Predicting Problematic Internet Use

Aaron Weinberg

Emilie Wiesner

Dan Visscher

The Problem

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Review article

Systematic review and meta-analysis of epidemiology of internet addiction

Yuan-Chien Pan[a], Yu-Chuan Chiu[b], Yu-Hsuan Lin[c,d,e,f,*]

[a] Department of Psychology, National Taiwan University, Taipei, Taiwan
[b] Department of Psychiatry, MacKay Memorial Hospital, Taipei, Taiwan
[c] Institute of Population Health Sciences, National Health Research Institutes, Miaoli, Taiwan
[d] Department of Psychiatry, National Taiwan University Hospital, Taipei, Taiwan
[e] Department of Psychiatry, College of Medicine, National Taiwan University, Taipei, Taiwan
[f] Institute of Health Behaviors and Community Sciences, College of Public Health, National Taiwan University, Taipei, Taiwan

ARTICLE INFO

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Internet addiction
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Internet gaming disorder
Gaming disorder
Prevalence
Meta-analysis

ABSTRACT

Background: The field of internet addiction has experienced significant debates
meta-analysis investigated the prevalence rates of generalized internet ad
disorder (IGD).
Methods: We included 113 epidemiologic studies covering 693,306 subjec
nations) that reported prevalence rates for GIA or IGD. We examined po
hypothesized moderators including year, geographic regions, types of
Results: All 133 effect sizes included 53,184 subjects with GIA or IGD.
IGD were 7.02 % (95 % CI, 6.09 %–8.08 %) and 2.47 % (95 %
prevalence was increased over time and prevalence rates variated
neither moderated by year, regions, nor sample representativene
Conclusions: The prevalence of GIA was higher than the prevale
over time and variated with different assessments. Our results
human-machine interaction.

1. Introduction

Although Internet addiction has become a popular research topic for more than two decades, the reported prevalence rates of internet addiction may still be influence by the wide range of conceptual approaches. Young (1996) first conceptualized internet addiction as a generalized impulse control disorder based on its core psychopathology—impaired control. Griffiths (1996) described this kind of technological addiction as behavioral addiction that involves human-machine interactions. Similarly, Beard (2005) claimed that internet addiction should classify as a type of behavioral addiction. In 2013, the American Psychiatric Association (APA) specified internet addiction as internet gaming disorder (IGD) in Section III research criteria of the DSM-5 (APA, 2013). The World Health Organization (WHO) has also listed "Gaming Disorder" as a substance use and addictive disorders in the ICD-11 beta draft (WHO, 2018). However, the psychopathological foundation of internet addiction is still controversial (King et al., 2018; Rumpf et al., 2018). Most self-report scales evaluating internet addiction were developed based on
use disorder (Cher
Young, 1998). Al
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the prevalence
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* Corresponding author at: 35 Keyan Road, Zhunan, Miaoli County, 3505
E-mail addresses: yuanchienpan@gmail.com (Y.-C. Pan), tonychiupsy@
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JMIR MENTAL HEALTH

Original Paper

Thom et al

Internet Use, Depression, and Anxiety in a Healthy Adolescent Population: Prospective Cohort Study

Robyn Pauline Thom[1], MD; David S Bickham[2], PhD; Michael Rich[2], MD, MPH

[1]Harvard Longwood Psychiatry Residency Training Program, Brigham and Women's Hospital & Beth Israel Deaconess Medical Center, Boston, MA, United States
[2]Center on Media and Child Health, Boston Children's Hospital, Boston, MA, United States

Corresponding Author:
Robyn Pauline Thom, MD
Harvard Longwood Psychiatry Residency Training Program
Brigham and Women's Hospital & Beth Israel Deaconess Medical Center
60 Fenwood Road
Department of Psychiatry
Boston, MA, 02115
United States
Phone: 1 857 307 5521
Email: rthom@bidmc.harvard.edu

Abstract

Background: Psychiatric disorders, including conduct disturbances, substance abuse, and affective disorde
approximately 20% of adolescents. In parallel with the rise in internet use, the prevalence of depression among a
increased. It remains unclear whether and how internet use impacts mental health in adolescents.

Objective: We assess the association between patterns of internet use and two mental health outcomes (depression
in a healthy adolescent population.

Methods: A total of 126 adolescents between the ages of 12 and 15 years were recruited. Participants reported the
computer and internet usage patterns. At baseline and one-year follow-up, they completed the Beck Depression Index for primary
care (BDI-PC) and the Beck Anxiety Inventory for Primary Care (BAI-PC). Individual linear regressions were completed to
determine the association between markers of internet use at baseline and mental health outcomes at one-year follow-up. All
models controlled for age, gender, and ethnicity.

Results: There was an inverse correlation between minutes spent on a favorite website per visit and BAI-PC score. No association
was found between internet use and BDI-PC score.

Conclusions: There is no relationship between internet use patterns and depression in adolescents, whereas internet use may
mitigate anxiety in adolescents with higher levels of baseline anxiety.

(JMIR Ment Health 2018;5(2):e44) doi: 10.2196/mental.8471

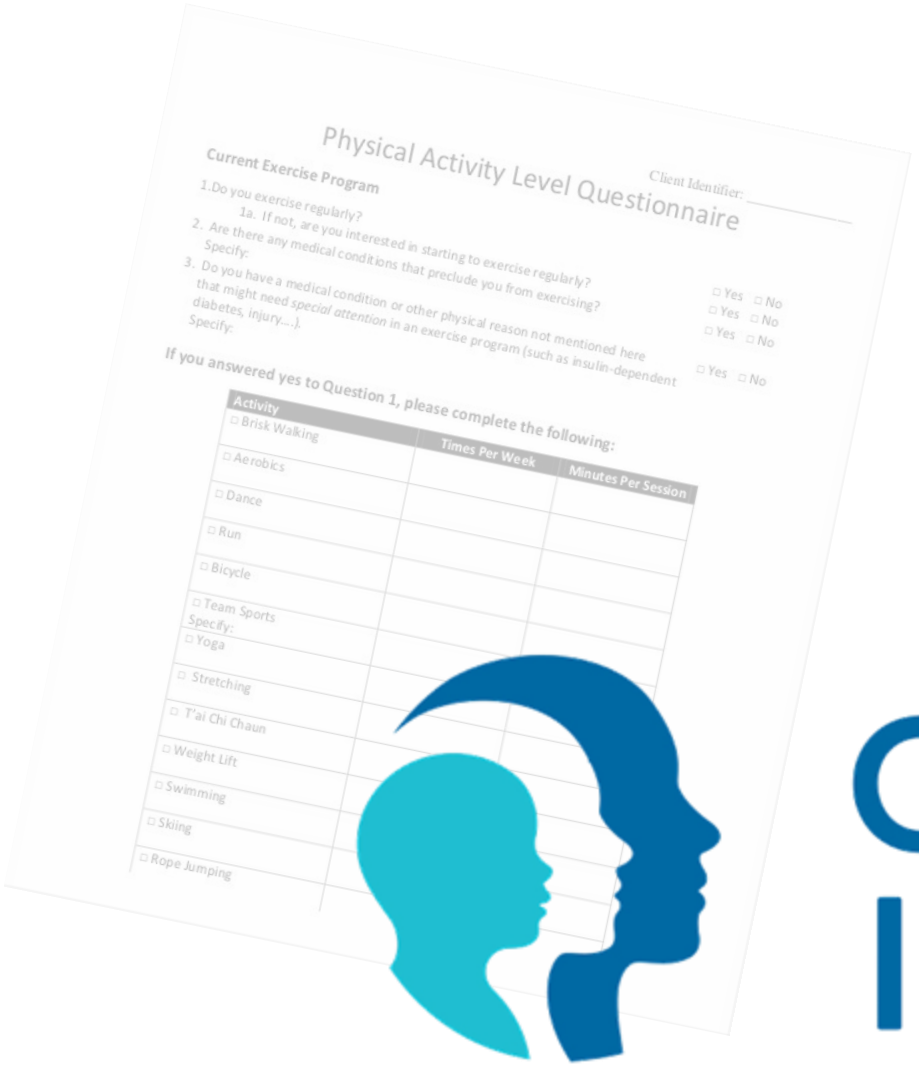
KEYWORDS

mental health; psychiatric disorders; internet use; social networking sites

Introduction

Background

Psychiatric disorders, including conduct disturbances, substance abuse, and affective disorders, emerge in approximately 20% of adolescents [1]. Internet use is pervasive among
92% of American teens reporting
reporting nearly constan
adolescence include
self-image, and crea
remain
develo
prevale
8.7% i
rise i



Child Mind Institute

The Goal

Identify early signs of problematic internet use based on physical activity and fitness data.

5,000 children
Ages 5 through 22

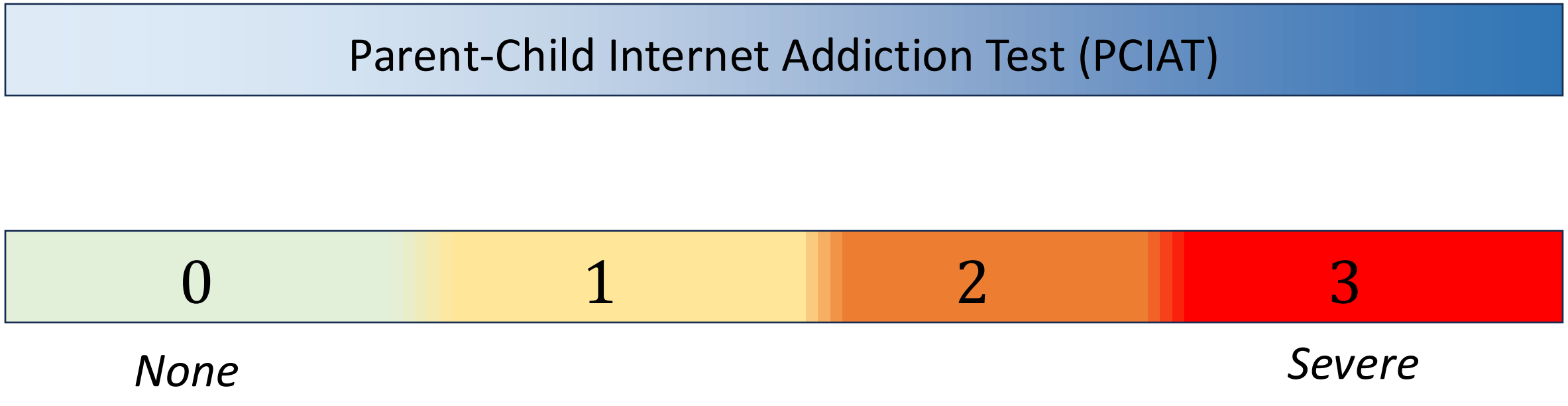
No participants with complete data

Child Mind Institute

HEALTHY BRAIN NETWORK

The Data

The Data: Target Variable



Severity Impairment Index (SII)

~3000 with at least some target information

Impute missing PCIAT scores

Demographics

Age

Sex

Physical

Height

Weight

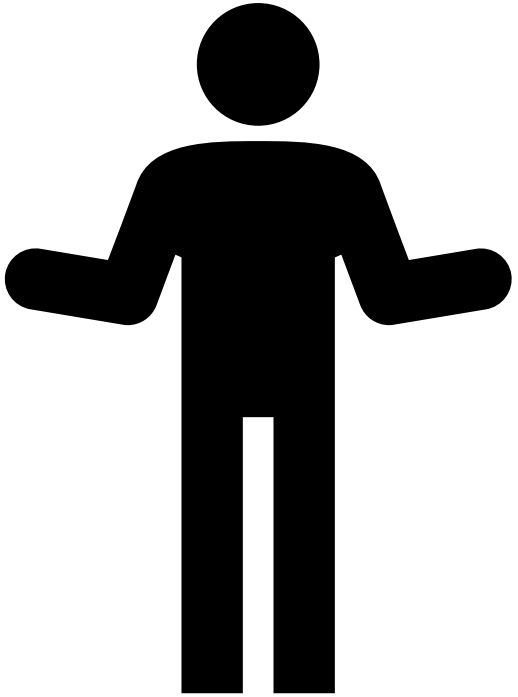
BMI

Waist

Systolic BP

Diastolic BP

Heart Rate



The Data: Predictor Variables

Demographics
Age
Sex

Physical
Height
Weight
BMI
Waist
Systolic BP
Diastolic BP
Heart Rate

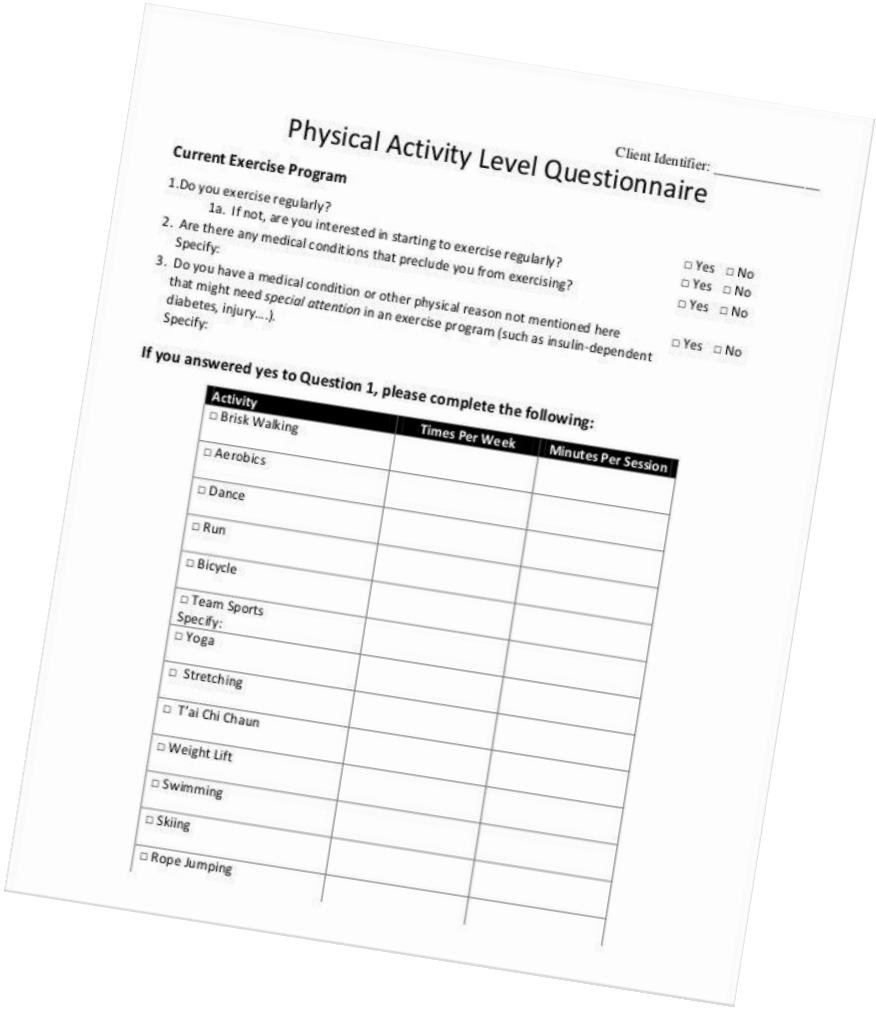
Internet Use
Hours per Day

Children's Global Assessment Scale

Sleep Disturbance Scale

Physical Activity Questionnaire

PAQ MVPA Zone



Physical Activity Level Questionnaire

Client Identifier: _____

Current Exercise Program

1. Do you exercise regularly? ☐ Yes ☐ No
   1a. If not, are you interested in starting to exercise regularly? ☐ Yes ☐ No
2. Are there any medical conditions that preclude you from exercising? ☐ Yes ☐ No
   Specify:
3. Do you have a medical condition or other physical reason not mentioned here that might need *special attention* in an exercise program (such as insulin-dependent diabetes, injury…).
   Specify: ☐ Yes ☐ No

If you answered yes to Question 1, please complete the following:

Activity	Times Per Week	Minutes Per Session
☐ Brisk Walking		
☐ Aerobics		
☐ Dance		
☐ Run		
☐ Bicycle		
☐ Team Sports Specify:		
☐ Yoga		
☐ Stretching		
☐ T'ai Chi Chaun		
☐ Weight Lift		
☐ Swimming		
☐ Skiing		
☐ Rope Jumping		

The Data: Predictor Variables

Demographics
Age
Sex

Physical
Height
Weight
BMI
Waist
Systolic BP
Diastolic BP
Heart Rate

Internet Use
Hours per Day

Children's Global Assessment Scale

Sleep Disturbance Scale

Physical Activity Questionnaire

PAQ MVPA Zone

Fitness
Endurance Time
Endurance Max
Curl-Up
Grip Strength D
Grip Strength ND
Push-Up
Sit & Reach Left
Sit & Reach Right
Trunk Lift

Fitness Zone
Curl-Up
Grip Strength D
Grip Strength ND
Push-Up
Sit & Reach Left
Sit & Reach Right
Trunk Lift

The Data: Predictor Variables

Demographics
Age
Sex

Physical
Height
Weight
BMI
Waist
Systolic BP
Diastolic BP
Heart Rate

Internet Use
Hours per Day

Children's Global Assessment Scale

Sleep Disturbance Scale

Physical Activity Questionnaire

PAQ MVPA Zone

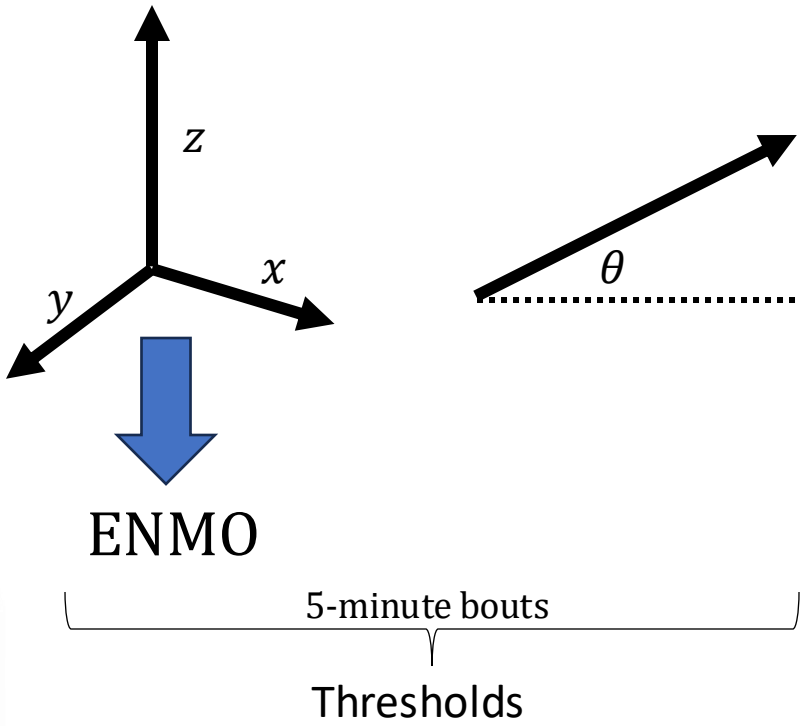
Fitness
Endurance Time
Endurance Max
Curl-Up
Grip Strength D
Grip Strength ND
Push-Up
Sit & Reach Left
Sit & Reach Right
Trunk Lift

Fitness Zone
Curl-Up
Grip Strength D
Grip Strength ND
Push-Up
Sit & Reach Left
Sit & Reach Right
Trunk Lift

BIA
Bone Mineral Content
BMI
Basal Metabolic Rate
Daily Energy Exp.
Extracellular Water
Fat Free Mass
FFM Index
Fat Mass Index
Body Fat Percentage
Body Frame
Intracellular Water
Lean Dry Mass
Lean Soft Tissue
Skeletal Muscle Mass
Total Body Water

The Data: Predictor Variables

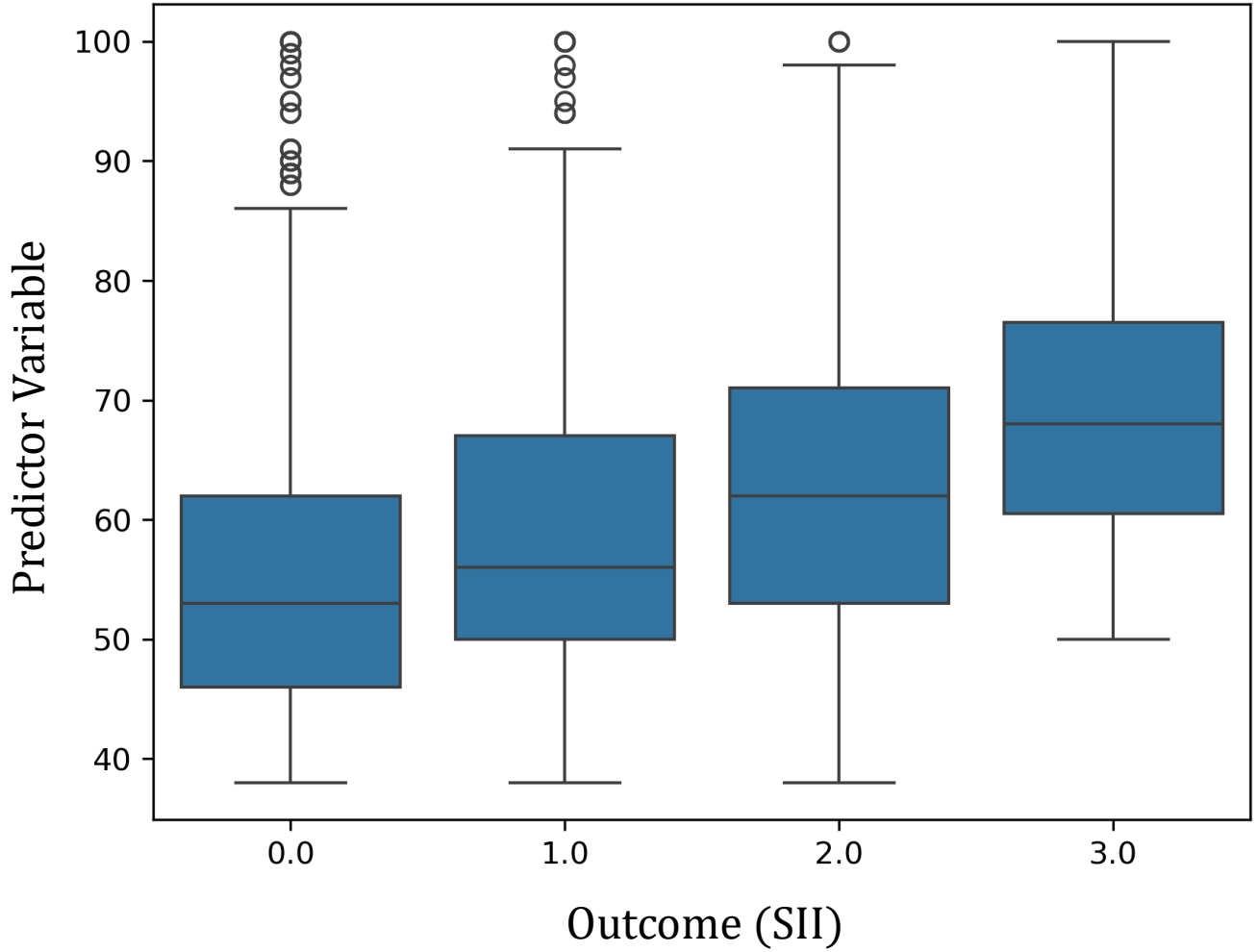
Continuous recording of accelerometer data for ~1000 subjects spanning many days.



The Data: Actigraphy

Missing data

Little predictive power

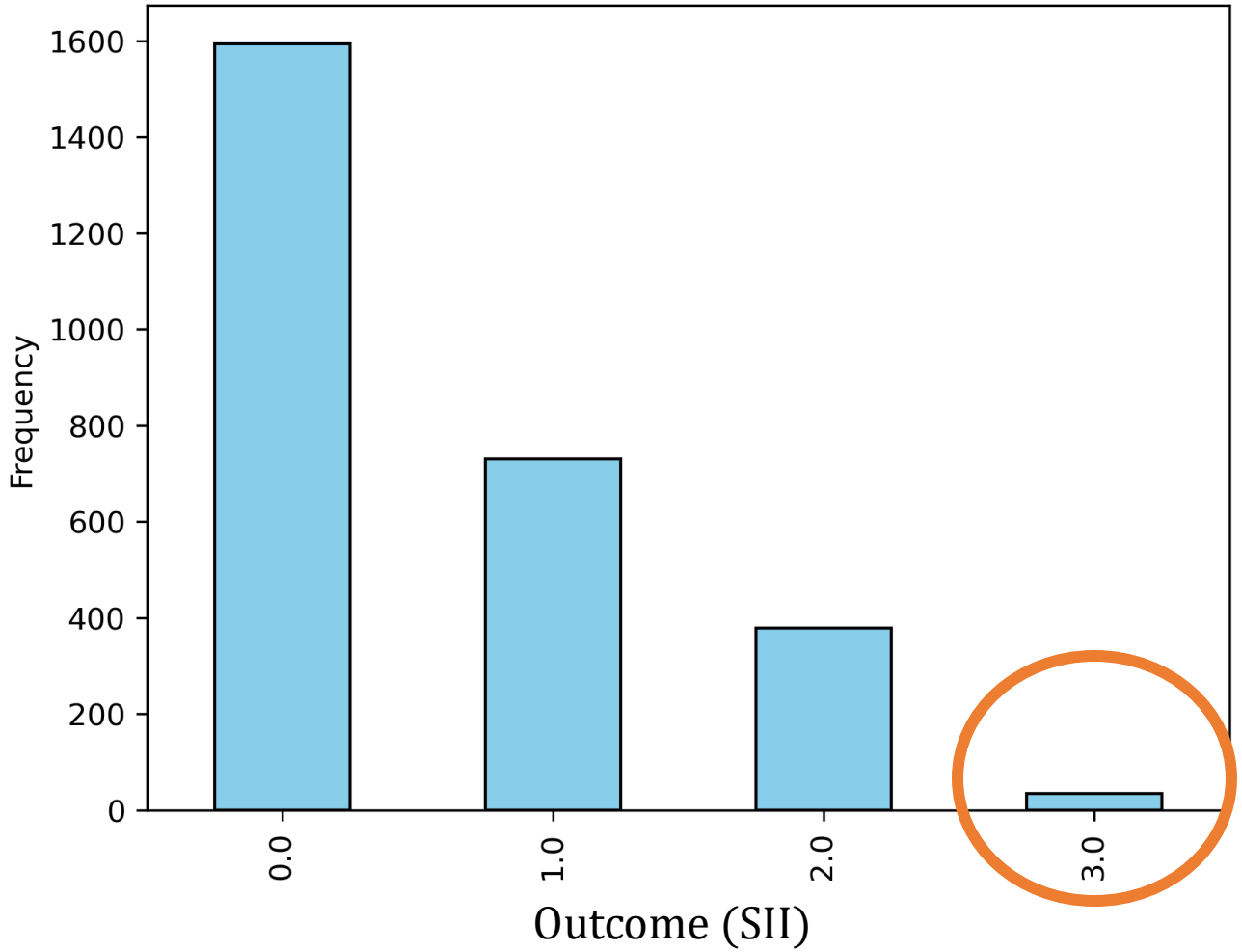


Data Challenges

Missing data

Little predictive power

Sparse data for SII score 3.



Data Challenges

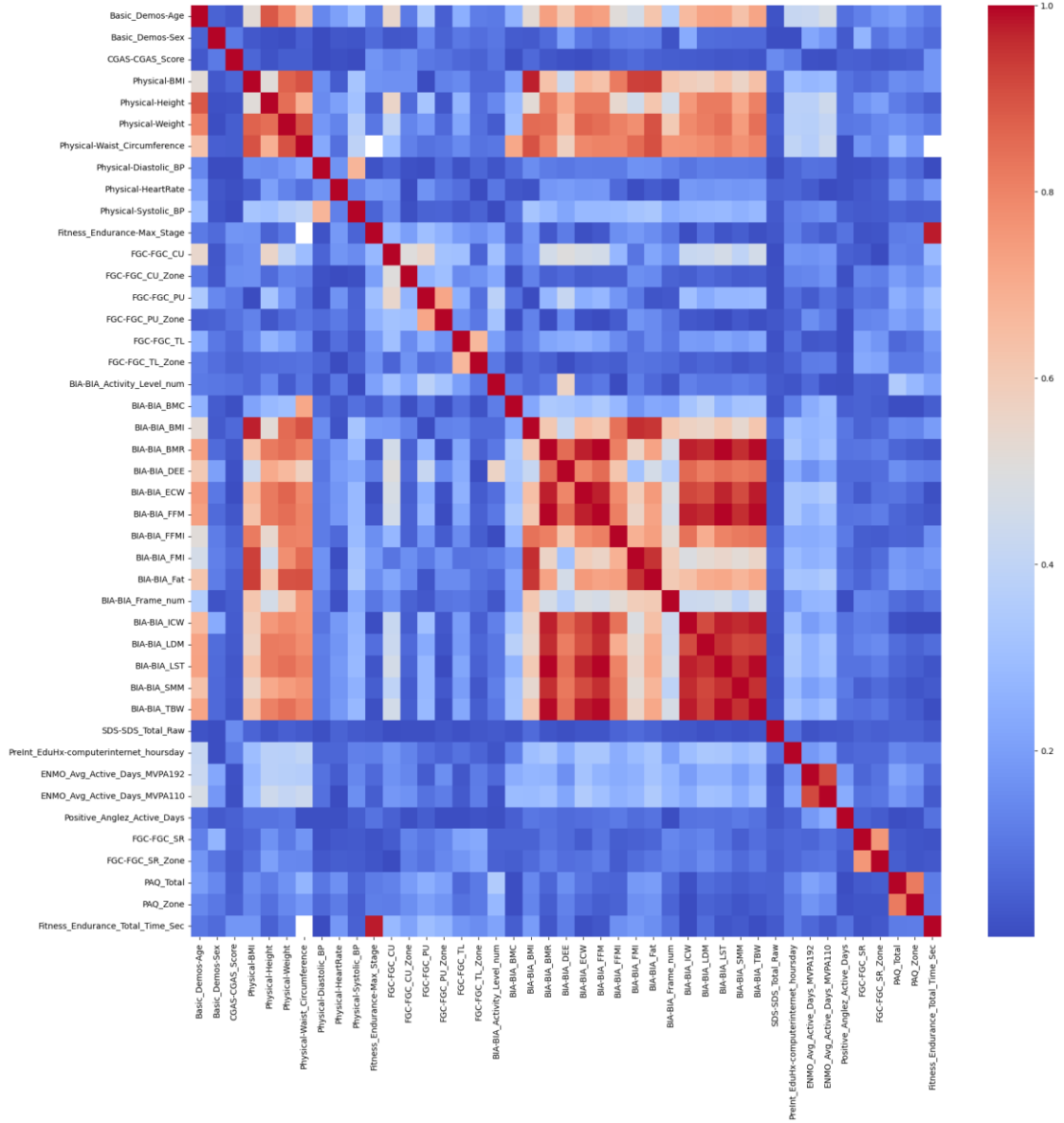
Missing data

Little predictive power

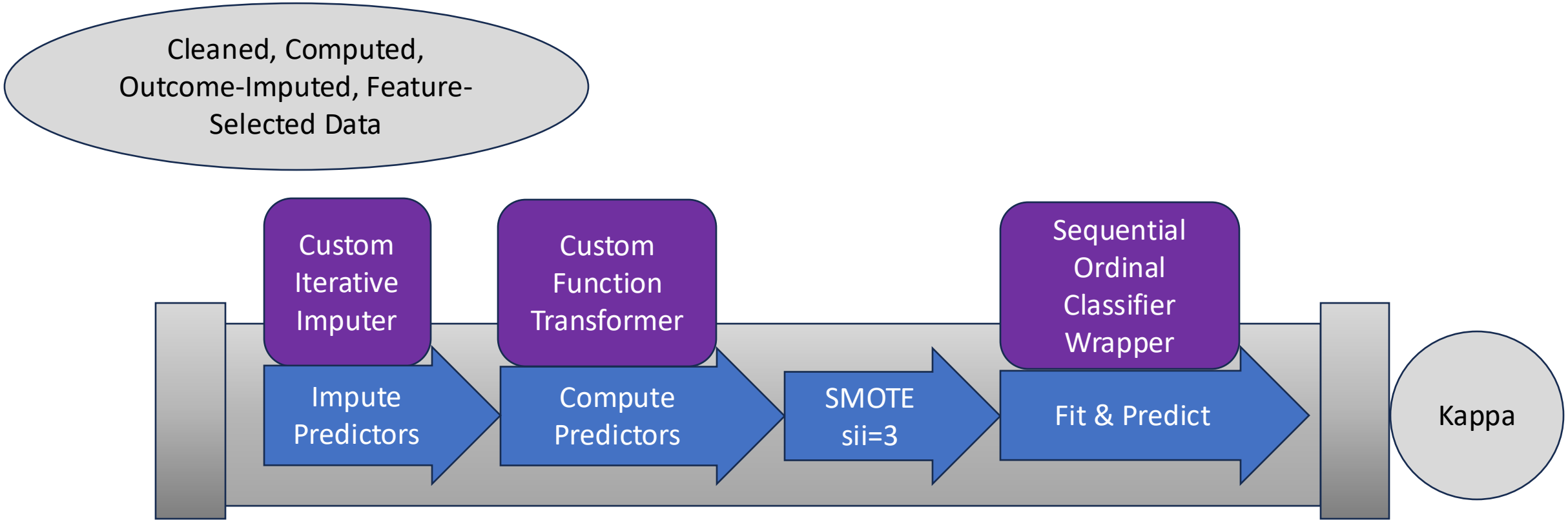
Sparse data for SII score 3.

Feature Reduction

Feature Selection



Data Challenges

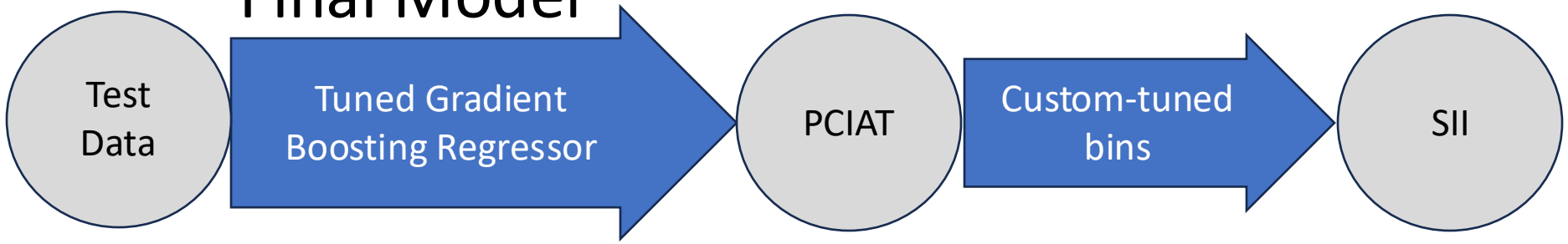


SLR
MLR
Logistic
Random Forest
SVR
AdaBoost
GradientBoost
XGBoost

+ Tuning

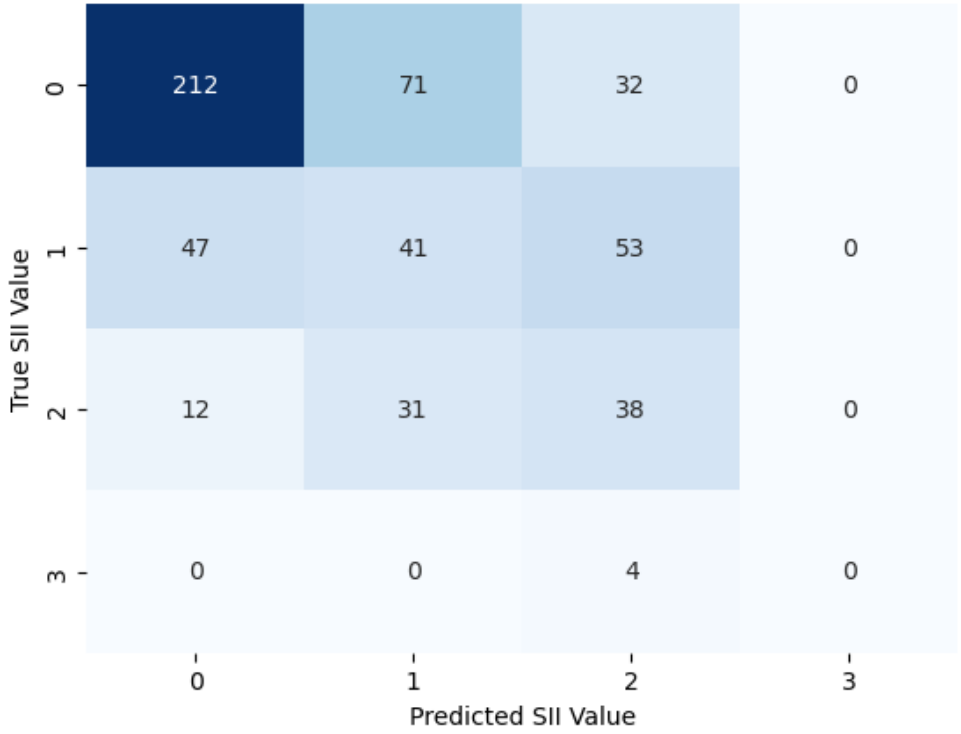
Modeling Process

Final Model



$\kappa = 0.456$

Kaggle leader: $\kappa = 0.5$



Final Results

Predicting problematic internet use is difficult… with the provided data

Expand methods for ordinal data

Final Results