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Exploring the Link Between Insomnia and Personality Disorders: A Comprehensive Systematic Review

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Abstract

Insomnia is one of the most diagnosed sleep disorders, affecting approximately 30% of the world's population. Insomnia significantly impairs psychological well-being and increases vulnerability to psychiatric disorders, particularly anxiety and depression. While numerous studies have highlighted the role of specific personality traits in insomniacs, research has not yet elucidated which features of each personality disorder (PD) are most closely associated with insomnia. This systematic review aimed to fill this gap by summarizing the results of studies that examined the co-occurrence of insomnia and PDs. None of the included studies specifically focused on Cluster A PDs, only one study specifically looked at Cluster C PDs, and 3 studies investigated all PD Clusters. Most studies focused on Cluster B PDs, revealing a specific link between insomnia and the distinctive features of borderline PD, in particular: marked emotion dysregulation and impulsivity, a tendency to exaggerate symptoms, and discouragement about treatment outcomes. These findings may contribute to the development of more personalized assessment and intervention protocols for insomniacs with borderline PD.

Keywords: Insomnia; Sleep disruption; Personality Disorders; Borderline Personality Disorder; Systematic Review

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Introduction

Insomnia is a sleep disorder characterized by difficulty falling asleep, difficulty staying asleep, frequent awakenings, or early morning awakenings without the ability to return to sleep, which causes clinically significant distress to the individual (American Psychiatric Association, 2013). The International Classification of Sleep Disorders, Version 3 (ICSD-3; American Academy of Sleep Medicine, 2014) defines insomnia as short-term or chronic if it lasts less than three months or more than three months, respectively. Insomnia is a common disorder affecting approximately 10% of the adult population, while a further 20% experience occasional symptoms of insomnia; this sleep disorder is more common in women, the elderly, and those with lower socioeconomic status (Morin & Jarrin, 2022).

Insomnia negatively affects individual functioning by impairing the ability to engage in satisfying relationships with others (Moul et al., 2002), to perform daytime activities (Lancel et al., 2021), and to be resilient to environmental adversity (Verster et al., 2018). Insomnia is also associated with daytime sleepiness, fatigue, and difficulties with attention and concentration (Léger et al., 2014), which in turn affect work productivity (Barnes & Watson, 2019; Pilcher & Morris, 2020), cause absenteeism from work (Swanson et al., 2011) and increase the risk of occupational accidents (Magnavita & Garbarino, 2017). Importantly, daytime difficulties caused by insomnia are also often associated with health complaints such as obesity, diabetes, cardiovascular disease, and hypertension (Chan et al., 2018; Kazemizadeh, 2021; Li et al., 2021). Taken together, these factors, which lead to a significant decline in psychological well-being and quality of life (Sateia & Buysse, 2010), play a key role in the well-documented comorbidity between insomnia and psychiatric disorders, particularly depression and anxiety disorders (LeBlanc et al., 2007).

Insomnia and altered sleep patterns are key symptoms in the assessment of both anxiety and depressive disorders (American Psychiatric Association, 2013). Epidemiological studies suggest that approximately 50% of people with insomnia also suffer from anxiety disorders (Oh et al., 2019). This association is believed to stem from dysfunction within a specific neurocircuitry (including dopamine, serotonin, and adenosine receptor systems) that contributes to the reinforcing effects observed between anxiety, hyperarousal, and sleep disturbances (Chellappa & Aeschbach, 2022). Furthermore, several studies have found a bidirectional relationship between insomnia and depression, with the former being both a predictor and a consequence of the latter (Baglioni et al., 2011; Fang et al., 2019).

Given the dramatic impact of insomnia on an individual's functioning, a large body of research has investigated the role of personality traits in insomnia. Studies in this area have found that "neuroticism" is both a predisposing and a worsening factor for insomnia (Akram et al., 2023; Dekker et al., 2017; Gurtman et al., 2014; Rojo-Wissar et al., 2021; van de Laar et al., 2010). Other relevant personality traits in insomnia are "extroversion" – which has been found to moderate the effect of insomnia on suicidal ideation after controlling for depression (Killgore et al., 2022) – obsessive personality traits and impulsivity – whose levels are higher in people with insomnia than in controls (Piccione et al., 1981; Schmidt et al., 2010) –, and traits associated with perfectionism (van de Laar et al., 2010). Notably, when considering the "Dark Triad" personality traits (which include Machiavellism, psychopathy, and narcissism), only psychopathy seems to predict the severity of insomnia symptoms (Akram et al., 2018a). Research on personality dimensions has also found that, compared with controls, people with insomnia show higher levels of harm avoidance and self-transcendence, and lower levels of novelty seeking, cooperativeness, and reward dependence, the latter of which is associated with the response to non-pharmacologic treatment (An et al., 2012). Finally, different studies have highlighted a significant association between insomnia, melancholic personality type (namely, typus melancholicus) (Kaneko et al., 2022), and distressed personality type (namely, type D) (Akram et al., 2018b).

Compared to the extensive research into personality traits among insomniacs, the relationship between insomnia and individual personality disorders (PDs) is still an under-explored area. This research gap becomes particularly significant when considering the fundamental differences between personality traits and personality disorders (PDs). While personality traits are patterns of thinking, feeling, and behaviors that can adapt to varying situations (Schacter, 2017), PDs are rigid, pervasive, and persistent patterns of maladaptive internal experiences and behaviors that deviate from social norms (Tanzilli et al., 2022). These patterns are manifested in at least two domains of personal and social functioning (namely, cognition, affectivity, interpersonal functioning, and impulse control) and result in clinically significant distress or impairment (American Psychiatric Association, 2000).

The DSM-IV/IV-TR/5 groups PDs (American Psychiatric Association, 1994, 2000, 2013) into three "Clusters" (A, B, and C) based on common and often overlapping features.

Cluster A (characterized by odd, eccentric, or bizarre behaviors and thinking) encompasses paranoid, schizoid, and schizotypal PDs. Patients with paranoid PD exhibit a pervasive and rigid pattern of distrust and suspiciousness of others. Patients with schizoid PD show marked detachment from social relationships and a restricted range of emotional expression. Patients with schizotypal PD are characterized by acute discomfort in close relationships, bizarre behaviors, cognitive or perceptual distortions, and eccentric (e.g., superstitious or paranormal) beliefs without frank delusions.

Cluster B (characterized by dramatic, excessively emotional, and erratic behaviors) includes antisocial, borderline, histrionic, and narcissistic PDs. Patients with antisocial PD show a lack of empathy, disregard for and violation of the rights of others, deceitfulness, and extreme impulsivity; they are also particularly prone to engage in irresponsible or criminal behaviors. Patients with borderline PD are characterized by poor self-image, emotional instability, extreme mood fluctuations, persistent feelings of emptiness, hypersensitivity to rejection and abandonment, suicidal ideations, and marked impulsivity (the latter of which may manifest in self-harm behaviors – including suicidal attempts – and substance abuse). Patients with histrionic PD show an exaggerated (often theatrical) emotionality and a marked need for attention from others, which may be expressed through inappropriate seductive

behaviors. Patients with narcissistic PD exhibit grandiosity, a need for admiration, and a lack of empathy for others towards whom they display arrogance and exploitative behaviors.

Cluster C (characterized by anxiousness or fearfulness) comprises avoidant, dependent, and obsessive-compulsive PDs. Patients with avoidant PD exhibit social inhibition despite a desire for close interpersonal relationships, feelings of inadequacy, and a hypersensitivity to rejection and negative evaluation. Patients with dependent PD show feelings of inadequacy as well as submissive and clinging behavior related to an excessive need to rely on or be cared for by others. Patients with obsessive-compulsive PD are characterized by rigid preoccupation with details, rules, and order, as well as perfectionism, stubbornness, and miserliness.

Research has shown that insomnia is often comorbid with borderline PD (Bastien et al., 2008; Selby, 2013; Somma et al., 2018), antisocial PD (Van Veen et al., 2017) – in which emotion dysregulation plays a crucial role (Fitzpatrick et al., 2023) – as well as with narcissistic and histrionic PDs (Somma et al., 2018). However, this body of research has yet to elucidate the specific link between insomnia and PDs.

We believe that greater research in this area may encourage the development of a theoretical framework that relates sleep disruption to the main features of individual PDs and, more broadly, their corresponding Clusters. This theoretical approach, already proposed by Simor and Horváth (2013) for borderline PD, may aid in the development of more personalized assessment and treatment protocols for insomniacs with PDs.

Based on these premises, the objectives of this systematic review were:

– To identify the distinctive features of each PD that are most closely associated with insomnia.
– To propose a theoretical framework that can link the distinctive features of each PD with insomnia.
– To make recommendations for clinical practice.
– To identify research gaps that may suggest avenues for future research.

Methods

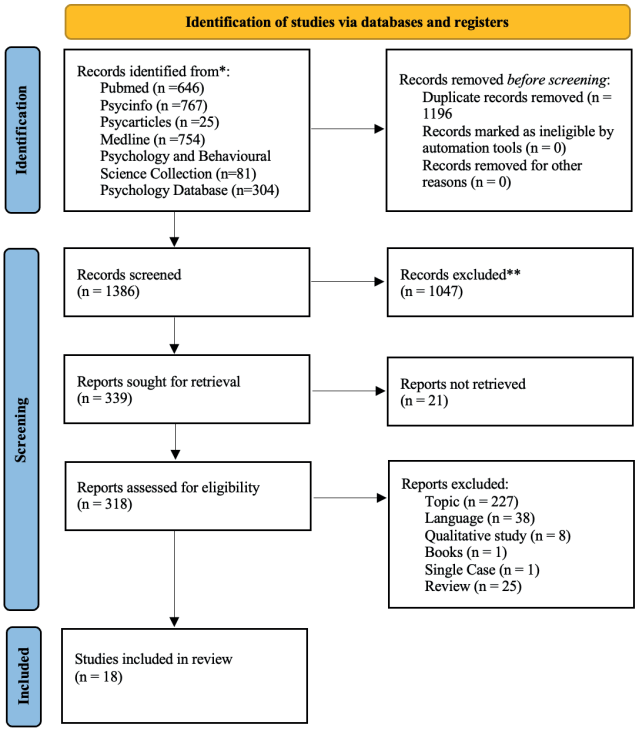
Search strategy

The current work was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines for systematic reviews (Moher et al., 2009). A comprehensive state-of-the-art review of studies on the association between sleep disruption and PDs was provided. The literature search was conducted in the following databases: PubMed, PsycInfo, PsycArticles, Medline, Psychology and Behavioural Science Collection, and Psychology Database.

The search strategy incorporated terms to identify studies investigating insomnia and sleep disorders. Specifically, terms from Appendix A were searched in the Title and Abstract fields, and the results were refined to include only published, peer-reviewed articles in English.

The search was conducted on June 12, 2023, identifying 2,577 records initially: of these, 1,196 duplicate entries were removed. Figure 1 shows the flow diagram outlining the processes of record identification, screening, and study inclusion.

Fig. 1. Flow diagram.



After identifying records by searching the previously described databases (N = 1386), titles and abstracts were screened based on the inclusion criteria. The inclusion criteria were as follows:

1) The manuscripts had to describe original research with a quantitative research design (i.e., reviews and meta-analyses were not included).
2) The studies had to provide an empirical investigation of the relationship between insomnia and PDs (studies that did not include samples with actual diagnoses of PDs were excluded).
3) English-language studies.

If there was any doubt about the eligibility of a study, the entire article was reviewed to determine whether the inclusion criteria were met. No restrictions were placed on publication dates.

A total of N = 1,047 articles were excluded based on title and abstract screening. Of the remaining N = 339 articles, the full text of N = 21 studies could not be retrieved (either because they were very old or only available as abstracts in conference proceedings). Therefore, the review references were evaluated to check for the presence of the excluded articles. The full texts of N = 318 potentially relevant articles were examined to assess whether they met the inclusion criteria for the review. After inspecting these studies, a total of N = 18 papers were included in the systematic review. The studies were therefore reviewed in a narrative and qualitative synthesis following the research objectives. The studies excluded from this review did not meet the inclusion criteria. Specifically, they were not fully aligned with the topic of this study, for example, by considering

personality traits or using non-diagnostic instruments (*N* = 227), were not in English language (*N* = 38), were qualitative studies (*N* = 8), or were reviews (*N* = 25). In addition, 1 book with no empirical data and 1 single case study were identified.

Data Extraction and Analysis

Two researchers independently extracted study characteristics and relevant outcomes. Disagreements were resolved by discussion until consensus was reached or, if necessary, by consulting a third researcher. A coding protocol book was created to extract and code five types of information: 1) publication characteristics (i.e., authors, year of publication, Country, Journal); 2) information on methodological characteristics (i.e., the type of research design); 3); sample characteristics (i.e., total sample size; gender - coded as the percentage of males; age - coded as the mean and standard deviation in years); 4) insomnia measures; 5) PD measures; 6) main results and conclusions.

Narrative summaries of specific findings are presented in Table 1 (the related references are provided in Appendix B). As can be seen in the same table, the papers have been grouped based on the PD Clusters addressed in the studies.

Tab. 1. Characteristics of the studies included in the review.

Cluster	Study	Country	Design	Sample type	*n*	% male	Age M	Age SD	Insomnia measures	PD measures	Main results
Cluster B											
	Asaad et al. (2002)	Egypt	C	BPD	20	40%	27.04	7.53	EEG, EOG, Over-night PSG	ICD-10 Symptom Checklist	Compared to a control group, BPD patients showed a higher sleep latency time, a lower sleep efficiency, significant variations in SWS, and a higher percentage of REM sleep.
				Major Depression	20	40%	27.83	7.65			
				HCs	20	40%	27.8	4.62			
	Bastien et al. (2008)	Canada	C	BPD	12	0.0%	33.3	10.7	Sleep diary, ISI, Insomnia Diagnostic Interview, PSG	DIB-R	BPD patients showed higher ISI scores than other groups, as well as chronic insomnia symptoms. PSG and objective data showed no significant sleep impairment in BPD patients.
				GS	15	6.7%	34.1	9.9			
				Psychophysiological insomnia	15	33.3%	36.6	7.1			
				Chronic primary paradoxical insomnia	15	26.7%	41.1	9.5			
	Fitzpatrick et al. (2023)	Canada	C	BPD	40	17.5%	25.35	6.77	DSISD, CSD	IPDE SCID-IV-TR	Although rates of insomnia were higher in the BPD group than in the GAD group, this was not accounted for analyses. Sleep efficiency and sleep quality were not significantly associated with emotion reactivity and emotion regulation in the BPD group.
				GAD	40	21.1%	25.95	7.20			
				HC	40	20.0%	24.70	6.88			
	Fitzpatrick et al. (2020)	Canada	C	BPD	40	20.0%	24.70	6.88	DSISD, ISI, CSD	MSI-BPD SCID–IV-TR IPDE	Both the BPD and GAD groups had higher insomnia severity than the control group. The BPD group showed a significantly delayed risetime relative to the GAD group. Higher Sleep Efficiency predicted higher emotion dysregulation in the BPD group.
				GAD	40	21.0%	25.95	7.20			
				HC	40	17.0%	24.70	6.88			
	Huỳnh et al. (2016)	Canada	C	BPD	18	16.6%	16.0	1.1	Actigraphy	Ab-DIB DIB-R	BPD patients showed a higher total sleep time than the control group during the weekends, whereas they spent less time asleep during school days, thus showing a higher variability in total sleep time and rise time compared to BD and HCs.
				BD	6	33.3%	16.7	1.0			
				HC	20	35.0%	14.7	1.0			
	Jenkins et al. (2022a)	Australia	C	BPD	40	10.0%	BPD: 19.77 (2.51)		ISI, PSQI, CSD, Actigraphy	SCID-5-RV SCID-5-PD	Adolescents with BPD reported a later chronotype than healthy and clinical comparison individuals, spent more time in bed, and slept longer; however, they had higher PSQI scores and reported more severe insomnia.
				Other mental problems	18	27.8%	20.52	3.14			
				HC	38	11.5%	20.06	2.52			
	Jenkins et al. (2022b)	Australia	C	BPD	40	10.0%	BPD: 19,77 (2.51)		PSQI, ISI, CSD, Actigraphy	SCID-5-RV SCID-5-PD	The underlying mechanisms between BPD features and sleep disturbance are difficulties in emotional regulation and impulse control, limited access to emotion regulation strategies, and anxiety, while the impact of insomnia was mediated by anxiety and impulse control difficulties.

Cluster	Study	Country	Design	Sample type	*n*	% male	Age M	Age SD	Insomnia measures	PD measures	Main results
Cluster B											
				HC:	38	15.0%	20.06	2.52			
	Lindberg et al. (2003a)	Finland	C	Violent offenders with APD	19	100%	30.7	2.58	BNSQ, PSG, Actigraphy, EEG, Sleep Diary	SCID-IV	Violent offenders with APD reported impaired subjective sleep quality, problems falling asleep, more awakenings during the night, and they felt sleepier in the morning than the controls. PSG findings confirmed the subjective data. SWS sleep and S4 sleep were significantly higher in the APD group than in controls.
	Lindberg et al. (2003b)	Finland	C	Violent offenders with APD	10	100%	30.75 (10.80)		EEG, EOG, PSG	SCID-IV	Violent offenders with APD and a comorbidity with BPD showed several awakenings during the night and consequently more sleep disruption and lower sleep efficiency compared to the APD-only group and the controls. APD and APD + BPD showed a higher percentage of S4 sleep (deep sleep) than controls. Subjects with a high number of CD symptoms in their childhood history, as well as subjects with a diagnosis of IED, showed a significantly higher amount of delta sleep compared to males with only mild or moderate disorder, and a higher percentage of S4 sleep compared to a control group.
				Violent offenders with APD+BPD	6	100%					
	Plante et al. (2013)	USA	C	Recovered BPD =105 (17.1%)			Recovered BPD: 41.17 (5.4)		DBAS-16	DIB- R DIPD-R	The DBAS-16 scores were significantly higher in non-recovered than recovered participants; non-recovered BPD participants were more worried about the consequences of their sleep problems and showed a higher score on the worry/ helplessness scale about their insomnia.
				Non-recovered BPD	118	20.3%	44.21	6.0			
	Schredl et al. (2012)	Germany	C	BPD	27	0.0%	29.3	7.7	PSG, SF-B, LISST	IPDE	Sleep was more disturbed in patients with BPD but without MDD; EEG findings showed that BPD patients had problems maintaining sleep, with an increased number of awakenings, arousal, and time spent awake.
				HC	20	0.0%	24.3	3.8			
	Selby (2013)	USA	C	BPD	214		NS		NCS-R	IPDE NCS-R	BPD subjects showed a significant association with delayed sleep onset latency, increased time to sleep onset, and increased Early Morning Awakenings. BPD associated with sleep problems predicted cognitive, social and emotional impairment, and difficulties with self-care.
	Van Veen et al. (2017)	The Netherlands	C	Patients with BPD, APD, or PDs not otherwise specified with BP or AP traits	112	91.1%	32.44	10.43	PSQI, SDL	Clinical interviews	In BPD patients, chronic insomnia was significantly related to subjective impulsivity, particularly on the Attentional Impulsiveness subscale.
	Weibel et al. (2017)	Switzerland	C	BPD	53	4.0%	BPD: 32.43 (10.13)		PSQI, ISI	SCID-5	BPD and BPD + ADHD patients had higher global ISI scores than the ADHD group; BPD patients tended to suffer from moderate or severe insomnia. However, when controlling for depression, BDI scores mostly explained sleep symptoms in the BPD and BPD + ADHD groups, while ADHD still predicted the 'sleep latency' and 'sleep efficiency' subscales of the PSQI.
				HC	65	29.2%	28.98	9.38			
				BPD + ADHD	17	0.0%	27	8.23			
Cluster C											
	Petrov et al. (2018)	USA	L	Total sample	23	26.1%	53	9.9	ISI, Sleep Diary, PSG	SCID-II-PQ	PSG measures, corroborated by subjective data collected from sleep diaries, showed that HDI patients with OCPD personality traits had a lower total sleep time, as well as a more disrupted and lighter sleep than those without OCPD after one year of BT-I treatment.
				OCPD	8						
All Clusters considered											
	Atalay (2011)	Turkey	C	Total sample: Patients in a Department of Psychiatry	224	36.0%	35	6.1	PSQI	SCID-II	The most common PDs were Cluster C PDs. When comparing Clusters, Cluster A PDs reported worse sleep quality than Cluster C PDs.
				Cluster A	17						
				Cluster B	40						
				Cluster C	129						

Cluster	Study	Country	Design	Sample type	*n*	% male	Age M	Age SD	Insomnia measures	PD measures	Main results
Cluster B											
	Grau-López et al. (2016)	Spain	C	Patients diagnosed with substance dependence disorder	481	72.6%	40.6	10.1	OSQ	SCID-II	Univariate analysis showed that 44% of patients with addiction and insomnia had an Axis II personality disorder comorbidity, especially Cluster C disorders.
	Somma et al. (2018)	Italy	C	Insomnia group	171	43.9%	40.88	10.48	PSQI, ISI, PSG, EOG, EMG	SCIDII	More than 50% of insomnia patients met criteria for a DSM-5/Section II diagnosis of PD, specifically narcissistic PD, Not Otherwise Specified/with other specification PD, histrionic PD, and borderline PD. Insomnia patients, therefore, show significant similarities to psychotherapy patients in terms of personality symptoms and significant differences from general population data.
				Psychotherapy patients' group	171	43.9%	40.88	10.48			

Note. C = Cross-sectional study; L = Longitudinal study; NS = Not Specified; SWS = Slow Wave Sleep: REM = Rapid Eye-Movement. BPD = Borderline Personality Disorder; HCs = Healthy Controls; GS = Good Sleepers; GP = General population; GAD = Generalized Anxiety Disorder; BD = Bipolar Disorder; PDs = Personality Disorders; APD = Antisocial Personality Disorder; OCPD = Obsessive-Compulsive Personality Disorder; ADHD = Attention-Deficit/Hyperactivity Disorder; AP = Antisocial Personality; BP = Borderline Personality; CD = Conduct Disorder; IED = Intermittent Explosive Disorder; MDD = Major Depressive Disorder; HDI = Hypnotic-Dependent Insomnia; BT-I = Behavioral Therapy for Insomnia. EEG = Electro-encephalogram ; EOG = Electroocculogram; PSG = Polysomnography; ISI = Insomnia Severity Index; DSISD = The Duke Structured Interview for Sleep Disorders-Insomnia Module; CSD = Consensus Sleep Diary; BNSQ = Basic Nordic Sleep Questionnaire; SF-B = the Schlaffragebogen B; LISST = Landecker Inventar zur Erfassung von Schlafstörungen; AIS = Athens Insomnia Scale; SDL = Sleep Diagnosis List; OSQ = Oviedo Sleep Questionnaire; IIS = Insomnia Impact Scale; EMG = Electromyography; PSQI = Pittsburgh Sleep Quality Index; DBAS-16 = Dysfunctional Beliefs and Attitudes about Sleep, 16-item version; NCS-R = National Comorbidity Survey – Replication Part II; DIB-R = Diagnostic Inventory for Borderline-Revised; IPDE = International Personality Disorders Examination - BPD Module; SCID-IV-TR = Structured Clinical Interview for DSM-IV-TR disorders; MSI-BPD = McLean Screening Instrument for BPD; Ab-DIB = Abbreviated Diagnostic Interview for Borderlines; SCID-5- RV = Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), Research Version; SCID-5-PD = Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), Personality Disorders; SIDP-IV = Structured Interview for DSM-IV Personality;; DIPD-R = Diagnostic Interview for DSM-III-R Personality Disorders; IPDE = International Personality Disorder Examination; ICD-10 = International Statistical Classification of Diseases; SCID-II = Structured Clinical Interview for DSM-IV - Axis II Personality Disorders; SCID-II-PQ = Structured Clinical Interview for DSM-IV Personality Questionnaire.

Results

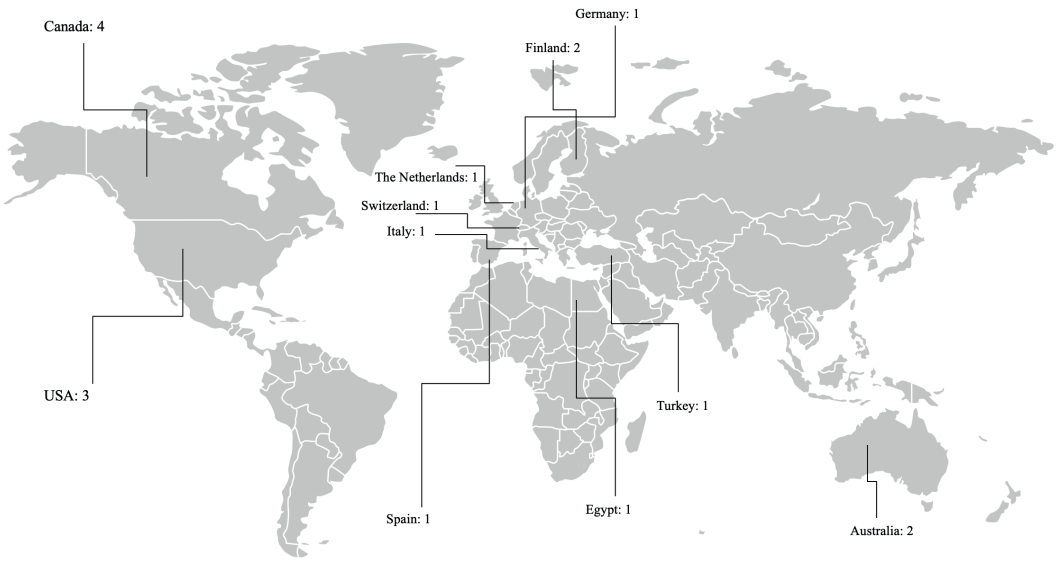
Publications by Year and Region

The investigation of the chronological distribution of the sampled articles reveals publication trends over 21 years (2002–2023) and shows an increasing number of articles published over time. Most studies were carried out (or samples were selected) in the North American region (n = 7) and Europe (n = 7) (see Figure 2).

Insomnia Measures

As shown in Table 1, studies used different tools to assess insomnia. Most studies used devices that monitor

Fig. 2. Frequency of articles included in the Systematic Review in different Countries.



and record physiological activity during sleep, such as electroencephalography (EEG), electrooculography (EOG), polysomnography (PSG), electromyography (EMG), and actigraphy (Asaad et al., 2002; Bastien et al., 2008; Huỳnh et al., 2016; Jenkins et al., 2022a; Jenkins et al., 2022b; Lindberg et al., 2003a; Lindberg et al., 2003b; Schredl et al., 2012; Petrov et al., 2018; Somma et al., 2018). Other studies used Sleep Diaries (Bastien et al., 2008; Fitzpatrick et al., 2023; Fitzpatrick et al., 2020; Jenkins et al., 2022a; Jenkins et al., 2022b; Lindberg et al., 2003a; Petrov et al., 2018).

Clinical interviews were used in only 2 studies (Bastien et al., 2008; Fitzpatrick et al., 2023). Finally, other studies utilized a series of self-report questionnaires, the most used being the Insomnia Severity Index (ISI) (Bastien et al., 2008; Fitzpatrick et al., 2020; Jenkins et al., 2022a; Jenkins et al., 2022b; Weibel et al., 2017; Petrov et al., 2018; Somma et al., 2018). In most studies, self-report questionnaires complemented instruments for monitoring and recording physiological activity during sleep, while in other cases they were used alone (Atalay, 2011; Grau-López et al., 2016; Plante et al., 2013; Van Veen et al., 2017; Weibel et al., 2017).

PD Measures

As highlighted above, this systematic review only included samples that received actual diagnoses of PDs. As shown in Table 1, diagnoses were made using different criteria and methodologies. Specifically, most studies used interviews according to the DSM-IV (American Psychiatric Association, 1994) and DSM-IV-TR (American Psychiatric Association, 2000) diagnostic criteria (Atalay, 2011; Bastien et al., 2008; Fitzpatrick et al., 2020; Fitzpatrick et al., 2023; Grau-López et al., 2016; Huỳnh et al., 2016; Lindberg et al., 2003a; Lindberg et al., 2003b; Petrov et al., 2018; Plante et al., 2013; Schredl et al., 2012; Selby, 2013; Somma et al., 2018; Van Veen et al., 2017), and of DSM-5 (Jenkins et al., 2022a; Jenkins et al., 2022b; Weibel et al., 2017). One study referred to the International Classification of Diseases (10th edition) (ICD-10; World Health Organization, 1993) criteria instead (Asaad et al., 2002).

PD Clusters

Data were analyzed following the DSM-IV, DSM-IV-TR, and DSM-5 cluster partition (American Psychiatric Association, 1994, 2000, 2013) addressed in the considered studies. Specifically: (1) Cluster A (including paranoid, schizoid, and schizotypal PDs); (2) Cluster B (including antisocial, borderline, histrionic, and narcissistic PDs); and (3) Cluster C (including avoidant, dependent, and obsessive-compulsive PDs).

Regarding the findings of this systematic review, we found that no study has specifically focused on the relationship between insomnia and PDs belonging to Cluster A.

As shown in Table 1, most studies have examined specific associations between insomnia and PDs belonging to Cluster B. Among these investigations, the vast majority have focused on borderline PD, where sleep difficulties are widely reported. Specifically, compared to controls, patients with borderline PD have been found to have higher sleep latency time and lower sleep efficiency, as well as significant variations in Slow-Wave Sleep (SWS) and a higher percentage of REM sleep (Asaad et al., 2002). Similarly, using EEG, Schredl et al. (2012) found difficulties in maintaining sleep in borderline PD patients, due to increased awakenings, arousals, and time spent awake. Additionally, individuals with borderline PD have been found to have delayed sleep onset latency, increased time to fall asleep, and increased early morning awakenings (Selby, 2013). Furthermore, greater variability in total sleep time and wake time has been observed in adult patients with borderline PD compared to both bipolar disorder patients and healthy controls (Huỳnh et al., 2016). Similar results have been reported by Jenkins et al. (2022a) in adolescents with borderline PD, who reported later chronotype, more severe insomnia symptoms, and poorer subjective sleep quality than healthy individuals and the clinical comparison group without borderline PD. Furthermore, Lindberg et al. (2003b) have found that violent offenders with antisocial PD and borderline PD comorbidity had several awakenings during the night and reported higher sleep disturbances and lower sleep efficiency relative to both the antisocial PD-only group and controls.

Using polysomnography (PSG), Bastien et al. (2008) have found that borderline PD insomniacs – similarly to chronic primary psychophysiological insomniacs and chronic primary paradoxical insomniacs – had longer sleep onset, shorter sleep duration, and lower sleep efficiency than good sleepers. Interestingly, although borderline PD patients spent more time in stage 4 sleep than primary paradoxical insomniacs, they reported feeling less restored in the morning than the others.

Jenkins et al. (2022a) found that the relationship between borderline PD features and subjective sleep disturbance was indirectly mediated by difficulties in emotional regulation and impulse control, limited access to emotion regulation strategies, depression, anxiety, and stress. These finding are consistent with those found by Van Veen et al. (2017) – who found an association between self-reported impulsivity (particularly, attentional impulsivity), poor sleep quality, and chronic insomnia – while they are discordant with those of Fitzpatrick et al. (2023) – who found no associations between emotional reactivity, emotion regulation, sleep efficiency, and sleep quality.

Selby (2013) has found an association between borderline PD and chronic sleep disturbances (namely, difficulty initiating sleep, difficulty maintaining sleep, and early awakening), which predicted cognitive, social, and emotional deterioration, as well as difficulties with self-care.

Focusing on Cluster C PDs, Petrov et al. (2018) have documented that insomniacs with obsessive-compulsive PD did not differ from those reporting Hypnotic-Dependent Insomnia (HDI)-only, when subjective measures of insomnia were considered. However, after one year of behavioral therapy, PSG sleep values and sleep diaries showed that insomniacs with obsessive-compulsive PD had a worse sleep quality in terms of less total sleep time, and lighter and more disrupted sleep compared to the HDI-only group (Petrov et al., 2018).

Other studies did not specifically investigate individual PD Clusters but examined the associations between insomnia and all PD Clusters, in insomnia samples (Atalay et al., 2011;

Somma et al., 2018) or other clinical samples (Grau-López et al., 2016). However, these studies do not provide any useful information for this review.

Atalay (2011) found that psychiatric patients with Cluster A PDs reported worse sleep quality than those with Cluster C PDs (although the latter was the more common PD in this sample).

Somma et al. (2018) have found that more than 50% of insomnia patients met criteria for a PD diagnosis, specifically narcissistic, Not Otherwise Specified/With Other Specified PD, histrionic, and borderline PDs.

Finally, Grau-López et al (2016) found a tendency for patients with addiction and PD Custer C comorbidity to present with insomnia.

Discussion

While numerous studies have highlighted the role of specific personality traits in insomniacs (Akram et al., 2018a; Akram et al., 2018a,b; Akram et al., 2023; An et al., 2012; Dekker et al., 2017; Gurtman et al., 2014; Kaneko et al., 2022; Killgore et al., 2022; Piccione et al., 1981; Rojo-Wissar et al., 2021; Schmidt et al., 2010; van de Laar et al., 2010), research has not yet elucidated which features of each PD are most closely associated with sleep disruption. This systematic review aimed to fill this gap.

The literature analysis indicated that none of the included studies specifically investigated Cluster A PDs, and only one study focused on Cluster C PDs. Furthermore, 3 studies investigated all PD Clusters, but failed to provide relevant information for this review. Most studies were specifically conducted on Cluster B PDs, revealing a specific link between insomnia and the core features of borderline PDs.

The first issue to be addressed is why research on the link between insomnia and PDs has mainly focused on Cluster B PDs, while neglecting or under-investigating Cluster A and C PDs. It may be assumed that the disproportionate focus on Cluster B PDs is driven by interest in emotional dysregulation and impulsivity, which are core features of these PDs (particularly borderline PD; see Bohus et al., 2021), as well as of insomnia (see Samea et al., 2025).

The Link between Insomnia and Cluster B PDs

Several studies have shown that borderline PD patients have higher levels of insomnia than the normative population, as well as higher levels of insomnia than patients with generalized anxiety disorder and other mental disorders (Fitzpatrick et al., 2020; Fitzpatrick et al., 2023; Jenkins et al., 2022a). Although borderline PD patients report the same insomnia severity and sleep hygiene as insomniacs, PSG studies have shown greater similarities between borderline PD patients and good sleepers: such evidence has been interpreted as reflecting "a part of the general constellation of symptoms [of borderline PD] or (…) of another cognitive distortion, like those associated with the personality disorder diagnosis" (Bastien et al., 2008; p. 468). From this perspective, it has also been suggested that laboratory settings may attenuate borderline PD patients' sensitivity to loneliness and interpersonal stressors, providing a more secure context for sleep than that offered by "home" (*ibidem*). The discrepancy between objective and subjective sleep measures has also been confirmed in young borderline PD patients by Jenkins et al. (2022a). In this investigation, the fact that objective data (collected in a naturalistic setting using the actigraph) did not support the results obtained from self-reported sleep measures has been interpreted as being due to the well-documented tendency of borderline PD patients to exaggerate their symptoms (see Stanley & Wilson, 2006; Thompson et al., 2018). Despite these discrepancies, it is well established that borderline PD patients have a higher sleep latency time and a lower sleep efficiency when compared to controls (Asaad et al., 2002). Moreover, borderline PD youths show more variability in sleep routines and more time spent awake in bed compared to both controls and patients with bipolar disorder (Huỳnh et al., 2006; Schredl et al., 2012): this alteration in sleep hygiene entails cognitive, social, and emotional deterioration in young patients (Selby, 2013). Research has also shown that antisocial patients with borderline PD comorbidity have greater sleep disruptions and lower sleep efficiency than patients reporting antisocial PD only (Lindberg et al., 2003b). This may be due to the greater impulsivity and to difficulties in emotion regulation that characterize antisocial individuals with borderline PD comorbidity (Lindberg et al., 2003b). In this regard, several studies have highlighted that insomnia and borderline PD are linked through emotion dysregulation (which is typical of borderline PD patients), especially when associated with high impulsivity (Ballarotto et al., 2017; Van Veen et al., 2017), high levels of anxiety (Fitzpatrick et al., 2020) and depression (Weibel et al., 2017). Furthermore, borderline PD is the only PD that predicts insomnia symptoms, even after controlling for depressive symptoms, race, and body mass index (Oltmanns et al., 2014). Other studies have shown that insomnia explains the high presence of depressive symptoms and suicide risk in patients with borderline PD and passive-aggressive personality, thus strengthening the emotion dysregulation theory (DeShong & Tucker, 2019). Finally, research has documented that borderline PD patients are very disheartened and have a great sense of helplessness regarding the treatment of their insomnia symptoms (Plante et al., 2013).

Research into the association between antisocial PD and sleep disturbances has also yielded interesting results. Several studies have documented that antisocial PD patients have poorer sleep quality, greater difficulty falling asleep, and more frequent nocturnal awakenings than controls, as well as subjective daytime sleepiness: subjective data have also been confirmed by PSG assessments (Lindberg et al., 2003a). It has been suggested that these difficulties may be due to substance dependence, depression, or both (Harty et al., 2010); such an assumption is relevant if we consider that antisocial PD patients report needing more medication to treat their insomnia (Kamphuis et al., 2013). Interestingly, insomnia and antisocial PD seem to share a genetic rather than an epigenetic pattern. Thus, while the overlap between insomnia and antisocial PD may stem from a shared genetic predisposition, the relationship between insomnia and conditions like depression or anxiety

may be more influenced by environmental factors (Lind et al., 2017). Another study has attempted to investigate whether the relationship between insomnia and antisocial PD could be predicted by conduct disorder (which is a typical precursor of antisocial PD). However, this study found no significant association (Lindberg et al., 2008).

The Link between Insomnia and Cluster C PDs

As regards the associations between insomnia and Cluster C PDs, Petrov et al. (2018) have shown that insomniac patients with an obsessive-compulsive PD did not differ from the HDI-only group when subjective measures of insomnia were considered. In this study, PSG and sleep diaries data collected after one year of behavioral therapy showed that obsessive-compulsive PD patients had a worse sleep quality in terms of less total sleep time and more disrupted and lighter sleep compared to the HDI-only group.

Theoretical and Practical Implications

The relevant findings of the reviewed literature allow for the proposal of a theoretical framework that, at this time, can link the distinctive features of borderline PD with insomnia.

Particularly, research has shown that marked emotional dysregulation and high levels of impulsivity are the main borderline PD factors that exacerbate insomnia symptoms (Lindberg et al., 2003b; Van Veen et al., 2017), especially when combined with high levels of anxiety (Fitzpatrick et al., 2020) and depression (Weibel et al., 2017). Another relevant issue is the discrepancy found when comparing objective and subjective measures of insomnia (Bastien et al., 2008; Jenkins et al., 2022a), which is thought to be due to the typical tendency of borderline PD patients to exaggerate their symptoms (Bastien et al., 2008; Stanley & Wilson, 2006; Thompson et al., 2018).

We believe that all the identified factors (which are consistent with the dramatic, over-emotional, and unpredictable behaviors and thoughts that characterize borderline PD and, more broadly, Cluster B PD) may contribute to the development of more personalized assessment and intervention protocols for insomniacs with borderline PD.

Assessment procedures should ideally be conducted in a laboratory setting, as this environment is thought to attenuate these patients' hypersensitivity to loneliness and interpersonal stressors (Bastien et al., 2008). The reassurance offered by a laboratory setting may also help decrease emotion dysregulation, impulsivity, and symptom exaggeration in borderline PD patients, resulting in better alignment between objective and subjective measures of both insomnia parameters and psychological functioning.

A timely and reliable assessment of insomnia could enable interventions specifically designed to enhance these patients' confidence regarding the improvement of their insomnia symptoms (Plante et al., 2013). When working with borderline PD insomniacs, it is crucial not to minimize their reports about their condition, even if they describe it as more severe and distressing than it may truly be. This approach may help prevent the common tendency of borderline PD patients to view others, including clinicians, as dismissive or inattentive to their needs. Additionally, scheduling frequent follow-up appointments may help reduce these patients' feelings of loneliness and hypersensitivity to rejection, thus improving their adherence to therapy.

These recommendations may assist borderline PD patients in coping more effectively with their insomnia symptoms, ultimately leading to improvement in their interpersonal functioning and social participation.

This integrated theoretical and application framework could also help reduce healthcare costs associated with the consequences of co-occurring insomnia and borderline PD (such as poor quality of life, impaired interpersonal relationships, work absenteeism, and decreased productivity), for the benefit of both patients and society.

Limitations and Directions for Future Research

We acknowledge that the results of our systematic review are not without limitations.

The exclusion of non-English language publications may have led to the omission of relevant studies, potentially including investigations into PDs that are still overlooked (such as Cluster A PDs) or underexplored (such as Cluster C PDs). These publications, if available, could have enriched the still embryonic understanding of the link between insomnia and PDs.

Another noteworthy limitation is the methodological heterogeneity of the selected studies. These included different populations, some of which reported multiple comorbidities or, as in the case of Cluster B, diagnoses of multiple PDs. This variability prevents us from determining which distinctive features of individual PDs are most closely associated with insomnia (except for emotional dysregulation and impulsivity, as regards borderline PD). Furthermore, the studies employed different measures of insomnia, which could be objective type (e.g., EEG, EOG, PSG, EMG, or actigraphy), subjective type (e.g., Sleep Diaries and self-report questionnaires), objective-subjective combined type, or collected through clinical interviews. This heterogeneity in insomnia measurement raises concerns about the comparability of results. As Herzog et al. (2025) have emphasized, subjective complaints about sleep disruption rarely align with objective sleep quality measurements, not only in people with sleep disorders (Schinkelshoek et al., 2020; Valko et al., 2021) but also (albeit to a lesser extent) in good sleepers (Stephan et al., 2021). These discrepancies, which are due to the variable degree of bias that characterizes self-report measures, are particularly relevant among insomniacs with borderline PD (Bastien et al., 2008; Philipsen et al., 2005). These individuals tend to misperceive their sleep quality due to dysfunctional personality traits, such as negative emotionality and impulsivity, and a tendency to overestimate sleep disturbances (Bastien et al., 2008; Jenkins et al., 2022a; Stanley & Wilson, 2006; Thompson et al., 2018). Finally, the selected studies used different diagnostic measures of PDs, including DSM- or, in one study, ICD-10-oriented interviews, which were sometimes combined with self-report questionnaires. The lack of uniform diagnostic criteria for PDs raises further questions about the comparability of results.

These constraints make it difficult to make definitive considerations at this stage. Further research, particularly focusing on Cluster A and C PDs and employing more homogeneous methods, is necessary to clarify the link between insomnia and PDs.

Conclusions

Despite the reported limitations, this systematic review is the first to address the link between insomnia and distinctive features of PDs, applying strict methodological inclusion criteria, the most important of which was the presence of a current diagnosis of PD.

Relevant aspects emerging from the reviewed literature have enhanced the understanding of the core features of borderline PD that are more closely associated with insomnia. These features include: marked emotional dysregulation and high impulsivity (Lindberg et al., 2003b; Van Veen et al, 2017), which are often coupled with high levels of anxiety (Fitzpatrick et al., 2020) and depression (Weibel et al., 2017); a tendency to exaggerate insomnia symptoms in self-reports (Bastien et al., 2008; Jenkins et al., 2022a); discouragement and helplessness regarding treatment outcomes (Plante et al., 2013).

Based on these starting points, this review has put forth borderline PD-oriented recommendations for assessment and treatment of insomnia. These recommendations, which aim to prevent the negative personal, interpersonal, and social consequences that arise from the co-occurrence of insomnia and borderline PD, can be summarized as follows:

The assessment of insomnia should ideally occur in a laboratory setting to mitigate the hypersensitivity to loneliness and interpersonal stressors experienced by borderline PD insomniacs. This approach would also help reduce emotional dysregulation, impulsivity, and the tendency of these patients to exaggerate symptoms, thereby facilitating a better alignment between objective and subjective measures of insomnia.

Insomniacs with borderline PD should primarily be supported in building confidence in their treatment. To achieve this, clinicians should refrain from minimizing their symptoms, even if they may be described as more severe than they are. Additionally, scheduling frequent appointments may help reduce these patients' feelings of loneliness and hypersensitivity to rejection.

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Not applicable

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Supplementary material
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Appendix A

Search: Concept 1 AND Concept 2

Concept 1: (Sleep disorder* OR sleep deseas* OR sleep problem* OR insomnia)

Concept 2: (Personality OR personality trait* OR personality disorder*) OR title(Personality OR personality trait* OR personality disorder*)

Appendix B

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