Insomnia Disorders: Nosology and Classification Past, Present, and Future

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Insomnia is the most common sleep disorder in the adult population. However, the definition of insomnia disorder has varied across major classification systems and changed over time. In the present study, the investigators traced the evolution of insomnia disorder across classification systems, contemplated the empirical basis for its current definitions, and surveyed ongoing research efforts that may clarify insomnia nosology in the future. Three major classification systems for insomnia are the International Classification of Sleep Disorders, the International Classification of Diseases, and DSM. Despite their divergent origins, these classification systems have converged to nearly identical contemporary insomnia definitions. Over time, the emphasis in classification approaches has shifted from symptomatology to etiology to treatment implications. Additionally, the historical multitude of insomnia subtypes has gradually consolidated into a few core diagnoses, reflecting inadequate evidence with which to support subtyping. Current insomnia definitions include frequency and duration criteria to operationalize these diagnoses, while the diagnostic criterion of nonrestorative sleep has been eliminated (with some controversy). In ongoing research efforts, the quest for insomnia biomarkers has not thus far yielded clinically deployable breakthroughs. Data-driven insomnia subtyping suggests a promising new approach in deriving empirically based subtypes; conversely, the transdiagnostic perspective proposes the elimination of categorical distinctions in favor of finding common processes underlying all psychiatric disorders. The continual evolution of insomnia nosology highlights that much remains to be learned about these conditions; all current diagnostic classification systems are best regarded as "works in progress." Nevertheless, refinement and convergence of classification approaches is essential to standardizing insomnia research, diagnosis, and treatment.

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Insomnia is the most common sleep disorder in the adult population and poses a major public health concern worldwide (1). The global prevalence of insomnia symptoms is about 30%−35%; the prevalence of insomnia disorder ranges from 3.9% to 22.1%, depending on the diagnostic criteria used (2). This wide variance in prevalence rates stems from the use of different classification systems defined by various professional bodies. This underscores the impact and importance of developing valid and concordant classification systems. Ideally, any classification for clinical purposes must be sensitive enough to detect most people who have the condition, yet specific enough to exclude most of those who do not. This is particularly difficult for disorders that present with a wide spectrum of possible symptoms. On the other hand, classification for research purposes benefits from a narrower definition of disorders or symptoms for higher homogeneity; research studies often treat these as dichotomous variables (i.e., either present or absent). Finally, the development of reliable and valid classification systems is critical, as they shape public policy in terms of advocacy, planning, and budgeting.

CLASSIFICATION SYSTEMS

Before delving deeper into the classification of insomnia, one can take a step back and review the general terminology for the classification of medical conditions. A symptom is the patient's complaint or subjective presentation; a sign is one that carries with it objective evidence; a syndrome or disorder is made up of a set of symptoms, signs, and abnormal functioning; and a disease is usually a disorder with etiologic connotations (3). In the evolution of medical nosology, insomnia has been variously described as a symptom of insomnia disorder, a symptom of another disorder (e.g., major depressive disorder), a sign (e.g., based on sleep questionnaires), a disorder (e.g., insomnia disorder), or sometimes a disease (e.g., familial fatal insomnia). Hence, a major challenge and source of debate over the decades is how insomnia should be categorized and whether it can appear in more than one category.

Fatal familial insomnia offers a classic case of such overlapping categories. It is characterized by clear symptoms of insomnia, is caused by mutation of the *PrP* gene, is inherited in an autosomal dominant way, and has an established

etiological cause: a prion disease of the brain. Diagnosis is made based on genetic testing, sleep study, and positron emission tomography scanning (4). As such, fatal familial insomnia is an amalgamation of all of the above: It presents with the symptoms and signs of insomnia, is a syndrome/disorder, and qualifies for the definition of a disease.

Insomnia as a symptom is associated with many medical conditions, such as chronic pain and reflux esophagitis; it is also associated with or constitutes part of the diagnostic criteria for some psychiatric disorders (e.g., major depressive disorder) (5). Above all, it is the cardinal symptom of insomnia disorder. In the major classification systems of sleep disorders, insomnia as a symptom has typically been defined as a composite of the following attributes: difficulty initiating sleep, difficulty maintaining sleep, early morning awakening, daytime sleepiness, and significant functional impairments arising from the aforementioned sleep difficulties, with minor variations among the various classification systems and editions over the years (6–10). There is little discordance regarding what constitutes insomnia as a symptom. Of note, however, is that nonrestorative sleep has been dropped from the description of insomnia symptoms in current classification systems, and this will be discussed later.

This article focuses on insomnia as a disorder, as defined by different professional bodies. To date, diagnosis of insomnia disorder is primarily based upon the patient's subjective complaints (2, 11) and determining the degree to which these complaints fit into the classification systems. We will examine the main classification systems, their evolutionary timeline, how they have changed, and why.

TIMELINE OF THE MAJOR CLASSIFICATIONS OF INSOMNIA

Diagnostic Classification of Sleep and Arousal Disorders (DCSAD)

Published in 1979, the DCSAD (12) was the first major classification of sleep disorders (13). It was developed by the Association of Sleep Disorders Centers (ASDC; the earliest incarnation of the American Academy of Sleep Medicine [14]) and the Association for the Psychophysiological Study of Sleep. The DCSAD comprised four main categories, the first of which was disorders of initiating and maintaining sleep (insomnias). The main limitations of the DCSAD were its lack of specific diagnostic criteria (3) and the listing of duplicate entries for a single disorder under different symptom categories (13).

International Classification of Sleep Disorders (ICSD)

The ICSD was published in 1990 as an update of the DCSAD (13). To avoid duplication of entries, the ICSD categorized sleep disorders based on pathophysiological mechanisms (6). It contained three main categories: dyssomnias, parasomnias, and secondary sleep disorders. Insomnia was classified as a dyssomnia.

ICSD-2 was published in 2005 by the American Academy of Sleep Medicine (7). It reorganized the sleep disorders into eight main categories based on presumed etiology and symptom presentation. The first category was insomnia, which contained six primary insomnias and five secondary insomnias (15). ICSD-3 was published in 2014, and consolidated all insomnia disorders under three umbrella categories: chronic insomnia, short-term insomnia, and other insomnia disorder (8).

International Classification of Diseases (ICD)

In the late 1970s, the World Health Organization (WHO) embarked on its first concerted effort to incorporate a sleep nosology in ICD-9 (16), and later in the North American ICD-9-CM (13). The ICD-9 and ICD-9-CM characterized sleep disorders as either "organic" or "nonorganic," with insomnia disorders appearing under both headings (16). During the development of ICSD-2, the ICSD-2 committee engaged in extensive liaison efforts with the WHO, resulting in a near-complete listing of all ICSD-2 sleep disorders in the ICD-10-CM (13, 15, 16). An advance version of the ICD-11 was endorsed at the World Health Assembly in May 2019 and will take effect on January 1, 2022 (17). The ICD-11 follows ICSD-3 terminology in having codes for chronic insomnia, short-term insomnia, and "insomnia disorders, unspecified" (18).

DSM

While the ICSD is used by sleep disorder specialists, the DSM is preferred among psychiatrists and general medical practitioners (19). DSM-III-R (20) was the first DSM edition to include a proper sleep disorder nosology. It divided sleep disorders into two main sections, dyssomnias and parasomnias, with insomnia disorders listed under dyssomnias. Three insomnia diagnoses were listed: primary insomnia and two secondary insomnias (related to another mental disorder or "known organic factor"). DSM-IV and DSM-IV-TR (9, 21) reorganized the sleep disorders into four main sections: primary sleep disorders and three secondary sleep disorder sections (related to another mental disorder, medical condition, or substance-induced). The first two sections contained insomnia disorders, while the latter two sections contained specifiers for insomnia subtypes.

DSM-5 (10) reorganized the sleep disorders into 10 major groups, with insomnia disorder as the first group. DSM-5 precedes ICSD-3 in consolidating all insomnia variants into the single diagnosis of insomnia disorder, with specifiers (i.e., with nonsleep disorder mental comorbidity, other medical comorbidity and other sleep disorder). The comorbid conditions can be specified without implying causality. Furthermore, one can specify if it is episodic (1–3 months), persistent (>3 months), or recurrent (two or more episodes within 1 year). While not included in the main diagnostic criteria, quantitative criteria are also recommended in the accompanying text (e.g., difficulty initiating sleep may be defined as subjective sleep latency greater than 20–30 minutes).

TRENDS IN THE EVOLUTION OF INSOMNIA NOSOLOGY

Classification Approach: From Symptom to Etiology to Treatment?

The DCSAD opened the first chapter of sleep disorder nosology by adopting a purely symptom-based approach to classification (3). This was clinically convenient but led to duplicate entries for a single disorder, which was untenable for statistical and epidemiological purposes (6).

For several decades afterward, the various classification systems strove to classify sleep disorders by etiology, pathology, or both. As much remained unknown about the pathology of insomnias (6, 22), each nosology produced varying interpretations of what this entailed. However, all of the classification systems sought to differentiate between insomnias that arose endogenously and insomnias that arose from other causes. The ICD-10 characterized insomnias as "organic" or "nonorganic" (psychogenic) (22), descriptors that also briefly made an appearance in the DSM-III-R. DSM-III-R, DSM-IV-TR, ICSD-1, and ICSD-2 have consistently made a distinction between primary and secondary insomnias; the latter are associated with medical conditions, psychiatric disorders, or substance use. Implicit in these dichotomies is the notion that secondary insomnias are symptoms of other primary conditions, and will naturally remit with the successful treatment of the primary disorder (5, 15).

However, the concept of secondary insomnias was increasingly challenged on the basis that insomnia may at times precede, precipitate, or exacerbate supposedly primary psychiatric conditions (5). A 2005 National Institutes of Health consensus development conference promulgated the concept of comorbid insomnia (23). Its rationale was that the term secondary may inadvertently perpetuate undertreatment of insomnia, which should warrant the same treatment attention as other coexisting conditions (24, 25).

Riding on the wave of this sentiment, the emphasis in insomnia nosology shifted from etiology to treatment. The ICSD-3, ICD-11, and DSM-5 abandoned all attempts at categorizing insomnias by presumed pathology, and put aside the primary/secondary and organic/nonorganic dichotomies. Their justification was that treatment methods for chronic insomnia were essentially the same, regardless of presumed etiology or comorbidity (22), and that treatment of insomnia should occur regardless of the treatment of any associated disorder (25).

Paring of Insomnia Diagnoses to Core Criteria

In contrast to the ICSD, DSM has traditionally favored a more simplified rather than differentiated approach to classification (26, 27). The ICSD hosted 10 insomnia subtypes (three intrinsic and seven extrinsic) in its first edition, and 11 (six primary and five secondary insomnias) in its second; in comparison, the DSM-III-R listed three insomnia disorders, which was pared down to two in the DSM-IV. This has been further distilled to a single insomnia disorder in DSM-5, and three for ICSD-3. The rationale for ICSD-3's abrupt conversion to the DSM approach was in part due to the shifting of emphasis toward treatment implications described above, and in part due to a paucity of evidence for the reliability and validity of the various insomnia subtypes (8, 19, 22).

The ICSD-3 diagnostic criteria for chronic insomnia disorder were built upon the foundations of the ICSD-2 general diagnostic criteria, with only the addition of the DSM's frequency criterion of three times per week, a duration criterion of at least 3 months, and an exclusion criterion for other sleep disorders. The diagnostic criteria for short-term insomnia disorder are identical to its chronic form, except in terms of duration (<3 months) and the lack of a frequency criterion.

EMPIRICAL EVIDENCE FOR THE MOST CURRENT CHANGES TO INSOMNIA NOSOLOGY

Nonrestorative Sleep (NRS)

There have been some key changes to the definition of insomnia symptoms, one of which is the removal of NRS from diagnostic criteria. NRS was defined in DSM-IV-TR (9) as the feeling that sleep was "restless, light, or of poor quality." It was eliminated from the diagnostic criteria for insomnia in DSM-5 and ICSD-3 due to its lack of specificity to insomnia and poorly defined features (28, 29). In particular, some researchers have argued that NRS is a primary complaint in conditions like fibromyalgia and chronic fatigue syndrome, raising the question of whether it is a distinct insomnia symptom that occurs in the absence of other disorders (30, 31). Researchers have also taken issue with incorporating a subjective experience with no clear objective indicators into formal diagnostic criteria (31).

To examine whether NRS can occur as a distinct insomnia symptom, Roth et al. (30) recruited a sample with NRS complaints, excluding individuals with any significant medical, psychiatric, or alternative sleep disorders. A pure NRS group emerged, verified by polysomnography. This pure group exhibited significant daytime impairments that were of comparable severity to participants who also reported difficulty in initiating or maintaining sleep. In a large-scale population study, Ohayon et al. (32) similarly found a "pure" sample of individuals (5.8%) who experienced NRS in the absence of other sleep and psychiatric disorders; about 67% reported significant daytime consequences. NRS emerged as the second predictor after global sleep dissatisfaction for predicting daytime impairments of insomnia, above difficulty resuming or initiating sleep. Other research studies have provided support for the association strength between NRS and daytime impairment (33, 34), independent of depression (35). There is a possibility that NRS may signify greater insomnia severity. A latent class analysis on medical claims yielded four subtypes of insomnia patients, with the final cluster fully populated by patients with NRS complaints (36). This cluster exhibited much higher prevalence of severe (21%) and

moderate (49%) insomnia, made more medical claims, and used more prescription sleep medications.

Regarding the issue of quantifying a subjective experience, a review has indeed found no reliable or well-validated instrument for measuring NRS (37). However, Wilkinson and Shapiro (38) developed and validated the Nonrestorative Sleep Scale, which was recently validated in a Mandarin-speaking Hong Kong population (39). More independent cross-cultural efforts are required for further validation of this scale. In sum, while empirical gaps remain on the role and assessment of NRS in insomnia, preliminary evidence suggests that NRS may be associated with greater daytime impairment and insomnia severity. Researchers have voiced concerns that its omission from current diagnostic criteria will lead to under-recognition of its consequences (33).

Frequency and Duration

The frequency criterion of three nights per week first appeared in DSM-III-R and ICD-10's general insomnia diagnostic criteria (20, 40). Before ICSD-3, earlier editions did not specify any minimum frequency for insomnia diagnoses (6, 41). The minimum duration for general insomnia diagnosis has traditionally been 1 month for DSM-III-R to DSM-IV-TR, ICD-10, and the bulk of ICSD-2 insomnia subtypes (40, 42). Paradoxically, the ICD-11 has drifted toward the more ambiguous terminology of "at least several times a week . . . for at least several months" for chronic insomnia, although it remains in sync with ICSD-3 and DSM-5 in specifying a duration of less than 3 months for short-term insomnia (18).

The frequency criterion was added to further operationalize the definition of insomnia and standardize research (28, 43), while the duration criterion was changed from 1 to 3 months, purportedly because of evidence that 3 months is a critical period after which insomnia is more likely to persist (28). Two early literature reviews found three times per week to be the most popular frequency used in insomnia research criteria (41, 43), although the selection of this number appears to be arbitrary. Interestingly, these two literature reviews produced divergent conclusions for duration: One recommended a minimum duration of 1 month by consensus (41) and the other, 6 months by popularity (43). Nevertheless, two recent research studies using receiver-operating characteristic curve analyses have provided preliminary support for an optimal cut-off of 3–4 nights per week for predicting daytime impairment (33, 44). Another year-long study found 3 months to be the most reliable duration for defining chronic insomnia; in particular, if participants reported insomnia symptoms for 3 consecutive months, the conditional probability of insomnia symptoms persisting to the next month became 100% (45). However, the empirical basis for selecting these frequency and duration criteria remains limited. There is also little research on the diagnostic validity of distinguishing short-term insomnia from chronic insomnia (46, 47). In ICD-3, insomnia that persists <3 months is coded as short-term insomnia, whereas in DSM-5 it is coded as insomnia disorder with the specifier "episodic."

Reclassification of Subtypes of Insomnia

In ICSD-3, chronic insomnia disorder has replaced the multiple primary insomnia subtypes of its predecessor, ICSD-2, such as psychophysiological insomnia (characterized by heightened arousal and learned sleep-preventing associations), idiopathic insomnia (early onset, lifelong course), paradoxical insomnia (complaints of sleep disturbance without corroborative objective evidence), and inadequate sleep hygiene. These subtypes were not found in DSM-IV. While these subtypes were framed heuristically, there is scant data on their reliability and validity (16). Two early cluster analytic studies found a considerable mix of insomnia subtypes in their empirically derived clusters (48, 49). In the only known study to examine the reliability and validity of all contemporaneous insomnia subtypes in DSM-IV-TR and ICSD-2, Edinger et al. (50) found poor empirical support for the bulk of the subtypes. In a cross-sectional study involving 25,579 subjects, Ohayon and Reynolds (51) showed that a significant proportion of the population with sleep complaints did not fit into the DSM-IV and ICSD classification system. Ohayon and Reynolds (51) specifically flagged the "excessive number of diagnoses" in the ICSD as contributing to clinical difficulty in diagnosing patients. Based on this lack of evidence for the ICSD-2 nosology of insomnia subtypes, the ICSD-3 consolidated all primary and secondary subtypes into the single diagnosis of Chronic insomnia disorder, in line with DSM-5.

ONGOING RESEARCH EFFORTS

The Quest for Biomarkers

Biomarkers are the holy grail of medical classifiers, but unfortunately, they are often elusive or found only in certain conditions. Examples of sleep disorders that can be reliably diagnosed based on biomarkers include fatal familial insomnia and type 1 narcolepsy (with cataplexy). It has been established that type 1 narcolepsy is caused by an irreversible loss of orexin/hypocretin neurons and can be diagnosed based on clinical presentation and low CSF orexin/hypocretin levels (8, 10). However, both fatal familial insomnia and type 1 narcolepsy are very rare.

Researchers have embarked on extensive efforts to identify putative biomarkers for other sleep disorders, including insomnia. These research efforts include genetic studies ranging from familial inheritance to genome-wide studies, EEG, and structural and functional neuroimaging. Unfortunately, no promising candidate biomarkers with high sensitivity and specificity for insomnia have emerged to date. For example, a truly impressive genome-wide analysis on insomnia studied 1,331,010 individuals and identified 202 loci, implicating 956 genes and functional pathways (52). Not unexpectedly, the researchers found considerable genetic

correlation of insomnia with psychiatric traits; moreover, meta-analysis only explained 2.6% of the variance. Another study with over 450,000 subjects found 57 loci that are related to subjective insomnia complaints (53). Shared genetic factors were found between frequent insomnia symptoms and nonspecifically with restless legs syndrome, aging, as well as cardio-metabolic, behavioral, psychiatric, and reproductive traits. Hence, at the present time, no specific gene, gene product, or "insomnia chip" has been shown to be clinically useful for the diagnosis of insomnia disorder.

Polysomnography (PSG) is the gold standard measurement of sleep, but is not currently required for the diagnosis of insomnia (2). However, it may be used to rule out other sleep disorders like obstructive sleep apnea, for which insomnia could be a symptom (11). In a study involving 76 individuals with primary insomnia and 78 normal sleepers, PSG was shown to lack the sensitivity and specificity for identifying insomnia disorders (54). A recent meta-analysis of polysomnographic studies showed that individuals with primary insomnia exhibit statistically significant impairments in sleep continuity and sleep architecture as compared with normal sleepers (55). However, these differences were not particularly pronounced (e.g., an additional 6 minutes more to fall asleep on average) (56), and may have limited clinical utility.

One putative objective biomarker that is already in popular use now is wrist actigraphy, which is accessible to the general public. Wrist actigraphy records the occurrence and degree of limb movement activity over time, which can provide objective information on the sleep habits of patients in their home environments over multiple nights (57). One major drawback of actigraphy is that it provides only an indirect measure of sleep: For example, if the patient is lying down quietly while trying to sleep, actigraphy may not capture this as an awake state (58). Current clinical guidelines do not recommend the routine use of actigraphy in the assessment of insomnia, except potentially in ruling out other sleep disorders (11, 56, 59). In two sequential studies, Natale et al. (58, 60) investigated the usage of actigraphy in the evaluation of insomnia, using different actigraphy devices. While each study found significant differences in various objective sleep parameters between normal sleepers and insomnia patients, the quantitative actigraphic criteria obtained in the two studies were not the same. Therefore, there is a need for methodological and technological standardization before actigraphy data can be considered for incorporation into the diagnostic criteria for insomnia disorder.

A number of validated self-report questionnaires are recommended as complementary tools in the assessment of insomnia, such as the Insomnia Severity Index and the Pittsburgh Sleep Quality Index (2, 56). As the sleep diary is a frequently used tool in clinical practice, a panel of experts recently sought to standardize it by developing the Consensus Sleep Diary (61). A recent study examining its psychometric properties has provided preliminary evidence for its validity, clinical utility, and usability (62), although more independent research is required. While these instruments provide objective and/or quantifiable scores that can be tracked over time, they are currently not required for the diagnosis of insomnia disorder. It is possible that in a bid to remain agnostic and impartial, professional bodies are reluctant to endorse the usage of one instrument or another in formal diagnostic criteria.

Data-Driven Insomnia Subtypes

Although current classification systems have eliminated insomnia subtypes due to a lack of empirical evidence, the discovery of valid insomnia subtypes may theoretically provide valuable information that can drive personalized treatment approaches. Instead of attempting to fit data into preconceived insomnia subtypes, a recent trend in insomnia research seeks to derive insomnia subtypes directly from data using cluster analyses. For instance, Miller et al. (63) derived at least two clusters from objective sleep parameters obtained from polysomnography: insomnia with normal objective sleep duration and insomnia with short sleep duration. Using a combination of objective polysomnographic measures and subjective self-report instruments, Crawford et al. (64) obtained three symptom cluster profiles: high subjective wakefulness, mild insomnia, and insomnia-related distress, with unique covariates (e.g., age and obesity) associated with each profile.

In a study involving about 4,500 participants, Blanken et al. (65) identified five novel insomnia disorder subtypes using a multidimensional set of nonsleep characteristics, such as life history, affective traits, and personality. The researchers validated their five-subtype model in a nonoverlapping sample and found a 0.87 probability of subtype stability after a mean follow-up of 4.8 years. They also extensively investigated the clinical relevance of these subtypes for the developmental trajectories of sleep complaints, current comorbidities, depression risk, and response to benzodiazepine intake, as well as an EEG biomarker and the effectiveness of cognitive-behavioral therapy for insomnia for two of the subtypes. On the basis of their findings, they constructed and validated the Insomnia Type Questionnaire to assist clinicians in subtyping their patients and released a publicly available web-based automatic scoring system. This model of insomnia subtyping awaits independent replication but holds the potential to start a new chapter in insomnia nosology.

Transdiagnostic Perspective

Taking an entirely different approach, the National Institutes of Mental Health (NIMH) argued for a paradigm shift from the current categorical distinctions in traditional classification systems to a transdiagnostic perspective (66). The transdiagnostic perspective aims to identify common underlying processes that cut across various traditional psychiatric disorders (67). To facilitate research for the transdiagnostic perspective, the NIMH developed the Research Domain Criteria, which conceptualizes mechanisms underlying

psychopathology in terms of five overarching domains, with recommended objective indices and biomarkers (66). In this framework, insomnia is not considered a distinct disorder. Instead, it can be considered both a descriptive process (i.e., it coexists with other psychiatric disorders) and a mechanistic process (i.e., it casually or bidirectionally affects other psychiatric disorders) (67). The advantage of adopting a transdiagnostic approach is that it circumvents the nosological challenges of pigeonholing insomnia into specific subtypes or diagnostic criteria and foregrounds treatment considerations. However, while the transdiagnostic perspective has its proponents, it remains at present an alternative approach to mainstream clinical and research practices.

CONCLUSIONS

Sleep science as a distinct medical or health specialty is relatively young, even though insomnia itself has a long and relentless history. The evolution of the classification systems over the years shows that much remains to be discovered and learned. In this sense, all classification systems are works in progress. At the present time, insomnia disorder remains a series of subjective complaints over a time course. There is currently inadequate empirical evidence for supporting the incorporation of objective measures into the diagnostic criteria for insomnia disorder, be they candidate genes, polysomnography, or actigraphy data. Hence, we rely primarily on expert consensus to arrive at somewhat arbitrary and qualitative criteria for classification. It is heartening that these expert workgroups have demonstrated the willingness to update their classification systems as more knowledge is accreted, acknowledge where knowledge remains lacking, and develop pragmatic though imperfect solutions to these difficulties in nosology building.

It is also encouraging that instead of remaining in silos, professional organizations have worked together to achieve greater concordance and confluence between the different sleep disorder classification systems. This began with the synchronizing of ICD-10-CM with ICSD-2 and progressed to the convergence of ICSD-3, ICD-11, and DSM-5 on the same core features in the diagnostic criteria for insomnia disorder. By reducing ambiguity and confusion, the convergence of classification systems will assist in streamlining research endeavors and standardizing evidence-based clinical diagnosis and treatment. Regardless of how it is classified, insomnia disorder, and insomnia itself, will likely continue to be described by molecular and electrophysiologic interactions in the context of complex psychosocial and environmental factors.

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