

## A Pilot Randomized Controlled Trial of the Effects of Cognitive-Behavioral Therapy for Insomnia on Sleep and Daytime Functioning in College Students

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The purpose of this study was to pilot test if cognitive behavioral therapy for insomnia (CBT-I) is an effective intervention for insomnia and daytime functioning in college students. College students' developmental stage and lifestyle are significantly different than the general adult population, yet there have been no studies of CBT-I in this age group.

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Thirty-four college students (ages 18–27;  $M = 19.71$ ,  $SD = 2.10$ ) were randomly assigned to and completed either six sessions of CBT-I or a 6-week wait list control (WLC). All participants completed 1-week sleep diaries and actigraphy, as well as sleep and daytime functioning questionnaires at baseline and posttreatment. The treatment group repeated all measures at 3-month follow-up.

Students who received CBT-I showed greater baseline to posttreatment improvements in sleep efficiency, sleep onset latency, number of awakenings, time awake after sleep onset, sleep quality, insomnia severity, dysfunctional beliefs about sleep, general fatigue, and global sleep quality than the WLC group. These improvements were durable at 3-month follow-up. Ninety-four percent of participants in the CBT-I condition completed at least 4 sessions of

treatment. Significantly more participants in the CBT-I group than the WLC group responded (68.8% vs 7.7%, respectively) and remitted (68.8% vs 15.4%, respectively). CBT-I is an effective treatment for insomnia in college students. This study found that treatment responses were similar to results from studies in the general population. The treatment appeared to be well tolerated based on very low attrition rates.

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INSOMNIA IS A UNIVERSAL PHENOMENON that has been experienced by most people (Edinger & Means, 2005). For an estimated 16% of the population, insomnia persists chronically (e.g., Lichstein, Durrence, Riedel, Taylor, & Bush, 2004), and has been associated with a myriad of daytime functioning problems, including anxiety, depression, medical problems, difficulties completing tasks, cognitive impairment, accidents, work absenteeism, and poor quality of life (Kuppermann et al., 1995; Roth & Roehrs, 1988; Taylor, Lichstein, Durrence, Riedel, & Bush, 2005; Taylor et al., 2007; Walsh, 2004). People with insomnia are also at a higher risk for developing depression, anxiety, substance abuse or dependence, suicide, impaired immune functioning, and cardiovascular disease (Taylor, Lichstein, & Durrence, 2003). Although complaints of insomnia are most frequently reported by older age groups (Lichstein et al., 2004; Ohayon, 2002), studies suggest 4% to 14% of young adults (ages 19–24) experience insomnia (Buboltz, Brown, & Soper, 2001; Ohayon & Roberts, 2001; Ohayon, Roberts, Zully, Smirne, & Priest, 2000; Taylor et al., 2011), with the most rigorous definition indicating a prevalence of 9.5% (Taylor, Bramoweth, Grieser, Tatum, & Roane, 2013).

College students with chronic insomnia report significantly worse sleep, fatigue, depression, anxiety, stress, and quality of life, as well as greater hypnotic or stimulant use for sleep problems, and increased health-care utilization, than normal sleepers (Bramoweth & Taylor, 2012; Taylor et al., 2013). Not surprisingly, over 60% of college students use stimulants to help them with daytime alertness, which may be causing some of the aforementioned sleep problems. Additionally, almost 7% report using sleep medication and over 11% report using alcohol as a sleep aid (Taylor & Bramoweth, 2010). This is a disturbing trend of substance use for a disorder that could affect these young adults for the rest of their lives without adequate treatment.

Cognitive-behavioral therapy for insomnia (CBT-I) is an effective multicomponent nonpharmacological

treatment that has been thoroughly studied in middle-aged and older adult populations (Morin et al., 2006; Morin, Culbert, & Schwartz, 1994; Murtagh & Greenwood, 1995; Nau, McCrae, Cook, & Lichstein, 2005). More research is needed to determine if typical CBT-I procedures are effective with college students, because these young adults differ from the general adult population in terms of their developmental stage, sleep schedules, and living environments, and may require adjustments to the typical CBT-I protocol (Breslau, Roth, Rosenthal, & Andreski, 1997; Crowley, Acebo, & Carskadon, 2007; Johns, 1992; Levine, Roehrs, Zorick, & Roth, 1988; Machado, Varella, & Andrade, 1998).

In addition, most previous studies of CBT-I have primarily focused on sleep-related outcomes. Very few of them examined the daytime effects of improving insomnia in this population, and none have done so comprehensively. Recently a panel of 25 experts in the field of sleep research developed recommendations for comprehensive standard assessments to be used in insomnia research studies in order for investigators to have “common metrics for describing insomnia participants and research outcomes” (Buysse, Ancoli-Israel, Edinger, Lichstein, & Morin, 2006). To date, no single study has reported CBT-I outcomes on all of the “essential” measures recommended by this group. The objective of the present study was to test the efficacy of CBT-I in college students to improve sleep and daytime functioning outcomes, following recommended assessment guidelines (Buysse et al., 2006).

## Methods

### PARTICIPANTS

A total of 171 individuals responded to study recruitment advertisements. The final sample contained 34 students aged 18 to 27 ( $M = 19.71$ ;  $SD = 2.10$ ), with 58.8% females, randomized into either the treatment ( $n = 17$ ) or waitlist control ( $n = 17$ ) group. The sample was 59% Caucasian, 21% Hispanic, 12% African American, 6% Asian/Pacific Islander, and 3% multiracial, which closely approximated the makeup of the student body. Participants received \$20.00 for completing the pretreatment phase, \$20.00 for completing the treatment phase and posttreatment questionnaires, and \$10.00 for completing follow-up questionnaires 3 months after treatment ended. Figure 1 summarizes participant flow through follow-up.

### PROCEDURES

Participants were recruited from the general student population of the University of North Texas and all procedures and treatment occurred in the Insomnia Research Clinic on campus. Students were included

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