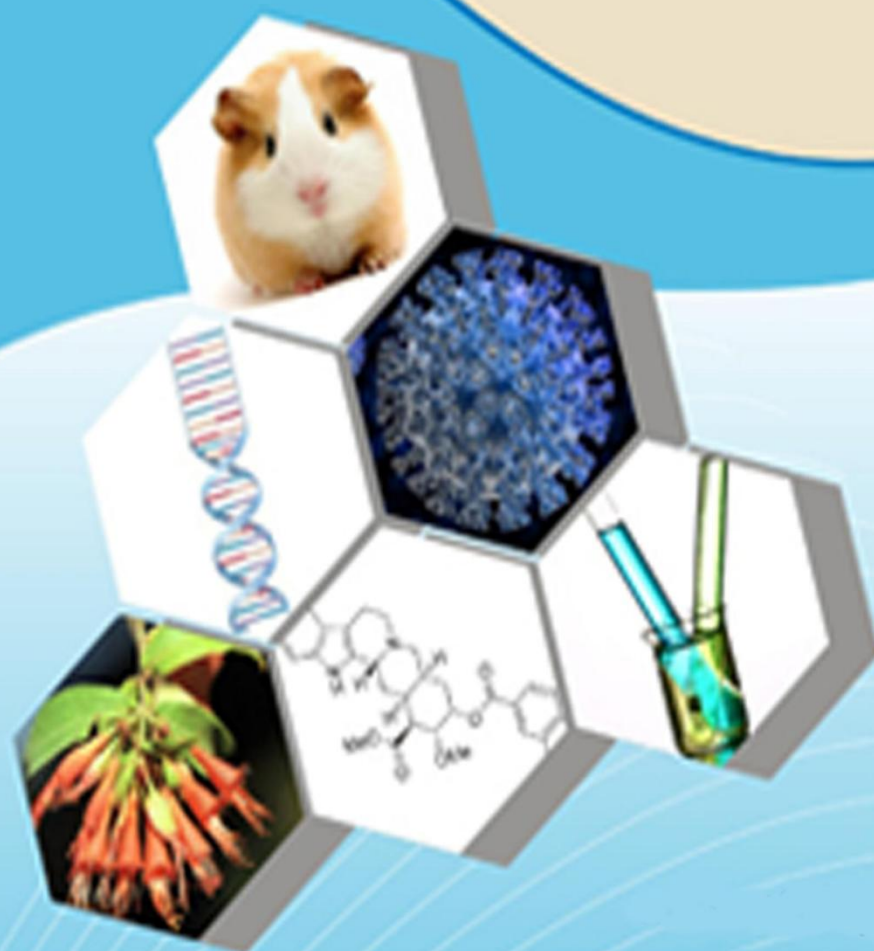




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## IMPACT OF CHRONIC INSOMNIA ON QUALITY OF LIFE

### A NARRATIVE REVIEW

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#### Abstract

Chronic insomnia is a widespread sleep disorder characterized by persistent difficulties in initiating or maintaining sleep, which significantly impairs health burden in various aspects of an individual's quality of life (QoL). Insomnia has profound effects on physical, psychological, occupational, and social domains.

This narrative review aims to explore and synthesize existing literature on the multidimensional impact of chronic insomnia on quality of life which highlighting the extents of impairment and the importance of early recognition and comprehensive management.

Relevant peer-reviewed studies, clinical guidelines, and epidemiological data were reviewed to assess the relationship between chronic insomnia and QoL parameters using certain tools such as the SF-36 and Quality of Life Scale for Insomnia (QOL-I).

Chronic insomnia is associated with increased risks of cardiovascular disease, metabolic dysfunction, mental health disorders (particularly depression and anxiety), cognitive impairments, and reduced work and social performance. Individuals with insomnia consistently report significantly lower scores on QoL assessments compared to healthy sleepers. Evidence supports the effectiveness of cognitive behavioral therapy for insomnia (CBT-I) in improving sleep quality and restoring overall well-being.

Chronic insomnia exerts a far-reaching negative impact on quality of life. A multidisciplinary approach involving behavioral therapies and holistic management is essential to mitigate its consequences and enhance the patient's overall functioning and life satisfaction.

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**Keywords:** Chronic insomnia, quality of life, sleep disorders, CBT-I, health impact, WHO.

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#### INTRODUCTION

Chronic insomnia is a prevalent sleep disorder characterized by difficulties in initiating or maintaining sleep, or experiencing non-restorative sleep for at least three nights a week over a duration of

three months or longer (1). It is not only a significant public health concern but also a critical determinant of overall wellbeing and daily functioning. Unlike transient sleep disturbances, chronic insomnia may



exerts a profound impact on both physical and mental health, contributing to fatigue, cognitive decline, mood disturbances, and reduced work productivity (2).

The World Health Organization recognizes sleep as one of the pillars of health, alongside diet and exercise. Despite this, insomnia remains underdiagnosed and undertreated in many populations. Studies have consistently shown that individuals suffering from chronic insomnia report significantly lower scores on quality of life indices, including the Short Form Health Survey (SF-36) and the WHO Quality of Life (WHOQOL) instruments (3,4). The consequences are not limited to subjective well-being; chronic insomnia is also associated with increased risk of comorbid conditions such as depression, anxiety, hypertension, and diabetes (1,5). Given the multifactorial nature of insomnia-spanning behavioral, psychological, physiological, and environmental which is crucial to explore its broader implications. This narrative review aims to synthesize current evidence on the impact of chronic insomnia on various domains of quality of life, identify vulnerable populations, and highlight the need for early recognition and integrated management strategies.

## **EPIDEMIOLOGY OF CHRONIC INSOMNIA**

Chronic insomnia is one of the most prevalent sleep disorders globally. It affects approximately 10-15% of the adult population, with 6-10% meeting the diagnostic criteria for insomnia disorder as defined by the International Classification of Sleep Disorders (ICSD-3)(6). The

prevalence increases with age and is more common among females compared to males (1). Additionally, chronic insomnia is more frequently reported among individuals with comorbid psychiatric conditions, especially anxiety and depression(7). In India, population-based studies show variable prevalence due to differences in definitions and assessment tools, with estimates ranging between 8% to 20% in community settings (8,9). Risk factors include older age, female gender, lower socioeconomic status, and poor physical health (10).

## **PHYSICAL & MENTAL HEALTH CONSEQUENCES OF CHRONIC INSOMNIA**

Chronic insomnia has been increasingly recognized as a significant contributor to adverse physical health outcomes, particularly cardiometabolic and immunological disorders.

### **Cardiovascular and Metabolic Risk**

Recent findings confirm that chronic insomnia is independently associated with increased risk of hypertension, coronary artery disease, and type 2 diabetes mellitus. A 2024 review emphasized that insomnia contributes to sympathetic overactivity, endothelial dysfunction, and systemic inflammation, all of which are linked to cardiovascular pathology (11). Insomnia accompanied by short sleep duration further intensifies these risks (12).

### **Inflammation and Hormonal Disruption**

Insomniacs exhibit elevated levels of pro-inflammatory cytokines such as interleukin-6 (IL-6) and C-reactive protein



(CRP), which promote atherosclerosis and insulin resistance (13). Sleep deprivation also leads to dysregulation of cortisol and growth hormone, impairing glucose metabolism (14). Furthermore, alterations in leptin and ghrelin contribute to increased appetite, caloric intake, and central obesity (15).

### **Immune Dysfunction**

Both acute and chronic insomnia impair immune responses. Recent evidence shows that even one night of sleep deprivation can suppress immune defenses to a degree comparable to obesity or smoking (16). This increases susceptibility to infections and delays recovery from illness.

### **Mood Disorders and Emotional Dysregulation**

Chronic insomnia and mood disorders exhibit a strong bidirectional relationship. Longitudinal studies show insomnia increases the risk of major depressive disorder and anxiety disorders (17). Emotional dysregulation, including irritability, reduced stress tolerance, and hopelessness, often occurs due to sustained sleep loss (18). A recent study found that over 60% of insomniacs display high neuroticism, which heightens emotional sensitivity and vulnerability to psychological distress (19).

### **Quality of Life and Daily Functioning**

Insomnia significantly impairs social and occupational functioning. Individuals frequently report reduced life

satisfaction, impaired concentration, and a diminished ability to manage interpersonal relationships (20). These effects perpetuate the chronic stress-insomnia cycle and contribute to long-term psychological decline.

### **Neurocognitive Deficits**

Insomnia is linked to deficits in attention, working memory, and executive functioning. A 14-year longitudinal study showed individuals with persistent difficulty initiating sleep scored significantly lower on cognitive tests, even after controlling for depression and vascular health (21). These impairments are likely due to sleep fragmentation and reduction in restorative slow-wave and REM sleep.

### **Neuro degeneration and Dementia Risk**

An umbrella review of large-scale cohort studies concluded that insomnia increases the risk of developing Alzheimer's disease and other dementias (22). Mechanisms include disruption of glymphatic clearance of neurotoxins, chronic inflammation, and hippocampal atrophy. Recent functional MRI studies have revealed altered activation in brain regions such as the prefrontal cortex, amygdala and anterior cingulate cortex in individuals with chronic insomnia, supporting the role of neurobiological mechanisms in emotional dysregulation and cognitive impairments (23).

### **Occupational Impact**

Chronic insomnia significantly reduces workplace productivity and increases presenteeism (working while



impaired). A RAND Europe study estimated that workers with insomnia lose 44–54 working days annually due to sleep-related issues(24).

### **Absenteeism and Workplace Accidents**

Chronic insomnia increases absenteeism and workplace accidents. Sleep-deprived workers have a higher risk of injuries and are more likely to miss work (25). Meta-analyses show that insomnia increases occupational accident risk by approximately 1.6 times (26).

### **Burnout and Job Dissatisfaction**

Insomnia is a strong predictor of emotional exhaustion and burnout, especially in healthcare workers. A 2023 study of Greek nurses found significant associations between insomnia, low resilience, and burnout symptoms during the COVID-19 pandemic (27)

### **Impaired Cognitive Function at Work**

Chronic sleep restriction impairs attention, memory, and executive functions, leading to poor workplace decision-making and decreased job performance (28).

### **Strained Interpersonal Relationships**

People with chronic insomnia often report emotional irritability, reduced patience, and difficulty maintaining close relationships (29). Insomnia is often stigmatized as a minor complaint, leading sufferers to internalize negative views. This stigma correlates with depression and reduced quality of life (30).

### **Cognitive and Emotional Dysregulation in Society**

Sleep deprivation decreases emotional empathy and disrupts social interactions by impairing recognition of facial expressions and emotional cues (31).

### **Economic Burden**

Insomnia costs billions annually through healthcare, accident-related expenses, and lost productivity. A comprehensive study found that total costs, including direct and indirect, exceeded \$100 billion per year in the U.S. alone (32).

### **QUALITY OF LIFE ASSESSMENT TOOLS IN CHRONIC INSOMNIA**

Assessing the quality of life (QoL) in patients with chronic insomnia is essential for understanding the full burden of the condition. Insomnia affects not only sleep but also physical health, mental well-being, and social functioning. Several validated instruments, both generic and insomnia-specific, have been developed to measure the QoL impact of insomnia in both clinical and research settings.

A recent advancement in this area is the Quality of Life Scale for Insomnia (QOL-I), developed specifically to assess insomnia-related QoL impairments. The QOL-I demonstrated excellent internal consistency (Cronbach's  $\alpha = 0.92$ ) and construct validity in a 2025 validation study involving patients with chronic insomnia and healthy controls (33).

The Insomnia Daytime Symptoms and Impacts Questionnaire (IDSIQ) is another recently validated instrument that captures the daytime consequences of insomnia, including fatigue, emotional distress, and cognitive impairments. Its use



has been expanded to patients with comorbid nocturia and has shown strong psychometric properties (34).

Instruments like the Insomnia Severity Index (ISI) and Athens Insomnia Scale (AIS), though primarily used to evaluate symptom severity, include items that relate to daytime functioning and overall well-being, making them useful for QoL assessment as well (35,36).

Generic health-related QoL tools such as the Short Form-36 (SF-36) and its abbreviated versions (SF-12, SF-8) assess broader domains including vitality, mental health, and social functioning. These tools are often used alongside sleep-specific instruments to provide a more comprehensive assessment (37). The EuroQol EQ-5D, particularly the five-level version (EQ-5D-5L), is also used for health economic evaluations, though it may lack sensitivity to sleep-specific issues (38).

Additional insomnia-focused tools like the Hotel-Dieu-16 (HD-16) and the Glasgow Sleep Impact Index (GSII) provide deeper insight into how sleep disturbances impact daily functioning, psychological well-being, and social interactions (39). These tools are particularly helpful in clinical trials and individualized treatment assessments.

Overall, a combined use of condition-specific instruments such as the QOL-I or IDSIQ and generic QoL tools like SF-36 or EQ-5D-5L is recommended to comprehensively capture the multi-dimensional impact of chronic insomnia on patients' lives.

## TREATMENT AND ITS IMPACT ON QUALITY OF LIFE

Cognitive Behavioral Therapy for Insomnia (CBT-I) is the first-line treatment for chronic insomnia, endorsed by clinical guidelines for its long-term efficacy and safety profile. CBT-I consists of components such as stimulus control, sleep restriction, cognitive restructuring, and relaxation training, aimed at correcting maladaptive behaviors and beliefs related to sleep.

Recent evidence demonstrates that CBT-I not only improves sleep parameters but also significantly enhances quality of life (QoL) across psychological, physical, and social domains. A 2025 meta-analysis of 29 randomized controlled trials ( $n = 9,475$ ) showed that fully automated digital CBT-I (FA dCBT-I) produced moderate-to-large improvements in insomnia severity and functional outcomes, with sustained QoL improvements across follow-up periods (40). In cancer survivors, CBT-I led to a clinically significant reduction in insomnia severity ( $-11.35$  points) and improvements in fatigue, cognitive performance, and emotional well-being compared to control groups (41).

Another 2024 observational study using a mobile CBT-I app ("Good Sleep 365") found that older age, longer illness duration, and consistent engagement were predictive of greater improvements in QoL (42). Remote and tele-CBT-I approaches have also demonstrated effectiveness in improving not only sleep but also anxiety, depression, and social functioning, thereby



positively impacting patients' perceived QoL (43).

Moreover, a 2023 review indicated that internet-based CBT-I formats are well-suited for diverse populations and offer scalable, cost-effective options, with comparable improvements in QoL and sleep satisfaction to therapist-delivered CBT-I (44).

Complementary and alternative medicine (CAM) approaches have been increasingly explored for the management of chronic insomnia, especially among individuals seeking non-pharmacological options to improve sleep and overall well-being. These treatments not only target insomnia symptoms but also show potential to enhance quality of life (QoL) through holistic approaches.

### **1. MINDFULNESS-BASED INTERVENTIONS:**

Mindfulness-based stress reduction (MBSR) and meditation techniques have shown effectiveness in reducing sleep latency and improving sleep quality. A 2023 randomized controlled trial demonstrated that an 8-week mindfulness program significantly improved insomnia severity and QoL, with benefits persisting at 3-month follow-up (45).

### **2. YOGA AND TAI CHI:**

Yoga has been associated with improved sleep efficiency and decreased arousal. A systematic review by Li et al. (2023) found yoga and tai chi significantly improved both subjective sleep quality and

health-related QoL in adults with chronic insomnia (46). These practices may exert their effects through regulation of autonomic function and reduction in anxiety.

### **3. ACUPUNCTURE:**

Acupuncture is one of the most studied CAM treatments for insomnia. A meta-analysis of RCTs published in 2024 found acupuncture significantly improved sleep quality and daytime functioning, with minimal side effects (47). It was also associated with better QoL scores, possibly due to its influence on melatonin and serotonin regulation.

### **4. HERBAL THERAPIES:**

Valerian root, chamomile, and passionflower are among the most commonly used herbal remedies. A recent clinical trial in 2023 showed that a standardized valerian extract improved sleep onset latency and perceived quality of life in adults with chronic insomnia (48). However, concerns about standardization and interactions with other medications persist.

### **5. AROMATHERAPY AND ESSENTIAL OILS:**

Aromatherapy, particularly with lavender oil, has shown moderate effects in improving sleep parameters and mood. A 2024 study reported improvements in sleep quality and emotional well-being among older adults using lavender essential oil at bedtime (49).

### **6. NUTRITIONAL SUPPLEMENTS:**



Melatonin and magnesium supplementation have also gained popularity. A 2023 RCT demonstrated that low-dose melatonin not only improved sleep initiation but also enhanced daytime performance and general well-being (50).

## CONCLUSION

Chronic insomnia significantly impairs multiple aspects of an individual's quality of life, affecting physical health, psychological well-being, cognitive functioning, occupational performance, and social relationships. Evidence from numerous studies highlights that the persistent lack of restorative sleep contributes to increased morbidity, emotional distress, and reduced productivity, ultimately diminishing overall life satisfaction. Early identification, comprehensive assessment, and effective treatment of chronic insomnia are crucial to mitigating these impacts. Enhancing public awareness and integrating quality of life measures into clinical evaluation can improve outcomes and promote a holistic approach to care. Future research should continue to explore long-term effects and the benefits of various therapeutic interventions to optimize quality of life in affected individuals.

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