

The Nature of Traumatic Stress and Its Association with Pain Catastrophizing and Sleep

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Abstract

*This study investigated the relationship between young adults' sleep quality, pain catastrophizing, and traumatic stress. Convenience sampling was used to select 120 individuals (60 men and 60 women) between the ages of 18 and 29. The Sleep Scale from the Medical Outcomes Study (MOS-Sleep Scale), Pain Catastrophizing Scale (PCS), and Impact of Event Scale-Revised (IES-R) were among the standardized tools used. Independent samples *t*-tests and Pearson's correlation were used to analyse the data. The results showed that traumatic stress is strongly linked to sleep problems and also strongly connected to pain catastrophizing. No major connection was found between pain catastrophizing and the quality of sleep. Big differences between men and women were seen in how much traumatic stress they experienced and how well they slept, but there was no big difference in how they think about pain. The results show how thinking and feeling play a part in sleep problems caused by stress, and they suggest ways that mental health treatments can be improved, as well as directions for more research in the future.*

Keywords: *Traumatic stress, pain catastrophizing, sleep quality, and young adults*

Introduction

Traumatic stress is a complex psychological and physiological response that arises following exposure to distressing or life-threatening events. These responses often include heightened arousal, intrusive thoughts, emotional dysregulation, and disruptions in normal functioning (Lazarus & Folkman, 1984). In recent decades, there has been a growing body of research examining how traumatic experiences influence not only emotional well-being but also cognitive processes and physical health outcomes.

One important cognitive factor associated with stress is pain catastrophizing. Pain catastrophizing refers to an exaggerated negative mental set brought to bear during actual or

anticipated painful experiences (Sullivan *et al.* 1995). It typically involves rumination on pain, magnification of its threat, and feelings of helplessness. Individuals who engage in catastrophic thinking are more likely to experience increased psychological distress and impaired coping mechanisms (Quartana *et al.* 2009).

Sleep quality is another critical component of overall health. Adequate sleep is essential for cognitive functioning, emotional regulation, and physical recovery (Harvey, 2011). However, individuals experiencing high levels of stress often report poor sleep quality, including difficulty falling asleep, frequent awakenings, and non-restorative sleep (Morin *et al.* 2020). Poor sleep, in turn, can exacerbate stress and maladaptive cognitive patterns, creating a cyclical relationship (Alvaro *et al.* 2017).

Previous research has independently linked traumatic stress with both pain catastrophizing and sleep disturbances (Palagini *et al.* 2019). However, fewer studies have examined the interaction among all three variables within a single framework, particularly among young adults. This population is especially relevant due to the developmental challenges and stressors they face, including academic pressure, career uncertainty, and social transitions.

The present study aims to explore the relationships between traumatic stress, pain catastrophizing, and sleep quality among young adults. Understanding these relationships may provide insights into psychological mechanisms underlying stress-related health outcomes and inform interventions aimed at improving mental health and well-being.

Methodology

Hypotheses

H0: There is no significant relationship between traumatic stress, pain catastrophizing, and sleep quality

H1: There is a significant relationship between traumatic stress, pain catastrophizing, and sleep quality

Research Design

The present study employed a quantitative correlational research design to examine relationships among variables.

Participants

The sample consisted of 120 young adults (60 males and 60 females) aged between 18 and 29 years. Participants were selected using convenience sampling.

Inclusion Criteria

- Individuals aged 18–29 years
- Ability to read and understand the questionnaire

Exclusion Criteria

- Individuals diagnosed with severe psychiatric or neurological disorders.
- Individuals undergoing treatment for severe sleep disorders

Instruments

Impact of Event Scale- Revised (IES-R)

The IES-R is a widely used self-report measure designed to assess subjective distress caused by traumatic events (Lazarus & Folkman, 1984). It evaluates symptoms such as intrusion, avoidance, and hyperarousal.

Pain Catastrophizing Scale (PCS)

The PCS measures the extent to which individuals experience catastrophic thoughts related to pain (Sullivan et al., 1995). It includes subscales for rumination, magnification, and helplessness.

Sleep Scale from the Medical Outcomes Study (MOS-Sleep Scale)

The MOS-Sleep Scale is a widely used self-report measure designed to assess sleep quality and sleep-related problems (Hays & Stewart, 1992). It evaluates domains such as sleep disturbance, sleep adequacy, somnolence, snoring, and daytime dysfunction.

Procedure

Participants were recruited through online platforms. Informed consent was obtained prior to data collection. Questionnaires were administered electronically, ensuring anonymity and confidentiality.

Statistical Analysis

The data was evaluated using the software known as SPSS. The correlation coefficient of Pearson was used to analyse the relationships among the variables. The significance level was then set ($p < .05$). T-tests were also conducted to identify gender differences.

Results

Table 1: Gender Differences in Traumatic Stress

Gender	N	Mean	SD	t	p
Male	60	24.15	16.767	-7.234	.000
Female	60	46.38	15.786		

Table 2: Gender Differences in Sleep Quality

Gender	N	Mean	SD	t	p
Male	60	23.90	12.013	-2.296	.023
Female	60	29.30	13.288		

Table 3: Gender Differences in Pain Catastrophizing

Gender	N	Mean	SD	t	p
Male	60	29.57	15.083	1.335	.184
Female	60	33.00	11.239		

Table 4: Correlation Analysis

Variables	r	p
Traumatic Stress – Sleep Quality	.529	.000
Traumatic Stress – Pain Catastrophizing	.259	.004
Sleep Quality – Pain Catastrophizing	.105	.256

Interpretation

The results indicate a significant positive relationship between traumatic stress and sleep disturbance, as well as between traumatic stress and pain catastrophizing. However, no significant relationship was observed between pain catastrophizing and sleep quality. Gender differences were significant for traumatic stress and sleep quality but not for pain catastrophizing.

Discussion

The present study aimed to examine the relationship between traumatic stress, pain catastrophizing, and sleep quality among young adults. The findings revealed significant positive relationships between traumatic stress and sleep disturbance, as well as between traumatic stress and pain catastrophizing. These results indicate that individuals experiencing higher levels of traumatic stress are more likely to report poorer sleep quality and increased maladaptive cognitive responses related to pain, consistent with previous research (Morin *et al.* 2020; Quartana *et al.* 2009). However, the relationship between pain catastrophizing and sleep quality was not found to be statistically significant. The study also identified significant gender differences in traumatic stress and sleep quality, with females reporting higher levels of traumatic stress and poorer sleep quality compared to males, whereas no significant gender differences were observed in pain catastrophizing.

The significant relationship between traumatic stress and sleep quality suggests that traumatic experiences and stress-related symptoms may substantially affect an individual's ability to achieve healthy and restorative sleep. Individuals exposed to traumatic stress often experience symptoms such as hyperarousal, intrusive thoughts, emotional dysregulation, anxiety, and heightened physiological activation, all of which may interfere with normal sleep patterns (Palagini *et al.* 2019). Sleep disturbances such as difficulty initiating sleep, fragmented sleep, nightmares, and non-restorative sleep are commonly associated with individuals experiencing elevated stress levels (Riemann *et al.* 2020). Poor sleep quality may further intensify emotional distress and impair cognitive functioning, thereby contributing to a cycle in which stress and sleep disturbances reinforce one another (Alvaro *et al.* 2017).

The positive association between traumatic stress and pain catastrophizing indicates that stress may influence the way individuals cognitively process and respond to pain-related

experiences. Individuals experiencing traumatic stress may develop maladaptive thinking patterns characterized by rumination, helplessness, and magnification of pain-related concerns (Sullivan *et al.* 1995). Increased emotional vulnerability and reduced coping capacity under stressful conditions may contribute to exaggerated negative interpretations of pain and discomfort (Quartana *et al.* 2009). These maladaptive cognitive patterns may increase psychological distress and negatively affect overall well-being.

Interestingly, the present study did not find a significant relationship between pain catastrophizing and sleep quality. This finding suggests that although catastrophic thinking patterns are associated with traumatic stress, they may not directly predict sleep disturbances among young adults in the current sample. It is possible that other psychological or environmental factors, such as anxiety, depression, coping strategies, lifestyle habits, or emotional regulation abilities, may have a stronger influence on sleep quality (Harvey, 2011). The absence of a significant relationship may also reflect differences in individual responses to stress and pain perception.

The findings related to gender differences indicate that females experienced significantly higher levels of traumatic stress and poorer sleep quality than males. These findings may be explained by biological, psychological, and sociocultural factors, as supported by previous literature (Riemann *et al.* 2020). Females are often reported to be more emotionally expressive and may experience greater emotional sensitivity to stressful events. Hormonal influences, social expectations, and differences in coping styles may also contribute to higher stress perception and sleep disturbances among females. However, the lack of significant gender differences in pain catastrophizing suggests that both males and females may engage in similar cognitive responses to pain experiences.

The findings of the present study are consistent with earlier research examining the relationship between stress, cognition, and sleep disturbances. Morin *et al.* (2020) reported that stress-related hyperarousal and emotional dysregulation are strongly associated with insomnia and poor sleep quality. Similarly, Palagini *et al.* (2019) emphasized that heightened stress reactivity contributes significantly to sleep disturbances and emotional difficulties. Alvaro *et al.* (2017) also highlighted the bidirectional relationship between stress and sleep problems, suggesting that poor sleep may increase vulnerability to emotional distress.

The association between traumatic stress and pain catastrophizing identified in the present study is also supported by previous literature. Edwards *et al.* (2006) found that individuals experiencing psychological distress are more likely to engage in catastrophic thinking patterns related to pain. Quartana *et al.* (2009) similarly reported that pain catastrophizing is associated with increased emotional distress, maladaptive coping strategies, and impaired psychological functioning. These findings support the view that cognitive responses to stress play an important role in shaping emotional and behavioural outcomes.

However, the absence of a significant relationship between pain catastrophizing and sleep quality differs from some earlier studies that reported catastrophic thinking as a predictor of sleep disturbances. This inconsistency may be due to differences in sample characteristics, cultural background, age group, sample size, or methodological approaches. It is also possible that the influence of pain catastrophizing on sleep quality may become more evident in clinical populations or individuals experiencing chronic pain conditions rather than in a general young adult population.

The present study contributes to the growing body of literature on traumatic stress by highlighting the interaction between emotional distress, cognitive functioning, and sleep quality among young adults. The findings support psychological theories suggesting that traumatic stress affects both cognitive and physiological functioning (Lazarus & Folkman, 1984). From a practical perspective, the study emphasizes the importance of early psychological intervention, stress management programs, and counselling services for young adults experiencing traumatic stress and sleep difficulties. Cognitive-behavioural interventions may be particularly useful in reducing maladaptive thinking patterns and improving emotional regulation and sleep quality.

Future research may further explore the role of additional psychological variables such as anxiety, depression, resilience, and coping strategies in understanding the relationship between traumatic stress, pain catastrophizing, and sleep quality. Researchers may also consider using longitudinal research designs to examine causal relationships among the variables over time. Including larger and more diverse samples from different cultural and social backgrounds may improve the generalizability of findings. Furthermore, qualitative or mixed-method approaches may provide deeper insight into the lived experiences of individuals experiencing traumatic stress and sleep disturbances.

Overall, the present study highlights the significant impact of traumatic stress on cognitive and sleep-related outcomes among young adults. The findings emphasize the importance of understanding the psychological mechanisms associated with stress and underline the need for continued research and intervention aimed at promoting mental health, adaptive coping, and healthy sleep functioning.

Conclusion

The study demonstrates significant relationships between traumatic stress, pain catastrophizing, and sleep quality. These findings emphasize the importance of addressing cognitive and emotional factors in interventions aimed at improving mental health and sleep outcomes.

References

- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer.
- Sullivan, M. J. L., Bishop, S. R., & Pivik, J. (1995). The pain catastrophizing scale: Development and validation. *Psychological Assessment*, 7(4), 524–532.
- Buysse, D. J., Reynolds, C. F., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. *Psychiatry Research*, 28(2), 193–213.
- Morin, C. M., Carrier, J., Bastien, C., & Godbout, R. (2020). Sleep and circadian rhythm in response to stress. *Sleep Medicine Clinics*, 15(2), 225–235.
- Alvaro, P. K., Roberts, R. M., & Harris, J. K. (2017). A systematic review assessing bidirectionality between sleep disturbances and anxiety. *Sleep*, 40(4), zsx028.
- Palagini, L., Moretto, U., Novi, M., et al. (2019). Sleep reactivity to stress: Pathophysiology and clinical implications. *Sleep Medicine Reviews*, 45, 1–13.
- Riemann, D., Krone, L. B., Wulff, K., & Nissen, C. (2020). Sleep, insomnia, and depression. *Neuropsychopharmacology*, 45(1), 74–89.
- Harvey, A. G. (2011). Sleep and circadian functioning: Critical mechanisms in the mood disorders? *Annual Review of Clinical Psychology*, 7, 297–319.
- Edwards, R. R., Bingham, C. O., Bathon, J., & Haythornthwaite, J. A. (2006). Catastrophizing and pain. *Pain*, 122(1–2), 6–12.
- Quartana, P. J., Campbell, C. M., & Edwards, R. R. (2009). Pain catastrophizing: A critical review. *Expert Review of Neurotherapeutics*, 9(5), 745–758.