

Sleep apnea as a risk factor in railroad operations

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Fatigue and sleepiness can occur in the railroad industry due to the demanding round-the-clock nature of operations. This is being recognized as having the potential to cause errors and accidents. Some individuals may be particularly at risk, for example, a number of studies have shown that individuals with sleep apnea have a 2-3 fold greater risk of having accidents due to fatigue (1). Sleep apnea affects between 1-5% of middle-aged men. Several studies have documented an elevated prevalence of sleep apnea in workers on irregular schedules (2). In this study, we analyzed the impact of sleep apnea on the health, sleep and alertness of railroad workers.

Methods. A total of 126 train crew workers participated in the study. They completed a survey asking questions about their general background, health, sleep, alertness and safety. The sleep apnea pre-screening questionnaire was based on the Sleep Disorders Questionnaire (3). Student-t and Chi-Square tests were used.

Results. 27 individuals had a score suggesting they may have sleep apnea (Apnea group, "A"). They were compared to 99 individuals with a normal score (Non-Apnea group, "NA"). Average age was the same in both groups (47 ± 1 years old).

Health: Group A had more gastro-intestinal complaints ($p < .01$), and they used antacids more often ($p < .05$) than group NA. There were more smokers in group A (55% vs 23%, $p < .01$) and they consumed more coffee (>7 cups while working: 33% vs 7%, $p < .01$) than in NA.

Sleep: Sleep duration was similar in both groups. In comparison, group A individuals reported overall poorer sleep quality and felt less rested after sleeping during the day.

Alertness and Safety: Although the number of accidents, mistakes or nodding-off while working was similar in both groups, group A reported losing concentration (several times/day: 44% vs 29%) and thinking that they had missed a signal (at least several times/week: 22% vs 10%) more often than group NA. Group A individuals reported their alertness to be affected by external factors more frequently than NA group: altitude changes (70% vs 55%, $p = .08$), temperature changes (81% vs 64%), cab environment (74% vs 41%, $p < .05$). They also estimated as "very high" the required concentration (48%) and the workload (25%), vs 31% and 8% respectively in the NA group.

In summary, group A individuals seemed to have more health complaints and found work more difficult to cope with than NA. It is suggested that programs used to identify and treat individuals with sleep apnea would improve health and safety in the workplace.

1. Findley L et al. Clinics in Chest Med. 13(3):427-35.1992.
2. Stoohs RA et al. Sleep 17(7):619-23.1994.
3. Douglass AB et al. Sleep 17(2):160-167.1994.

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