**Association between screen time and depression among U.S. adults: Findings from National Health and Nutrition Examination Survey (NHANES)**

***This document outlines how to write up a scientific paper. Please use it to guide your project.***

**Authors/Co-authors**

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***Before you formally start your analysis or writing, make sure you have a clear research question. The analysis you do should answer your research question. For instance, if you're interested in association between X and Y, you would perform appropriate regression analysis not the descriptive analysis. Headings/sub-headings for Research Question and Hypotheses is not required. I kept them here just to emphasize the importance of having them finalize before starting the analysis or other sections of the paper.***

**Research Question:**

* What is the association between screen time and depression among U.S. adults?

**Hypothesis:**

* Those who are have higher amounts of screen time will have higher odds of experiencing depressive symptoms[1](#_ENREF_1).

1. **Background**

***Write at least four paragraphs on the area of investigation. It is helpful to begin this section with some data specifically about the prevalence/incidence of your primary outcome. You can also state some facts and major findings from previous studies about the association/relationship that you’re investigating.***

***The last paragraph will state why this study is important, what new information will be added to the body of literature. Then you will write study objective/goal.***

1. **Methods**

**2a. Study Design and Population**

***State your study design and sample population under this sub-heading. Please state any inclusion or exclusion criteria you have here.* *For instance, if you are using NHANES data, you can say….***

This study is a cross-sectional study using the 2020-2021 cycle of National Health and Nutrition Examination Survey (NHANES) data. NHANES is a cross-sectional survey, representing the noninstitutionalized civilian resident population of the United States. Individuals who were 20 years or more were included in this study. Those with missing values for screen time or depression were excluded from the study. The final sample size included in study was XXXX U.S. adults.

**2b. Data Source**

***Explain your data here. Make sure you also state timeline of your data such as: survey years (such as: 2020, 2021.), diagnosis year or so on…….***

**2c. Measures**

***In this section you will define the primary exposure and primary outcome variables as well as additional study covariates*. *When you define your outcome or exposure variables it is always a good idea to back up your method (i.e. cite paper(s) that have used the same cut-off or criteria to define the study outcome.***

**Outcome**

**Diagnosis and classification of depressive symptoms:**

Depressive symptoms were determined based on participant’s responses to the PHQ-9 questionnaire in the NHANES 2011-2012 cycle. PHQ-9 is a 9-item self-report depression scale that asks questions about the frequency of symptoms of depression over the past two weeks. Each item is scored from 0 (not at all) to 3 (nearly every day). The PHQ-9 score can range from 0 to 27 and was classified into two categories. Individuals with a PHQ-score less than 9 were classified as “no or mild depression” and those with a PHQ-score of 9 or more, were classified as “moderate to severe depression”.

**Exposure**

**Screen time:**

Self-reported total hours per day spent on watching television and use of computer was the primary exposure of interest. Screen time was calculated based on responses to questions, 1). “Over the past 30 days, on average how many hours per day did you sit and watch TV or video”, 2). “Over the past 30 days, on average how many hours per day did you use a computer or play computer games outside of work or school”. “Average number of hours per day watching TV or video and “average number of hours per day using computer or playing computer games outside of work” were summed and a new variable “screen time” was created. Participants’ screen time was classified into as low vs high. Individuals with screen time more than 4 hours per day were categorized as high screen time and those with less than 4 hours per day of screen time were categorized as low screen time.

**Covariates:**

***List and explain our study covariates here. Also, you need to inform readers what variables were considered as confounders and also state how you classified them.***

Based on the existing literature on screen time and depression, age, sex, race/ethnicity (Non-Hispanic White, Non-Hispanic black, Hispanic and Other race) and education were included in this study as confounding variables.

**2d. Statistical Analysis:**

***In this section you will describe what analyses you completed with the data. Be sure to include information on both the descriptive analysis as well as the analyses to answer your study question. You can create one or statistical models based on different sets of covariates that need to be adjusted in the model. Creating a DAG can be very helpful for model building.***

Descriptive analysis was performed. Frequency/percentage for categorical analysis or mean (SD) were calculated for continuous variables……

Simple logistic regression analyses were performed to evaluate the association between individual predictors and outcome variable….. Multiple logistic regression models were used to examine the associations between screen time and depression level adjusting potential confounders. Four models were created to establish the relationship between screen time and depression. Model 1 was adjusted for all potential confounders (such as: age, race, gender, BMI, screen time, education, and poverty); Model 2 was adjusted for race, gender, BMI, screen time, education, and poverty; Model 3 was adjusted for gender, BMI, screen time, education, and poverty; and Model 4 was adjusted for (gender, screen time, education and poverty). Model 4 was selected to assess and predict the relationship between screen time and depression.

**2e. Results:**

***Include at least 2 tables- 1 showing the descriptive statistics of your population (Table 1) and 1 or more that shows the outcome of the analyses you performed. You should also include paragraphs describing what you found using numbers.***

Mock tables

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table 1: Characteristics of study population (N=XXXXX)** | | | | | |
| **Characteristics** | **N** | **(%)** | **No or Mild Depression n (%)** | **Moderate or Severe Depression n (%)** | **P-value** |
| **Gender** | | | | | |
| Male |  |  |  |  |  |
| Female |  |  |  |  |
| **Education level** | | | | | |
| Less than High school |  |  |  |  |  |
| High school or more |  |  |  |  |
| **Race** | | | | | |
| Non-Hispanic White |  |  |  |  |  |
| Non-Hispanic Black |  |  |  |  |
| Hispanic |  |  |  |  |
| Other |  |  |  |  |
| **Age** | | | |  |  |
| 20-35 years |  |  |  |  |  |
| 36- 50 years |  |  |  |  |
| 51-65 years |  |  |  |  |
| >65 years |  |  |  |  |
| **BMI** | | | |  |  |
| Underweight |  |  |  |  |  |
| Normal |  |  |  |  |
| Overweight |  |  |  |  |
| Obese |  |  |  |  |
| **Poverty** | | | | | |
| Yes (below poverty level) |  |  |  |  |  |
| No (above poverty level) |  |  |  |  |
| **Screen time** | | | | | |
| Less than 4 hours per day |  |  |  |  |  |
| 4 to 6 hours per day |  |  |  |  |
| More than 6 hours per day |  |  |  |  |

\*p-values were calculated using Chi-square test.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table 2: Associations between screen time and depression | | | | |
| Characteristics | **Univariable Model** | **Multivariable model** | **95 % CI** | |
| Gender |  |  |  |  |
| Male | Reference | Reference |  |  |
| Female |  |  |  |  |
| Education level |  |  |  |  |
| High than High school |  |  |  |  |
| Less school or more | Reference | Reference |  |  |
| Race |  |  |  |  |
| Non-Hispanic White | Reference | Reference |  |  |
| Non-Hispanic Black |  |  |  |  |
| Hispanic |  |  |  |  |
| Other |  |  |  |  |
| Age |  |  |  |  |
| 20-35 years | Reference | Reference |  |  |
| 36- 50 years |  |  |  |  |
| 51-65 years |  |  |  |  |
| >65 years |  |  |  |  |
| BMI |  |  |  |  |
| Underweight |  |  |  |  |
| Normal | Reference | Reference |  |  |
| Overweight |  |  |  |  |
| Obese |  |  |  |  |
| Poverty |  |  |  |  |
| Yes (below poverty level) |  |  |  |  |
| No (above poverty level) | Reference | Reference |  |  |
| Screen time |  |  |  |  |
| Less than 4 hours per day | Reference | Reference |  |  |
| 4 to 6 hours per day |  |  |  |  |
| More than 6 hours per day |  |  |  |  |

**2f. Discussion:**

***Start out with a recap of your main results, using prose, not actual numbers. That is, don’t write “We found that 50% of Black patients and 60% of white patients received surgery (P=0.003)” Rather, in the discussion, you’d write “We found a substantial racial disparity….”***