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ORIGINAL RESEARCH

A Randomized Controlled Study of Group-Administered Cognitive Behavioral Therapy for Hypersexual Disorder in Men

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ABSTRACT

Background: Hypersexual disorder (HD) is defined as a condition in which the individual loses control over engagement in sexual behaviors, leading to distress and negative effects on key life areas. Cognitive behavioral therapy (CBT) has been proven to reduce symptoms of hypersexual behavior; however, no randomized controlled study of CBT interventions for HD has been reported previously.

Aim: To investigate the efficacy of group-administered CBT for HD.

Methods: Male participants (n = 137) diagnosed with HD, were randomized between 7 weeks of group-administered CBT (n = 70) and a waitlist control receiving the intervention after 8 weeks (n = 67). Measurements were administered at pre-, mid-, and posttreatment, with follow-up after 3 and 6 months.

Outcomes: The primary outcome was the Hypersexual Disorder: Current Assessment Scale (HD:CAS), and secondary outcomes were the Sexual Compulsivity Scale (SCS) and measures of 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: A significantly greater decrease in HD symptoms and sexual compulsivity, as well as significantly greater improvements in psychiatric well-being, were found for the treatment condition compared with the waitlist. These effects remained stable at 3 and 6 months after treatment.

Clinical Implications: CBT can ameliorate HD symptoms and psychiatric distress, suggesting that the CBT program may serve as a first-line treatment in clinical settings.

Strengths & Limitations: This is the first randomized controlled study evaluating the efficacy of a CBT program in a rather large sample of HD-specific diagnosed men. The long-term treatment effects are vague due to the low response rate on follow-up measurements, and the efficacy of this program for hypersexual women remains unknown.

Conclusion: This study supports the efficacy of a group-administered CBT program as a treatment option for HD; however, future studies should include women, comprise dismantling analysis of the constituting interventions, and evaluate other treatment formats, for example, administration via the Internet. **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;■:1—13.**

Key Words: Male Sexual Desire Disorders; Basic science male behavioral; Mental Health and Male Sexuality

INTRODUCTION

In this article, we report the results of a randomized controlled study of cognitive behavioral therapy (CBT) for hypersexual disorder (HD). HD, which has been suggested as a diagnostic entity for the *Diagnostic and Statistical Manual of Mental Disorders*, Fifth Edition (DSM-5), involves excessive and persistent sexual behaviors in relation to various mood states, with an impulsivity component and experienced loss of control.[1] Although it has been rejected for inclusion, hypersexual behavior has been shown to cause clinically significant distress and impairment, and the classification "compulsive sexual behavior disorder" is now presented as an impulse

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control disorder in the International Classification of Diseases, 11th Revision.[2,3] The negative consequences of sexual behavior on social and psychological functioning have been reported in a sample of hypersexual help-seekers.[4] Significantly more childhood trauma and depressive symptoms have also been found among hypersexual patients compared with healthy volunteers.[5] Reid et al[6] found that as many as 73% of patients diagnosed with HD reported negative effects on mental health, and 68% reported that they had "emotionally hurt" a loved one. In addition, shame and rumination have been linked to hypersexual behavior,[7–9] as have being single, depressed, and prone to sexual boredom.[10]

Although hypersexual behavior is seen in an increasing number of help-seeking patients, foremost in men,[1,4] access to evidence-based treatment programs are scarce. Attempts have been made to explore treatments for conditions resembling HD, such as sexual dysregulation, sexual addiction, and compulsive sexual behavior.[11] Overall, this research contains methodological limitations, such as small sample sizes, lack of validated instruments, and questionable study designs. Only 1 study used a randomized trial design. In a comparative study of acceptance and commitment therapy (ACT) for problematic internet pornography use, Crosby and Twohig[12] found significant posttreatment intergroup differences in symptom reduction (ACT group, 93% vs waitlist, 21%). In a trial of a brief multimodal experiential therapy for sexual addiction (n = 38), significant decreases in depression, anxiety, preoccupation with sex, and shame were found.[13] Preliminary results from an online recovery program in a rather large sample of hypersexual men (n = 138) showed decreases from an initial mean level of 13 ± 9.5 times/month to 4.1 ± 4.9 times/month post-program in pornography use, and from 14 ± 9.2 times/month to 5.4 ± 5.7 in masturbation (effect sizes $\eta^2 = 0.50$ and 0.52 for pornography use and masturbation, respectively.).[14] Furthermore, changes in psychological aspects of recovery (ie, constructive reactions to temptation, self-control, and healthy pleasure outlets) were associated with changes in pornography use and masturbation. When the efficacy of CBT was investigated in 114 clients with "Internet addiction," 75% reported Internet-related sexual problems; most participants were found to be "able to manage their complaints" during treatment and at the 6-month follow-up.[15] In a recent study reported by Kjellgren,[16] 27 males received treatment provided by specialized social welfare units. Hypersexual behavior, according to the Sexual Addiction Screening Test (SAST),[17] had decreased significantly on subscales measuring sexual addiction and preoccupation. Furthermore, average mental health had improved posttreatment, although Internet use, loss of control, and relationship and affect disturbances had not.[16] Attenuated hypersexual problems have further been found as a result of pharmacologic treatment, although the authors concluded that the results should be interpreted cautiously owing to small sample sizes and invalidated outcome measures.[18]

To our knowledge, only 1 study of CBT for the HD-specific criteria taken from the American Psychiatric Association (APA) proposal[1,19] has been reported to date.[20] The HD criteria encompass an inability to control excessive sexual thoughts, fantasies, and behaviors in relation to dysphoric mood states and stress and have been validated in a clinical population.[6] The function of sexual acts as a coping strategy for negative emotions and psychological distress has been explored by Kafka[21] and Parsons et al,[22] whereas other studies have identified important roles of sexual excitation and elevated sexual desire in the explanation of hypersexual behavior.[23,24] The structure of hypersexuality symptoms has been characterized as a core network of psychological distress and negative emotions triggered by sexual behaviors together with loss of control. It has been suggested that this core network of hypersexuality could be a target for clinical interventions.[25]

Although there has been but 1 study on the specific diagnostic symptoms of HD,[20] there is a body of studies supporting CBT interventions for depressive symptoms, stress, and impulsivity.[26–28] We performed a cognitive behavioral therapy (CBT) group treatment program, including 10 men diagnosed with HD in a feasibility study.[20] The treatment components addressed the suggested core criteria for HD as a nonparaphilic sexual desire disorder with lack of impulse control.[1] Significant treatment effects were found posttreatment, with decreases in HD symptom severity and the number of problematic sexual behaviors. No significant differences in the outcome measures were found in relation to the duration of treatment in a 7-session or 10-session program.[20] Therefore, the more time- and cost-efficient 7-session program was favored in this study. Although the CBT program was found to be feasible, the results should be interpreted with caution due to the small sample size and lack of a control condition. Further evaluations of CBT in larger studies with a randomized controlled design are needed to explore the efficacy and long-term effects on HD.

The overall purpose of the present study was to investigate the efficacy of a manual-based cognitive behavioral group-therapy for HD. Specific aims were to examine the differences between the treatment and waitlist condition in severity of hypersexual symptoms and overall psychiatric distress, the intragroup long-term effects of treatment, and participants' level of treatment satisfaction.

METHODS

Setting

The study took place at the ANOVA Clinic, Karolinska University Hospital, Sweden, a multidisciplinary clinic for research, assessment, and treatment in the fields of andrology, sexual medicine, and transgender medicine.

Design

In this randomized controlled study of a manual-based group-administered CBT program for HD comparing active treatment

with a waitlist control group, during an initial 7-week study period, the treatment group underwent therapy. The waitlist condition subsequently received the same therapy, starting at 1 week after the initial study period.

Outcome measures were administered simultaneously for both conditions at the initiation of the study protocol (pretreatment), during the fourth week (mid-treatment), and during the seventh week (posttreatment). Data collected from the waitlist control group during the therapy period (measurements performed according to the study protocol) were pooled with retrieved data from the treatment condition and analyzed for intragroup, long-term treatment effects. Follow-up measures were administered at 3 and 6 months after the completion of treatment for both conditions.

Procedure

Recruitment and the subsequent treatment study (Figure 1), were performed continuously over a 4-year period (December 14 2011 to July 28, 2015). Participants were recruited through media advertisements and Google AdWords. In addition, patients referred to or contacting the ANOVA clinic exhibiting suitable clinical presentations received information of the study and, if interested in participating, were encouraged to apply for the study according to the enrollment procedure presented below.

The target population was adult women and men suffering from self-identified problematic "hypersexual behavior," "out-of-control sexual behavior," or "sex addiction" who were interested in participating in a clinical study of a group treatment intervention for HD. Information about the study was published on the official website of the clinic at which the study took place. The inclusion criteria were (i) age >18 years, (ii) fulfillment of the proposed criteria for hypersexual disorder,[20] (iii) willingness to be randomized to either the treatment group or the waitlist group, and (iv) stable in medication regimen (≥3 months), if medicated with psychoactive compounds. Exclusion criteria were (i) paraphilias of pedophilia, voyeurism, exhibitionism, frotteurism, sadism, and sexual coercion; (ii) severe psychiatric comorbidity (ie, severe anxiety, depression, other contraindicating psychiatric conditions, or substance abuse) assessed through the Mini-International Neuropsychiatric Interview (MINI)[29]; (iii) ongoing psychotherapy; and (iv) other circumstances contraindicated for participation in group therapy (eg, poor hygiene, deviant or therapy-obstructing behavior).

Participants submitted their application for the study on a secure Internet platform by providing informed consent and valid contact information. They were instructed to complete an online screening battery consisting of 23 structured questionnaires on sociodemographic aspects, hypersexual behavior (including the Hypersexual Disorder Screening Inventory [HDSI] and the Hypersexual Disorder: Current Assessment Scale [HD:CAS]), overall psychiatric status, paraphilic interest or behaviors, and substance use. Subsequently, participants were invited by phone to 2 clinical assessment interviews, performed on a single occasion at the clinic. HD was preliminarily screened for using the HDSI, and the final diagnostic status was established through the clinical assessments conducted by a psychiatrist and a psychologist/licensed sexologist. To ensure reliability of the diagnostic procedure, each participant was reviewed in a referral meeting between the psychologist and psychiatrist.

In case of exclusion, participants in need of further assessment and treatment were offered standard clinical procedure at ANOVA or, if more appropriate, referred to adequate healthcare services.

To prevent unnecessary risks of malign pair bonding, the groups were split based on gender. Substantially fewer women (n = 20) than men (n = 138) were found to be eligible after assessment. Consequently, given the prolonged recruitment period, randomization of women was not feasible.

Randomization

Randomizations were performed when a sufficient number, 8−12 participants, were included to form at least 2 groups. Randomizations were performed independently of the research group, using the random sequence generator from www.random.org.[30] The first group formed was designated the "treatment" group, and the second was designated the "waitlist" group.

Ethics

This study received ethics approval from the Regional Ethical Review Board in Stockholm, Sweden (Registration ID: 2010/5:3).

Measures

Screening Measures

The HDSI was designed to screen for HD according to the APA's proposed DSM-5 criteria.[21] Five core diagnostic items cover the A criteria of hypersexual behavior, and 2 B criteria items cover distress and impairment. A scale of 0−4, ranging from "never true" to "almost always true" during the past 6 months, is applied. Six different sexual behavior specifiers (masturbation, pornography, sexual behavior with consenting adults, cybersex, telephone sex, and venues for sexual entertainment), are examined on a yes/no scale. For a probable diagnosis of HD, a score of 3 or 4 is required on 4 out of 5 A criteria and on 1 B criterion. Total scores range from 0 to 28, and the minimum score to meet the probable diagnosis of HD gathered from at least 4 A criteria and 1 B criterion is 15. An additional clinically relevant unidimensional cutoff score of 20 points was suggested by Parsons et al.[22]

Primary Outcome Measure

The HD:CAS[31] measures the symptom intensity/severity of current HD during the previous 2 weeks, following the APA's DSM-5 proposed criteria for HD. The scale consists of 7 items:

- A.1: a multioption item for 6 sexual behavior specifiers: masturbation, pornography, sexual behavior with consenting

adults, cybersex, telephone sex, and venues for sexual entertainment
- A.2: the number of times the respondent has had orgasm through any of the specified sexual behaviors
- A.3: the amount of time spent on problematic sexual fantasies, urges, or behaviors
- A.4: sexual behaviors or fantasies used to cope with dysphoric feelings (anxiety, depression, boredom, frustration, guilt, or shame)
- A.5: sexual fantasies and behaviors to postpone or handle stressful life events or other problems or obligations in life
- A.6: experienced level of control over sexual fantasies, urges, or behaviors
- A.7: participation in activities that are risky, harmful, or even dangerous to himself/herself, his/her partner, or another person.

Scores range from 0 to 24 points, providing a dimensional measure of symptom intensity/severity. The scale remains to be validated, and cutoff scores remain to be specified. To calculate the internal consistency, responses from a sample of age-matched, healthy volunteers recruited via the Karolinska Trial Alliance[5] were pooled with the responses from the present study's online screening measurement and yielded a Cronbach's α value of 0.89.

Secondary Outcome Measures

The Sexual Compulsivity Scale (SCS) is a 10-item scale in which respondents rate their agreement with various statements related to compulsive sexual behavior, preoccupations, and intrusive sexual thoughts.[32,33] All items are scored on a 4-point scale ranging from 1 to 4. A clinical score is calculated by the summed score/number of items. A respondent is considered sexually compulsive at a mean score exceeding 2.1. The scale has been judged reliable in a sample of HIV-positive men ($\alpha = 0.89$) and women ($\alpha = 0.92$).[33]

The Montgomery–Åsberg Depression Rating Scale (MADRS-S)[34] was developed to be sensitive to changes in the level of depressive symptoms through an assessment of 9 items. Scores range from 0 to 54 points, with the following score span categorizations: 0– 12, no depression; 13–19, mild depression; 20–34, moderate depression; and ≥35, severe depression. The scale exhibits good test-retest reliability ($r = 0.80–0.94$) and high internal validity ($\alpha = 0.82–0.90$).

The Clinical Outcomes in Routine Evaluation Outcome Measure (CORE-OM) consists of 34 items rated from 0 to 4, designed to describe the patient's level of psychological distress.[35] Four dimensions of distress are measured: symptoms (anxiety, depression, somatic and trauma related), functioning (close relationships, overall, social), subjective well-being, and risks (to self and others). The scale exhibits good internal reliability ($r = 0.75–0.95$) and test-retest stability for all subscores ($\alpha = 0.87–0.91$), except for the risk subscore (0.64). The total score is divided by the number of items, resulting in a mean score of 0–4. In the present study, the risk dimension was excluded and, as recommended, the mean score was multiplied by 10 to obtain a clinically straightforward score.[36] The CORE-OM has been validated for the Swedish population with a cutoff score of 14 to divide a clinical population from a subclinical population.[37]

The posttreatment level of treatment satisfaction was measured with the Client Satisfaction Questionnaire (CSQ-8), a questionnaire with 8 items scored from 1 to 4 points.[38] Based on the summed scores, categorization of the respondent's level of satisfaction can be made. Scores of 8–13, 14–19, 20-25, and 26-32 represent "poor," "fair," "good," and "excellent," respectively.[39] The questionnaire has exhibited high internal consistency (Cronbach $\alpha = 0.83–0.93$; weighted mean, -0.88); scores correlate with changes in self-reported symptoms. All participants submitted responses to the CSQ-8 after completion of treatment, that is, at the end of their respective treatment periods.

Treatment Components and Procedure

The CBT interventions were included in the treatment program to target the core criteria for HD as a nonparaphilic sexual desire disorder with lack of impulse control.[1] HD may, along with excessive engagement and loss of control in sexual behaviors, include dysfunctional means to cope with dysphoric mood states, such as anxiety, depression, or stressful life events. Thus, treatment components addressing these mood states were included. In our preceding pilot study, the symptoms of HD were ameliorated, and thus the program was found to be feasible.[20]

The treatment program consisted of 7 CBT-based modules that were delivered at the group sessions over a period of 7 weeks, through lectures and written materials:

1. An introduction to the current study and basic psychoeducation of CBT and hypersexual disorder
2. Psychoeducation of surplus and deficits of behaviors, basic behavioral/functional analysis, and stimulation of motivation
3. Urge surfing techniques and identification of values
4. Behavioral activation according to identified values and advanced behavioral/functional analysis
5. Psychoeducation on the influence of dysfunctional thoughts and beliefs and to challenge these, design and implementation of behavioral experiments to be performed in between sessions, cognitive restructuring, and problem-solving techniques
6. Interpersonal behavioral activation through assertiveness skill training, conflict management, and identification and engagement of interpersonal goals
7. Treatment summary, design, and implementation of the individual maintenance program.

Each module contained an average of 18 pages of text and visual material, and homework assignments/exercises to be completed each week (a total of 127 pages plus appending exercises). Each group session lasted for 2.5 hours, and the treatment material was presented and distributed during the sessions (could also be downloaded). The therapists reviewed and gave feedback on the homework assignments, corrected

misunderstandings of the treatment rationale, reinforced behavior change, designed behavioral experiences in cooperation with each group member, and promoted repeated exercises. The group treatment was led by 2 licensed psychologists and a licensed psychotherapist, with a minimum of 1.5 years and a maximum of 15 years of experience in CBT and a minimum of 3 years of experience in the field of sexology/sexual medicine. Out of the 2 group psychologists, 1 male therapist was present throughout the treatment protocol. Group sizes varied depending on the number of included participants from each period of recruitment and consisted of 2−8 participants. A total of 26 groups (13 in each contingency) were formed throughout the study. The first author was present at 77% of the groups formed, equally distributed between the treatment and waitlist groups.

Statistics and Data Analysis

The t test was used for analysis of differences in sociodemographic and screening characteristics and for the posttreatment CSQ-8 measurement. Dichotomized and categorical variables were analyzed with the χ^2 test for independence. The internal consistency of HD:CAS was determined by Cronbach's α.

For comparison between the study conditions and the evaluation of the long-term intragroup treatment effects (pooled group), mixed-model analyses using restricted maximum likelihood and with the patient as a random intercept[40] were performed. The mixed-model design handles missing data in an efficient manner. According to White et al,[41] the analysis is congruent with the concept of an "intent-to-treat" principle, given that the missing data are equal in distribution to observed data. The missing data were regarded as missing at random. Time was defined as a categorical variable, with pretreatment as the reference time point. A group variable was included (treatment vs waitlist), as were interactions between group and time, where the latter was used to test differences in change between the 2 conditions. The β-coefficients (considered as an unstandardized effect size measure) are the results in the metric of the original outcome scale (eg, mean difference between groups as a function of 1 unit change in time).

Standardized effect sizes were established through calculations for growth models (ie, mixed-model analysis) as proposed by Feingold,[42] a method proposed as suitable for reports of studies on psychosocial treatments.[43] In the present study, intergroup effect sizes (d) of 0.20, 0.50, and 0.80 are considered indicators of small, medium, and large effects, respectively, in accordance with Cohen.[44] Based on experiences drawn from previous treatment studies of psychiatric disorders, an effect size of Cohen's $d = 0.6$ is estimated. To obtain a statistical power of 80%, a minimum of 44 participants need to be randomized to each condition.

For sensitivity analyses of the primary and secondary outcomes (ie, results from primary analyses), ordinal regression analyses with cluster robust standard errors (with patient as cluster) were performed with computations of odds ratios (ORs). Ordinal logistic regression can be seen as a generalization of the Wilcoxon test,[45] and thus provides nonparametric forms of analysis. An odds is defined as the probability for an event to occur in relation to the probability that it does not occur. The method was further used to investigate changes of the number of reported sexual behavior specifiers over the study period, using the pretreatment measurement as the reference point. 95% confidence intervals (CIs) are provided for statistical analyses when applicable. Statistical significance was defined as a P value $<.05$.

RESULTS

Sociodemographic and Screening Characteristics

Participants' (n = 137) sociodemographic and screening characteristics are presented in Table 1. No statistically significant differences were found between the treatment and waitlist groups. According to the HDSI cutoff score proposed by Kafka,[21] 56% of the participants were classified as subclinical regarding HD at screening. When the cumulative cutoff score of HDSI proposed by Parsons et al[22] was applied, the corresponding proportion was 50%; however, all participants in the treatment study protocol met the diagnostic criteria for HD during assessment.

Twenty-five randomized participants (treatment, n = 12; waitlist, n = 13), dropped out before the start of treatment and subsequently did not submit any of the outcome measures before treatment (Figure 1). Analysis regarding HD status according to screening results on HDSI revealed no significant differences ($P > .05$) between the dropouts and respondents in the main analyses, irrespective of the HDSI cutoff score applied. Neither were there any statistically significant differences in age or outcome measures at screening.

Primary Outcome

Observed means and SDs for each continuous outcome by condition over time are provided in Table 2, along with the results from the mixed-model analyses (β-coefficients and their related 95% CIs). As can be seen, the mixed-model analysis revealed statistically significant sum-score differences between treatment and control conditions regarding the effects on HD:CAS over the study period. For the treatment group, there were negative time coefficients at the mid-treatment ($\beta = -2.5$) and posttreatment ($\beta = -3.6$) measurements, suggesting improvements regarding hypersexual symptoms. The mean sum-scores for the waitlist group at mid-treatment and posttreatment remained in line with the pretreatment measurement and were significantly higher than those of the treatment group ($\beta_1 = 2.0$ and $\beta_1 = 3.2$, respectively). Based on the estimated means, the intergroup standardized effect size was small at the mid-treatment measurement (Cohen's $d = 0.41$; 95% CI = 0.042−0.77), increasing to a medium size at the posttreatment measurement ($d = 0.66$; 95% CI = 0.29−1.0).

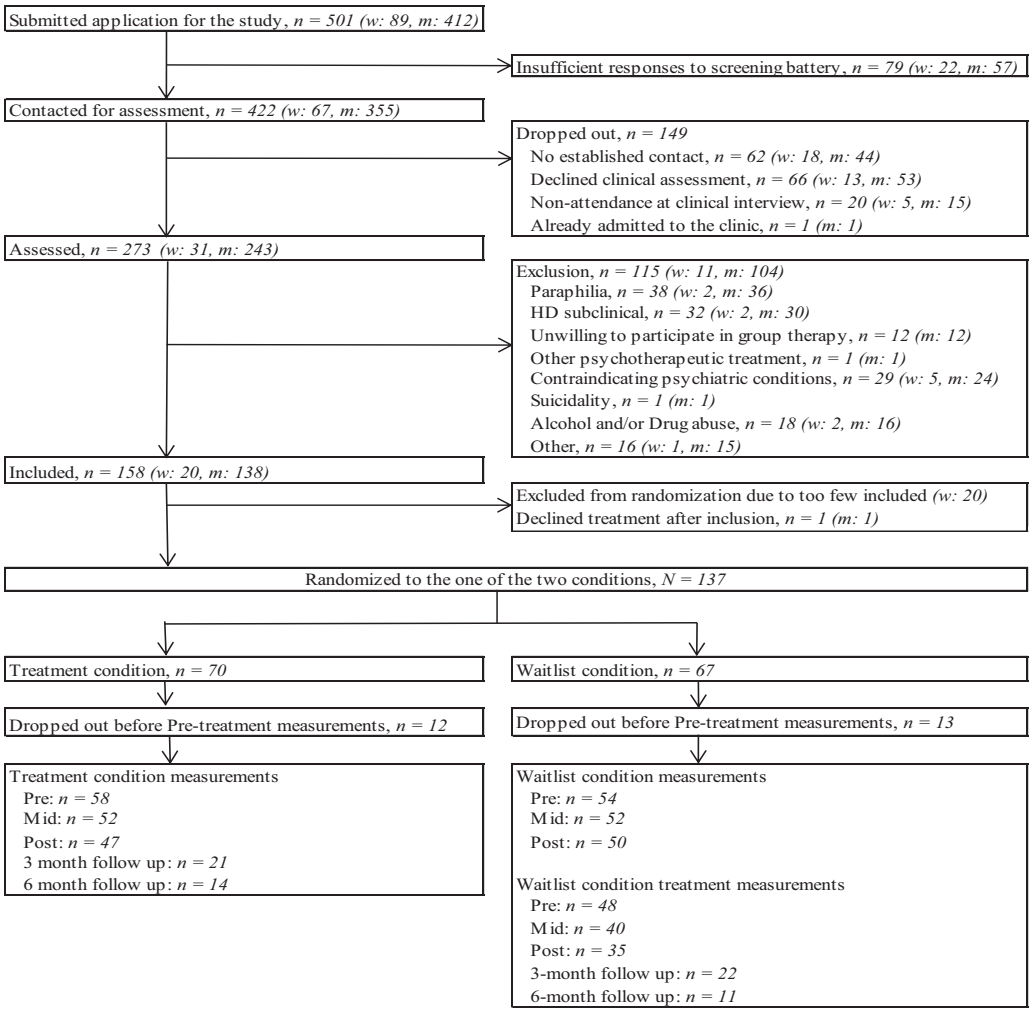

Figure 1. Participant flow in the randomized, controlled study of group-administered CBT for HD (*w* = women; *m* =men).

A statistically significant ($P < .05$) time × group interaction (ordinal regression analysis) for the number of reported sexual behavior specifiers during the study period was found. At mid-treatment, the participants in the treatment group were less likely to report the same or an increased number of sexual behaviors compared with the pretreatment measurement (OR = 0.51; SE = 0.14; 95% CI = 0.30−0.86), whereas the waitlist controls, were more than two times as likely as the treatment group to do so (OR = 2.2; SE = 0.71; 95% CI = 1.2−4.2). At posttreatment, the likelihood for the participants in the treatment group decreased even further (OR = 0.24; SE = 0.078; 95% CI = 0.13−0.45), whereas the waitlist participants were nearly 4-fold more likely to report a higher number of specifiers than those who had received treatment (OR = 3.6; SE = 1.3; 95% CI = 1.7−7.4).

Secondary Outcomes

During the treatment period, sexual symptoms according to the SCS were reduced in the treatment group. At mid-treatment and posttreatment measurements, the waitlist group had significantly higher levels of sexual compulsivity symptoms than the treatment group (β_1 = 3.0 vs 3.3). The intergroup standardized effect sizes were substantial; medium at mid-treatment (d = 0.78; 95% CI = 0.38−1.2) and large at the posttreatment measurement (d = 0.83; 95% CI = 0.42−1.2).

The treatment group exhibited significant improvement in the level of depressive symptoms (MADRS-S) over the course of treatment, whereas the waitlist controls did not. The intergroup effects were small at the mid-treatment measurement (d = 0.43; 95% CI = 0.060−0.8) but increased to medium at the post-treatment measurement (d = 0.65; 95% CI = 0.27−1.0). As shown in Table 2, clinical scores for psychiatric distress (CORE-OM) were significantly higher among the waitlist controls than among the participants in the treatment condition at mid-treatment and post-treatment. Substantial intergroup effects were found at mid-treatment (d = 0.46; 95% CI = 0.074−0.84) and posttreatment (d = 0.72; 95% CI = 0.33−1.1).

Long-Term Treatment Effects

The intragroup analysis of the pooled group results on HD:CAS (Table 2) revealed a significant declining trend for the β-coefficient at mid-treatment and posttreatment compared with the pretreatment measurements. The mid-treatment effect was

Table 1. Distribution of screening characteristics and sociodemographic data for the randomized participants in the treatment study of men with hypersexual disorder

Baseline characteristic	Treatment (N = 70)	Waitlist (N = 67)	Full sample (N = 137)
Age, y, mean ± SD*	40 ± 12	40 ± 11	40 ± 12
Civil status, n (%)†			
Married, cohabitant or registered partner	33 (47)	45 (67)	78 (57)
Unmarried	24 (34)	16 (24)	40 (29)
Divorced	11 (16)	5 (7.5)	16 (12)
Widower	2 (2.9)	1 (1.5)	3 (2.2)
Cohabitation status, n (%)†			
Other adult	3 (4.3)	1 (1.5)	4 (2.9)
Alone	25 (36)	15 (22)	40 (29)
Parent(s)	4 (5.7)	1 (1.5)	5 (3.6)
Spouse/partner	38 (54)	50 (75)	88 (64)
Children, yes, n (%)†	40 (57)	38 (57)	78 (57)
Highest education level, n (%)†			
Compulsory school	4 (6)	2 (3.0)	6 (4.4)
High school (vocational)	12 (17)	8 (12)	20 (15)
High school (college preparatory)	11 (16)	17 (25)	28 (20)
University	42 (60)	38 (57)	78 (57)
Other	1 (1)	3 (4.5)	4 (2.9)
Occupation, n (%)†			
Student	6 (8.5)	3 (4.5)	9 (6.6)
Unemployed	4 (5.7)	1 (1.5)	5 (3.6)
Paid work	54 (77)	58 (87)	112 (82)
Paternal leave	1 (1.4)	2 (3.0)	3 (2.2)
Sick leave	2 (2.9)	1 (1.5)	3 (2.2)
Retired (age)	2 (2.9)	2 (3.0)	4 (2.9)
Retired (medical condition)	1 (1.4)	0 (0)	1 (0.7)
Psychotropic drug use, n (%)†	14 (20)	6 (9.0)	20 (15)
Antidepressants and anxiolytics	13 (19)	5 (7.5)	18 (13)
Mood stabilizers	1 (1.4)	0 (0)	1 (0.7)
Stimulants	0 (0)	1 (1.5)	1 (0.7)
HD diagnosis, HDSI screen, n (%)†			
According to Kafka's cutoff	29 (41)	31 (46)	60 (44)
According to Parsons's cutoff	32 (46)	36 (54)	68 (50)
Number of sexual behavior specifiers, HD:CAS screen, mean ± SD*	1.9 ± 1.3	1.9 ± 1.2	1.9 ± 1.3
Sexual compulsivity, SCS screen, n (%)†	59 (84)	58 (87)	117 (85)

HD = hypersexual disorder; HD:CAS = Hypersexual Disorder: Current Assessment Scale; HDSI = Hypersexual Disorder Screening Inventory; SCS = Sexual Compulsivity Scale.

*Group differences nonsignificant ($P > .05$) according to the t test.

†Group differences nonsignificant ($P > .05$) according to the χ^2 test for independence.

medium-sized ($d = 0.51$; 95% CI, 0.32−0.69) and increased further at the posttreatment measurement ($d = 0.74$; 95% CI = 0.55−0.93). These effects were maintained at the 3-month ($d = 0.70$; 95% CI = 0.46−0.94) and 6-month ($d = 0.69$; 95% CI = 0.39−0.99) follow-up measurements.

Significantly ($P < .05$) fewer sexual behavior specifiers were reported along the treatment period compared with the pretreatment measurement. At mid-treatment, there was a decreased likelihood (OR = 0.50; SE = 0.11; 95% CI = 0.32−0.76) of reporting the same or a larger number of problematic sexual behaviors, which further decreased at posttreatment (OR = 0.24; SE = 0.058; 95% CI = 0.15−0.39). At the 3- and 6-month follow-ups, the probability of the number of reported sexual specifiers declined even more (OR = 0.22; SE = 0.10; 95% CI = 0.085−0.55 and OR = 0.17; SE = 0.11; 95% CI = 0.050−0.60, respectively).

The β-coefficient of the SCS mean sum-scores demonstrate a decreasing pattern compared with the pretreatment measurement. The standardized effect was medium-sized at mid-treatment ($d = 0.56$; 95% CI = 0.39−0.73), and post-treatment ($d = 0.62$; 95% CI = 0.44−0.80), but had increased at the 3- and 6-month follow-ups ($d = 0.88$; 95%

Table 2. Observed means, β-coefficients, 95% confidence intervals, and sample sizes for primary and secondary measures by condition and pooled group over treatment in a sample of HD-diagnosed men participating in a randomized controlled study of group-administered CBT for HD

	Treatment				Waitlist				Pooled			
Measurement	Mean ± SD	β	95% CI	*n*	Mean ± SD	β_1	95% CI	n	Mean ± SD	β	95% CI	n
HD:CAS												
Pretreatment	9.1 ± 4.7	-	-	58	9.1 ± 4.9	-	-	54	8.7 ± 4.9	-	-	106
Mid-treatment	6.5 ± 4.1	−2.5*	−3.5 to −1.5	52	8.6 ± 4.9	2.0*	0.58−3.4	52	6.3 ± 4.1	−2.5*	−3.4 to −1.6	92
Posttreatment	5.5 ± 3.9	−3.6*	−4.6 to −2.5	47	8.8 ± 5.0	3.2*	1.8−4.7	50	5.1 ± 3.7	−3.6*	−4.5 to −2.7	82
3-mo follow-up	-	-	-	-	-	-	-	-	5.0 ± 4.2	−3.4*	−4.6 to −2.2	43
6-mo follow-up	-	-	-	-	-	-	-	-	5.5 ± 5.3	−3.3*	−4.8 to −1.9	25
SCS												
Pretreatment	25 ± 6.2	-	-	58	27 ± 6.2	-	-	54	26 ± 6.4	-	-	106
Mid-treatment	22 ± 6.9	−3.4*	−4.6 to −2.1	52	26 ± 6.8	3.0*	1.3−4.8	52	23 ± 7.1	−3.6*	−4.7 to −2.5	92
Posttreatment	22 ± 6.8	−3.4*	−4.7 to −2.2	47	27 ± 7.0	3.3*	1.5−5.1	50	22 ± 7.0	−4.0*	−5.2 to −2.8	82
3-mo follow-up	-	-	-	-	-	-	-	-	20 ± 7.4	−5.7*	−7.2 to −4.2	43
6-mo follow-up	-	-	-	-	-	-	-	-	20 ± 6.6	−5.6*	−7.5 to −3.8	25
MADRS-S												
Pretreatment	13 ± 9.1	-	-	58	14 ± 7.1	-	-	54	12 (8.8)	-	-	106
Mid-treatment	10 ± 7.7	−3.1*	−4.6 to -1.6	52	14 ± 8.3	2.6*	0.50−4.8	52	10 (7.5)	−2.5*	−3.9 to −1.2	92
Posttreatment	8.8 ± 7.5	−4.3*	−5.9 to −2.8	47	14 ± 9.1	4.4*	2.2−6.6	50	8.6 (7.1)	−4.4*	−5.8 to −3.0	82
3-mo follow-up	-	-	-	-	-	-	-	-	9.8 (8.2)	−3.0*	−4.8 to −1.2	43
6-mo follow-up	-	-	-	-	-	-	-	-	10 ± 10	−1.9	−4.1 to 0.32	25
CORE-OM clinical score												
Pretreatment	14 ± 6.9	-	-	58	15 ± 5.8	-	-	54	14 ± 6.6	-	-	106
Mid-treatment	11 ± 6.9	−2.5*	−3.8 to -1.3	52	14 ± 6.6	2.1*	0.34−3.9	52	12 ± 6.6	−2.8*	−3.9 to −1.6	92
Posttreatment	10 ± 6.6	−3.6*	4.9 to −2.3	47	15 ± 6.5	3.8*	2.0−5.6	50	11 ± 6.1	−3.8*	−5.0 to −2.6	82
3-mo follow-up	-	-	-	-	-	-	-	-	11 ± 7.8	−3.0*	−4.5 to −1.4	43
6-mo follow-up	-	-	-	-	-	-	-	-	11 ± 9.3	−2.0*	−3.9 to −0.020	25

The β and β_1 values indicate the group's β-coefficients at the given time points. The treatment and pooled groups' β values show the mean sum score change (in the metric of the original measure) from the sample's pretreatment measurement. The β_1 values indicate the waitlist's mean sum score differences from the treatment group's scores at the respective time points.
CI = confidence interval; CORE-OM: Clinical Outcomes in Routine Evaluation Outcome Measure; HD:CAS = Hypersexual Disorder: Current Assessment Scale; MADRS-S = Montgomery−Åsberg Depression Rating Scale; SCS = Sexual Compulsivity Scale.
*$P < .05$.

CI = 0.65−1.1 and d = 0.87; 95% CI = 0.59−1.2, respectively).

The mean sum-score β-coefficients of MADRS-S revealed a slightly different pattern. Compared with the pretreatment measurement, the levels of depressive symptoms were significantly decreased, with a small-sized effect (d = 0.28; 95% CI, 0.13−0.44) at mid-treatment, a medium-sized effect (d = 0.50; 95% CI = 0.34−0.66) at posttreatment, and once again a small-sized effect at the 3-month follow-up (d = 0.34; 95% CI = 0.14−0.54). At the 6-month follow-up, the mean sum-score did not differ significantly from the pretreatment measurement ($P > .05$).

The overall psychiatric distress was significantly decreased at mid-treatment, with a medium-sized effect (d = 0.42; 95% CI = 0.24−0.60) compared with the pretreatment measurement. These improvements were maintained posttreatment (d = 0.57; 95% CI = 0.39−0.76) and at the 3-month follow-up (d = 0.46; 95% CI = 0.22−0.69), but decreased to a small-sized effect at the 6-month follow-up (d = 0.30; 95% CI, 0.0031−0.59).

Results from the nonparametric sensitivity analyses of the outcome data were in line with those found in the primary analyses and remained robust. There was no significant difference in the number of attended sessions between the treatment and waitlist groups (treatment: mean 5.1 ± 1.9; waitlist: mean, 4.2 ± 2.8; $t(112)$ = 2.0−1.97; $P > .05$).

Treatment Satisfaction

The mean sum-score on the CSQ-8 for both groups was 29 at treatment cessation (N = 79; SD = 3.0). No significant difference was found between the treatment (n = 48) and waitlist (n = 31) groups [t(79) = -0.90; P = 0.37], and the participants all scored within the "good" or "excellent" ranges.

DISCUSSION

The present study, the first on the effects of CBT on the specific HD criteria, used a randomized controlled trial to compare the treatment with a waitlist condition. Overall, our findings provide evidence for the treatment protocol's efficacy in decreasing HD symptoms and the number of sexual behavior specifiers. The medium to large effect sizes indicate improvements that, with reservation for the limitation associated with the increasing number of dropouts, were maintained for up to 6 months after treatment cessation. Effects were also found for overall psychiatric distress, suggesting that the treatment addresses the dysphoric mood states related to HD. Furthermore, participants reported being highly satisfied with the treatment.

One interesting finding was that symptoms of sexual compulsivity seemed to decrease more than the overall hypersexual symptoms. As suggested, sexual compulsivity comprises both impulsivity and compulsivity components.[1,46] Tentatively, the treatment's present structure and content target the compulsive/impulsive components of HD to a greater degree than the overall HD symptoms. Another explanation could be the difference between measurement tools. HD:CAS consolidates aspects of impaired self-regulatory functioning, manifested by sexual behaviors in response to dysphoric mood states including impulsivity/compulsivity traits.[31] By not taking the self-regulatory functions of sexual behaviors into account, a narrower set of symptoms are measured with SCS, and thus the score could be more susceptible to changes. In line with this, Bothe et al[47] hypothesized that self-regulatory function (ie, coping) might not be a good factor for assessing HD symptom severity.

Our finding that the decreases in depressive symptoms were not maintained at the 6-month follow-up is somewhat surprising, given that improvements on all outcome measures would be expected if there were an amelioration of the reported HD symptoms. However, this may be explained by the decreased number of participants submitting responses to the follow-up measurements. Those who did submit responses might have been motivated to seek more treatment owing to their higher level of depressive symptoms, even though their HD symptoms had declined. However, the aim of the treatment was to target excessive sexual behaviors and not depressive symptoms; although interventions of behavior activation originate from treatments specified for depression, these were presented as means to mitigate HD symptoms and thus might have been less attractive than interventions specifically addressing sexual behaviors. Furthermore, the pretreatment levels of depression were on average low in relation to proposed clinical cutoffs of MADRS-S, which suggests a relatively low nuisance level of depressive symptoms in participants.

As noted above, the participants were highly satisfied at the completion of treatment. This is congruent with research findings indicating that treatment satisfaction is associated with positive treatment outcomes.[38]

There are several possible ways in which the administration of CBT might have influenced the results. There may be HD-specific benefits from the group treatment format. Opportunities to disclose intimate personal experiences without being met with judgmental attitudes have previously been proposed as a key treatment target when recovering from sexual compulsivity.[48] This may have led to reduced shame, although this was not measured. Reid et al[8] found that shame activates neurotic coping in hypersexual individuals, leading to emotional instability that in turn may trigger hypersexual symptoms. Previously group-administered CBT for social anxiety was found to reduce shame to a greater degree than individual treatment, which may be tentatively explained by the fact that problems shared with others enables participants to embrace new, more workable beliefs.[49] If this applies to hypersexual individuals experiencing high levels of shame, then group-administered CBT may be a beneficial treatment format. The treatment materials were presented both in written form (supplied in-session and on a secure Internet platform) and through in-session lectures. Thus, the

treatment materials were digitally available for all participants, even if absent from a particular therapy session. This might have maximized the participants' knowledge of the HD diagnosis, the treatment plan, and the comprising interventions. This is in line with the results of a treatment study for social anxiety by Andersson et al[50] suggesting a small but significant correlation between diagnosis-specific knowledge and treatment outcome.

Although the present treatment has positive results, it may nevertheless be further developed. In accordance with others,[51,52] it is our contention that HD patients compose a heterogeneous group regarding sexual behavior outlet and psychological predisposition. Although Rettenberger et al[23] identified sexual excitation as the most important predictor of hypersexual behavior, it is reasonable to assume that there are differences between those engaging in interpersonal sexual behaviors (ie, sexual behaviors with consenting adults) and those engaging in solitary sexual behaviors (eg, pornography consumption, masturbation). It has long been argued that HD can be subclassified into sexual behaviors used as a strategy for coping with anxiety and negative mood states on the one hand[1,53] and a sexually motivated condition, with emphasis on loss of impulse control and sexual sensation-seeking, on the other hand. Sexual behaviors with consenting adults may be further subdivided based on, for example, repeated purchases of sexual services or repeated establishment of short-term sexual relations. By not taking these differences into account, the treatment efficacy on an individual level may have been compromised, leading to weaker group-level effects. In a review on therapeutic interventions, this was supported by the conclusion that a more "flexible approach" in the treatment of different subgroups of hypersexual behavior could be "promising."[54] In the revision of the ICD-11,[3] the diagnostic category compulsive sexual behavior disorder is included in the section for impulse control disorders. The criteria bear many similarities to those of HD and a more nuanced research on possible social, psychological, and biological causes can now be performed. This may in turn enable research on accurately constructed and efficacious treatment options.

The strengths of this study include its randomized controlled design, a relatively large number of participants, and the use of several measurement points. To date, only 1 randomized controlled trial has been performed in patients suffering from arbitrary and less scientifically endorsed diagnostic criterion, "problematic pornography viewing."[12] That study was performed with a rather small sample (n = 28), including 27 members of a Christian church. Even though we did not control for religious beliefs or attitudes toward pornography, our study had a substantially larger sample and included participants diagnosed with HD exhibiting a wider range of problematic sexual behaviors.

Another strength of this study was that outcomes were analyzed using a mixed-model design, with benefits for handling the problem of missing data. Molnar et al[55] argued that a complete-case analysis of repeated-measures data is not consistent with the intent-to-treat analysis strategy if there are dropouts, even if such procedures as "last observation carried forward" or other data imputation techniques are used. Given the statistical model applied, the present results are more naturalistic, because all data were taken into account, not merely the data from complete responders.[41] The results were confirmed by the sensitivity analyses performed, showing that results from the primary analyses remained robust when applying a nonparametric alternative to the mixed model. By supplying a stringent method of analysis, the results from the ordinal regression analyses provide additional credibility to the interpretations of, and conclusions drawn from, the main analyses.

Some limitations of this study must be acknowledged. The study suffers from a lack of posttreatment assessment interviews and this raises questions concerning the clinical validity of the treatment effects. The use of a passive waitlist control condition can be considered a weak alternative since waitlist participants may not behave in a manner representative for help-seeking hypersexual individuals. Thus, the effects may be due to factors other than the included interventions. Furthermore, we cannot exclude that any activity would have had a similar effect, and that "treatment as usual" or an active placebo condition would provide more credible differences for inferences. The primary outcome measure of this study, HD:CAS, is not currently validated, and its reliability for assessing the current severity of HD symptoms is thus unknown. Thus, conclusions regarding treatment effects must be drawn with caution. However, at the time of study initiation, HD:CAS was the only available scale for measuring the severity of HD symptoms in accordance with the specific HD criteria. The SCS (a measurement widely used for problematic excessive sexual behavior), was applied in conjunction with HD:CAS to tentatively capture a reasonable measure for hypersexual symptoms. Elaborated conclusions regarding long-term treatment effects might not be drawn owing to the low response rates at the 3-month and 6-month follow-up measurements. In addition, we did not measure the participants' adherence to the treatment regimen, and thus it is not possible to draw inferences regarding compliance with the homework assignments.

Another limitation pertains to the generalizability of our results. The sample reported a higher education level than the general population, and this has been found to predict treatment outcome in studies of obsessive-compulsive disorder, albeit to a small extent.[56] The possible treatment responsivity for women is unknown, because only men were included in the study. A significant proportion of the included participants did not screen positive for HD diagnosis on the HDSI according to the proposed cutoff scores (Kafka, 55%; Parsons et al, 50%). Nonetheless, they met the HD criteria in the ensuing assessment interviews. This was further indicated by the screening results on the SCS, in which substantially more participants qualified as being sexually compulsive despite not reaching the cutoff scores on HDSI. As noted in our previous study,[4] the

proposed cutoff scores of HDSI are, for clinical purposes, rather stringent.

CONCLUSION

This is the first randomized controlled study evaluating and validating the efficacy of the CBT program for HD-specific diagnosed men. The treatment resulted in a significant reduction in hypersexual as well as psychiatric symptoms, suggesting that the CBT program could serve as a first-line treatment for these patients in clinical settings. Future studies should, along with including women, involve dismantling analysis of the intervention to optimize the treatment outcome and evaluate other treatment formats, for example, administration via the Internet.

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