

Cognitive Dysfunction, Psychophysiological Regulation, and Psychosocial Factors in Psychosomatic Disorders: A Narrative Review

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ABSTRACT

Background: Psychosomatic disorders result from complex interactions among biological, psychological, cognitive, and social factors. Growing evidence suggests that cognitive dysfunction, particularly in attention, executive functioning, and working memory, contributes to the development and persistence of psychosomatic symptoms. This review aimed to synthesize current evidence on cognitive dysfunction, psychophysiological regulation, self-regulation mechanisms, and psychosocial factors associated with psychosomatic disorders..

Method: A narrative review was conducted using articles published between 2016 and 2026 and retrieved from Scopus, PubMed, ScienceDirect, and ProQuest through a literature search conducted on April 24, 2026. The search strategy was based on the PICOS framework and included terms related to psychosomatic disorders, somatic symptom disorder, executive functions, attention, working memory, self-regulation, and psychosocial factors. Following the screening and eligibility assessment, 14 articles were included in the review.

Result: The findings indicate that impairments in attention, executive functioning, and working memory are consistently associated with psychosomatic disorders and may influence symptom severity and treatment response. Psychophysiological regulation, particularly autonomic nervous system functioning, plays an important role in self-regulation and symptom management. Furthermore, psychosocial factors, including depression, illness beliefs, maladaptive coping, chronic pain, and childhood trauma, contribute to psychosomatic vulnerability and disease progression. Psychosomatic disorders are influenced by interactions among cognitive, psychophysiological, and psychosocial factors, highlighting the importance of integrated, patient-centered approaches to assessment and treatment.

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INTRODUCTION

Persistent physical symptoms accompanied by excessive cognitive, emotional, and behavioral responses that cause significant distress and functional impairment are the hallmark of somatic symptom disorder (SSD). According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), SSD is a diagnostic condition characterized by distressing somatic symptoms accompanied by disproportionate psychological responses. In contrast, terms such as medically unexplained symptoms (MUS), somatization disorder, and psychosomatic disorders represent related but distinct concepts derived from different diagnostic frameworks or broader clinical contexts. In this review, the term SSD is used when referring specifically to the DSM-5 diagnosis, whereas psychosomatic disorders is used as an umbrella term when discussing the broader literature on mind-body interactions. The DSM-5 reflects a more comprehensive

understanding of the biological, psychological, and social dimensions of SSD by shifting the diagnostic focus from the absence of a medical explanation for symptoms to the presence of maladaptive psychological responses.(1) Functional somatic syndromes (FSS) and bodily distress are prevalent across a wide range of medical specialties and constitute a significant component of the global burden of disease. These conditions are associated with diagnostic uncertainty, patient frustration resulting from limited treatment effectiveness, and considerable challenges in clinical management, underscoring the need to improve the recognition and management of somatic symptom-related disorders.(2) The importance of interdisciplinary approaches to SSD management is further supported by evidence that effective interventions, particularly modular cognitive behavioral therapy (CBT), focus on modifying maladaptive thoughts and behaviors.(1)

Additionally, foundational research has demonstrated that patients with psychosomatic disorders often exhibit neurocognitive deficits, particularly in executive functioning and attention, which are essential for self-regulation and adaptive behavior. These findings have been consistently supported by more recent studies reporting impairments in executive functioning, attentional control, and cognitive flexibility among individuals with somatic symptom–related disorders. Neuropsychological assessments, including the Continuous Performance Test (CPT) and the Wisconsin Card Sorting Test (WCST), have consistently identified deficits in these cognitive domains.(3) Comparisons between patients with conversion disorder and those with other somatic symptom–related disorders have revealed significant impairments across several neurocognitive domains, including attention and information-processing speed(4) Similar cognitive deficits have also been documented in post-traumatic stress disorder (PTSD), a condition that frequently presents with impairments in attention and memory.(5)

Recent evidence further supports these observations, demonstrating that deficits in executive functioning, attention, and cognitive flexibility are consistently associated with greater symptom severity and poorer functional outcomes in individuals with somatic symptom disorders and related psychosomatic conditions. Collectively, these findings suggest that dysfunction in attentional and executive processes may contribute to maladaptive interpretations of physical sensations, thereby exacerbating somatic symptoms and perpetuating the cycle of psychosomatic distress.(6)

Beyond influencing symptom perception, cognitive dysfunction has important clinical implications that may directly affect disease severity and treatment outcomes. Research has shown that approximately half of patients with severe obesity and metabolic disorders exhibit measurable cognitive impairments, particularly in executive functioning and working memory.(7) These deficits may complicate disease management by increasing somatization tendencies and amplifying the perception of physical symptoms.(8) Furthermore, psychoactive medication use, metabolic comorbidities, and systemic inflammation have all been identified as contributors to cognitive impairment.(9)(10) Conversely, preserved executive functioning supports effective decision-making and adherence to treatment, underscoring the importance of integrated healthcare approaches that address cognitive health alongside physical health.(7)(10) Therefore, understanding these relationships is essential for developing targeted interventions that improve both cognitive functioning and overall health outcomes.

Beyond cognitive function, psychological and psychophysiological self-regulatory mechanisms play a crucial role in shaping symptom perception and behavioral responses. Cognitive processes, such as interoceptive sensitivity, influence emotional regulation and decision-making by affecting how individuals perceive and interpret bodily sensations.(11) In addition, contextual factors, including age, psychological distress, and illness beliefs, may influence self-regulation strategies and health-related behaviors.(12) Collectively, these findings suggest that psychosomatic disorders result from interactions among psychological, neurobiological, and social factors, underscoring the need for comprehensive, multidisciplinary treatment.(13)

Additionally, the biopsychosocial framework has become increasingly important for understanding psychosomatic disorders by emphasizing the dynamic interactions among biological vulnerability, psychological functioning, and social experiences. For example, adverse childhood experiences, maladaptive coping strategies, and difficulties with emotional regulation are frequently associated with chronic pain disorders, all of which contribute to the development and persistence of somatic symptoms [14]. Consistent with the biopsychosocial model, emotional and cognitive factors influence pain and disability beyond physiological mechanisms.(14) Collectively, these findings suggest that cognitive dysfunction, psychophysiological dysregulation, and psychosocial vulnerability interact dynamically in the development and maintenance of psychosomatic disorders, ultimately influencing symptom onset, persistence, and treatment outcomes.

Despite the growing body of evidence linking cognitive functioning to psychosomatic disorders, the available findings remain dispersed across diverse populations and clinical conditions. Most previous reviews have focused on individual aspects of psychosomatic disorders, such as neurocognitive impairment, emotional regulation, chronic pain, or specific psychiatric diagnoses, without comprehensively integrating these mechanisms within a unified biopsychosocial framework. In addition, uncertainties remain regarding the relative contributions of executive dysfunction, psychophysiological regulation, and psychosocial vulnerability to symptom development and disease progression across different psychosomatic conditions. Consequently, a comprehensive synthesis of the literature is needed to clarify the roles of cognitive dysfunction, psychophysiological regulation, and psychosocial factors in psychosomatic disorders. By critically integrating evidence across these interconnected domains rather than examining them in isolation, this

review seeks to identify areas of convergence and divergence in the current literature and provide a broader conceptual understanding of the mechanisms underlying psychosomatic disorders. Therefore, this narrative review aims to examine the existing scientific evidence regarding: impairments in attention and executive functioning in psychosomatic disorders, the impact of cognitive dysfunction on symptom severity and treatment response, psychophysiological regulation and self-regulation mechanisms in psychosomatic disorders, and the contribution of psychosocial and neuropsychological factors to vulnerability and disease progression. By integrating these interconnected mechanisms, this review seeks to provide a more comprehensive understanding of the pathogenesis of psychosomatic disorders and their implications for the development of more effective, patient-centered intervention strategies.

METHOD

Study Design

This study employed a narrative review approach to synthesize and critically examine the existing literature on the roles of cognitive dysfunction, psychophysiological regulation, self-regulation mechanisms, and psychosocial factors in psychosomatic disorders. A narrative review was considered appropriate because the available evidence is derived from diverse populations, clinical conditions, and study designs, making it necessary to integrate findings from multiple disciplines, including psychology, psychiatry, neuropsychology, and psychosomatic medicine. The review aimed to provide a comprehensive understanding of impairments in attention and executive functioning in psychosomatic disorders, the influence of cognitive dysfunction on symptom severity and treatment outcomes, psychophysiological regulation and self-regulation mechanisms underlying psychosomatic symptoms, and the psychosocial and neuropsychological factors contributing to vulnerability and disease progression.

Search Strategy and Data Sources

A comprehensive literature search was conducted on April 24, 2026, using four electronic databases: PubMed, Scopus, ScienceDirect, and ProQuest. This date refers to the date on which the literature search was performed. Studies published between 2016 and 2026 and indexed in the selected databases up to April 24, 2026, were eligible for inclusion. The search period was limited to this 10-year timeframe to capture recent evidence relevant to the review objectives. The search strategy was developed using the

PICOS framework and combined controlled vocabulary (where applicable) with free-text keywords.

For the Population (P) component, search terms included psychosomatic disorder, psychosomatic disease, psychophysiological disorder, somatic symptom disorder, somatoform disorder, somatization, somatisation, somatic symptom, somatic complaint, somatic problem, and medically unexplained symptoms. The Intervention/Exposure (I) component included terms related to cognitive and executive processes, such as executive function, executive dysfunction, cognitive control, working memory, inhibitory control, response inhibition, cognitive flexibility, set shifting, planning, goal-directed behavior, metacognition, and self-regulation. Additional keywords related to psychophysiological regulation, symptom severity, functional impairment, and treatment response were incorporated to identify studies relevant to the review objectives.

Searches were performed in the title, abstract, and keyword fields whenever permitted by the database interface. Boolean operators ("AND" and "OR") were used to combine search terms and maximize the retrieval of relevant studies. The complete search strategies for each database are provided in Supplementary Material 1, while the study selection process is summarized in Figure 1.

Eligibility Criteria

Studies were considered eligible for inclusion if they examined psychosomatic disorders, somatic symptom disorder (SSD), somatization, medically unexplained symptoms (MUS), or related somatic symptom presentations. In addition, eligible studies were required to investigate cognitive functioning, particularly attention, executive functioning, self-regulation, psychophysiological processes, or psychosocial factors associated with psychosomatic conditions. Original research articles, review articles, and conference papers were included, provided that the full text was available and the publication was written in either English or Indonesian.(15)(16)

Studies were excluded if they did not examine the relationship between cognitive, psychological, or psychophysiological factors and psychosomatic symptoms. Publications without accessible full text, written in languages other than English or Indonesian, or lacking sufficient methodological detail or outcome data to permit data extraction and synthesis were also excluded from the review.

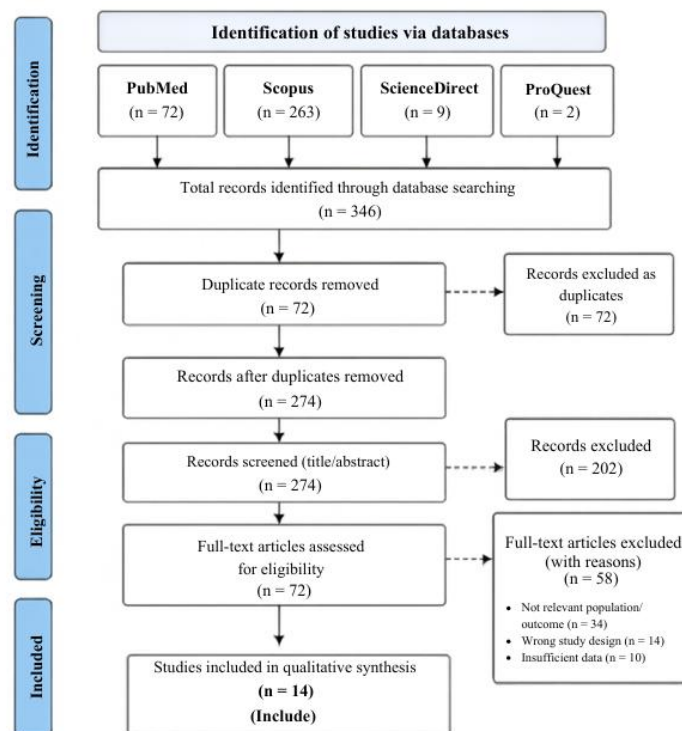


Figure 1. Detailed search results from each database at every stage of the literature search and screening process

Study Selection and Data Extraction

All records retrieved from the database search were exported and screened for duplicate entries. The remaining records underwent title and abstract screening to assess their relevance to the review objectives. Full-text articles that met the eligibility criteria were subsequently assessed for inclusion. Data extraction was performed by the sole author (DR) using a standardized data extraction form developed specifically for this review to ensure consistency in data collection. To minimize errors and ensure accuracy, all extracted data were reviewed twice by the author. Because this narrative review was conducted by a single reviewer, independent data extraction and discrepancy resolution procedures were not applicable. The following information was extracted from each included study: study characteristics, participant populations, psychosomatic conditions investigated, cognitive and psychophysiological variables assessed, psychosocial factors examined, and the main findings related to symptom severity, self-regulation, and treatment outcomes. The initial database search identified 346 records, including 263 from Scopus, 72 from PubMed, 9 from ScienceDirect, and 2 from ProQuest. After duplicate removal and title and abstract screening, 274 records remained for full-text assessment. Following full-text review according to the predefined inclusion and exclusion criteria, 14 studies published between 2016 and 2026 were

included in the final narrative review and synthesized according to the study's thematic framework.

RESULT AND DISCUSSION

Attentional and Executive Function Dysfunction in Psychosomatic Disorders

The reviewed literature consistently demonstrates that psychosomatic disorders are associated with impairments in cognitive performance, particularly in attention and executive functioning. Patients with irritable bowel syndrome (IBS) exhibit greater reaction time variability and a higher frequency of perseverative errors than healthy controls, indicating deficits in cognitive flexibility and executive control. Notably, these impairments persisted after adjustment for anxiety, depression, and somatization and were not associated with disease duration or the severity of gastrointestinal symptoms. These findings suggest that attentional dysfunction may represent a relatively independent feature of IBS rather than a consequence of psychological comorbidities or disease subtype.⁽¹⁷⁾

Similar findings have been reported in older adults with somatoform disorders, who demonstrated impairments in working memory, executive functioning, and attention. Although the severity of somatic symptoms was not consistently associated with all identified cognitive deficits, impairments in executive functioning and working memory

appeared to contribute to the development and persistence of somatic symptoms in this population.(18) Likewise, compared with healthy controls, patients with somatic symptom disorder (SSD) performed significantly worse on measures of verbal memory and attention. Furthermore, attentional functioning was significantly correlated with both anxiety levels and the severity of somatic symptoms, suggesting that attentional processes may contribute to the perception and maintenance of symptoms.(19)

The Role of Cognitive Dysfunction in Symptom Severity and Treatment Response

Several studies suggest that cognitive dysfunction is a key mechanism linking biological factors to the severity of somatic symptoms. In patients with somatic symptom disorder (SSD), body mass index (BMI) has been shown to indirectly influence symptom severity through its effects on working memory. Higher BMI was associated with poorer working memory performance, which in turn was associated with greater somatization. These findings suggest that metabolic factors may exacerbate somatic symptoms by impairing cognitive functioning, potentially through systemic inflammatory mechanisms.(20)

Executive functioning also appears to play a significant role in treatment outcomes. In a longitudinal study of older adults with somatoform disorders, clinical symptoms improved over a two-year follow-up period, whereas executive functioning continued to decline. Baseline executive dysfunction and hyperlipidemia were associated with poorer treatment response, suggesting that age-related neurocognitive changes may influence long-term therapeutic outcomes.(21) This finding is further supported by a six-month longitudinal study of patients with SSD, which demonstrated improvements in verbal learning and attention, accompanied by reductions in somatic symptoms, anxiety, and depression. Together, these findings indicate that improvements in cognitive functioning are closely associated with clinical recovery.(19)

Psychophysiological Regulation and Self-Regulation Mechanisms in Somatic Disorders

In addition to cognitive dysfunction, psychophysiological regulation plays a critical role in the development and persistence of psychosomatic symptoms. In individuals with somatic symptom disorder (SSD), heart rate variability biofeedback (HRV-BF) has been shown to improve autonomic nervous system functioning and reduce the severity of somatic symptoms. Compared with autogenic training, HRV-BF produced greater improvements in psychological and cognitive symptoms as

well as emotional regulation, suggesting that enhanced autonomic regulation may facilitate adaptive self-regulatory processes and more effective symptom management.(22)

Further evidence for the interaction between cognitive functioning and physiological regulation comes from studies demonstrating that neuropsychological characteristics mediate the relationship between psychopathology and heart rate variability (HRV). Among women, psychomotor speed and emotion recognition mediated the associations between depression or health anxiety and HRV indices. In contrast, selective attention and set-shifting ability were identified as important mediators among men. These findings suggest that cognitive functioning and autonomic regulation interact dynamically to influence the manifestation of both psychological and physical symptoms.(23)

Furthermore, self-regulation in individuals with chronic medical conditions is strongly influenced by environmental and psychosocial factors. Variables such as age, socioeconomic status, disease duration, physical activity, social participation, and depressive symptoms have been associated with the development of illness beliefs that shape perceptions of disease control, expected consequences, and expectations regarding disease progression. Among these factors, depressive distress emerged as the strongest predictor of illness beliefs and self-regulation strategies, highlighting its central role in psychosomatic adaptation.(24)

Psychosocial and Neuropsychological Factors in Chronic Pain and Psychosomatic Vulnerability

The reviewed studies also highlight the important contributions of neuropsychological and psychosocial factors to cognitive dysfunction and psychosomatic vulnerability. Patients with persistent idiopathic facial pain (PIFP) and chronic orofacial pain (COP) exhibit complex neuropsychological profiles characterized by impairments in executive functioning and attention, accompanied by depression, loneliness, alexithymia, reduced quality of life, and a predominance of maladaptive coping strategies, such as catastrophizing. These cognitive and psychological difficulties are closely associated with pain-related disability, impaired social functioning, and diminished overall well-being.(25) In addition, early-life trauma appears to exert long-lasting effects on both psychosomatic vulnerability and cognitive functioning. Histories of physical abuse and emotional neglect have been associated with poorer interference control in later life, although the effects of childhood adversity vary across cognitive domains and according to the type of adverse experience.

These findings suggest that the cognitive consequences of childhood trauma are domain-specific and influenced by the nature of adverse developmental experiences.(26)

Previous research has consistently identified cognitive dysfunction, particularly impairments in executive functioning, working memory, and attention, as a key mechanism underlying symptom development in both psychosomatic and somatic disorders. Studies involving conditions such as fibromyalgia, somatic symptom disorder (SSD), and irritable bowel syndrome (IBS) indicate that neurocognitive deficits contribute substantially to both the onset and persistence of symptoms. For example, patients with IBS exhibit impairments in executive functioning and attentional control that are not fully explained by psychological factors such as depression or anxiety, suggesting the presence of disorder-specific cognitive abnormalities.(17)(27) Similarly, working memory has been shown to mediate the relationship between body mass index (BMI) and somatic symptom severity in patients with SSD, underscoring the important role of cognitive dysfunction in the pathogenesis of the disorder.(20) Furthermore, patients with fibromyalgia frequently report significant cognitive difficulties, particularly in working memory and concentration, with greater pain severity associated with more pronounced cognitive impairment.(28) Overall, these findings consistently demonstrate that impairments in attention, executive functioning, and working memory represent common neurocognitive features of psychosomatic disorders. However, some variability exists regarding the strength of the association between cognitive deficits and symptom severity. While several studies have reported significant associations,(19)(20) others have found that certain cognitive impairments are relatively independent of symptom severity or psychological comorbidities.(17)(18) These differences may reflect variations in study populations, diagnostic criteria, age groups, disease characteristics, and neuropsychological assessment methods. Collectively, the available evidence underscores the central role of neurocognitive dysfunction in the onset, progression, and maintenance of psychosomatic disorders(29)

Psychosomatic disorders are complex conditions that arise from interactions among psychophysiological regulation, psychosocial influences, and individual life experiences. Previous research has highlighted the importance of self-regulatory mechanisms in symptom development and management, with heart rate variability biofeedback (HRV-BF) emerging as a promising intervention for improving autonomic regulation and reducing the severity of somatic symptoms.(30)(31)

Furthermore, contextual factors such as age, socioeconomic status, and psychological distress strongly influence illness perceptions and health-related behaviors, suggesting that purely biological models are insufficient to explain the complexity of psychosomatic symptoms.(31)(32) The documented associations among childhood trauma, chronic pain, maladaptive coping strategies, and cognitive dysfunction further reinforce the need for a biopsychosocial approach to both clinical practice and research.(31)(33) Although the included studies consistently support the biopsychosocial model, they differ in the mechanisms they emphasize. Some studies primarily focused on autonomic dysregulation,(22) whereas others highlighted cognitive dysfunction (17–21) or psychosocial experiences, such as childhood adversity and chronic pain.(25)(26) Together, these complementary findings indicate that psychosomatic disorders cannot be adequately explained by a single pathogenic pathway but instead arise from dynamic interactions among neurocognitive, physiological, and psychosocial processes. Integrating assessments of physiological regulation, emotional functioning, and cognitive performance may improve treatment effectiveness, enhance quality of life, and reduce the risk of persistent chronic symptoms.(32)(33) Overall, the available evidence demonstrates that cognitive dysfunction, psychophysiological regulation, contextual factors, and psychosocial experiences interact in complex ways to influence the development and progression of psychosomatic disorders. Executive functioning, attention, working memory, and emotion regulation appear to play central roles in symptom development, treatment response, and patient well-being. These findings have important clinical implications, supporting comprehensive assessment strategies that integrate neuropsychological, physiological, and psychosocial evaluations to facilitate more individualized and effective interventions. A deeper understanding of these interconnected mechanisms may provide a more comprehensive framework for elucidating the pathophysiology of psychosomatic disorders and for developing more effective, patient-centered treatment approaches.

This review has several limitations. The included studies were heterogeneous with respect to study design, participant characteristics, psychosomatic conditions, and assessment methods, limiting direct comparisons across studies. In addition, most studies did not report findings according to sex, geographic region, or cultural background. Consequently, the extent to which neurocognitive impairments and psychosomatic characteristics vary across different populations remains unclear. Future research should include more diverse

populations and report findings across demographic and cultural contexts to improve the generalizability and applicability of the evidence.

CONCLUSION

This narrative review highlights the complex interplay among cognitive dysfunction, psychophysiological regulation, and psychosocial factors in the development and progression of psychosomatic disorders. Impairments in working memory, executive functioning, and attention appear to contribute to symptom severity and treatment outcomes, while emotion regulation, illness beliefs, coping strategies, and life experiences influence disease progression and adaptation. Collectively, the available evidence supports a biopsychosocial framework and underscores the importance of integrated, patient-centered approaches that address both the psychological and physical dimensions of psychosomatic disorders. However, this review has several limitations. As a narrative review, it did not include a formal risk-of-bias assessment or quantitative synthesis. In addition, the included studies were heterogeneous with respect to participant populations, psychosomatic conditions, and methodological approaches, and the review was limited to publications in English and Indonesian, which may restrict the generalizability of the findings. Future research should prioritize well-designed longitudinal and multicenter studies, employ standardized diagnostic criteria and neuropsychological assessment methods, and further investigate the mechanisms linking cognitive dysfunction, psychophysiological regulation, and psychosocial factors with psychosomatic disorders. Such efforts will strengthen the evidence base and support the development of more targeted and effective clinical interventions.

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