The Incremental Impact of Trauma-Related Nightmares on PTSD Symptom Severity

Posttraumatic stress disorder (PTSD) often develops following trauma exposure and affects between 7.8-9.2% of the United States population (Breslau, Davis, Andreski, & Peterson, 1991; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). PTSD is a significant public health concern given that it is associated with mental and physical health comorbidities. Sleep disturbances are highly comorbid with posttraumatic stress. Sleep disturbances associated with PTSD include nightmares or bad dreams related to a specific traumatic experience, nightmares or bad dreams not related to a specific traumatic experience, hot flashes, general nervousness, severe anxiety or panic, episodes of terror or screaming, and episodes of acting out during dreams. It has been postulated that nightmares may contribute to the development of PTSD (i.e., Levin & Nielsen, 2007; Levin & Nielsen, 2009). According to the neurocognitive model (see Levin & Nielsen, 2007 for review), cognitive and neural factors together form an emotion network and produce dreaming. Normal dreaming plays a role in fear extinction. However, when disruptions occur in this neurocognitive network, disordered dreaming such as nightmares occur. Among vulnerable individuals who are fear conditioned or primed for select emotional reactivity (i.e., a traumatic event), nightmares can activate previously encoded structures containing specific fear memories. This, in turn, can lead to elevated waking distress and more intense/frequent nightmares. Based on this model, nightmares containing content related to the trauma should play a role in fear conditioning and reduce the chance for fear extinction. Although an association between nightmares and PTSD symptoms has been established, several sleep disturbances often co-occur among individuals displaying PTSD symptomology, and few studies are statistically powered enough to examine a number of PTSD-related sleep disturbances simultaneously to examine each disturbance’s unique contribution to PTSD. The current study examined the relationship between seven PTSD-related sleep disturbances and PTSD symptom severity, in a sample of 983 college students. Further, we hypothesized that trauma-related nightmares would be associated with greater PTSD symptom severity after controlling for other PTSD-related sleep disturbances, including non-trauma-related nightmares. Measures included the Pittsburgh Sleep Quality Index-Addendum for PTSD (PSQI-A; Germain, Hall, Krakow, Shear, & Buysse, 2005), and the PTSD diagnostic scale (PSD; Foa, Cashman, Jaycox, & Perry, 1997). Results of a hierarchical linear regression indicated that PTSD-related sleep disturbances accounted for 34% of the variance in PTSD symptoms (Adjusted $R^2 = .339$). Moreover, consistent with our hypothesis, trauma-related nightmares were most strongly associated with PTSD symptom severity, $F(7, 975) = 72.08, p < .001$, accounting uniquely for 14.8% of variance in PTSD symptoms after controlling for the other PTSD-related sleep disturbances. Moreover, nightmares and bad dreams not related to a specific traumatic event were not related to PTSD symptoms, $F(1, 976) = 1.467, p = .226$. These results support theories proposing that trauma-related nightmares are uniquely associated with the exacerbation of PTSD symptoms. Moreover, these results imply that trauma-related nightmares may be the most influential sleep disturbance in relation to PTSD, supporting the idea that trauma-related nightmares may interfere with the extinction of fear memories related to a traumatic experience.