

Word Count: 1,586

Examining the bi-directional relationship between sleep disorders and mental health.

Introduction

Within the context of the profound interconnection between sleep and mental well-being, a bidirectional relationship emerges, wherein sleep, recognised as a fundamental component of human existence, intricately interacts with mental health. This complex interaction entails the reciprocal flow of information and actions in opposite directions (Cambridge Dictionary, 2023). Within this mutually influential dynamic, both sleep and mental health exert reciprocal influence, assuming pivotal roles in the holistic functioning and well-being of individuals.

Mental health, influenced by biology, society, psychology, and environment, encompasses relationships, social roles, emotions, and self-perception, highlighting the interplay between individuals and society (Bhugra, Till & Sartorius, 2013). Sleep disorders comprise syndromes distinguished by disruptions in sleep duration, quality, timing, or associated sleep-related behaviours and physiological states (Fallon & Finley, 2018). With approximately seventy distinct forms, common examples include insomnia, obstructive sleep apnoea (OSA), and restless legs syndrome (McArdle *et al.*, 2022). The criteria for clinical recognition of sleep disorders have been outlined to include persistence as a recurring issue, substantial emotional distress, and impairment of social and occupational performance (Fallon & Finley, 2018).

In exploring the connection between sleep disorders and mental health, three critical components warrant examination: the influence of sleep disorders on mental well-being, the reciprocal disruption of sleep patterns by mental health issues, and the underlying mechanisms that drive this bi-directional relationship.

Implications of sleep disorders on mental health

Sleep disorders can have significant ramifications for mental health, particularly within the domain of mental healthcare. Many individuals experiencing sleep disorders turn to psychiatric services instead of specialised sleep clinics, underscoring the importance of mental health professionals possessing knowledge about these conditions (Selsick & O'Regan, 2018). In the realm of psychiatric practice, OSA is a commonly encountered sleep-related breathing disorder characterised by recurrent airway collapse during sleep, leading to restricted airflow and decreased oxygen levels. OSA is linked to cognitive impairment, mood disorders, and a heightened prevalence of depression. Additionally, psychiatric medications that may induce weight gain can elevate the risk of OSA (Selsick & O'Regan, 2018). Another sleep disorder with implications for mental health is hypersomnolence, characterised by excessive daytime sleepiness. It can co-occur with anxiety, irritability, cognitive difficulties, and other psychiatric symptoms (Kolla *et al.*, 2019). Recognising and comprehending these sleep disorders within the contextual framework of mental healthcare is crucial for effective diagnosis and treatment. Parasomnias, such as sleep terrors and nightmare disorder, can also mimic psychiatric disorders and potentially have associations with psychiatric conditions. Selsick and O'Regan accentuate that diagnosis and management of sleep-related movement disorders, including restless legs syndrome and periodic limb movements during sleep, should take into account the impact of psychotropic medications and address underlying causes (Selsick & O'Regan, 2018). Milojevich &

Lukowski posit that understanding the impact of sleep disorders on mental health is crucial for individuals with generally healthy sleep habits, focusing on university students in their research. Reportedly, even short-term sleep problems can carry severe consequences for mental well-being (Milojevich & Lukowski, 2016). Their study utilised data from sixty-nine undergraduate students and aimed to examine the association between sleep quality and mental health. The results indicated that poor sleep quality was related to increased externalising and internalising problems. Nighttime sleep disruptions were associated with anxiety and somatic complaints, while sleep duration was not predictive of mental health. Their findings suggest that specific aspects of sleep quality may affect mental functioning (Milojevich & Lukowski, 2016). Furthermore, it is important to note that certain professional occupations exhibit a higher susceptibility to the development of sleep disorders, which in turn can worsen or perpetuate mental health conditions (Ebrahimzadeh et al., 2018). Sleep disorders can have a particularly considerable impact on mental wellbeing in work environments. Factors such as job-related stress and inadequate sleep quality contribute to diminished levels of attentiveness and accuracy, thereby escalating the risk of injuries and reducing overall productivity (Ebrahimzadeh et al., 2018). Extensive research has demonstrated a widespread prevalence of job stress across various industries worldwide, including the nursing profession. Nurses, due to their frequently irregular shifts, face heightened vulnerability to sleep disorders and associated complications. Substandard sleep quality among nurses can result in decreased work performance, increased medical errors, and potential jeopardy to patient safety (Ebrahimzadeh et al., 2018).

Impact of mental health conditions on sleep patterns

Mental health issues can disrupt sleep patterns through various factors, including post-traumatic stress disorder (PTSD), depression, and substance abuse (Novak, 2010). Insomnia often predicts the onset of mental health disorders, and the co-occurrence of sleep apnoea and depression further illustrates the association between sleep and mood/anxiety symptoms (Novak, 2010). These sleep disorders have detrimental effects on daytime functioning, leading to daytime sleepiness, fatigue, impaired cognition, and reduced quality of life for both the patients and their families. By recognising the ubiquity of sleep disorders in medically ill populations, Novak highlights the significance of "Sleep Health" in mentally and medically ill individuals (Novak, 2010). Alongside this, research on chronic kidney disease patients has identified a high incidence of sleep disorders, including restless legs syndrome, which predicts mortality in kidney transplant recipients.

Moreover, a study conducted by Kramer and Kinney examined the effects of PTSD on sleep patterns. Their research centred on a group of eight Vietnam combat veterans and revealed significant disruptions in their sleep. This group was divided into two subgroups: one with recurring nightmares stemming from their wartime experiences, and the other displaying various symptoms typically associated with PTSD (Kramer & Kinney, 1988). Both subgroups exhibited sleep patterns distinct from the norm, marked by shallower sleep and more frequent interruptions. Interestingly, the subgroup plagued by recurring nightmares had an extended period of REM latency and experienced more awakenings during the first part of the night. All participants in this subgroup received formal clinical diagnoses of PTSD, whereas none of those in the comparison group received such diagnoses. These

findings suggest that the comparison group may have latent PTSD, further emphasising the complex relationship between psychological well-being and sleep patterns (Kramer & Kinney, 1988). Substance abuse has also been implicated in disturbed sleep (Hasler et al., 2012). Substance use can directly create sleep problems, while difficulty sleeping can increase the risk of relapse to substance use. Circadian rhythms also play a role in substance abuse, although further research is needed to understand the directionality of this relationship. The circadian system, which regulates sleep and reward processing, may contribute to substance abuse independently of sleep pathways. Understanding the link between sleep, circadian disturbance, and substance use is crucial for developing effective interventions in the prevention and treatment of substance use disorders (Hasler et al., 2012).

Potential mechanisms underlying the bi-directional relationship

A myriad of potential mechanisms can be attributed to the bi-directional relationship between sleep disorders and mental health, inclusive of genetic factors, the comorbidity of insomnia and pain with depression, and the reciprocal relationship between the treatment of sleep disorders and mental health disorders, where improving sleep can lead to better outcomes in mental health treatment.

Genetic influences have been implicated in certain sleep disorders, such as narcolepsy, where specific genetic markers like HLA DQB1-0602 have been identified (Kushida, 2002). Although this haplotype – a cluster of genomic variants that are usually inherited together (National Human Genome Research Institute, 2019) – is not sufficient or necessary for diagnosing narcolepsy, it spotlights the potential genetic basis of the disorder. Other sleep disorders such as restless legs syndrome, sleepwalking, and snoring may be influenced by familial factors. Individuals with affected family members have an increased risk of developing these disorders. Kushida suggests that recognising the familial history of sleep disorders aids clinicians in reducing differential diagnoses and assessing related individuals (Kushida, 2002).

Within the complex interaction between sleep disorders and mental well-being, it becomes evident that mental health assumes a central role in shaping sleep patterns. While insomnia often accompanies several physical ailments, including rheumatic disorders, chronic pain, and chronic obstructive pulmonary diseases, its connection with mental health offers deeper insights into the mechanisms at play (Riemann et al., 2017). This link extends to depression, a prominent mental health concern (Smith & Haythornthwaite, 2004). The intertwined neural networks governing pain perception and sleep regulation provide essential clues to how mental health profoundly affects sleep quality. When mental health, especially depression, becomes a consideration, disrupted sleep patterns and reduced sleep duration carry more significant consequences (Smith & Haythornthwaite, 2004). This realisation highlights the importance of adopting a comprehensive approach within mental health, as it is essential to address these factors for effective patient treatment; improving mental well-being can indirectly lead to improved sleep quality, while treating sleep disorders can positively impact an individual's mental health (Wichniak et al., 2020). Further to this, documented reductions in pain

through interventions like pharmacotherapy and cognitive-behavioural therapy underscore the connection between mental health, sleep patterns, and overall well-being (Wichniak et al., 2020).

Conclusion

In summary, the bi-directional relationship between sleep disorders and mental health is multifaceted. Sleep disorders, especially insomnia, have significant implications for mental well-being, contributing to cognitive impairment and mood disorders like depression. Conversely, mental health conditions, such as depression, substance abuse, and PTSD, disrupt sleep patterns and adversely affect both daytime functioning and quality of life. Genetic factors play a role in certain sleep disorders, while the comorbidity of insomnia and pain with depression underpins the interplay between these conditions, suggesting shared underlying mechanisms. Implementing interventions for sleep disorders can yield favourable outcomes in terms of mental health, while reciprocally, addressing the intricate mechanisms that underlie this relationship is essential to comprehensive management strategies targeted at improving sleep quality and managing mental health symptoms to promote overall well-being.

Bibliography

- Bhugra, D., Till, A. and Sartorius, N. (2013). What is mental health? *International Journal of Social Psychiatry*, [online] 59(1), pp.3–4. doi: <https://journals.sagepub.com/doi/full/10.1177/0020764012463315> (Accessed: 18th June 2023)
- Cambridge Dictionary (2023). *bidirectional*. [Online] @CambridgeWords. Available at: <https://dictionary.cambridge.org/us/dictionary/english/bidirectional> (Accessed: 17th June 2023)
- Ebrahimzadeh, M., Akbarzadeh, A., Rezaghole, P., Ebrahimzadeh, M. and Tavana, H. (2018). The Relationship between Sleep Disorders and Job Stress: A Case Study among 160 Nurses. *Archives of Occupational Health*, [online] 2(2), pp.96–101. Available at: https://aoh.ssu.ac.ir/browse.php?a_id=69&sid=1&slc_lang=en&html=1 (Accessed: 23rd June 2023)
- Fallon, L.F., Jr., MD, DrPH and Finley, K. (2018) 'Sleep Disorders' in Longe, J.L., ed., *The Gale Encyclopedia of Nursing and Allied Health*, 4th ed., vol. 6, Farmington Hills, MI: Gale, 3253-3259, available at: <https://go-gale-com.manchester.idm.oclc.org/ps/i.do?p=GVRL&u=jrycal5&id=GALE|CX3662601052&v=2.1&it=r&sid=bookmark-GVRL&asid=e6f242f9> (Accessed: 16th June 2023)
- Hasler, B.P., Smith, L.J., Cousins, J.C. and Bootzin, R.R. (2012). Circadian rhythms, sleep, and substance abuse. *Sleep medicine reviews*, [online] 16(1), pp.67–81, available at: <https://www.sciencedirect.com/science/article/abs/pii/S1087079211000335> (Accessed: 20th June 2023)
- Kolla, B.P., He, J.-P., Mansukhani, M.P., Kotagal, S., Frye, M.A. and Merikangas, K.R. (2019). Prevalence and Correlates of Hypersomnolence Symptoms in US Teens. *Journal of the American Academy of Child & Adolescent Psychiatry*, [online] 58(7), pp.712-720, available at: <https://www.sciencedirect.com/science/article/abs/pii/S0890856718319087> (Accessed: 27th August 2023)
- Kramer, M., & Kinney, L. (1988). Sleep patterns in trauma victims with disturbed dreaming. *Psychiatric Journal of the University of Ottawa*, 13(1), 12–16. Available at: <https://psycnet.apa.org/record/1989-05114-001> (Accessed: 20th June 2023)
- Kushida, C.A. (2002). *Sleep Disorders*. [Online] ScienceDirect. Available at: <https://www.sciencedirect.com/science/article/abs/pii/B0122272102003204?via%3Dihub> (Accessed: 24th June 2023)
- McArdle, N. et al. (2022) 'Prevalence of common sleep disorders in a middle-aged community sample', *Journal of Clinical Sleep Medicine* [Preprint]. Available at: <https://doi.org/10.5664/jcsm.9886> (Accessed: 24th June 2023)
- Milojevich, H.M. and Lukowski, A.F. (2016). Sleep and Mental Health in Undergraduate Students with Generally Healthy Sleep Habits. *PLOS ONE*, [online] 11(6), p.e0156372. doi: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0156372> (Accessed: 24th June 2023)
- National Human Genome Research Institute (2019). *Haplotype*. [Online] Genome.gov. Available at: <https://www.genome.gov/genetics-glossary/haplotype> (Accessed: 24th June 2023)

Novak, M. (2010) "S27-04 - Sleep Disorders, Mental Health and Quality of Life," *European Psychiatry*. Cambridge University Press, 25(S1), pp. 25–94. doi:

<https://www.cambridge.org/core/journals/european-psychiatry/article/s2704-sleep-disorders-mental-health-and-quality-of-life/67C3E7C670E7C83CC76CD12D1E5C3EC9> (Accessed: 22nd June 2023)

Riemann, D., Baglioni, C., Bassetti, C., Bjoervatn, B., Dolenc Groselj, L., Ellis, J.G., Espie, C.A., Garcia-Borreguero, D., Gjerstad, M., Gonçalves, M., Hertenstein, E., Jansson-Fröjmark, M., Jennum, P.J., Leger, D., Nissen, C., Parrino, L., Paunio, T., Pevernagie, D., Verbraecken, J. and Weeß, H.-G. (2017). European guideline for the diagnosis and treatment of insomnia. *Journal of sleep research*, [online] 26(6), pp.675–700. Available at: <https://onlinelibrary.wiley.com/doi/full/10.1111/jsr.12594> (Accessed: 24th June 2023)

Selsick, H. & O'Regan, D. (2018) "Sleep disorders in psychiatry", *BJPsych Advances*, vol. 24, no. 4, pp. 273-283, available at: <https://doi.org/10.1192/bja.2018.8> (Accessed: 16th June 2023)

Smith, M.T. and Haythornthwaite, J.A. (2004). How do sleep disturbance and chronic pain inter-relate? Insights from the longitudinal and cognitive-behavioral clinical trials literature. *Sleep Medicine Reviews*, 8(2), pp.119–132. Available at:

<https://www.sciencedirect.com/science/article/abs/pii/S1087079203000443> (Accessed: 24th June 2023)

Wichniak, A., Gustavsson, K., Wierzbicka, A. and Jernajczyk, W. (2020). *Sleep Disorders*. [Online] ScienceDirect. Available at:

<https://www.sciencedirect.com/science/article/abs/pii/B9780128012383113224> (Accessed: 24th June 2023)