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ABSTRACT

Title: Impact of Concurrent Exercise Training on Sleep, Autonomic and Neuromuscular

Function: An Empirical Study on Sedentary Women in Formal Sector

Background: Sleep disturbances and physical inactivity are two major public health challenges that have increasingly affected working populations, especially women in sedentary occupations. These factors can negatively influence health and quality of life. However, there is a dearth of studies focusing on this issue.

Objective: This study aimed to investigate sleep quality, mental health, and related factors in sedentary Indian working women through two interconnected studies: (1) a cross-sectional study to find the prevalence and identify the predictors of sleep disturbances, and (2) a randomized controlled trial assessing the effects of concurrent training of different intensities and sleep hygiene education on sleep mental health, well-being, quality of life, autonomic and neuromuscular function.

Methodology :Study 1 - Cross-sectional Study: A total of 343 Indian working women (aged <45 years) were assessed for sleep, mental health, physical activity and quality of life parameters using standardized tools. Multiple regression analysis revealed that stress, anxiety, depression, burnout, dysfunctional sleep beliefs, and fatigue were significant predictors of sleep disturbances (poor sleep quality and sleep health).

Study 2 - Randomized Controlled Trial: Thirty-three sedentary working women with poor sleep quality were randomly allocated into three groups for four weeks: Group A (low-intensity CT+SHE), Group B (moderate-intensity CT+SHE), and Group C (SHE only). Interventions included thrice-weekly exercise sessions. Pre- and post-intervention assessments included subjective and objective sleep parameters, mental health and well-being indicators, physical

activity levels, and quality of life, neuromuscular parameters, salivary cortisol levels and heart rate variability (HRV)

Results: Group B showed the most substantial improvements in objective sleep parameters (TST, SE, N3, REM), subjective sleep quality (PSQI, DBAS, SHI), and psychological outcomes (stress, anxiety, fatigue, burnout). Salivary cortisol regulation improved significantly in Group B, along with HRV and neuromuscular outcomes. Group A showed moderate improvements, while Group C exhibited minimal change.

Conclusion: The findings emphasize the synergistic benefits of combining concurrent training with behavioral sleep interventions. This integrative approach significantly enhances sleep, mental health, and physical functioning in sedentary working women. The results offer valuable insights for designing workplace wellness initiatives tailored to Indian women.

Keywords: Sleep quality, Concurrent training, Sleep hygiene education, Sedentary women, Mental health, Cortisol, Heart Rate Variability, Polysomnography