Relations among mindfulness, well-being, and sleep

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ABSTRACT

The current study tested predictions that well-being and mindfulness are positively associated with sleep quality and with a morning circadian preference. A model was also tested wherein mindfulness directly predicts well-being and indirectly predicts well-being through improved sleep quality. Results from a sample of 305 undergraduates revealed positive associations among measures of emotional, psychological, and social well-being, mindfulness, sleep quality, and morningness. A path analysis yielded support for mindfulness as a direct predictor of well-being and for mindfulness as an indirect predictor of well-being, mediated by sleep quality. Results are considered in terms of additional plausible relationships between mental health and sleep, and in terms of suggestions for future work.

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1. Introduction

Anxiety disorders, mood disorders, substance-related disorders, psychotic disorders, and cognitive disorders often involve disrupted sleep (Ford & Kamerow, 1989; Nofzinger, Buysse, Reynolds, & Kupfer, 1993). Even among non-clinical populations, sleep difficulties frequently co-occur with symptoms of depression and anxiety (Spoormaker & van den Bout, 2005). Notwithstanding evidence for a relationship between disordered sleep and psychopathology, there has been limited attention to associations between adaptive sleep characteristics and mental health. In other words, do aspects of sleep, such as sleep quality, correlate with indices of mental health?

1.1. Indices of mental health

Keyes (2005, 2007) operationalized mental health as a combination of emotional well-being (emphasizing positive affect and life satisfaction; see Diener, Suh, Lucas, & Smith, 1999), psychological well-being (emphasizing a positive self-evaluation and a view of oneself as having a purpose in life and growing as an individual; see Ryff, 1989; Ryff & Keyes, 1995), and social well-being (emphasizing a positive view of others and believing that one is making a contribution to one's community; see Keyes, 1998). Among a representative sample of US adults, Keyes (2005) subjected well-being scores and diagnoses of psychopathology to confirmatory factor analysis. Two negatively correlated factors emerged, corresponding to mental health and mental disorder dimensions, consistent

with the notion that mental health is not simply the absence of disorder.

Another marker of mental health is mindfulness (Kabat-Zinn, 1990). As defined by Brown and Ryan (2003), mindfulness is "the state of being attentive to and aware of what is taking place in the present" (p. 822). Characteristics of mindfulness include a pre-conceptual awareness and acceptance of experiences; flexible regulation of attention; an objective receptivity to experience; and an orientation to the here-and-now (Brown, Ryan, & Creswell, 2007a). Mindfulness is conceptualized as promoting high levels of well-being; specifically, mindfulness is viewed as directly fostering well-being by providing additional fullness and richness to experience, and mindfulness is seen as indirectly enhancing well-being by facilitating healthy self-regulatory behaviour, including an enhanced attentiveness to, and acceptance of, one's needs or personal values and an enhanced capacity to act in accordance with them (Brown & Ryan, 2003; Brown et al., 2007a).

1.2. Sleep, well-being, and mindfulness

Indices of mental health such as well-being or mindfulness have rarely been associated with indices of sleep such as sleep duration or sleep quality. Indeed, in their review of more than 200 correlational, longitudinal, and experimental studies concerning relationships between positive affect (i.e., a component of emotional well-being) and outcomes such as physical health and work performance, Lyubomirsky, King, and Diener (2005) cited only one study that included a sleep-specific measure. That study demonstrated, among an adult sample, that vigour correlated with total sleep time as measured by polysomnography (Bardwell, Berry, Ancoli-Israel, & Dimsdale, 1999). One earlier study, not cited by Lyubomirsky et al.,

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showed that daily ratings of positive mood correlated directly with earlier sleep onset among an adult sample (Totterdell, Reynolds, Parkinson, & Briner, 1994). More recently, Fulgini and Hardway (2006) revealed positive associations between happiness and self-reported sleep duration among an adolescent sample; Norlander, Johansson, and Bood (2005) showed that positive affect among their adult sample was associated with self-reported sleep quality; and Gray and Watson (2002) showed that self-reported sleep quality and sleep efficiency were associated with positive affect among an undergraduate sample.

Two recent studies assessed sleep and aspects of mental health other than emotional well-being by employing the psychological well-being subscale used by Keyes (2005): Ryff, Singer, and Love (2004) evidenced, among a sample of women aged 61–91, positive associations between psychological well-being and objective measures of sleep duration and amount of rapid eye movement sleep, and Hamilton, Nelson, Stevens, and Kitzman (2007) established a positive correlation between psychological well-being and self-reported sleep duration among a community sample. Hamilton et al. also suggested that "future research on sleep may wish to adopt broader measures of well-being" (p. 159), such as Keyes' comprehensive measure. Finally, no research has examined associations between mindfulness and sleep characteristics such as quality or duration. However, mindfulness has been shown to correlate positively with broadly assessed physical health (Brown & Ryan, 2003). Moreover, there is evidence that boosting mindfulness improves self-reported sleep quality and efficiency among cancer patients (Shapiro, Bootzin, Figueredo, Lopez, & Schwartz, 2003).

Another aspect of sleep that could relate to indices of mental health is circadian preference for the timing of bedtimes and rise times (Horne & Ostberg, 1976; Kerkhof, 1985). Those who have an evening circadian preference prefer later than average bedtimes and rise times and function at their peak later in the day (e.g., as indexed by alertness levels and body temperature) relative to those with a morning or intermediate preference (Horne & Ostberg, 1976). Bedtimes and rise times are not completely constrained by biology or environment; to some extent, people choose when to go to bed and when to get up. The choice of later bedtimes and rise times for those with an evening preference may be related to more general difficulties with behavioural self-regulation. Indeed, an evening circadian preference predicts poor adaptive functioning: Eveningness is related to substance abuse and other behaviour disorders (see review by Cavallera and Giudici (2008)), and an evening preference is associated with personality features which suggest relatively poor self-regulation, including low stability (DeYoung, Hasher, Djikic, Criger, & Peterson, 2007), low conscientiousness (Hogben, Ellis, Archer, & von Schantz, 2007), and high procrastination (Hess, Sherman, & Goodman, 2000). Poorer self-regulation among those with an evening preference suggests that well-being or mindfulness may also vary with circadian preferences. There is as yet only indirect support for such associations: Diaz-Morales and Sanchez-Lopez (2008) showed inverse correlations between morningness and anxiety among female adults; Chelminski, Ferraro, Petros, and Plaud (1999) showed that depression among college students was more common among those with an evening preference; and Wittmann, Dinich, Merrow, and Roenneberg (2006) showed that an evening preference among community-dwelling men and women was associated with depressed mood. Additional research is needed to see whether circadian preference is related to positive markers of mental health, such as well-being and mindfulness.

1.3. The current study

A first purpose of the current study was to examine relations between a comprehensive measure of well-being and sleep quality and between mindfulness and sleep quality. It was hypothesized that greater well-being, and greater mindfulness, would predict better sleep quality. A second purpose was to correlate well-being and mindfulness with circadian rhythm preference. It was hypothesized that greater well-being, and greater mindfulness, would predict greater preference for a morning circadian rhythm. Finally, a third purpose was to test a model concerning mindfulness and sleep quality as predictors of well-being. As described previously, mindfulness has been conceptualized as promoting well-being both directly (by enriching ongoing experience) and indirectly (by enhancing healthy self-regulation of behaviour; Brown & Ryan, 2003; Brown et al., 2007a). The latter process may involve heightened sensitivity to bodily cues including those related to sleep, as a result of which one is better able to respond to basic needs (Brown & Ryan, 2003). Being attentive to cues of fatigue and lowered functioning in relation to sleepiness may be fostered by mindfulness. Such awareness may increase the likelihood of taking steps toward addressing one's need for sleep. Moreover, the lessened egoism of the mindful state may, at bedtime, reduce preoccupations and ruminations that can foster insomnia (Harvey, 2003), including worry about sleep itself (Brown, Buboltz, & Soper, 2002). Therefore, mindfulness may, by facilitating awareness of bodily states and by reducing self-related preoccupations, promote improved sleep quality, which may in turn conduce toward overall well-being. This study examined whether mindfulness directly predicts well-being and whether mindfulness indirectly predicts well-being as mediated by sleep quality.

2. Method

2.1. Participants

Participants were 305 introductory psychology students at a Canadian undergraduate college. Females comprised 74.1% of the sample, and 90% of participants identified Canada as their country of birth. The average age of participants was 21.1 (SD = 4.91), and 95% were aged 18–30. First- and second-year students comprised 72% and 24% of the sample, respectively. The mean grade point average among the sample was 2.86 (out of 4.00; SD = 0.66).

2.2. Measures

Well-being: Keyes (2005) devised a 40-item measure of emotional, psychological, and social well-being. Emotional well-being is assessed via ratings of positive affect and ratings of life satisfaction; psychological well-being is assessed via ratings of self-acceptance, positive relations with others, personal growth, purpose in life, environmental mastery, and autonomy; and social well-being is assessed via ratings of social acceptance, social actualization, social contribution, social coherence, and social integration. Keyes reported internal consistency coefficients for emotional well-being, psychological well-being, and social well-being scales of .91, .81, and .81, respectively. For total scores, emotional, psychological, and social well-being scores were summed and re-scaled so they ranged from 0 to 60 (Keyes, 2005).

Mindfulness: The Mindful Attention Awareness Scale (Brown & Ryan, 2003) employs 15 items to assess the extent to which an individual is aware of and attends to current experiences. Participants rate statements such as, "I find myself doing things without paying attention" using a rating scale with endpoints labeled 1 (*almost always*) and 6 (*almost never*). An overall score is derived by summing across the items, with higher scores denoting greater mindfulness. Brown and Ryan established the internal consistency of the measure (α = .82), its test–retest reliability (r = .81), and its convergent validity with related measures (e.g., positive correlations with well-being).