

Impact of Smartphone Usage Patterns on Cognitive Outcomes in University Students: A Narrative Review

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ABSTRACT

Smartphones have become a vital aspect of university life, which facilitates academics, social communication, and entertainment. However, the cognitive consequences of such extensive use remain unclear, especially when we take into account the purpose of smartphone use, whether academic, social, or recreational. This narrative review examines the impacts of such smartphone use patterns on cognitive performance, indicating reaction time, decision making, and dual-task performance among university students. The sources of the relevant studies include platforms like PubMed, ScienceDirect, Scopus, Cochrane, and PEDro databases. Eleven articles were shortlisted from the twenty that met the inclusion criteria of being published between 2015 and 2025 and they were screened to ensure relevance and avoid duplication. Articles included were mostly cross-sectional, correlational, observational, and meta-analytic in design. The results show that long-term recreational and multitasking smartphone use is linked to sluggish reaction

times, an increase in dual-task costs, and loss of executive control. Research on decision-making has shown a greater prevalence of impulsivity and preference for immediate rewards, and late-night use being linked to poor quality of sleep and diminished attention. Whereas study-related and well-organised smartphone usage shows neutral or adaptive impacts, potentially enhancing sustained attention when intentional. Taken together, it is likely that cognitive inefficiency is more about context and intent of use than duration. Neurocognitive hypotheses refer to prefrontal fatigue, dopaminergic system desensitisation, and impaired circadian regulation. More longitudinal studies, which combine purpose-specific smartphone measurements and standard cognitive measures, are required to clarify the causal relationship and digital behaviour interventions in university students.

Keywords: Cognitive dual-tasking, Decision making, Reaction time, Smartphone usage pattern

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