Sleep Perception Among Individuals With Posttraumatic Stress Disorder

Nearly 70% of individuals with posttraumatic stress disorder (PTSD) report clinically significant levels of sleep disturbances, and sleep complaints appear more refractory to therapy than other features of the disorder. However, data from several polysomnography (PSG) and actigraphy-based studies suggest that individuals with PTSD often report sleep disturbances in the absence of any demonstrable disruption in objectively measured sleep, calling into question the validity of subjective sleep complaints in PTSD. Since healthy adults are capable of relatively accurately estimating sleep state and duration, some researchers suggest that individuals with PTSD exhibit a perceptual bias with regard to sleep. In this issue of SLEEP, Kobayashi and colleagues challenge these conceptualizations of sleep misperception and offer empirical evidence in favor of a more nuanced perspective.

Consistently observed discrepancies between subjective and objective indices of sleep impairment among insomnia patients led some researchers to suggest a new phenotype of the disorder called "paradoxical insomnia": a condition marked by significant sleep misperception. Evidence for sleep misperception in PTSD, however, remains less conclusive. Lack of replication as well as methodological inconsistencies in assessment techniques (PSG vs. actigraphy; daily sleep diary vs. retrospective questionnaire) and settings (home vs. laboratory) have prevented data comparisons across studies. Kobayashi et al. attempt to overcome these limitations by comparing self-reported sleep data from questionnaires and morning sleep diaries with more objective data from in-lab PSG and home actigraphy. Further, they assess whether discrepancies between subjective and objective sleep indices are moderated by current or prior PTSD status. According to results, trauma/PTSD did not consistently contribute to discrepancies between subjective and objective sleep measures. Specifically, participants who did not meet current PTSD criteria overestimated total sleep time (TST) relative to actigraphy measures. With respect to sleep onset latency (SOL), all participants overestimated SOL in the sleep diaries relative to PSG, but not to actigraphy. In addition, while participants with current or lifetime PTSD underestimated SOL via self-report questionnaires relative to PSG, the other groups underestimated SOL. Finally, all participants underestimated time spent awake after sleep onset (WASO) relative to actigraphy.

Sleep Perception in PTSD

Arguably, the most noteworthy of the findings of Kobayashi et al. is that participants with trauma exposure/PTSD did not exhibit any consistent biases in sleep perception, and, in some cases, estimated sleep more accurately than controls. These findings are counter to those suggesting that sleep complaints in PTSD are artifacts of sleep misperception. As Harvey and Tang note, the idea that patients misperceive or exaggerate their sleep difficulties may dissuade clinicians from adequately treating sleep problems, in addition to discouraging researchers from fully investigating these complaints. As such, the findings of Kobayashi et al. are timely in questioning the extent to which PTSD is associated with actual versus misperceived sleep disruption. However, their results must be interpreted cautiously and with provisions for specific study and sample characteristics.

First, although the authors excluded “first-night” data, results were based on only a single night of actigraphy and PSG assessment. Experts recommend continuous actigraphy measurement for at least three nights to account for between-night variance. Second, as the authors note, the PTSD group was comprised of adults with mild to moderate levels of symptom severity. Hence, it is unclear whether sleep misperception is correlated with overall symptom severity; it is possible that sleep misperception only accompanies more severe PTSD presentations.

Finally, though Kobayashi et al. present a provocative argument, replication is necessary in order to increase confidence in the present findings. As in-lab or home PSG and actigraphy studies typically use small samples, they possess limited statistical power to detect modest effects. Thus, nonsignificant findings regarding sleep misperception may reflect potential type II errors. Hence, the field is in need of more empirical data on the concordance between objective and subjective sleep assessment in PTSD.

The Future of Sleep Assessment

In a prior issue of SLEEP, a panel of experts urged researchers to adopt a multi-method approach to sleep assessment by using actigraphy and PSG in conjunction with sleep diaries. The findings of Kobayashi and colleagues’ support this recommendation. In their study, even healthy participants’ self-reports of SOL and WASO significantly deviated from actigraphy and PSG, respectively, a finding that runs counter to prior studies. This underscores a larger question in the sleep literature; not whether certain populations misperceive sleep, but whether self-report measures of sleep are inconsistent with more objective PSG or actigraphy measures in general. For instance, Spielman et al. noted that a sample of insomnia patients over-
estimated PSG-based SOL when sleep onset was defined as the first appearance of three consecutive epochs of stage 1 sleep. However, participants’ self-reports significantly improved when onset was redefined as the first emergence of “consolidated sleep” (i.e., the passing of 10 minutes of stage 1 sleep). Similarly, Argyropoulos et al. suggested that errors in estimating WASO may be due to PSG defined “wake states” that rely on relatively short (< 16 or < 30-second) epochs, which are not consciously discernible to most adults.

Hence, additional research is needed to determine the reliability of subjective versus objective indicators of sleep. Recent advances in assessment such as cyclic alternation pattern (CAP) analysis and other forms of sleep microstructure analysis show promise in affording a more intricate view of these phenomena. However, exclusive reliance on any single mode of sleep assessment, even an objective measure, is problematic. Objective measures fail to capture clinically relevant variables such as sleep quality, which has been found to predict daytime dysfunction. Further, objective measures such as actigraphy, as evidenced in the study by Kobayashi et al. also suffer from poor reliability in distinguishing between sleep and restful (or motionless) waking. Thus, it would behoove future researchers to include multiple assessment strategies to fully capture the inherent heterogeneity in sleep disturbances.

CITATION
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REFERENCES