The Effects of Stress on Sleep Reactivity
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Introduction
• Stress has been shown to negative effects on sleep quality. “Stress arises when individuals perceive that they cannot adequately cope with the demands being made on them or with threats to their well-being” (Lazarus, R.S, 1966, p.2).
• Stress can often cause a vicious cycle with sleep deprivation as sleep deprivation causes stress. “studies have shown that sleep deprivation can predict several disorders, such as cardiovascular disease, diabetes, depression, obesity, and even death (Vahle-Hinz, Bamberg, Dettmers, Friedrich, and Keller, 2014 p.217).
• In a study conducted called The Effects of Poor Sleep on Cognitive, Affective, Physiological Responses to a Laboratory Stressor (Paula, et al., 2013, p.40) found that poor sleep and stress have a strong correlation.
• An electrocardiogram (ECG) and a Galvanic Skin Response (GSR) was used to measure physiology.
• This study will attempt to measure the relationship between sleep test scores and both heart rate reactivity and galvanic skin response. It is hypothesized that there will be a negative correlation between test means and skin response and heart rate reactivity.

Procedure
• All participants completed the Ford’s Insomnia Response to Stress Test (FIRST) online, which consists of nine multiple choice questions ranging from very likely to very unlikely.
  • Each test was measured on a four point Likert scale, ranging from “very unlikely” to “very likely”.
  • Participants blood pressure and Skin response was recorded using Biopac™ electrocardiograms and Galvanic Skin Response tests, respectively.
  • The participants then were connected to the ECG and GSR and asked to answer the questions as they appeared on the screen.

Results
Sleep sum
M=2.34
SD=5.00
n=21.50
SD=4.99

• There is no correlation between the sleep scale score and either heart rate reactivity or galvanic skin response.
• A Spearman’s correlation was calculated examining the relationship between participants sleep scale score and both heart rate reactivity and galvanic skin response. A weak correlation that was not significant was found (r(8)=.27, p=.46).
• Neither heart rate reactivity nor galvanic skin response were related to the sleep scores.

Methods
• The population used for this study was a biased sample taken from a college setting (N = 10, male n=2, female n=8) With a mean age of 18.9 years.
  • All participants were involved in the research program.
  • Participants ethnicity was predominately white (n=8) with some Hispanic (n=2) participants as well.
  • All participants were students at Eastern Connecticut State University.

Conclusions
• The present study analyzed the relationship between heart rate, galvanic skin response and sleep scores.
  • Though no statistical significance was found in the study, results show that with significant editing, the study could be reworked to potentially show significant correlation.
  • This experiment would be made more effective potentially if the participant was placed in a mock stress scenario, where they believed they had a large stressor in the morning before being given the FIRST test.
  • Prior work has shown greater reduction in sleep with the introduction of a stressor the night before.

References