Review Article ISSN: 2833-0382

International Journal of Family Medicine & Healthcare

Prevalence and Structural Drivers of Sleep Disturbance Among Adults Experiencing Homelessness

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Received: 12 Jan 2026; **Accepted:** 24 Feb 2026; **Published:** 07 Mar 2026

Citation: Bryan Tune, Brandon M. Rudd. Prevalence and Structural Drivers of Sleep Disturbance Among Adults Experiencing Homelessness. Int J Family Med Healthcare. 2026; 5(1): 1-3.

ABSTRACT

Sleep disturbance is increasingly recognized as a critical determinant of physical and mental health. People experiencing homelessness (PEH) face environmental, structural, and psychosocial barriers that significantly impair restorative sleep. This mixed-methods cross-sectional study examined the magnitude of sleep disturbance and explored perceived barriers and facilitators to sleep among 55 adults receiving street medicine services in Fresno, California. Sleep disturbance was measured using a modified PROMIS Sleep Disturbance Short Form, and qualitative responses were analyzed using inductive thematic analysis. The mean PROMIS T-score was 64.26 (SD = 8.38), exceeding the population norm of 50. Environmental exposure, lack of safety, chronic health conditions, and encampment sweeps were primary contributors to poor sleep. Findings highlight sleep instability as both a consequence and perpetuator of homelessness-related health disparities.

Keywords

Sleep disturbance, Hypertension, Diabetes, Cardiovascular disease, Homelessness.

Introduction

Sleep is a fundamental biological process necessary for immune regulation, metabolic homeostasis, cardiovascular stability, and neurocognitive functioning [1]. Chronic sleep deprivation has been linked to hypertension, diabetes, cardiovascular disease, depression, impaired executive functioning, and increased mortality [2]. Adults are generally recommended to obtain 7 to 9 hours of sleep per night to maintain optimal health [3]. Despite these recommendations, structural determinants such as poverty, housing instability, and environmental exposure limit the ability of vulnerable populations to achieve restorative sleep.

People experiencing homelessness represent one of the most sleep-vulnerable populations in the United States. Unsheltered individuals often sleep in vehicles, tents, sidewalks, or parks—settings not intended for habitation and characterized by exposure to extreme temperatures, noise, violence, and theft [4]. Hypervigilance and fear further disrupt slow-wave and rapid eye movement sleep, perpetuating chronic stress activation [5]. Sleep disruption in this population is therefore not merely behavioral but structurally produced.

Although prior studies have documented elevated insomnia symptoms among homeless populations [6], few investigations integrate standardized quantitative measures with qualitative exploration of lived experiences. Understanding both magnitude and context is essential to inform clinical and policy interventions.

Literature Review

Theoretical frameworks such as the Theory of Unpleasant Symptoms [7] emphasize the multidimensional interaction of physiological, psychological, and situational factors influencing

symptom experience. Within the context of homelessness, environmental exposure, trauma history, substance use, and chronic illness intersect to shape sleep outcomes. Research demonstrates strong associations between sleep disruption and cardiometabolic disease, systemic inflammation, and psychiatric morbidity [2].

Housing First interventions have demonstrated improvements in health stability [8]; however, sleep-specific outcomes remain understudied. Encampment sweeps and forced displacement have been associated with worsening self-reported health and psychological distress [9], suggesting potential circadian disruption as a mechanism.

Methods

This cross-sectional mixed-methods study was conducted between September 2024 and May 2025. Participants included 55 English-speaking adults aged 18–65 years who met U.S. Department of Housing and Urban Development criteria for homelessness and were receiving care through a street medicine clinic in Fresno, California. Written informed consent was obtained prior to participation.

Sleep disturbance was measured using a modified 5-item PROMIS Sleep Disturbance Short Form. Raw scores were converted to T-scores standardized to a mean of 50 (SD = 10). Higher scores indicate greater sleep disturbance. Descriptive statistics including mean, standard deviation, and range were calculated.

Participants also responded to two open-ended questions addressing factors that worsen or improve sleep. Qualitative responses were transcribed and analyzed using inductive thematic analysis. Codes were grouped into themes, and frequencies were calculated to quantify theme prevalence.

Results

Quantitative Findings

A total of 55 participants completed the PROMIS Sleep Disturbance Short Form. The mean T-score was 64.26 (SD = 8.38), substantially exceeding the standardized population mean of 50. Scores ranged from 37.7 to 72.4, with the majority of participants clustered within the moderate-to-severe disturbance range. Overall, 94.5% of respondents scored above the general population norm, and more than two-thirds scored at least one standard deviation above the mean, indicating clinically meaningful sleep impairment.

Item-level responses demonstrated high frequency of difficulty initiating sleep, maintaining sleep, and experiencing non-restorative sleep. Participants frequently endorsed statements reflecting persistent sleep fragmentation and dissatisfaction with sleep quality. Reports of daytime fatigue and impaired concentration were common, suggesting downstream functional consequences.

Qualitative Findings

Inductive thematic analysis of open-ended responses identified five primary themes contributing to poor sleep: environmental exposure, perceived lack of safety, chronic physical and mental health conditions, encampment sweeps, and theft or fear of theft. Environmental exposure was the most frequently reported barrier (70.9%). Participants described difficulty sleeping due to cold temperatures, rain, damp ground surfaces, excessive heat, and wind. Many reported waking repeatedly throughout the night due to discomfort or the need to reposition themselves to avoid environmental stressors.

Perceived lack of safety (49.1%) emerged as a major contributor to hypervigilance. Participants reported fear of assault, harassment, or violence, leading to light sleep and frequent awakenings. Several described sleeping in short intervals to remain alert to potential threats.

Chronic health conditions (45.4%), including pain syndromes, respiratory illness, anxiety, depression, and substance withdrawal symptoms, further disrupted sleep continuity. Pain-related awakenings and anxiety-driven rumination were commonly cited.

Encampment sweeps (25.4%) were described as acutely destabilizing events. Participants reported abrupt displacement, loss of bedding or personal belongings, and uncertainty regarding safe sleeping locations, contributing to sleep instability beyond the immediate event.

Theft or fear of theft (23.6%) contributed to persistent nighttime alertness. Participants described keeping belongings close or sleeping lightly to prevent loss of essential items.

Facilitators of Sleep

When asked what improved sleep, 72.7% of participants cited access to indoor shelter. Warmth and dry conditions (61.8%) were frequently noted as essential to uninterrupted rest. Perceived safety (32.7%) and effective management of medical conditions (29%) were also associated with improved sleep quality. Participants emphasized that predictable sleep environments and reduced nighttime disturbances were critical to feeling rested.

Overall, the integration of quantitative and qualitative findings demonstrates a pattern of clinically elevated sleep disturbance embedded within environmental and structural instability. The convergence of elevated PROMIS scores with consistent thematic reporting strengthens the validity of the findings and underscores the pervasive nature of sleep disruption in this population.

Discussion

Findings demonstrate pervasive and clinically meaningful sleep disturbance among PEH in Fresno. PROMIS scores exceeded normative values by more than one standard deviation, suggesting substantial physiological burden. Environmental instability and safety threats appear central drivers of sleep fragmentation, consistent with prior research [4].

Chronic hyperarousal may contribute to inflammatory activation and cardiometabolic risk [2]. Impaired sleep may also reduce cognitive flexibility and executive functioning, potentially limiting engagement with housing services and healthcare systems. Encampment sweeps likely disrupt circadian continuity and intensify psychological stress [9].

Interventions addressing environmental safety, trauma-informed shelter design, and policy stability may improve physiologic restoration. Recognizing sleep as a structural determinant of health reframes it as a public health priority rather than an individual behavioral issue.

Limitations

This study is limited by modest sample size, single geographic setting, and reliance on self-reported sleep measures. The cross-sectional design precludes causal inference. Seasonal effects were not examined. Future longitudinal and multisite studies incorporating objective sleep measures such as actigraphy are warranted.

Conclusion

Sleep disturbance among people experiencing homelessness represents a clinically significant and structurally embedded contributor to health inequity. The findings of this study demonstrate that sleep instability in this population is not merely an individual behavioral concern, but rather a predictable consequence of environmental exposure, safety threats, displacement policies, and chronic health burden. PROMIS T-scores exceeding population norms by more than one standard deviation underscore the magnitude of physiologic strain experienced by participants.

Sleep disruption likely functions both as a consequence, and a perpetuating factor of homelessness. Fragmented sleep and chronic hyperarousal may exacerbate cardiometabolic disease, impair executive functioning, and diminish emotional regulation, thereby limiting individuals' ability to engage with healthcare services, employment opportunities, and housing systems. Without adequate restorative sleep, efforts aimed solely at clinical treatment may have limited sustainability.

These findings highlight the importance of reframing sleep as a public health and policy priority within homelessness response systems. Interventions that prioritize environmental protection, trauma-informed shelter design, low-barrier housing models, and reductions in forced displacement may meaningfully improve sleep stability and downstream health outcomes. Integrating sleep assessment into street medicine and community-based outreach programs may further identify individuals at heightened physiologic risk.

Future research should incorporate longitudinal and multisite designs to evaluate whether housing stabilization leads to normalization of sleep disturbance scores and whether improvements in sleep mediate reductions in chronic disease burden. Objective sleep measures, including actigraphy, would strengthen future investigations.

Ultimately, recognizing sleep as a foundational human need and a structural determinant of health may advance more humane, effective, and health-centered approaches to addressing homelessness.

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