

Health & Physiology

How the COVID-19 lockdown affected our sleeping patterns

by **María Juliana Leone**¹ | Professor

¹: Universidad Nacional de Quilmes – Universidad Torcuato Di Tella, Buenos Aires, Argentina

This Break was edited by Max Caine, Editor-in-chief - TheScienceBreaker

Light exposure and social cues are essential to set our internal clock's time and be healthy. The COVID-19 lockdown forced us to be at home, affecting the main parameters which synchronize our circadian rhythms. Here we compared sleep and chronotype of 1021 participants from Argentina before and during the first month of the lockdown associated with the COVID-19 pandemic.



Image credits: Pixabay

Human biology and behavior change throughout the day. A primary internal timekeeper, located in the brain, and synchronized by light, controls these daily fluctuations. Social and cultural temporal cues are also able to set the time of our internal clock. Humans are a diurnal species: our body is biologically prepared to be active when there is sunlight outside and rest during the night. When we are active during the day – for example, work, school, social activities- and we sleep at night, both environmental and social cues are aligned to set our internal clock's time (i.e. our so-called "chronotype"). This in turn orchestrates the daily rhythms of the rest of the body. However, when our biological time is not correctly synchronized with the environmental time or social time cues, our performance and health are affected. In the last

decades, the ubiquitous electrical light presence and a 24/7 society's demands pushed our sleep to later times. However, we continued starting work or school early in the morning. Consistently, our clock is set to late times, and, as a consequence, we tend to sleep less than recommended during the working days.

But what would happen if one day our life dramatically changes, and we have to stay at home for many weeks or even months? Would the internal clock still be synchronized to the external light-dark cycle? The lockdown associated with the COVID-19 pandemic has modified our temporal routines. We were forced to stay home, decreasing the possibility of being infected by the virus but also

reducing exposure to sunlight. In this situation, both circadian rhythms and sleep might be affected.

During the first month of the total lockdown in Argentina (which started on March 20th, 2020), 1021 participants (mean age: 37.43 y.o., 69.64% women) completed a survey related to sleep timing, sleep duration, and habits. These participants had also previously answered a similar survey before the lockdown, which allowed us to compare their sleep habits during the lockdown with the control condition.

We found that sleep was longer. During the lockdown, the mean sleep duration on weekdays was almost 40 min longer, and only 37.30% of participants did not reach the recommended minimum 7h of sleep (compared to 60.24% in the control condition). Sleep timing was more consistent throughout the week: social jetlag levels – the difference in sleep timing on free days and weekdays -decreased by about 1h. Sleep onset and offset were delayed on weekdays, and sleep quality was not affected. Significantly, all previously described effects were modulated by age and working status. Younger participants experienced more considerable differences in their sleep and chronotype than older participants. The working status also modulated the magnitude of the lockdown effects: those participants that stopped working or started working from their homes exhibited more extensive changes than those who continued working outside.

As a whole, sleep was longer, later, and more consistent during the lockdown. So, can we say that sleep is "better" under lockdown? Well, sleep duration was improved, and social jetlag decreased, and these are beneficial changes. However, we should be aware that the chronotype (the internal time) was delayed, and this is a sign of a worse synchronization of our internal timekeeper. Chronotype can be delayed under different situations, including a weaker synchronizer: sunlight exposure decreased, and temporal schedules were less robust during the lockdown, and our circadian rhythms started to respond to these variations. The modulation we found in chronotype was not extensive (i.e., 36 min), but this occurred only after less than a month of lockdown. It is essential to pay attention to these changes because a delayed chronotype is an early signal of internal desynchronization, which is, in turn, associated with lower performance and health problems. Indeed, this should force us to be aware of the problem and introduce changes in our daily activities to improve our internal clock synchronization. Exposure to sunlight during the morning and maintaining regular sleep times are easy to achieve habits that could help set our internal clock's correct time. The maintenance of a synchronized clock and healthy sleep are important for our performance and well-being during the stay-at-home period and as a protective strategy against infections. Most importantly, a robust circadian rhythm contributes to a robust immune system.