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Editorial

Sleep, physical activity and mental health during the COVID-19 pandemic: complexities and opportunities for intervention



The COVID-19 pandemic, which has become the defining public health crisis of our times, has affected even the most fundamental aspects of our lifestyle. These changes have been caused not so much by the direct effects of infection with the novel coronavirus SARS-CoV-2 as by the widespread implementation of stringent infection control measures, including lockdowns, quarantine, social distancing, and work-from-home or “smart work” policies. While such measures are essential in containing the spread of COVID-19 at a community level, they have led to significant changes in exposure to daylight as well as to social and environmental “timekeepers” or *zeitgebers*, leading to disturbances in biological circadian rhythms and sleep-wake patterns [1,2]. These effects are compounded by the adverse psychological effects produced by fear of infection, social isolation and loneliness caused by quarantine, and disruptions in education, employment, access to health care, and economic stability, leading to symptoms of anxiety, depression and post-traumatic stress in a substantial proportion of the general population [3,4]. These symptoms of mental distress are often associated with disturbances in the quantity and quality of sleep, though this relationship appears to be bi-directional, with disturbed sleep in turn leading to more severe symptoms of depression and anxiety [5,6]. A further mediating variable of interest in this context is physical activity, which has been observed to change in complex manners during the COVID-19 lockdown, and which can influence sleep both by acting as an environmental “timekeeper” and by positively influencing psychological resilience in the face of COVID-19 [7–9]. While some individuals report a decrement in physical activity due to restrictions on mobility in the context of COVID-19, others report increases in physical exercise and other efforts to “stay fit”, including normalization of sleep and dietary patterns [7].

In the context of this contemporary scenario, Ernstsen and Havnen have examined the relationship between self-reported sleep disturbances and mental health during the COVID-19 lockdown in Norway. Using a sample of 1281 adults who were physically active prior to the lockdown, they tested the hypothesis that the relationship between mental health and sleep is mediated by changes in physical activity [10]. 21.9% of study participants reported disturbances in sleep using a modified version of the Karolinska Sleep Questionnaire, but these were severe enough to qualify for a formal diagnosis of insomnia in only 1.2%. Significant symptoms of depression or anxiety were reported by 9% and 4.4% of the sample respectively. Both depressive and anxiety symptoms were significantly associated with disturbed sleep, but no statistically significant evidence was found for a mediating role of changes in physical activity.

These study findings illustrate the complexity of the three-sided relationship between sleep, physical activity and mental health in the context of the COVID-19 pandemic, which is unlikely to conform to a simple linear model. From a theoretical and empirical perspective, physical activity improves both mental health and sleep quality [8,11,12]; good sleep quality ameliorates symptoms of anxiety and depression [13,14]; and both activity level and sleep are adversely affected by depression and anxiety [15]. Thus, interventions aimed at improving sleep quality or physical fitness in the context of COVID-19 could alleviate psychological distress. Such a possibility is consistent with Ernstsen and Havnen’s results: their subjects, recruited from a fitness association, reported lower rates of depressive (9% vs. 33.7%) and anxious symptomatology (4.4% vs. 31.9%) than that generally reported in the context of COVID-19 [3,10]. On the other hand, as this study and others of its kind suggest, depression and anxiety can worsen sleep and activity patterns, leading to a vicious circle that can perpetuate psychological distress [16]. All these factors are themselves influenced by a wide array of moderating variables, including gender, age, loneliness, physical health status, prior psychological resilience or vulnerability, and the extent and duration of quarantine or lockdown [17,18].

The exact nature of the links among these variables remains to be clarified in further studies, including longitudinal designs measuring changes in sleep, activity and mental health indices and the correlations among them. Nevertheless, the current study has important implications for interventions in the related fields of sleep medicine and mental health care. Individuals reporting disturbed sleep in the context of the COVID-19 pandemic should be carefully screened for symptoms of depression and anxiety; likewise, sleep and physical activity patterns should be assessed in all patients presenting with new-onset or recurrent symptoms of psychological distress in this setting. In planning treatment for these individuals, it should be remembered that conventional sleep medicine or psychiatry services may be difficult to access in the context of lockdowns or related restrictions on mobility. Novel interventions to address mental health and sleep-related concerns due to COVID-19 have been developed, and are undergoing initial testing [19,20]. If positive results are obtained from initial trials of these innovative approaches, they can be adopted – and adapted to local circumstances – by both mental health and sleep medicine professionals, along with similar interventions aimed at optimizing levels of physical activity. Such an integrative approach, tailored to the needs and individual circumstances of each patient, could potentially lead to optimal outcomes in all these three domains.

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Conflict of interest

None to declare.

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