



PROBLEMATIC INTERNET USE

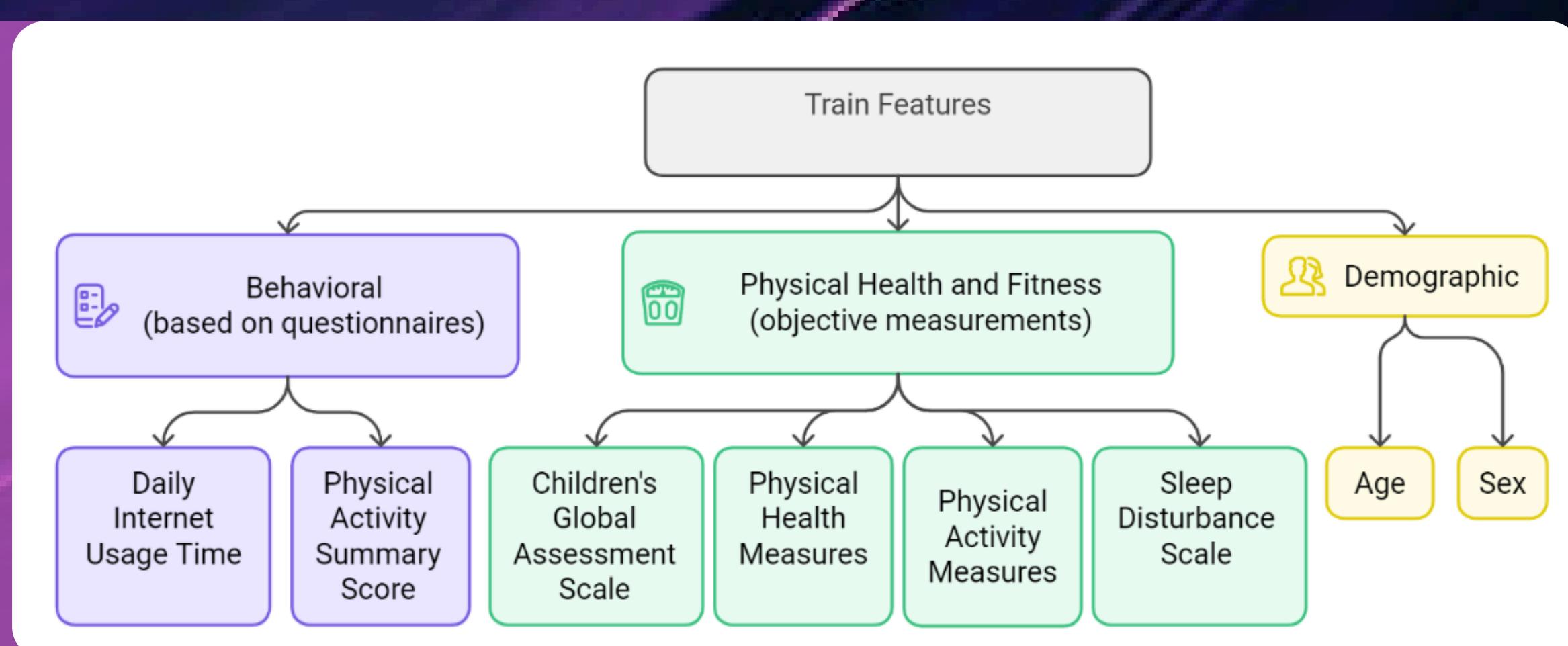
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Introduction

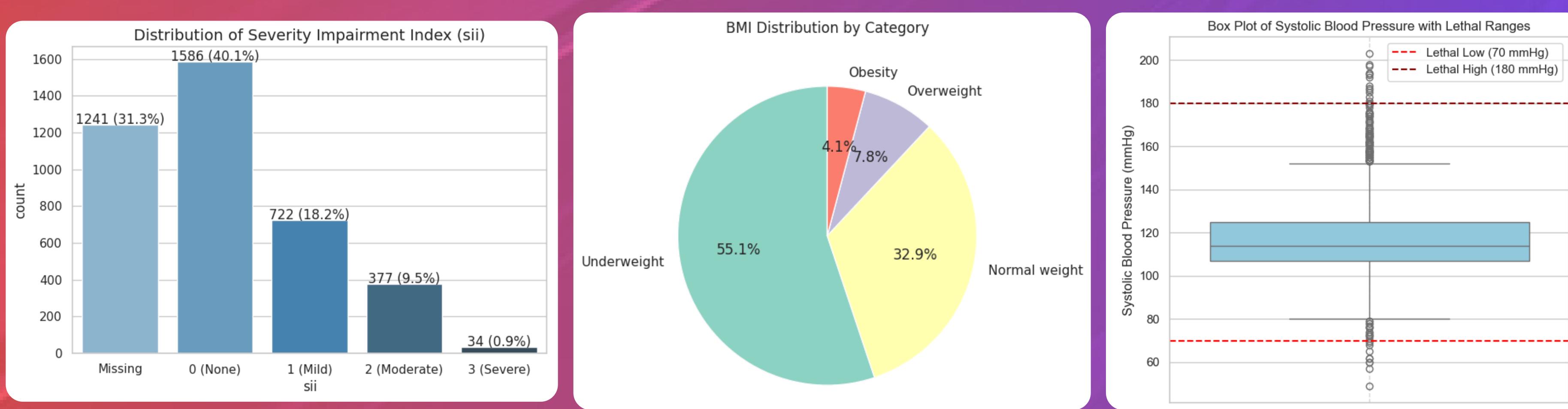
In today's digital age, problematic internet use among children and adolescents is a growing concern. Physical & fitness measures are extremely accessible and widely available with minimal intervention or clinical expertise. Child Mind Institute proposed using these easily obtainable physical fitness indicators as proxies for identifying problematic internet use, especially in contexts lacking clinical expertise or suitable assessment tools. The aim of this project is to predict the Severity Impairment Index (sii), which measures the level of problematic internet use among children and adolescents, based on physical activity data and other features.

Grouping of features by type and measurement method:



Challenges

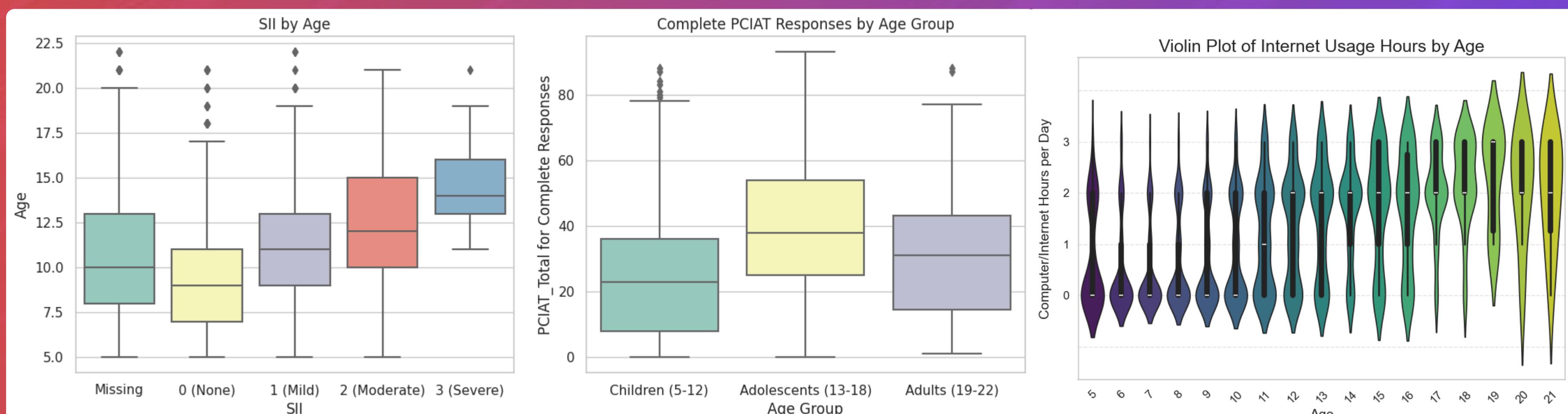
- Missing target and non-target values
- Imbalanced dataset
- Lots of extreme/conflicting outliers
- Deficient info about data origin



Behavioral Data Analysis

The dataset is based on the Parent-Child Internet Addiction Test (PCIAT), which consists of 20 questions. Each question is scored on a scale of 0 to 5, and the total score indicates the Severity Impairment Index. The target variable (SII) is categorized as follows:

- 0: None – PCIAT total score 0 to 30
- 1: Mild – PCIAT total score 31 to 49
- 2: Moderate – PCIAT total score 50 to 79
- 3: Severe – PCIAT total score 80 and above

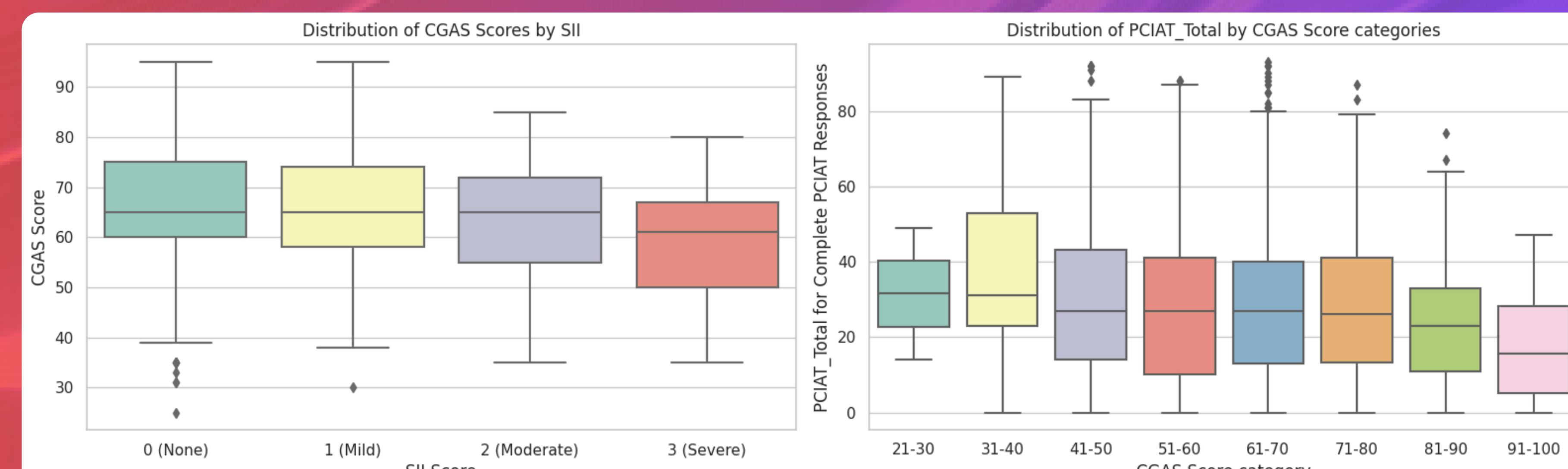


The SII scores show an overall U-shaped relationship with age: adolescents tend to have the highest median PCIAT scores, indicating greater severity of internet addiction in this age group. A linear trend is observed between age and the number of hours spent online, with older participants spending more time online.

While higher SII scores are generally associated with increased online activity, adolescents stand out as the most affected group across all categories of internet use. Interestingly, there are participants across almost all age groups (5 to 21) who spend less than an hour online per day yet exhibit high SII scores, suggesting that factors other than time spent online may contribute to internet addiction in some cases.

Physical Health and Fitness Data Analysis

The majority of individuals have CGAS (Children's Global Assessment Scale) scores between 51-80 (79.7%), i.e. sporadic difficulties to only slight impairments. There are no participants with the highest SII scores who have good CGAS scores (81-100: good/superior functioning in all domains). This suggests that parental responses to the PCIAT questionnaire may reflect some effects of PIU on global health and functioning (Look figure below).

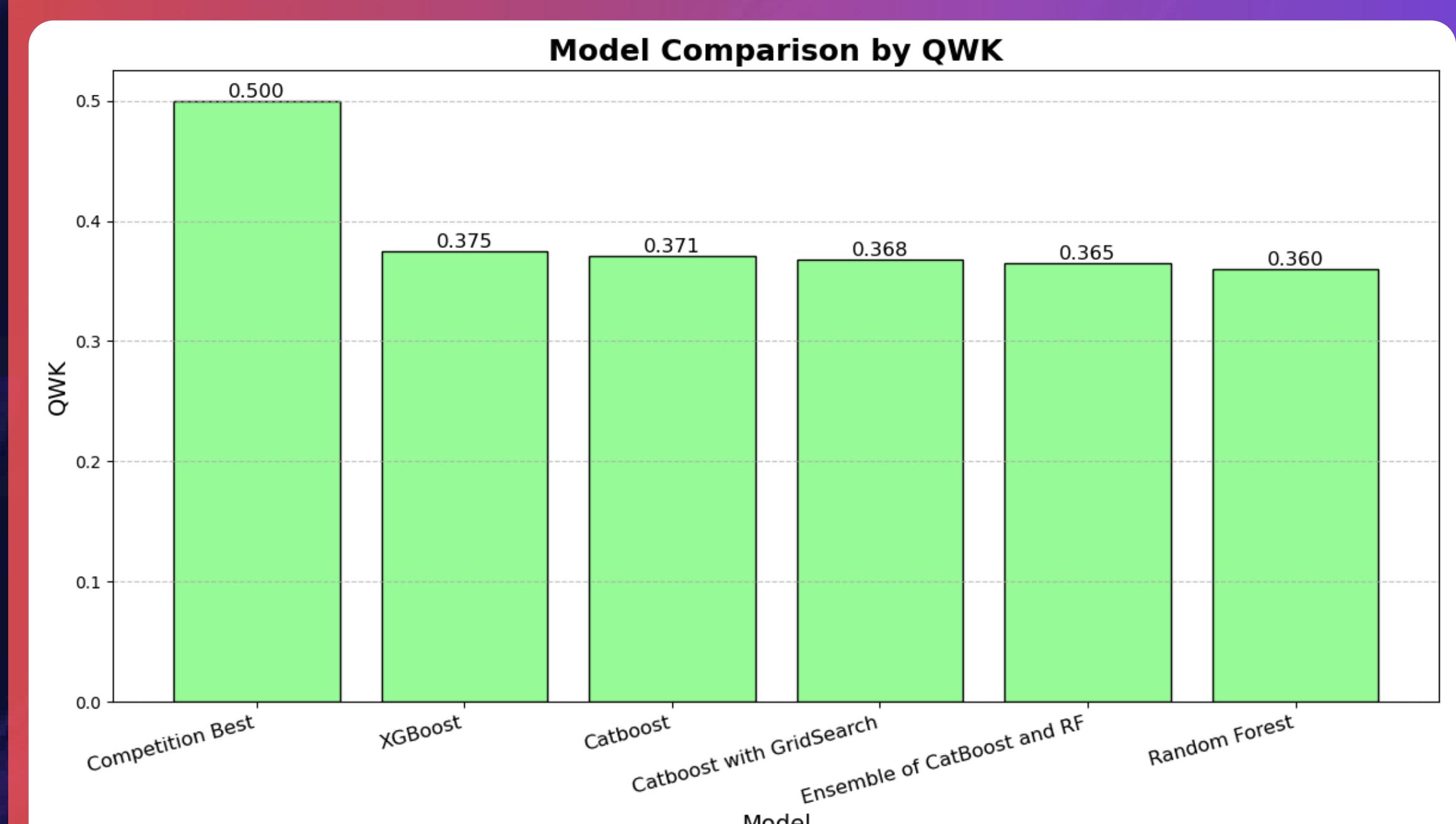


References:

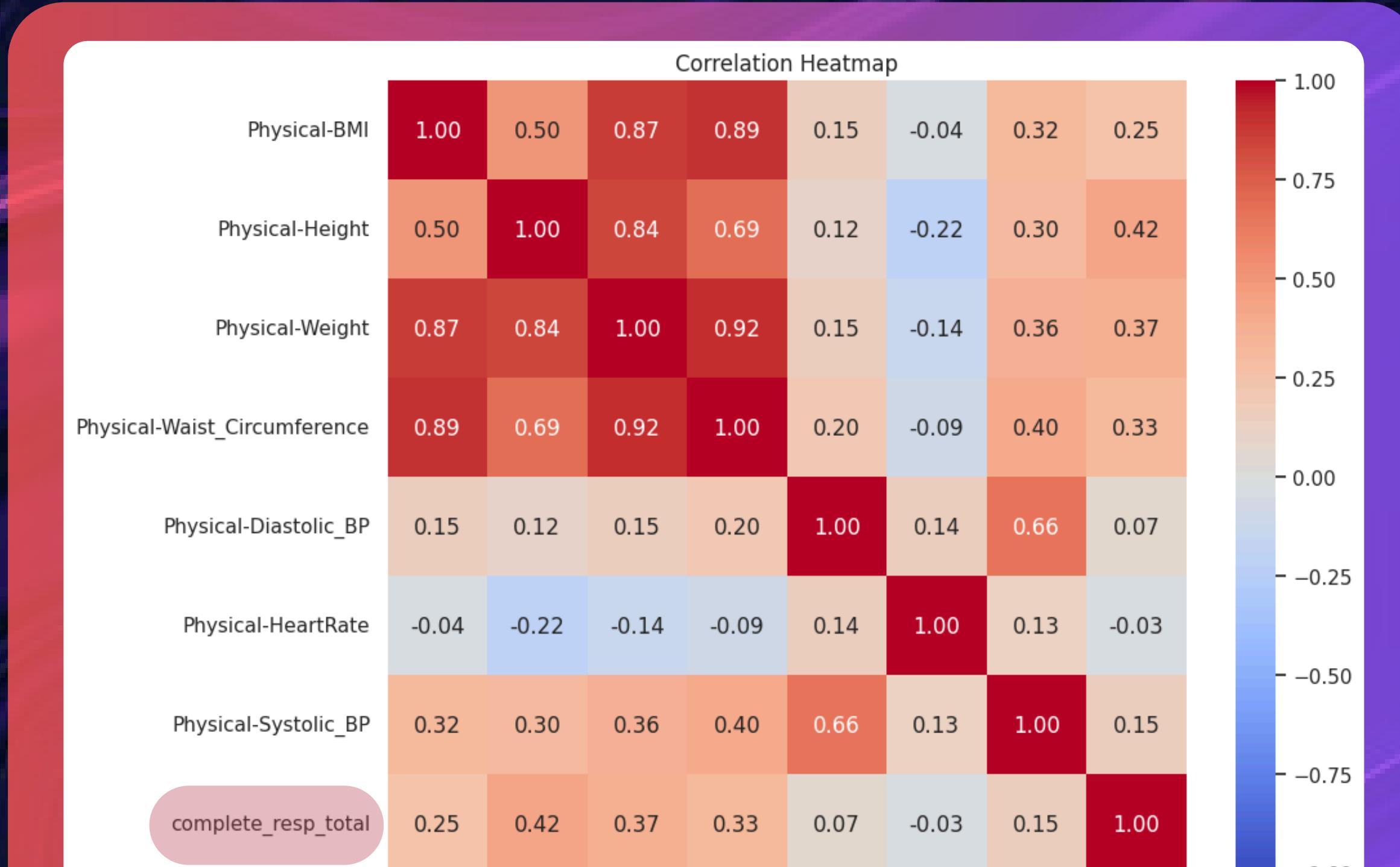
- Problematic Internet Use (<https://www.kaggle.com/competitions/child-mind-institute-problematic-internet-use>)
- Illustration images of this poster are generated by Copilot

Results

SII categories (0: None, 1: Mild, 2: Moderate, 3: Severe) have a meaningful order, where higher values indicate greater severity of internet addiction. This is one of the characteristics of ordinal data. Since SII predictions are ordinal, using QWK (*The Quadratic Weighted Kappa*) ensures the model's performance reflects the quality of its ordinal predictions. A QWK score greater than 0 is the minimum acceptable threshold, indicating that the model performs better than random guessing. We have predicted a SII values with QWK score of 0.375.



Average participants



The positive correlation with the target is for height, weight, and waist circumference, which means that taller and fatter people tend to have a higher SII. But as these physical parameters increase with age, and we already know that SII tends to be highest in adolescents, this could indicate that they act as a proxy for age.