

Screening for Adolescent Problematic Internet Use: Validation of the Problematic and Risky Internet Use Screening Scale (PRIUSS)



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ABSTRACT

OBJECTIVE: Problematic Internet use (PIU) is an emerging health concern that lacks screening measures validated for use with adolescents and young adults. This study aimed to validate the Problematic and Risky Internet Use Screening Scale (PRIUSS) for use with older adolescents and to increase its clinical utility by determining scoring guidelines and assessing the relationship between PIU and other mental health conditions.

METHODS: This cross-sectional survey study took place at a large, public Midwestern university among 330 older adolescents aged 18 to 25 years. Confirmatory factor analysis and Spearman's correlations were used to assess the PRIUSS' structural and construct validity, respectively. A risk-based scoring cutoff was estimated using a Bayesian latent class modeling approach to computing a receiver operating characteristic curve.

RESULTS: The confirmatory factor analysis indices for the 3-factor model indicated an acceptable fit (goodness-of-fit index

0.89, root mean square error of approximation 0.07). A cutoff of 25 (sensitivity 0.80, 95% confidence interval [CI] 0.47–0.99; specificity 0.79, 95% CI 0.73–0.84) is proposed for identifying those at risk for PIU. Participants at risk for PIU were at significantly greater odds of also reporting symptoms of attention-deficit/hyperactivity disorder (odds ratio [OR] 2.36, 95% CI 1.21–4.62, $P = .009$), depression (OR 3.25, 95% CI 1.65–6.42, $P = .008$), and social anxiety (OR 3.77, 95% CI 2.06–6.89, $P < .000$).

CONCLUSIONS: The PRIUSS demonstrated validity as a PIU screening instrument for adolescents and young adults. Screening for PIU may also help to identify those at high reciprocal risk for other mental health conditions.

KEYWORDS: assessment; college health; media; mental health; prevention

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WHAT'S NEW

Problematic Internet use (PIU) affects approximately 4% to 6% of US adolescents and young adults. This study validates a clinical screening measure, the Problematic and Risky Internet Use Screening Scale (PRIUSS), and provides scoring guidelines for its use in interpreting older adolescents' risk for PIU.

PROBLEMATIC INTERNET USE (PIU) is an emerging health concern among US adolescents and young adults (AYAs). A study of high school students throughout Connecticut estimated its prevalence at 4%.¹ Moreover, 3 recent studies sampling from AYA university students estimated the prevalence between 4% and 6%,^{2–4} which is a rate comparable to other conditions often addressed clinically among this population such as depression.⁵ PIU has been associated with poor academic performance,

stress, and fewer positive health behaviors.³ Longitudinal studies have also suggested bidirectional relationships between PIU and other mental health conditions such as depression.^{6–8}

Although definitive diagnostic criteria for PIU are yet to be established, Internet use addiction disorder is currently included in the appendix of the *Diagnostic and Statistical Manual of Mental Disorders*, version 5, as a disorder requiring further study. Irrespective of its official designation, there are undoubtedly a substantial number of youth for whom Internet use has adverse effects and who may thus benefit from intervention. Given that online activities now often begin early in childhood, primary care pediatric clinicians are uniquely positioned to help prevent the development of PIU.⁹ Further, PIU appears to follow a similar developmental trajectory to other risk behaviors such as bullying or tobacco or alcohol use, all of which are commonly screened for and addressed during AYA wellness visits.

Thus, the development of a screening tool specific to PIU during adolescence and young adulthood and suitable for clinical settings is an important step in designing primary prevention efforts. The majority of existing rating scales for PIU symptoms have been adapted from diagnostic criteria for disparate psychiatric disorders and developed for adults.^{10,11} A recent systematic review of PIU highlighted the diversity of measurement tools that lack validation and the resultant disparate prevalence estimates, and concluded that a uniform and validated approach to measurement is a necessary next step to understanding prevalence of PIU among AYAs.¹⁰ Moreno and colleagues¹² described the first data-driven conceptual framework for PIU specific to AYAs, including a definition of PIU as, “Internet use that is risky, excessive or impulsive in nature leading to adverse life consequences, specifically physical, emotional, social or functional impairment.” Further, the framework identifies 7 core constructs of PIU: 3 describing the nature of PIU (“risky Internet use” “impulsive Internet use,” “Internet use dependency”); 3 describing its impact on AYA health and well-being (“physical impairment,” “emotional impairment,” “social/functional impairment”); and a final construct describing factors that may predispose AYAs to PIU (“psychosocial risk factors”). In a follow-up study, Jelenchick and colleagues¹³ adapted the comprehensive list of characteristics, behaviors, and symptoms describing each of the framework’s construct into an item pool for use in a scale development study. Specifically, 75 of the descriptive terms were assessed using the psychometric methods for scale development described by DeVellis.¹⁴ The end product, the Problematic and Risky Internet Use Screening Scale (PRIUSS), is an 18-item risk-based screening scale for PIU with questions organized into 3 subscales: Social Impairment, Emotional Impairment, and risky/impulsive Internet use. [Figure 1](#) summarizes the process used to integrate Moreno and colleagues’ conceptual framework into the development of the PRIUSS.

Although the PRIUSS underwent an empirical development process and demonstrated strong reliability and content validity, further validation is needed to support its use in AYA health settings. Thus, the aims of the current study were 3-fold: 1) to assess the PRIUSS’ structural validity by confirming its factor structure, 2) to extend the construct validation of the PRIUSS, including establishing convergent and divergent validity with other behavioral and mental health conditions, and 3) to determine preliminary scoring guidelines to facilitate its clinical utility.

METHODS

SUBJECTS AND SETTING

This cross-sectional survey study was conducted between January 2012 and June of 2013. Approval of the study was granted by the institutional review board at the University of Wisconsin. Participants were older adolescents aged 18 to 25 years recruited from undergraduate students enrolled in a nutritional sciences course at a public university located in the Midwest, a course that has both

a high enrollment number and fulfills general education requirements for a variety of programs and majors.

PROCEDURE

Students were initially invited to participate in the study through an in-class announcements; a posting was also placed on course Web sites. All participants provided written consent before completing the survey on a secure online site. The survey contained standard demographic questions and general Internet use questions. Internet use questions included the respondents’ average number of times using the Internet per day, total daily hours spent online, number of hours spent on work or school activities, and number of hours spent on recreational activities. When responding to these questions, participants were instructed to think of their use over the last month and include time spent on any Internet application, whether using a computer or mobile device. Time spent text messaging was not included unless text messages were being used to interact with an online application. Finally, the survey contained the PRIUSS, as well as behavioral and mental health measures intended to assess the PRIUSS’ construct validity. Students who completed the survey received a \$10 gift card.

MEASURES

PROBLEMATIC AND RISKY INTERNET USE SCREENING SCALE (PRIUSS)

The PRIUSS has 18 items and 3 subscales: 1) Social Impairment (items 1–6), which assesses the impact of Internet use on both off-line and online social interactions; 2) Emotional Impairment (items 7–11), which assesses degree of emotional attachment to Internet use; and 3) Risky/Impulsive Internet Use (items 12–18), which assess salient problematic behaviors regarding Internet use.¹³ The full text of the PRIUSS as it was presented to participants is available as an [Online Supplementary Figure 1](#).

ADULT ADHD SELF-REPORT SCREENER (ASRS)

The ASRS is a 6-item scale adapted from the *Diagnostic and Statistical Manual of Mental Disorders*, version 4, symptoms for attention-deficit/hyperactivity disorder (ADHD) that has been validated in both adolescents and adults.^{15,16} On the basis of existing recommendations, at least 4 of the 6 symptoms had to be positively endorsed to classify participants reporting symptoms consistent with ADHD.

PATIENT HEALTH QUESTIONNAIRE (PHQ-9)

The PHQ-9 is 9-item self-report scale for frequency of depression symptoms experienced in the last 2 weeks that has been validated for use in adolescents and adults.¹⁷ On the basis of existing recommendations, scores of ≥ 11 were used to classify participants reporting symptoms consistent with major depressive disorder.¹⁷

SOCIAL PHOBIA INVENTORY (SPIN)

The SPIN is a 17-item self-report scale for social phobia symptoms that has been validated for use in

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