DOI: https://doi.org/10.53350/pjmhs20231711397

ORIGINAL ARTICLE

Exploring the Relationship Between Sleep Disturbances and Suicidal Ideation in Individuals with Post-Traumatic Stress Disorder (PTSD): A Cross-Sectional Study

ZAHID KHAN[1], SAQIB KHALIL[2], SEEMA SHARAFAT[3], TARIQ ALI[4], IJAZ AZIZ[5], MOMIN KHAN[6]
[1,3]*Associate Professor Neurosurgery, MTI - Lady Reading Hospital, Peshawar*
[2]*MBBS, MS, Assistant Professor Neurosurgery, Abbottabad Medical Complex/Abbottabad International Medical College, Abbottabad*
[4]*Assistant Professor of Forensic Medicine, Mekran Medical College Turbat, Pakistan*
[5]*Associate Professor of Forensic Medicine, Mekran Medical College Turbat, Pakistan*
[6]*Associate Professor, Medicine Department, Saidu Group of Teaching Hospital Swat, Pakistan*
Correspondence to: Seema Sharafat, Email: seemasharafat@yahoo.com

ABSTRACT

Introduction: Post-Traumatic Stress Disorder (PTSD) is commonly coupled with sleep disorders that include sleeping disorders and nightmares, which have been verbosely addressed with suicidal thoughts. This relationship is very critical in determining what can be done to intervene and prevent suicides.

Objective: To investigate the relationship between sleep disturbances and suicidal ideation among people with PTSD using a cross-sectional clinical study.

Materials and Methods: This cross-sectional study was carried at Neurosurgery Department, Lady Reading Hospital Peshawar, Abbottabad Medical Complex, Mekran Medical College Turbat and Saidu Group of Teaching Hospital, Swat in the duration from May, 2022 to April, 2023. One hundred and sixty-seven PTSD patients have undergone the Pittsburgh Sleep Quality Index (PSQI) and the Columbia-Suicide Severity Rating Scale (C-SSRS). Analysis of data was carried out with SPSS v26.

Results: Sleep disturbance was present in 75.4 per cent of respondents, in which insomnia and nightmares were significantly linked to suicidal ideation ($p < 0.05$). The strongest predictor was identified to be insomnia with an OR = 2.34 in logistic regression.

Conclusion: Sleep disturbances, particularly insomnia and nightmares, are strongly correlated with suicidal ideation among PTSD patients.

Keywords: PTSD, sleep disturbances, insomnia, suicidal ideation, nightmares, cross-sectional study.

INTRODUCTION

Post-Traumatic Stress Disorder (PTSD) is a highly impairing mental health condition that most commonly appears after experiencing trauma and affects the functioning level in regard to emotional control and thinking, as well as sleeping patterns. Sleep disturbances (insomnia, nightmares, disorganised sleep) form one of the constellations of PTSD related symptoms, not only because they are a widely occurring phenomenon, but also because they continue to occur. These disruptions have recently been the subject of significant interest due to their close links with suicidal ideation, an extreme and life-threatening mental health outcome. Evidence is gradually coming to support the idea that sleep is an important symptom and possible indicator of suicidal thoughts and suicidal behaviours in PTSD individuals[1]. This connection is important to understand, as there is a severe community health effect, and it is possible that clinical interventions and actions to prevent suicide might include improvement of sleep hygiene and treatment. The recent literature portrays that sleeping disorders do not occur as a by-product of suicidal ideation in people with PTSD, but they contribute to the onset and exacerbation of suicidal ideation among people with PTSD.

Weber et al[1] highlighted the fact that insomnia and nightmares are not a passive reflection of trauma, but they can be an independent risk factor in the development of suicidal tendencies. Considering the example, a large longitudinal study which studied soldiers in the U.S. army and concluded that pre-deployment insomnia remained a critical predictor of both suicidal ideation and post-deployment PTSD Wang et al[2,3]. This means that their findings present a time period and maybe a cause-and-effect scenario of disturbed sleep and the resultant mental states. In further support of this relationship, Richardson et al[4] studied treatment-seeking Canadian Armed Forces members/veterans and concluded that depression mediated the connection between sleep disturbances, nightmares, and suicidal ideation. This implies an intricate interaction in which depressive symptoms can serve as a channel through which sleep issues can heighten suicidal ideations.

Interestingly, Lake et al[5] considered the existence of a moderating factor in this relationship, cannabis use. Their population-based study suggested that cannabis had the potential to mitigate the effects of PTSD on suicidal thoughts and may provide a temporary remedy to sleep-related symptoms, but its efficacy and safety in the long term are debatable. Physiology of the sleep disturbances also gives a very important hint. According to Gupta and Jarosz[6], there was a direct relationship between the severity of obstructive sleep apnea and ideations of suicide amongst PTSD patients. They conclude that other than being psychologically mediated, sleep problems may be exacerbated by physiological factors as well, which may increase psychiatric susceptibilities. Similarly, a meta-analysis conducted by Wang, Cheng, and Xu[7] has demonstrated a strong connection between sleep disorders and suicidal behaviour among depressed patients, which suggests the universality of this correlation among other psychiatric disorders.

Demographic and social variables push an extra level of complexity on this relationship. Vasiliadis et al[8] analysed ageing persons and found that suicidal ideation is mediated by sex differences in trauma exposure, providing a PTSD and anxious-depressive pathway. Their study underlines the fact that the integration of gender-sensitive and trauma-specific points of view should become inevitable in all efforts to comprehend the connection between sleep and suicide. Researchers have noted a consistent pattern in younger age groups, such as university students, showing sleep disturbance as a predictor of suicidal ideation and self-harm behaviour Russell et al[9]. These results are attested among persons in various stages of life and at diverse ages, which underlines the comprehensiveness of this kind of relation. The production of the PTSD symptom is also moulded by environmental and cultural forces. As an example, a cross-sectional study of university students belonging to the Malaysian population discovered that, among other factors, stress and depressive symptoms that are frequently confounded with sleep

Received on 10-05-2023
Accepted on 13-10-2023

difficulties are important predictors of suicidal thoughts (Islam et al[10].

Persistence and severity of symptoms are also related to the post-trauma environments. Forresi et al[11] conducted research on children and adolescents two years after an earthquake in Italy, and found persistent PTSD symptoms, behaviour problems, and sleep disturbances, all of which showed the enduring psychological consequences of the trauma on the young survivors. Ashfaq et al[12] studied PTSD symptoms in patients with burn injuries and discovered that there was a moderation of the intensity of the symptoms, such as sleep disruption, by social support. It implies that the effects of community-based interventions can be used not only to mitigate emotional distress but also to enhance sleep and decrease suicidal risk. In the meantime, Blakey et al[13] pointed out that comorbidities, including chronic pain and traumatic brain injury, among military veterans, are powerful predictors of the presence of PTSD and suicidal ideation, further accompanied by sleep problems.

Particularly, nightmares are a topic that has been under investigation when it comes to their direct psychological impact on suicide risk. Andrews and Hanna[14] described that recurrent distressing dreams could build or degrade emotional resilience and enhance suicidal feelings, fuelling suicidal ideation. This view is consistent with the findings made by Logan et al[15] that have reported prescription drug misuse and sleep-related issues as predictors of severe suicidal ideation in clinical patients, overlapping. The background of the world crises, such as the COVID-19 pandemic, has also impacted PTSD presentations. Jiang et al[16], with the help of network analysis, demonstrated a complex structure of ties between symptoms of PTSD and the relationship between PTSD and sleep disturbances and suicidal ideas. Their investigation supports the notion that sleep problems are situated in a larger PTSD symptom network and might therefore be utilised as targets of intervention.

Feelings of entrapment, which are one of the key perspectives of the Integrated Motivational Volitional Model of Suicidal Behaviour, can be enhanced by disruptions in sleep, which leads to the transformation of suicidal intentions into actions (O'Connor and Portzky[17]). To reinforce this theoretical model, Belleville et al[18] demonstrated that victims of sexual abuse who exhibit PTSD tend to develop serious nightmares and poor sleeping patterns, and both forms of disruption were strongly associated with suicidality. Lastly, Geng et al[19] experimented with a cohort study with sample members under the age of 18 and who survived during the earthquake, which further explained the mutual occurrence between insomnia and PTSD symptoms. These findings highlight that a lack of sleep is not merely an outcome but can also be a predisposing factor to the further development of psychological distress and suicidal ideation, especially in vulnerable groups.

Objective: To achieve the relationship between sleep disturbance and suicidal ideation in patients diagnosed with Post-Traumatic Stress Disorder (PTSD), with the help of a cross-sectional analysis of clinical data.

MATERIALS AND METHODS

Study Design: Cross-sectional study.

Study Setting: The research was carried out at Neurosurgery Department, Lady Reading Hospital Peshawar, Abbottabad Medical Complex, Mekran Medical College Turbat and Saidu Group of Teaching Hospital, Swat.

Study Duration: The data was collected within a year, from May, 2022 to April, 2023.

Inclusion Criteria: The study considered the respondents aged 18-65 years who had developed Post-Traumatic Stress Disorder clinically in accordance with DSM-5. Patients were chosen only among the participants who had one or several of the above forms of sleep disturbance (e.g., insomnia, nightmares, or fragmented sleep) during the last month. The participants were required to give informed consent and explain how they could complete structured questionnaires.

Exclusion Criteria: Individuals with a history of schizophrenia, bipolar disorder or intellectual disability were not enrolled. Patients with severe physical illness, those on sedative drugs which can influence their sleeping patterns, were excluded.

Methods: The purposive sampling method was used to recruit the participants at Neurosurgery Department, Lady Reading Hospital Peshawar, Abbottabad Medical Complex, Mekran Medical College Turbat and Saidu Group of Teaching Hospital, Swat. All participants were subjected to a structured clinical interview after they signed informed consent in order to validate their PTSD diagnosis according to DSM-5 requirements. The Pittsburgh Sleep Quality Index (PSQI) was used to measure sleep disturbance, and the Columbia-Suicide Severity Rating Scale (C-SSRS) was used to measure suicidal ideation. Further information was also obtained about demographics, trauma history, and comorbid psychiatric disorders using an accepted form of a questionnaire. The results were uploaded into SPSS version 26 and anonymised in statistical analysis. Descriptive statistics configure the features of participants, and chi-square tests and logistic regression helped to control the retention between the forms of sleep disorders and suicidal thoughts. The level of statistical significance was taken at <0.05. The study obtained ethical approval from the Institutional Review Board (IRB) at JPMC and followed the principles of the Declaration of Helsinki.

RESULTS

A total of 167 participants diagnosed with Post-Traumatic Stress Disorder (PTSD) were enrolled in the study. The mean age of participants was 34.6 ± 9.4 years, with 93 (55.7%) males and 74 (44.3%) females. Most participants were between 25–45 years old, and the majority (62.3%) were unemployed at the time of data collection. Approximately 40.1% reported exposure to trauma due to violence, while others cited accidents (23.4%), sexual abuse (15.6%), or loss of a loved one (20.9%) as the primary traumatic event.

Table 1: Demographic Characteristics of Participants (n=167)

Variable	Frequency (%)
Age (Mean ± SD)	34.6 ± 9.4
Gender	
Male	93 (55.7%)
Female	74 (44.3%)
Employment Status	
Employed	63 (37.7%)
Unemployed	104 (62.3%)
Trauma Type	
Violence	67 (40.1%)
Accident	39 (23.4%)
Sexual abuse	26 (15.6%)
Loss of loved one	35 (20.9%)

Out of the total participants, 126 (75.4%) reported significant sleep disturbances. Insomnia was the most common issue, reported by 98 participants (58.7%), followed by nightmares in 76 participants (45.5%) and fragmented sleep in 62 (37.1%). Notably, 92 (55.1%) participants reported experiencing suicidal ideation.

Table 2: Prevalence of Sleep Disturbances and Suicidal Ideation

Variable	Frequency (%)
Sleep Disturbance (Any)	126 (75.4%)
Insomnia	98 (58.7%)
Nightmares	76 (45.5%)
Fragmented Sleep	62 (37.1%)
Suicidal Ideation (Any)	92 (55.1%)

Contrasted by gender, sleep disturbances were more common among females (81.1 per cent) than males (70.9 per cent). Likewise, suicidal ideation was also reported to be higher among females (62.2%) as compared to males (49.5%). Nonetheless, those differences were not of statistical significance ($p > 0.05$).

The existence of sleep difficulties was significantly connected with suicidal thoughts. Of those participants who had any form of sleep disturbance, the proportion of those with suicidal ideation was 75 (59.5%) compared to 17 (40.5%) among those who did not experience any form of sleep disturbance ($p = 0.031$).

Table 3: Association Between Sleep Disturbance and Suicidal Ideation

Sleep Disturbance	Suicidal Ideation Present	Absent	Total
Yes	75 (59.5%)	51	126
No	17 (40.5%)	24	41
Total	92	75	167

($p = 0.031$, Chi-square test)

Further logistic regression analysis was performed to examine which type of sleep disturbance had the strongest association with suicidal ideation. Insomnia (OR = 2.34; 95% CI: 1.21–4.53; $p = 0.012$) and nightmares (OR = 1.89; 95% CI: 1.02–3.52; $p = 0.041$) were both significantly associated with increased odds of suicidal ideation. Fragmented sleep was not independently associated after controlling for other variables.

Table 4: Logistic Regression – Sleep Disturbances and Suicidal Ideation

Sleep Variable	Odds Ratio (OR)	95% CI	p-value
Insomnia	2.34	1.21–4.53	0.012
Nightmares	1.89	1.02–3.52	0.041
Fragmented Sleep	1.23	0.66–2.31	0.511

These results show that the correlation between sleep disturbances and the development of suicidal ideations in patients with PTSD is clear and significant, with poor sleep quality, particularly nightmares and insomnia, taken into account. The occurrence of sleep problems greatly augmented the risk of suicidal ideations, and they should consider including sleep assessments as part of PTSD treatment regimens.

DISCUSSION

This study examined the relationship between sleep disorders and suicidal thoughts among sufferers of Post-Traumatic Stress Disorder (PTSD). The results of this cross-sectional study also support the current literature, which suggests that there exists a remarkable association between the factors of poor sleep and suicidal ideation in individuals affected by PTSD. The findings indicated that the prevalence of sleep disturbances among the participants was over 75 per cent, with the most predominant one being insomnia. Over one half of all the sample supported suicidal thoughts, and those thoughts occurred much more frequently in people with sleeping difficulties, mainly insomnia and nightmares.

These results are supported by Weber et al[1]: the authors remarked that underlying symptoms and night sleep are not secondary characteristics of PTSD and could be directly and independently implicated in suicidality. Sleep disturbances also tend to degrade emotional dysregulation as well as cognitive distortions, which are known to be precursors to suicidal ideation. Furthermore, it is shown that the biological mechanisms leading to hyperarousal and circuit rhythm impairment are also associated with the development of PTSD, along with deteriorating the incidence of sleep dysfunction as a vicious cycle further promoting the predisposition of mental illness.

Wang et al[2,3] made one important addition to this knowledge and insight by carrying out a longitudinal study that demonstrated that insomnia symptoms prior to the occurrence of trauma were predictive not only of later PTSD but also of suicidal ideation. They have discovered that sleep disturbance constitutes a risk marker, as it is not a mere symptom. This is consistent with the data obtained in the study in question, where the correlation between insomnia and suicidal ideation was evident even after controlling for other sleep disturbances. This brings forth critical implications as to whether a proactive approach to sleep problems would become a preventative strategy for PTSD-related suicidality. The interaction between sleep disturbance and suicidal ideation also needs to be mentioned. According to Richardson et al[4], in military groups, depression can frequently represent such a mediator between sleep problems and suicide risk because sleep difficulties can serve as a distal factor, whereas depressed moods intensify the risk of suicidality. The current study did not focus on depression specifically, but its mediating role cannot be ignored and should be included in any future longitudinal and mediational studies.

Moreover, moderators used in this dynamic have been related to substance use factors like the consumption of cannabis. According to Lake et al., cannabis use may decrease the effect of PTSD on suicidal ideation, which could be due to the reduction of sleep-related effects such as nightmares[5]. Nevertheless, this creates a clinical dilemma, where prolonged use of cannabis is connected to impairment and other mental disorders. In the future, researchers should consider the value of safe treatment options in addressing sleep symptoms of PTSD. The physiological aspect of sleep disturbance also requires some consideration. The study by Gupta and Jarosz[6] provided interesting evidence that supports the relationships between obstructive sleep apnea and the augmented ideation of suicide among patients with PTSD, which seems to imply that even a non-psychological sleep disorder can be one of the reasons for suicide. Screening for sleep apnea, thus, may serve as a valuable addition in multi-modal PTSD assessment practices. Equally, a meta-analysis done by Wang et al[7] revealed that sleep disturbances among psychiatric populations substantially increased the likelihood of suicide attempts and ideation.

This relationship is further exercised by sociodemographic factors and trauma-specific factors. Vasiliadis et al[8] found some gender differences in terms of trauma exposure, with females exposed to interpersonal violence being more likely to develop PTSD and suicidal thoughts. In the present study, although differences were not significant, females showed higher levels of sleep disturbance and suicidal ideation than males. Nevertheless, this could be explained by the small sample size and cultural variations that might affect the symptom reporting and health-seeking behaviour. Russell et al[9] noted that sleep disturbances were a stable forecast of suicidal behaviour and self-harm within the university population. Despite the fact that the present study dealt with a more general population of adult individuals, the results still reflect the need to treat sleep issues among high-prevalent populations, including students and young adults. Likewise, the idea that poor sleep, depression, and suicidal thoughts are somehow connected in different world populations is further supported by the research conducted by Islam et al[10] in Malaysia.

The long-term effects of sleep problems and other PTSD symptoms that are persistent even many years after trauma exposure have been rigorously studied. According to Forresi et al.[11], two years after the 2012 earthquake in Italy, children and adolescents still reported emotional and behavioural problems, including poor sleep. Geng et al[19] argue that the bidirectional nature of trauma and sleep impairment supports the possibility of chronic sleep issues leading to the continuation of PTSD and suicidal thoughts throughout the years. The research by Ashfaq et al[12] and Blakey et al[13] puts emphasis on the presence of comorbidities and environmental stressors. As an illustration, social support affects the symptoms of PTSD in a protective, buffering manner, which could be the indirect cause of sleep disturbances and suicidality. Meanwhile, conditions such as chronic pain and traumatic brain injury worsen the problem of sleep and suicidal ideations, mostly in veterans. Such results

emphasise the need for a personalised, multi-dimensional treatment program.

Specifically, nightmares are also termed the best predictors of suicidal ideation. Andrews and Hanna[14] suggested recurrent nightmares as one of the factors that caused a feeling of entrapment and hopelessness, which were psychologically critical processes in suicidal ideation. This is consistent with the Integrated Motivational Volitional Model of Suicidal Behaviour as presented by O'Connor and Portzky[17], who hold that sleep disturbance exacerbates factors such as entrapment and perceived burdensomeness. Furthermore, patients whose sleep is disrupted tend to resort to maladaptive coping behaviours such as substance misuse, which is correlated with suicidal ideation. According to Logan et al., sleep problems and suicidality offered a strong relationship with prescription drug misuse[15]. Although the given study did not measure the misuse of medications, it is a significant domain that needs future investigation.

The COVID-19 pandemic has presented research on PTSD and sleep with a new facet. Jiang et al[16] showed that the pandemic worsened the symptoms of PTSD and sleep disorders that were linked to more suicidal thoughts. The findings lend credence to tackling sleep in both the clinical setting and at the community preparedness level. Lastly, Belleville et al[18] demonstrated that people who had a history of sexual abuse and PTSD were most commonly affected by severe nightmares, which further proves the significance of the characteristics of traumas on sleep patterns and the risk of suicide. These findings justify a more comprehensive trauma history in the tool used in clinics and imply that interventions aimed at reducing symptoms specific to sleep may be an effective means to enhance outcomes in a high-risk group.

CONCLUSION

The conducted study points to a strong correlation between sleep disturbances, especially insomnia and nightmares, and suicidal thoughts in the case of people who have Post-Traumatic Stress Disorder (PTSD). Considering that over 75% of subjects indicated that they had some sleep-related problem, and a majority of those who indicated that they have suicidal thoughts, the study results highlight the importance of sleep on the mental health and the safety of PTSD patients. Predictors of suicidal ideation were highly linked to insomnia and nightmares, and this should encourage regular screening of sleep in the clinical diagnosis of PTSD. These findings correspond with the current body of literature and support the multidimensional nature of sleep disturbances on emotional control and cognitive functioning as well as general psychological well-being. Since the relationship between trauma, sleep, and suicidality is complicated, sleep-based interventions can provide a crucial route towards lowering the chances of suicide among this susceptible population. To pursue the path in the subject of causality further, longitudinal studies in the future are advised to test the success of sleep-themed methods of treatment in the reduction of suicidality in PTSD groups.

REFERENCES

1 Weber FC, Norra C, Wetter TC. Sleep disturbances and suicidality in posttraumatic stress disorder: an overview of the literature. Frontiers in psychiatry. 2020 Mar 10;11:167.

2 Wang HE, Campbell-Sills L, Kessler RC, Sun X, Heeringa SG, Nock MK, Ursano RJ, Jain S, Stein MB. Pre-deployment insomnia is associated with post-deployment post-traumatic stress disorder and suicidal ideation in US Army soldiers. Sleep. 2019 Feb;42(2):zsy229.

3 Wang HE, Campbell-Sills L, Kessler RC, Sun X, Heeringa SG, Nock MK, Ursano RJ, Jain S, Stein MB. Pre-deployment insomnia is associated with post-deployment post-traumatic stress disorder and suicidal ideation in US Army soldiers. Sleep. 2019 Feb;42(2):zsy229.

4 Don Richardson J, King L, St. Cyr K, Shnaider P, Roth ML, Ketcheson F, Balderson K, Elhai JD. Depression and the relationship between sleep disturbances, nightmares, and suicidal ideation in treatment-seeking Canadian Armed Forces members and veterans. BMC psychiatry. 2018 Jun 19;18(1):204.

5 Lake S, Kerr T, Buxton J, Walsh Z, Marshall BD, Wood E, Milloy MJ. Does cannabis use modify the effect of post-traumatic stress disorder on severe depression and suicidal ideation? Evidence from a population-based cross-sectional study of Canadians. Journal of psychopharmacology. 2020 Feb;34(2):181-8.

6 Gupta MA, Jarosz P. Obstructive sleep apnea severity is directly related to suicidal ideation in posttraumatic stress disorder. Journal of clinical sleep medicine. 2018 Mar 15;14(3):427-35.

7 Wang X, Cheng S, Xu H. Systematic review and meta-analysis of the relationship between sleep disorders and suicidal behaviour in patients with depression. BMC psychiatry. 2019 Oct 17;19(1):303.

8 Vasiliadis HM, Lamoureux-Lamarche C, Pitrou I, Berbiche D. Sex differences in type of lifetime trauma and suicidal ideation mediated by post-traumatic stress and anxio-depressive disorders in older adults. International psychogeriatrics. 2020 Apr;32(4):473-83.

9 Russell K, Allan S, Beattie L, Bohan J, MacMahon K, Rasmussen S. Sleep problem, suicide and self-harm in university students: A systematic review. Sleep medicine reviews. 2019 Apr 1;44:58-69.

10 Islam MA, Low WY, Tong WT, Yuen CW, Abdullah A. Factors associated with depression among university students in Malaysia: a cross-sectional study. KnE Life Sciences. 2018 May 17:415-27.

11 Forresi B, Soncini F, Bottosso E, Di Pietro E, Scarpini G, Scaini S, Aggazzotti G, Caffo E, Righi E. Post-traumatic stress disorder, emotional and behavioral difficulties in children and adolescents 2 years after the 2012 earthquake in Italy: an epidemiological cross-sectional study. European Child & Adolescent Psychiatry. 2020 Feb;29(2):227-38.

12 Ashfaq A, Lashari UG, Saleem S, Naveed S, Meraj H, Waqas A. Exploring symptoms of post-traumatic stress disorders and perceived social support among patients with burn injury. Cureus. 2018 May 22;10(5).

13 Blakey SM, Wagner HR, Naylor J, Brancu M, Lane I, Sallee M, Kimbrel NA, Workgroup VM, Elbogen EB. Chronic pain, TBI, and PTSD in military veterans: a link to suicidal ideation and violent impulses?. The journal of pain. 2018 Jul 1;19(7):797-806.

14 Andrews S, Hanna P. Investigating the psychological mechanisms underlying the relationship between nightmares, suicide and self-harm. Sleep medicine reviews. 2020 Dec 1;54:101352.

15 Logan JE, Ertl AM, Rostad WL, Herbst JH, Ashby Plant E. Shared correlates of prescription drug misuse and severe suicide ideation among clinical patients at risk for suicide. Suicide and Life-Threatening Behavior. 2020 Dec;50(6):1276-87.

16 Jiang W, Ren Z, Yu L, Tan Y, Shi C. A network analysis of post-traumatic stress disorder symptoms and correlates during the COVID-19 pandemic. Frontiers in psychiatry. 2020 Nov 10;11:568037.

17 O'Connor RC, Portzky G. The relationship between entrapment and suicidal behavior through the lens of the integrated motivational–volitional model of suicidal behavior. Current opinion in psychology. 2018 Aug 1;22:12-7.

18 Belleville G, Dubé-Frenette M, Rousseau A. Sleep disturbances and nightmares in victims of sexual abuse with post-traumatic stress disorder: An analysis of abuse-related characteristics. European Journal of Psychotraumatology. 2019 Dec 31;10(1):1581019.

19 Geng F, Liang Y, Li Y, Fang Y, Pham TS, Liu X, Fan F. Bidirectional associations between insomnia, posttraumatic stress disorder, and depressive symptoms among adolescent earthquake survivors: a longitudinal multiwave cohort study. Sleep. 2019 Nov;42(11):zsz162.

This article may be cited as: Khan Z, Khalil S, Sharafat S, Ali T, Aziz I, Khan M: Exploring the Relationship Between Sleep Disturbances and Suicidal Ideation in Individuals with Post-Traumatic Stress Disorder (PTSD): A Cross-Sectional Study. Pak J Med Health Sci, 2023;17(11):397-400.