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REVIEW ARTICLE

Nightmares in borderline personality disorder – narrative review.

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Abstract

BACKGROUND: Borderline personality disorder (BPD) patients commonly suffer from nightmares. Still, the prevalence of this issue does not match the little clinical attention it usually receives. Nightmares impact sleep and daily functioning and may play a role in BPD symptomatology, including suicidality. Since BPD has been linked with high rates of suicide, the potential connection with suicidality is crucial to address.
AIMS: To create an up-to-date review of current knowledge on nightmares in BPD and to explore the links between nightmares, insomnia, and suicidality or self-harm in BPD patients.
METHOD: This narrative review was conducted using the PubMed, Web of Science, and Google Scholar databases to search for articles published between January 1990 and October 2022, using the following key terms: 'borderline personality disorder' and 'nightmares' or 'insomnia' and 'suicidality' or 'self-harm' or 'self-injuring'. The final list consisted of 99 publications.
RESULTS: Sleep disturbances often occur in BPD patients. The prevalence of nightmares in BPD is higher than in general or clinical populations. Nightmares influence borderline personality traits and vice versa through emotional dysregulation, poorer sleep quality, nightmare anxiety, higher arousal, and worsened self-control. A link between nightmares and suicidal behaviour was established in some psychiatric conditions (depression, insomnia); studies on BPD are lacking in this area. Studies comparing nightmares in BPD to other disorders are also missing. There are some suggestions for pharmaceuticals or psychotherapy in treating nightmares, but their application to BPD needs more research.
CONCLUSION: Sleep disturbance and nightmares are common among individuals with BPD yet underrepresented in research. Nightmares have been linked with suicidality in other conditions (depression, PTSD) but only indirectly in BPD. More clinical studies are needed to explore the phenomenon further.

INTRODUCTION

Borderline personality disorder (BPD) is defined by interpersonal hypersensitivity, emotional dysregulation, self-harming, impulsivity, and identity disorder, which are major causes of morbidity and mortality (Grant *et al.* 2008). Although sleep-related problems often occur in patients with BPD in clinical settings, sleep disorders are not included in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) and DSM-5 diagnostic criteria for BPD (APA 2000; APA 2013).

Many studies have shown that BPD is indeed associated with sleep disorders. In particular, a meta-analysis by Winsper *et al.* (2017) compared 32 studies studying patients with BPD and healthy controls and found several significant differences, such as objective lapses in sleep continuity, especially reduced sleep time, sleep latency, and sleep efficiency and different sleep architecture, more nightmares and decreased sleep quality were found in self-reports of patients with BPD. Co-occurring depression was also studied, but not every sleep problem was explained by its presence, similar to using psychotropic substances (Winsper *et al.* 2017). Other studies highlighted a higher prevalence of nightmares in individuals with BPD than in the general population (Hartmann *et al.* 1981; Asaad *et al.* 2002; Selby *et al.* 2013; DeShong & Tucker, 2019). Nightmares are defined in DSM-5 as extremely dysphoric dreams that threaten an individual's life or at least their emotional or physical sense of security (APA 2013). Additionally, they may impact emotions during the subsequent day through increased distress, anxiety or concern (Vanek *et al.* 2020).

Simultaneously, in patients diagnosed with BPD, suicidality is one of the most significant aspects. Some sources say up to 10 % of patients with BPD commit suicide and have a fiftyfold higher suicide risk than the general population (APA 2001). History of suicide attempts can be found in 84 % of patients with BPD (Soloff *et al.* 2002), and some studies found a mean lifetime risk ratio of suicide attempts of 3.4 per individual (Soloff *et al.* 1994). Since the peak of psychopathology in BPD often occurs at a younger age, and suicidal behaviour is one of the most closely monitored features of BPD, as it has an extreme impact on the lives of the patients with BPD and their close ones (Ennis *et al.* 2017; Morales-Muñoz *et al.* 2020).

This review aimed to examine the exact relationship between nightmares and BPD and whether there is a known connection between nightmares and suicidal behaviour in patients with BPD.

Several research questions have been formulated:

(1) How common are nightmares in BPD?
(2) What is the relationship between nightmares and borderline personality disorder?
(3) Are nightmares in BPD linked with self-harm and suicidality?
(4) Are nightmares in BPD different from nightmares in other disorders?
(5) What are the treatment options for nightmares in BPD?

METHOD

A narrative review was compiled using the PubMed, Web of Science, and Google Scholar databases to search for articles published between January 1990 and September 2022, with the use of the following key terms: '(borderline personality disorder) and (nightmares or insomnia) and (suicidality or self-harm or self-injuring)' in different combinations. Inclusion criteria were (1) studies in humans only, (2) published in a peer-reviewed journal, (3) clinical trials, meta-analysis, randomized controlled trials, review, a systematic review on a related topic, and (4) English language. The exclusion criteria were: (1) thesis or dissertation papers, (2) abstracts from conferences, (3) popular articles, and (4) editorial commentaries.

More studies were accessed by exploring the references of the primary findings. Texts were gathered and organized according to their relevance.

Selection of studies

Figure 1 shows the flow chart of the source search. The primary keyword search yielded 298 articles, of which 201 papers met the inclusion criteria and were studied closely. Secondary documents from the references of the previously selected documents were scrutinised, evaluated for suitability, and supplemented to the list. A total of 99 papers were used for review (Figure 1).

RESULTS

1) How common are nightmares in BPD?

Studies found that nightmare frequency and subjective sleep quality are strongly associated with BPD symptoms (Kessler & Merikangas, 2004). Patients with BPD experience nightmares more often (Hartmann *et al.* 1981; Asaad *et al.* 2002; Selby *et al.* 2013; DeShong & Tucker, 2019).

Insomnia in BPD

Many studies have shown an association between BPD and sleep disorders (Vanek *et al.* 2021). The study of Selby *et al.* (2013), who analyzed part of the National Comorbidity Survey–Replication (NCS-R) sample (Kessler & Merikangas, 2004), found that many BPD patients have at least one sleep problem (63 %) and at least one consequence from lack of sleep over the past year (66%) (Selby *et al.* 2013). Semiz *et al.* (2008) found sleep issues in 95.5 % of the studied patients with BPD (Semiz *et al.* 2008).

Research on sleep disorders in BPD using questionnaires and self-report scales found latency of sleep onset, higher sleep arousals, nightmares occurring more

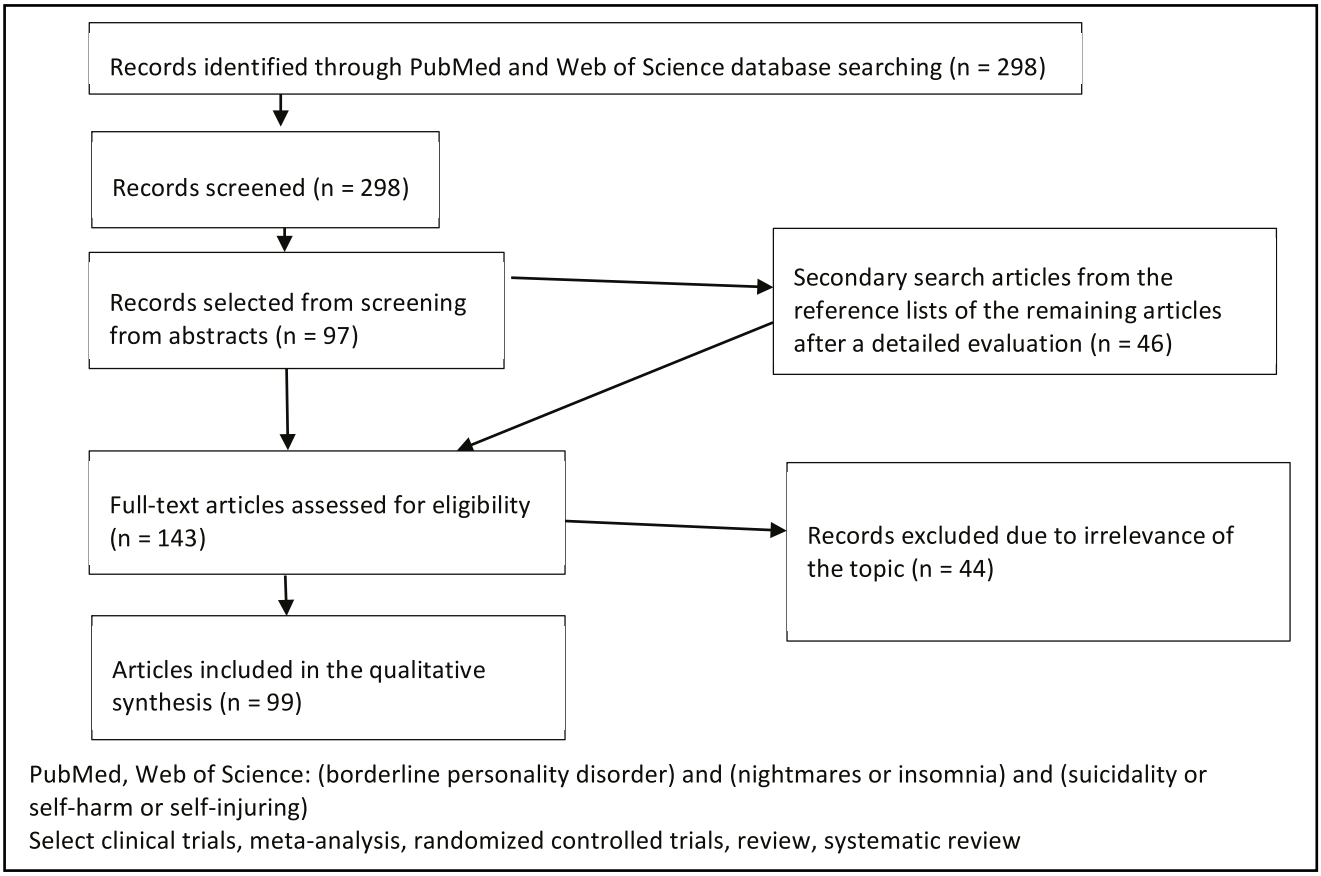

Fig. 1. Diagram of the literature selection process

often, and frequent waking up in people with borderline personality disorder (via Van Dream Anxiety Scale (VDAS) and Pittsburgh Sleep Quality Index (PSQI) (Semiz *et al.* 2008). Poor sleep among current borderline patients was represented by a decrease in subjective quality of sleep, increased sleep latency and overall less time spent sleeping. Sleep efficiency was lower, even though the medication used for sleeping was higher. More sleep disorders in general and worsened daily functioning due to lack of sleep were all established by PSQI (Noll *et al.* 2006). Plante *et al.* (2013) used the Dysfunctional Beliefs and Attitudes about Sleep questionnaire (DBAS-16) for patients diagnosed with BPD. The participants with BPD who did not recover slept subjectively worse than those with recovered BPD. These differences were apparent even after ruling out some variables, such as age, gender, co-occurring affective disorder or anxiety disorder, obstructive sleep apnea, and restless legs syndrome. The authors emphasized the importance of research in recognizing maladaptive cognitions about sleep and its impact on the severity of BPD (Plante *et al.* 2013).

A cross-sectional study also used PSQI and found a correlation between the test result and some objective measurements of BPD traits (including self-harm), suggesting that patients who suffer from more pronounced symptoms of BPD also have poor sleep (Sansone *et al.* 2010). Limitations of this study on the topic of BPD are that it did not rule out other psychiatric comorbidities, and the sample did not include diagnosed BPD patients but internal medicine patients with different problems (Sansone *et al.* 2010). Harty *et al.* (2010) conducted subjective sleep quality in 513 jail inmates and confirmed a strong connection between sleep problems and BPD symptoms while ruling out depression and addiction (Harty *et al.* 2010).

Systematic screening and objective evaluation using polysomnography (PSG) showed that healthy controls had better sleep quality than BPD patients (Asaad *et al.* 2002). Empirical data suggest that borderline patients have some differences in sleep architecture from the general population: reduced REM latency, decreased sleep time, more phase 1 sleep, and less phase 4 sleep (Benson *et al.* 1990). Recent research that used polysomnography in BPD patients has shown changes in sleep with rapid eye movement, slow-wave sleep and the continuity of sleep compared to healthy controls, but the results were inconsistent. Overall, patients with BPD reported subjectively worse sleep and showed objectively presented irregular or different sleep patterns, which are sometimes observed in sleep deprivation or depressive syndrome (Huỳnh *et al.* 2016; Van Veen *et al.* 2017; Jenkins *et al.* 2021; Bastien *et al.* 2008).

Several studies specifically ruled out possible comorbidities. Philipsen *et al.* (2005) reported that non-depressed BPD subjects reported significantly shorter sleep, and its quality was worse than in healthy controls (Phillipsen *et al.* 2005). Schredl *et al.* (2012) also used PSG and found similar differences as previous studies independent of comorbid PTSD, which was present in 33% of their patients (Schredl *et al.* 2012). A previously mentioned meta-analysis by Winsper *et al.* (2017) found significant lapses between BPD and healthy controls in objective and subjective measures independent of depressivity and concomitant use of psychotropic drugs (Winsper *et al.* 2017). However, Fleischer *et al.* (2012) concluded that such PSG abnormalities occur not exclusively in BPD patients but have been reported in other psychiatric disorders as well (Fleischer *et al.* 2013).

Prevalence of nightmares in BPD

It is well-documented that nightmares and sleep disorders often occur in individuals with BPD (Asaad *et al.* 2002; Selby *et al.* 2013). "High" prevalence is reported in many studies; interestingly, the specific prevalence is rarely determined. Some studies estimate the prevalence of nightmares in BPD to be around 49-50 % (Kessler *et al.* 2004; Hafizi *et al.* 2013). Semiz *et al.* (2008) aimed to determine the difference in the subjective assessment of nightmares, the anxiety experienced in them, and sleep problems in BPD and control patients. Participants often suffered from nightmares (49 %), as reported in PSQI and VDAS. These patients also reported stronger anxiety from dreams and lower sleep quality than those without diagnoses (Semiz *et al.* 2008). Whereas the nightmares prevalence in the general population varies from about 1–10 % according to different sources, a clinical psychiatric population shows a prevalence ranging from 10 to 20 % (Hafizi *et al.* 2013; Spoormaker & van den Bout, 2005; Schredl, 2010; Sandman *et al.* 2013; Skrzypińska & Szmigielska, 2015). However, nightmares in BPD occur more often than in general or clinical populations (Hafizi *et al.* 2013).

2) What is the relationship between nightmares and borderline personality disorder?

Nightmares and emotional regulation

Emotional dysregulation is an essential feature of BPD that has been bidirectionally linked with sleep disorders (Conklin *et al.* 2006; Glenn & Klonsky, 2009; Palagini *et al.* 2017). Emotional dysregulation can influence sleep through increased arousal and affectivity and have an overall negative impact on sleep quality; at the same time, sleep difficulties can increase emotional dysregulation (Selby *et al.* 2013; Vanek *et al.* 2020; Fairholme *et al.* 2013; Baum *et al.* 2014; Palmer *et al.* 2018; Goldschmier 2019; Harvey *et al.* 2011). Emotional regulation also mediates the effects of nightmares on daily functioning in the general population (Ward-Ciesielski *et al.* 2018). Pre-sleep arousal is an important factor contributing to sleep difficulties (Vanek *et al.* 2020; Harvey *et al.* 2002; Tang & Harvey, 2004). Anxiety and stress decrease sleep quality and emotion regulation in BPD individuals; however, this relationship is frequently neglected (Winsper *et al.* 2017).

Two studies inquired about the effect of emotional dysregulation on sleep in young individuals showing BPD traits (Grove *et al.* 2017; Wall *et al.* 2020). Grove *et al.* (2017) hypothesise that emotional dysregulation is one of the bridges between BPD problems and disrupted sleep in university students. They also studied specific characteristics of emotional dysregulation – deficiency in emotional awareness and emotion regulation identified by the Difficulties in Emotional Regulation Scale (DERS) contributed to subjective sleep problems associated with BPD (Grove *et al.* 2017). However, the following study with a clinical sample did not detect any effect of emotion regulation problems and emphasised the necessity for further investigation using objective sleep measuring (Wall *et al.* 2020).

Nightmares could also intensify daytime emotional dysregulation and therefore disrupt sleep even further. The Emotional Cascade Model (ECM), presented recently as an explanation for turbulent emotions in borderline patients, included a hypothesis about nightmares as well, that we may consider them a rumination of negative thoughts that may induce aversive emotional states (or emotional cascades) during sleep (Selby *et al.* 2013; Selby *et al.* 2009). Selby *et al.* (2013) expected that stress experienced during waking hours could increase thought ruminations during sleep and nightmare-like phenomena. They assessed 47 participants with dysregulated behaviour; 16 were diagnosed with BPD. Negative emotions, negative thought ruminations, and nightmare occurrences were observed every day for fourteen days. Studies showed that BPD patients reported more nightmares; the experience of emotional cascades and intense rumination predicted more nightmares. These findings followed a review of key variables, including sleep quality, depression, and posttraumatic stress disorder. Results also suggest that daily managing ruminations and negative emotions in psychotherapy could improve sleep (Selby *et al.* 2013).

Nightmares, impulsivity, and self-control

Wall *et al.* (2020) propose that anxiety, stress and consecutive depression stemming from an unhinged emotional reaction in BPD patients might greatly contribute to sleep problems (Wall *et al.* 2020). Worsened sleep and higher impulsivity have been linked in studies (Huỳnh C *et al.* 2016; Morales-Muñoz *et al.* 2021), as well as poorer self-control and coping skills of BPD patients (Selby *et al.* 2013). In a contemporary study, Jenkins *et al.* (2022) studied sleep in borderline patients using wrist actigraphy and questionnaires. Analyses showed that difficulties in controlling and handling emotional impulses and stress and anxiety contribute to subjective sleep impairment in the studied group (Jenkins *et al.*

2022). Higher impulsivity was further connected with more self-harming behaviour in BPD patients (Colle *et al.* 2020).

Nightmares, identity, and childhood trauma

Childhood trauma and attachment problems resulting in disrupted identity have been closely linked with BPD (Agrawal *et al.* 1997). Adults and children who experienced trauma often report sleep disturbances that often defy treatment (Semiz *et al.* 2008; Glod *et al.* 1997). It has been reported that 77 % of sexual assault survivors suffer from sleep disturbances and nightmares, which can, unfortunately, last for many years (Krakow *et al.* 2002). This makes the history of trauma important as a confounding factor in sleep disturbances in people with BPD; however, this has not been included in many studies concerning sleep disorders in this group (Zanarini *et al.* 1997).

In an adolescent group, Agargun *et al.* (2003) described the initial role of adverse or traumatic events while growing up, their connection to nightmare and dream anxiety experience, and dissociative tendencies (Morin & Benca, 2012). More severe dream anxiety, stronger dissociation and sleep problems were connected to the severity of trauma experienced in childhood (Neylan *et al.* 2001). Dissociation is strongly linked with BPD and childhood trauma, although these papers did not specifically study borderline personality disorder (Watson *et al.* 2006). Adolescents who show borderline traits have more often experienced recurrent nightmares in childhood (Morales-Muñoz *et al.* 2020). In this cohort study of 7,155 individuals, frequent night awakenings at 18 months of age and uneven sleep routines at 6, 30, and 5.8 years were connected to psychotic experiences. On the other hand, constricted sleep periods and the shifted onset of sleep at 3.5 years are associated with borderline traits (Morales-Muñoz et al. 2020). Frequent nightmares might amplify trauma experiences and add to the possible development of borderline personality disorder (Winsper *et al.* 2017). Lereya *et al.* (2017) also report that persistent nightmares in early adolescence (around 11-12 years) predicted BPD symptoms and mediated the association between emotional temperament and maladaptive parenting (Lereya *et al.* 2017).

Several lines suggest an interconnection between borderline traits, childhood trauma, and nightmares. Claridge *et al.* (1998) found more adverse events and more stress caused by nightmares in their borderline subjects. Current results report that borderline personality traits and a history of abuse or neglect predicted more adverse nightmare experiences (Claridge *et al.* 1998). Stronger dream anxiety is linked to more frequent adverse childhood events, dissociation, and sleep problems in BPD (Kessler *et al.* 2004).

3) Are nightmares in BPD linked with suicidality and self-harm?

BPD's severity can be assessed by the number of symptoms presented, intensity, frequency, need for psychiatric hospitalizations, or suicidal behaviour. Suicidality and suicidal behaviour are among the most severe and impactful factors of BPD – the risk of suicide significantly increases compared to the general population (APA 2001). A history of self-harming behaviour is a diagnostic criterion for BPD (APA 2013).

Generally, BPD patients with more pronounced symptoms also report more nightmares (Kessler & Merikangas, 2004). A cross-sectional study used the Pittsburgh Sleep Quality Index (PSQI) to find a positive correlation between the severity of symptoms of BPD and sleep disorders (Plante *et al.* 2013).

Nightmares and suicidality

The link between poor sleep, frequent nightmares and contemplating or committing suicide has been the subject of many studies (Krakow *et al.* 2002; Bernert *et al.* 2005; Bernert *et al.* 2009; McCall *et al.* 2011). Nightmares and their association with suicidal thoughts have been confirmed in general and clinical populations. Studies comparing or reviewing depressed patients also linked insomnia and nightmares with suicidal behaviour (Agargun *et al.* 1998; Coryell & Young, 2005; McCall *et al.* 2013). In PTSD, nightmares worsen the overall condition (Krakow *et al.* 2002; Krakow *et al.* 2002). McCall *et al.* (2013) found maladaptive attitudes toward sleeping and suicidal ideation intensity in depressed patients. However, these papers did not examine specific borderline patterns; therefore, they cannot be automatically referred to borderline patients, although we might expect a similar connection (McCall *et al.* 2013).

DeShong *et al.* (2019) measured BPD symptoms and their link to insomnia, nightmares, and suicide risk in 281 patients recruited via self-report measures, 10 % of whom had a high score in the McLean Screening Instrument for BPD (MSI-BPD) and therefore showed high sensitivity and specificity for BPD (Zanarini *et al.* 2003). Symptoms of BPD were connected with sleep problems and, through it, suicide risks, although nightmares were not specifically linked. The probable influence of nightmares on other BPD traits (such as emotional regulation) was mentioned in the discussion (DeShong & Tucker, 2019).

Winsper & Tang, (2014) searched for possible factors behind the link between suicide and insomnia that could be relevant in BPD patients. The tendency to impulsive reactions, emotion regulation problems, and negative cognitions such as catastrophizing and hopelessness seem most involved (Winsper & Tang, 2014).

Nightmares and nonsuicidal self-injury

The relationship between nonsuicidal self-injury (NSSI) and insomnia has been observed in a study with adolescents (Bandel & Brausch, 2020). Ennis *et al.* (2017) linked nightmares, but not insomnia, with NSSI in clinical samples (Ennis *et al.* 2017). Hochard *et al.* (2019) explored nightmare content in connection with the NSSI in participants suffering from nightmares but found no significant links between particular nightmare themes and self-injury (Hochard *et al.* 2019).

4) Are nightmares in BPD different from nightmares in other disorders?

The frequency and content of nightmares have been studied in both clinical and general populations. The content of a nightmare itself is not specific for psychiatric diagnoses (apart from trauma flashbacks in PTSD) (Hochard *et al.* 2019; Schredl *et al.* 2003; Vanek *et al.* 2020). However, some differences in phenomena accompanying nightmares (such as dream anxiety, conviction about dreams etc.) were found when studying other psychiatric illnesses, although only a few studies compared nightmares in BPD and different disorders.

Nightmares in BPD and depression

Depression, anxiety, and stress frequently coincide with BPD (Chanen *et al.* 2007; Winsper *et al.* 2016) and are independently associated with sleep disturbance (Papadimitriou & Linkowski, 2005; Nutt *et al.* 2008; Alvaro *et al.* 2013). Agargun *et al.* (1998) found that nightmares have a strong connection to suicidal behaviour related to major depression (Agargun *et al.* 1998). McCall *et al.* (2013) linked insomnia to the intensity of suicidal ideas. These studies did not include personality disorder comorbidities (McCall *et al.* 2013).

Although sleep difficulties in borderline patients cannot be exclusively ascribed to comorbid depressive disorder, interestingly, there have been reports of similarities between the two disorders (Winsper *et al.* 2017; Hafizi 2013; Oltmanns & Oltmanns, 2015). Depressive symptoms present in BPD patients may therefore worsen sleep problems further. However, no studies are comparing BPD patients with comorbid depression and without comorbidity.

Nightmares in BPD and anxiety disorders

Pre-sleep arousal contributes to sleep problems and intensifies subjective sleep difficulties (Harvey *et al.* 2002; Tang & Harvey, 2004). Patients with BPD sometimes report significant anxiety from nightmares and fear of falling asleep due to experiencing them, which exacerbates the pre-sleep arousal (Kessler & Merikangas, 2004). BPD patients already have higher arousal (Kuo & Linehan, 2009), and these dream anxiety arousals can subsidise sleep problems (Selby *et al.* 2013). Nevertheless, anxiety and stress levels were not always included in studies assessing sleep disorders in BPD (Winsper *et al.* 2017).

In addition to poor sleep quality, many individuals with nightmares also report higher tension during the day and night that stems from nightmares. It has been suggested that nightmares and nightmare anxiety predict higher psychosocial disturbance (Levin & Fireman, 2002). The level of dream anxiety stems more likely from personality traits than the content of a nightmare, and nightmare occurrence may be a function of significant stress (Schredl, 2003).

Studies comparing BPD with and without comorbid anxiety disorder are also lacking. Despite growing interest in sleep disorders in the psychiatric field, evaluating sleep disorders as a factor of BPD severity is hardly ever done. To our knowledge, measuring nightmares in patients with BPD and their subjective measurements of dream anxiety and sleep efficiency has not yet been reported.

Nightmares in BPD, dissociative disorders, and PTSD

As there is also a connection between nightmares and dissociative symptoms, dreams were hypothesised to be a form of dissociation process that reflected monitoring and reaction to dreamers´ state and environment (Neylan *et al.* 1998). Dreams may play an essential role in emotional adaptation to adverse events, and even nightmares may have an adaptive function (Agargun *et al.* 2003). These results are proportionate with other studies on traumas, which explored the subjective perception of sleep and found increased sleep disturbances (Semiz *et al.* 2008; Neylan *et al.* 1998).

BPD and dissociative disorders have also been associated. Agargun *et al.* (2003) reported an increased occurrence of nightmare disorders in patients suffering from dissociative disorder and that BPD and nightmare disorder often appear together. In addition, the neuroanatomical correlates of nightmares and dissociative phenomena are thought to be comparable to traumatic dreams, especially in the amygdala and frontal-orbital structures (Agargun *et al.* 2003). As mentioned, high anxiety connected to dreaming correlates with adverse childhood experiences, worsened sleep and dissociative problems in BPD (Kessler & Merikangas, 2004).

It can be loosely concluded that mechanisms of nightmares in BPD might be similar in origin and adaptive function. However, their overall impact on the general functioning of people with BPD, compared to people with PTSD or dissociative disorder, might be different; this is yet to be explored by research.

5) What are the treatment options for nightmares in BPD?

Studies on patients with BPD that focused on treating BPD scarcely monitored changes in nightmares and sleep disorders. Several studies worked with the treatment of nightmares by imagery rehearsal therapy; however, they did not reach significant results with BPD

patients (Krakow & Zadra, 2006; Thünker & Pietrowski, 2012; Van Schagen *et al.* 2015; Ellis *et al.* 2019).

As for other psychotherapeutic approaches, cognitive behavioural therapy (CBT) is well-researched in association with sleep problems. Non-pharmacological approaches to persistent sleeplessness, particularly cognitive-behavioural methods, have shown effectiveness, in some cases even higher than pharmacological approaches and might be useful in people with BPD (Morin & Benca, 2012); however, studies on BPD groups are missing. Several methods of CBT are suitable for reducing symptoms of nightmares (Vanek *et al.* 2020; Spoormaker *et al.* 2006; Lancee *et al.* 2008), but their efficiency on nightmares in BPD, in particular, has not been evaluated. It has also been revealed that nightmare distress could stem from nightmares and maladaptive cognitions (McCall *et al.* 2013). Working with these cognitions was shown to have a soothing effect on the overall distress of patients with nightmares. (Krakow 2015; Plante *et al.* 2013).

Dialectic Behavioural Therapy (DBT) works specifically with borderline personality disorder and related problems; research on the impact of this treatment on sleep parameters is missing (Kessler & Merikangas, 2004). Imagery rehearsal therapy, sleep hygiene and stimulus control are also connected with treating nightmares and improving overall condition in patients with PTSD (Krakow *et al.* 2001); however, the effect in BPD patients was not confirmed. Weinhold *et al.* (2017) conducted an interesting study on patients with comorbid PTSD and BPD who enrolled in Narrative Exposure Therapy (NET) and demonstrated improved sleep parameters with polysomnography. This also emphasizes the potential similarity between traumatic and BPD nightmares (Weinthold *et al.* 2017).

As for the pharmacological treatment of nightmares, smaller studies of selective serotonin reuptake inhibitors lead to documented benefits for BPD behavioural symptoms and trauma-related sleep problems (Neylan *et al.* 2001; Rinne *et al.* 2002). The effectiveness in patients with BPD has not been studied yet.

Many other pharmaceuticals have been studied regarding nightmares (e.g., prazosin, doxazosin, gabapentin, risperidone, and trazodone), usually in PTSD patients, but not in BPD patients specifically (Vanek *et al.* 2020). Some researchers suggested prazosin (an alpha1-adrenergic antagonist) to reduce nightmares in BPD patients (Selby *et al.* 2013).

DISCUSSION AND FUTURE DIRECTIONS

This review intended to examine connections between nightmares and BPD and whether there is a known connection between nightmares and suicidal behaviour in individuals with BPD.

Overall, there seems to be a shift of interest toward this condition in clinical practice and medical research, especially when assessing new psychotherapeutic approaches. However, studying BPD symptoms and their interaction with the overall condition is also important – knowing more about specific phenomena could help identify the needs of these patients and select the most suitable treatment. However, studies focusing on specific problems in patients with BPD are still scarce.

1) How common are nightmares in BPD?

Despite growing interest in sleep problems in psychiatric patients, BPD is rarely assessed together with sleep difficulties. For example, measuring nightmares in patients with BPD and their subjective measurements of dream anxiety and the quality of sleep has not been reported. Many studies on sleep disorders in psychiatric patients did not search for personality disorders, and many studies with BPD patients did not examine other psychiatric comorbidities, which may further complicate matters.

Increased numbers of nightmares in BPD are reported in many studies; however, specific prevalence has rarely been determined. Studies conducted on smaller samples show that the prevalence of nightmares in BPD is around 50 % (Kessler & Merikangas, 2004; Hafizi, 2013). Interestingly, this suggests that not every patient with BPD experiences nightmares. However, the real prevalence might also be diminished due to the data gathering methodology – questionnaires concerning sleep problems usually cover short periods. Most studies used self-report scales, PSQI and VDAS, which cover different periods (1 month in PSQI) or the present (as VDAS). Even objective examinations of BPD individuals using polysomnography rarely explore data using validated questionnaires for sleep problems. Although polysomnography is the gold standard, its limitations include price, the first-night effect, and having properly qualified staff (Oltmanns & Oltmanns, 2015). Therefore, the lifetime prevalence of nightmares may be much higher than reported in the studies. It might also be interesting to study changes in the occurrence of nightmares during the lifetime of BPD patients – it has already been reported that recovered patients report much fewer nightmares/dream anxiety than patients who still present the majority of BPD symptoms (Noll *et al.* 2006).

Sleep problems are very often underrepresented in clinical practice as well. That might be because people with BPD usually have other problems at the centre of clinical attention (e.g., suicidality, self-harm, impulsivity, substance abuse, etc.). The knowledge that poor sleep also influences these factors (emotional dysregulation, suicidality) should not be overlooked.

2) What is the relationship between nightmares and borderline personality traits?

Some studies mentioned above discuss the possible adaptive role of nightmares (Agargun *et al.* 2003).

However, if nightmares result from processing impactful experiences, it is unclear whether this is an adaptive or maladaptive process (only certain individuals will develop nightmares after an adverse experience). The role and function of nightmares are still unclear, so identifying their role in BPD is even harder. Understanding this phenomenon is essential to navigate future interventions to treat sleep problems and optimize treatment effectiveness (Jenkins *et al.* 2022). For example, it was mentioned that persistent bad dreams in young adolescents are significantly related to BPD development (Lereya *et al.* 2017). Reports like this could help clinicians identify the patients needs early on.

Pre-sleep arousal seems to be an important factor in sleep disorders and their chronic occurrence. (Harvey, 2002; Tang & Harvey, 2004). This could also mean that understanding sleep disorders in BPD might be connected to short-term events (e.g. an argument with a partner the previous day) rather than long-term underlying conditions (e.g. traumatic childhood). In addition to poor sleep quality, many people with nightmares also report anxiety during the day and greater distress experienced in dreams. Nightmare anxiety, not just its presence, predicts higher psychosocial disturbance (Levin & Fireman, 2002). The level of dream anxiety stems more likely from personality traits than the nightmare itself, and the presence of bad dreams may be a function of acute stress (Schredl *et al.* 2003). Studies on this topic should include measuring dream anxiety in participants with a specific personality.

Higher arousal, lower self-control, and enhanced emotional dysregulation could also lead to more behavioral phenomena, such as violence, aggression or self-harm, which would also occur in BPD patients with insomnia or nightmares. Studies of this connection exist in clinical populations but not BPD patients.

Although adverse or traumatic experiences at a young age are often present in BPD, their influence on sleep alone has not been investigated as a possible confounding factor in most studies (Zanarini *et al.* 1997).

3) Are nightmares in BPD linked with suicidality and self-harm?

Generally, BPD patients who experience nightmares tend to have more pronounced symptoms than those who do not. Experiences with nightmares likely worsen emotional regulation and reduce the ability to cope with stress during the day (Selby *et al.* 2013). Nightmares, insomnia, BPD, and depression have been individually linked with suicidality, suggesting that currently depressed BPD patients suffering intensively from nightmares may be at higher risk of suicide. Treatment of depression and nightmares, in this case, might be crucial. However, research in this field is not robust enough to support this deduction. One descriptive study found that insomnia, not nightmares, is linked to suicidal risk through BPD traits (DeShong & Tucker, 2019). This again emphasises the importance of studying sleep in BPD patients.

These results highlight the impact of insomnia and nightmare in BPD and their connection to BPD symptoms. Frequent nightmares causing significant distress may be perceived as a severity mark, which is not reflected in clinical practice yet (Martínez *et al.* 2005).

4) Are nightmares in BPD different from nightmares in other disorders?

Comparing personality disorders with other clinical groups might be complicated due to the higher occurrence of comorbidities in personality disorders in general and rapid changes in the condition in BPD. For example, many studies link BPD, childhood trauma, and nightmares, and only some exclude comorbid PTSD. Differentiating diagnoses may be harder if a traumatic event occurs at a younger age and is not diagnosed immediately. More homogenous groups of BPD patients – e.g. similar age and symptom range – should be selected for studies to bring more comparable results. Diagnosing comorbidities (e.g., BPD and depression) should be standardized (with scales or structured interviews) to be as precise as possible.

5) What are the treatment options for nightmares in BPD?

Sleep problems are not usually part of BPD diagnostics, so well-researched treatment for nightmares in BPD options are scarce.

Stimulating serotonin activity by SSRIs leads to some relief in behavioural symptoms of BPD in small studies (Rinne *et al.* 2002). Similar results have been found in trauma-related sleep problems (Zanarini *et al.* 1997). Abnormalities in serotoninergic function linked with insomnia and suicide have been explored in some studies, as reviewed by Bernert *et al.* (2009). Thus, disruptions in serotonin activity could be one of the factors contributing to sleep disorders and nightmares. However, based on other results, clinical guidelines for treating BPD do not recommend giving SSRIs to every patient (some suggest pharmacotherapy being the second line altogether) but use them for comorbidities only (Simonsen *et al.* 2019); prescribing SSRIs for BPD sleep disorders is possible only off-label.

Some researchers emphasized the importance of research on the impact of maladaptive cognitions about sleep on overall BPD pathology. Applying CBT methods to sleep disorders in BPD could produce results as well. However, this hypothesis does not have enough findings to back it up.

New studies on psychotherapeutic approaches to BPD emerge, which could provide some answers on sleep disorders in BPD. Researchers studying their efficacy for BPD should include measuring sleep disorders and nightmares (on self-report scales, PSG or

both) and monitoring changes in this area, as it could provide much more clarity into this phenomenon.

CONCLUSION

BPD patients often encounter sleep disturbance, nightmares, and suicidal behaviour. Sleep disorders are not a rarity, and there is proof of objective changes in sleep onset and architecture as examined by PSG. Nightmares in BPD are higher than in the general or clinical population.

Nightmares influence individuals with BPD in several ways. Emotional dysregulation may be bidirectionally linked. Some studies suggest this is not due to nightmare content but rather the level of anxiety experienced during sleep. Poor sleep itself also worsens emotional dysregulation. Higher arousal and worsened self-control have also been linked with insomnia and nightmares. Childhood adverse experiences and traumatic events were linked with more nightmares, higher nightmare anxiety, and dissociation.

A clear assessment of nightmares and suicidality in borderline patients is missing. Assessing sleep disorders remains important, as studies in other disorders (like depression) linked nightmare distress to suicidality. Studies focusing on treating nightmares in BPD are lacking.

There is still room for more focused research and implementation of more sleep-focused treatments in patients with BPD.

CONFLICT OF INTEREST

All authors declare that the research was conducted without any commercial or financial relationships construed as potential conflicts of interest.

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