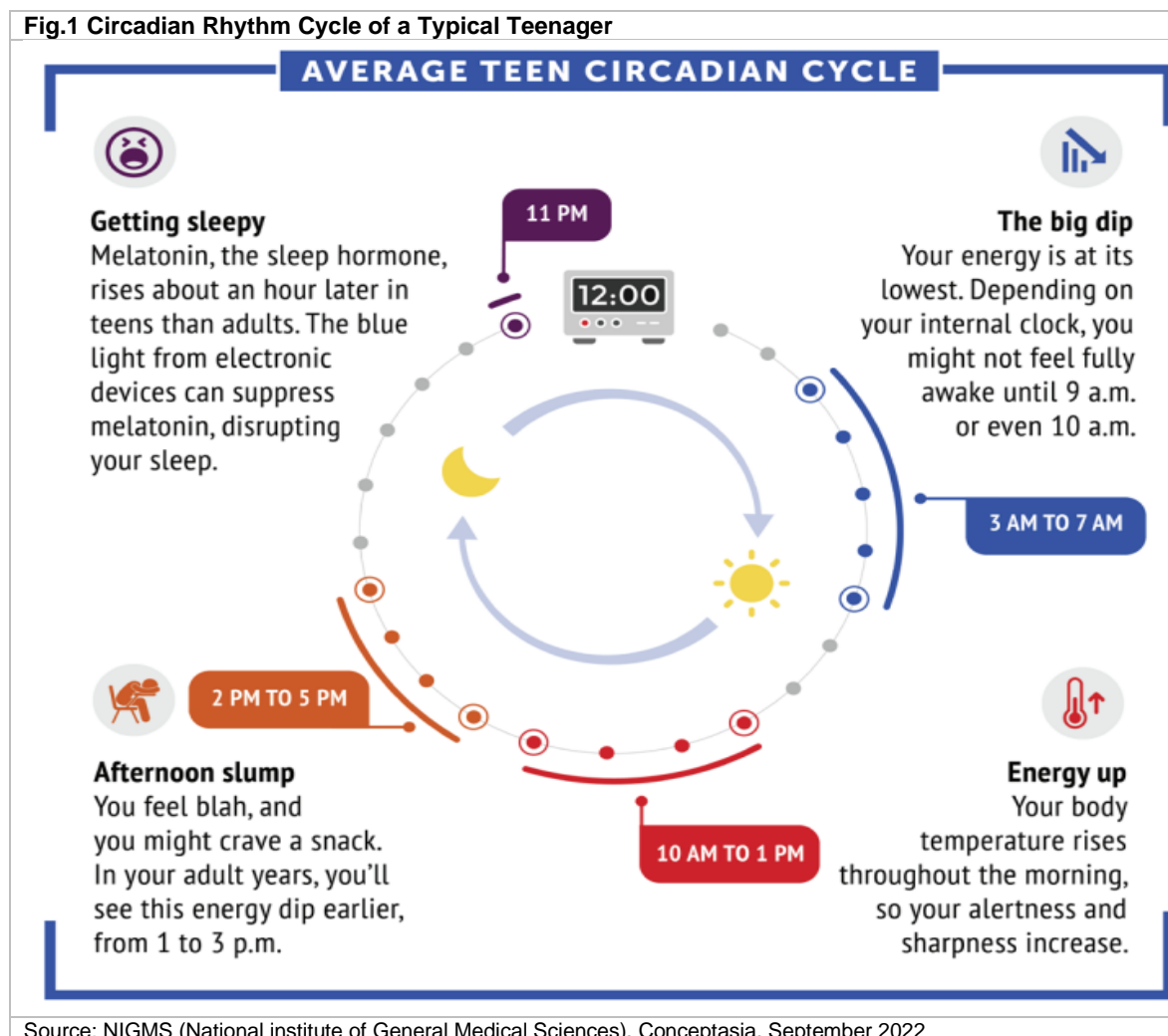


Sleep Health

One potential benefit of holidays, a wellness-orientated adventure, is the opportunity to recover from a sleep deficit, and more importantly being able to groove more healthy sleep habits, in tune with one's circadian rhythms.

Circadian rhythms are physical, mental, and behavioral changes that follow a 24-hour cycle. These natural processes respond primarily to light and dark and affect most living things, including animals, plants, and microbes. ⁽¹⁾

Fig.1 shows the circadian rhythm for a teenager, with comparisons to a typical adult.



In addition to sleep patterns, circadian rhythms also influence the body's temperature, hormone release, eating habits and digestion. Being aware of what the body naturally wants to do, can lead to more in-tune behaviors.

The Global Wellness Institute provides a Wellness Evidence website ⁽²⁾ that gathers relevant clinical research on a breadth of subjects. To quote the GWI:

The definition of healthy sleep depends on several factors, such as duration and how many times a person awakens during the night. The quality of sleep is subjective and includes sleep satisfaction, how much time a person spends in bed compared to sleep time and alertness after sleeping. Research shows that poor sleep is associated with physical and mental health, including heart disease, obesity, diabetes, hypertension, and depression.

The study: *Estimating individual optimal sleep duration and potential sleep debt*, ⁽³⁾ found:

- 1) That healthy young adults were not aware of sleep problems but were experiencing approximately 1 hour of sleep debt (i.e., deficit relative to optimal sleep duration) every day.
- 2) One hour of potential sleep debt takes four days to recover to the optimal level.

This suggests that sleep debt is a pervasive issue; one that many people are unaware of.

The study ⁽³⁾ summarizes the consequences of sleep debt. The body undergoes a significant deterioration in both physical and mental performance. Sleep loss (or sleep debt) causes sleepiness and a decline in performance ^(4, 5) and impairs many other psychological and physical functions such as memory, learning, ⁽⁶⁾ metabolism, ⁽⁷⁾ and immunity. ^(8, 9) Epidemiological studies have expressed the relationship between sleep time and various health risks (e.g., cardiovascular disease, ^(10, 11, 12) obesity and metabolism, ^(13, 14) depression, ⁽¹⁵⁾ and mortality rate ^(16, 17, 18, 19)) as a U-shaped curve with 7-8 hours at the trough.

Whilst 7-8 hours is the commonly accepted recommendation for sleep for adults, two observations.

There can be significant differences at the individual level, with research having found a range from 5 to 10 hours. ^(20, 21, 22)

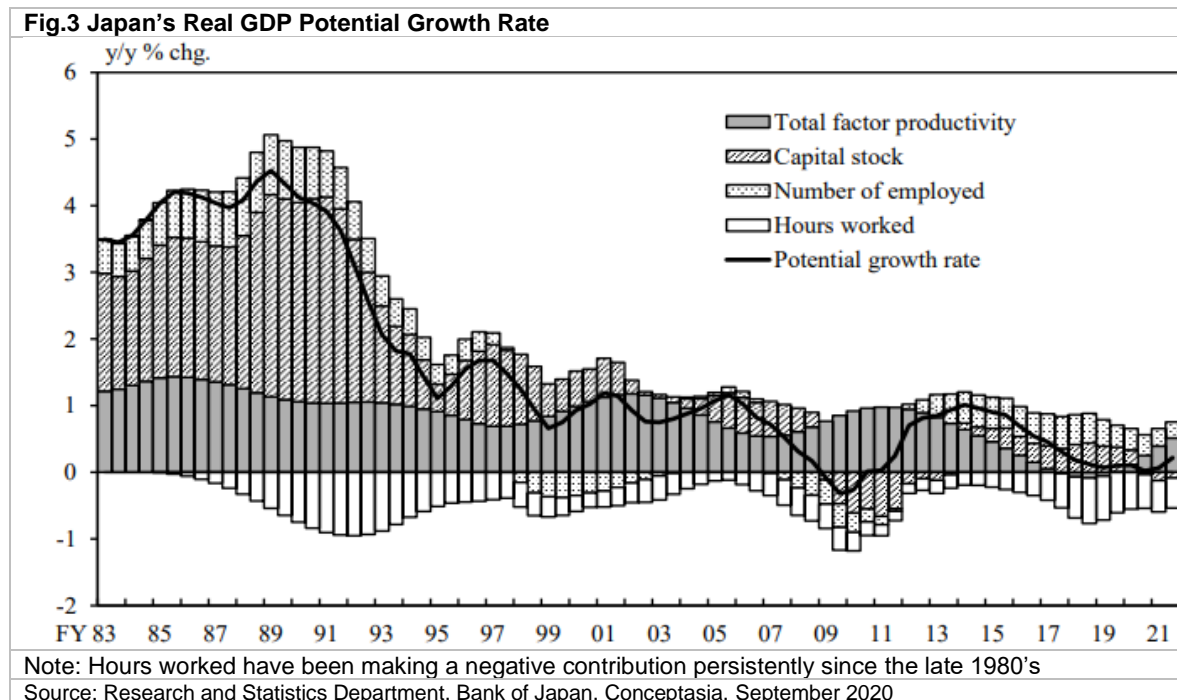
Secondly, as of now, there is no clinical research supporting the view that older adults need less sleep than other adults. Fig.2 is an example of the many techniques put forward to improve sleep behavior.

Fig.2 Suggestions for How to Improve One's Sleep	
1.	Go to bed and wake up at the same time every day
2.	Avoid caffeine, especially in the afternoon and evening
3.	Avoid nicotine
4.	Exercise regularly, but don't exercise too late in the day
5.	Avoid alcoholic drinks before bed
6.	Avoid large meals and beverages late at night
7.	Don't take a nap after 3 p.m.
8.	Relax before bed, for example by taking a bath, reading or listening to relaxing music
9.	Keep the temperature in your bedroom cool
10.	Get rid of distractions such as noises, bright lights, and a TV or computer in the bedroom. Also, don't be tempted to go on your phone or tablet just before bed.
11.	Get enough sunlight exposure during the day
12.	Don't lie in bed awake; if you can't sleep for 20 minutes, get up and do something relaxing
Note: From the MedlinePlus summary of health topic pages	
Source: MedlinePlus, National Library of Medicine, Conceptasia, September 2022	

Japanese and Sleep Health

International surveys have regularly found that the Japanese people have relatively less sleep. ⁽²³⁾ OECD statistics via the Gender Data Portal 2019 shows that daily average sleep was just 7 hours and 22 minutes (442 minutes) in Japan. People in other countries average: USA, 528 minutes, U.K., 508 minutes, Spain, 516 minutes, China, 542 minutes, and South Korea, 471 minutes.

Given the negative consequences for health, the Japanese government has been trying to reduce Japan's long work hours. This frees up time for leisure activities and/or more sleep. Bank of Japan statistics show steady improvement on the reduction in average work hours, Fig.3.



A survey undertaken by Video Research Ltd. and Dentsu Inc., ⁽²⁴⁾ suggests that progress is beginning. The survey in 2019 updates a similar survey undertaken in 2009, Fig.4.

Fig.4 Survey of 20-34 year-olds, Average Sleep per day		
	2009 Survey	2019 Survey
Men	7 hours and 11 minutes	7 hours and 55 minutes
Women	7 hours and 19 minutes	7 hours and 59 minutes
Note: Video Research Ltd. and Dentsu Inc., ⁽²⁴⁾		
Source: Japan Times, Conceptasia, September 2022		

The increase in average sleep time over the decade to 2019 is principally because survey participants are going to bed earlier than before. According to the survey, 34.7% of men went to bed before 11 PM in 2019, up from 18.6% in 2009. For women, the percentage rose to 44.9% in 2019, versus 30.0% in 2009

Perhaps the trend to longer sleep amongst young Japanese adults reflects the emergence of new knowledge-based industries and related flexible work practices, which those in their twenties and early thirties have been attracted to.

References:

- 1) <https://nigms.nih.gov/education/fact-sheets/Pages/circadian-rhythms.aspx>
- 2) <https://globalwellnessinstitute.org/wellnessevidence/>
- 3) *Estimating individual optimal sleep duration and potential sleep debt*, by Shingo Kitamura, Yasuko Katayose, Kyoko Nakazaki, Yuki Motomura, Kentaro Oba, Ruri Katsunuma, Yuri Terasawa, Minori Enomoto, Yoshiya Moriguchi, Akiko Hida and Kazuo Mishima, 2016
- 4) *Behavioral and physiological consequences of sleep restriction*, by Banks, S. & Dinges, D. F., 2007
- 5) *Uncovering residual effects of chronic sleep loss on human performance*, by Cohen, D. A. et al., 2010
- 6) *About sleep's role in memory*, by Rasch, B. & Born, J., 2013
- 7) *Implications of sleep restriction and recovery on metabolic outcomes*, by Killick, R., Banks, S. & Liu, P. Y., 2012
- 8) *Sleep and immune function*. By Besedovsky, L., Lange, T. & Born, J., 2012
- 9) *How (and why) the immune system makes us sleep*, by Imeri, L. & Opp, M. R., 2009
- 10) *A prospective study of sleep duration and coronary heart disease in women*, by Ayas, N. T. et al., 2003
- 11) *Extreme sleep durations and increased C-reactive protein: effects of sex and ethno-racial group*, by Grandner, M. A. et al., 2013
- 12) *Sleep duration and coronary heart disease mortality among Chinese adults in Singapore: a population-based cohort study*, by Shankar, A., Koh, W. P., Yuan, J. M., Lee, H. P. & Yu, M. C., 2008
- 13) *Changes in diet and lifestyle and long-term weight gain in women and men*, by Mozaffarian, D., Hao, T., Rimm, E. B., Willett, W. C. & Hu, F. B., 2011
- 14) *Association between sleep duration and hemoglobin*, by Nakajima, H. et al., 2008
- 15) *The relationship between depression and sleep disturbances: a Japanese nationwide general population survey*, by Kaneita, Y. et al., 2006
- 16) *Sleep duration and all-cause mortality: a systematic review and meta-analysis of prospective studies*, by Cappuccio, F. P., D'Elia, L., Strazzullo, P. & Miller, M. A., 2010
- 17) *Sleep duration and mortality: a systematic review and meta-analysis*, by Gallicchio, L. & Kalesan, B., 2009
- 18) *Sleep and mortality: a population-based 22-year follow-up study*, Hublin, C., Partinen, M., Koskenvuo, M. & Kaprio, J., 2007
- 19) *Mortality associated with sleep duration and insomnia*, by Kripke, D. F., Garfinkel, L., Wingard, D. L., Klauber, M. R. & Marler, M. R., 2002
- 20) *Temporal link between plasma thyrotropin levels and electroencephalographic activity in man*, by Gronfier, C. et al., 1995.
- 21) *Sleep duration in the United States: a cross-sectional population-based study*, by Krueger, P. M. & Friedman, E. M., 2009
- 22) *Sleep duration, subjective sleep need, and sleep habits of 40- to 45-year-olds in the Hordaland Health Study*, by Ursin, R., Bjorvatn, B. & Holsten, F., 2005
- 23) *Shut-Eye Deficit: OECD Survey Reveals Japan Most Lacking in Sleep*, Nippon.com, 8 April 2019
- 24) *Japanese 20-somethings sleep eight hours a day – longer than 10 years ago*, The Japan times, 12 July 2020