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College students and Problematic Internet Use (PIU): A pilot study assessing self-appraisal and independent behavior change

Megan A Moreno, MD MEd MPH¹, Jens Eickhoff, PhD², Qianqian Zhao, MS², and Joan-Carles Suris, MD PhD³

¹Department of Pediatrics, University of Wisconsin-Madison

²Department of Biostatistics and Medical Informatics, University of Wisconsin-Madison

³Department of Pediatrics, Lausanne University

Abstract

Purpose: Problematic Internet Use (PIU) is a growing health concern; universal screening and validated interventions remain elusive. This pilot study's purpose was to assess participants' self-appraisal of PIU risk, and the subsequent frequency and outcome of behavior change after validated PIU screening.

Methods: In this 3-year study, college student participants reported yearly self-appraised PIU risk, and then completed a Problematic and Risky Internet Use Screening Scale (PRIUSS). At Time 3, participants reported behavior change based on Time 2 screening.

Results: Our 283 participants were 57% female and 75% Caucasian. Participants' self-appraisal of PIU risk had a sensitivity of 23-39%. Of 29 participants at risk at Time 2, 6 (20.6%) reported attempted behavior change at Time 3, though 83.3% remained at risk.

Conclusions: College students have varied capacity to assess and implement effective behavior change regarding PIU. The role of providers in identification and intervention for PIU remains critical.

Implications and contribution: Problematic Internet Use (PIU) is a growing health issue. This pilot study assessed college students' PIU self-appraisal and subsequent behavior change post-screening. Findings indicate college students' limited effectiveness in independent assessment and personal behavior change regarding PIU. The role of clinical providers in PIU identification and intervention remains essential.

Corresponding author: Megan A. Moreno, MD, MEd, MPH, Academic Division Chief, General Pediatrics and Adolescent Medicine, Vice Chair of Digital Health, Associate Professor, Department of Pediatrics, University of Wisconsin-Madison, 2870 University Ave, Suite 200, Mailcode 9010, Madison, WI 53705, mamoreno@pediatrics.wisc.edu, Phone: 608-263-2846, Website: www.smahrtresearch.com.

Conflict of Interest:

No authors have conflicts of interest to report. The study sponsor had no role in (1) study design; (2) the collection, analysis, and interpretation of data; (3) the writing of the report; and (4) the decision to submit the manuscript for publication.

INTRODUCTION

Problematic Internet Use (PIU) is defined as “Internet use that is risky, excessive or impulsive in nature leading to adverse life consequences, specifically physical, emotional, social or functional impairment.[1]” Estimated PIU prevalence among college students is 4-6%.[2, 3] PIU has been associated with depression, stress and fewer positive health behaviors.[2]

A validated screening instrument for PIU is available.[4] However, PIU screening is not standard clinical practice, and it is unclear how many youth would self-identify as at risk without screening, or whether such PIU self-appraisal is accurate. Further, PIU screening can pose challenges for those identified as at risk; there are currently no validated interventions for PIU.

In absence of validated PIU interventions, it is possible that PIU screening could motivate behavior change. Previous alcohol research supports that the screening experience can lead to self-reported behavior change.[5] The purpose of this pilot study was 1) to understand whether college students are accurate in self-appraisal for PIU, 2) frequency of behavior change following validated PIU screening, and 3) effectiveness of independent behavior change at reducing PIU risk one year later.

METHODS

Study design and Setting

This prospective longitudinal pilot study included two large state universities, one in the Midwest and one in the Northwest. Data were collected between May 11, 2013 and June 15, 2015. This study received approval from the two relevant Institutional Review Boards.

Subjects and Recruitment

College students were recruited via random selection from registrar’s lists. Participants were eligible if they were enrolled at one of these two universities and between the ages of 17 and 19 years when entering college. Students were recruited through emails, phone calls and Facebook messages.

Interview measures and procedure

Interviews were conducted yearly at 3 time points: T1=junior year, T2=senior year, T3=5th year/post-graduation. Trained staff completed phone interviews and data were recorded using a FileMaker© database.

First, for T1-T3, participants were provided a definition of PIU[1] and asked if they had any concerns that they may have PIU. Response options included Yes, No or Maybe. Participants then completed The Problematic and Risky Internet Use Screening Scale (PRIUSS), a validated 18-item scale with scores ranging from 0 to 72. A score cutoff of 25 identifies those at risk for PIU.[6, 7]

At T2, after completing the PRIUSS, participants were told whether their score met criteria as at risk for PIU. At T3, participants were asked whether they had made behavior changes in their Internet use based on the prior year's PRIUSS screening.

Demographic variables included gender, race/ethnicity and university.

Analysis

Demographic characteristics were summarized in terms of frequencies and percentages. We dichotomized participants' self-appraisal of PIU risk into Yes/Maybe and No. We then used participants' self-appraisal of risk for PIU to determine estimates for sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of the PRIUSS score at each time point (T1-T3). Furthermore, data from T2 and T3 were used to determine 1) if behavioral change had been attempted at T3, and 2) proportion of at-risk participants at T2 who engaged in behavior change and were low-risk at T3. All reported *p*-values were 2-sided, and $p < .05$ was used to define statistical significance. Statistical analyses were performed using SAS software version 9.4 (SAS Institute, Cary, NC).

RESULTS

A total of 283 participants included 57% female and 75% Caucasian. At Time 1, PRIUSS scores had mean of 12.04 (SD=9.72), median of 10 (IQR: 4-18), with score range of 0-49. Participant's self-appraisal of PIU risk for T1-T3 compared to PRIUSS screening results are described in Table 1. There was high specificity and low sensitivity at all 3 time points. No significant differences in demographics or PIU were noted among drop-outs.

At T2, a total of 29 participants (11.2%) were at risk based on PRIUSS scores. Among these 29 participants, 6 (17.6%) reported at T3 that they had tried behavior change following T2 screening. At T3, 5 of 6 of these participants (83.3%) remained at-risk based on PRIUSS score. Most participants who reported engaging in behavior change at T3 were not at risk at T2 (Table 2).

DISCUSSION

In this pilot study, we describe college student participants' experiences with self-appraisal for PIU, as well as frequency of pursuing behavior change after PIU screening. Findings suggest that college students at low risk for PIU are likely accurate in their appraisal of their low level of risk, while higher risk students have poor accuracy in estimating their risk.

Our study also followed college students over time to evaluate how often students attempt behavior changes based on PIU screening. We found that about 13% of students engaged in behavior change following PIU screening, but most of these students were not at high risk. Among students who were at high risk for PIU, only a fraction engaged in behavior change and most remained at risk the following year.

Limitations to our study include that while the sample is representative of the colleges from which the data were drawn, the sample is not representative of all colleges, especially those with more racially diverse students. All interview variables were via self-report, creating the

possibility for recall and social desirability bias. The end-of-college time point we evaluated may have introduced bias. Further, our small sample size limited our capacity for more complex analyses of students identified as at-risk.

Despite these limitations, this pilot study suggests clinical implications and future study directions. Our data support the crucial role of providers in working with youth to identify and intervene with PIU. Findings suggest that solo efforts by patients at behavior change are unlikely to reduce PIU. While no validated interventions are available, it is possible that approaches that are effective in other complex behavioral issues, such as motivational interviewing[8] with follow up visits for accountability, or partnership with a mental health professional, may be effective. Studies about effective PIU interventions are needed.

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Abbreviations

PIU	Problematic Internet Use
PRIUSS	Problematic and Risky Internet Use Screening Scale
PPV	positive predictive value
NPV	negative predictive value

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Table 1.

College students participants' self-appraisal of Problematic Internet Use (PIU) risk compared to PIU risk identified by validated screening^{*}

Time 1			
PIU self-appraisal	n (%)	PRIUSS score (mean/SD)	p value [*]
Yes	35 (12.37)	22.31 (11.45)	p<0.0001
No	226 (79.86)	10.01 (8.40)	
Maybe	22 (7.77)	16.64 (7.61)	
	Time 1 n=283	Time 2 n=265	Time 3 n=261
Sensitivity	30.29%	23.27%	39.42%
Specificity	95.25%	93.27%	97.27%
Positive predictive value (PPV)	63.86%	53.75%	75.87%
Negative predictive value (NPV)	83.13%	79.86%	86.52%

^{*} ANOVA comparing PRIUSS score across self-appraisal categories

^{*} Screening used the Problematic and Risky Internet Use Screening Scale

Table 2.

PRIUSS^{*} score at Time 2 and self-reported behavior change at Time 3

	Time 2 PRIUSS score indicated at risk (score>25)	Time 2 PRIUSS score indicated NOT at risk (score <=25)
Time 3 Self-reported behavior change based on PRIUSS	6 (17.6%)	28 (82.4%)
Time 3 Self-reported NO behavior change based on PRIUSS	23 (10.5%)	196 (89.5%)

* PRIUSS: Problematic and Risky Internet Use Screening Scale