quality sleep. Similar outcomes were observed in research where significant improvements in sleepiness levels were reported after a 12-week Pilates intervention (Leopoldino et al., 2013). The American Sleep Disorders Association also recognizes physical exercise as an effective, non-drug

approach for enhancing sleep. Regular physical activity can improve sleep patterns, reduce daytime drowsiness, elevate serotonin levels, synchronize the biological clock, and indirectly aid in thermoregulation, all contributing to better sleep (Lu et al., 2020). Oropharyngeal exercises can significantly reduce OSA severity and symptoms, providing a promising approach for managing moderate OSA (Guimarães et al., 2009). Enhancing sleep quality and psychosocial function in OSA patients fosters better social interactions and overall well-being, supporting a more balanced lifestyle (Persaki et al., 2024).

## CONCLUSION

The study demonstrates that incorporating Pilates and myofunctional therapy as part of the management for patients with obstructive sleep apnoea (OSA) can lead to significant improvements in both physical and mental health. These interventions not only enhance sleep quality but also help reduce anxiety and depression, addressing the psychosocial challenges commonly associated with OSA. These findings highlight the potential of non-pharmacological therapies in managing OSA and suggest that such interventions should be considered in clinical practice to promote long-term health benefits.

**Ethical considerations:** Does this study include human subjects? YES

Authors confirmed the compliance with all relevant ethical regulations.

**Conflict of interest:** No conflict of interest

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**Authors' contributions:** Dr. Jayabharathi R – Study design, Data collection, first draft, approval of the final version, statistical analysis. Dr. Ramalakshmi K – Study design, Data collection, first draft, approval of the final version, statistical analysis

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