

Spring 2015

The Influence of Light Activity on Academic Performance and Sleep Quality

Stewart A. Bryant
Clemson University

Jesse H. Walker
Clemson University

Rosaria C. Bryan
Clemson University

Cameron N. Drummond
Clemson University

Vanessa K. Macpherson
Clemson University

See next page for additional authors

Follow this and additional works at: <https://tigerprints.clemson.edu/foci>

Recommended Citation

Bryant, Stewart A.; Walker, Jesse H.; Bryan, Rosaria C.; Drummond, Cameron N.; Macpherson, Vanessa K.; Morris, Drew M.; Merritt, Paul S.; and Pilcher, June J., "The Influence of Light Activity on Academic Performance and Sleep Quality" (2015). *Focus on Creative Inquiry*. 110.

<https://tigerprints.clemson.edu/foci/110>

This Poster is brought to you for free and open access by the Research and Innovation Month at TigerPrints. It has been accepted for inclusion in Focus on Creative Inquiry by an authorized administrator of TigerPrints. For more information, please contact kokeefe@clemson.edu.

Authors

Stewart A. Bryant, Jesse H. Walker, Rosaria C. Bryan, Cameron N. Drummond, Vanessa K. Macpherson, Drew M. Morris, Paul S. Merritt, and June J. Pilcher



The Influence of Light Activity on Academic Performance and Sleep Quality

Stewart A. Bryant, Jesse H. Walker, Rosaria C. Bryan, Cameron N. Drummond, Vanessa K. Macpherson, Drew M. Morris, Paul S. Merritt Ph. D., and June J. Pilcher Ph. D.
Department of Psychology, Clemson University



Abstract

The goal of this study was to examine the effects of low level activity during study sessions on academic performance in college students. Students in an introductory psychology course completed 2 hours of prescribed studying each week after their first exam. Individuals were placed in the Sedentary Desk or FitDesk group. The FitDesk is a stationary bike with a desk top attachment. Sleep quality was subjectively measured weekly across the semester and compared with class grades using a regression. Sleep quality predicted class grades. Further analysis found that FitDesk users with high sleep quality outperformed Sedentary Desk students with low sleep quality on their exams. Finally, an interaction between sleep quality and group suggested FitDesk use mitigated gradual decrease in sleep quality.

Introduction

- Studies show that impaired sleep can lead to serious physical, psychological, and social dysfunction in college students and lower academic achievement [1,3].
- It has been shown that significant positive associations exist between self-reported exercise habits and better self-reported sleep [4].
- Acute exercise has been shown to increase the speed of information processing, improve executive function, enhanced cognitive flexibility, as well as working memory [2].

The purpose of the study was to determine the effects of LIGHT ACTIVITY on GRADES, ATTENTION, and other STUDY HABITS.

Methods

Participants

- 117 Clemson students were recruited from an undergraduate introductory psychology course
- 73 female students and 44 male students ages 18 to 23.

Methods

- Students were asked to complete at least 2 hours of studying for PSYC 2010 001 each week for 12 weeks in Cooper Library Room 108
- Participants were grouped into a Sedentary Desk group (58, 62.9% female) or a FitDesk group (59, 62.5% female) for studying
- The students completed surveys on sleep quality each week in addition to studying
- Participants finished the study the week before final exams

Figure 1: Sleep Quality Versus Class Grades

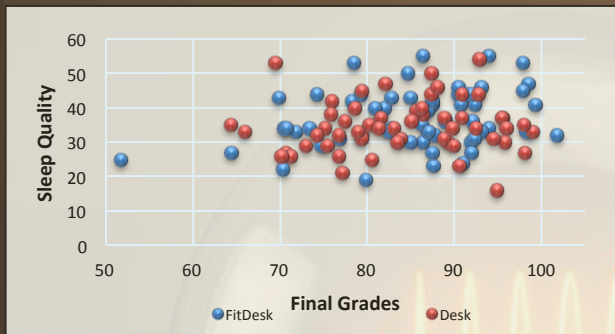


Figure 2: Subjective Sleep Quality Over 11 Weeks

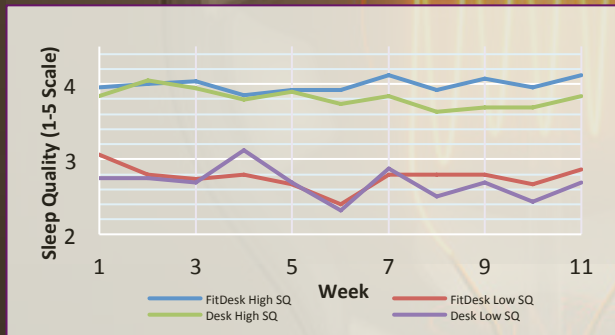
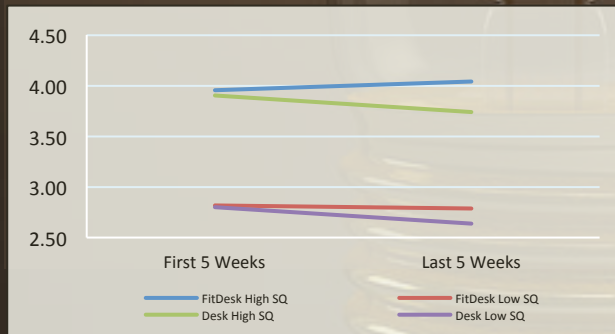


Figure 3: Subjective Sleep Quality Averaged Across First and Last 5 Weeks



Results

- Sleep Quality correlated positively with Final Course Grades ($R = 0.207, p = 0.027$). (See Figure 1)
- Trends suggest FitDesk users maintained Sleep Quality better compared to sedentary desk users. (See Figure 2 and 3)
- High Sleep Quality FitDesk and Low Quality Sedentary Desk users' Final Course Grades differed significantly ($t(60.478) = 2.146, p = 0.036$)
- A Repeated Measures ANOVA found an interaction between Sleep Quality and Group (Wilk's Lambda multivariate test for interaction: $F(1, 74) = 4.857, p = 0.031$) (See Figure 3)

Conclusions

- Overall, the findings suggest that increased light activity have positive effects on sleep quality and academic performance
- Participants assigned to the FitDesk with high sleep quality yielded better test scores on their exams than those assigned to the Sedentary Desk with low sleep quality
- An interaction between sleep quality and group revealed that FitDesk users maintained sleep quality over a semester while Sedentary Desk users reported decreased sleep quality

Ultimately, findings indicate that light activity while studying is beneficial to sleep quality and may influence course grades. College students could benefit from utilizing the effects of light activity to better maintain sleep quality.

References

1. Jean-Louis, G. (1998). Mood states and sleepiness in college students: Influences of age, sex, habitual sleep, and... *Perceptual & Motor Skills*, 87(2), 507
2. Schmidt-Kassow, M., Deusser, M., Thiel, C., Otterbein, S., Montag, C., Reuter, M., ... Chao, L. (2013). Physical Exercise during Encoding Improves Vocabulary Learning in Young Female Adults: A Neuroendocrinological Study. *PLoS ONE*, 8(5), E64172-E64172.
3. Tavernier, R. & Willoughby, T. (2013). Bidirectional Associations Between Sleep (Quality and Duration) and Psychosocial... *American Psychological Association: Developmental Psychology* 2014, Vol. 50, No. 3, 674 – 682
4. Youngstedt, S. D. and Kline, C. E. (2006). Epidemiology of exercise and sleep. *Sleep and Biological Rhythms*, 4: 215–221. doi: 10.1111/j.1479-8425.2006.00235.x

Research funded in part by the Creative Inquiry Program at Clemson University. Presented at FoCI Symposium Clemson, SC; April 2015. For more information contact Dr. Pilcher at jpilche@clemson.edu or Stewart Bryant at sabryan@clemson.edu