



Research paper

Sleep duration, life satisfaction and disability



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ABSTRACT

Background: Although sleep is considered an essential part of individuals' lives, there are no previous studies analysing how sleep duration affects the levels of life satisfaction reported by males and females with disabilities.

Objective/Hypothesis: To analyse and compare the impact of hours of sleep on life satisfaction scores reported by people without and with disabilities (stratified by sex) in Germany.

Methods: Using data taken from the German Socio-Economic Panel for the period 2008–2013, we estimate life satisfaction equations for males and females (running a fixed-effects model) which include a set of variables measuring the number of sleep hours on workdays and weekends.

Results: A higher number of sleep hours on workdays increase life satisfaction for all males and females. However, the contribution of each hour of sleep on workdays is greater for males with disabilities in terms of life satisfaction, whereas for females no significant differences by disability status have been found. Although sleep hours on weekends also increase life satisfaction, the magnitude of the coefficients is relatively higher than that found for the corresponding hours of sleep on workdays, but only for the male sample (disabled or not).

Conclusions: The participation and commitment of policymakers, governments, trade unions, employers, and health care professionals are key aspects for developing and formulating new guidelines and specific measures that promote a healthy lifestyle and increase sleep duration. Such guidelines and measures are of essence for people with disabilities who are employed (e.g. using brief sleep opportunities during prolonged work periods, which can contribute to reducing fatigue, stress and anxiety).

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Sleep is a vital and basic day-to-day activity for all individuals, which consumes more time than any other single activity.^{1,2} However, habitual sleep time differs greatly among individuals and even by countries.^{3–5} Sleep duration among adults has been decreasing in recent years in some countries such as Japan, Russia, Finland, and Germany, whereas in others such as Bulgaria, Canada, France, Britain, Korea and the Netherlands, the opposite result is found.⁶ Apart from these regional differences, the existing literature shows that lack of sleep has important implications for productivity, occupational injuries, traffic safety and health status (e.g. increasing the risk of coronary heart disease, obesity, cancer, diabetes, depression, fatigue, and irritability), and overall quality of life.^{7–10} Sleep duration has been analysed by age, race and socio-economic status.^{11–14} Fredriksen et al.¹¹ find that students who

obtained less sleep over time reported heightened levels of depressive symptoms and decreased self-esteem. For older individuals, the consequences of poor sleep also include difficulty in sustaining attention, slowed response time, trouble with memory, and decreased performance.¹⁵ Within this context, less attention within the literature has been paid to the disparities in hours of sleep by disability status,¹⁶ and particularly to its effect on the levels of life satisfaction reported by people with disabilities. Kinne et al.¹⁷ found that adults with disabilities were significantly more likely than adults without disabilities to report unattributed conditions such as, for example, feeling sad or depressed, being worried or anxious, or sleeping poorly. Recently, Shandra et al.¹⁶ use cross-sectional data to study the association between short and long sleep durations and having a work disability or an impairment among working-age adults in the United States. These authors find that people with disabilities especially those with cognitive, physical, or multiple impairments are less likely than those without disabilities to have optimal sleep durations. However, none of these

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previous studies has examined the contribution of sleep to life satisfaction for the disabled population.

The aim of this study is to investigate the impact of hours of sleep on the levels of life satisfaction reported by people without and with disabilities in Germany. Our main interest is to test the hypothesis that people with disabilities obtain higher levels of life satisfaction from each hour of sleep as compared to those observed for their non-disabled counterparts. Overall, a negative relationship between life satisfaction and poor sleep is found in the works of Pilcher and Ott,¹⁸ Jean-Louis and Kripke,¹⁹ Groeger et al.,²⁰ Steptoe et al.,²¹ and Paunio et al.²² Pilcher and Ott¹⁸ find that life satisfaction is positively related to daily sleep quality. Greater life satisfaction is associated with increased sleep satisfaction, younger age, less obesity, and greater experienced illumination.¹⁹ Furthermore, Groeger et al.²⁰ point out that quality of life is positively associated with sleep duration, for durations up to 9 h, but negatively associated beyond these hours. Steptoe et al.²¹ also conclude that negative psychosocial factors including financial strain, social isolation, limited emotional support, negative social interactions, and psychological distress are also related to reported sleep problems and lower life satisfaction scores. Finally, Paunio et al.²² obtained that poor sleep predicted a consistent pattern of life dissatisfaction, whereas life dissatisfaction did not consistently predict poor sleep.

On the other hand and according to the existing literature,^{23–25} disability can be considered a condition that “steals time”,²³ due to the fact that people with disabilities need more time to rest, receive medical treatment and accomplish everyday activities. Consequently, they devote less time than people without disabilities to market work and more time to household production, leisure and personal care.²⁴ According to Anand and Ben-Shalom,²⁵ on average most of the decrease in paid work time is offset by more time spent on leisure activities and sleeping, which is likely due to these being default activities for individuals whose medical issues and environment constrain them from participating in other activities. In this sense, Lallukka et al.²⁶ find that a disadvantaged socioeconomic position in adulthood, in particular having a low income, being unemployed, or being on a disability pension are associated with poor sleep, whereas improved sleep quality is associated with decreased depressive symptoms and reduced pain-related disability.²⁷ Patel and Hu²⁸ reviewed the existing literature (between 1966 and 2007) on the relationship between sleep duration and obesity and found a positive relationship between short sleep duration and increased obesity (for children and adults). Krueger and Friedman²⁹ also find that those individuals who are limited in their basic mobility or social activities are 60% more likely to report less than 5 h of sleep than those who are not limited. Furthermore, the number and quality of hours of sleep predict the risk of developing type 2 diabetes and mental illnesses.^{30,31} Inactivity, dissatisfaction with social life and the presence of organic diseases and mental disorders (common characteristics among people with disabilities) are the best predictors of insomnia.³²

All these findings lead us to assume that the contribution of each hour of sleep to life satisfaction may be different by disability status, being higher for people with disabilities because of health concerns and time restrictions. To test this hypothesis, we use data drawn from the German Socio-Economic Panel (GSOEP) for the period 2008–2013, and estimate a fixed-effects model on life satisfaction, which includes the number of hours of sleep for individuals among its explanatory variables. An important novelty of the GSOEP is the fact that we have information on sleep duration during both a normal workday and a weekend day. As a result, we can analyse and compare the impact of these two types of hours of sleep on life satisfaction and identify a different contribution for German people without and with disabilities. The existing literature^{28,33,34} has

found that sleep habits vary greatly between weekdays and weekends, with the sleep duration being longer on average on weekends. These differences are even greater for those who have more severe sleep restriction during the week (e.g. those employees with long working hours). However, Lauderdale³⁴ also concludes that wording of questions can affect the reporting of sleep duration in complicated ways, as it is difficult to compare studies that use different ways of inquiring about it.

In addition and following the previous literature,^{3,4,12} we have estimated our life satisfaction equations separately for males and females. The gender division of labour and the traditional male-breadwinner family model^{35,36} contribute to explaining the gender differences in sleep duration found in the literature. We have to bear in mind that in Germany after the reunification the “two parts of the country converged toward the male-breadwinner/female part-time carer arrangement—in which males are employed full-time and their female partners hold part-time jobs and retain the majority of caregiving responsibilities³⁵ p. 121”. In our case, these gender differences in paid and unpaid work responsibilities and leisure time lead us to expect females to report less sleep than males, because sleep also represents a somewhat discretionary use of time.^{37,38} Although we can find several studies analysing the impact of disability on life satisfaction and other domains of satisfaction,^{39–42} none of them have focused on investigating the contribution of hours of sleep to life satisfaction for people with disabilities. Recently, the work of Piper⁴³ has examined whether sleep is an important factor for individuals' happiness, and how many sleep hours maximise their life satisfaction. However, this author does not include any specific study on the sleep duration of people with disabilities and its effect on life satisfaction. Therefore, our study contributes to filling this important gap in the existing literature and provides new insights into the relationship between sleep duration and life satisfaction for people with disabilities.

Within the economic literature on sleep, it is worthwhile mentioning the works of Biddle and Hamermesh,³⁷ Asgeirsdottir and Zoega,² and Antillon et al.⁴⁴ The work of Biddle and Hamermesh³⁷ was the first paper to include in their economic models time spent sleeping. They found that time spent sleeping among males is inversely related to both the wage received and time spent in the labour market. Asgeirsdottir and Zoega² conclude that sleep duration decreases when the economy is doing well. Antillon et al.⁴⁴ find that higher aggregate unemployment is associated with longer mean sleep duration. To take into account the time spent in the labour market and its negative effect on sleep duration,^{37,45} we have re-estimated our life satisfaction equations according to the individual's labour status (see the “robustness check” section). Employed males and females may have multiple roles as a worker, spouse and parent, and all these roles can be hypothesized to have health-promoting or health-damaging impacts (e.g. fewer hours of sleep).⁴⁶ Moreover, paid work outside the home may be less compatible with finding time to sleep than unpaid work in the home.^{37,45}

As noted earlier, to carry out this analysis we use panel data thanks to the availability in the GSOEP of specific information on the number of hours of sleep (on a workday or weekend day). Therefore, the longitudinal nature of the GSOEP allows us to use panel-data techniques and estimate a fixed-effects model, and thus control for unobserved individual effects, which may capture individual personality traits. Finally, our results can help policymakers, governments, employers, trade union, and health professionals to formulate and implement measures and policies that promote healthy sleep through, for example, lifestyle changes, thereby improving the quality of life of all individuals in general and of people with disabilities in particular.

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