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PARAPHILIAS

Internet-Administered Cognitive Behavioral Therapy for Hypersexual Disorder, With or Without Paraphilia(s) or Paraphilic Disorder(s) in Men: A Pilot Study

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ABSTRACT

Background: Hypersexual disorder (HD) is a condition in which the individual experiences loss of control over engagement in sexual behaviors, leading to negative effects on various areas of life. Paraphilias often present concomitantly with HD, and although cognitive behavioral therapy (CBT) has been proven to reduce engagement in hypersexual behavior, no studies have investigated the effects of Internet-administered CBT (ICBT) on HD, with or without paraphilia(s) or paraphilic disorder(s).

Aim: To investigate the effects of Internet-administered CBT on HD, with or without paraphilia(s) or paraphilic disorder(s).

Methods: Male participants (n = 36) evaluated positive according to the proposed diagnostic HD criteria, with or without paraphilia(s) or paraphilic disorder(s), received 12 weeks of ICBT. Measures were administered weekly over the treatment period, with an additional follow-up measurement 3 months after completion of treatment. An assessment interview was performed 2 weeks after treatment.

Outcomes: The primary outcome was the Hypersexual Behavior Inventory (HBI-19), and secondary outcomes were the Hypersexual Disorder: Current Assessment Scale (HD:CAS), the Sexual Compulsivity Scale (SCS), as well as a tentative composite of 6 Severity Self-rating Measures, for Paraphilic Disorders and depression (Montgomery-Åsberg Depression Rating Scale [MADRS-S]), psychological distress (Clinical Outcomes in Routine Evaluation Outcome Measure [CORE-OM]), and treatment satisfaction (CSQ-8).

Results: Large, significant decreases in HD symptoms and sexual compulsivity were found, as well as moderate improvements in psychiatric well-being and paraphilic symptoms. These effects remained stable 3 months after treatment.

Clinical Implications: ICBT can ameliorate HD symptoms, psychiatric distress, and paraphilic symptoms, which suggests that the ICBT for HD, with or without paraphilia(s) or paraphilic disorder(s), may constitute a valuable addition of treatment options in clinical settings.

Strengths and Limitations: This is the first study evaluating the efficacy of ICBT on a sample of men suffering from HD. In addition, a proportion of the sample reported concomitant paraphilic interests and disorders, thus mirroring an everyday clinical practice in the field of sexual medicine. No control group was assigned, and some of the outcome measures are still to be validated. The long-term effects of ICBT and its efficacy in hypersexual women are unknown.

Conclusions: This study gives support for ICBT as an effective treatment option for HD. Future evaluations of the treatment program should include women and larger samples in randomized controlled procedures and investigate the long-term effects. **Hallberg J, Kaldo V, Arver S, et al. Internet-Administered Cognitive Behavioral Therapy for Hypersexual Disorder, With or Without Paraphilia(s) or Paraphilic Disorder(s) in Men: A Pilot Study. J Sex Med 2020;17:2039–2054.**

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INTRODUCTION

The present study is one in a series of articles,[1−3] all based on a research project initiated in 2010 with the overall aim to develop and evaluate treatment interventions for problematic hypersexual behavior. Throughout the project, problematic hypersexual behavior was defined in accordance with the criteria proposed for hypersexual disorder (HD)[4] which are presented in Table 1.

HD was proposed as a new psychiatric disorder for the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders, DSM-5, characterized by a nonparaphilic sexual desire with excessive sexual fantasies, urges, and behaviors in relation to dysphoric mood states with an impulsivity component.[4] The American Psychiatric Association[6] declined inclusion of HD in the DSM-5 although the diagnostic criteria were found to be valid in a multicenter field trial.[7] Sharing many features with HD, the diagnosis compulsive sexual behavior disorder (CSBD) was however included in the International Classification of Diseases, 11th revision.[8] Characterized by a persistent pattern of failure to control intense repetitive sexual impulses or urges, resulting in repetitive sexual behavior, the criteria for CSBD and HD differ inasmuch as the latter includes sexual behavior as a response to dysphoric moods and stress (ie, coping) whereas CSBD does not.

Prevalence estimates for conditions characterized by excessive or out-of-control sexual behavior, have historically been uncertain,[9] mainly due to considerable disagreement regarding the exact symptom presentation, etiology, and nomenclature to describe the clinical phenomenon.[9] In a recent national survey on sexual health, in a large sample of men aged 18−50 years, as many as 10.3% were found to meet a clinical screening point on a measure for compulsive sexual behavior.[10] The authors conclude that "health-care professionals should be alert to a high number of people distressed about their sexual behavior".

Aside from the negative consequences of excessive normophilic sexual behavior, hypersexuality is associated with an increased risk of concomitant paraphilic sexual interests (eg, exhibitionism, voyeurism, or pedophilia).[11] The relationship between hypersexual behavior and paraphilic interests/disorders has previously been noted.[12,13] Paraphilia(s) and paraphilic disorder(s) have been considered the closest diagnostic neighbors of HD, whether independently coassociated, concomitantly expressed, or apparent without HD.[4] Furthermore, sexual preoccupation, a clinical feature of HD usually defined as recurrent sexual thoughts and/or behaviors toward numerous casual or impersonal sexual encounters, has been identified as a risk factor for recidivism in sexual offenses[14,15] and excessive pornography use with attitudes predisposing violence against women.[16]

Although several treatment studies on problematic hypersexual behavior have been performed, most suffer from methodological limitations such as small samples, arbitrarily conceptualized diagnostic starting points, and unstandardized outcome measures.[17,18] In addition to the lack of availability of treatment options, hypersexuality is commonly associated with shame, guilt, feelings of hopelessness, and embarrassment, which all contribute to delayed help-seeking.[12,19−21] This delay may lead to prolonged and severe inconvenience and significant negative consequences.[21] Access to adequate and effective treatment options is therefore vital.

Internet-administrated treatment options are relatively anonymous tools as they do not require physical presence in face-to-face meetings. This facilitates access to treatment for patients reluctant to seek appropriate help.[22] Treatment programs administered via the Internet have been found to be as effective as face-to-face interventions, lead to sustained clinical improvements, and offer cost-effective alternatives to conventional psychotherapy. Considering the suggested advantages of Internet-administered psychotherapy[22] and the positive findings from our previous study on cognitive behavioral group therapy (CBGT) for HD,[3] the development and implementation of Internet-administered cognitive behavioral therapy (ICBT) for the condition could be an important expansion of the currently limited range of treatment options.

The aim of the study was to investigate the efficacy of Internet-administered ICBT for HD in a sample of men evaluated in accordance with the proposed diagnostic criteria for HD, with or without paraphilia(s) or paraphilic disorder(s). Specific aims were to (i) examine the treatment effects on HD and paraphilic symptoms, and psychiatric well-being, (ii) examine the participants' treatment adherence and satisfaction, and (iii) investigate the co-occurrence of HD and paraphilia(s) and paraphilic disorder(s).

METHODS

Setting

The study was performed at the ANOVA clinic at the Karolinska University Hospital, Stockholm, Sweden. ANOVA is a multidisciplinary clinic for research, assessment, and treatment in the fields of sexual medicine, andrology, and trans-medicine.

Design

An intragroup treatment efficacy study of a 12-week Internet-administered ICBT protocol for hypersexual disorder (HD), with or without paraphilia or paraphilic disorder.

Table 1. Suggested criteria for hypersexual disorder as proposed for the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition

A	Over a period of ≥6 months, recurrent and intense sexual fantasies, sexual urges, or sexual behaviors in association with ≥4 of the following 5 criteria:
A1	Time consumed by sexual fantasies, urges, or behaviors repetitively interferes with other important (nonsexual) goals, activities, and obligations
A2	Repetitively engaging in sexual fantasies, urges, or behaviors in response to dysphoric mood states (eg, anxiety, depression, boredom, irritability)
A3	Repetitively engaging in sexual fantasies, urges, or behaviors in response to stressful life events
A4	Repetitive but unsuccessful efforts to control or significantly decrease these sexual fantasies, urges, or behaviors
A5	Repetitively engaging in sexual behaviors while disregarding the risk for physical or emotional harm to self or others
B	There is clinically significant personal distress or impairment in social, occupational, or other important areas of functioning associated with the frequency and intensity of these sexual fantasies, urges, or behaviors
C	These sexual fantasies, urges, or behaviors are not due to the direct physiologic effect of an exogenous substance (eg, a drug of abuse or a medication)

Specify if: masturbation, pornography, sexual behavior with consenting adults, cybersex, telephone sex, venues for sexual entertainment, other.

Outcome measures were administered weekly, from initiation of the treatment protocol and up to the 12th week (after treatment). Follow-up measurements were administered 3 months after the end of the active treatment period (at the end of the 12th week of treatment). Two weeks after completion of treatment, a follow-up appointment was offered with a clinical psychologist other than the participant's assigned ICBT therapist. Clinical status regarding HD was assessed and assigned to one of 3 categories: deteriorated, unchanged, or improved.

Procedure

Recruitment for the study was performed over a 1-year period (December 5, 2016, to December 3, 2017). Participants were recruited from the ANOVA clinic via PrevenTell, a national telephone helpline for unwanted sexuality launched by ANOVA. Furthermore, recruitment was performed in collaboration with the Swedish Prison and Probation Service. Convicted clients under probation with sex offenses as their primary conviction received oral and written information about the study from their assigned probation officer and were directed to contact ANOVA via PrevenTell if interested in participation in the study. Participation in the study was voluntary and independent of any administrative court and probation procedures. Hence, all study participants underwent the same assessment procedure for inclusion/exclusion. The flow of the recruitment and study procedure can be seen in Figure 1. Potential participants were informed about the study and encouraged to apply on a secure Internet platform by submitting informed consent, valid contact information, and responses to an initial screening battery. A Web survey constituted the introductory part of the study and included 22 structured questionnaires on sociodemographics, hypersexuality, paraphilic interests, history of purchase of sexual services, exploitation of children, and usage of online child sexual exploitation material. Alcohol and drug use were also screened for, as were the neuropsychological and overall psychiatric status. Participants were contacted after completing the screening battery, and if interested in participation were scheduled for 2 clinical assessment interviews on the same occasion at the ANOVA clinic. A preliminary HD diagnosis for HD was carried out at screening with the Hypersexual Disorder Screening Inventory, HDSI[23] using the cutoff score proposed by Kafka.[24] Paraphilia(s) and/or paraphilic disorder(s) were screened for using the Severity Self-Rating Measures for Paraphilic Disorders.[25] Endorsements of diagnostic statuses were verified in the clinical assessment interviews, which were conducted by a psychiatrist and a psychologist/licensed sexologist. The interviews entailed clinical assessments of (i) HD, (ii) paraphilia, (iii) overall psychiatric health, and (iv) contraindications to participation. Assessment of paraphilia was made in accordance with the criteria specified in DSM-5,[6] defined as: (i) any intense and persistent sexual interest other than genital stimulation or preparatory fondling with physically mature, consenting human partners, or (if the criteria "intense and persistent …" is difficult to apply), (ii) "any sexual interest greater or equal to normophilic sexual interests". Fulfillment of (i) or (ii) is sufficient to be considered as having a paraphilia and constitute criterion A for a paraphilic disorder. Paraphilic disorder denotes the presence of a paraphilia (meeting criterion A) that currently causes distress, harm, or impairment to the individual or others, defined as criterion B. Thus, paraphilia was categorized as either: (i) having a paraphilia by meeting criterion A, or (ii) being diagnosed with a paraphilic disorder by meeting both criterion A and B.

All potential participants were reviewed in an ensuing referral meeting between the assessing psychiatrist and psychologist. 39 male participants were found to be eligible and were offered participation in the treatment study program (Figure 1).

Inclusion criteria were: (i) >18 years old, (ii) adequate proficiency in the Swedish language, (iii) access to a computer or

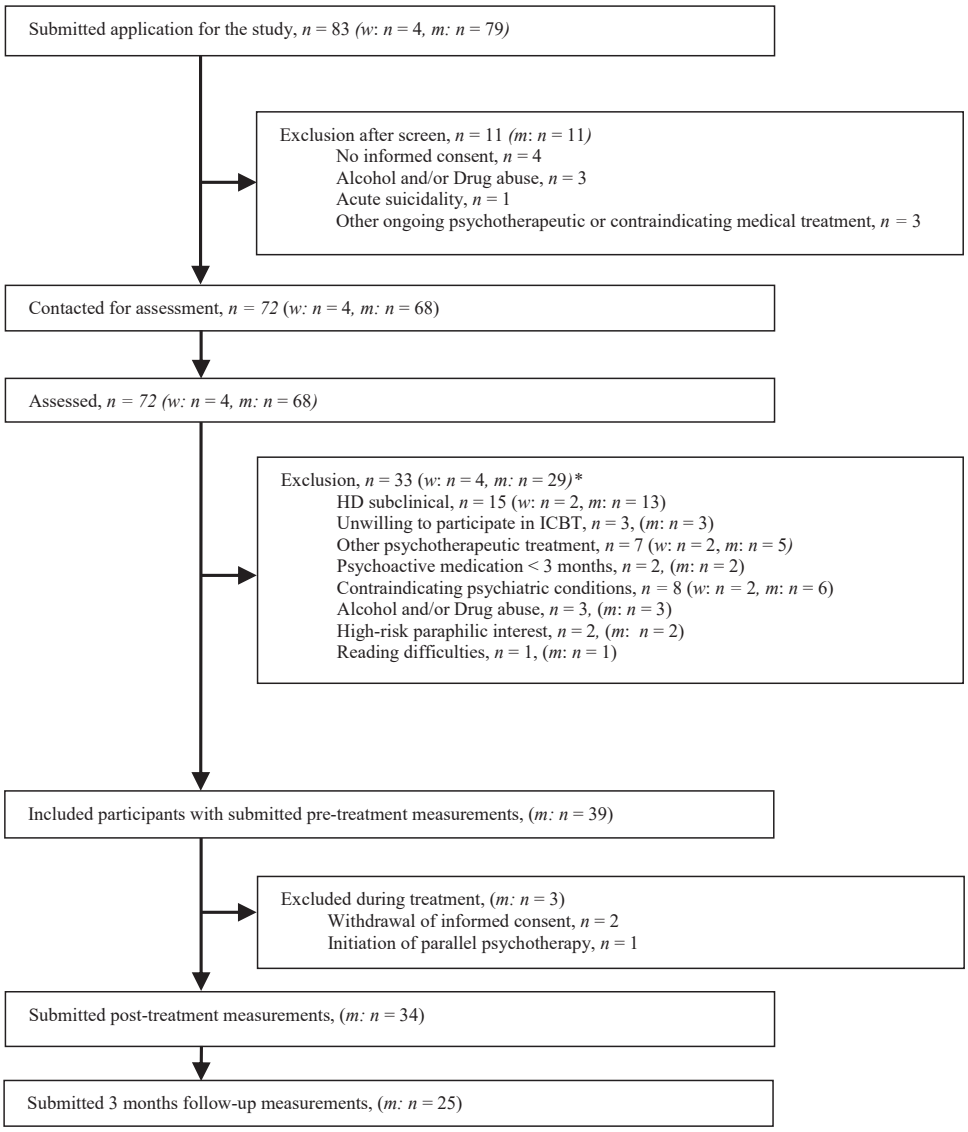

Figure 1. Participant flow in the feasibility study of ICBT for HD, with or without paraphilia(s)/paraphilic disorder(s) (*w* = women; *m* = men). *Several participants met more than one exclusion criterion. Thereof, the sum of reported reasons for exclusion differ from the total number of excluded participants.

other compatible digital device with Internet connection, (iv) fulfillment of the proposed criteria for hypersexual disorder, with or without paraphilia/paraphilic disorder, and (v) willingness to take part in the Internet-administered CBT. Exclusion criteria were (i) considered at high risk of committing child sexual abuse (ie, high sexual preoccupation concomitantly diagnosed with pedophilia and hebephilia and easy access to children), (ii) severe depression, anxiety, or other contraindicating psychiatric conditions assessed by a psychiatrist with Mini-International Neuropsychiatric Interview, M.I.N.I.)[26] (iii) psychoactive medication < 3 months, and (iv) ongoing psychotherapy.

Participants were withdrawn from the study protocol during the treatment period if the following occurred: (i) initiation of other psychotherapeutic or pharmacological treatment, (ii) suicidal ideation or behavior, (iii) engagement in sexually abusive behaviors, or (iv) indication of seriously deteriorated psychiatric health. If excluded or withdrawn from the study, participants were offered treatment at ANOVA, or referral to other relevant health-care services if appropriate. Potential changes regarding psychoactive medication and psychotherapy was controlled for at the follow-up appointment.

Primary Outcome Measure

Hypersexual Behavior Inventory (HBI-19) is an instrument for the measurement of hypersexual behavior according to Kafka's proposed diagnostic criteria for HD.[27] The instrument consists of 19 statements that are rated 1–5 (1 = "Never", 2 = "Rarely", 3 = "Sometimes", 4 = "Often", and 5 = "Very Often"), leading to the sum score range of 19–95 with a proposed lower cutoff score of 53. Through confirmatory factor

analysis, 3 factors were found that give further support for the criteria of HD as proposed by Kafka.[4] The factors measure "Control", "Coping", and "Consequences" of hypersexual behavior.[27] Reliability analysis of the scale using Cronbach's alpha coefficient showed high internal reliability for the overall scale ($\alpha = 0.96$) and for the subscales (control: $\alpha = 0.95$, coping: $\alpha = 0.91$, and consequences: $\alpha = 0.89$). The scales also exhibit high test-retest reliability ($r = 0.91$, $P < .01$) based on a subset of help-seeking males ($n = 92$).

Secondary Outcome Measures

Hypersexual Disorder

Current Assessment Scale, HD:CAS[28] is a tool to measure the severity of HD symptoms in accordance with HD criteria[4,5,28] over the last 2 weeks. The scale consists of 7 items covering the HD criteria as proposed by Kafka.[4] Item 1 consists of 7 multiple-choice questions regarding predefined sexual behavior specifiers: "masturbation", "pornography", "sex with consenting adults", "cybersex", "telephone sex", "visits to venues for sexual entertainment", and "other". The multiple-choice item is not included in the calculation of the total sum score. Items 2−7 measure the severity of the HD criteria; item 2 measures the number of times the respondent has experienced orgasm through any of the specified sexual behaviors; item 3 measures the amount of time spent daily on sexual fantasies, urges, or behaviors; item 4 measures sexual behaviors or fantasies used to cope with dysphoric moods; item 5 measures sexual fantasies and behaviors used to postpone or manage stressful life events or other problems in life; item 6 measures the experienced level of control over sexual fantasies, urges, or behaviors, and item 7 measures engagement in risky, harmful, or dangerous sexual behaviors. The questions measure the severity of HD-symptoms over the *last 2 weeks* on a 5-point Likert scale from 0−4 points with a sum score range of 0−24 points. During the analyses it was found that the third item was incorrectly worded, as it addressed the amount of time over the *last 6 months* and engagement in sexual behaviors "*in response*" to distressing feelings (ie, anxiety, grief, boredom, guilt, or shame). The response option was however correct. To investigate the extent to which the results had been affected by this error, the internal consistency at the pre-, and post-treatment measurement was computed with and without item 3. A good internal consistency with all items included was found (pre-treatment: $\alpha = 0.81$; post-treatment: $\alpha = 0.90$) and when item 3 was excluded, the internal consistency was insignificantly higher ($\alpha = 0.82$, $\alpha = 0.91$) (pre-treatment and post-treatment respectively). HD:CAS has not been validated.

Sexual Compulsivity Scale

SCS rates the respondent's agreement with 10 statements relating to compulsive sexual behavior, sexual preoccupations, and intrusive sexual thoughts.[29,30] Each item is scored on a 4-point scale ranging from 1−4. The overall score is calculated by the sum score/number of items. Respondents are considered sexually compulsive if their mean score exceeds 2.1. The cutoff has in previous studies been at the 80th percentile and above. The scale has been proven highly reliable in a sample of HIV-positive men and women with $\alpha = 0.89$ and $\alpha = 0.92$ respectively.

Severity Self-Rating Measures for Paraphilic Disorders

The DSM-5[25] Paraphilia Sub-workgroup proposed self-rating scales for the measurement of the severity of specified paraphilia(s) and paraphilic disorders involving nonconsenting victims that is, exhibitionism, voyeurism, pedophilia, frotteurism, sadism, and sexual coerciveness. The self-rating measures offer reasonable metrics to quantify the degree of severity of a specific paraphilia that could be psychometrically validated over time.[31] However, at the time of study, they were not. Each measure consists of 5 items rated from 0−4 points over the preceding 2 weeks, with a total sum score range of 0−20 points. Item 1 assesses experienced sexual urge related to the paraphilia and item 2 measures sexual arousal from imagining engagement in the paraphilic behavior with response alternatives: (a) "Never" (0 points), (b) "Once" (1 point), (c) "About once a week" (2 points), (d) "Several times a week" (3 points), and (e) "Almost every day" (4 points). Item 3 measures the level of sexual excitement arising from the idea of engaging in the paraphilic behavior. The item is scored on a 5-point Likert scale (0−4 points) with response alternatives ranging from "Not at all exciting" to "Extremely exciting". Items 4 and 5 assess the number of nonconsenting victims the respondent has exposed to the paraphilic behavior. Item 4 concerns "the last 2 weeks" from 0 to ≥4 victims, (0−4 points). Item 5 assesses "over the course of your life" with categorical numbers of 0, 1, 2, 3−50, and ≥50 (0−4 points). To obtain a tentative screening measure for paraphilia(s)/paraphilic disorder(s), the sum scores of the severity measures were dichotomously recoded into: <1 = *"no indication of paraphilia"* and a score ≥ 1 = *"indication of paraphilia"*. To construct a global severity measure on paraphilia *per se*, a composite measure was created by summing the scores of *all six* of the severity measures. The total sum score (range = 1-120) was then divided with the number of measures on which the individual participant scored ≥ 1. The global measure was used to monitor any change in severity of paraphilic symptom.

Forward/backward translations of HBI-19, HD:CAS, HDSI, SCS, and the Self-Rating Severity Measures for Paraphilic disorders were performed by 2 certified translators.

The Montgomery-Åsberg Depression Rating Scale, MADRS-S,[32] is a 9-item scale designed to assess the severity of and changes in depressive symptoms. The total scale range is 0−54; a score of 0−12 indicates "no discomfort", 13−19 "mild depression", 20−43 "moderate depression", and >34 indicates "severe depression". The scale has been shown to have good test-retest reliability ($r = 0.80-0.94$) and high internal consistency ($\alpha = 0.82-0.90$).

The Clinical Outcomes in Routine Evaluation

Clinical outcomes in routine evaluation (CORE-OM) consists of 34 items, the responses to which describe the patient's level of psychological distress.[33] The scale exhibits good internal reliability (0.75−0.95) and test-retest stability for all subscores (0.87−0.91), except for the risk subscore (0.64). It is recommended to multiply the mean scores by 10 to obtain a clinically straightforward score format.[34] CORE-OM has been validated for the Swedish population.[35]

The Client Satisfaction Questionnaire

Client satisfaction questionnaire (CSQ-8)[36,37] is a structured, 8-item survey for the assessment of the level of satisfaction with care. Each item measures one aspect of treatment satisfaction and is scored on a Likert scale ranging from 1 to 4 points. The total range is 8−32 points, with higher scores indicating greater satisfaction with care. Sum score intervals of 8−13 and 14−19 points denote "poor" and "fair", while 20−25 and 26−32 indicate "good" and "excellent".[38] The questionnaire has exhibited high internal consistency (Cronbach α range = 0.83−0.93, a weighted mean -0.88) and scores correlate with changes in self-reported symptoms.

Treatment Procedure and Modules

Each participant was assigned a personal therapist (n = 9), a CBT-trained psychologist/psychotherapist working at the ANOVA clinic and with experience in the field of sexual medicine and given access to the ICBT through a secure internet platform. On average, each therapist treated 4 clients (SD = 2.8, range = 1−10). If absent, another therapist covered for the absentee. Therapist-client communication was mainly conducted through a secure e-mail service and by telephone if necessary. The therapists were available for guidance in treatment-related questions and to provide feedback on performed exercises and worksheets on 3 scheduled days each week. To increase compliance with the treatment, SMS notifications were sent to the participants whenever new material or therapist messages were available. In addition, SMS notifications were used to alert the participant that measurements were to be submitted. If the need for additional contact was expressed or there were indications of a deterioration in psychiatric health, participants were contacted by telephone.

The ICBT treatment was based on a CBT treatment protocol previously found to be effective for amelioration of hypersexual symptoms[1,3]; it consisted of 10 modules administered over a 12-week period. Thus, the expected work rate was one module per week, with a time margin of 2 weeks to buffer for occasional delays. Each module consisted of written information relevant for management of HD and related symptoms with 1−3 questions for reflection on the content, worksheets, and exercises associated with the information presented. The aggregated module text comprised a total of 54 (M = 5.4, range: 3−6) pages of text and the worksheets 26 (M = 1.7, range: 1−2) pages. The targeted HD-features of each treatment module and accompanying worksheets are presented in Table 2. The treatment followed a sequential order in which completion of a module was a prerequisite for gaining access to the next, and hence advancement in the treatment. A module was considered completed when the participant had submitted responses to the relevant assignments and received therapist feedback.

Module 1 presented the treatment procedure and means for client/therapist communication. It included education on the principles of CBT, that is, the relationships between thoughts, behaviors, and emotions. Based on previous findings that diagnosis-specific knowledge improve treatment responsivity,[39] module 2 focused on depicting the proposed diagnose of HD and diagnoses pf paraphilia(s) from a CBT-perspective and contributing factors in the maintenance of excessive sexual behavior. Information on consensual sex was included to increase knowledge, develop, and maintain benign interpersonal intimacy and sexual activity. In module 3, psychoeducation on theoretical perspectives of behavioral change in accordance with "the transtheoretical model of change" was presented.[40] It included exercises of motivational interviewing[41] to stimulate willingness of behavioral change by identifying pros and cons. Through functional behavioral analyses,[42] module 4 aimed to increase awareness of sexual and non-sexual behavioral surpluses and deficits. Incentives for, and function of problematic/excessive sexual behaviors were identified by means of basic behavioral principles, for example, classic and operant conditioning processes. In module 5, the situational and incentive processes identified in module 4, were addressed through development of functional impulse management techniques for risk situations, including urge-surfing, mindfulness practice and generation of alternative impulse responses.[42] The client was encouraged to create a personal "risk card" to prepare for situations in which the aforementioned techniques effectively could be employed. In accordance with principles of acceptance and commitment therapy, ACT,[43] identification of values in different areas of life was performed in module 6. These values were supposed to facilitate awareness of, and motivation for, engagement in valued behavior. Further, material for development of personal and interpersonal intimacy and sexuality included exercises for sensual communication and sensate focus.[44] Spawning of the value identification in module 6, the values were operationalized in realistic short- and long-term goals. Methods for continuous work and techniques for arbitrarily established and reinforcing rewards in accordance with behavioral activation[45] were applied with the aim to alleviate depressive oriented mood states. Module 8 contained information on the nature and function of cognitions and emotions. Negative versions of these inner experiences were addressed through cognitive restructuring,[46] behavioral experiments,[44] and behavioral activation[45] for achievement of the identified short- and long-term goals from module 7. Module 9 focused on behavior-analysis of communicative skills in various social contexts, including sexual and intimate situations. Improvement of skill deficits was produced through behavioral

Table 2. Treatment modules and appending worksheets for respective module, HD-feature(s) and paraphilia addressed and last completed module(s) of participants during the treatment study

Module	Addressed HD-feature/Paraphilia	Worksheets	Participantsá last completed module Completed module n (%)*
1. CBT and Internet-administered therapy	A1-5, B	1.1 Registration of problematic sexual behaviors	2 (5.6)
		1.2 CBT-triangle	
2. Sexuality	A1-5, B	1.1 Registration of problematic sexual behaviors	3 (8.3)
	Paraphilia		
3. Motivation and behavioral change	A, B	1.1 Registration of problematic sexual behaviors	4 (11)
		3.1 Cross of change	
		3.2 Wheel of change	
4. To understand ones behavior	A1-5, B	1.1 Registration of problematic sexual behaviors	2 (5.6)
		4.1 Behavioral surplus and deficits	
		4.2 Behavior analysis form	
5. Urges, risk-cards and mindfulness	A1-5	1.1 Registration of problematic sexual behaviors	2 (5.6)
		5.1 Registration of urge-eliciting situations	
		5.2 Risk.Card	
6. Values and intimacy	A2, A5, B	1.1 Registration of problematic sexual behaviors	2 (5.6)
		6. Values in areas of life	
7. Goal Formulation	A1-5	1.1 Registration of problematic sexual behaviors	3 (8.3)
		7. Identification of value-based goals	
8. Negative cognitions and emotions	A2, A3,	1.1 Registration of problematic sexual behaviors	4 (11)
		8.1 Behavioral experiement form	
		8.2 Observation of emotions	
9. Communication skills	A1, A2, A3, A4	1.1 Registration of problematic sexual behaviors	1 (2.8)
		4.2 Behavior analysis form	
		9. Assessment of communication skills	
		8.1 Behavioral experiement form	
10. Maintenance	A, B	1.1 Registration of problematic sexual behaviors	13 (36)
		10. Maintenance program	

*2 participants (n = 2, 5.6%) did not complete any module.

experiments and activation in accordance with assertiveness skill training.[47] A review and summary of the treatment and identification of the most feasible interventions were performed in the final module 10. Areas in need of further development were identified. Relapse prevention procedures referring to the clients' self-management skills were enhanced to maintain the therapy-induced behavior changes over time.[48,49] Education on how to handle setbacks was included. At the end of the study period (12 weeks after the start), independently of how many modules were completed, the participant was granted access to all 10 modules for another 4 weeks—albeit without therapist guidance.

Statistics

Students *t*-tests were used for the analysis of differences in baseline characteristics and for the posttreatment CSQ-8 measurement. A chi-square test for independence was used for the analysis of dichotomized and categorical variables.

For analysis of the intragroup treatment effects, linear mixed models using maximum likelihood[50] were used. Participants were used as random intercepts. Time was defined as a categorical variable using the pretreatment measurement as baseline and the weekly and 3-month follow-up measurements as the other categories. The beta-coefficients (β) represent an unstandardized measure of effect size in the metric of the original outcome and are the estimated mean change at midtreatment and posttreatment and the 3-month follow-up. The β_1 is the estimated mean difference as a function of the number of completed treatment modules. The estimated marginal means was implied by the LMM analysis. Observed means and standard deviations (SD) were also calculated.

Effect sizes (Cohen's *d*) and 95% confidence intervals were based on the estimated means derived from the LMM together with the observed pooled standard deviation.[51,52] Hence, intragroup effect sizes were based on the differences in estimated

means within the group, divided by the observed pooled intragroup standard deviation. These methods have been suggested as suitable when reporting results from Internet intervention studies using mixed model analysis.[53] In line with Cohen,[54] intragroup effect sizes (*d*) of 0.20, 0.50, and 0.80 were defined as small, medium, and large, respectively.

Ordinal regression analyses with cluster-robust standard errors and calculations of odds ratios (OR) were used for the analysis of changes in the number of reported sexual behavior specifiers. The pretreatment measurement was used as a reference point. Ordinal logistic regression can be considered a generalization of the Wilcoxon test.[55]

Based on the estimated reliability of HBI-19,[27] the Reliable Change Index,[56] was calculated for HBI-19. This was carried out to determine whether the sum scores had changed sufficiently to be regarded as reliable, not just a consequence of low test-retest reliability. A change exceeding 1.96 times the standard error of a measurement is considered unlikely to occur in more than 5% of the measuring times solely because of lack of reliability.[57] The criteria for clinically significant change (CS) proposed by Jacobson and Truax[58] were used to determine the proportion of participants falling outside the range of the dysfunctional population regarding hypersexual symptom severity as measured with HBI-19. CS was thus defined as a posttreatment score that was 2 SD beyond the mean of the pretreatment measurement in the direction of functionality, in combination with exhibiting a reliable change.[58]

For all statistical analyses including the effect sizes, confidence intervals (CIs) of 95% are provided where applicable. Results with *P* values less than 0.05 were regarded as statistically significant.

Ethics

The present study received ethical approval from the Regional Ethical Review Board in Stockholm, Sweden (reference no.: 2016/1783-31/2).

RESULTS

Sociodemographic, Screening, and Assessment Characteristics

Participants' (n = 36) sociodemographic, screening, and assessment characteristics are presented in Table 3. Twenty-four (67%) of the participants lived in Stockholm county. At screening, 53% (n = 19) of the participants screened positive for HD according to the HDSI cutoff score proposed by Kafka[24]; however, all participants met the HD diagnostic criteria in the clinical assessments. At screening, 25 participants (69%) gave indication for at least one paraphilia, and of these, a majority (n = 15, 60%) did for 2 or more paraphilias. In the ensuing assessment interviews, 9 (25%) participants met the criteria for either *having* ≥ 1 paraphilia (n = 8) (fulfilling criterion A) or paraphilic disorder(s) (n = 3), meeting both criteria A and B.

Table 3. Sociodemographic, screening, and assessment characteristics of male participants in the pilot study of ICBT for HD, with or without paraphilia(s)/paraphilic disorder(s), n = 36

Variables	(*n* = 36)
Age*, M (SD), years	39 (8.5)
Country of birth*, n (%)	
Sweden	31 (86)
Other	5 (14)
County*, n (%)	
Stockholm	24 (67)
Other	12 (33)
Civil Status*, n (%)	
Married, cohabitant, registered partner	22 (61)
Unmarried	8 (22)
Divorced	6 (17)
Currently in a relationship*, n (%)	30 (83)
Cohabitation status*, n (%)	
Another adult	1 (2.7)
Alone	6 (17)
Parent(s)	3 (8.3)
Partner	26 (72)
Children*, yes, n (% yes)	27 (75)
Education*, n (%)	
Compulsory school	3 (8.3)
Senior high school (vocational or college preparational)	11 (31)
University	21 (58)
Other	1 (2.7)
Occupation*, n (%)	
Student	2 (5.6)
Unemployed	2 (5.6)
Paid work	32 (89)
Psychotropic drug use†, n (%)	
Antidepressant	2 (5.6)
Positive HD status, HDSI*, n (%)	17 (53)
HBI-19 score ≥ 53*, n (%)	32 (89)
Purchase or vending of sexual services*, n (%)	8 (22)
Indication paraphilia(s)*, n (%)	25 (69)
Paraphilia†, n (%)	8 (22)
Paraphilic Disorder†, n (%)	3 (8.3)
Child sexual exploitation material*, n (%)	5 (14)
Last 6 months	3 (8.3)
Lifetime	2 (5.6)
Convicted of sexual offense, on probation†, n (%)	1 (2.8)

*Screening.
†Assessment.

Four participants fulfilled criterion A for voyeurism, 2 participants for exhibitionism, and 2 participants for hebephilia. Of the latter, one participant was diagnosed with exhibitionistic disorder, one participant met the criteria for pedophilic disorder, and a third participant concomitant voyeuristic and frotteuristic disorders. A significant correlation ($r = 0.50$, $P = .02$) was found between lifetime consumption of child sexual exploitation material and ascertained hebephilia or pedophilic disorder. No

significant mean score differences of HBI-19 at screening were found between the participants with paraphilia/paraphilic disorder and those without.

Outcomes

As can be seen in Table 4, the sum scores decreased significantly from the pretreatment to posttreatment measurement on the primary outcome HBI-19. These changes were maintained at the 3-month follow-up. According to the mixed model analyses, the estimated mean decrease from pretreatment to posttreatment was 19 points ($\beta = -19$, $z = -14$, CI = −17; −22, $P < .05$). Furthermore, the estimated sum score reduction per completed treatment module was 2.1 points ($\beta_1 = 2.1$, $z = -3.0$, CI = −3.4; −0.74, $P < .05$). Of the 34 participants who submitted posttreatment measurements, 15 (44%) fulfilled the criteria of a clinically significant change. The sum scores on the secondary outcome HD:CAS also decreased significantly (Table 4), with an estimated sum score reduction of 3.8 points at completion of treatment ($\beta = -3.8$, $z = -9.6$, CI = −4.6; −3.0, $P < .05$), −0.48 points per completed treatment module ($\beta_1 = -0.48$, $z = -2.5$, CI = −0.86; −0.10, $P < .05$). The likelihood of reporting the same or an increased number of sexual behavior specifiers had decreased after treatment, although this was not significant (OR = 0.47, CI = 0.19−1.0, $P = .071$). However, at the 3-month follow-up measurement, the likelihood was significantly lower in comparison to pretreatment (OR = 0.35, CI = 0.13−0.91, $P = .032$).

Item A.3 of HD:CAS was incorrectly worded (see Methods). To control whether this error inflated the results and the estimated effect sizes, we reanalyzed the data with item A.3 omitted. In the absence of item A.3, the unstandardized effect was marginally larger after treatment ($\beta = -3.9$, CI = −4.7; −3.1,

Table 4. Observed and estimated means, standard deviations, standard errors, effect and sample sizes, and 95% confidence intervals for each outcome measure over the 4 time points in the pilot study of ICBT for HD in a sample of HD-diagnosed men, with or without paraphilia(s)/paraphilic disorder(s)

Measure	Observed means		Estimated means		Effect size		
Time points	M (SD)	CI	M (SE)	CI	d	CI	N
HBI-19							
Pretreatment	67 (13)	62; 71	64 (2.8)	58; 69	-	-	36
Midtreatment	49 (16)	43; 55	49 (2.6)*	44; 54	0.99	0.49; 0.25	33
Posttreatment	42 (19)	35; 49	44 (2.7)*	39; 50	1.2	0.70; 1.7	34
3-month follow-up	42 (22)	32; 51	44 (3.1)*	38; 50	1.1	0.57; 1.7	25
HD:CAS							
Pretreatment	9.9 (0.83)	8.2; 12	9.8 (0.74)	8.4; 11	-	-	36
Midtreatment	7.6 (0.85)	6.0; 9.3	7.5 (0.69)	6.2; 8.9	0.88	0.38; 1.4	33
Posttreatment	5.7 (0.84)	4.0; 7.3	6.0 (0.72)	4.6; 7.4	0.91	0.42; 1.4	34
3-month follow-up	5.4 (0.92)	3.6; 7.2	5.5 (0.83)	3.9; 7.2	0.79	0.26; 1.3	25
SCS							
Pretreatment	28 (1.1)	26; 30	28 (1.1)	26; 30	-	-	36
Midtreatment	25 (1.2)	23; 28	24 (1.1)*	22; 26	0.65	0.16; 1.3	33
Posttreatment	21 (1.2)	19; 23	21 (1.2)*	19; 23	1.1	0.57; 1.6	34
3-month follow-up	20 (1.3)	17; 22	20 (1.3)*	17; 22	1.1	0.60; 1.7	25
Paraphilia composite							
Pretreatment	6.3 (6.5)	4.1; 8.5	6.3 (0.82)	6.1; 8.5	-	-	36
Midtreatment	3.4 (3.9)	1.5; 3.7	3.8 (0.84)	3.8; 5.9	0.49	0.010; 0.96	33
Posttreatment	2.4 (3.4)	0.96; 4.0	2.6 (0.84)	2.3; 4.5	0.76	0.27; 1.2	34
3-month follow-up	3.12 (5.2)	0.45; 4.4	3.1 (0.68)	1.7; 4.4	0.55	0.027; 1.1	25
MADRS-S							
Pretreatment	14 (7.7)	11; 17	13 (1.3)	11; 16	-	-	36
Midtreatment	9.7 (7.7)	7.5; 13	9.9 (7.6)*	7.6; 12	0.43	0.052;0.90	33
Posttreatment	8.1 (10)	5.8; 12	8.7 (6.3)*	6.3; 11	0.51	0.033; 0.99	34
3-month follow-up	7.7 (8.6)	5.1; 11	8.4 (1.4)*	5.6; 11	0.58	0.067; 1.1	25
CORE-OM							
Pretreatment	16 (1.2)	13; 18	15 (1.5)	12; 18	-	-	36
Midtreatment	14 (1.3)	11; 16	13 (1.2)*	10; 15	0.33	−0.14; 0.81	33
Posttreatment	11 (1.2)	9.0; 14	11 (1.3)*	8.8; 1.4	0.53	0.051; 1.0	34
3-month follow-up	10 (1.4)	7.6; 1.3	10 (1.4)*	7.5; 13	0.52	−0.0012; 1.0	25

CI = 95% confidence interval; d = Cohen's *d*; M = mean; SD = standard deviation; SE = standard error.
*$P < .05$.

$P < .05$), as was the standardized effect size of the sum score change after treatment in the absence of item A.3 ($d = 0.96$, CI = 0.46−1.5).

Symptoms of sexual compulsivity measured with SCS also decreased significantly over the study period (Table 4). The estimated sum score reduction of SCS at treatment cessation was 7.0 points ($\beta = -7.0$, $z = -6.2$, CI = −9.3; −4.8, $P < .05$), with an estimated reduction per completed module of 0.33 points; this estimated change was however not significant ($\beta_1 = 0.33$, $z = -1.3$, CI = −0.91; −0.25, $P = .26$).

The analysis revealed a significant reduction of the scores on the paraphilia composite measure ($\beta = -3.7$, $z = -4.6$, CI = −5.3; −2.2, $P < .05$). The model-implied reduction per completed module was 0.019 points, although this estimate was not significant ($\beta_1 = -0.019$, $z = -0.09$, CI = −0.43; 0.39, $P = .93$).

The participants exhibited significant improvement in the level of depressive symptoms (MADRS-S) over the course of treatment. At posttreatment, a significant model-implied sum score reduction of 4.5 points ($\beta = -4.5$, $z = -7.0$, CI = −5.8; −3.2, $P = .05$) was found. An estimated reduction per module of 0.64 points was also found; however, this relationship was not statistically significant ($\beta_1 = 0.64$, $z = -1.8$, CI = −1.3; −0.053, $P = .07$).

The participants reported significant score reductions on the CORE-OM, with an estimated posttreatment decrease of 0.38 points ($\beta = -3.8$*, $z = -2.9$, CI = −6.3; −1.2, $P < .05$). As for MADRS, the number of completed modules did not significantly impact sum score reduction ($\beta_1 = -0.42$, $z = -1.2$, CI = −1.1; −2.8, $P = .24$).

Follow-up Clinical Assessment

Out of the 72% (n = 26) who participated in the follow-up assessment interviews, 73% (n = 19) were considered "improved", 6 (23%) "unchanged", and one (4%) "deteriorated". There was a strong positive correlation ($\eta = 0.97$ or $r = 0.98$) between the 3 categories of levels of clinical assessments and treatment responsivity as measured by the HBI-19 Δ-score (pretreatment sum score minus posttreatment sum score).

Treatment Adherence

As can be seen in Table 2, 13 of the 36 participants (36%), enrolled in the study program completed all 10 treatment modules. On average, the participants completed 67% of the treatment protocol as measured by the number of completed treatment modules ($M = 6.7$, $SD = 3.3$). Half of the sample (50%) completed at least 7 modules and 2 participants (5.6%) did not complete any of the treatment modules.

Treatment Satisfaction

The posttreatment mean score on CSQ-8 (n = 33) was 25 ($SD = 4.7$), indicating that on average, the participants regarded the treatment as good. Of the participants entering responses to CSQ-8, 4 participants (12%) rated the treatment as "fair", 11 (33%) as "good", and 18 (55%) as "excellent". Thus, 88% of the participants expressed a high level of treatment satisfaction. There was a strong correlation between the HBI-19 Δ-score (pretreatment sum score minus posttreatment sum score) and the CSQ-8 sum score ($r = -0.59$, $P < .001$).

DISCUSSION

The main purpose of this study was to evaluate the effects and feasibility of ICBT for HD, with or without paraphilia(s) or paraphilic disorder(s). The results suggest that ICBT with therapist support leads to a significant decrease in hypersexual symptoms and that these improvements are maintained 3 months after completion of treatment. We found a dose-response effect, inasmuch as the further a participant advanced through the treatment protocol, the larger the ameliorating effects. Treatment compliance was high, as was the participants' treatment satisfaction.

The intragroup effect sizes for improvements in HD symptomatology were large, with the largest effect seen on HBI-19. Despite over 25% of subjects not participating in the follow-up assessment interview, the observed treatment effects were supported by congruence with the assessed clinical status. Furthermore, in line with our previous treatment studies,[1,3] we found fewer sexual behavior specifiers. This demonstrates the efficacy of the present treatment protocol, which is also underlined by the finding that a wider repertoire of sexual behavior is associated with hypersexuality and HD-positive screening on HDSI.[2,59]

It is difficult to determine whether or not the posttreatment group of 44% of participants who fulfilled the criteria for clinically significant improvements is to be considered large. In a similar pilot study design,[60] Andersson et al. investigated the efficacy of ICBT in a sample of participants diagnosed with obsessive compulsive disorder (OCD) and found that 14 of 23 (61%) fulfilled the criteria for CS. The relatively smaller proportion of improved participants in our study may be explained by the fact that the psychopathological mechanisms underlying HD are less understood than OCD. There is substantial support for the identified psychological, neurochemical, and neuroanatomical bases of OCD[61]; CBT was found to be an effective treatment for the condition[62] before it was implemented for Internet administration. In comparison, HD has not been investigated as thoroughly with regard to causes or efficacy of treatments. As pointed out by Montgomery-Graham,[17] the HD population seem heterogeneous with regard to underlying substrates that manifest as hypersexual behaviors. The applied treatment interventions were selected based on the features of HD as proposed by Kafka[4] and may not have adequately addressed individual needs, resulting in less symptom reduction. The criteria for CS according to the calculation procedure

suggested by Jacobson and Truax[58] are however considered a very restrictive measure of improvement. It has been pointed out that a general adoption of these CS criteria in treatment studies would make psychotherapy appear much less effective than the standard statistical comparisons would imply.[63]

SCS is the most commonly used measure of hypersexual behavior that has demonstrated discriminant validity due to being unaffected by ethnicity, level of education, or age.[64] Although HBI-19 is constructed in accordance with the HD criteria, it has not been used in studies on hypersexuality to the same extent as SCS. The effect sizes found for SCS were almost as large as those found for HBI-19, indicating reliability of the observed treatment effects. SCS and HBI-19 measure 2 similar but nonidentical diagnostic constructs. While SCS measures sexual compulsivity, a construct with sexual impulsive and compulsive components,[4,29,65] it does not acknowledge sexual behaviors as a dysfunctional coping strategy. The similar effect sizes for the 2 measures may indicate that the use of sexual behavior for coping purposes is less relevant for patients exhibiting hypersexual behavior. The latter may have merit as a plausible explanation because the coping dimension has not been consistently supported in the scientific literature.[66,67] This however does not mean that sex for coping purposes cannot be a valid aspect of problematic hypersexuality. Apart from the specified criteria for HD,[4] the coping function has been formulated and advocated as a main feature in sex addiction.[68] It has also been pointed out that HD may in fact be a combination of symptoms related to difficulties surrounding the control of sexual behaviors and that there may be a plethora of possible causes that result in HD symptomatology,[4,17] either alone or in combination. The coping function may apply to a subgroup of patients demonstrating hypersexual behavior.

More than two-thirds of the participants had indications of paraphilias in the online screening. This proportion is similar to the findings from a study of the characteristics of self-identified sex addicts (n = 72) in an outpatient clinic in which 61% presented with at least one paraphilia.[69] Although a lesser proportion (31%) met the criteria for having at least one paraphilia or paraphilic disorder at the assessment interview, the results add merit to the notion that hypersexuality and paraphilia are related, as has been demonstrated in several studies.[2,11,12] Apart from the symptoms and negative consequences of HD, paraphilia(s) add adverse consequences within the realm of sexuality and lead to a heavier burden because of social stigmatization, discrimination, and social isolation.[70] Lost opportunities for primary reinforcement as a result of isolation are an important aspect of the contextual model for depression.[45] Symptom severity is an identified predictor of treatment adherence in studies on ICBT.[71] A clinical presentation of severe concomitant paraphilia(s) could explain the higher level of motivation to engage in and adhere to the treatment found here in comparison to the findings in our previous study on CBGT for HD.[3] The moderate posttreatment effects of paraphilia must be interpreted with caution because of the combination of unvalidated measures and small sample size. The treatment effects found in this study may actually have been influenced by the general reduction in sexual preoccupation and it is uncertain whether the treatment ameliorated the paraphilic symptoms independently of the HD symptoms. However, if the paraphilic symptoms are a subset of sexual expression, reductions to hypersexual symptoms would entail a decrease in paraphilia. The demonstrated changes may be attributed to the interventions included: development of benign sexuality, respect for mutual consent, and functional communication. Well-developed skills within these areas of interpersonal functioning have previously been linked to the normalization of sexual arousal after exposure to deviant sexual stimuli.[72,73] Sexual preoccupation is associated with paraphilia and an increased risk of recidivism in sexual offending.[14,15,72–74] Reduction of sexual preoccupation may therefore have the potential to reduce the risk of sexual offending and the development of paraphilic interests, even though the design of the present study does not allow such elaborated conclusions. It is our contention that it is important to manage symptoms of hypersexuality when treating patients with concomitant paraphilia or paraphilic disorder.

Moderate effects were found on measurements of the participants' overall psychiatric well-being. This is not surprising as the inclusion criteria specified the absence of severe psychiatric comorbidity and pretreatment levels of depressive and psychiatric symptoms were on average low. Another tentative explanation for the small posttreatment changes in overall psychiatric well-being is that it might not be prime areas of dysphoria among patients on HD. As previously proposed, shame is a dysphoric mood state that may cause or maintain hypersexual behavior, and the study could have benefitted from inclusion of a relevant measurement on shame for treatment outcome.

The ICBT format may influence the treatment effects and result in less vulnerability to attrition than in CBGT. It has been reported that the freedom from temporal constraints and physical presence[22,62,75] facilitates patients' adherence to the intended treatment. This is supported by the high number of completed modules and the link to the magnitude of symptom reduction found in this study. One-third of the participants lived outside Stockholm County with very limited access to appropriate treatment for HD and paraphilias. Treatment accessibility independent of time and location and with frequent access to therapist support may have contributed to high treatment motivation. Engagement in therapy and compliance with homework assignments are robust predictors for positive treatment outcomes in studies of CBT for anxiety disorders.[76,77] Another predictor for adherence and positive treatment outcomes are high levels of therapist-patient interaction.[78,79] The participants were offered frequent therapist input and guidance throughout the study, with only a short delay (≤48 h). We did not measure the level of therapist-patient interaction, but it is reasonable to assume that this contributed to steady progression through the therapeutic process. In our previous study,[3] the

group session format did not permit the same level of individual therapist guidance. Johansson et al.[80] have demonstrated that overly complex or long treatment texts are factors that can partially explain a lack of adherence to ICBT. Although the number of included components was expanded (development of benign sexuality, information on mutual consent), the treatment protocol was a condensed version of the interventions and exercises from our previous study.[3] By keeping the materials to a minimal length, yet comprehensive in scope, participants may have been more inclined to adhere to the treatment. On average, the participants completed two-thirds of the intended treatment modules, a finding that is in line with the aforementioned study on ICBT for OCD.[60]

One strength of the study was the benefit provided by the properties of treatment modality. For both participants and therapists, the written material prevented drift away from the intended treatment components (ie, treatment integrity), which in turn may have diminished the discrepancy between the intended and the implemented treatment interventions. Therapist drift from the intended treatment intervention is considered a common reason for failure to respond to treatment and possibly also for symptom deterioration.[81] If treatment integrity is secured, the interpretation of the results from empirical treatment studies becomes more reliable.[82]

The statistical analysis used for examination of the treatment effects is a further strength. It has been claimed that linear mixed model analyses are superior to more traditional analyses (ie, analysis of variance), as missing data are handled efficiently without the use of substitutional procedures that introduce the risk of distortion or inflated interpretation.[50,83] The retrieved data from weekly measurements were included in the analysis, which balanced and increased the precision of the parameter estimations and in effect increased the predictive value of the results.

Another strength of the study relates to the generalizability of the results. By including paraphilic disorder and interest, the target sample population was potentially more representative than our previous study.[3] Efficacy studies typically involve clear cut, diagnosed patients, a circumstance which jeopardizes the treatment's external validity, that is, the extent to which the results can be generalized to real clinical settings.[84]

Some limitations must be acknowledged. The first and most obvious limitation relates to the validity of the HD diagnosis. Although the diagnostic criteria were found to be valid in field trials, HD was not included in DSM-5.[85–87] The use of a tentative diagnosis which is not officially endorsed is a shortcoming. At the initiation of the project, HD was the best available diagnostic formulation of problematic hypersexuality and a diagnostic proposal that did not make pathogenetical claims.[4,88] Since then, the research field has developed and led to the inclusion of CSBD in the ICD-11.[89] Regarding the validity of the treatment and its long-term impact, inferences cannot be drawn with regard to whether the observed treatment gains seen beyond 3 months after treatment can be attributed solely to the treatment. No control condition was assigned; the sample size was rather small and consisted entirely of men. Hypersexual behavior is not exclusively a male phenomenon, and gender-based differences have recently been found to be smaller than previously suggested.[10]

As pointed out, item A3 of HD:CAS was incorrectly formulated, which casts doubt on the reliability of the measure in question. However, the internal consistency without the faulty item did not improve to a significant degree. The reanalysis of the retrieved data indicated that the effects were larger if the item was excluded. We concluded that the results and the treatment effects as measured with HD:CAS can be interpreted despite the erroneous item. HD:CAS was not the primary outcome measure, and the outcomes were therefore affected to a lesser degree.

In the present study, only measures regarding paraphilia(s) and paraphilic disorders[25] involving nonconsenting persons were analyzed. Participants may however have suffered from other forms of paraphilia(s) that were not included as an outcome. Another limitation relating to the paraphilias is the composite measurement used to monitor symptom changes. We based the composite measurement on the proposed severity self-ratings measures for paraphilic disorders,[25] even though their psychometric properties have not been evaluated in field trials. This is also true for the diagnostic criteria for paraphilias that were included in DSM-5.[90] At the initial screening, we used dichotomized values on each scale, which resulted in a rough estimation of the presence/absence of paraphilia(s). This somewhat simplified interpretation resulted in a highly sensitive measurement of paraphilic interests by registering any instance as an indication of presence of paraphilic interest. In effect, the screening results were likely overinclusive, a contention confirmed by the smaller proportion of endorsed paraphilia and paraphilic disorder statuses after the clinical interviews. First[91] pointed out that the A criterion for paraphilic disorders in DSM-5[6] was modified from previous editions to minimize the risk of a false positive diagnosis of a paraphilic disorder based on the occurrence of a sexual act alone. This reasoning is strengthened by the results from a study of a group of men convicted of sexual offenses (n = 113), in which only 66 (58%) exhibited paraphilias.[92] The same line of reasoning may explain why there was not full agreement between lifetime usage of sexual child exploitation material and a positive pedophilic diagnosis. Even though a history of "child pornography offenses" (the legal term for offenses concerning sexual child exploitation material) has been considered a valid indicator of pedophilia, not all such offenders meet the criteria for pedophilia.[91,93]

To the best of our knowledge, the present study is the first of its kind, so it is difficult to draw conclusions about the effects of the treatment in comparison with traditional face-to-face CBT for HD. However, we have previously demonstrated that the symptoms of HD as proposed by Kafka[4] can be treated with the

interventions in the treatment protocol, albeit in a cognitive behavioral group therapeutic setting.[3] Despite differences in the studied samples and outcome measures, the effects were smaller than those found in the present study, which suggests that ICBT may be more effective than CBGT in the treatment of HD. The ICBT treatment may also be suitable for patients suffering from the recently included ICD-11 diagnosis compulsive sexual behavior disorder, CSBD,[8,9,89] because it shares many features with HD. Still, HD-patients constitute a heterogeneous clinical group and greater flexibility in the available treatment interventions is seen as promising on the condition that etiological mechanisms are formulated and "contain interventions for previously neglected areas".[94]

CONCLUSION

This is the first study evaluating the effects of Internet-administered CBT designed specifically for HD, with or without paraphilia(s)/paraphilic disorder(s). The treatment significantly reduced hypersexual, paraphilic, and psychiatric symptoms. By being flexible, efficacious, and unaffected by circumstances of time and place, ICBT constitutes an important addition to existing treatment options for hypersexuality and should be integrated in standard clinical practice. Future studies should include women and larger samples in randomized controlled procedures, as well as investigate the long-term effects.

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REFERENCES

1. Hallberg J, Kaldo V, Arver S, et al. A Cognitive-Behavioral Therapy Group Intervention for Hypersexual Disorder: A Feasibility Study. **J Sex Med 2017;14:950-958.**
2. Oberg KG, Hallberg J, Kaldo V, et al. Hypersexual Disorder According to the Hypersexual Disorder Screening Inventory in Help-Seeking Swedish Men and Women With Self-Identified Hypersexual Behavior. **Sex Med 2017;5:e229-e236.**
3. Hallberg J, Kaldo V, Arver S, et al. A Randomized Controlled Study of Group-Administered Cognitive Behavioral Therapy for Hypersexual Disorder in Men. **J Sex Med 2019;16:733-745.**
4. Kafka MP. Hypersexual Disorder: A Proposed Diagnosis for DSM-V. **Arch Sex Behav 2010;39:377-400.**
5. American Psychiatric Association. Hypersexual Disorder. 2010. Available at: http://www.dsm5.org/ProposedRevisions/Pages/proposedrevision.aspx?rid=415#. Accessed March 12, 2010.
6. American Psychiatric Association. Diagnostic and statistical manual of mental disorders: DSM-5. Fifth edition. Arlington, VA: American Psychiatric Publishing, [2013] ©2013; 2013.
7. Reid RC, Carpenter BN, Hook JN, et al. Report of findings in a DSM-5 field trial for hypersexual disorder. **J Sex Med 2012;9:2868-2877.**
8. World Health Organization. 6C92 Compulsive sexual behaviour disorder. 2018. Available at: https://icd.who.int/dev11/l-m/en#/http%3a%2f%2fid.who.int%2ficd%2fentity%2f1630268048. Accessed June 21, 2018.
9. Kraus SW, Krueger RB, Briken P, et al. Compulsive sexual behaviour disorder in the ICD-11. **World Psychiatry 2018;17:109-110.**
10. Dickenson JA, Gleason N, Coleman E, et al. Prevalence of Distress Associated With Difficulty Controlling Sexual Urges, Feelings, and Behaviors in the United States. **JAMA Netw Open 2018;1:e184468.**
11. Langstrom N, Hanson RK. High rates of sexual behavior in the general population: correlates and predictors. **Arch Sex Behav 2006;35:37-52.**
12. Kafka MP. Hypersexual Desire in Males: An Operational Definition and Clinical Implications for Males with Paraphilias and Paraphilia-Related Disorders. **Arch Sex Behav 1997;26:505-526.**
13. Kafka MP, Hennen J. The paraphilia-related disorders: an empirical investigation of nonparaphilic hypersexuality disorders in outpatient males. **J sex marital Ther 1999;25:305-319.**
14. Hanson RK, Morton-Bourgon KE. The characteristics of persistent sexual offenders: a meta-analysis of recidivism studies. **J consulting Clin Psychol 2005;73:1154-1163.**

15. Kingston DA, Bradford JM. Hypersexuality and Recidivism among Sexual Offenders. **Sex Addict Compulsivity 2013; 20:91-105.**
16. Hald GM, Malamuth NM, Yuen C. Pornography and attitudes supporting violence against women: revisiting the relationship in nonexperimental studies. **Aggressive Behav 2010; 36:14-20.**
17. Montgomery-Graham S. Conceptualization and Assessment of Hypersexual Disorder: A Systematic Review of the Literature. **Sex Med Rev 2016.**
18. Hook JN, Reid RC, Penberthy JK 2nd, et al. Methodological review of treatments for nonparaphilic hypersexual behavior. **J sex marital Ther 2014;40:294-308.**
19. Reid RC, Stein JA, Carpenter BN. Understanding the roles of shame and neuroticism in a patient sample of hypersexual men. **J Nerv Ment Dis 2011;199:263-267.**
20. Gilliland R, South M, Carpenter BN, et al. The Roles of Shame and Guilt in Hypersexual Behavior. **Sex Addict Compulsivity 2011;18:12-29.**
21. Kuzma JM, Black DW. Epidemiology, prevalence, and natural history of compulsive sexual behavior. **The Psychiatr Clin North America 2008;31:603-611.**
22. Andersson G. Internet-Delivered Psychological Treatments. **Annu Rev Clin Psychol 2016;12:157-179.**
23. American Psychiatric Association. Hypersexual Disorder Screening Inventory; 2010. Available at: http://www.dsm5.org/ProposedRevisions/Pages/proposedrevision.aspx?rid=415#. Accessed March 12, 2010.
24. Kafka MP. The Development and Evolution of the Criteria for a Newly Proposed Diagnosis for DSM-5: Hypersexual Disorder. **Sex Addict Compulsivity 2013;20:19-26.**
25. American Psychiatric Association. Severity Self-rating Measures for Paraphilic Disorders; 2011. Available at: http://www.dsm5.org/ProposedRevisions/Pages/Paraphilias.aspx. Accessed March 12, 2010.
26. Sheehan DV, Lecrubier Y, Sheehan KH, et al. The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. **J Clin Psychiatry 1998; 59:22-33.**
27. Reid RC, Garos S, Carpenter BN. Reliability, Validity, and Psychometric Development of the Hypersexual Behavior Inventory in an Outpatient Sample of Men. **Sex Addict Compulsivity 2011;18:30-51.**
28. American Psychiatric Association. Hypersexual Disorder: Current Assessment Scale; 2010. Available at: http://www.dsm5.org/ProposedRevisions/Pages/proposedrevision.aspx?rid=415#. Accessed March 12, 2010.
29. Kalichman SC, Rompa D. Sexual Sensation Seeking and Sexual Compulsivity Scales: Validity, and Predicting HIV Risk Behavior. **J Personal Assess 1995;65:586-601.**
30. Kalichman SC, Rompa D. The Sexual Compulsivity Scale: further development and use with HIV-positive persons. **J Pers Assess 2001;76:379-395.**
31. Krueger R, Kaplan M. Paraphilic diagnoses in DSM-5. **Isr J Psychiatry Relat Sci; 2012;49:248-254.**
32. Svanborg P, Asberg M. A comparison between the Beck Depression Inventory (BDI) and the self-rating version of the Montgomery Åsberg Depression Rating Scale (MADRS). **J Affective Disord 2001;64:203-216.**
33. Evans C, Connell J, Barkham M, et al. Towards a standardised brief outcome measure: Psychometric properties and utility of the CORE-OM. **Br J Psychiatry 2002;180:51-60.**
34. Barkham M, Mellor-Clark J, Connell J, et al. A core approach to practice-based evidence: A brief history of the origins and applications of the CORE-OM and CORE System. **Counselling Psychotherapy Res 2006;6:3-15.**
35. Elfström ML, Evans C, Lundgren J, et al. Validation of the Swedish version of the Clinical Outcomes in Routine Evaluation Outcome Measure (CORE-OM). **Clin Psychol psychotherapy 2013;20:447-455.**
36. Attkisson CC, Greenfield TK. Client Satisfaction Questionnaire-8 and Service Satisfaction Scale-30. The use of psychological testing for treatment, planning and outcome assessements. Mahwah: Lawrence Erlbaum Associates; 1994.
37. Larsen DL, Attkisson CC, Hargreaves WA, et al. Assessment of client/patient satisfaction: Development of a general scale. **Eval Program Plann 1979;2:197-207.**
38. Smith D, Roche E, OáLoughlin K, et al. Satisfaction with service following voluntary an involuntary admission. **J Ment Health 2014;23:38-45.**
39. Andersson G, Carlbring P, Furmark T; Group SOFIER. Therapist experience and knowledge acquisition in internet-delivered CBT for social anxiety disorder: a randomized controlled trial. **PloS one 2012;7:e37411.**
40. Norcross JC, Wampold BE. Evidence-based therapy relationships: research conclusions and clinical practices. **Psychotherapy (Chic) 2011;48:98-102.**
41. Levensky ER. Motivational Interviewing. In: O`Donohue W, Fisher JE, Hayes SC, eds. Cognitive behavior therapy : applying empirically supported techniques in your practice. Hoboken, New Jersey: John Wiley & Sons, Inc; 2003. p. 252-260.
42. O'Donohue WT, Fisher JE. General Principles and Empirically Supported Techniques of Cognitive Behavior Therapy. New York, NY: John Wiley & Sons; 2009.
43. Hayes SC, Strosahl KD, Wilson KG. Acceptance and Commitment Therapy, Second Edition: The Process and Practice of Mindful Change. New York, NY: The Guilford Press; 2011.
44. O'Donohue WT, Fisher JE. Cognitive behavior therapy: Applying empirically supported techniques in your practice. 2nd ed. Hoboken, NJ, US: John Wiley & Sons Inc; 2008.
45. Martell CR, Addis ME, Jacobsen NS. Depression in Context: Strategies for Guided Action. New York, NY: W W Norton & Co; 2001.
46. Ellis A. Cognitive Restructuring of the Disputing of Irrational Beliefs. In: O'Donohue W, Fisher JE, Hayes SC, eds. Cognitive Behavior Therapy: Applying Empirically Supported Techniques in Your Practice. Hoboken, NJ: John Wiley & Sons, Inc; 2003. p. 79-83.

47. Paterson RJ. The Assertiveness Workbook: How to Express Your Ideas and Stand Up for Yourself at Work and in Relationships. New Harbinger Publications; 2000.
48. Brunswig KA, Sbraga TP, Harris CD. Relapse Prevention. In: O'Donohue W, Fisher JE, Hayes SC, eds. *Cognitive Behavioral Therapy: Applying Empirically Supported Techniques in Your Practice* Hoboken. New Jersey: John Wiley & Sons, Inc.; 2003. p. 321-329.
49. George WH. Marlatt and Gordon's relapse prevention model: A cognitive-behavioral approach to understanding and preventing relapse. **J Chem Dependency Treat 1989;2:125-152.**
50. Laird NM, Ware JH. Random-Effects Models for Longitudinal Data. **Biometrics 1982;38:963-974.**
51. Feingold A. Effect sizes for growth-modeling analysis for controlled clinical trials in the same metric as for classical analysis. **Psychol Methods 2009;14:43-53.**
52. Feingold A. Confidence interval estimation for standardized effect sizes in multilevel and latent growth modeling. **J consulting Clin Psychol 2015;83:157-168.**
53. Hesser H. Modeling individual differences in randomized experiments using growth models: Recommendations for design, statistical analysis and reporting of results of internet interventions. **Internet Interventions 2015;2:110-120.**
54. Cohen J. Statistical Power Analysis for the Behavioral Sciences. New York, NY: Routledge Academic; 1988.
55. Harrell FE, Lee KL. The practical value of logistic regression. In: Proc, ed. 10th Annual SAS User's Group International Conference. SAS Institute; 1985. p. 1031-1036.
56. Evans C, Margison F, Barkham M. The contribution of reliable and clinically significant change methods to evidence-based mental health. **Evidence-Based Ment Health 1998;1:70-72.**
57. Jacobson NS, Follette WC, Revenstorf D, et al. Variability in outcome and clinical significance of behavioral marital therapy: A reanalysis of outcome data. **J consulting Clin Psychol 1984; 52:497-504.**
58. Jacobson NS, Truax P. Clinical Significance: A Statistical Approach to Denning Meaningful Change in Psychotherapy Research. **J Consultin Clin Psychol 1991;59:12-19.**
59. Dhuffar MK, Pontes HM, Griffiths MD. The role of negative mood states and consequences of hypersexual behaviours in predicting hypersexuality among university students. **J Behav Addict 2015;4:181-188.**
60. Andersson E, Ljótsson B, Hedman E, et al. Internet-based cognitive behavior therapy for obsessive compulsive disorder: a pilot study. **BMC psychiatry 2011;11:125.**
61. Barlow DH. Clinical handbook of psychological disorders: a step-by-step treatment manual. Fifth edition. New York: Guilford Publications; 2014.
62. Andersson E. Enhancing Cognitive Behavior Therapy in The Treatment if Obsessive-Compulsive Disorder. Department of Clinical Neuroscience. Stockholm, Sweden: Karolinska Institutet; 2014. p. 62.
63. Wise EA. Methods for analyzing psychotherapy outcomes: a review of clinical significance, reliable change, and recommendations for future directions. **J Pers Assess 2004; 82:50-59.**
64. Hook JN, Hook JP, Davis DE, et al. Measuring sexual addiction and compulsivity: a critical review of instruments. **J sex marital Ther 2010;36:227-260.**
65. Derbyshire KL, Grant JE. Compulsive sexual behavior: a review of the literature. **J Behav Addict 2015;4:37-43.**
66. Bothe B, Kovacs M, Toth-Kiraly I, et al. The Psychometric Properties of the Hypersexual Behavior Inventory Using a Large-Scale Nonclinical Sample. **J sex Res 2018:1-11.**
67. Prause N, Staley C, Fong TW. No Evidence of Emotion Dysregulation in "Hypersexuals" Reporting Their Emotions to a Sexual Film. **Sex Addict Compulsivity 2013;20:106-126.**
68. Carnes P. Out of the shadows: Understanding sexual addiction. Minneapolis, MN: CompCare; 1983.
69. Wery A, Vogelaere K, Challet-Bouju G, et al. Characteristics of self-identified sexual addicts in a behavioral addiction outpatient clinic. **J Behav Addict 2016;5:623-630.**
70. Jahnke S, Imhoff R, Hoyer J. Stigmatization of people with pedophilia: two comparative surveys. **Arch Sex Behav 2015; 44:21-34.**
71. Christensen H, Griffiths KM, Farrer L. Adherence in internet interventions for anxiety and depression. **J Med Internet Res 2009;11:e13.**
72. Marshall WL, Marshall LE, Serran GA, et al. Sexual offender treatment: a positive approach. **The Psychiatric clinics of North America 2008;31:681-696.**
73. Marshall WL. The Relationship Between Self-Esteem and Deviant Sexual Arousal in Nonfamilial Child Molesters. **Behav Modification 1997;21:86-96.**
74. Willis GM, Ward T. Striving for a good life: The good lives model applied to released child molesters. **J Sex Aggression 2011;17:290-303.**
75. Andersson G, Bergström J, Buhrman M, et al. Development of a New Approach to Guided Self-Help via the Internet: The Swedish Experience. **J Technology Hum Serv 2008;26:161-181.**
76. Glenn D, Golinelli D, Rose RD, et al. Who gets the most out of cognitive behavioral therapy for anxiety disorders? The role of treatment dose and patient engagement. **J consulting Clin Psychol 2013;81:639-649.**
77. Chavira DA, Golinelli D, Sherbourne C, et al. Treatment engagement and response to CBT among Latinos with anxiety disorders in primary care. **J consulting Clin Psychol 2014; 82:392-403.**
78. Palmqvist B, Carlbring P, Andersson G. Internet-delivered treatments with or without therapist input: does the therapist factor have implications for efficacy and cost? **Expert Rev Pharmacoecon Outcomes Res 2007;7:291-297.**
79. Kelders SM, Kok RN, Ossebaard HC, et al. Persuasive system design does matter: a systematic review of adherence to web-based interventions. **J Med Internet Res 2012;14:e152.**
80. Johansson O, Michel T, Andersson G, et al. Experiences of non-adherence to Internet-delivered cognitive behavior

therapy: A qualitative study. **Internet Interventions 2015; 2:137-142**.

81. Waller G. Evidence-based treatment and therapist drift. **Behav Res Ther 2009;47:119-127**.
82. Perepletchikova F. On the Topic of Treatment Integrity. **Clin Psychol (New York) 2011;18:148-153**.
83. White IR, Carpenter J, Horton NJ. Including all individuals is not enough: lessons for intention-to-treat analysis. **Clin Trials 2012;9:396-407**.
84. Andersson G, Carlbring P, Cuijpers P. Internet interventions: Moving from efficacy to effectiveness. **E-Journal Appl Psychol 2010;5**.
85. Scanavino MT, Ventuneac A, Rendina HJ, et al. Sexual Compulsivity Scale, Compulsive Sexual Behavior Inventory, and Hypersexual Disorder Screening Inventory: Translation, Adaptation, and Validation for Use in Brazil. Archives of sexual behavior; 2014.
86. Parsons JT, Rendina JH, Ventuanec A, et al. A Psychometric Investigation of the Hypersexual Disorder Screening Inventory among Highly Sexually Active Gay and Bisexual Men: An Item Response Theory Analysis. **J Sex Med 2013;10:3088-3101**.
87. Kafka MP. What happened to hypersexual disorder? **Arch Sex Behav 2014;43:1259-1261**.
88. Samenow CP. What You Should Know about Hypersexual Disorder. **Sex Addict Compulsivity 2011;18:107-113**.
89. World Health Organization. The 11th Revision of the International Classification of Diseases (ICD-11). Available at: https://icd.who.int/browse11/l-m/en#/http://id.who.int/icd/entity/1630268048; Accessed June 21, 2018.
90. Fedoroff JP, Di Gioacchino L, Murphy L. Problems with paraphilias in the DSM-5. **Curr Psychiatry Rep 2013;15:363**.
91. First MB. DSM-5 and Paraphilic Disorders. **J Am Acad Psychiatry L Online 2014;42:191**.
92. Dunsieth NW Jr, Nelson EB, Brusman-Lovins LA, et al. Psychiatric and Legal Features of 113 Men Convicted of Sexual Offenses. **J Clin Psychiatry 2004;65:293-300**.
93. Babchishin KM, Hanson RK, VanZuylen H. Online child pornography offenders are different: a meta-analysis of the characteristics of online and offline sex offenders against children. **Arch Sex Behav 2015;44:45-66**.
94. von Franque F, Klein V, Briken P. Which Techniques Are Used in Psychotherapeutic Interventions for Nonparaphilic Hypersexual Behavior? **Sex Med Rev 2015;3:3-10**.