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Journal search and commentary

Does sleep disturbance mediate the health impacts of post-traumatic stress disorder?

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1. Article reviewed

Title: The mediating effects of sleep in the relationship between traumatic stress and health symptom in urban police officers.

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Journal: Psychosom Med 2003;65:485–489.

2. Objectives

To explore the degree to which sleep disturbance mediate the relationship between post-traumatic stress disorder (PTSD) symptoms and health in a sample of police officers.

3. Study design

A cross-sectional convenience sampling from three urban police departments, with greater recruitment of minority and female officers.

4. Study population

A total of 1200 officers were mailed questionnaires, 790 (66%) returned materials, 741 (62%) packages were usable, and 713 (59%) contained complete data sets.

5. Methods

Two sets of independent variables (PTSD and sleep quality) were used in a series of stepped logistic regression analyses to examine the strength of their relative effects on self-reported health status. PTSD was assessed using the Mississippi Scale–Civilian Version (MS-CV), sleep- and health-related items were excluded. Sleep quality was

assessed using the Pittsburgh Sleep Quality Index (PSQI), excluding items assessing absolute sleep latency and duration of sleep. Two dependent measures of health status were physical functioning, assessed using the Physical Composite Score (PCS) of the SF-12, and somatic symptoms, assessed using the Somatization subscale of the Symptom Checklist-90-R (SCL-90).

Three sets of potential confounding variables (demographics—specifically age and Hispanic ethnicity; alcohol abuse, and duty-related trauma history) were entered in the first step of each hierarchical logistic regression analysis. The relative changes in the proportion of variance explained by PTSD or sleep quality were explored.

6. Results

Controlling for potential confounders, 18% of the variance in somatic symptoms was predicted by PTSD symptoms directly, this was significantly reduced to 8% when the sleep quality was entered as a primary factor. Conversely, the association between sleep quality and somatization was considerably strengthened from 15 to 25% when sleep quality was entered before the PTSD. Although the strengths of the observed relationships are relatively weak, this finding suggests that sleep disturbance may mediate somatic symptoms in this population. In a second set of analyses predicting residual physical health status, 2% of the variance was (very weakly) predicted by PTSD symptoms, dropping essentially to zero (0.3%) when the sleep quality was entered in the prior step.

7. Conclusions

The authors argue that, in general, the results support the hypothesis that relationship between PTSD and health is mediated by sleep quality; more specifically, that sleep

quality acts as a partial mediator of the effects of PTSD on somatic symptoms and a full mediator of health function.

8. Commentary

Sleep disruption has been found to adversely affect a wide variety of illness conditions including: the physical and mental health components of health-related quality of life (HRQoL) and PTSD symptom severity [1,2] and also pain [3], somatic complaints [4] and emotional distress or moodiness [5,6]. Patients' disturbed sleep patterns have also been found to be a correlate of greater health service utilization [7] and are associated with higher relative risk of developing clinical conditions including arterial and cardiac disease, pulmonary disease, and diabetes [8–10]. Thus it seems reasonable for the authors to conclude that sleep disruption resulting from PTSD causes some of the health problems observed with this condition.

In fact, however, the authors actually extend the implications of their particular findings a bit too far when suggesting that they provide evidence that sleep mediate the PTSD effects on physical health. While both HRQoL and somatization have been shown to be associated with physical health states, they are typically thought of as somewhat independent constructs, not as proxy measures of physical health. Indeed, the psychiatric definition of somatization is the presence of somatic complaints in the *absence* of any evidence of organic disease. A second concern is that the effect of PTSD on the HRQoL, as measured by the particular scale used in this study, may reflect the dominant effect of disturbed sleep on the vitality/energy items in the scale and not the implied effects of various physical diseases induced by sleep disturbance.

The relationship between respondents' perception of ill health and sleep disturbance is in itself an interesting finding worthy of further study. Somatic complaints may reflect a neurological vulnerability to environmental stressors, the long-term effects of which are not well understood. Disturbed sleep may result in a hypersensitivity to negative stressors in daily life. This might explain why sleep disturbance is often associated with emotional volatility, irritability [11] and use of avoidant coping styles [12].

Use of a cross-sectional design is another significant limitation of this study. The use of shared variance estimates between independent and dependent measures in a cross-sectional design does not allow critical examination of the inferred temporal (causal) relationships among them. It is conceivable that the observed sleep disturbance is actually the result rather than a cause of impaired health.

9. Summary

The results of the current study are intriguing but are insufficiently strong to allow for argument of a convincing case. Clearly, the results do not stand on their own but they do contribute to a growing body of knowledge about mechanisms that might explain the association between PTSD and increased risk for various illness conditions. Further longitudinal study is required to examine the mechanisms through which sleep disturbance affects both the emotional–perceptual manifestations of distress and fundamental physiological processes essential to the maintenance of a life free from disease.

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