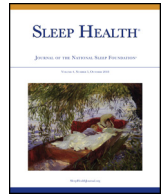




Contents lists available at ScienceDirect

# Sleep Health

Journal of the National Sleep Foundation

journal homepage: [sleephealthjournal.org](http://sleephealthjournal.org)

## Calculating the contribution of sleep problems to undergraduates' academic success

Monica E. Hartmann, PhD<sup>a</sup>, J. Roxanne Prichard, PhD<sup>b,\*</sup>

<sup>a</sup> Department of Economics, University of St. Thomas, St. Paul, MN

<sup>b</sup> Department of Psychology, University of St. Thomas, St. Paul, MN

### ARTICLE INFO

#### Article history:

Received 28 January 2018

Received in revised form 30 May 2018

Accepted 10 July 2018

#### Keywords:

Sleep

Higher education

Academic success

Regression analysis

GPA

### ABSTRACT

**Objectives:** The objective of this study is to determine to what degree sleep disturbances predict academic success, relative to other known risk factors for decreased academic performance.

**Methods:** We performed regression analyses on data from the Spring 2009 American College Health Association National College Health Assessment II dataset (n=55,322 students) to isolate the relative contribution of the frequency of sleep problems in the previous week to GPA and the likelihood of withdrawing from a course. In our estimations, we also controlled for other factors that influence academic success such as demographic and academic variables, drug and alcohol use, perceived stress, and employment hours.

**Results:** Sleep disturbances were found to be a significant independent predictor of academic problems; on average, each additional day per week that a student experienced sleep problems raised the probability of dropping a course by 10% and lowered the cumulative GPA by 0.02. Factors such as stress, binge drinking, marijuana and other illicit drug use, which typically receive more attention by university administrators, had similar or relatively smaller negative associations with academic success as compared to disturbed sleep. Approximately three quarters of students surveyed reported never receiving information about sleep from their university.

**Conclusions:** Sleep education represents an underutilized opportunity for universities to maximize retention rates and academic success.

© 2018 National Sleep Foundation. Published by Elsevier Inc. All rights reserved.

### Introduction

Universities use predictors of college achievement to select students and allocate student support services to raise retention rates. Historically, attempts to predict academic success at the university level have focused on measures such as high school GPA and performance on standardized college admissions tests, which collectively account for only one fourth of the variance in college GPA.<sup>1–3</sup> As colleges and universities in the United States cope with record high levels of psychological distress among students,<sup>4,5</sup> the higher education community is recognizing that non-academic factors like mental health and wellbeing are intricately related to academic success.<sup>6–9</sup> In fact, a prospective study of 204 first-year students found that 56% of the variance in GPA could be predicted by a survey comprised

primarily of measures of behavioral health.<sup>10</sup> Accordingly, colleges and universities are searching for ways to improve students' wellbeing and academic success by promoting behavioral health. Although seminal studies of academic success and retention have not included sleep measures as predictor variables,<sup>11–15</sup> sleep represents a modifiable risk factor with great potential to impact success. If sleep is found to impact academic success, universities can integrate this information into budgetary decisions regarding allocation of student services.

The consensus of the scientific community is that the vast majority of adults require seven to nine hours of restorative sleep a night for optimal physical and mental health and cognitive performance.<sup>16</sup> Yet, a minority of college students regularly achieve this target.<sup>17</sup> More than two-thirds of students experience significant problems with excessive daytime sleepiness, more than a third of students fall asleep in class at least once a week,<sup>17</sup> and more than a quarter describe their sleep problems as traumatic or difficult to handle.<sup>18</sup> In college students, insufficient and poor sleep quality exacerbate physical and mental health concerns. Specifically, inadequate sleep has

\* Corresponding author at: University of St. Thomas, 2115 Summit Avenue, JRC LL56, Saint Paul, MN 55105. Tel.: +1 651 962 5043; fax: +1 651 962 55051.  
E-mail address: [jprichard@stthomas.edu](mailto:jprichard@stthomas.edu) (J.R. Prichard).

been shown to decrease their immune function, increase the expression of underlying psychological disorders (particularly anxiety and mood disorders), increase motor vehicle accident risk, and increase other risk-taking behaviors like unsafe sex and substance abuse.<sup>19–21</sup>

Multiple single-institution studies have shown that insufficient, inconsistent, and poor quality sleep are also significant and independent predictors of university students' academic performance. Taylor et al. (2013) used a prospective sleep diary approach in a large population ( $n = 867$ ) to compare unique contributions of sleep problems to GPA in context with other important academic variables including high school GPA, standardized test scores, and health variables (e.g., alcohol abuse; perceived stress; depression, and marijuana).<sup>22</sup> After high school GPA and standardized test scores, they found that the most significant predictors of academic success were total sleep time and sleep time inconsistency, with students sleeping less than six or more than nine hours a night achieving the lowest grades. Gomes, Tavares, & de Azevedo (2011) performed a multi-measure, multi-predictor study of college success from Portugal, which included measures of previous academic success, class attendance, study time, drug and alcohol habits, and lifestyle questions ( $n = 1654$ ).<sup>23</sup> Their results indicated that achieving sufficient sleep was the third most important variable in predicting end of semester grades, after previous academic achievement and class attendance. Academic success has also been found to positively correlate with consistent sleep/wakefulness schedules. In a survey of community college students ( $n = 157$ ), Eliasson et al. (2009) found that students in the highest GPA quintile had significantly earlier bedtimes and rise times than those in the lowest quintile, although total sleep time was not different between groups.<sup>24</sup> Peters, Joireman, and Ridgway (2005) demonstrated that students with higher GPAs were less likely to oversleep ( $n = 231$ ).<sup>25</sup> A prospective sleep diary and actigraphy-based study of 61 college students found that academic performance was positively correlated with sleep schedule regularity.<sup>26</sup> Achieving restorative sleep also predicts academic success; a large study of undergraduate students ( $n = 1845$ ) found that those who screened positive for possible sleep disorders were significantly more likely to be at risk for academic failure ( $GPA < 2.0$ ).<sup>27</sup>

In our study, we use data from the American College Health Association's National College Health Assessment (ACHA-NCHA) II survey<sup>28</sup> to compare the relationship sleep problems and GPA and course completion with other demographic, academic, health, and social variables. To our knowledge, this study is the first to use a multi-institution national dataset to examine whether sleep problems are a significant predictor of academic success. Because of the detail in the survey instrument, we are able to control for a multitude of health-related and demographic variables such as sexual orientation, learning disability, volunteer and work hours, serious illness, and depression/anxiety diagnosis and treatment – all factors that can influence the quantity and quality of sleep students obtain. Our objectives were to determine whether sleep disturbances independently predict academic performance and, if so, how the strength of this relationship compares to the predictive capacity other health factors.

Students already recognize the adverse effect of sleep on their academic performance. Summary statistics from the Spring 2017 ACHA-NCHA IIc survey showed that the top four self-rated impediments to undergraduate academic success are stress (34%), anxiety (26%), sleep difficulties (22%), and colds and flu (17%).<sup>18</sup> Despite the frequency of self-reported academic problems associated with sleep, the majority (73%) of students surveyed in the spring 2017 ACHA-NCHA reported never having received information about healthy sleep from their universities.<sup>18</sup> In fact, released summary statistics from the 2017 ACHA-NCHA IIc report show that sleep ranked second to last in health related topics undergraduate students report

**Table 1**

Percent of undergraduates who report receiving and being interested in receiving health information from their university

Health Topic	Received	Interested
Sexual assault prevention	84%	59%
Alcohol & other drug use	83%	36%
Stress reduction	69%	74%
Depression & anxiety	66%	64%
STD* prevention	63%	55%
Physical activity	61%	62%
Nutrition	57%	67%
Cold, flu, sore throat	55%	46%
How to help others in distress	54%	69%
Suicide prevention	53%	58%
Violence prevention	50%	53%
Pregnancy prevention	49%	45%
Relationship difficulties	45%	51%
Tobacco use	42%	33%
Grief & loss	39%	53%
Eating disorders	36%	45%
Injury prevention	36%	49%
<b>Sleep difficulties</b>	<b>27%</b>	<b>66%</b>
Problem use of internet/games	18%	29%

Data Source: Spring 2017 ACHA-NCHA IIc Undergraduate Student Reference<sup>18</sup> group questions 2A ("Have you received information on the following topics from your college or university?") and 3A ("Are you interested in receiving information on the following topics from your college or university?"); responses ranged from 47,151 to 47,723.

\* STD = sexually transmitted disease or infection.

receiving information about from their universities, despite being one of the topics students were most interested in learning about (Table 1).<sup>18</sup> Given the strong student interest in receiving information on sleep health, as well as the demonstrated and perceived impact of sleep on student success, instituting a sleep education program may potentially represent an underutilized opportunity for universities to maximize retention rates and academic success.

## Method

### Survey Instrument

We received permission from the American College Health Association to analyze data from the Spring 2009 administration of the ACHA-NCHA II, a nationally-recognized research survey that collects detailed information about thousands of graduate and undergraduate students' mental and physical health habits, illnesses, behaviors and perceptions. Over 87,000 students from 110 2-year and 4-year institutions of higher learning across the United States and abroad completed the assessment that semester. Campuses included private (37%) and public (63%) institutions in rural, town, and metropolitan locations; 19 campuses had religious affiliations and five were post-secondary minority institutions. Institutions distributed the survey by random assignment any time during the semester, however most were distributed between January and March. Surveys that were collected in the month after spring break were not included in the dataset. The overall response rate was 30%. Further details about the survey methodology, including information about validity, reliability, and generalizability, can be found on the ACHA-NCHA website.<sup>18</sup>

### Sample Construction

We only included undergraduate students in our sample who were under the age of 25 and attended a 4-year institution of higher learning in the United States. These restrictions were made for two reasons. First, the measure of academic success is not constant across levels of higher education. For instance, earning a B in graduate school is not equivalent to earning a B as an undergraduate. Second,

Download English Version:

<https://daneshyari.com/en/article/10153360>

Download Persian Version:

<https://daneshyari.com/article/10153360>

[Daneshyari.com](https://daneshyari.com)