



Contents lists available at ScienceDirect

Journal of Behavior Therapy and Experimental Psychiatry

journal homepage: www.elsevier.com/locate/jbtep



I sleep with my Mind's eye open: Cognitive arousal and overgeneralization underpin the misperception of sleep



Keisuke Takano^{*}, Yannick Boddez, Filip Raes

Center for Learning and Experimental Psychopathology, University of Leuven, Belgium

ARTICLE INFO

Article history:

Received 16 January 2016

Received in revised form

23 April 2016

Accepted 25 April 2016

Available online 26 April 2016

Keywords:

Sleep perception

Cognitive arousal

Overgeneralization

Actigraphy

ABSTRACT

Background and objectives: Misperception of sleep (e.g., underestimation of sleep time relative to objective measures) is a common feature of insomnia and other psychopathologies. To elucidate the mechanisms underlying this tendency, we examined the role of pre-sleep cognitive arousal and overgeneralization.

Methods: We monitored the sleep of 54 community dwellers (the majority being university students), using actigraphy and a sleep diary for 7 days. Immediately after this period, the participants provided an additional global evaluation of their sleep for the past week. In this global evaluation, participants were asked to estimate their average number of hours of sleep and the duration of time taken to fall asleep (sleep onset latency) across the past seven nights.

Results: Single-night misperceptions (difference between actigraphy and sleep diary estimations) of sleep time and sleep onset latency were significantly associated with pre-sleep cognitive arousal, but not with overgeneralization. In contrast, global misperception of sleep (difference between sleep diary and global estimations) were associated with overgeneralization, but not with cognitive arousal.

Limitations: Our sample mainly consisted of female university students, which limits the generalizability of the results.

Conclusions: Misperception of sleep occurs in two cases: (1) in the case of a single night due to excessive arousal, and (2) in the case of multiple nights due to overgeneralization.

© 2016 Elsevier Ltd. All rights reserved.

1. Introduction

The misperception of sleep, namely, the tendency to perceive sleep as wakefulness without objective evidence of sleep disturbances, is a well-known phenomenon observed in individuals with insomnia (Harvey & Tang, 2012). It is operationally defined as an underestimation of total sleep time (TST) and overestimation of sleep onset latency (SOL, i.e., the duration of time taken to fall asleep) relative to the results of objective measures of sleep such as polysomnography (PSG; e.g., Carskadon et al., 1976; Frankel, Coursey, Buchbinder, & Snyder, 1976; Vanable, Aikens, Tadimeti, Caruana-Montaldo, & Mendelson, 2000) and methods such as actigraphy (e.g., Tang & Harvey, 2004a, 2004b; Wicklow & Espie, 2000). The misperception of sleep is argued to be common among people with insomnia as a primary and secondary

symptom; for example, patients with depression (Rotenberg, Indursky, Kayumov, Sirota, & Melamed, 2000), post-traumatic stress disorder (Kobayashi, Huntley, Lavela, & Mellman, 2012), and chronic pain (Wilson, Watson, & Currie, 1998) tend to misperceive and exaggerate their sleep problems even when there is no indication of deficits in objectively measured sleep.

Cognitive models of insomnia have proposed that the misperception of sleep plays a central role in the development and persistence of sleep problems (e.g., Espie, Broomfield, MacMahon, Macphie, & Taylor, 2006; Harvey, 2002). According to these theoretical accounts, the perception of insufficient sleep fuels anxious worry about sleeplessness and daytime dysfunctions, which, in combination with high levels of physiological arousal and emotional distress, directly interferes with getting sleep (Harvey, 2002). Furthermore, in order to avoid this sleep-related anxiety, people who believe that they suffer from a lack of sleep tend to engage in irrational “safety behaviors” and establish maladaptive sleep habits (e.g., staying longer in bed, drinking excessive alcohol, and cancelling appointments to take a nap). Ironically, such

^{*} Corresponding author. Center for Learning and Experimental Psychopathology, University of Leuven, Tiensestraat 102, Leuven 3000, Belgium.

E-mail address: Keisuke.Takano@ppw.kuleuven.be (K. Takano).

attempts to get more sleep actually worsen the quality of their sleep, because they interfere with the normal sleep cycle and disrupt the biological body clock (Harvey, 2002; Morin, 2002). In addition, intervention studies have suggested that correcting the misperception of sleep reduces insomnia symptoms and anxiety about sleeplessness (Tang & Harvey, 2004a, 2006). However, despite the potential importance of the misperception of sleep for our understanding of the development, maintenance, and treatment of sleep disorders, the underlying psychological mechanisms of the misperception of sleep are still largely unknown.

One possible factor that can influence the perception of sleep is cognitive arousal. Indeed, theories suggest that pre-sleep worry distorts the perception of how long it takes to fall asleep, because time tends to be perceived as longer under a high-arousal state (Borkovec, 1982; Harvey & Tang, 2012). Furthermore, it has been argued that excessive cognitive activity and hyperarousal of the central nervous system can blur the distinction between states of sleep and wakefulness, resulting in people even mistaking sleep for wakefulness (Bonnet & Arand, 1992; Perlis, Giles, Mendelson, Bootzin, & Wyatt, 1997; Perlis, Merica, Smith, & Giles, 2001). In line with these suggestions, a number of empirical studies have suggested that manifestations of negative cognitive arousal such as depressive rumination and anxious worry contribute to the perception of poor sleep (Nicassio, Mendlowitz, Fussell, & Petras, 1985; Takano, Iijima, & Tanno, 2012; Thielsch et al., 2015; Thomsen, Mehlsen, Christensen, & Zachariae, 2003), impaired objective sleep (Gross & Borkovec, 1981; Takano, Sakamoto, & Tanno, 2014), or both (Pillai, Steenburg, Ciesla, Roth, & Drake, 2014; Wicklow & Espie, 2000; Zoccola, Dickerson, & Lam, 2009). Other studies have directly examined the discrepancies between subjective and objective estimations of sleep by using PSG or actigraphy measurement and have suggested that worry contributes to the overestimation of SOL and underestimation of TST, relative to the corresponding estimates of objective sleep measures (Tang & Harvey, 2004b; Tang, Schmidt, & Harvey, 2007; Van Egeren, Haynes, Franzen, & Hamilton, 1983; Vanable et al., 2000).

As has been previously stated, the misperception of sleep is often defined as the single-night discrepancy between objective and subjective estimations of sleep. However, this single-night discrepancy cannot capture the “total picture” regarding the misperception of sleep, because a sense of sleeplessness is often based on an overall evaluation of sleep across several days or weeks. Therefore, in the present study, we also investigated another type of sleep misperception, that is, the estimation bias that occurs when providing a global evaluation of sleep across multiple nights. Although the discrepancy between daily and global estimations of sleep has never been examined before, there is indeed evidence that suggests that such global estimations (often measured as habitual sleep) could be more biased than single-night estimations. Silva et al. (2007) examined sleep in a community sample by using the following three measures of sleep: (a) an objective measurement of sleep by using PSG, (b) a self-report of sleep taken on the morning after PSG administration, and (c) the retrospective recall of habitual sleep. They found that sleep duration in habitual sleep reports was overestimated relative to the sleep duration measured by PSG and the self-reported morning estimations of sleep (see also Biddle, Glozier, Robillard, Hermens, & Hickie, 2015; Lauderdale, Knutson, Yan, Liu, & Rathouz, 2008; Wolfson et al., 2003). The differences between the diary and retrospective reports (i.e., a sleep questionnaire measuring sleep obtained in the week prior to the maintenance of the sleep diary) have also been examined in individuals with insomnia. These individuals tend to underestimate TST and overestimate SOL in retrospective estimations relative to the average of sleep recorded in their sleep diary (Fichten, Creti, Amsel, Bailes, & Libman, 2005).

It is of particular importance to identify factors that are related to these biased global estimations. First, the global estimation bias can contribute significantly to the vicious cycle of sleep-related anxiety and irrational behaviors that exacerbate sleep problems. In this regard, these global estimations might be even more crucial than single-night misperceptions, because they tap the long-term negative evaluation of sleep quality. Second, asking respondents to globally evaluate the sleep they have had over the past weeks is a common assessment style in self-report questionnaires such as the Pittsburgh Sleep Quality Index (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989) and Insomnia Severity Index (Bastien, Vallières, & Morin, 2001). Given the wide usage of these questionnaires, it is essential to reveal the factors that might bias the responses to certain items.

In the present study, we investigated whether negative overgeneralization contributes to the global misperception of sleep. When judging the overall quality of sleep, respondents typically aggregate their perceived sleep across multiple nights to provide a single global score such as an “average” sleep time. This aggregation process could be a source of bias. Negative overgeneralization has mainly been studied in relation to depression, in which a single negative experience or failure is generalized across multiple dimensions, occasions, aspects of the self, or even to a global sense of self-inadequacy (Carver, 1998; Carver, La Voie, Kuhl, & Ganellen, 1988). Because generalized mental representations do not incorporate specific contextual details, people with a tendency to overgeneralize are more likely to feel that they always fail at everything rather than to focus on context-specific difficulties or particularities (Watkins, 2008). We hypothesized that a similar process might occur in retrospective global evaluations of sleep: Individuals with this vulnerability may unjustifiably generalize their experience of a single or few (bad) nights of perceived insufficient sleep and thereby claim that they have had a whole series of bad nights (“I slept badly this entire week”).

Taken together, the misperception of sleep can occur (a) in the case of a biased estimation of sleep parameters for a single night and/or (b) in the case of a biased global estimation of sleep parameters for multiple nights. To assess the bias in these two cases, we used actigraphy to measure sleep across seven consecutive days to obtain objective sleep measures, and a sleep diary to measure day-to-day perceptions of sleep. At the end of the sleep monitoring, we also asked the participants to provide an overall evaluation of the sleep they had had in the past seven days in order to obtain retrospective global estimations of sleep (i.e., average TST and SOL). Based on these sleep measures, we defined single-night misperception of sleep as the difference between objective (i.e., actigraphy) and subjective (i.e., sleep-diary) estimations in terms of single-night TST and SOL. We also assessed the global misperception of sleep, which was defined as the difference between sleep diary estimations and the retrospective global estimations of TST and SOL. We examined the relation between these two discrepancies, on the one hand, and pre-sleep cognitive arousal and negative overgeneralization, on the other hand. Our specific hypotheses were that (a) the single-night misperception (discrepancy between actigraphy estimations and sleep diary estimations) would be uniquely associated with increased pre-sleep cognitive arousal, and (b) the global misperception (discrepancy between sleep diary estimations and global estimations) would be specifically explained by the tendency to overgeneralize.

2. Method

2.1. Participants

We recruited 60 individuals (7 males and 53 females) from a

Download English Version:

<https://daneshyari.com/en/article/7267756>

Download Persian Version:

<https://daneshyari.com/article/7267756>

[Daneshyari.com](https://daneshyari.com)