

Potential Markers for Problematic Internet Use: A Telephone Survey of 2,513 Adults

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ABSTRACT

Objective: The Internet has positively altered many aspects of life. However, for a subset of users, the medium may have become a consuming problem that exhibits features of impulse control disorders recognized in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*.

Method: This is the first large-scale epidemiological study of problematic Internet use through a random-digit-dial telephone survey of 2,513 adults in the United States. Given the lack of validated criteria, survey questions were extrapolated from established diagnostic criteria for impulse control disorders, obsessive-compulsive disorder, and substance abuse. Four possible diagnostic criteria sets were generated. The least restrictive set required the respondent to report an unsuccessful effort to reduce Internet use or a history of remaining online longer than intended, Internet use interfering with relationships, and a preoccupation with Internet use when offline.

Results: The response rate was 56.3%. Interviews averaged 11.3 minutes in duration. From 3.7% to 13% of respondents endorsed

Needs Assessment

There has been a great deal of speculation in the media and among mental health professionals about the existence of pathological Internet use. This article reports the results of the first nationwide random-sample survey of problematic Internet use in the United States.

Learning Objectives

At the end of this activity, the participant should be able to:

- Understand the similarities between problematic Internet use and other established psychiatric conditions.
- List questions that can help clinicians determine if an individual's Internet use constitutes a problematic behavior.
- Estimate the percentage of adults with problematic Internet use.

Target Audience: Neurologists and psychiatrists

Accreditation Statement

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≥1 markers consistent with problematic Internet use. The least restrictive proposed diagnostic criteria set yielded a prevalence of problematic Internet use of 0.7%.

Conclusion: Potential markers of problematic Internet use seem present in a sizeable proportion of adults. Future studies should delineate whether problematic Internet use constitutes a pathological behavior that meets criteria for an independent disorder, or represents a symptom of other psychopathologies.

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INTRODUCTION

As an educational, business, and entertainment tool, the Internet has markedly enhanced many aspects of life. According to February 2006 figures from Nielsen//NetRatings,¹ United States household Internet penetrance has reached 74%, with the number of active Internet users continuing to grow. However, a problematic side of this new tool is emerging. Accumulating data²⁻⁴ point to a growing number of individuals for whom the medium becomes a consuming habit with significant negative consequences for their personal and professional lives. Preliminary phenomenological studies^{3,5} of this problem have described the typical affected individual as a college-educated single white male in his fourth decade, with substantial psychiatric comorbidity, who spends ~30 hours/week on computer use that is not essential to his work or well being, resulting in significant subjective distress and functional impairment. E-mail, chat rooms, auction houses, gambling casinos, the "blogosphere," and pornography sites are only a few of the Internet venues that have been associated with problematic use.²

Problematic Internet use—variably termed Internet addiction, compulsive computer use, compulsive Internet use, pathological Internet use, "internetomania," and computer addiction⁶—shares features with the impulse control disorders recognized in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)*⁷: The affected user experiences a repetitive, intrusive urge to perform an act that is pleasurable in the moment but that causes subsequent distress or functional impairment. No consensus exists about whether problematic Internet use forms a distinct disorder or is merely

one expression of an underlying impulsivity/compulsivity that can manifest in a number of behaviors, such as gambling, shopping, hair-pulling, or substance abuse. Researchers⁸ who have considered problematic Internet use as a distinct disorder have suggested diagnostic criteria modeled on the *DSM-IV* criteria for substance abuse, for impulse control disorders (eg, pathological gambling),⁹ and for impulse control disorders not otherwise specified (eg, compulsive shopping disorder).¹⁰ However, no criteria set has been validated against measures of distress, dysfunction, and impairment in subjects free of comorbid, officially recognized psychiatric disorders.

We are unaware of any large-scale random-sample, epidemiological study of this putative disorder. However, a telephone survey of 1,500 companies, which produced responses from 224, reported that 60% of these companies had disciplined, and >30% had terminated, employees for inappropriate Internet use.¹¹ A study of 18,000 individuals who logged onto the ABC News Web site reported that 5.7% met criteria for "compulsive Internet use."¹²

To begin establishing a more accurate prevalence estimate, we conducted a nationwide, random-sample telephone survey utilizing a structured interview that elicited demographic data along with some suggested measures of problematic Internet use. Given the absence of valid diagnostic criteria, we elected to utilize a combination of potential markers of problematic Internet use borrowed from obsessive compulsive disorder, impulse control disorders, and substance abuse.

METHODS

Data and Sampling

The data were generated from a national household telephone survey conducted in the spring and summer of 2004; 2,513 US adults ≥18 years of age were interviewed. Following institutional review board approval, interviews were conducted by the Social and Behavioral Research Institute at California State University San Marcos. Interviewers had an average of 14 months of experience in health-related telephone surveys and received specific training for this project. The Social and Behavioral Research Institute conducts health surveys for the federal Health and Human Services Agency, the Centers for Disease Control and Prevention, numerous health agencies, and academic research-

ers. Interviewers used a computer-assisted telephone-interviewing system, which guards against errors of omission and presentation. As an additional quality-control measure, supervisors made random, real-time reviews of interviews in progress.

To obtain informed consent, interviewers identified themselves, the survey organization and study sponsor, informed potential respondents of the survey topic, and stated that the interview was anonymous, voluntary with no incentive provided, could be terminated by the respondent at any time, and may be monitored by a supervisor. The interview was conducted with the first person to answer the telephone who was ≥ 18 years of age. Interviews averaged 11.3 minutes in duration.

The sample was obtained via random-digit-dial telephone calls within the continental US, stratified by state. All listed and unlisted residential telephone numbers within each state had an equal chance of inclusion. Cellular phone numbers were not included. In order to help insure that busy individuals were represented, telephone numbers were called until finalized or 15 call attempts had been made.

The response rate was 56.3% according to formula RR4 of the American Association of Public Opinion Researchers (AAPOR),¹³ which is approved by both the AAPOR and the Council of American Survey Research Organizations. Formula RR4 defines response rate as the ratio of respondents to the sum of respondents, refusals, break-offs, those unable to be contacted, and those unable to respond (eg, because of illness or language barriers). Any individual who completed a partial or full interview was considered a respondent. The cooperation rate, using AAPOR cooperation rate formula COOP4, was 97.6%, demonstrating a low rate of refusal. This cooperation rate is the number of respondents divided by the sum of respondents, refusals, and break-offs.

The survey attempted to measure prevalence rates for compulsive buying, body dysmorphic disorder, and problematic Internet use. The survey's eight Internet-related questions were created by extrapolating from diagnostic criteria for other impulse control disorders, obsessive-compulsive disorder, substance abuse scales, and from suggested criteria for problematic Internet use. Interviewers asked whether the respondent: (Q 1) uses the Internet regularly; (Q 2) feels that

personal relationships have suffered as a result of excessive Internet use; (Q 3) conceals non-essential Internet use; (Q 4) feels preoccupied by the Internet when offline; (Q 5) finds it difficult to stay away from the Internet for several days at a time; (Q 6) goes online to escape problems or relieve negative mood; (Q 7) has tried to cut back on Internet use, and, if so, (Q 7A) whether the attempt was successful; and (Q 8) how often respondent stays online longer than intended (very often, often, sometimes, rarely, or never).

Four sets of possible diagnostic criteria for problematic Internet use were generated. The first set (Dx 1) required that Internet use (Q 1) interfere with relationships (Q 2); that the respondent be preoccupied with the Internet when offline (Q 4); and, have either tried unsuccessfully to cut down on Internet use (Q 7 and Q 7A), or stayed online longer than intended "often" or "very often" (Q 8).

Three alternative more rigid diagnostic criteria (Dx) sets were also examined. Those included the Dx 1 criteria, plus:

1. Dx 2: The respondent finds it hard to stay away (Q 5);
2. Dx 3: The respondent goes online for escape or relief (Q 6); and
3. Dx 4: The respondent conceals use (Q 3).

RESULTS

Compared with the US adult population, the respondents include a substantially higher percentage of women and to a lesser extent, a higher percentage of people ≥ 55 years of age. A little over half (56.7%) of the respondents were married compared with 52.5% in the general US population ($\chi^2 17.33$, $df=1$, $P<.001$) (Table 1). The respondents' ethnic distribution closely resembles that of the US population but includes a smaller proportion of Hispanic individuals (Table 1). The mean age of respondents was 48.5 years. The mean number of people per household was 2.8. Most respondents (50.8%) fell in the middle class socioeconomic stratum reporting an annual household income between \$50,000 and \$150,000. Because the study sampling method stratified based on state, the respondents are representative of the US population with regard to distribution by state. Further demographic data are shown in Table 1.

We adjusted the response data to the gender distribution of the US adult population. In this gender-adjusted response set, 68.9% were reg-

ular Internet users; 5.9% felt their relationships suffered as a result of excessive Internet use; 8.7% attempted to conceal non-essential Internet use; 3.7% felt preoccupied by the Internet when offline; 13.7% found it hard to stay away from the Internet for several days at a time; 8.2% utilized the Internet as a way to escape problems or relieve negative mood; 12.3% had tried to cut back on Internet use, of whom 93.8% were successful; and, 12.4% stayed online longer than intended very often or often.

Using the proposed diagnostic criteria sets for problematic Internet use (Dx 1–4), the proportions of respondents meeting criteria for the putative disorder were: Dx 1: 0.7%; Dx 2: 0.4%; Dx 3: 0.4%; and Dx 4: 0.3%.

The likelihood of endorsing one potential marker of problematic Internet use given the presence of another is shown in Table 2. Preoccupation with the Internet when offline (Q 4) was the single criterion most highly associated with other potential diagnostic criteria. The item regarding difficulty staying away from the Internet (Q 5) was the least associated with other criteria.

TABLE 1.
Respondents' Marital Status, Ethnicity, and Household Income

<i>Ethnicity</i>	<i>%</i>
White	79.7
Black	10.3
Hispanic	7.1
American Indian/Alaska Native	5.2
Asian/Pacific Islander	2.5
<i>Marital Status</i>	
Married	56.7
Never married	16.8
Divorced	10.7
Widowed	9.1
Currently living as a couple	4.8
<i>Total Annual Household Income</i>	
<\$15,000	11.4
\$15,000 to <\$50,000	31.6
\$50,000 to <\$150,000	50.8
≥\$150,000	6.2

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DISCUSSION

The proportion of regular Internet users among respondents to our telephone survey (68.9%) was similar to other reported general population surveys. Of the respondents, 3.7% to 13.7% endorsed one or more of our markers consistent with problematic Internet use. However, when these measures of problematic Internet use were combined in any of four proposed sets of diagnostic criteria (each set containing at least three symptoms), the prevalence of the disorder ranged from 0.7% for the least strict criteria set (Dx 1), to 0.3% when additional symptoms were added. But these proposed criteria sets may be setting the bar too high, and a more liberal definition that included only two markers of problematic Internet use, say excessive use along with one item suggesting impairment or distress, could yield considerably higher rates.

To determine the accurate prevalence of clinically significant problematic Internet use will require agreement on diagnostic criteria and a study utilizing a clinically validated, structured interview administered to a large and representative sample of the population. The estimate of problematic Internet use is constrained by our response rate of 56.3%. While substantial, it does not guarantee that this sample is representative of the general population with regard to Internet use.

This response rate compares reasonably well, however, with those obtained in nationwide health surveys.¹⁴ This estimate is also constrained by differences between the study sample and the US adult population. First, the sample contained a higher proportion of women. To compensate for this difference, we provided a gender-adjusted prevalence estimate. Second, the sample contained a smaller proportion of younger individuals, perhaps because the sampling method did not include cellular phone numbers. Younger individuals are generally more computer-literate and may be more likely to suffer from problematic Internet use. This underrepresentation would bias our prevalence estimate downward. Third, this sample contained fewer Hispanic individuals. The effect of this bias is unknown. Finally, some of the problematic Internet use may have been symptomatic of acknowledged mental disorders, such as bipolar disorder, pathological gambling, paraphilias, or non-paraphilias.^{3,5}

CONCLUSION

Problematic Internet use is a little-studied, negative by-product of the Internet revolution of the last decade. The telephone survey of 2,513 adults suggests that potential markers of problematic Internet use are present in a sizeable portion of the population. Other phenomenological studies have pointed to significant distress and dysfunction due to problematic Internet use.^{3,5} With the Internet poised to expand and permeate further many aspects of life, rigorous studies of this phenomenon would seem to be necessary.

Future studies should attempt to discover whether problematic Internet use can be considered a pathological behavior (ie, Does it meet the criteria in the *DSM-IV* for identifying a mental disorder?) conceptualized as a "clinically significant behavioral or psychological syndrome or pattern that occurs in an individual and that is associated with present distress... or disability... or with a significantly increased risk of suffering death, pain, disability, or an important loss of freedom." If it is a pathological behavior, is it an independent dis-

order or merely a symptom of other psychiatric conditions? Studies¹⁵ have suggested that problematic Internet use (variously defined) may be a risk factor for, or associated with, other "addictions," behavioral (eg, pathological gambling) and substance-related (eg, alcoholism). Small studies^{3,5} have also suggested that individuals with problematic Internet use are highly likely to suffer from mood and anxiety disorders.

If problematic Internet use is found to be an independent mental disorder, a valid screening instrument will be needed, along with structured clinical interviews conducted in a large, representative sample to better gauge the condition's prevalence and better identify those markers that carry the most clinical significance. Meanwhile, in cases where individuals present clinically with distress and functional impairment resulting from problematic Internet use, a diagnosis of "impulse control disorder not otherwise specified" may be justified.

Sociocultural factors warrant exploration. Social isolation and the desire for connected-

TABLE 2.

Conditional Probabilities for Eight Potential Markers of Pathological Internet Use: Probability of Subject Answering "Yes" to Rows if Subject Answered "Yes" to Columns

	Questions							
	<i>Relation- ships suffer</i>	<i>Conceal use</i>	<i>Pre-occupied when offline</i>	<i>Hard to stay away</i>	<i>Used to escape</i>	<i>Tried to cut back</i>	<i>Online longer than intended: Very Often</i>	<i>Online longer than intended: Often</i>
Relationships suffer		.39	.39	.13	.20	.17	.24	.07
Conceal use	.34		.40	.15	.21	.22	.26	.15
Pre-occupied when offline	.25	.17		.12	.19	.33	.33	.07
Hard to stay away	.31	.24	.45		.39	.39	.53	.38
Use to escape	.25	.20	.42	.24		.22	.34	.15
Tried to cut back	.35	.30	.40	.30	.33		.41	.24
Online longer than intended: Very Often	.20	.14	.42	.18	.20	.16		
Often	.10	.13	.16	.21	.14	.15		

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ness, the thrill and freedom brought on by online anonymity, and the extreme, unregulated, advertising tools used to lure individuals to Internet venues all likely play a role in promoting problematic Internet use and, as such, deserve attention. **CNS**

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