

The effects of sleep quality, sleepiness, fatigue, and psychological resilience on attention performance

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Abstract

Introduction: The aim of the study was to examine the relationships between sleep quality, sleepiness, fatigue, resilience, and attention parameters in a sample consisting of university students.

Material and methods: The study involved 123 university students aged between 18 and 33 years. A socio-demographic data form, the Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale (ESS), Fatigue Severity Scale (FSS), Depression, Anxiety, and Stress Scale (DASS-21), and the Brief Resilience Scale (BRS) were administered to the participants. Attention assessment was conducted using the Cognitron (COG), Signal Detection (SIGNAL), Inhibition (INHIB), and Perception and Attention Functions Battery, part of the computer-based Vienna Test System (VTS).

Results: Out of all the participants, 77.2% were female, and 22.8% were male, with an average age of 21.53 (SD = 2.54) years. A positive correlation was found between COG-Corrects and PSQI scores, and COG-Incorrects and DASS-Stress. There was a negative correlation between SIGNAL-Corrects and FSS. No correlation was revealed among sleep quality, sleepiness, fatigue, resilience variables, and reaction inhibition or divided attention. Furthermore, multiple regression analysis indicated that attention scores were predicted only by sleep quality and fatigue severity.

Conclusions: Based on the study's findings, it is conceivable that situational factors such as sleep quality, sleepiness, and fatigue have a more significant impact on attention compared with constant variables such as depression, anxiety, stress, and resilience.

Key words: Vienna Test System, attention, fatigue, sleepiness, resilience.

Introduction

Attention is a primary and complex cognitive function that refers to the frontage and focus of mental resources on a stimulus. Simultaneously, it represents turning towards a stimulus while disregarding others (Posner *et al.* 2016). Attention is separated into four types: selective, sustained, executive, and divided. Selective attention refers to the capacity to focus on a particular stimulus while disregarding other distracting stimuli. Divided attention is the ability to deal with multiple stimuli simultaneously, and executive attention ensures that attention is maintained (Rueda *et al.* 2023). Sustained attention requires long-term focus on a stimulus and is regarded as a concept associated with alertness (Cohen 2013). According to contemporary theories, attention is a system that consists of

multiple brain networks with interrelated but distinct functions (Fisher 2019). Spikman and van Zomeren (2010) stated that attention has two general dimensions, selectivity and intensity; they also refer in their articles to the Vienna Test System (VTS), which is a computer-based application used in the assessment of sustained attention, focused/selective attention, and divided attention (Spikman and van Zomeren 2010).

Although attention is a parameter that multiple psychological factors can impact, there has been more focus on how specific psychological processes such as sleep, fatigue, and psychopathological processes (e.g., depression, anxiety) affect attention. Sleep has a restorative function in human life and is essential for physiologic and circadian rhythms. Quantitative and qualitative shifts in sleep influence multiple systems (Bryant

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