Examining the Association Between Screen Time Exposure and Anxiety-Related Symptoms Among Adolescents

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Chapter 3: Methodology

The availability of smartphones among adolescents has increased considerably in the 2020s, with 95% of US teenagers having access to electronic and internet-connected devices (Alsaigh et al., 2022). Consequently, children aged between 12 and 17 years have excess daily screen time, which elevates their risk of adverse mental health outcomes, including anxiety, stress, depression, and conduct disorders due to factors such as sleep deprivation, physical inactivity, and reduced social interactions (Mohd Saat et al., 2024; Santos et al., 2023). The purpose of this quantitative, cross-sectional study is to examine the association between higher screen time exposure and increased prevalence of anxiety-related symptoms among adolescents in the US. This chapter contains the following sections: (a) study hypothesis, (b) study design, (c) population and sample, (d) study setting, (e) data collection procedures, (f) data analysis, (g) ethical considerations, and (h) a summary.

Study Hypothesis

The hypotheses that will be utilized to examine the relationship between the dependent and the independent variable in this study are:

H_0: There is no significant association between screen time exposure and the prevalence of anxiety-related symptoms among adolescents.

H_1: There is a significant association between screen time exposure and the prevalence of anxiety-related symptoms among adolescents.

Study Design

A quantitative, cross-sectional analytical design will be used to investigate whether high screen time is positively correlated with the occurrence of anxiety symptoms among US teens. The methodology was selected because it will enable the researcher to estimate the prevalence of

a psychiatric condition in a specific population at a single point in time (Pérez-Guerrero et al., 2024). The approach is also appropriate for evaluating exposure and outcome simultaneously using a representative sample and generalizing the findings to the target group. In addition, the design will facilitate the use of correlational analysis to examine the relationship between a dependent variable (DV) and an independent variable (IV) (Capili, 2021). In this study, the DV is anxiety-associated symptoms, while the IV is daily screen time. The outcomes of the cross-sectional methodology will be crucial for establishing preliminary evidence to evaluate a causal association in future research (Pérez-Guerrero et al., 2024).

Population and Sample

The target population for this cross-sectional study is US adolescents aged 12 to 17 years. As of 2025, there are approximately 42,910,044 teenagers nationwide (U.S. Census Bureau, 2025). The racial distribution of this demographic group comprises 49% Caucasian, 26% Hispanic, 14% African American, 5% Asian American, 4% multi-racial, 1% Alaska Native or American Indian, and 0.5% Pacific Islander. In addition, 86% of adolescents live in metropolitan areas, 8% reside in micropolitan regions, and 5% dwell in rural neighborhoods (U.S. Census Bureau, 2025). The 2023 National Health Interview Survey showed that 50.4% of teens, particularly in urban settings, spend a minimum of 4 hours daily on screen-based devices (Zablotsky et al., 2024). Therefore, a representative sample will be selected from the demographic to make inferences about teenagers' daily screen use in the US.

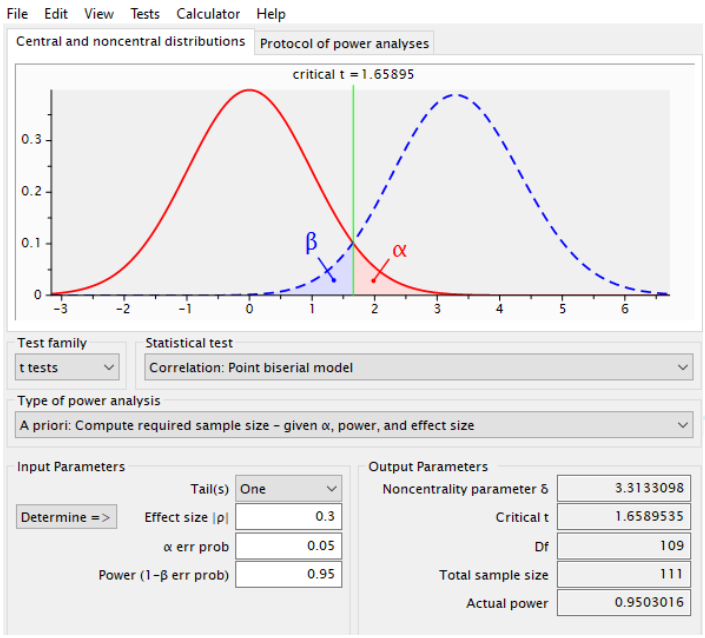
Sampling Procedures

A power analysis was conducted using Cochran's formula to estimate a representative sample size to be included in the proposed study: $n = (Z^2 P (1\text{-}P)) / d^2$. In Cochran's approach, n represents the sample size, Z is the desired level of confidence, P is the approximated population

proportion, and *d* is the magnitude of the effect (Ahmed, 2024). For this cross-sectional study, the sample size was analyzed using G*Power software at a 95% confidence interval and 0.5 effect level (Serdar et al., 2021). Based on the estimates, 111 adolescents aged between 12 and 17 years will be included in this study (see Figure 1).

Figure 1

Power Analysis for Estimating Sample Size



Study Setting

This cross-sectional study will involve the analysis of secondary data obtained from the National Health Interview Survey-Teen (NHIS-Teen), and facilitated by the National Center for Health Statistics (NCHS) (Zablotsky et al., 2024). The survey was conducted from July 2021 to December 2023 by a team of NCHS academic researchers who sent web-based invitations to parents and children in every US state, inviting them to participate in completing a self-reporting questionnaire about adolescents' mental well-being, social behaviors, physical activity, and emotional support (see Appendix A). In this study, the researcher will utilize a subset of NHIS-Teen data on social experiences and mental health outcomes.

Data Collection Procedures

Secondary data on adolescents' mental health and social experiences will be obtained from the NCHS database to evaluate the association between daily screen time and anxiety in children aged from 12 to 17 years. Permission will not be required to access the data, as it is publicly available and freely accessible from the organization's website (CDC, 2025). Although sensitive and personally identifiable information will be excluded from the survey files, the researcher will be required to read and comply with NCHS's Data User Agreement (CDC, 2024).

Instrumentation

The NHIS-Teen survey was conducted using a 95-item self-reporting questionnaire that was administered to US teenagers from July 2021 to December 2023 (see Appendix B). The tool was designed using instruments, such as the Generalized Anxiety Disorder-2 (GAD-2) scale and Patient Health Questionnaire-2 (PHQ-2), to collect adolescents' health information, including mental well-being. The GAD-2 and PHQ-2 are two-item questionnaires used to briefly screen individuals for the likelihood of having anxiety and depression disorders, respectively (see Appendix C and D). Both tools are reliable and valid, with high internal consistency indicated by Cronbach's alpha of 0.75 and 0.80, respectively (Scoppetta et al., 2021; Vrublevska et al., 2022). The researcher will download participants' responses from the NCHS website and compile the data on a Microsoft Excel spreadsheet to eliminate unnecessary information before analysis. The variables that will be retained for this study include daily screen time, anxiety-related symptoms, and demographic statistics, such as gender, age, ethnicity, and family socio-economic status.

Data Analysis

The secondary data obtained from NCHS will be cleaned in a Microsoft Excel spreadsheet by eliminating missing values and inaccuracies before being transferred into the

Statistical Package for Social Sciences (SPSS) version 28.0 for descriptive and inferential analyses. Descriptive statistics will involve summarizing the study variables and participants' demographic information, using frequencies, percentages, means, and standard deviation. The results will be presented in tables and graphs to enhance the interpretation of the findings (Divecha et al., 2023). Inferential tests will be conducted using Pearson's correlational analysis to test the null hypothesis by evaluating whether there is a significant association between excessive daily screen time and increased symptoms of anxiety among participants, at $\alpha = 0.05$ significance level (Janse et al., 2021). Pearson's correlation is appropriate because the study is aimed at quantifying the relationship between two continuous variables without establishing causality (Janse et al., 2021).

Ethical Considerations

The cross-sectional study will be conducted in compliance with the Health Insurance Portability and Accountability Act (HIPAA) guidelines for protecting individuals and information in research (U.S. Department of Health and Human Services, 2025). Four measures will be implemented to maintain ethical compliance. First, the researcher will cite the NCHS to accredit the agency as the data source for transparency (CDC, 2024). Second, data will be utilized strictly for statistical analysis and reporting to ensure adherence to the data user agreement. Third, data will be stored on a password-encrypted laptop accessible only to the researcher in accordance with HIPAA principles of privacy and protection (Edemekong et al., 2024). Fourth, NHIS-Teen survey responses will be permanently deleted three years after the study completion to uphold the ethical principles of retention and destruction.

Summary

A quantitative, cross-sectional analytical design will be used to examine the association between high screen time and the prevalence of anxiety symptoms in adolescents. The methodology is appropriate because it will enable the researcher to estimate the prevalence of a mental disorder in a specific population and assess the relationship between variables at a single point in time. The data to be utilized in the study will be obtained from the NHIS-Teen, an online cross-sectional survey conducted by the NCHS between July 2021 and December 2023 to investigate adolescents' health information in every US state. The data will be analyzed using descriptive and inferential tests via SPSS version 28. Specifically, frequency, mean, percentage, and standard deviation analyses will be computed to summarize participants' descriptive information. Pearson's correlational analysis will also be conducted to investigate the relationship between daily screen time and anxiety symptoms, without establishing causality. The next chapter is the results section, which will contain the introduction, descriptive statistics, inferential results, and a summary.

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