NATIONAL SLEEP FOUNDATION

Breaking Report: new insights on sleep health during the pandemic

A National Sleep Foundation analysis of over 12,000 Americans in the Sleep Health Index® from 2019 to 2021

Introduction

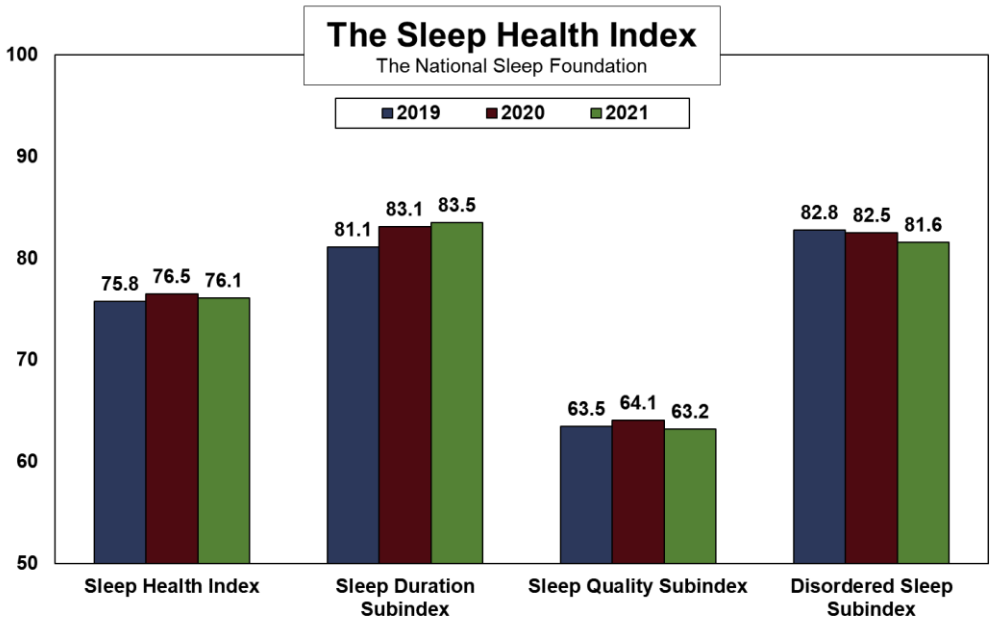
The past two years of the global COVID-19 pandemic have placed a virtually unprecedented strain on Americans, with ongoing stressors related to occupational hazards faced by essential workers, financial difficulties and unemployment, challenges shifting to remote work and schooling, childcare shortages, social restrictions, and wide-scale disruption to daily habits and routines. These ongoing stressors present a significant challenge to sleep health, which is closely linked to daily routines, physical health, and personal stress. Moreover, many of these pandemic stressors are disproportionately experienced by people of color, potentially worsening pre-existing disparities in sleep health, including insufficient sleep and poor sleep quality.[1,2] Conversely, sleep may have improved for some Americans during the pandemic due to more flexible work/school schedules that allow them to sleep at preferred times and keep a consistent schedule across work days and non-work days.[3]

Existing studies examining pandemic-era changes in sleep health are limited to early in the pandemic (e.g., 2020), perhaps not representative of the ongoing effects of the pandemic, now two years in. This analysis explores sleep changes from pre-pandemic through 2021 for a broader picture of how the nation's sleep health has changed in response to ongoing challenges, the durability of these changes, and how we can learn from these changes to advance sleep health in America. We also examine racial/ethnic sleep health disparities during the pandemic, consistent with our mission to promote actionable solutions to eliminate them and achieve sleep health equity.

The National Sleep Foundation's Sleep Health Index® (SHI) is a validated gauge of Americans' sleep health, including an overall score and subindices of sleep quality, sleep duration, and disordered sleep, with higher scores indicating better sleep health. The SHI has been fielded in nationally representative surveys quarterly since 2016. Aggregated results provide a unique opportunity to examine sleep trends across time and within groups. All differences in data described in this report have been tested for statistical significance. Differences that are significant at the 95 percent confidence level (or higher) are reported without qualification. Those that are significant at 90-94 percent confidence are described as "slight" differences. Those that are significant at less than 90 percent confidence are not reported as differences.

Sleep Health Overall

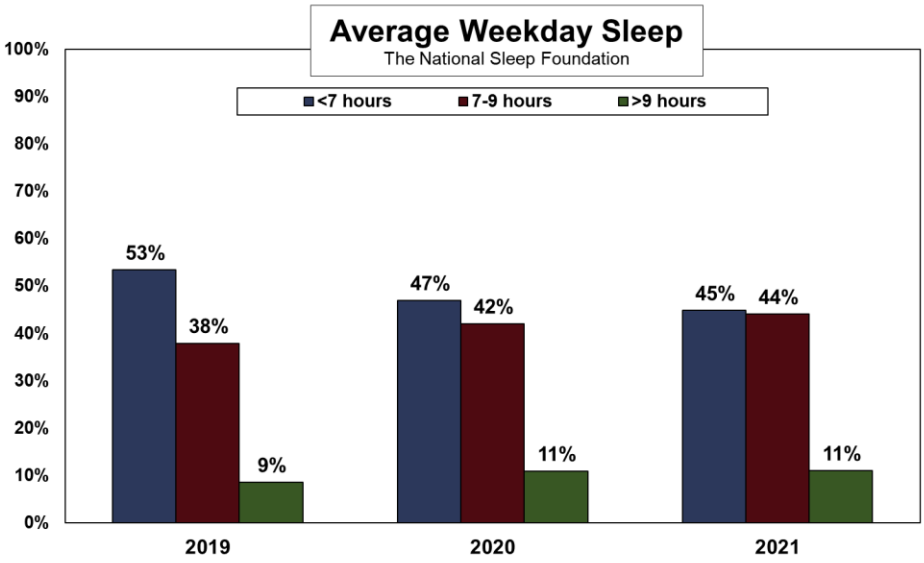
Sleep health overall held steady from 2020 to 2021 in the National Sleep Foundation's SHI surveys. Over 2021, the overall index averaged 76.1 on its 0-100 scale, comparable to its annual average of the previous five years, 75.9.



Increases in Sleep Duration from 2019-2021

The most notable pandemic-era change was an increase in sleep duration. The sleep duration subindex measures how well self-reported weekday sleep times match expert recommendations, self-assessed sleep needs, and weekend sleep times. This subindex averaged 83.5 in 2021 and a similar 83.1 in 2020, up from 81.1 in 2019, with improvements across all three of its components. Gains stem primarily from Americans getting more sleep on weeknights because of later wake-up times, especially among those with children at home. Weekday morning wake times moved later by an average of 13 minutes since the pandemic began, including 17 minutes later among those with children at home and 12 minutes later among all others. Average wake times moved later by more than 10 minutes across all age groups with the exception of seniors, among whom they held essentially steady.

More American adults in 2021 got the National Sleep Foundation's recommended seven to nine hours of sleep on weekdays, 44 percent, than in 2019, 38 percent.[4] Deficits between self-assessed sleep needs and weekday sleep duration narrowed from 1.1 hours to 0.94 hours on average. And the difference between weekday and weekend sleep, known as social jetlag, tightened by about 9 minutes, to just less than an hour.



These findings have been replicated in other studies using objective measures, including national wearable-device data from 2020 showing increased sleep duration and decreased weekday-weekend differences in sleep timing[5] and international smartphone app data showing an increase in sleep duration.[6]

Despite these overall increases in Americans' sleep duration, differences were seen by race, reinforcing the critical need for attention to sleep health disparities and sleep health equity. During the pandemic, white individuals have scored better than others in the sleep duration subindex. It's 85.8 among white individuals, compared with 79.7 among Hispanic individuals and 78.4 among Black individuals. This gap persists despite greater pandemic-era gains in the sleep duration subindex among Black individuals (+5.4 percentage points) vs. among white (+2.0 points) and Hispanic (+1.9, slight) individuals, respectively. Other studies confirm these findings. Research from 2020 showed that Black young adults reported the shortest sleep duration, possibly due to a higher likelihood of being essential workers.[7]

Decreases in Sleep Quality in 2021

While sleep duration increased from pre-pandemic levels, several components of the sleep quality subindex worsened in 2021 vs. 2020. The SHI survey asks Americans to rate their sleep quality as excellent, very good, good, fair or poor. On average in 2021 nearly two-thirds rated it good or better, but 37 percent rated it fair or poor, an increase of 3 percentage points from the averages for both 2020 and 2019. This represents a new low for the sleep quality measure in annual SHI data. Americans also experienced more trouble staying asleep in 2021 vs. 2020 – reporting this problem on average 2.7 nights out of the previous seven. Less affected, though still worsening, was the SHI's measure of trouble falling asleep, with slightly more Americans experiencing trouble falling asleep in 2021, reporting this problem on average 2.3 nights a week.

These declines in sleep quality tended to occur more frequently in women, individuals without college degrees, and middle-to-lower-income Americans, exacerbating already-existing gaps in sleep quality among these groups.

Previous research from earlier in the pandemic in 2020 found people reporting a greater number of days with difficulty falling asleep, staying asleep, and not feeling rested,[8] with an estimated 40% of people being affected by sleep problems.[9] In contrast, this study suggests declines in sleep quality concentrated later in the pandemic, in 2021.

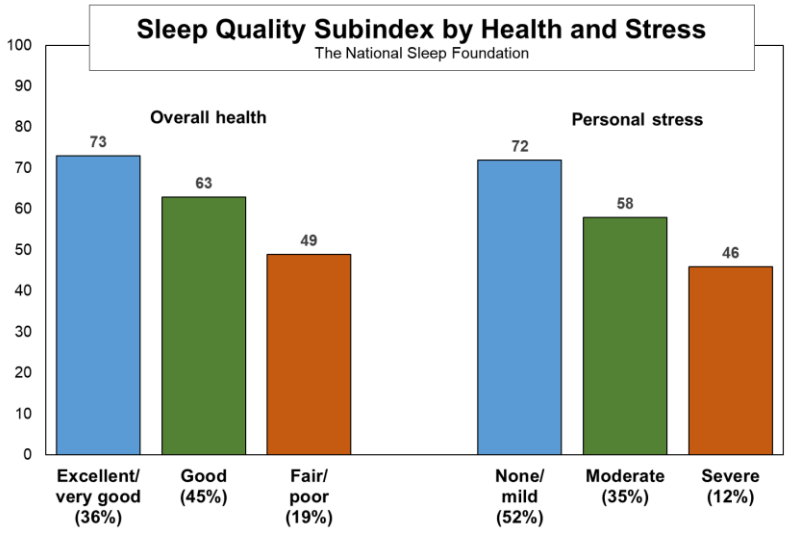
Increases in Disordered Sleep from 2019-2021

The disordered sleep subindex dropped from 82.8 in 2019 to 81.6 in 2021, reflecting a slight increase in indicators of disordered sleep (scores are reverse-scaled, so that lower prevalence of these indicators produces a higher score). This is primarily due to a rise in people using sleep medications: 21 percent in 2021 said they did so least once a week, compared with 18 percent in 2019. There were no significant differences in the other two disordered sleep components, measuring the prevalence of sleep disorder diagnoses and discussing sleep problems with a medical professional.

Changes in this subindex have largely been defined by income. Those with household incomes of $50,000 to under $100,000 have fallen behind the most, with the subindex overall dipping from 84.9 to 81.3 from 2019-2021 and significant drops in each of the three components. By contrast, declines among those making $100,000 or more were limited to the sleep medication component, while there were no significant changes in the subindex or its components among those in the lowest income group.

Overall Health, Personal Stress, and Sleep Health During the Pandemic

It is possible that sleep health, particularly sleep quality, has been negatively affected by the ongoing strain the pandemic has placed on physical health and wellbeing, especially later in the pandemic. Our late 2021 study found that overall health and stress are linked most closely with the SHI's sleep quality subindex. This subindex score falls to 49 among those in fair or poor health and 46 among those with severe stress, compared with 73 among those in very good or excellent health and 72 among those with mild or no stress.



That said, we did not find a significant pandemic related increase in stress levels among the general population in our studies. About half of Americans reported no more than mild stress in November 2021; 35 percent, moderate stress; and 12 percent, severe stress. This distribution of perceived stress is comparable with those observed in both July 2020 and December 2019 surveys.

There are likely individual differences at play. Previous research from early in the pandemic reported that sleep quality worsened among individuals with greater stress vulnerability[3,10,11] and less resilient pandemic-related coping styles.[12] Similarly, an international study found that poorer sleep health during 2020 was associated with being laid off from a job, financial strain, and difficulties transitioning to working from home.[13] Unfortunately, the cross-sectional nature of the SHI survey precluded the examination of such possibilities in our data.

It is also important to note that there are differences in levels of stress and overall health among groups. Our findings from 2021 show that men, people age 50 and older, those with $100,000+ household incomes and those without children are all less likely than their counterparts to report stress. For health, education, race, and income play a greater role, as those without college educations, those with lower incomes and Black individuals are all less likely to report very good or excellent health.

Conclusion

SHI results show a divergence in apparent impacts of the pandemic on the nation's sleep health in its second year. On one hand, Americans have been able to achieve longer sleep time, perhaps reflecting pandemic-related changes in schedule and lifestyle. On the other, sleep quality has worsened in what for many has been a challenging health, social, and economic environment. While the coronavirus pandemic has enabled Americans to increase their average sleep duration, data through 2021 show declines in sleep quality—an important reminder that quantity does not necessarily guarantee quality.

Exploring changes in America's sleep across the pandemic provides an opportunity to promote and sustain positive changes in sleep duration. For example, more Americans were getting the recommended duration of sleep in 2020-2021 compared to 2019. As individuals return to work and school, it will be important to maintain these positive gains. One cautionary study from Singapore showed that returning to work and school after lockdown was associated with a return to earlier, shorter sleep times and greater social jetlag.[14]

Simply prioritizing sleep to meet minimum sleep duration recommendations is necessary but not sufficient for optimal sleep health. We need to continue working to improve sleep quality in the face of personal stress and physical health challenges.

These findings also support our assertion that racial and ethnic disparities in sleep health are a major public health problem and highlight the need for public investment in resources, education and training, and system and policy level changes so everyone can get the sleep they need to thrive, especially during challenging and stressful times.[2,15]

All of this points to the importance of practicing the behaviors recommended by the National Sleep Foundation that promote healthy sleep and help maintain a regular sleep/wake cycle, such as: 1) daytime activities, including exercise, maximizing light exposure during the day, and consistent mealtimes, 2) evening activities, including relaxing routines before bed, avoiding screens before sleep, and avoiding heavy meals and alcohol before bed, 3) setting up your sleeping environment to promote sleep, including reducing light and noise at night and keeping temperatures cool, and most importantly, 4) making time for recommended sleep duration with regularly maintained bedtimes and risetimes.[16]

Published by the National Sleep Foundation on March 7, 2022.

Appendix A. Methodology and Demographics

The Sleep Health Index was formulated in 2016 on the basis of 2014 and 2015 National Sleep Foundation surveys. Factor analysis established that the 14 index questions relate to the three discrete constructs of sleep duration, sleep quality and disordered sleep. Subindices reflecting each construct, and the full index, were tested for internal consistency, reliability over time, convergent validity and known-groups validity. For details see Knutson, et al. (2017). The National Sleep Foundation's Sleep Health Index. Sleep Health, 3(4):234-240.

In addition to annual results, this report compares data from pre-pandemic surveys conducted from January to December 2019 (n=5,347) to those conducted from May 2020 to November 2021 (n=7,277). Results in these groups have margins of sampling error of 1.4 and 1.2 percentage points, respectively.

The surveys were produced by Langer Research Associates of New York, N.Y., with sampling and data collection by Ipsos Public Affairs via its online KnowledgePanel®, which provides internet access to randomly recruited participants.

	2019		**2020**		**2021**	
	Unweighted	*Weighted*	*Unweighted*	*Weighted*	*Unweighted*	*Weighted*
Male	49%	48%	48%	48%	48%	48%
Female	51%	52%	52%	52%	52%	52%
White, non-Hispanic	70%	64%	71%	63%	71%	63%
Black, non-Hispanic	9%	12%	10%	12%	9%	12%
Hispanic	13%	16%	12%	16%	12%	16%
Other/multiracial, non-Hispanic	8%	8%	7%	9%	8%	9%
18-34	21%	29%	19%	29%	19%	27%
35-49	23%	24%	22%	23%	23%	25%
50-64	31%	27%	31%	27%	31%	27%
65+	26%	20%	28%	21%	28%	21%

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