

SOCIAL DETERMINANTS OF SLEEP HEALTH AND PSYCHOLOGICAL DISTRESS: A REPORT FROM THE CHILDHOOD CANCER SURVIVOR STUDY (CCSS)

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- **Abstract text – limited to 300 words** including acknowledgements.

Background and Aims

Adult survivors of childhood cancer face elevated risks of poor sleep and psychological distress. Neighborhood conditions influence sleep in the general population, but their role in sleep and associated distress among survivors is unclear. We examined associations between neighborhood factors and sleep and whether neighborhood modifies the association between sleep and subsequent psychological distress.

Methods

Neighborhood-sleep associations were evaluated in 12,970 survivors from the Childhood Cancer Survivor Study (≥ 5 years post-diagnosis; 51% female; mean $\pm$ SD age 39 $\pm$ 10 years). Neighborhood exposures included census-tract socioeconomic context (Area Deprivation Index [ADI], rurality), built environment (walkability, green space), and environmental quality (air and noise pollution). Sleep outcomes (Pittsburgh Sleep Quality Index, PSQI) were assessed 2.8 $\pm$ 0.8 years later and psychological distress (Brief Symptom Inventory-18) 2.2 $\pm$ 0.7 years after sleep. Multivariable logistic regression calculated ORs adjusted for demographics, lifestyle, and psychoactive medications. Neighborhood-sleep interaction terms were further evaluated to examine effect modification on psychological distress.

Results

Sleep disturbances were prevalent among survivors (PSQI >5 =42.2%) and common for residents of the most deprived neighborhoods (ADI, third-tertile). Survivors residing in high deprivation areas (20.2%) had significantly higher odds of poor sleep, including short duration, delayed latency, low efficiency, and snoring (OR range=1.2-1.8). Built environment and environmental quality factors were significantly associated with short sleep and snoring (OR range=1.2-1.6). Neighborhood factors modified associations between sleep and distress. For anxiety, moderate (vs low) noise significantly

intensified the effect of sleep disturbance (OR=5.02 vs 1.90), and low (vs high) walkability amplified the effect of sleep medication (OR=2.12 vs 1.45). For depression, moderate air pollution significantly strengthened the association with delayed sleep latency (OR=3.98 vs 2.59), and low (vs high) green space coverage intensified associations with sleep medication (OR=2.06 vs 1.32).

Conclusions

Neighborhood conditions exacerbate sleep problems and amplify their impact on psychological distress among childhood cancer survivors. Sleep interventions should consider neighborhood factors to maximize effectiveness.