Applying Sleep Research to University Students: Recommendations for Developing a Student Sleep Education Program

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Several studies indicate that university students report at least twice as many sleep difficulties than the general population; especially those related to variable sleep schedules (Brown, Buboltz, & Soper, 2001; Lack, 1986). Further, students' sleep problems may be getting worse. One study found that students average sleep length declined from 7.5 hours in 1969 to 6.5 hours in 1989 (Hicks & Pellegrini, 1991). This reduction in sleep length is especially alarming since the last several hours of sleep contain the Rapid Eye Movement Sleep, a time when many people dream, appears to play a key role in learning efficiency (Smith & Lapp, 1991).

Such trends in student sleep patterns are especially concerning since sleep difficulties in college students can result in increased irritability and lowered interpersonal sensitivity, (Jean-Louis, Von Gizycki, Zizi, & Nunes, 1998; Pilcher & Ott, 1998; Zammit, 1988), impaired cognitive functioning (De Koninck, Lorrain, Christ, Proulx, & Coulombe, 1989; Lack, 1986; Pilcher & Walters, 1997) and more anxious and depressive symptoms (Pilcher, Ginter, & Sadowsky, 1997). Many students are unaware that their academic difficulties may be related to their sleep habits. In fact, many rate their cognitive abilities higher when they are sleep deprived, while objective evidence indicates they perform worse than those who obtain eight hours of sleep (Pilcher & Walters, 1997).

Sleep difficulties go beyond simply getting insufficient sleep to include not getting the right kind of sleep. For example, students who do not get adequate amounts of REM sleep perform significantly worse recalling newly learning information than students who had normal sleep or missed non-REM sleep stages (Karni, Tanne, Rubenstein, Askenasy, & Sagi, 1994). This finding is especially relevant since alcohol consumption, which is used by some to induce sleep, actually results in suppression of REM sleep (Lobe & Tufik, 1997; Yules, Lippman, & Freedman, 1967). In addition, the last couple hours of sleep contain the most REM sleep time (De Koninck et al., 1989). Thus, students who habitually sleep six hours a night are missing the type of sleep most vital for facilitating the recollection of newly learned material (Smith & Lapp, 1991).

Clearly, the aforementioned academic and emotional difficulties go beyond resulting in lower grades. Such difficulties can significantly impact students' decisions to remain in college (Bray, Braxton, & Sullivan, 1999; Edwards & Trimble, 1992; Holmbeck & Wandrei, 1993; Strahan, 1999). Thus, reducing students' sleep difficulties cannot only serve to improve their health and grades, but increase universities' retention rates.

Students who take classes later in the day

tend to report fewer sleep difficulties and more consistent week and weekend sleep-wake times (Machado, Varella, & Andrade, 1998). However, changing university schedules to reduce sleep problems may pose many practical difficulties. Fortunately, improving most students' sleep habits may be much easier and less expensive than reorganizing university schedules. Research in clinical populations indicates that psychoeducational programs are among the most effective means to reduce sleep difficulties (Morin, Culbert, & Schwartz, 1994; Murtagh & Greenwood, 1995) and are clearly more effective than sleep medications (Bootzin & Perlis, 1992; Morin et al., 1994; Morin & Wooten, 1996). Psychoeducational interventions receive further support by research indicating that students with misperceptions about sleep promoting behaviors have less healthy sleep habits (Hicks, Lucero-Gorman, & Bautista, 1999).

Despite the potential ease of implementing a sleep educational program for students, articles that suggest practical means of doing this are not available in the literature. This article seeks to remedy this shortcoming by introducing key elements of a student sleep education program that can be easily incorporated into many universities first-year orientation classes or as part of residential housing programs.

Ingredients for a Student Sleep Education Program

Chronic insomniacs who have experienced years of sleep difficulties are highly motivated to seek treatment because they feel miserable and realize that their sleep problems are interfering with their daily functioning. College students with sleep difficulties, on the other hand, tend to be less aware that their academic, social, and emotional problems may be related to their poor sleep habits. Students with poor sleep habits may even be unaware they have sleep difficulties (Hicks et al., 1999). Students' common tendency to go to sleep and wake several hours later and sleep several hours longer on the weekend than during the week, suggests they mistakenly believe they can make up for lost sleep on the weekend. Thus, the first step is providing students with a brief literature summary of the impact that sleep difficulties can have on their lives (e.g., lower grades, concentration difficulties, and irritable mood), similar to the introduction of this article.

Sleep Hygiene Instructions

As previously mentioned, some of the most effective interventions for improving sleep quality are psychoeducational in nature. The following recommendations are based upon sleep hygiene and stimulus control instructions that sleep clinics often provide to patients (Bootzin & Nicassio, 1991). These instructions while relatively simple, are consistently some of the most effective interventions for improving sleep quality (Bonnet, 2000; McCurry, Logsdon, & Teri, 1996; Morin et al., 1994; Murtagh & Greenwood, 1995).

One of the most important sleep hygiene instructions are to stop using caffeine within four to five hours of their planned bedtime. As little as one cup of coffee can increase sleep onset time, reduce the total amount of sleep, increase awakenings during sleep, and generally can produce lighter sleep through an increase in stage one and decreases in stages two and four sleep (Bonnet & Arand, 1992; Roehrs & Roth, 1997).

Alcohol is another substance that interferes with students' sleep quality. Many people mistakenly believe alcohol helps sleep

when it actually reduces sleep quality (Johnson, 1997). Thus, students should be encouraged to reduce their alcohol intake, especially when it is close to their bedtime. In occasional alcohol users, it can increase sleep onset and suppress REM sleep(Lobe & Tufik, 1997; Yules et al., 1967). When the alcohol begins to wear off it has a rebound effect of increased nocturnal awakening (Roehrs & Roth, 1997). In alcoholics, sleep disruptions worsen over time. Even after cessation of alcohol use, sleep quality may continue to remain poor for weeks or even months (LeBon et al., 1997; Roehrs & Roth, 1997).

Another common sleep hygiene instruction is to avoid naps. In three separate studies with young adults, researchers found that a two-hour nap in the late afternoon or early evening can reduce sleep quality (Feinberg et al., 1985; Karacan, Williams, Finley, & Hursch, 1970; Werth, Dijk, Acherman, & Borberly, 1996). However, an early afternoon nap may help a tired student become more alert for afternoon and evening study sessions (Bonnet & Arand, 1994). Thus, while it is usually okay for students to take a brief nap after lunch, they should be discouraged from naps that last more than an hour and are later than two or three o'clock in the afternoon.

Many students mistakenly believe that sleeping late on the weekends makes up for lost sleep. However, they must be assured such is not the case. Such habits simply will result in grogginess, depressed mood, attention and concentration difficulties, poor test performance, and long-term sleep difficulties (Lack, 1986; Machado et al., 1998; Taub, 1978; Zammit, 1997). Similarly, people need to know that the idea that eight hours of sleep is the most important thing and that sleep debt can be repaid are myths that are not supported by empirical evidence.

Since many students will continue to have variable sleep schedules, it is important to include practical recommendations that will reduce the ill-effects of such sleep habits. Along these lines, it is important that students try and keep schedule variations to less than two hours (Lack, 1986; Machado et al., 1998; Taub, 1978; Zammit, 1997). Students who keep a daily sleep wake schedule of 11:30 – 7:30 during the week should go to bed by 1:00 and wake by 9:00 on the weekend. If students like to stay up until 3:00 one night, it should be Friday night. They should then move closer to their regular schedule on Saturday and Sunday to get ready for Monday morning. Finally, students should awake within 90 minutes of their normal wake time even if they occasionally only receive 4 hours of sleep. Research indicates that large variations in sleep schedules produce almost the same difficulties as receiving less than a normal amount of sleep (Taub, 1978; Taub & Berger, 1974). Since these suggestions will be difficult to implement, the following sections on exercise and bright light therapy may be especially helpful to countering the ill effects of a poor sleep schedule.

Regular exercise is a daytime activity clearly associated with good sleep quality. People who regularly exercise report less sleep difficulties and have shorter sleep onset than those who do not (Duncan, Bomar, Nicholson, & Wilson, 1995; Youngstedt, O'Connor, & Dishman, 1997). Even people who find it impossible to completely stabilize their schedule, such as airline pilots, can reduce the ill effects of jet lag and variable sleep schedules through regular exercise (Shiota, Sudou, & Ohshima, 1996).

Bright light exposure is another good treatment for university students with irregular sleep patterns (Ando, Kripke, Cole,

& Elliott, 1999; Leproult, Van Reeth, Byrne, Sturis, & Van Cauter, 1997). A morning walk outside is a good way to integrate both exercise and bright light. Artificial bright light can also be helpful in promoting regular sleep schedules. To demonstrate the ease and affordability of bright light therapy for university students, in most hardware stores it costs less than thirty dollars to buy a 500-Watt Halogen "shop light" and an appliance timer. Using an appliance timer allows the individual to set the amount of time he or she would like to be exposed to bright light prior to the alarm sounding. This imitates bright light shinning through a window and may help ease the transition from sleep to awakening. Students should use a lamp that gives off more than 250 lumens and try to be exposed to it for at least 30 minutes upon awakening (Trinder, Armstrong, O'Brien, Luke, & Martin, 1996).

Stimulus Control Instructions

Stimulus Control instructions are procedures that promote associating the bedroom with sleep. Specifically, students are instructed to only use the bed for sleep and sex; lie down only when sleepy, if unable to sleep after 10 minutes go in another room and do something else until sleepiness increases, get up at the same time regardless of the amount of sleep acquired. and do not nap during the day (Bootzin & Epstein, 2000). These instructions are based on the observation that people with insomnia begin to associate the bedroom with anxiety associated with trying to fall asleep. Non-sleeping activities in the bedroom also may interfere with sleep. People begin to associate the bedroom with reading, studying, bills, sewing or other activities rather than the process of falling asleep (Bootzin & Nicassio, 1991). Reviews and meta-analysis of treatment methods indicate that stimulus control is one of the most effective and in some cases the most effective, single treatment for insomnia (Morin et al., 1994; Morin & Wooten, 1996; Murtagh & Greenwood, 1995).

Implications for Practice

The apparent trend for college students to sacrifice their sleep for social and academic demands needs to end. Previous efficacy studies (Bonnet, 2000; McCurry et al., 1996; Morin et al., 1994; Murtagh & Greenwood, 1995) demonstrate this may not be as difficult as it seems. The recommendations included in this article can be developed into a brief presentation that can be easily incorporated into many universities and colleges' previously existing orientation programs. In addition to presenting this information orally, it may also be useful to list the recommendations on a handout so students can refer to these instructions when they feel especially motivate, like after a night of poor sleep. In addition, presenters may want to create a handout with a list of substances with caffeine, since many are unaware substances like chocolate and some cold medications contain caffeine. While some students will continue to demonstrate poor sleep habits, presenting a sleep education program can ensure that such habits are a choice rather than the result of misperceptions regarding sleep.

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