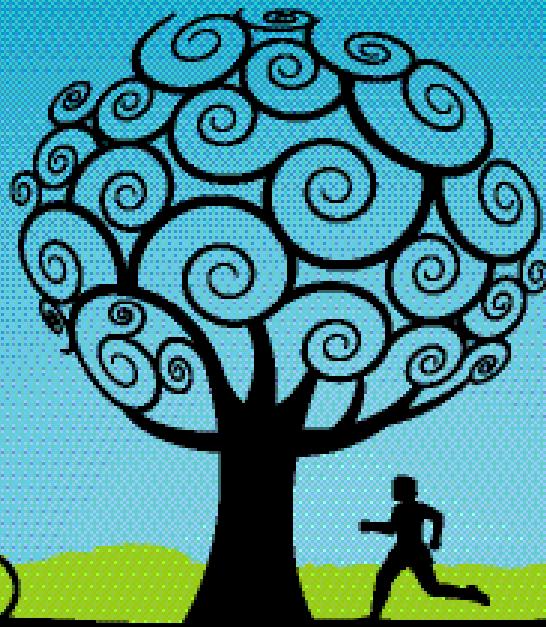


The Research File



Summary from the Canadian Fitness and Lifestyle Research Institute and ParticipACTION

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Staying Active to get a Good Night's Rest



The fast pace of today's society coupled with the pressures of having to juggle family and work life has resulted in poor sleeping behaviors (e.g., many Canadians report having to cut back on sleep in order to have more time to complete daily tasks).¹ According to the 1998 General Social Survey (GSS) conducted by Statistics

Canada, 15% of Canadians received less 6.5 hours of sleep a night despite evidence which suggests that adults require an average of 8 hours of uninterrupted sleep a night.¹ Moreover, approximately half of Canadians (47%) reported cutting back on sleep in an attempt to meet demands (this proportion has likely increased since 1998).¹ Perhaps equally as concerning is the growing number of individuals who report having sleep disorders (e.g.: insomnia, obstructive sleep apnea and restless leg syndrome). According to the American Psychological Association (APA), 60% of Americans report having some sort of sleep disorder.² Similarly, a study conducted in Canada revealed that 40% of Canadians suffer from sleep disorders.³ Chronic lack of sleep has serious implications on one's health. Specifically, constant sleep deprivation has been associated with increased risk of injury, illnesses such as diabetes, heart disease, and certain cancers. Moreover, research has also linked sleep deprivation to impaired immune function, metabolism, memory and learning.²⁻⁵ The high prevalence of sleep problems among Canadians and its associated (negative) impact on both physical and psychological

health is a public health concern that warrants more research to identify factors that may improve sleep quantity as well as quality. Currently, exercise is being recognized as a potentially effective agent for treating and/or preventing sleep problems. Here we summarize the findings of two recent studies that examined the impact of exercise on sleep.

Relationship between exercise and sleep

There is growing evidence to support the benefits of exercise on sleep. For example, a recent study conducted by Gerber and colleagues found that individuals with high fitness levels and no perceived lack of activity were less likely to suffer from sleep disturbances.⁵ Moreover, these individuals were more likely to report higher perceived sleep quality on both weekdays and weekends, were more restored after waking and reported increased concentration and reduced sleepiness during the day on weekdays.⁵

To date there are no definitive theories to explain how regular physical activity may affect sleep; although it is highly likely that various complex mechanisms are involved. Buman and King reviewed



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the literature to identify potential mechanisms whereby exercise may influence sleep. According to the authors regular exercise may improve sleep by:

- Acting as an anti-depressant, as depression has been shown to contribute to poor sleep;
- Reducing anxiety-hyperarousal, which is a hallmark sign of insomnia;
- Enhancing restorative effects through increased energy expenditure (i.e., increasing the amount of slow wave sleep);
- Activating more efficient body thermoregulation, which is important for sleep onset and deeper forms of sleep;
- Facilitating synchronization of the circadian rhythm as sleep disturbances are more likely when one's circadian rhythm is desynchronized (for example as a result of shift work or due to jet lag);
- Increasing cytokine concentrations as cytokines have been linked to slow-wave sleep;

Apart from the direct mechanisms mentioned, exercise may also affect

sleep indirectly. Regular exercise has been shown to aid in weight control, reduce the use of medications (e.g.: sedatives, diuretics, and antidepressants); as well as to facilitate the prevention and/or treatment of certain chronic conditions-all of which have been shown to negatively impact sleep quality.⁴

Potential moderators of the exercise-sleep relationship

According to Buman et al a number of factors may affect the relationship between exercise and sleep, such as:⁴

- **Intensity and duration**—to improve sleep quality physical activity should be performed at or above the US national recommendations (150 minutes/week of moderate intensity or 75 minutes/week of vigorous intensity or an equivalent combination of moderate and vigorous);
- **Age**—older adults are more likely to experience declines in sleep quality and quantity and are more likely to suffer from chronic pain and functional limitations (which may impair sleep), and therefore are likely to benefit more from exercise than youth or adults without sleep complaints;
- **Time of day**—for optimal benefit, exercise should be performed between 4 to 8 hours prior to sleep, although according to this study, exercise any time of the day appears to be beneficial.

More info...

- 1 Williams, C. (2001). You snooze, you lose? Sleep patterns in Canada. Canadian Social Trends. Statistics Canada. Catalogue No. 11-008.
- 2 American Psychological Association. (2011). Why is sleep important and what happens when you don't get enough? Accessed from: <http://www.apa.org/topics/sleep/why.aspx>
- 3 Morin et al. (2011). Sleep disorders affect 40 percent of Canadians. Science Daily. Retrieved Oct. 7. 2011. Accessed from: <http://www.sciencedaily.com/releases/2011/09/110908104005.htm>
- 4 Buman, M., King, A. (2010). Exercise as a Treatment to Enhance Sleep. American Journal of Lifestyle Medicine. Vol. 4(6): 500-514.
- 5 Gerber et al. (2009). Fitness and Exercise as Correlates of Sleep Complaints: Is it All in Our Minds? Medicine & Science in Sports & Exercise. 893-901.

What have we learned?

- Sleep deprivation is linked to various health problems such as increased risk of diabetes, heart disease and certain cancers.
- Chronic lack of sleep has also been associated with impaired cognitive, immune and metabolic function.
- Individuals suffering from sleep debt are more likely to be irritable, drowsy, at a greater risk for cognitive decline, injuries and functional disability.
- Regular physical activity is an inexpensive non-pharmacological alternative that has been shown to improve the quality and quantity of sleep.
- The relationship between exercise and sleep is complex, involving multiple pathways.
- The effects of exercise are best when performed at least 4 hours before bedtime and at or above the recommended levels.
- In addition to aerobic exercise, resistance training and Tai chi may also improve sleep (particularly among older adults).