Relationship Between Mindfulness and Sleep Quality on College Students' Concentration on an Attention Task

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Abstract

Poor sleep quality is found to cause sleep deprivation, which lowers cognitive functions. Prior research found that mindfulness scores and sleep quality were correlated with scores on concentration. Results suggest that there was no correlation between mindfulness, sleep quality, and concentration. However, results also indicated that sleep may be a bigger predictor of concentration than overall mindfulness scores.

Introduction

Around 39% of adults in America experience poor quality of sleep each night, which leads to sleep deprivation. Within this group are college students who are trying to keep up with their course work. A few indicators of good sleep quality are at least 85% of one's time in bed is spent sleeping, falling asleep within 30 minutes or less of being in bed, and not waking up more than once during the night (Sleep Foundation, 2017). When an individual does not meet these key indicators, they have a poor sleep quality, which in turn, ends up causing sleep deprivation. Sleep deprivation has been shown to lower cognitive functions. For example, it worsens concentration on mental and physical tasks (Taylor, 2015). However, there is a way for individuals with poor sleep quality to improve their sleep quality. Studies have shown that after mindfulness intervention, the participants' sleep quality improved and the duration of their sleep increased as well (Hulsheger, Feinholdt, & Nubold, 2015) This could also help improve one's concentration on an attention task.

Mindfulness is defined as being aware of stimuli in the present moment (Brown & Ryan, 2003). It helps decrease our reactivity to negative stimuli or thoughts. Most of the time when a person is unable to sleep it is because they are either stressed or worried. College students stress and worry over their course work and exams, which causes them to stay up later during the night to finish assignments or because they are too stressed to relax and fall asleep. Mindfulness practice helps individuals to let go, or relax, and allow for sleep to occur.

Concentration, which is synonymous with focus, is defined as investing one's attention and mental effort on one or more stimuli or tasks (Reed, 2013; Chaplin, 2010). Mindfulness practice includes different techniques that help people concentrate and focus more, one such technique is meditation. Meditation helps focus the mind on one's breathing and helps teach the meditator how to refocus his or her attention when a thought comes to distract them.

Many college students have poor sleep quality, which results in decreased concentration. Mindfulness can help improve one's sleep quality as well as help them to be able to become more aware of present stimuli. Both aspects of mindfulness can lead to increased concentration, whether it is the mindfulness affecting the sleep quality which than affects concentration or both sleep quality and mindfulness help to improve concentration at the same time.

The purpose of this study is to see if there is a link between mindfulness, sleep quality, and concentration on an attention task among college students. This purpose is critical in studying to help college students to become more aware of the negative effects of poor sleep quality on their physical health as well as on their grades and performance in class. The awareness of how mindfulness can help the sleep quality as well as help college students to concentrate is something that needs to be more well-known.

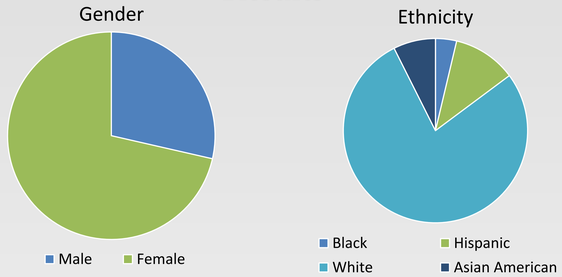
Demographics

	N	Mean	Std. Dev.	Min.	Max.
Age (years)	28	20.96	7.83	18	55
MAAS	28	4.11	0.74	2.40	5.40
PSQI	28	7.39	2.86	2	14
Stroop Correct Responses	28	37.75	2.44	29.00	40.00
Stroop Reaction Time	28	1072.66	185.42	725.33	1454.25

Method

- **Participants**
  - Participants were recruited from a small college using *Sona Systems Ltd.* participant pool software. Participants primarily included those enrolled in Introduction to Psychology and Research Methods, although students from other classes were encouraged to participate. Participation was limited to those aged 18 and older. Participation was kept confidential and individual responses were anonymously collected.
- **Measures**
  - ***Mindful Attention Awareness Scale:*** The Mindful Attention Awareness Scale (Brown & Ryan, 2003) was created to measure the dispositional mindfulness of participants. It uses a Likert-type scale to determine the mindfulness score.
  - ***Pittsburgh Sleep Quality Index Scale:*** The Pittsburgh Sleep Quality Index (Buysse et al., 1980) was created to score self-reported sleep quality of patients. Scores of 5 and higher are indicative of poor sleep quality.
- **Materials**
  - ***Stroop Task:*** The Stroop task was administered on the computer through the website called *PsyToolKit*. The Stroop task is an attention task that requires participants to determine the font color of the word and not the actual word. For example, if the participant is shown BLUE, the correct answer is red, not blue.
- **Procedure:**
  - After giving consent to participate, all participants completed a demographics form stating their age, gender, ethnicity, if they meditated before and how many times, if they have been diagnosed with a psychiatric disorder, and ethnicity. The Mindful Attention Awareness Scale, Pittsburgh Sleep Quality Index and the Stroop Task were then distributed in a counter-balanced fashion.

Results

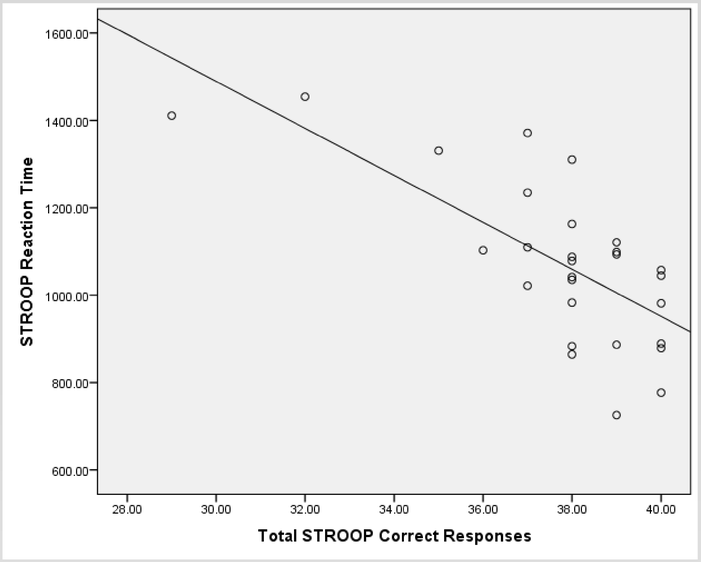


Female participants made up the majority of participants (71%) and the majority of participants also reported being White (75%).

Pearson's r Correlation Table

	MAAS	Stroop Correct Responses	Stroop Reaction Time	PSQI
MAAS		.051	-.078	-.084
Stroop Correct Responses	.051		-.709**	.163
Stroop Reaction Time	-.078	-.709**		-.155
PSQI	-.084	.163	-.155	

A Pearson's *r* correlation test revealed no significant relationships between the variables of sleep quality, mindfulness and STROOP reaction time or correct responses ($p > .05$) except not surprisingly between STROOP reaction time and number of correct STROOP responses, r (26) = -.709, p = .000.



A Pearson's *r* correlation test revealed a significant negative relationship between STROOP reaction time and number of correct STROOP Reponses, r (26) = -.709, p = .000. This indicates that participants got more correct responses if they took longer to respond.

A multiple regression was also performed to determine which variable best predicted STROOP performance. The overall multiple regression was significant F (3, 24) = 8.163, p = .001 with an R^2 .505. However, reaction time was the only significant predictor of correct responses on the STROOP task.

Conclusions

- There was no significant relationship found between sleep quality, mindfulness, and concentration.
- The best predictor of concentration was reaction time. Reacting slower led to a greater number of correct responses.
- Although not significant ,mindfulness scores were tending to show a negative relationship with reaction time and sleep quality and a positive relationship with correct responses.
- Although not significant there was a trend that better sleep quality led to a positive relationship with number of correct responses and a negative relationship with reaction time. Those that had better quality of sleep tended to react quicker and had a greater number of correct responses.
- A small number of participants may have contributed to the lack of significant findings.

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