

Efficacy of Transcutaneous Auricular Vagal Nerve Stimulation (taVNS) on Anxiety and Quality of Sleep Among School Teachers

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To the Editor,

We would like to share our experience with the Neuropsychiatric Investigation audience that 1 prevalent psychological illness is anxiety. It usually includes feelings of dread, nervousness, unease, and fear, but it can also impact lung function, digestive, neurological, or circulatory systems, either independently or in conjunction with one another.¹ 14% of the population aged 14-65 experience anxiety problems, with women experiencing it 2 to 3 times more frequently than men.² Individuals with anxiety disorders often struggle with sleep, particularly insomniacs, which can lead to or worsen their anxiety.³ Stress at work negatively impacts teachers' mental and physical health, leading to anxiety and despair, hindering their ability to handle daily challenges and perform well at work.⁴

Research has demonstrated that non-invasive transcutaneous auricular vagal nerve stimulation (taVNS) and the Jacobson relaxation technique reduce anxiety levels considerably. Literature from the past has administered taVNS on retired teachers to reduce anxiety and improve sleep quality, and they did not exhibit any side effects.⁵ Here, we present a case study of an individual who was diagnosed with anxiety and poor sleep quality. Following treatment with taVNS and the Jacobson relaxation technique, her anxiety was reduced, and sleep quality improved. This study was approved by Institutional Scientific Review Board of Saveetha College of Physiotherapy (Approval no: 01/020/2023/ISRB/PGSR/SCPT, Date: April 17, 2023). After being informed about the study's methodology, the subject agreed to receive the treatment. The subject's anonymity was maintained, and informed consent was obtained. A 27-year-old female teacher working in a private school was diagnosed with anxiety and reduced sleep quality after screening with the Generalized Anxiety Disorder-7 (GAD-7) and Sleep Quality Scale. She complained of feeling nervous, panicked, and tired throughout the day. This phase lasted for the previous 6 weeks. She also complained of self-doubt, random negative thoughts, and a lack of confidence. These issues made her mental health unstable. She had not received any psychiatric drugs, and there was no family history of psychiatric disease. We then collected a full history of her mental health in which she faced many disappointments in her workplace from superior staff related to teaching quality. These disappointments made her feel anxious, and she had some random negative thoughts at night. She reported that her sleep duration had reduced during the past 6 weeks due to random negative thoughts at night, which made it difficult to fall asleep. Waking up early in the morning made her tired the whole day. She lacked confidence in the classroom and got easily irritated with the students' behavior. Her eating habits changed due to the work schedule at the school.

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We have assessed her with the Generalized Anxiety Disorder-7, which evaluates the generalized anxiety level, in which she has a score of 15/21, and the Sleep Quality Scale, which assesses the quality of sleep, in which she has a score of 43/84, which would be considered severe anxiety and reduced quality of sleep. Following the assessment, taVNS stimulation and Jacobson relaxation exercises as treatments for 4 weeks. Each week consisted of 4 sessions, each lasting 60 minutes: 30 minutes of taVNS and 30 minutes of the Jacobson relaxation technique. The electrodes for taVNS were positioned over the left ear's cymba concha. A sinusoidal waveform with a 0.2 ms pulse width, 20 Hz frequency, and 1 milliamperere amplitude was selected as the stimulation setting, with the intensity was set to the maximum level the patient could tolerate. For the Jacobson relaxation exercise, she was instructed to close her eyes and find a comfortable seat. She would then tighten the muscle and hold it for slow counts of 5 seconds during this portion of the exercise cycle. Then, she would rapidly and completely relax the muscle for 10 seconds. After each step, to help you calm down, take 3 deep breaths—to inhale through the nose and exhale through the mouth—to aid in through the nose and out through the mouth. After the 4-week intervention, her GAD-7 score of 8/21 and the sleep quality scale score reduced to 27/84, which would be considered a mild level of anxiety and moderate quality of sleep. This case study shows that following the intervention, there was a reduction in negative thoughts, improved sleep, and the patient did not exhibit any side effects.

She gained self-confidence in teaching and achieved better job satisfaction. She became active all day, falling asleep without any disturbance from negative thoughts at night. She started spending time with family members, and a good diet habit was maintained. Now, she is managing her life in a clearly balanced way. As a result, taVNS and Jacobson relaxation exercises reduced her anxiety and improved her sleep quality. I believe this study will add a lot to the collection of knowledge on anxiety and the use of vagal nerve stimulation as a treatment.

Ethics Committee Approval: Ethics committee approval was received for this study from the Institutional Scientific Review Board of Saveetha College of Physiotherapy (Approval no: 01/020/2023/ISRB/PGSR/SCPT, Date: April 17, 2023).

Informed Consent: Written informed consent was obtained from the patient who participated in this study.

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