

Sleep Disorders, Smartphone Use and Mental Health: A Cross-Sectional Study on a Sample of Students from the University of Palermo – MORPHEO

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INTRODUCTION

Sleep disorders constitute a significant public health concern recognized by the World Health Organization (WHO) in the ICD (International Classification of Diseases), with notable implications for young populations. Research demonstrates that disrupted sleep patterns significantly impair mental recovery processes and emotional stability [1]. Poor sleep quality contributes to mental health deterioration through disruption of emotional regulation and neurobiological mechanisms. Inadequate sleep compromises hypothalamic-pituitary-adrenal axis function, increasing cortisol production and stress perception, potentially leading to depressive symptoms [2]. Young adults represent the population stratum with the highest smartphone and electronic device usage rates, sometimes developing behavioural dependencies. Studies show that light exposure to these devices before falling asleep significantly disrupts sleep quality [3]. Moreover, excessive smartphone use is associated with reduced cognitive performance, negatively affecting work efficiency and academic achievement [4].

This study investigates the interactions between sleep disorders, mental health, electronic device usage, and academic performance among university students. We specifically examine how sleep quality and quantity influence students' psychological functioning, with particular attention to psychological distress.

METHODS

The Pittsburgh Sleep Quality Index (PSQI) [5], the Kessler Psychological Distress Scale (K10) [6] and the Smartphone Application-Based Addiction Scale (SABAS) [7] were used

to assess sleep quality, mental distress and problematic smartphone use, respectively. Descriptive statistics were expressed as Mean (SD), for continuous variables, and as count/percentages for categorical variables. "Good sleepers" and "Poor sleepers" were compared using Chi-square test or Fisher's exact test for categorical variables, and Student's t-test or the Wilcoxon-Mann-Whitney test for continuous variables, with significance at $P < 0.05$. Logistic regression identified independent predictors of poor sleep quality (PSQI > 5). Variables with significant univariate association ($p < 0.05$) were included in the multivariate model, with results expressed as odds ratios (OR) with 95% confidence intervals (95% CI).

RESULTS

This cross-sectional study involved 208 students from the University of Palermo, with 58.7% ($n=122$) enrolled in medical degree programs. The average age of the sample was 22 ± 1.99 years, and 71.6% were female.

The analysis revealed that 61.54% ($n=128$) of students had inadequate sleep quality. Univariate analysis showed that their exam completion rate (80.1%) was lower than that one reported for good sleepers (83.5%) ($p < 0.05$). On average, daily smartphone use was higher among poor sleepers (6.46 ± 3.03 vs 5.57 ± 2.22 hour/day, $p < 0.05$), and a significant association was found between poor sleep quality and the risk of problematic smartphone use (OR=2.83, 95%CI [1.27-7.00], $p < 0.05$). Furthermore, results from K10 revealed that reporting severe psychological distress was significantly associated to poor sleep quality (OR=13.25, 95%CI= [5.34-37.28], $p < 0.001$).

The multivariate analysis confirmed that higher daily smartphone usage, measured in hours, is associated with poor

sleep quality (AdjOR=1.21; 95% CI [1.02-1.45]) and, notably, subjects with high probability of severe psychological distress have significantly higher likelihood of being classified as poor sleepers (AdjOR = 9.59, 95% CI = [3.57-28.82]).

DISCUSSION

Our analysis revealed a strong association between psychological distress (K10 scale) and poor sleep quality among university students. Students experiencing significant psychological distress showed markedly higher likelihood of being poor sleepers, confirming bidirectional relationships between mental health and sleep, as documented in previous research. Daily smartphone uses also emerged as a significant predictor of poor sleep quality, aligning with literature on electronic devices' detrimental effects on sleep hygiene. Smartphone light emissions, particularly blue light, suppress melatonin production and disrupt circadian rhythms [8]. These findings emphasize the importance of addressing sleep health within university mental health and academic support initiatives. The strong psychological distress-sleep quality association suggests interventions targeting either aspect may benefit the other. Universities should consider implementing screening programs to identify students at risk of sleep disorders, especially those reporting psychological distress symptoms. Additionally, digital hygiene education should be incorporated into student wellness programs to mitigate electronic devices' negative impact on sleep.

CONCLUSIONS

The study highlights the link between psychological distress, smartphone use, and sleep quality in university students. The strong connection between mental health struggles and sleep issues underscores the need to integrate sleep health into mental health services. Universities should promote well-being and responsible technology use to enhance academic performance and overall student health.

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