



## SLEEP DISORDERS AND REHABILITATION EFFECTIVENESS IN POST-STROKE PATIENTS

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### ABSTRACT

*The present study provides an analysis of the prevalence of sleep disorders in patients who have suffered an ischemic stroke and their impact on the effectiveness of early motor rehabilitation. Considering that sleep plays a key role in neuroplasticity, memory consolidation, and motor function recovery, the investigation of this issue has significant clinical and practical importance.*

*Recent international studies (Cai et al., *Sleep Disorders in Stroke: An Update on Management, Aging Dis.*, 2021; Rissardo et al., *Med. Sci.*, 2025; Li et al., *J. Clin. Med.*, 2024) emphasize that insomnia and sleep apnea markedly impair neurological recovery and functional outcomes. Moreover, sleep disturbances cause hypoxia, dysregulation of corticolimbic networks, and increase the risk of recurrent strokes (*Practical Neurology*, 2024; *Neurología [English Edition]*, 2013). These findings are consistent with the results of the present study and confirm the necessity of an integrated approach to the diagnosis and correction of sleep disorders in post-stroke patients.*

### Relevance of abstract

According to various authors, sleep disturbances after stroke are observed in 50–70% of patients and are associated with impaired cognitive function, decreased motivation, and prolonged recovery periods (Yan et al., *Sleep Medicine Reviews*, 2023; Hermann & Bassetti, *Neurology*, 2022).

Modern meta-analyses (Cai et al., 2021; Rissardo et al., 2025) show that the most common disturbances are insomnia and obstructive sleep apnea, which exert a bidirectional influence on stroke progression: on the one hand, they impair recovery, and on the other, they increase the risk of recurrence (*The Bidirectional Relationship between Sleep Disorders and Stroke, Practical Neurology*, 2024).

Furthermore, studies (Benbir & Ince, *Neurología [English Edition]*, 2013) indicate that sleep deficiency leads to elevated levels of proinflammatory cytokines and reduced neurogenesis, hindering neural network restoration. Despite its clinical importance, the assessment of sleep quality is often excluded from standard rehabilitation protocols, thereby reducing the effectiveness of recovery measures and worsening prognosis.

### Objective of the Study

To evaluate the prevalence of sleep disorders and their impact on the functional outcomes of motor rehabilitation in patients during the acute phase of ischemic stroke.

### Materials and Methods

The study included 98 patients (mean age  $65 \pm 7.8$  years) who were treated in the Neurology Department of Tashkent Medical Academy between September 2024 and May 2025.

The following methods were applied:

**1. Pittsburgh Sleep Quality Index (PSQI);**

**2. Epworth Sleepiness Scale (ESS);**

**3. Barthel Index** to assess functional independence. Patients with PSQI  $> 5$  were classified as having insomnia. Statistical analysis was performed using Student's *t*-test and Pearson's correlation coefficient.

### Results and Discussion

Sleep disturbances were identified in 68% of patients (67 out of 98). The most common symptoms included: sleep fragmentation (75%), non-restorative sleep (80%), and daytime sleepiness (60%). The insomnia group demonstrated a significantly smaller improvement in the Barthel Index by discharge ( $+18.5 \pm 9.2$  points) compared with the group without sleep disturbances ( $+32.1 \pm 8.7$ ;  $p < 0.01$ ). A negative correlation was found between sleep disturbance severity (PSQI score) and rehabilitation effectiveness ( $r = -0.52$ ;  $p < 0.05$ ), confirming the direct impact of sleep quality on recovery processes.

### Conclusion

The findings confirm that sleep disturbances are a frequent and clinically significant complication of the post-stroke period, exerting a negative impact on the effectiveness of neurorehabilitation. Patients with insomnia show slower functional recovery and lower motivation for motor training. Therefore, screening and correction of sleep disorders should become an integral part of post-stroke patient assessment. Including cognitive-behavioral therapy, normalization of sleep-wake patterns, and both pharmacological and non-pharmacological interventions (relaxation, light therapy, breathing techniques) in rehabilitation protocols may reduce long-term neurological complications.

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