



Mid Atlantic Regional Chapter of the American College of Sports Medicine

46th Annual Scientific Meeting, November 3rd - 4th, 2023
Conference Proceedings

International Journal of Exercise Science, Issue 9, Volume 12



The Effects of Cellphone Usage on Cognitive Function in College-Aged Individuals

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The technological advancement of cellphones has prompted young adults to spend an average of nine hours a day on their device, increasing their risk for a dependency syndrome called nomophobia. The prevalence of nomophobia amongst young adults is between 77-99%. Research has shown that nomophobia creates recognizable mood fluctuations such as depression, stress, anxiety, loneliness, and fear of missing out. There are growing concerns on how cellphone usage affects individuals' cognitive function; however, little research has been done assessing cellphone usage on cognitive performance. **PURPOSE:** To assess the cognitive effects of cellphone usage in college-aged individuals. **METHODS:** Forty-nine subjects (age 19.6 ± 0.82 yrs, body mass index 26.3 ± 6.1 kg/m², weight 75.7 ± 18.0 kg) completed a randomized, cross-over study. Individuals reported to the exercise science laboratory on two separate occasions, for 60 minutes, and were either allowed unlimited access to their cellphone or were separated from their device. Before and immediately after each experimental session subjects completed the congruent and incongruent Stroop as well as the Switching cognitive tests. For each cognitive test, the mean reaction time for all responses and only for correct responses were recorded. **RESULTS:** There was a significant ($p=0.04$) condition*time interaction for mean reaction time in correct responses for the switching test. Individuals who were separated (PRE: 1693.7 ± 7 ms; POST: 1486.1 ± 55.9 ms) from their cellphone showed a greater improvement in reaction time than individuals with unlimited access (PRE: 1655.8 ± 78.3 ms; POST: 1561.70 ± 2 ms) to their device. There was a significant main effect of time for mean reaction time in switching ($p \leq 0.001$; PRE: 1665.3 ± 60.9 ms; POST: 1507.5 ± 53.1 ms), incongruent stroop ($p=0.03$; PRE: 689.9 ± 25.7 ms; POST: 670.61 ± 23.9 ms), and congruent stroop ($p < 0.001$; PRE: 575.86 ± 14.9 ms; POST: 552.6 ± 14.1 ms). There was a significant ($p < 0.001$) main effect of time (PRE: 574.3 ± 14.6 ms; POST: 552.9 ± 14.0 ms) for mean reaction time in only correct responses for the congruent stroop test. **CONCLUSION:** The results of this study showed that cellphone usage impaired college-aged students' cognitive function. Specifically, college-aged students may benefit from not having access to their cellphone on tasks that require cognitive flexibility and divided attention. **SIGNIFANCE/NOVELTY:** This is one of the first studies to assess cellphone usage on cognitive function. College-aged students are repeatedly told to get off their cellphones in academic settings. The results of this study support the notion that cellphone usage over a period of time may impair brain activity and decrease cognitive performance on certain tasks that require higher-order thinking.

Supported by Grove City College Exercise Science department