



Adults should get 7 to 8 hours of sleep per night for optimal health.

Sleep: Should we pay closer attention to it?

In the fast-paced world we live in today, advances in technology have transformed our lives to one of convenience and multi-tasking. We have greater access to more information, services and choice than ever before, all available 24/7. The ability to increase productivity through technology seems to have changed our approach to the 24-hour day. This article looks at the growing field of sleep epidemiology and considers whether society needs to pay closer attention to a simple physiological need that assists in maintaining health and preventing disease. It will also examine the relevance of sleep in insurance risk assessment.

The American Academy of Sleep has recommended that adults should get 7 to 8 hours of sleep per night for optimal health¹. According to a poll done by Gallup in 2013, the number of hours slept by Americans has dropped by more than an hour since the 1940s. While this study was conducted in the US, similar patterns could be applicable to other population groups. A reduction in sleep of just one hour translates to 12.5% less sleep as per the American Academy of Sleep's recommendation. In 1942, the average number of hours slept was 7.9; in 2013, it had decreased by

¹ See Short Sleep Duration Among US Adults; Centers for Disease Control and Prevention. Retrieved on 4th of Jan 2019

more than an hour with approximately 40% of individuals experiencing 6.8 hours of sleep per night². This is not surprising in a contemporary era where cities never seem to sleep and ongoing entertainment remains available through social platforms and digital devices. In 2014, the Behavioural Risk Factor Surveillance System (BRFSS) similarly reported a comparable finding to the effect that 35.2% of all adults experienced a short sleep duration of less than 7 hours per night³.

Studying sleep

Sleep studies play an important role both in diagnosing sleep disorders as well as in studying normal and abnormal sleep physiology. Sleep research depends on accurate self-reporting (which may present a challenge to obtaining valid data) and the use of equipment to measure sleep patterns and waves. Generally accepted as the gold standard of sleep assessment, polysomnography is known to be costly and time-consuming, which rules out its use in large-scale epidemiological studies. In studying sleep patterns, actigraphy has proven to be a reliable method for tracking the quantity and quality of sleep. This involves a wrist-worn device which measures movements in 3 directions over a 24-hour period for several days⁴. The last few years have seen a surge in wearable devices that track sleep patterns and provide insights into sleep quality, with ongoing research linking sleep patterns to health.

² See JONES, JM. In U.S., 40% Get Less Than Recommended Amount of Sleep. Retrieved on 4th of Jan 2019

³ See footnote 1

⁴ See FERRIE JE, KUMARI M, SALO P, SINGH-MANOUX A, KIVIMAKI M. Sleep Epidemiology – A Rapidly Growing Field. International Journal of Epidemiology. 2011

The genetics of sleep is another field in which advances in research have yielded interesting results. Genome-wide association studies have also provided evidence of a number of overlapping pathways that link sleep to circadian rhythms, metabolism and disease. It is anticipated that genomic determinants of sleep will be identified in future genomic research⁵.

Detrimental effects of short sleep duration

Short sleep duration may be due to lifestyle choices or medical/mental health conditions. One might argue that a single hour's reduction in sleep seems rather insignificant; however, the research performed on sleep indicates that a short duration of sleep for sustained periods does affect morbidity. Short sleep duration is related to increases in fatal and non-fatal accidents and it has been estimated that 10–15% of motor vehicle accidents are due to driver fatigue⁶. Other detrimental effects of short sleep duration include mental health problems, decreased cognitive functioning,

cardiovascular disease and metabolic derangements such as diabetes and obesity^{7, 8}. The BRFSS report indicated that adults who slept less than 7 hours per night were more likely to be obese (BMI ≥ 30 kg/m²), physically inactive and smokers.

Apart from reduced sleep duration, other sleep disorders such as obstructive sleep apnoea (OSA) and insomnia have also been linked to cardiovascular disease and metabolic disorders. It is believed that insomnia affects about 5–15% of the US population and OSA is prevalent in about 27–34% of men and 9–28% of women aged 30–70⁹.

In addition to the cardio-metabolic risks associated with short sleep duration, the effects on cognitive abilities are noteworthy. Cognitive functions requiring speed, accuracy and judgement are affected soon after a reduction in sleep and individuals are therefore prone to accidents and risky behaviour¹⁰.

Table 1: Adults who sleep <7 hours per night are more likely to report one of the following 10 chronic conditions*

Chronic condition	Short sleep (<7 hours)		Sufficient sleep (≥ 7 hours)	
	%	95% CI**	%	95% CI
Heart attack	4.8	(4.6–5.0)	3.4	(3.3–3.5)
Coronary heart disease	4.7	(4.5–4.9)	3.4	(3.3–3.5)
Stroke	3.6	(3.4–3.8)	2.4	(2.3–2.5)
Asthma	16.5	(16.1–16.9)	11.8	(11.5–12.0)
COPD (chronic obstructive pulmonary disease)	8.6	(8.3–8.9)	4.7	(4.6–4.8)
Cancer	10.2	(10.0–10.5)	9.8	(9.7–10.0)
Arthritis	28.8	(28.4–29.2)	20.5	(20.2–20.7)
Depression	22.9	(22.5–23.3)	14.6	(14.3–14.8)
Chronic kidney disease	3.3	(3.1–3.5)	2.2	(2.1–2.3)
Diabetes	11.1	(10.8–11.4)	8.6	(8.4–8.8)

*Centers for Disease Control and Prevention, 2014

**CI = confidence interval

⁵ See FERRIE JE, KUMARI M, SALO P, SINGH-MANOUX A, KIVIMAKI M. Sleep Epidemiology – A Rapidly Growing Field. *International Journal of Epidemiology*. 2011

⁶ See footnote 5

⁷ See ST-ONGE MP, et al. Sleep Duration and Quality: Impact on Lifestyle Behaviors and Cardiometabolic Health: A Scientific Statement From the American Heart Association. *Circulation*. 2016

⁸ See Insufficient Sleep: Definition, Epidemiology, and Adverse Outcomes. Retrieved on 4th Jan 2019

⁹ See footnote 7

¹⁰ See Normal Sleep, Sleep Physiology, and Sleep Deprivation. *Medscape*. Retrieved on 4th Jan 2019

The relationship between short sleep duration and all-cause mortality is one which requires ongoing research. Various meta-analyses have supported an association with an increased mortality risk, but many of the conclusions lack evidence that could validate the findings and the results are often related to measurement bias, an inability to adjust for confounders such as demographics, socioeconomic class and health factors, not to mention inconsistent definitions of short sleep duration. Systematic reviews and meta-analyses of prospective studies have shown an increased relative risk associated with both short and long duration sleep^{11, 12}.

The future of sleep

Where does this leave us – the insurer and the individual? Sleep is an essential part of our daily lives that impacts our quality of life and the ability to function optimally in society. Quantity and quality of sleep affects our risk of comorbid diseases. The current focus in health is on preventative care and further health promotion. Many health and life insurers are finding ways to incentivise their members to actively engage in preventative health care by increasing their level of exercise and activity, managing their diet, stopping smoking and participating in wellness days so as to identify health problems at an early stage. With epidemiological studies suggesting that sleep is an important driver of health and cognitive functioning, the preventative measure available in this area (sleeping) is unique as it does not require additional financial cost – unlike other preventative strategies. Healthy sleep strategies require an awareness of the quantity and quality of sleep and how our lifestyles affect our sleep. Wellness strategies should include education on sleep to increase awareness of the importance of quality sleep and maintaining a balanced lifestyle.

The literature proposes that short sleep duration increases both mortality and morbidity risks and it is therefore valid to consider its relevance as part of risk assessment.

Currently, insurance underwriting tends to focus on a biomedical approach with limited reference to behavioural health. Apart from questions relating to smoking, alcohol, exercise and drug use, no further enquiry appears to be made into other behavioural health factors that may complement risk assessment. Insurers are currently exploring the benefit of evaluating sleep through wearable technology as part of the initial underwriting process as well as ongoing evaluation of customers to improve their risk assessment. Wearable devices providing data points relating to diet, exercise and sleep patterns, along with mental wellness questionnaires, may provide a more holistic risk profile of individuals at the underwriting stage.

Using various sleep parameters in isolation as a risk factor may not always be suitable; however, as more studies focus on sleep and provide data that establishes adverse outcomes related to short sleep duration and health, sleep data could be used as part of a biopsychosocial context to assess risk.

Through the growing field of sleep epidemiology, knowledge of the risks associated with short sleep duration has led to increased awareness of how good sleep hygiene improves health and reduces the accidental risk. This will likely continue to result in both an improvement in well-being and an increase in bio-mathematical data that can be utilised by insurers to assess the risk associated with an individual's sleep behaviour.

One thing is clear: There is substantial value in paying closer attention to this physiological need – not only to improve physical and psychological well-being, but also to better assess medical and accidental risks.

¹¹ See CAPPUCIO FP, et al. Sleep Duration and All-Cause Mortality: A Systematic Review and Meta-Analysis of Prospective Studies. Sleep. Retrieved on 4th Jan 2019

¹² See Jiawei Yin, MD; et al. Relationship of Sleep Duration With All-Cause Mortality and Cardiovascular Events: A Systematic Review and Dose-Response Meta-Analysis of Prospective Cohort Studies. J Am Heart Assoc. 2017

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