**Written Assignment Unit 2**

University of the People

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**The Effects of Sleep Deprivation on Cognitive Performance: A Review**

**Introduction**

Sleep deprivation (SD) is a prevalent issue in modern society and is known to affect physical, emotional, and cognitive functioning. One study specifically explored how 36 hours of total sleep deprivation impacts working memory, a critical cognitive function essential for reasoning, decision-making, and learning. The authors hypothesized that prolonged sleep deprivation would impair the brain’s capacity for processing and storing information.

**Methods**

The study included 16 healthy university students who underwent two experimental conditions: a well-rested baseline condition and 36 hours of total sleep deprivation. Participants performed working memory tasks while their brain activity was recorded using electroencephalography (EEG). The researchers focused on event-related potentials (ERPs), particularly the N2-P3 wave components, as indicators of cognitive processing.

**Findings**

The findings revealed significant impairments in working memory after sleep deprivation. The N2-P3 amplitude decreased, indicating a reduction in the brain's ability to focus and respond effectively to stimuli. Additionally, latency was prolonged, meaning that participants took longer to process information. These results confirm that SD diminishes working memory efficiency by disrupting neural processes essential for cognitive functioning.

**Study Limitations**

While this study provided valuable insights, it had some limitations:

1. **Sample Size:** The small number of participants (16) limits the generalizability of the findings.
2. **Homogeneity:** All participants were healthy young adults, which may not reflect the effects of sleep deprivation in older adults or individuals with pre-existing conditions.
3. **Task Type:** The study focused only on working memory tasks, neglecting other cognitive domains such as decision-making or emotional regulation.

Future research could expand on these areas by increasing sample size, diversifying the participant pool, and exploring other cognitive domains affected by SD.

**Implications**

The study’s implications extend to both practical applications and future research. For example, professionals in high-stakes roles, such as healthcare or transportation, could benefit from workplace interventions to mitigate the risks of SD. Additionally, further exploration of sleep's role in memory consolidation may inform strategies for improving educational outcomes.

**Personal Reflection**

As a university student, I have experienced the detrimental effects of sleep deprivation firsthand, particularly during exam periods. A lack of sleep significantly impaired my ability to concentrate and retain information, mirroring the study’s findings. To remedy this, I adopted strategies such as adhering to a strict sleep schedule and prioritizing rest before critical tasks. These adjustments improved my academic performance and overall well-being.

**References**

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