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An exploratory examination of At-Risk/Problematic Internet Use and disordered eating in adults

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HIGHLIGHTS

- Examined At-Risk/Problematic Internet Use (ARPIU/PIU) and eating disorders (EDs)
- ARPIU/PIU and subthreshold/full ED groups reported greater pathology than controls.
- ARPIU/PIU and Sub-ED/ED share links to depression and poor self-control.
- Co-occurrence of ARPIU and subthreshold ED was associated with greater depression.
- Co-occurrence of PIU and ED was associated with greater depression.

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ABSTRACT

Purpose: At-Risk/Problematic Internet Use (ARPIU) has been associated with impairment in multiple domains including psychopathology. The present study examined the relationship between ARPIU and disordered eating in a large community sample.
Methods: Participants (n = 1000) completed an online survey about health behaviors. Two thresholds of ARPIU and disordered eating each were examined.
Results: The ARPIU and Sub-ED (subthreshold eating disorders) groups reported greater depressive symptoms and poorer self-control than the Control group; the Sub-ED group reported greater impulsivity than the Control group. The ARPIU and Sub-ED groups significantly differed in key features related to each condition. Finally, the co-occurrence of ARPIU and Sub-ED was associated with greater depression. In the second set of analyses based on more stringent thresholds, the Problematic Internet Use (PIU) and ED groups differed on all measures compared to the Control group. The PIU and ED groups also differed on key features related to each condition, but did not differ on measures of impulsivity or self-control. The co-occurrence of PIU and ED was associated with greater depressive symptoms than either PIU or ED independently.
Conclusions: ARPIU and Sub-ED share links to depression and poor self-control and these may represent possible therapeutic targets across Internet-use and disordered-eating behaviors. Co-occurring PIU and ED at either lenient or stringent thresholds is associated with greater depression. Future studies should examine the temporal nature of these associations and the extent to which targeting depression, Internet use, or disordered eating may lead to improvements across domains.

1. Introduction

Internet use may become excessive, and when it interferes with daily functioning, it may be considered problematic or possibly addictive. Various terms have been used to describe excessive Internet use including "At-Risk/Problematic Internet Use" (ARPIU; Yau, Potenza, & White, 2013), "pathological Internet use" (Morahan-Martin & Schumacher, 2000), "Problematic Internet Use" (PIU; Liu, Desai, Krishnan-Sarin, Cavallo, & Potenza, 2011) and "compulsive Internet use" (Claes et al., 2012). Defining features of ARPIU have ranged from loss of control and associated distress (Shapira, Goldsmith, Keck, Khosla, & McElroy, 2000) to withdrawal symptoms, impairment, and conflicts surrounding Internet

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use (Claes et al., 2012). PIU has been defined as having features such as attempts to cut back Internet use, strong urges to use the Internet, and reductions in anxiety following Internet use (Liu et al., 2011). Given different operational definitions of ARPIU, prevalence estimates vary widely across studies (Rodgers, Melioli, Laconi, Bui, & Chabrol, 2013; Petry & O'Brien, 2013), ranging from less than 1% (Aboujaoude, Koran, Gamel, Large, & Serpe, 2006) to over 50% (Yau et al., 2013).

Problems with Internet use — defined previously in various ways — is controversial with some individuals having advocated for inclusion of an Internet use disorder in the DSM-5 (American Psychiatric Association, 2013) and others not (Block, 2008; Petry & O'Brien, 2013). Although not considered a formal psychiatric disorder, problems with Internet use are associated with psychopathology and other dysfunction including depressive symptoms (Kraut et al., 1998; Young & Rogers, 1998), social, vocational and financial impairment (Shapira et al., 2000), poor self-control (Kim, Namkoong, Ku, & Kim, 2008), impulsivity (Lee et al., 2012), and psychiatric disorders relating to anxiety, attention deficits, substance use, and disordered eating (Bernardi & Pallanti, 2009; Claes et al., 2012; Shapira et al., 2000; Tao & Liu, 2009; Yen, Ko, Yen, Chen, & Chen, 2009).

With respect to disordered eating, preliminary evidence in both outpatient (Claes et al., 2012) and community samples (Rodgers et al., 2013) suggests that ARPIU and eating disorders (EDs) may co-occur. Claes et al. (2012) found that in persons diagnosed with ED, approximately 12% met criteria for PIU. Conversely, in persons with PIU, approximately 15% met criteria for EDs (Shapira et al., 2000). The nature of the relationship between ARPIU and EDs, however, is still unclear. For example, individuals may eat in unhealthy fashions while engaged in Internet use in general, or specific features (depressed mood, poor self-control, or elevated impulsivity) may link disordered eating and PIU. More research is needed to better understand this association including the extent of the co-occurrence as well as differences/similarities in correlates and associated functioning.

Given the lack of consistent thresholding with respect to PIU, the present study aimed to examine ARPIU, often defined as endorsing at least one problematic Internet feature, and PIU, a more stringently thresholded and perhaps more clinically relevant construct (Liu et al., 2011). There may be public health relevance for understanding behaviors/conditions that are more prevalent (such as at-risk behaviors) and clinical relevance for understanding behaviors or conditions that are more severe (more stringently thresholded) and thus associated with treatment seeking and treatment engagement. Therefore, in the current study, we compared individuals with ARPIU to a control group on various indices relating to depression, self-control and impulsivity, compared ARPIU to less stringently defined disordered eating (subthreshold ED or Sub-ED), and examined whether the combination of ARPIU and Sub-ED was characterized by poorer health (e.g., greater depression) than either group independently. We also compared PIU to more stringently defined disordered eating (ED) and examined whether the combination of PIU and ED is characterized by poorer health (e.g., greater depression) than either condition independently or to a control group. Given strong links between depression and both PIU and ED, we hypothesized that co-occurring PIU and ED at both stringently and leniently defined thresholds would be associated with greater depression and that PIU and ED groups at both thresholds would differ on measures related to the respective pathologies (e.g., Internet use for PIU and disordered eating for ED).

2. Materials and methods

2.1. Participants

One thousand adults responded to online advertisements seeking volunteers aged 18 years or older for a survey of health behaviors (methodology described in Grilo, Masheb, & White, 2010; Yau et al., 2013). Participants included 132 (13.2%) males and 865 (86.8%) females (3 did not report sex/gender); race/ethnicity was 77.7% (n = 775) White, 6.8% (n = 68) Hispanic, 6.2% (n = 62) Black, 5.2% (n = 52) Asian, and 4.0% (n = 43) "other" or missing. Mean age and Body Mass Index (BMI) were 34.0 (SD = 12.8) years and 28.5 (SD = 7.9) kg/m^2, respectively. The ARPIU group was 14.4% (n = 75) male and 85.6% (n = 446) female (1 did not report sex/gender); race/ethnicity was 73.7% (n = 384) White, 7.5% (n = 39) Hispanic, 7.3% (n = 38) Black, 7.3% (n = 38) Asian, and 4.2% (n = 23) "other" or missing. Mean age and BMI for the ARPIU group were 33.1 (SD = 12.5) years and 28.4 (SD = 8.1) kg/m^2, respectively. The PIU group was 19.1% (n = 17) males and 80.9% (n = 72) females; race/ethnicity was: 72.7% (n = 64) White, 10.2% (n = 9) Hispanic, 5.7% (n = 5) Black, 8.0% (n = 7) Asian, and 3.4% (n = 4) "other" or missing. Mean age and BMI for the PIU group were 30.7 (SD = 10.7) years and 28.5 (SD = 7.8), respectively.

2.2. Procedures and assessments

Advertisements with keywords such as "health" or "weight/dieting" were placed on Craigslist Internet ads. Participants completed an anonymous online survey consisting of demographic information, self-reported height and weight, and self-report questionnaires through SurveyMonkey, a secure online data-gathering platform. The study was approved by the Yale Human Investigations Committee.

Body Mass Index (BMI) was calculated using self-reported height and weight (kg/m^2).

The Eating Disorder Examination-Questionnaire (EDE-Q; Fairburn & Beglin, 1994) assesses the frequency of Objective Bulimic Episodes (OBEs; defined as feeling a loss of control while eating unusually large quantities of food; this definition corresponds to the DSM-5 criteria for binge-eating), the frequency of Subjective Bulimic Episodes (SBEs; defined as feeling a loss of control while eating, but not eating an unusually large quantity of food), and inappropriate weight control and purging methods over the past 28 days; it comprises four subscales and a global total score. The EDE-Q has good test–retest reliability (Reas, Grilo, & Masheb, 2006), convergence with the EDE interview (Grilo, Masheb, & Wilson, 2001a; Mond, Hay, Rodgers, & Owen, 2007a), and good performance in community studies (Mond et al., 2007a).

The Yale Food Addiction Scale (YFAS; Gearhardt, Corbin, & Brownell, 2009) is a 25-item self-report measure of addictive eating. Items correspond to substance-dependence criteria from DSM-IV (American Psychiatric Association, 1994). The YFAS has adequate internal reliability, convergent validity, and incremental validity in predicting binge-eating problems (Gearhardt et al., 2009; Gearhardt et al., 2012; Gearhardt, White, Masheb, & Grilo, 2013).

The Beck Depression Inventory (BDI; Beck & Steer, 1987) assesses depressive symptoms and levels; it has strong psychometric support (Beck, Steer, & Garbin, 1988) and performs well as a marker for severity and distress (Grilo, Masheb, & Wilson, 2001b).

The Barratt Impulsiveness Scale-11 (BIS-11; Patton, Stanford, & Barratt, 1995) consists of thirty items measuring three domains of impulsivity: attentional, motor, and non-planning impulsivity. Higher scores are indicative of greater impulsivity.

The Brief Self-Control Scale (BSCS; Tangney, Baumeister, & Boone, 2004) consists of thirteen items measuring self-control over thoughts, emotions, impulse control, performance regulation and habit breaking. Higher scores are indicative of better self-control.

2.3. Creation of study groups

In the first set of analyses, groups were created based on "at-risk" behaviors. The ARPIU group was created based on endorsement of at least one of the following six features previously used to assess ARPIU (Yau et al., 2013; Yau et al., 2014; Yau, Potenza, Mayes, & Crowley, 2015): 1) Have you ever tried to cut back on your Internet use?,

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