

National Sleep Foundation Sleep Health Index

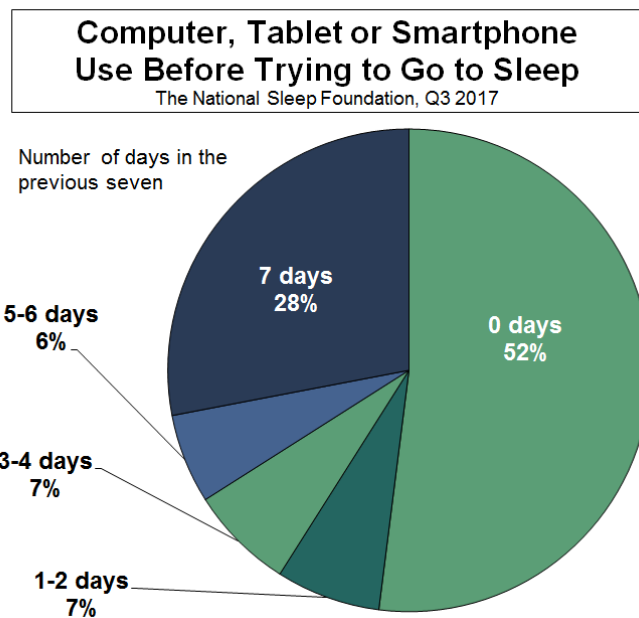
Quarterly Report – Q3 2017

Nearly half of Americans used a smartphone, tablet or computer in bed before trying to go to sleep in the past week, and one in five went to sleep, then woke up and returned to the device – both practices associated with poor sleep health.

A national survey by the National Sleep Foundation finds that 48 percent of adults used such devices in bed at least once in the past week, including 28 percent who did so every day of the week. Moreover, 21 percent report picking up the device again after initially falling asleep – including nearly one in 10 who went so far as to send emails or texts in such circumstances.

It's not a good sign. Using a smartphone, tablet or computer in bed is associated with getting worse sleep. And this is especially so for people who've used one of these devices after initially falling asleep: Their overall scores for sleep health are just 68 on a 1-100 scale, vs. 78 for others, and 57 specifically for sleep quality, compared with 70 for those who steer clear of such devices in bed, or at least keep their hands off them after first dropping off to sleep.

These results come from the National Sleep Foundation's latest sleep health survey, which tracks the nation's sleep health on a quarterly basis and explores related topics. In addition to a look at use of electronic devices at bedtime, this quarter's report also evaluates the strong role of stress and overall health in sleep health.

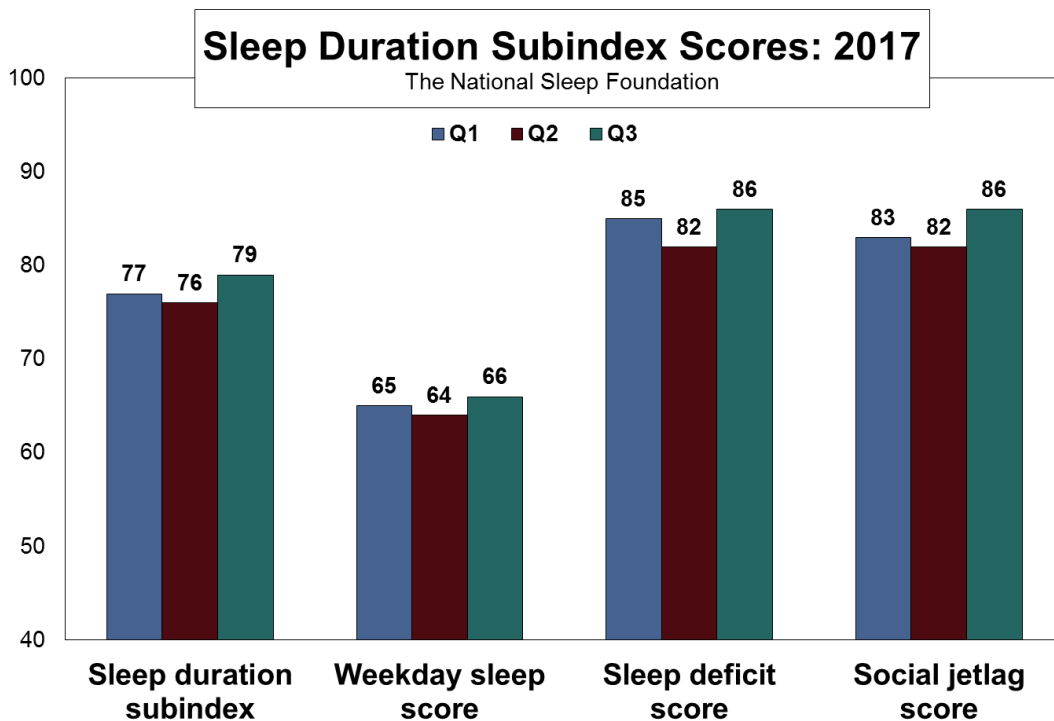


The Foundation’s Sleep Health Index, based on responses to the nationally representative telephone survey, stands at 76 overall, essentially unchanged from the first two quarters of the year.

The index is comprised of three subindices: sleep duration, sleep quality and disordered sleep, all also computed on a 1-100 scale. The sleep duration score, at 79, is at a new high, up 3 points from last quarter’s 76. Sleep quality stands at 68, in line with its average, 67, since the quarterly SHI began in the first quarter of 2016. Lack of disordered sleep, consistently the highest of the subindices, remains at 82.

Sleep Health Index

Among the SHI’s subindices, sleep duration, as noted, hit a new high this quarter, 79. It’s based on items measuring how well respondents’ self-reported time in bed on weekdays meets their self-assessed sleep needs (sleep deficit), matches up with expert recommendations (weekday sleep) and aligns with time spent in bed on weekends (social jetlag). Higher scores indicate less sleep deficit and social jetlag, and better weekday sleep.



Weekday sleep shows slight growth. After 6.6 hours in the first two quarters of the year, it’s now 6.8 hours, a marginally significant increase.

Moreover, Americans’ sleep deficit shrank from last quarter, from an average of 1.1 to 0.9 hours; the resulting sleep deficit score, 86, is its best on record, like the sleep duration score overall. Thirty-five percent have no sleep deficit at all, vs. 29 percent last quarter, a significant gain.

The disordered sleep subindex matches its average this quarter, 82, a relatively high score reflecting the fact that most Americans do not take sleep medication, have not spoken with a doctor about sleep problems and have not been told by a doctor that they have a sleep disorder.

Still, results over time show an increase in the likelihood that one has been diagnosed with a sleep disorder, from 14 percent in the first two quarters of 2016 to 18 percent now, a new high. It's a trend worth watching.

The sleep quality subindex, consistently the weakest gauge in sleep health, is based on Americans' ratings of their overall sleep quality as well as the number of days in the past week in which they felt well-rested, had trouble falling asleep, had trouble staying asleep, were negatively impacted by lack of sleep and dozed unintentionally. Among those results:

- Thirty-seven percent rate their sleep quality as only fair or poor – 6 percentage points more than rate their sleep as excellent or very good. (The rest, 32 percent, say their sleep in the past week was “good.”) The negative margin has ranged from 3 to 9 points in the SHI's seven quarters, averaging 6.7 points, about where it is now.
- About half (49 percent) woke up feeling well-rested on five or more days in the past seven. Nineteen percent say they haven't woken well-rested even once in the past week – down marginally from 23 percent last quarter, a slight improvement. (That 23 percent was an SHI high; the average is 18 percent.)
- Forty-five percent report unintentionally dozing, about half had trouble falling asleep (48 percent) or staying asleep (49 percent) and nearly four in 10 (37 percent) report being “significantly impacted” by poor or insufficient sleep at least once in the past week. Each is very near its average since the first quarter of 2016.

Device Use in Bed

As noted, 48 percent of Americans report using a computer, tablet or smartphone before trying to go to sleep at least once in the past week. That includes 28 percent who did so every night, 6 percent who used a device before trying to sleep on five or six nights, and 7 percent who did so on three or four nights.

Among those who used such a device before trying to sleep in the past week, the average frequency is 5.5 nights, suggesting that the practice, once acquired, becomes habitual.

Twelve percent of adults say that on one to four nights in the past week they awakened after falling asleep, picked up their device and used it again; an additional 8 percent did so on five to seven nights. Rounding brings the total to 21 percent.

Among those who woke up and used a device in bed before trying to go back to sleep, a substantial 43 percent say they sent an email or text after waking up in bed. (This group makes up 9 percent of all adults.)

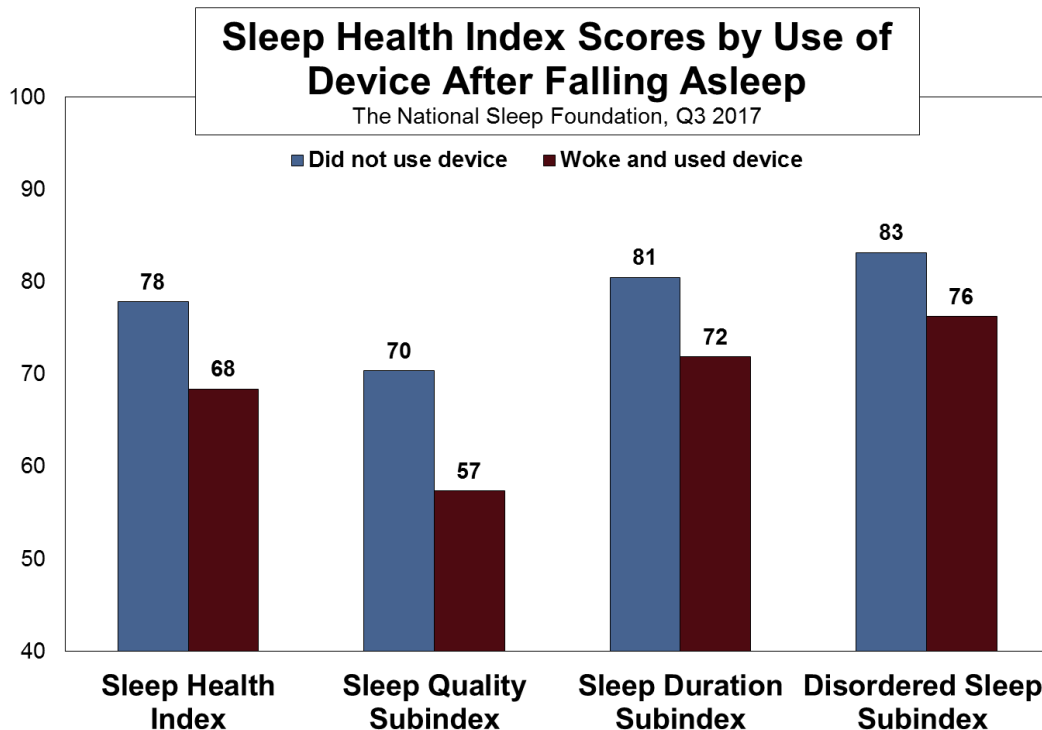
Computer, tablet and smartphone use in bed is strongly related to age. Eighteen- to 29-year-olds do this on an average of 4.4 nights a week, compared with 3.5 nights among 30- to 39-year-olds, 2.8 among those 40-49, 1.8 among those 50-64 and less than one night a week among those 65 and up.

The same pattern of use by age is apparent among those who report technology use in bed every night in the past week: This peaks at half of those age 18-29, dropping to 36 percent of those 30-39 and falling further among their elders.

Still, it's notable that technology use in bed isn't exclusive to millennials: Even among those 50-64, one in five (19 percent) report using an electronic device in bed every night last week. As tablet/smartphone use continues to rise, so may the prevalence of these devices in bed.

Using technology in bed is related to lower scores on the overall Sleep Health Index (75 vs. 77) and its sleep quality and duration subindices (65 vs. 70 and 76 vs. 81, respectively). Moreover, in statistical modeling, holding demographic factors constant, in-bed use of these devices independently predicts worse sleep health.

Waking up and using a device before trying to go back to sleep is more strongly related to worse sleep health scores – as mentioned 13 points lower on sleep quality and 10 points on sleep health overall, as well as 9 points lower on sleep duration and 7 points on lack of disordered sleep.



Computer/tablet/phone screen use before bed is a significant predictor of sleep health when overall health and stress are not included. And the frequency with which one wakes up and looks

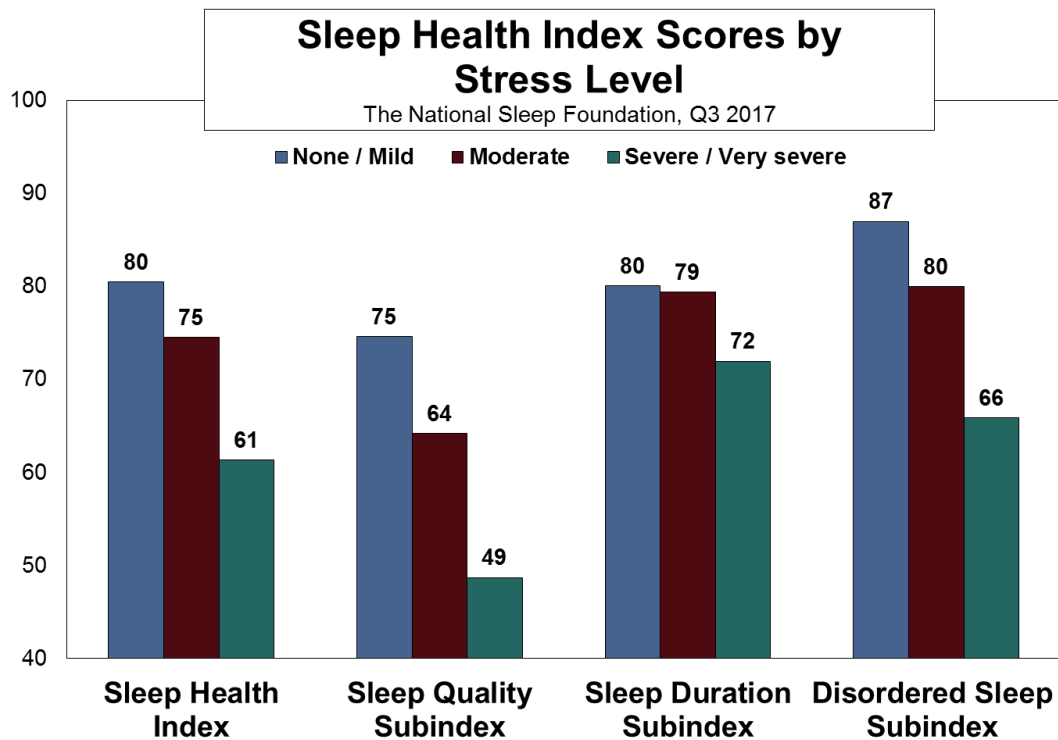
at a screen before trying to go back to sleep is a significant predictor even when taking overall health and stress – two leading predictors of sleep health – into account. (See Appendix A.)

Directionality is an open question. Using electronic devices in bed may be a cause of poor sleep or a symptom of it. Likewise, lack of sleep can contribute to being in poor health and stressed, or poor health and stress can produce lack of sleep. The path likely is bi-directional; regardless, it's clear that these are all related to sleep health.

Indeed, one result indicates that simply waking up after initially falling asleep is not the whole problem – using technology when this happens is associated with worse overall sleep health. The SHI among those who had trouble staying asleep at least once in the past week but didn't use technology after waking is 6 points higher than it is among those who say they had trouble staying asleep and used technology, 71 vs. 65.

Stress and Sleep

The survey confirms previous findings (see the SHI Reference Report) that sleep health is strongly related to personal stress and overall health. The SHI ranges from 61 among those who report severe or very severe personal stress in the past week (13 percent of all adults) to 75 among those who have moderate stress (a third of the public) and 80 among those with mild or no stress (53 percent of all adults). Comparing the most- and least-stressed groups, subindex scores are 49 vs. 75 for sleep quality, 72 vs. 80 for sleep duration and 66 vs. 87 for disordered sleep – vast gaps in sleep health.



The pattern is similar in terms of overall health. Those who report poor or fair health have an SHI score of 64, compared with 83 for those who rate their health as excellent or very good. As with stress, the biggest subindex difference is in sleep quality: A score of 48 for those with worse health, vs. 78 for those with better health. It's 67 for those at the midpoint, good health.

In statistical modeling, overall health is the strongest predictor of the SHI when accounting for stress, frequency of using an electronic device (before trying to sleep or after waking) and demographic variables. Stress also is a strong predictor of overall sleep health.

METHODOLOGY – This survey for the National Sleep Foundation was conducted among a random national sample of 1,019 adults via landline and cell phone interviews July 14-18, 2017. Results have a margin of sampling error of 3.7 points for the full sample. The survey was produced for the Foundation by [Langer Research Associates](#) of New York, N.Y., with sampling, data collection and tabulation by SSRS of Glen Mills, Pa. See methodological details [here](#).

Full results follow. * = <0.5%

1. In general, how would you rate your sleep quality? Would you say it's excellent, very good, good, only fair, or poor?

	--- Excellent/very good ---				--- Fair/poor ---			No
	NET	Excellent	Very good	Good	NET	Fair	Poor	opinion
7/18/17	31	13	18	32	37	23	14	*

2. Thinking about just the past 7 days, what time did you most often go to bed on workdays? Please answer about weekdays if you did not work last week.

3. What about on non-work days or weekends - what time did you most often go to bed on those days?

4. What time did you most often wake up for the day on work days or weekdays?

5. What about on non-work days or weekends - what time did you most often wake up for the day on those days?

	----- Number of hours in bed: Weekday -----							
	<5	5 to <6	6 to <7	7 to <8	8 to <9	9+	Mean	SD
7/18/17	5	5	11	26	24	29	8.0	2.2

	----- Number of hours in bed: Weekend -----							
	<5	5 to <6	6 to <7	7 to <8	8 to <9	9+	Mean	SD
7/18/17	4	4	7	19	25	41	8.5	2.4

6. During the past 7 days, how many days did you wake up feeling well-rested, if any?

	0 days	1-2 days	3-4 days	5-6 days	7 days	No opin.	Mean	SD
7/18/17	19	13	18	20	29	1	4.0	2.6

7. How many nights did you have trouble falling asleep?

	0 days	1-2 days	3-4 days	5-6 days	7 days	No opin.	Mean	SD
7/18/17	52	20	10	4	14	*	1.9	2.5

8. And how many nights did you have trouble staying asleep?

	0 days	1-2 days	3-4 days	5-6 days	7 days	No opin.	Mean	SD
7/18/17	50	15	9	5	20	2	2.2	2.8

9. Still thinking about the past 7 days, how many days did poor or insufficient sleep significantly impact your daily activities, like your work performance, socializing, exercising, or other typical activities?

	0 days	1-2 days	3-4 days	5-6 days	7 days	No opin.	Mean	SD
7/18/17	60	18	10	3	6	2	1.2	2.0

10. How many days did you fall asleep without intending to, such as dozing off in front of the TV or in any other situation?

	0 days	1-2 days	3-4 days	5-6 days	7 days	No opin.	Mean	SD
7/18/17	55	21	9	4	11	1	1.6	2.4

11. How many nights did you take over-the-counter or prescription medication to help you sleep?

	0 days	1-2 days	3-4 days	5-6 days	7 days	No opin.	Mean	SD
7/18/17	86	3	3	*	7	*	.7	1.9

12. Have you ever been told by a doctor that you have a sleep disorder, such as insomnia or sleep apnea, or not?

	Yes	No	No opinion
7/18/17	18	82	*

13. Have you ever discussed any sleep problems you were having with a doctor or medical professional, or has this not come up?

	Yes	No	No opinion
7/18/17	27	73	*

14. How many hours of sleep do you need per day to be well-rested and feel your best?

	----- Number of hours -----						Mean	SD
	<5	5 to <6	6 to <7	7 to <8	8 to <9	9+		
7/18/17	4	9	20	25	25	7	6.9	1.7

15. Thinking about the last seven days, how would you describe your overall health?

	----- Better -----				----- Worse -----			No opinion
	NET	Excellent	Very good	Good	NET	Fair	Poor	
7/18/17	43	15	28	35	22	16	6	*

16. Thinking about the last seven days, how would you describe your personal stress?

	----- Less -----				----- More -----			No opinion
	NET	None	Mild	Moderate	NET	Severe	Very severe	
7/18/17	53	24	29	34	13	9	4	*

17. Again in the last seven days, how many nights did you use a computer, tablet or smartphone in bed before trying to go to sleep?

	None	One or two	Three or four	Five or six	Seven	No op.	Mean	SD
7/18/17	52	7	7	6	28	*	2.6	3.1

18. Again in the last seven days, how many nights did you fall asleep, then wake up and use a computer, tablet or smartphone in bed before trying to go back to sleep?

	None	One or two	Three or four	Five or six	Seven	No op.	Mean	SD
7/18/17	79	7	5	1	7	*	.8	2.0

19. [IF WOKE UP AND USED A DEVICE IN BED BEFORE TRYING TO SLEEP AGAIN, WC-04] How many of those nights did you send an email or text after waking up in bed?

	None	One or two	Three or four	Five or six	Seven	No op.	Mean	SD
7/18/17	57	19	7	6	11	1	1.6	2.4

18-19 NET:

	----- Woke and used device -----				
	Sent	Didn't send	No	Didn't wake	
	email/text	email/text	opinion	and use device	
7/18/17	21	9	12	*	79