

## Psychology

# When the girdle of social timing relaxes: Effects of the COVID-19 lockdown on human sleep

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### ABSTRACT

*Increased regularity of sleep-wake patterns and more sleep: The 'lockdown'-induced relaxation of social schedules had positive effects on people's sleep. However, not everyone slept well in this unprecedented situation.*



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Do you know these Monday mornings when the alarm clock shakes you out of sleep way too early, and you already yearn for the next weekend, when you can finally lie in again? Actually, this illustrates a common situation in modern societies, where internally or biologically foreseen sleep-wake rhythms often clash with external or social factors, such as working hours. The name for this mismatch between external social and internal biological timing is 'social jetlag'. It denotes shifts in sleep-wake patterns between workdays and free days, that is when external or internal factors determine the sleep-wake cycle, respectively. For most of us, one consequence of social jetlag is that we sleep too little

during the workweek while on weekends, we sleep late trying to make up for this accumulated sleep debt. The changes in sleep-wake patterns between workdays and free days have repeatedly been associated with adverse health consequences, including depressive symptoms or performance deficits at work or school. While we cannot change the internal biological factors that determine individual sleep-wake timing, external or social factors are modifiable. This is precisely what happened when in mid-March 2020, numbers of infections with the novel Coronavirus (COVID-19) increased in Europe, and many countries entered a 'lockdown' to contain the pandemic. As a

consequence of stay-at-home orders, travel restrictions, and school and shop closures, a large proportion of employees started working from home and public life came to a standstill. Consequently, social timing relaxed, and this unprecedented situation allowed us to study the effects on social jetlag, sleep, and sleep quality.

Between 23 March and 26 April 2020, 435 participants (75% women, median age group 26-35 years) from Austria, Germany, and Switzerland took our one-time online survey. They answered questions on sleep duration, sleep times, and wake-up times on work and free days, self-perceived sleep quality, as well as wellbeing and self-perceived burden. Additionally, we collected detailed background information on, for instance, their work-related situation and leisure activities, among other aspects. Importantly, within the same survey, they once answered the questions about the time before the 'lockdown' and once concerning the time since they personally noticed the effects of the 'lockdown' where applicable.

We found that during the 'lockdown', social jetlag (the mismatch between internal and external time) was reduced. This suggests that volunteers' sleep-wake rhythms followed their bodies' internal signals rather than external rhythms such as working hours. Practically, this means that their sleep-wake rhythms on weekdays became more similar to the weekend-like pattern: they went to bed later, but also got up later. Overall, participants even got more sleep: 50% reported sleeping up to 13 minutes longer, and 75% reported sleeping up to about 50 minutes longer. Additionally, we found sleep during the 'lockdown' to be especially prolonged on workdays. These changes in sleep-wake patterns were consistently associated with an increment in the amount of work

that was accomplished from home, which was paralleled by a considerable increase in the flexibility of working hours. Particularly later chronotypes' sleep, that is, those who usually prefer to go to rather a bit later, benefitted from this relaxation of social schedules. Interestingly, the findings were also related to an overall reduction in working hours, but not evening leisure time activities.

While the effects on sleep-wake patterns and sleep duration are good news from a sleep health perspective, we also found that self-reported sleep quality was slightly reduced during the 'lockdown' compared to before. However, in this unprecedented and for many people extremely challenging situation, this is probably not very surprising. And indeed, the reduction in sleep quality was strongly related to increases in the self-perceived burden on the one hand and decreases in physical and mental wellbeing on the other hand. On a more positive note, though, we were also able to identify factors that limited this decline in sleep quality. Here, physical exercising and exposure to natural daylight may have buffered the negative consequences of the lockdown. Possibly, these factors helped people to cope with the stress this unprecedented situation brought about.

In sum, the COVID-19 'lockdown' in Austria, Germany, and Switzerland, during which a large proportion of people worked from home, public life came to a standstill, and people experienced increased flexibility regarding social schedules, led to a 'healthier' individual sleep-wake timing and overall, more sleep. This exceptionally burdening situation, however, was also associated with a decrease in self-reported sleep quality. Exercising and exposure to natural daylight may be strategies to mitigate these adverse effects, though.