

Predictors of Adherence to a Brief Behavioral Insomnia Intervention: Daily Process Analysis

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Behavioral interventions for insomnia are effective in improving sleep, yet adherence is variable, and predictors of adherence have not been consistently replicated. The relationships between daily variations in state factors at the initiation of treatment and adherence have not been investigated. Using 2-week, self-report online logs, this study determined, among 53 college students with probable insomnia, the associations of pretreatment factors and daily factors during treatment on daily variations in adherence to one session of behavioral treatments for insomnia. These treatments included stimulus control therapy (SCT), sleep restriction therapy (SRT), and sleep hygiene (SH). Low self-efficacy was associated with poorer SCT and SH adherence. Participants with a “bed partner or pet” at least some of the time had better SCT adherence. Greater total sleep time and poorer sleep quality were associated with poor SCT and SRT adherence the following night.

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Greater sleep efficiency was related to greater next night SCT and SRT adherence. Alcohol consumption was related to poorer SRT and SH adherence the following night. Future studies should test the replicability of these findings. Adherence trials may want to test whether discouraging alcohol intake, enhancing treatment-related self-efficacy, and monitoring and providing feedback on sleep, early in treatment, affects adherence.

Keywords: adherence; insomnia; behavior therapy; self-efficacy; alcohol

Sleep disorders, such as chronic insomnia, are among medical conditions with the lowest treatment adherence rates (DiMatteo, 2004). Chronic insomnia is a costly public health problem afflicting 6–15% of the general population (Lichstein, Durrence, Riedel, Taylor, & Bush, 2004; Morin, LeBlanc, Daley, Gregoire, & Mérette, 2006; Ohayon, 2002). Stimulus control therapy (SCT) and sleep restriction therapy (SRT) are evidence-based, effective treatments for chronic insomnia (Edinger & Means, 2005; Morgenthaler et al., 2006). However, adherence rates to these interventions have been highly variable and often suboptimal (Matthews, Arnedt, McCarthy, Cuddihy, & Aloia, 2013). Adherence rates were likely variable across studies because study duration and treatment components varied, and

different metrics to measure adherence (e.g., often dichotomously vs. continuously) were used (Matthews et al., 2013). Currently there is no gold standard for measuring adherence to behavioral treatments for insomnia. Examples of how adherence has been measured have ranged from calculating the amount of deviance from a prescribed sleep schedule on a continuous scale (Riedel & Lichstein, 2001) to whether participants completed all treatment sessions (Vincent & Lionberg, 2001). Despite differing conceptualizations, the data available suggest that adherence, however it was defined, could be improved. In order to boost adherence, effective identification of patient and behavioral factors that alter adherence rates is crucial.

Adherence to SCT, SRT, and general sleep hygiene (SH) recommendations is significantly linked to improvements in sleep (Harvey, Inglis, & Espie, 2002; Riedel & Lichstein, 2001; Vincent & Hameed, 2003; Vincent, Lewycky, & Finnegan, 2008). However, identifying replicable predictors of adherence has been elusive. Factors identified that are associated with improved adherence were acceptance of the intervention (Vincent & Lionberg, 2001), greater self and task-related efficacy (Bouchard, Bastien, & Morin, 2003), higher intentions to change sleep behavior (Hebert, Vincent, Lewycky, & Walsh, 2010; Matthews et al., 2013), lower fatigue (Matthews, Schmiede, Cook, Berger, & Aloia, 2012), less pretreatment sleepiness (Vincent et al., 2008), and greater pretreatment sleep disturbance severity (Hebert et al., 2010; Matthews et al., 2012; Morgan, Thompson, Dixon, Tomeny, & Mathers, 2003). Reported barriers to adherence were heightened psychopathological status (Dashevsky & Kramer, 1997; Hebert et al., 2010; McChargue et al., 2012; Vincent & Hameed, 2003), sleep concerns (Dashevsky & Kramer, 1997), fatigue (Dashevsky & Kramer, 1997), poor physical health (Hohagen et al., 1993; Morgan et al., 2003), and reductions in sleep disturbances (McChargue et al., 2012).

One of the major problems with these studies is most if not all predictors were assessed at baseline or at the exit interview. Little information has been documented on the day-to-day factors that affect adherence during the initial treatment engagement. These factors may be more influential than those measured prior to treatment because they may affect subsequent adherence behavior or the decision to continue being engaged in treatment at all. Furthermore, in a changing health care field that increasingly emphasizes cost-effective, brief behavioral interventions, it is important to identify predictors for treatment-planning purposes, especially if provider-patient contact is infrequent or not feasible.

In the present study we sought to determine the predictors of variations in daily adherence during initial treatment engagement after one session of behavioral therapy for insomnia among young adults with probable insomnia. To do this we examined the daily relationships between several literature-based and exploratory factors and adherence to SCT, SRT, and SH over a 14-day period using self-reported, online daily diaries. The literature-based daily factors that were measured were fatigue, mood, perceived health status, and sleep quality, total sleep time, and sleep efficiency (Hebert et al., 2010; Matthews et al., 2012; McChargue et al., 2012; Morgan et al., 2003). Exploratory factors were defined as daily experiences known to affect sleep quality and were proposed in the literature as potentially interfering with adherence, yet have not been systematically investigated. The exploratory factors measured were pain (Smith, Perlis, Smith, Giles, & Carmody, 2000; Suh et al., 2011), stress, daily exercise (Baron, Reid, & Zee, 2012; Buman, Hekler, Bliwise, & King, 2011), and alcohol intake (Ebrahim, Shapiro, Williams, & Fenwick, 2013; Singleton & Wolfson, 2009). For replication purposes we also examined whether baseline sleepiness, self-efficacy, acceptance of treatment, intentions to adhere, depressive or anxiety symptoms, general health, insomnia symptom severity, and frequency of sleeping with a "bed partner or pet" were also associated with subsequent adherence rates. Bed partner or pet status was of particular interest because previous literature suggests involving a bed partner affects adherence to treatment for other sleep disorders (Baron et al., 2011; Cartwright, 2008).

Materials and Methods

DESIGN

The primary aim of the study was to identify day-to-day factors that were associated with adherence during behavioral insomnia treatment initiation. We employed a one-group design to determine daily factors experienced in the 2 weeks after one, in-person treatment session. Insomnia severity was assessed at baseline and after 2-week follow-up.

PARTICIPANTS

In an online survey study, 1,678 college students participating in an introductory psychology course research subject pool were screened for probable insomnia. Those meeting study inclusion criteria were invited to take part in one didactic session of behavioral treatment for insomnia ($n = 251$). Participating in the study partially satisfied a course requirement. Fifty-eight college students agreed to participate in the study of those eligible (i.e., 23.5% response rate). Five participants dropped out during

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