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PATHOS: A brief screening application for assessing sexual addiction

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Abstract

Sexual addiction is estimated to afflict up to 3-6% of the population. However, many clinicians lack clear criteria for detecting potential cases.

Objectives—The present studies were conducted to assess the effectiveness of a brief sexual addiction screening instrument (i.e., PATHOS Questionnaire) to correctly classify patients being treated for sex addiction and healthy volunteers.

Methods—In Study One, a six-item questionnaire which utilizes the mnemonic "PATHOS" was examined in regard to sensitivity and specificity using a sample combining patients being treated for sex addiction and healthy volunteers (970 men/80.2% patients; 938 women/63.8% patients). In Study Two, a cross-validation sample of 672 men (93%patients) and 241 women (35.3% patients) completed the PATHOS screener.

Results—Results of ROC analyses in Study One demonstrated that the PATHOS captured 92.6% of the area under the curve, and achieved 88.3% sensitivity and 81.6% specificity for classifying the male sample (n = 963) as patients and healthy subjects using a cut-off score of 3. Similarly, the PATHOS captured 90.2% of the area under the curve and, with a cut-off of 3, achieved 80.9% sensitivity and 87.2% specificity for the female sample (n = 808). In Study Two, results of ROC analyses indicated that the PATHOS captured 85.1% of the area under the curve, with sensitivity of 70.7% and specificity of 86.9% for men (cut-off of 3). For women, the PATHOS captured 80.9% of the area under the curve and achieved 69.7% sensitivity and 85.1% specificity with the cut-off of 3.

Conclusions—These studies provide support for the use of the PATHOS as a screening instrument to detect potential sexual addiction cases in clinical settings.

Keywords

Sexual Addiction; Sexual Compulsivity; Screening; Assessment; Psychometrics

Pathos: arousing emotion, especially sorrow or pity

-- From Greek *pathos* for "suffering"

Sexual addiction (also referred to as Sexual Dependence, Hypersexuality, Compulsive Sexual Disorder, Paraphilia-Related Disorder, Sexual Impulsivity, Nymphomania, and Out of Control Sexual Behavior) appears to be relatively common disorder. It is estimated to affect up to 3-6% of the U.S. population [Carnes, 1991], and a recent study from New Zealand demonstrated that subclinical levels of this behavior may be much higher [Skegg et al 2009]. Sexual addiction has been described as "The existence of recurrent, intense, sexually arousing fantasies, sexual urges, or behaviors that persist over a period of at least six months and do not fall under the definition of paraphilia," and causes significant distress and impairment to afflicted individuals [Stein, Black, Pienaar, 2000]. Despite the significant personal and social consequences related to sexual addiction, relatively little attention has been paid to this serious disorder. The lack of attention is likely due, in large part, to confusion regarding its etiology and nosology. In fact, sexual addiction is not even included in the Diagnostic and Statistical Manual of Mental Disorders [APA, 2000], although "hypersexual disorder" is under consideration for the next edition [Kafka, 2010].

Fortunately, a growing body of knowledge is emerging to document and describe the problem. For example, the journal, Sexual Addiction and Compulsivity: The Journal of Treatment and Prevention, is in its twentieth year of publication. Similarly, Sadock and Sadock's (2005), *Comprehensive Textbook of Psychiatry* includes a chapter on sex addiction and its treatment [Carnes, 2005]. However, the constellation of behaviors currently referred to as "sexual addiction" were first identified by Orford [Orford, 1978 & 1985]. This work was followed by more in depth descriptions by Carnes [1983, 1988, 1991a], Goodman [1992], and Earle [1995]. Various researchers have applied diagnostic criteria which parallel those developed for substance abuse and pathological gambling to individuals displaying symptoms of sexual addiction [Carnes, 1983, 1988, 1991a, and Schneider, 1991], and others have applied independent diagnostic criteria to this population [Black, 2000].

Considerable research has examined the etiology of sexual addiction and identified common contributors, including a history of trauma [Earle and Earle, 1995], family factors [Sussman, 2007], and exposure to unique stimulations such as "cybersex" [Hunt & Kraus, 2009]. In addition, much attention has been focused on the co-occurrence of sexual addiction and other addictive behaviors [Carnes, Murray and Charpentier, 2005]. Early conceptualizations of the neuroscience of sexual addiction appeared in the 1980's [Milkman and Sunderwirth, 1987], and as the neuroscience research base has developed, biological mechanisms underlying sexual addiction have been identified [Berlin, 2008; Cozolino, 2006; Kafka, 2008; Krueger & Kaplan, 2000; Stein et al., 2000]. Concrete efforts to summarize current research have appeared in more general medical journals [Coleman, 1990, Coleman-Kennedy 2002]. Similarly, treatment approaches have been described and various populations studied [Carnes and Adams, 2002].

Still, there is a relative lack of awareness regarding sexual addiction among health care providers. In addition, there is a lack of evidence-based assessment/screening measures to help clinicians identify individuals who suffer from this condition. Together, these factors have interfered with patient access to effective treatments. Therefore, there existed a need to generate a simple screening application similar to the CAGE Questionnaire [Ewing, 1984],

which is a short screener for the detection of alcoholism (i.e., C= Have you ever felt you ought to <u>cut down</u> your drinking?, A= Have people <u>annoyed</u> you by criticizing your drinking?, G= Have you ever felt bad or <u>guilty</u> about your drinking?, E= Have you ever had a drink first thing in the morning to steady your nerves or to get rid of a hangover [<u>eye-opener</u>]). The CAGE has served as a useful benchmark for clinicians working in both mental health and general medical settings.

A number of sexual addiction assessments have appeared and been compared in the extant literature [Carnes, Green and Carnes, 2010; Delmonico and Miller, 2003; Hook et al., 2010; Kalichman and Rompa, 2001]. One of the most widely used is the Sexual Addiction Screening Test (SAST), which has been used in at least eight published, peer-reviewed empirical studies, and is routinely used in practice at several inpatient residential treatment centers, and by certified sex addiction therapists (CSATS) across the United States, and in other countries. It first appeared in 1989 [Carnes, 1989] and has subsequently been revised (SAST-R) [Carnes et al., 2010]. Both the SAST and SAST-R were based on decades of clinical experience. However, the SAST-R is relatively long (i.e., 45 items), making it unwieldy for use in general clinical settings (e.g., doctor's office or emergency room). Given the confusion inherent to identifying individuals who suffer from a disorder with no consistent conceptualization, definition, or diagnostic criteria, and the need for a concise assessment device, the purpose of this study was to develop <u>the PATHOS</u>, a brief screening instrument to assist clinicians with the identification of individuals <u>who may have</u> sexual addiction. A series of two studies was conducted in order to develop the measure and to validate it on a separate sample. The PATHOS consists of six items found in both the SAST and SAST-R.

Method: Study One

Measures

Diagnostic Clinical Interview—Given that diagnostic criteria for sexual addiction have not yet been included in the Diagnostic and Statistical Manual of Mental Disorders, patients referred for treatment were diagnosed with sexual addiction based on a clinical interview, using criteria established by Carnes (2001). These diagnostic criteria are listed in Table 1.

Sexual Addiction Screening Test (SAST)—PATHOS items were extracted from the original SAST in this study. The SAST is a 25-item measure that assesses for symptoms of sexual addiction [Carnes, 1989]. All items are scored dichotomously (yes/no). Sample items include, "Do you feel controlled by your sexual desire?" and "Do you hide some of your sexual behaviors from others?" Previous research demonstrated that the SAST efficiently and effectively discriminated between sex addicts and nonaddicts. Using 13 as a cutoff score, 96.5% of respondents were correctly classified as sexually addicted, while only 3.5% scoring 13 or more were nonaddicted, and thus misclassified, using the SAST. For this sample, internal consistency of the SAST was excellent (KR-20 = .94) [George and Mallery, 2003].

Participants

The study sample (N = 1,908) was comprised of two sub-samples of individuals. Data from 1,118 <u>patients</u> (30.4% female, n = 340) who were being treated at a residential inpatient treatment center for sexual addiction between 1996 and 2004 were enrolled in this study. In order to protect anonymity, demographic data were not collected from the <u>patient</u> sample. In addition, a total of 790 healthy volunteers (75.7% female, n = 598) were recruited from a large southern university over a period of one year. The student sample ranged in age from 18-58 years (*M* = 20.60, *SD* = 3.88) and primarily self-reported as Caucasian (59.6%, n =

471), followed by Black/African American (37.1%, n = 293) and "Other" (1.4%, n = 11). There were also eight Hispanic (1.0%), six Asian (0.8%), and one Native American (0.1%) individual included in the sample. The obvious disparity in gender proportions between the two samples reflects the fact that more men seek treatment for sex addiction than women, and that more women participate in research than men at the university where the healthy volunteer participants were recruited.

Procedures

Individuals in the patient sample were administered the SAST questionnaire during their clinical intake. De-identified responses were extracted from the medical records for this study. In order to assess the discriminant validity of the PATHOS, a sample of healthy volunteers was recruited to use as a comparison sample. With <u>Institutional Review Board (IRB)</u> approval, college students were informed about the study through attendance in introductory psychology courses and were offered the opportunity to participate in the present study or a variety of other studies as part of their course requirements. After obtaining informed consent, the participants were asked to complete a short demographic questionnaire and the SAST.

SAST items were selected for inclusion on the PATHOS based on results of exploratory principal components analyses of the SAST and W-SAST[1], which suggested a four-factor structure for sex addiction [for details of this analysis see: Carnes, Green and Carnes, 2010]. Four PATHOS items were selected to tap the four SAST factors (Preoccupation, Loss of Control, Relationship Disturbance, and Affective Disturbance) based on highest factor loading for both men and women being treated for sex addiction. Two additional items were selected to represent other clinically important features associated with sex addiction (shame and treatment seeking), not specifically represented by the first four items. The final version was named the PATHOS Questionnaire, based on the mnemonic developed from its items. The PATHOS Questionnaire items are listed in Table 2.

Statistics

Results were compared to assess group differences. Internal consistency was assessed for the male and female samples separately, using KR-20 analyses. Descriptive and inferential statistics were also computed separately for men and women. T-tests were utilized to analyze the significance of differences between the patient samples and the healthy volunteers. Receiver operating characteristics (ROC) analyses were utilized to determine the optimal clinical cut-off scores.

Results: Study One

A total of 970 men participated in the study. The mean PATHOS screener score for men in the patient sample (n = 778) was 4.53 (*SD* = 1.48); whereas, the mean score for the healthy subject sample (n = 192) was 1.52 (*SD* = 1.19). This difference was statistically significant ($t(968) = 29.8$, p < .001; *M* difference=3.01, 95% CI=2.81 to 3.21). Results for the 808 female participants were similar. The mean score for the women in the patient sample (n = 340) was 3.82 (*SD* = 1.50); whereas, the mean score for the healthy subject sample (n = 598) was 1.16 (*SD* = 1.12). Again, there was a statistically significant difference in scores between the two groups ($t(936) = 28.5$, *p* < .001; *M* difference=2.66, 95% CI=2.48 to 2.84).

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[1]The W-SAST is an early alternate form of the original 25-item SAST, which was intended to better detect sex addiction in women. The W-SAST was similar to the original SAST, changing only six items and slightly rewording three others. All of the six PATHOS items were also W- SAST items. Two of them were slightly reworded in the W-SAST.

For both the male and female samples, the internal consistency of the PATHOS was excellent at KR-20 = .94 and KR-20 = .92, respectively. Results of the ROC analyses for the male sample indicated that the PATHOS captured 92.4% of the area under the curve ($p <$ .001). Using a cut-off score of 3, the PATHOS correctly identified 88.3% of the male patient sample (sensitivity) and 79.7% of the healthy male sample (specificity). Using the same cut-off, the PATHOS correctly identified 80.9% of the female patient sample and 88.1% of the healthy female sample, capturing 90.6% of the area under the curve ($p <$ .001).

Discussion: Study One

The PATHOS Questionnaire was developed as a rapid screener for sexual addiction. Results of Study One demonstrated that this extremely brief instrument (i.e., six items), which can be administered in less than one minute, can be used to accurately detect individuals with sexual addiction. Sensitivity and specificity ratings for the PATHOS demonstrated excellent accuracy, particularly considering the brevity of the questionnaire. Indeed, recent research has demonstrated similar results for the CAGE questionnaire in identifying men with alcohol dependence (91.0% sensitivity; 87.8% specificity) and alcohol abuse (87.5% sensitivity; 80.9% specificity) [do Amaral and Malbergier, 2008].

Though results are promising, cross-validation on a separate sample was necessary to verify the findings. As a result, a second validation study was undertaken to assess the stability of results.

Method: Study Two

Measures

PATHOS Questionnaire—Participants in this second study were administered the SAST-R, a 45-item revision of the original SAST, which contains the same PATHOS items as the original SAST. The PATHOS Questionnaire items were extracted from the SAST-R (as described in Study One). The PATHOS contains six items, and was developed as a quick screening instrument for the detection of potential sexual addiction. Items are listed in Table 2 and are scored in a yes/no format.

Participants

Individuals in the second study sample (N = 913) were recruited from three populations: outpatients receiving treatment for sex addiction (n = 646, 86.8% male), individuals receiving residential treatment for sex addiction (n = 64, 100% male), and undergraduate college students (n = 203, 23.2% male). Given that sexual addiction is much more prevalent among male patients [Goodman, 1992], the substantial imbalance in numbers of male and female patient participants was expected. Sample demographics for Study Two are presented in Table 3.

Procedures

All procedures were undertaken in accordance with professional ethical standards and were approved by the appropriate institutional review boards. In order to validate the PATHOS Questionnaire as an appropriate screening instrument for the detection of sexual addiction, patients with sexual addiction were recruited from a specialized treatment center for sexual addiction and from the patient flow of outpatient therapists specializing in treatment of sexual addiction from around the United States. Individuals presenting for either inpatient residential or outpatient treatment of sexual addiction were informed about a study evaluating patients with sexual addiction and asked to participate. After providing informed consent, they were administered the SAST-R (from which PATHOS items were extracted)

during their clinical intake assessment. Healthy volunteers were recruited from an undergraduate student population and were administered the measure after providing informed consent to participate in the research study.

Statistics

Internal consistency was assessed for the combined male and female samples using the Kuder-Richardson-20 (KR-20) coefficient. Frequency counts were computed for the positive responses to each item for the outpatient, residential treatment, and healthy volunteer samples. Univariate ANOVA analyses were computed to assess the significance of difference among the patient sample(s) and the student sample within each gender. For ROC analyses residential treatment and outpatient groups were combined to create a composite patient group. The healthy volunteers group consisted of students only. Independent samples t-tests were used to compare PATHOS scores for the patient and healthy volunteer samples. ROC analyses were utilized to assess the adequacy of the previously-determined clinical cut-off score (i.e., total score = 3).

Results: Study Two

Considering the brief nature of the measure, internal consistency for the present samples was acceptable (men: KR-20 = .77; women: KR-20 = .81) [George and Mallery, 2003]. A univariate ANOVA comparing the male samples was significant ($F(2,669) = 53.71$, $p < .001$; adj. $R^2 = 0.14$; power = 1.00). Post hoc analyses, using Tamhane due to unequal group variances, found that all three groups differed significantly from each other (Residential treatment, $M = 4.78$, $SD = 1.46$; Outpatient, $M = 3.41$, $SD = 1.87$; Students, $M = 1.21$, $SD = 1.23$[2]). Because there were only two groups of women, a t-test was used to compare means. The t-test for women was significant ($t(239) = 9.75$, $p < .001$; $d = 1.51$; power = 1·00). The mean differences were similar to those for outpatient and student men (outpatient women: $M = 3.26$, $SD = 2.11$; student women: $M = 0.88$, $SD = 1.04$; <u>M difference=2.38, 95% CI=1.90 to 2.86).</u>

In ROC analyses, the PATHOS correctly categorized individuals in the male patient sample (n = 625; residential treatment and outpatient samples combined) and healthy volunteer sample (n=47) 83.3% of the time. Using the cut-off score of 3, the PATHOS correctly identified 69.6% of the patient sample (sensitivity) and 80.9% of the healthy volunteer sample (specificity). In ROC analyses of the sample of women (outpatient n = 85; college n = 156) the PATHOS correctly categorized 81.4% of the sample overall. Using the cut-off score of 3, the PATHOS correctly identified 65.9% of the patient sample (sensitivity) and 91.0% of the healthy sample (specificity).

Discussion: Study Two

Results of Study Two provide additional support for the utility of the PATHOS Questionnaire as a brief screener for sexual addiction. The internal consistency estimates for the male and female samples suggested adequate reliability. The ANOVA analyses of the male groups in Study Two demonstrated particularly impressive performance of the PATHOS by clearly distinguishing between all three groups. This finding suggests that the PATHOS Questionnaire can be a useful tool for clinicians to identify individuals who would benefit from additional assessment of their sexual addiction symptoms, and may also serve as a rough index of case severity. The t-test results for the sample of women demonstrated that the PATHOS efficiently distinguishes outpatient women from a normal college student

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[2]ANOVA pairwise comparison confidence intervals available upon request from authors.

comparison group. Categorizations in ROC analyses were not as accurate as in Study 1, but still suggest effectiveness of the PATHOS. The lower accuracy in Study 2 is likely due in part to the smaller healthy male sample, as large differences in base rates tend to reduce categorization accuracy. For the data from women there is also an imbalance in base rates. Though it is proportionally smaller and in the opposite direction, this imbalance may also have attenuated accuracy. For both male and female data, the inclusion of outpatient data may also have reduced accuracy, as outpatients tend to report less severe pathology (as can be seen from comparing the means for the male patients).

Although the results are compelling, some limitations of the study should be noted. First, there is striking imbalance of gender representation in the patient and student samples. The patient sample has many more men than women (about seven to one), and the student sample is imbalanced in the other direction (about three women to each man). In addition, it is noteworthy that there were significant age differences between the patient and student samples. Therefore, future research should include an older healthy subject sample in order to reduce age effects as a threat to validity in comparisons among the two groups, and balance gender representation.

Conclusions

Results of the current studies demonstrated preliminary evidence that the PATHOS Questionnaire has utility as a screening measure for sexual addiction. Despite using different samples, Studies One and Two demonstrated remarkably similar results. In general, the PATHOS Questionnaire, which can be administered in less than one minute, demonstrated very respectable sensitivity and specificity ratings when distinguishing between patient and healthy subject samples. This suggests that it may assist clinicians in identifying individuals who would benefit from a more extensive assessment and/or referral for treatment of this under-recognized and under-treated disorder.

A significant limitation of both studies was the demographic differences of age and gender between the sex addicted and healthy volunteer samples (known in Study 2 and presumed in Study 1). Future comparisons of demographically matched sex addicted and healthy samples would be useful. Future research should also be conducted to validate the use of the PATHOS Questionnaire with older healthy subject samples, as well as clinical samples without sexual addiction, to provide additional support for its use. In addition, our samples did not provide adequate representation of various ethnicities to allow for comparison across such groups. Obtaining adequate patient samples of ethnic minorities with sex addiction should also be addressed by future research to allow for better assessment and treatment of those groups. Lastly, the PATHOS data analyzed for the studies were not collected by administering the six-item PATHOS Questionnaire, but rather by extracting PATHOS item data from administrations of the SAST and SAST-R. Therefore, there is some chance that question ordering effects could have influenced our results, though it seems unlikely given the consistency between the two studies, using different parent questionnaires and unrelated samples.

Previously, no brief screener has been introduced to identify underlined potential cases of sexual addiction. Indeed, many individuals who would benefit from treatment remain undiagnosed. The PATHOS Questionnaire was developed to fill this need and to assist clinicians in identifying individuals who may suffer from symptoms of sexual addiction. The current results provide support for its use as a brief screener of sexual addiction in general practice or other clinical settings.

Acknowledgments

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Table 1
Diagnostic Criteria for Sexual Addiction Patients

Three or more of the following symptoms:

1   Recurrent failure to resist impulses to engage in specific sexual behavior

2   Frequent engaging in sexual behaviors to a greater extent or over a longer period of time than intended

3   Persistent desire or unsuccessful efforts to stop, reduce, or control sexual behaviors

4   Inordinate amount of time spent in obtaining sex, being sexual, or recovering from sexual experience

5   Preoccupation with sexual behavior or preparatory activities

6   Frequent engaging in sexual behavior when expected to fulfill occupational, academic, domestic, or social obligations

7   Continuation of sexual behavior despite knowledge of having a persistent or recurrent social, financial, psychological, or physical problem that is caused or exacerbated by the behavior

8   Need to increase the intensity, frequency, number, or risk of sexual behaviors to achieve the desired effect, or diminished effect with continued sexual behaviors at the same level of intensity, frequency, number, or risk

9   Giving up or limiting social, occupational, or recreational activities because of sexual behavior

10   Distress, anxiety, restlessness, or irritability if unable to engage in sexual behavior

Table 2

PATHOS Questionnaire Items

1	Do you often find yourself preoccupied with sexual thoughts? [**Preoccupied**]
2	Do you hide some of your sexual behavior from others? [**Ashamed**]
3	Have you ever sought help for sexual behavior you did not like? [**Treatment**]
4	Has anyone been hurt emotionally because of your sexual behavior? [**Hurt others**]
5	Do you feel controlled by your sexual desire? [**Out of control**]
6	When you have sex, do you feel depressed afterwards? [**Sad**]

Table 3

Demographic Data for the Study 2 Sample

Men	n	Age (*M/SD*)	Cau	Hisp/Lat	Af Am	As/Pac Is	Other
Inpat.	64	18-69 (41.3/11.2)	90.6%	3.1%	1.6%	--	4.7%
Outpat.	561	18-79 (43.4/11.4)	72.4 %	16.4%	4.5%	2.3%	4.4%
College	47	18-49 (21.65/5.6)	68.1%	4.3%	21.3%	4.2%	2.1%
Women							
Outpat.	85	19-60 (37.9/10.8)	77.6%	8.2%	5.9%	1.2%	7.1%
College	156	18-37 (19.9/2.8)	62.4%	0.6%	31.2%	3.1%	2.5%

Note. Cau = Caucasian; Hisp/Lat = Hispanic/Latino; Af Am = African American; As/Pac Is = Asian or Pacific Islander.