Siesta: Still an Enigma

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Napping in the daytime is common among people across the globe, especially those living in warm climate, e.g., Asia, Africa, Mediterranean, and Latin America [1]. In addition, day-time napping has been reported to be influenced by genetic factors. One of the studies among dizygotic twins suggested that heritability accounted for 65% chances of taking a siesta and 61% chances of day-time sleep duration [2]. Thus, little room is left for environmental factors and this study showed that what appears to be cultural could actually be genetic. However, the more important issue is the fact that day-time napping may result from various pathological conditions, e.g., inadequate sleep duration at night, sleep disorders resulting in poor sleep quality at night, and, finally, central disorders of hypersomnolence [3]. A recent study has shown that most of the daily naps result from sleep deprivation [4]. These factors have an independent effect on the outcome variables, e.g., mood, cognition, cardiovascular health, and metabolic parameters.

Health effects of siesta are still a debatable issue despite the fact that a number of studies have paid attention to this issue [5]. Studies have utilized two types of designs—cross-sectional as well as longitudinal. While cross-sectional studies establish only the association, longitudinal studies favor causality.

Studies favoring siesta reported that day-time naps improve cognitive functions and reduce sleep pressure [3]. Reduction of sleep pressure may result in reduced systemic inflammation as sleep deprivation has been found to increase inflammation. Day-time napping has been found to reduce the risk of rupture of an aneurysm, perhaps, through reduction of blood pressure [6]. A short nap (< 30 min/day) has been found to have a protective effect on obesity, but this effect may disappear among night-time short sleepers [7].

Similarly, taking a siesta in any frequency or of any duration was protective for the coronary events compared to not taking a siesta at all when potential confounders were excluded [8]. Reduction of blood pressure and the sympathetic tone was observed during siesta even after a night of sleep deprivation, suggesting that siesta as a mean of catching up sleep is also beneficial [9].

However, another body of literature suggests that day-time napping may have a deleterious effect on cardiovascular and metabolic parameters even after controlling for night-time sleep-related factors [3]. A meta-analysis showed that siesta increased risk of type 2 diabetes mellitus across different populations—American, European, and Chinese, ruling out the possibility of cultural, dietary, and environmental factors on outcome variables [10]. A longitudinal study suggested that, even after controlling for confounding variables including physical parameters, psychiatric disorders, substance use, night-time sleep duration, and quality, in younger subjects, day-time napping was associated with increased risk of respiratory problems [11].

It is pertinent to understand that the effect of siesta is mediated through two variables: duration and frequency. Among these, duration of nap appears to be a major factor determining the risk for diabetes mellitus in both cross-sectional and cohort studies. Napping longer or equal to than 1 h/day has been found to be associated with increased risk of diabetes, while shorter naps were not found to have any effect [12]. Daily long-duration siesta (> 1 h/day) was found to increase the risk of incidental cardiovascular and metabolic disorders and risk of mortality compared to the daily short-duration and infrequent siesta [13, 14].

However, findings of various studies discussed so far are conflicting and should be taken with caution. Studies which have addressed this issue have many potential biases. For example, is it the night-time sleep deprivation, sleep quality, and sleep disorders that influenced the result or just the siesta [4, 15]? Persons with sleep deprivation theoretically take longer naps and sleep deprivation has been found to have adverse consequences on metabolic parameters [16]. This fact is further reiterated by the fact that short naps or

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power naps were not found to have any association with sleep quality and sleep duration at nighttime [17]. Second, in epidemiological studies, it is difficult to rule out all potential confounders for the dependent variable under study. For example, cardiovascular and metabolic disorders, which were the dependent variables across studies, have a multifactorial basis. Similarly, effect of potential confounders, e.g., objectively measured night-time sleep duration, sleep quality, sleep disorders, change in sleeping pattern, daily activity, dietary habits, stress, hereditary factors, frequency of napping, duration, and quality of napping, is difficult to be controlled in a single study. In addition, most of the studies have relied upon the self-reported data of night-time sleep duration and day-time nap, which can potentially result in recall bias [15]. Chronotype and shift work are other factors that can influence the length and frequency of day-time napping [18]. Evening chronotype and shift work, both, are risk factors for cardiovascular and metabolic disorders. Chronotype and shift work can also influence metabolic and cardiovascular parameters through other medical disorders, e.g., depression, fatigue, addiction, and stress. Finally, the age of the study population has an important role during the assessment of the effect of Siesta as chronotype and night-time sleep architecture changes with age. These factors need to be assessed in future studies.

Until the time conclusive evidence is available, it is important that we follow the guidelines stipulated by sleep societies across the globe, i.e., sleep well and sleep on time.

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