Severity-related Association Between Sleep-Disordered Breathing and Nocturnal Enuresis in Children: A Systematic Review and Meta-Analysis

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Background

Nocturnal enuresis (NE) and sleep-disordered breathing (SDB) are prevalent pediatric conditions with significant psychosocial and health impacts. While previous studies have explored their association, the relationship between SDB severity and NE risk remains unclear.

Methods

This systematic review and meta-analysis followed the PRISMA 2020 guidelines. Studies were collected from PubMed, Web of Science, Embase, and the Cochrane Library, including case-control, cohort, or cross-sectional studies. The search included the keywords, 'Nocturnal Enuresis' and 'Sleep Apnea, Obstructive', from database inception to 17 May 2024, with 5-18years children clear diagnoses of NE or SDB in the study population.

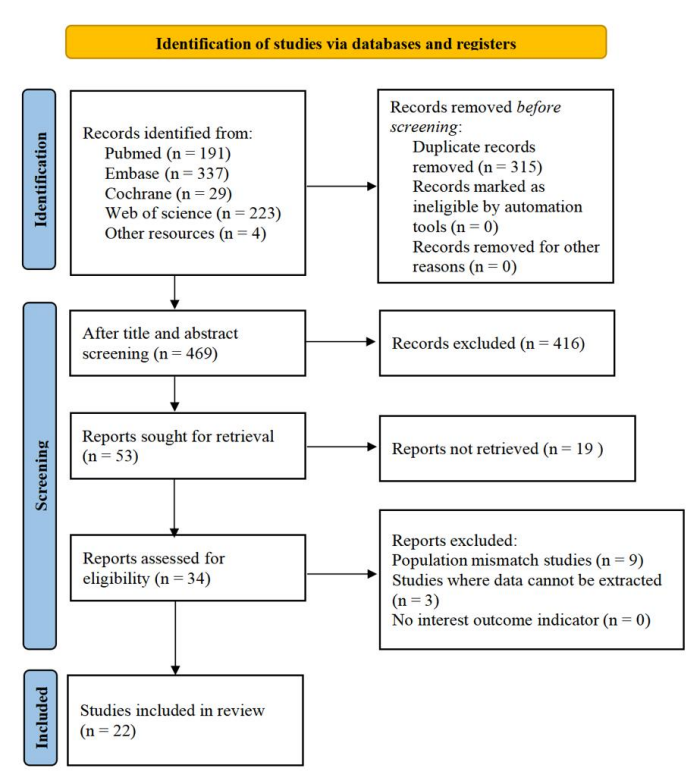

Figure 1. Study Flowchart

Results

A total of 22 studies (40,296 participants) were included, of which 20 were rated as moderate to high quality. NE patients had a 32.3% (95% CI: 28.3–36.2) SDB prevalence (SWN), while SDB patients had a 24.5% (95% CI: 15.7–33.3) NE prevalence (NWS). The meta-analysis revealed a significant positive NE-SDB association (adjusted OR=2.85, 95% CI: 2.35–3.45), indicating SDB is an independent NE risk factor. Subgroup analyses showed that both mild SDB (e.g., habitual snoring) and moderate-to-severe SDB (e.g., OSA) were associated with higher NE risk—mild: OR 2.48 (95% CI 1.68–3.67); moderate-to-severe: OR 2.91 (95% CI 2.20–3.86)—but the differences between severity strata were not statistically significant (test for subgroup differences P=0.758).

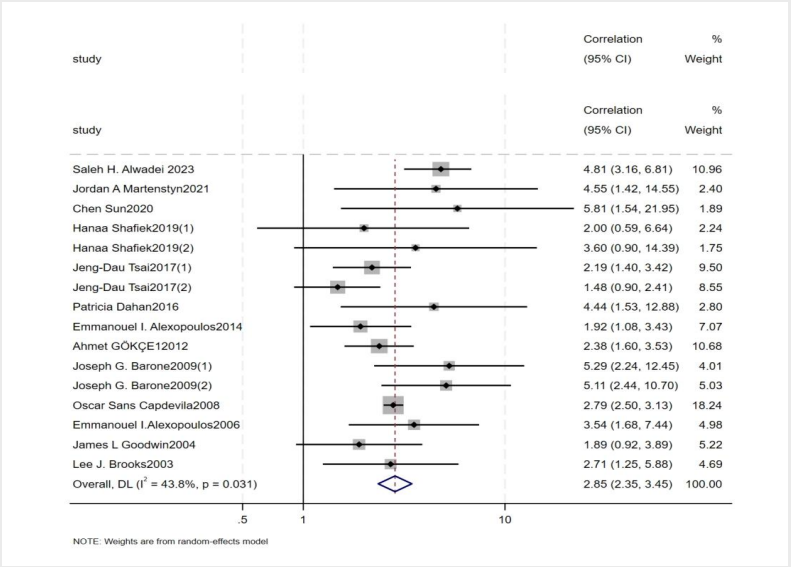

Figure 2. The results of ORs between nocturnal enuresis and mild sleep-disordered breathing

Conclusion

A significant association exists between SDB and NE, revealing the high prevalence of SWN and NWS. Both mild SDB (primary snoring) and moderate-to-severe SDB (e.g., OSA) significantly increase NE risk. Early diagnosis and intervention for SDB—even mild forms—represents a promising preventive strategy for NE.