



## Examining the role of psychological need satisfaction in sleep: A Self-Determination Theory perspective



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### ABSTRACT

Although ample research has shown the satisfaction of the basic psychological needs for autonomy, competence, and relatedness, as defined within Self-Determination Theory, to be related to well-being, the relation with sleep-related functioning has not yet been examined. Hence, the present study explored the association between basic psychological need satisfaction and subjective measures of sleep and daytime dysfunction, as well as the explanatory role of need satisfaction in the relation between mindfulness and financial strain and these outcomes, in an adult sample ( $N = 215$ , 61% female; Mean age = 31). The results indicated that low psychological need satisfaction related to poor sleep quality, lower sleep quantity, and more daytime dysfunction. Finally, mindfulness and financial strain related, respectively, negatively and positively to poor sleep quality and daytime dysfunction through need satisfaction, suggesting that need satisfaction represents a critical explanatory mechanism. The role of psychological need satisfaction in the adequate regulation and satisfaction of the physiological need for sleep is discussed.

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### 1. Introduction

Poor sleep impairs cognitive functioning (Curcio, Ferrara, & De Gennaro, 2006) and is associated with various adverse health outcomes, such as diabetes, obesity, and cardiovascular disease (Reite, Ruddy, & Nagel, 2002). Such findings highlight the necessity to identify predictors of people's sleep. Previous studies found perceived stress (Fuligni & Hardway, 2006), loneliness (Cacioppo et al., 2002), financial strain (Burgard & Ailshire, 2009), and negative affect (Stewart, Rand, Hawkens, & Stines, 2011) to relate to poor sleep, while mindfulness (Howell, Digdon, Buro, & Sheptycki, 2008) and gratitude (Wood, Joseph, Lloyd, & Atkins, 2009) related to better sleep. However, although a broad range of theoretical explanations have been proposed as to why sleep and psychological functioning are related (e.g., Riemann et al., 2010), past work examining psychological predictors of sleep has not always been grounded in an overarching psychological framework.

Self-Determination Theory (SDT; Deci & Ryan, 2000; Vansteenkiste, Niemiec, & Soenens, 2010) provides such a framework as it specifies principles that may help to explain why previously identified predictors of sleep relate to sleep outcomes. SDT identifies three basic psychological needs which are essential for

psychological and social wellness and physical health: Autonomy involves the experience of a sense of volition and self-endorsement in one's activity; competence refers to the experience of effectiveness when interacting with one's environment; and relatedness involves the experience of reciprocal care and concern for others. Akin to drive theory (Hull, 1943) which focuses on the study of physiological needs (e.g., food, sleep), SDT conceives these psychological needs as inherent, universal, and essential for well-being. Various studies have found psychological need satisfaction to relate positively to well-being (e.g., life satisfaction), and negatively to ill-being (e.g., depressive symptoms and anxiety) (Deci & Ryan, 2000). These findings emerged across diverse life domains and both at the between-person and within-person level (Vansteenkiste et al., 2010).

More recently, a few studies began to explore the role of psychological need satisfaction in the regulation of physiological needs. For example, on days when basic psychological needs are frustrated, problems with eating regulation are more likely to occur (Verstuyf, Vansteenkiste, Soenens, Boone, & Mouratidis, 2013). In addition, psychological need satisfaction has been found to play a role in peoples' sexual experiences (Smith, 2007). However, to date no study has focused on the interplay between psychological need satisfaction and the physiological need for sleep, although indirect evidence for this association exists. For example,

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loneliness and attachment anxiety, which presumably involve experiences of relatedness frustration, as well as financial strain, which likely engenders experiences of autonomy frustration, have been found to relate to poorer sleep (Burgard & Ailshire, 2009; Carmichael & Reis, 2005). Further, the frustration of psychological needs is associated with stress, negative affect (Deci & Ryan 2000) and reduced vitality (Chen, Yao, & Yan, 2014), all of which negatively relate to sleep outcomes (Fulgini & Hardway, 2006; Stewart et al., 2011; Visser, Hirsch, Brown, Ryan, & Moynihan, 2014). Presumably, when individuals fail to get their psychological needs met, they have more negative experiences to handle which may increase pre-sleep arousal through worry and stress and in this way negatively influence sleep.

We propose that the concept of psychological need satisfaction allows for a deeper understanding of the ways in which psychological factors relate to sleep. Indeed, the effect of previously identified antecedents of sleep outcomes, such as mindfulness and financial strain, may be explained through their association with need satisfaction. Mindfulness involves a non-judgmental stance and receptivity for present experiences (Brown & Ryan, 2003). With regard to sleep, mindfulness would allow for a greater attunement to bodily cues of fatigue and be conducive to a greater acceptance of sleep-related functioning. Rather than trying to get a grip on or alter disturbing sleep-related thoughts and feelings, the more observing stance characteristic of mindful individuals would be conducive to a greater detachment of everyday worries that impede restful sleep. In line with this, a few previous studies found mindfulness to relate positively to sleep (Howell, Digdon, & Buro, 2010; Howell et al., 2008). Herein, we propose that need satisfaction can explain the observed salutary effects of mindfulness on sleep. Because mindful individuals display a greater awareness of ongoing events, they may be more capable of deriving a sense of need satisfaction from these events, which, in turn would predict better sleep.

In addition to mindfulness, financial strain is likely to yield a negative association with sleep through need satisfaction. Financial strain is likely to restrict freedom in daily life, cause relational conflicts, and increase self-doubts as to whether one can competently run one's life, thus leading to low need satisfaction. Although previous research found financial strain to impair sleep (Burgard & Ailshire, 2009), the mechanism accounting for this association has not received attention yet.

The objective of the present cross-sectional study was to explore the relation between psychological need satisfaction and subjective measures of sleep. Two more specific aims were pursued. First, in contrast to previous research which often treated sleep as a non-differentiated category comprising diverse indicators (e.g., Howell et al., 2008), we examined whether need satisfaction would yield a similar relation to two sleep-related components, that is, sleep quantity (e.g., number of hours of sleep) and perceived sleep quality. Further, consistent with available measures in the field, such as the commonly used Pittsburgh Sleep Quality Index (PSQI) (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989), we also included various indicators of day-time dysfunction, including the Insomnia and Lassitude subscales of the Inventory of Depression and Anxiety Symptoms (IDAS) (Watson, O'Hara, Simms, Kotov, & Chmielewski, 2007), the Fatigue Severity Scale (FSS) (Rietberg, Van Wegen, & Kwakkel, 2010) and the General Vitality Scale (Ryan & Frederick, 1997). Although strictly speaking such measures are not indicative of individuals' sleep as such, because they tap into feelings of exhaustion and energy during the day, they are directly related to one's sleeping pattern. We hypothesized that need satisfaction would relate negatively to poor sleep quality and daytime dysfunction. With regard to sleep quantity, we had no formal hypothesis, but rather examined the association between psychological need satisfaction and sleep quantity in an explorative fashion. In examining this hypothesis, we first tested

the role of a composite score of need satisfaction and then proceeded by testing the individual and unique contributions of each of the three needs.

Second, we examined whether psychological need satisfaction would account for the relation between mindfulness and financial strain and sleep outcomes and daytime dysfunction. By proposing the same mechanism (i.e., need satisfaction) to account for the previously observed effects of diverse antecedents of sleep (i.e., mindfulness, financial strain), the concept of psychological need satisfaction may allow for a deeper integration of findings from previous studies (e.g., Burgard & Ailshire, 2009; Howell et al., 2008, 2010).

## 2. Method

### 2.1. Participants and procedure

The original sample consisted of 245 Belgian adults; however, 30 were later excluded on the basis of the exclusion criteria resulting in a final sample of 215 (61% female; Mean age = 31, SD = 14.39). Participants were recruited through the social network of three Master students of Clinical Psychology at the University of Ghent. Participants were excluded if they were less than 18 years old, had children under the age of 3, worked in shifts, used hypnotics or had a self-reported diagnosis of depression, anxiety or primary sleep disorder. All participants gave informed consent and the sample was approved by the University's Institutional Review Board.

#### 2.1.1. Measures

All variables were coded so that a higher value represented a higher amount of the labeled construct. Reliabilities of all measures can be found on the diagonal in Table 1.

#### 2.1.2. Basic Psychological Need Satisfaction and Need Frustration Scale (BPNSNFS)

Psychological need satisfaction was assessed using the BPNSNFS (Chen et al., 2014). Participants rated on a scale of 1 (*not at all true*) to 5 (*very true*) as to whether they felt their needs for autonomy (e.g., "I feel my choices express who I really am"), competence (e.g., "I feel confident that I can do things well") and relatedness (e.g., "I feel connected with people who care for me and whom I care for") were satisfied during the past month. The scale consists of 24 items in total, 8 items per need, 4 of which tap into need satisfaction and 4 which tap into need frustration. Apart from creating three separate need scores by averaging the respective means for autonomy, competence, and relatedness, we also created an overall composite score by averaging the sum of the three need variables (see also Deci et al., 2001).

#### 2.1.3. Mindful Attention Awareness Scale (MAAS)

Mindfulness was assessed using the MAAS (Brown & Ryan, 2003). The scale consists of 15 items which assessed the individual's awareness of his/her attention during the past month (e.g., "I found myself doing things without paying attention"). Participants rated responses on a scale of 1 (*almost always*) to 6 (*almost never*).

#### 2.1.4. Financial strain

Eight items assessed the degree to which participants worried about their financial situation over the last month (e.g., "During the last month I worried about whether I would have sufficient financial resources to provide medical care for my family and for myself") (Vansteenkiste, Lens, De Witte, De Witte, & Deci, 2004). Participants were asked to rate each item on a 5-point Likert scale ranging from 1 (*Completely disagree*) to 5 (*Completely agree*).

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