Association between Internet Use Behavior and Palpitation among Adolescents: A Cross-Sectional Study of Middle School Children from Northwest Romania

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## Authors

Lazea C.;Popa A.;Varga C.

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## Sample

A total of 1147 eligible participants (46.8% female, 53.2% male; mean age = 13.86 ± 0.76 years, range 12–15) responded to the present study.

# Abstract

Purpose: The use of the internet is a tool and media literacy has become an essential skill among adolescents. Related to this behavior, some adolescents evoke cardiovascular effects. The purpose of this study was to explore a possible correlation between internet use behavior and occurrence of palpitations and related symptoms among a representative cohort of adolescents from the north-west region of Romania. Method: The study included students of seven middle schools from Northwest Romania. Participants completed an anonymous questionnaire consisting of 18 questions about internet use. Results: In total, 1147 students responded to the study. Mean duration of daily internet usage was 2.57 h during school time and 3.57 h during the holidays. A total of 77% of adolescents had more than one symptom related to internet use, and 11% of them reported palpitations and related symptoms. We found an independent relation between palpitation and urban background, palpitations and the internet usage time interval 20:00–24:00, and palpitations and tobacco smoking. Strong heartbeats were independently associated with the time interval 12:00–16:00, tobacco smoking, and energy drink consumption. Conclusion: In our cohort, the most important factors associated with the occurrence of palpitations and related symptoms were the timeframe of internet usage and smoking.

# Outcome

"In our study, independent correlations between palpitations and related symptoms were established as the following: during the time interval 8:00 p.m. to 12:00 a.m. for tachycardia, during the time interval 12:00 p.m. to 16:00 p.m. for strong heartbeats, and during the time interval 08:00 p.m. to 12:00 a.m. for palpitations (OR = 3.38; OR = 3.14, and OR = 3.62, respectively). Even though we found strong statistical evidence that some time intervals of internet usage were independent risk factors for these symptoms, we did not identify any certain causality for those effects. We thus assume that this was due to a third factor. In light of the findings of other studies, we cannot rule out the possibility that shorter sleep duration could be the result of symptoms that occur after extensive internet use, since the excessive use of electronic media leads to less sleep [17,26]. This observation is consistent with studies that have demonstrated reduced autonomic flexibility, impaired control of emotions, and anxiety in problematic internet users, similar to substance addictions (where autonomic functioning is also impaired), and that excessive internet use affects the sympathetic nervous system and dopaminergic pathways associated with increased systolic blood pressure, increased heart rate, and compromised immune function."