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SEXUAL FUNCTIONING IN WOMEN WITH EATING DISORDERS

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Abstract

Objective—To describe sexual functioning in women with eating disorders.

Method—We assessed physical intimacy, libido, sexual anxiety, partner and sexual relationships in 242 women from the International Price Foundation Genetic Studies relative to normative data.

Results—Intercourse (55.3%), having a partner (52.7%), decreased sexual desire (66.9%), and increased sexual anxiety (59.2%) were common. Women with restricting and purging anorexia nervosa had a higher prevalence of loss of libido than women with bulimia nervosa and eating disorder not otherwise specified (75%, 74.6%, 39% and 45.4%, respectively). Absence of sexual relationships was associated with lower minimum lifetime body mass index (BMI) and earlier age of onset; loss of libido with lower lifetime BMI, higher interoceptive awareness and trait anxiety; and sexual anxiety with lower lifetime BMI, higher harm avoidance and ineffectiveness. Sexual dysfunction in eating disorders was higher than in the normative sample.

Conclusion—Sexual dysfunction is common across eating disorders subtypes. Low BMI is associated with loss of libido, sexual anxiety, and avoidance of sexual relationships.

Keywords

anorexia nervosa; eating disorders; sexual behavior; sexual dysfunction

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Little empirical evidence exists concerning the extent to which women with eating disorders experience problems with intimacy and sexual functioning. Extant research has not adequately examined the prevalence of sexual dysfunction across subtypes of eating disorders nor the degree to which psychological and physiological features associated with eating disorders influence sexual functioning.1 Additionally, sexual functioning is rarely discussed as an important component of treatment except in the context of sexual abuse and trauma history.2

Studies of sexual functioning in eating disorders point to considerable concerns in the area of sexuality.3–6 The loss of sexual interest, especially in women with AN, may reflect physiological consequences of the hypogonadism of emaciation.7 Increases in sexual drive accompany weight restoration in patients with AN, which is consistent with physiological causes of altered sexuality.3–5 Sexual satisfaction in AN is inversely related to degree of caloric restriction;8 similarly, the greater the weight loss, the greater the loss of sexual enjoyment.5 Even though malnutrition may affect libido, other central features of eating disorders such as distorted body image, body dissatisfaction, and shame can also compromise healthy sexual functioning and relationships among individuals who struggle with eating pathology.9–11 Women with AN often report difficulties in their sexual relationships,6 and sexual discord with their partners.12

The existing literature on sexual functioning does not adequately differentiate across AN subtypes, and few studies have examined these sexual dysfunction parameters in bulimia nervosa (BN), where hypogonadism associated with emaciation is typically not a factor. Small studies have suggested that women with restricting AN are less likely to have a romantic partner or to have engaged in sexual intercourse than women with BN.5, 8, 12 Consistent with these findings, women with BN symptomatology report an earlier age of sexual encounters and have more sex partners and higher sexual desire and fantasy compared with women with restricting AN.8, 12–14 Mangweth-Matzek et al 15 showed that women with AN and BN were similar to healthy controls in age at menarche and achievement of most sexual milestones, but rated their sexual experiences significantly more negatively than both a psychiatric and a healthy control group, corroborating earlier findings.14 Sexual concerns among women with AN are similar to concerns of women within other groups known to have sexual difficulties such as women with major depression and post-partum women.16

Personality traits of individuals with eating disorders may also influence sexual functioning. 17, 18 In fact, personality variables may account for a greater proportion of variance in sexual attitudes and behaviors than eating disorders diagnoses and symptoms. Individuals with eating disorders who are emotionally constricted and overcontrolled report restrictive sexual functioning, whereas those with personality profiles marked by emotional dysregulation and undercontrol report more impulsive and self-destructive sexuality profiles. 17, 18

The current study emerged from: (1) evidence that an eating disorder negatively affects sexual functioning and partner relationships; (2) scant literature examining sexual functioning in adult women with eating disorders, across well defined eating disorders subtypes; and (3) the need for improved understanding of the role of psychological variables and personality traits on sexual functioning. To address these issues, we: (1) examined sexual functioning in a large, multinational sample of women with well-characterized eating disorders; (2) compared sexual functioning across eating disorder subtypes; (3) compared sexual functioning of women with eating disorders with normative data; and (4) determined the association between clinical and psychological variables and sexual functioning. We

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hypothesized that sexual functioning would be particularly disturbed in individuals with clinical profiles marked by low body mass index (BMI).

METHOD

Participants

Participants were from the multisite international Price Foundation Genetic Studies of Eating Disorders: AN Affected Relative Pair Study. This study was designed to identify susceptibility loci involved in risk for eating disorders. Informed consent was obtained from all study participants, and all sites received approval from their local Institutional Review Board. A full description of the study can be found in Kaye et al.19 A brief description of the study is provided below.

AN Affected Relative Pair Study—The sample for this study included both probands and affected relatives. Probands met the following criteria: 1) a lifetime diagnosis of AN by DSM IV 20 criteria, waiving the single criterion of amenorrhea for 3 consecutive months; 2) low weight that is/was less than 5th percentile of BMI for age and gender according to the Hebebrand et al 21 chart of NHANES epidemiological sample; 3) age between 13 and 65 years; 4) onset prior to age 25; and 5) fulfillment of the criteria of AN not less than 3 years prior to ascertainment. Affected relatives were biological family members who: 1) were between the ages of 13 and 65 years; and 2) had lifetime eating disorder diagnoses of modified DSM-IV AN (i.e., criterion D not required), lifetime eating disorder diagnoses of DSM-IV BN, purging type or nonpurging type, or EDNOS.

Eating Disorders Diagnoses

Eating Disorder Diagnoses—Lifetime histories of eating disorders in probands and affected relatives were assessed with the Structured Interview for Anorexic and Bulimic Disorders–psychopathology scale (SIAB-P).22 The diagnostic categories were: 1) restricting AN (RAN), 2) AN with binge eating, with or without purging behavior (BAN), 3) AN with purging behaviors, with no history of binge eating (PAN), 4) DSM-IV 20 BN - purging (PBN) and non purging (NPBN) type; 5) individuals with a history of both AN and BN (ANBN); and 6) EDNOS which encompassed subthreshold AN, subthreshold BN, and subthreshold mix [for more details on EDNOS diagnostic criteria see Kaye et al19].

The sample initially comprised 431 participants. Those excluded from the analyses were participants missing SIAB-P data (n=15), males (n=24), and individuals who responded to fewer than three of the sexual functioning items (n=15). In order to match the age range of the normative comparison sample (see below), we also excluded participants younger than 18 years old (n=30) or older than 32 (n=105). The resulting sample comprised 242 individuals. The mean age of participants was 24.4 (SD=4.2; range 18–32).

Based on results from the SIAB-P, 22 there were 84 (34.7 %) individuals with RAN, 67 (27.7 %) with PAN, 25 (10.3 %) with BAN, 23 (9.5 %) with BN, 21 (8.7 %) with ANBN, and 22 (9.1 %) with EDNOS.

Normative data—Published SIAB-P norms from 202 German women without eating disorders ages 18–32 were available for libido, sexual anxiety, partner and sexual relationships.23 These data were not analyzed, and are presented for comparison only.

Measures

Sexual Functioning—Sexual functioning was assessed using five questions in the SIAB-P22 concerning intimacy, libido, sexual anxiety, partner and sexual relationships. Table 1

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includes the list of questions, response options and categorization for the sexual functioning items.

Clinical variables—Data relative to minimum and maximum lifetime BMI, age of onset of eating disorder, age at menarche, body image disturbance (no or slight versus marked, severe, or very severe) and low self esteem (none or slight versus marked, strong or very strong) were obtained from the SIAB-P.22 High interrater reliability and internal consistency has been established for the present (Chronbach's alpha =0.93) and past (Cronbach's alpha=0.87) symptom scores for this instrument. 22

Personality and symptom assessments—Personality and symptom assessments included the Temperament and Character Inventory (TCI),24 the Frost Multidimensional Perfectionism Scale (MPS),25 the State-Trait Anxiety Inventory (STAI Form Y-1),26 and the Eating Disorder Inventory-2 (EDI-2).27

Statistical Analyses

The five sexual functioning variables (intimacy, loss of libido, sexual anxiety, partner and sexual relationship) were first compared across eating disorder subtypes using PROC GENMOD in SAS,28 corrected for age and relatedness of participants. Logistic regression was performed to test for the significant differences in prevalence of the sexual dysfunction items across eating disorders subtypes.

General linear regression models were applied to examine the relation between the sexual functioning items and various eating disorder descriptors and personality variables. The variable describing partner relationship was not examined in relation to personality and eating disorder items due to its particular multidimensionality in assessing not just the stability of the relationship, but also the degree of tension experienced. Age at interview was entered as a covariate in all models. Eating disorder subtype was entered as a covariate into models predicting loss of libido and sexual anxiety. Given the lack of variance on this item, subsequent analyses pertaining to intimacy were not performed. All significant predictors ($p<0.05$ in univariate analysis) were then entered into stepwise regression (loss of libido and sexual anxiety) and stepwise discriminant (sexual relationships) models for the respective sexual functioning variables using the LOGISTIC and STEPDISC procedures, respectively, in SAS.28

Generalized estimating equation corrections were used in all models to account for the nonindependence of the data due to the use of affected relatives in the analyses, with the exception of sexual relationship as this method cannot be applied to multinomial data.29–33 These statistical analyses were conducted using GENMOD procedure of SAS version 9.28 P-values presented are after false discovery rate corrections for multiple comparisons.34 All significance tests were two-tailed. Normative data were not analyzed, and are presented for comparison only.

RESULTS

Sexual functioning description and comparison across eating disorder subtypes

Table 2 lists the sexual functioning items and the response frequencies. The vast majority of participants with eating disorders reported having experienced some physical intimacy with another person (98.4%, n=238). Concerning loss of libido, sexual anxiety and partner relationships, over half the participants reported some degree of distress on each of these items. Almost half of the women (44.7%) reported either avoidance of or absence of sexual relationships (left column Table 2).

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Significant differences across eating disorders subtypes were observed for loss of libido only. Specifically, women with RAN (75.0%) and PAN (74.6%) reported a significantly higher prevalence of loss of libido than women with BN (39.1%) and NOS (45.5%). Loss of libido was 4.78 times greater (95% CI 1.74, 13.18; $\chi 2 = 7.04$, $p < 0.008$) in participants with RAN, and 4.59 times greater (95% CI 1.65, 12.80; $\chi 2 = 6.79$, $p < 0.010$) in individuals with PAN compared with the BN group. Also, it was 3.85 times greater (95% CI 1.32, 11.24; $\chi 2 = 4.69$, $p < 0.031$) in the RAN group, and 3.70 times greater in the PAN group (95% CI 1.24, 11.05; $\chi 2 = 4.51$, $p < 0.034$) compared to those with EDNOS.

Sexual functioning in women with eating disorders relative to a normative sample

Table 2 also includes the response frequencies on the sexual functioning items for 202 women with no history of eating disorders (right column Table 2). As these data were not collected as part of this investigation, they are presented for comparative purposes only. In comparison to the normative data, 1) more women with ED had loss of libido, 2) prevalence of sexual anxiety, tension, frequent changes and detached relationships was higher for women with ED, 3) more women with ED had relationships without intercourse and fewer with intercourse, and 4) more women with ED avoided sexual relationships, but fewer reported not having a partner.

The relation between sexual functioning and clinical and psychological variables for women with eating disorders

Table 3 lists the results of the regression models examining the effects of clinical and psychological variables on three sexual functioning outcomes (loss of libido, sexual anxiety, and sexual relationship). We report below the results for the stepwise and discriminant regression analyses only.

Loss of libido—The stepwise regression indicated that reported loss of libido was associated with lower minimum lifetime BMI (OR=0.53; 95% CI: 0.32, 0.89), higher interoceptive awareness (OR=1.91; 95% CI: 1.25, 2.93), and higher trait anxiety (OR=1.70; 95% CI: 1.14, 2.56).

Sexual anxiety—Stepwise regression also indicated that women with lower minimum lifetime BMI (OR=0.63; 95% CI: 0.44, 0.92), higher harm avoidance (OR=1.58; 95% CI: 1.02, 2.46), and higher ineffectiveness (OR=2.65; 95% CI: 1.69, 4.16) were more likely to report sexual anxiety.

Sexual relationship—When all significant variables were entered into a stepwise discriminant analysis, only minimum lifetime BMI (partial $R2 = 0.12$; $F = 13.07$; $p < 0.001$) and age of onset (partial $R2 = 0.05$; $F = 5.21$; $p < 0.007$) remained in the model. Women with no relationships reported lower minimum lifetime BMI and earlier age of onset compared with women who had relationships with or without intercourse.

DISCUSSION

This study examined aspects of sexual functioning in a large sample of women with a lifetime history of eating disorders. Overall, the vast majority of women in this sample reported having experienced intimate relationships (98%), with 55% reporting relationships with intercourse, and 87% reporting significant relationships of varying degrees of stability. These figures concur with previous studies[35, 36] that show a substantial proportion of individuals with eating disorders are in relationships.

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Nearly two thirds of women with eating disorders reported loss of libido and sexual anxiety. Compared with women from a normative German sample, more women with eating disorders reported loss of libido, sexual anxiety, relationships without sex, and relationships with tension. Taken together, these findings indicate that women with eating disorders experience more difficulties in the sexual and relationship domain. One previous study found that women with eating disorders view their marital relationship as less satisfying than their spouses view it, but that satisfaction improved significantly in treatment as the eating disorder symptoms were addressed.37 Sexual intimacy is a fundamental aspect of healthy relationships that can be disrupted by an eating disorder, and should be assessed routinely along with other more commonly evaluated realms of functioning (e.g., social, occupational, exercise, nutritional).

Additionally, we found differences in sexual functioning across eating disorders subtypes: women with RAN or PAN reported a higher prevalence of loss of libido than women with BN or EDNOS. This finding is expected given that the results of the stepwise regression indicating that lower lifetime minimum BMI was associated with loss of libido.

One consistently observed finding across sexual functioning domains was the association between low lifetime minimum BMI and loss of libido, sexual anxiety and sexual relationships. These findings are consistent with the explanation that low body weight impairs the physiological functioning of sexual organs 7 and with evidence from other studies that fluctuations in BMI were directly related to changes in sexual interest.3–5 An alternative explanation is that independent of physical changes, individuals with lower BMI's experience a more severe presentation of the eating disorder. This increased illness severity may be associated with more profound body dissatisfaction, distortion, depression and discomfort with physical contact, all of which may be associated with loss of libido and elevated sexual anxiety. Supporting that hypothesis, personality traits such as trait anxiety, ineffectiveness, harm avoidance and interoceptive awareness were also consistently associated with loss of libido and sexual anxiety in women with eating disorders. Most likely physiological and psychological factors converge to lead to disturbed sexual functioning in this group of patients.

Several limitations of this design should be considered. First, this is a cross sectional study and no conclusions concerning the direction of the observed associations can be drawn. Second, the associations identified in this study between self-reported symptoms and relationship variables are based on retrospective patient recall and are vulnerable to memory biases inherent in this type of data. Third, the SIAB was not designed specifically to measure sexual functioning and therefore, these results are considered to be preliminary and motivational for future studies to use instruments designed to assess relationship and sexual functioning. The SIAB questions do not have the sufficient specificity to determine when these variables occurred relative to the eating disorder symptoms. The SIAB questions encompass not only sexual functioning but interpersonal relationship functioning as well. Our data also only included patient ratings of sexual functioning. Inclusion of partner ratings would enrich the clinical picture beyond the patient perspective which may be negatively biased secondary to the specific pathology associated with the eating disorder (e.g. body dissatisfaction, body image distortion, perfectionism).1 Also, the sample of non-eating disorder women were not from the same study, thus prohibiting analytical comparisons between the groups.

One important feature that we were unable to address is the impact of comorbid depression on sexual functioning. Depression is known to affect libido40 and in most studies more than 80% of individuals with eating disorders report lifetime comorbid depression.41 Given that other studies have found that women with depression have high rates of sexual dysfunction

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42 and have similar rates of sexual dysfunction as women with eating disorders,16 controlling for depression in this population will ultimately be necessary to clarify the unique contribution of an eating disorder to sexual functioning. This is underscored by the observed association in this study between ineffectiveness and sexual anxiety. Although not a perfect proxy measure for depression, ineffectiveness and depression ratings are highly correlated.43, 44

With these limitations in mind, women with eating disorders are engaging in relationships and report experiencing problems with sexual functioning. Very little is known regarding the impact of recovery from eating disorders on improvement in sexual functioning. Even less in known about sexual functioning from the perspective of partners of individuals with eating disorders. Women with eating disorders highlight the importance of relationships in their recovery,45 yet the extent to which improvement in sexual functioning is a goal in their recovery is unknown. Future studies of the impact of eating disorders on intimate relationships will assist with developing approaches to treatment that will address sexual concerns in a manner that is acceptable to individuals with eating disorders and provides them with the opportunity to improve intimacy and interpersonal connections that enhance their quality of life.

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Table 1

Sexual functioning questions, response options and categorization from the SIAB-P.

Item	SIAB-P question	Response options	Response categories
Intimacy	Have you ever had a date with a boy/man or girl/women and did you ever get physically intimate with another person?	- yes - no	- yes - no
Loss of libido	Were there times in which your sexual desire was reduced?	- sexual desire in accordance with peer group or slight reduction of sexual desire - marked reduction in sexual desire - severe reduction in sexual desire - very severe reduction in sexual desire - increase sexual in desire	- no or slight reduction in sexual desire - marked, severe or very severe loss of libido
Sexual anxiety	Have you been tense or anxious when you're about to get involved in sexual interactions (kissing, petting, intercourse)?	- not at all or slightly - marked sexual anxiety - severe sexual anxiety - very severe sexual anxiety	- no or slight sexual anxiety - marked, severe or very severe sexual anxiety
Relationship with a partner	Did you have a stable relationship? For how long? How close and stable was the relationship? Were there times in the past when you had no partnership? Did you feel incapable of getting involved in a serious relationship?	- stable, close partner-relationship - stable, close partner-relationship with quite a bit of tension - frequent changes, or a longer period of time without a partner or a fairly detached relationship - very detached relationship with rare contacts; no partner-relationship - no partner relationship	- the same as in response options
Sexual relationship	Did you have a sexual relationship?	- had intercourse - relationship without petting and intercourse or occasional or frequent petting but no intercourse - avoidance of any closer contact with other persons in order to avoid petting and sexual intercourse.	- the same as in response options

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Table 2

Response Frequencies of the Sexual Functioning Items: percent (n)

Women with eating disorders		**Normative sample**		
	No	**Yes**	**No**	**Yes**
	No/Slight	**Marked, Severe, Very Severe**	**No/Slight**	**Marked, Severe, Very Severe**
Loss of Libido	33.1 (80)	66.9 (162)	64 (130)	35 (72)
Sexual Anxiety	40.8 (98)	59.2 (142)	85 (171)	15 (31)

Partner Relationships	Women with eating disorders	Normative Sample
Partner Relationships	30.3 (73)	48 (97)
Partner relationships with tension	22.4 (54)	11 (22)
Frequent Changes in Partners	27.4 (66)	14 (28)
Detached relationships	7.1 (17)	4 (9)
No Partner	12.9 (31)	22 (46)
Sexual Relationship		
With intercourse	55.3 (130)	90 (182)
With no intercourse	21.7 (51)	5 (9)
Avoidance	23.0 (54)	5 (11)

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Table 3

General linear models applied to examine the relation between the sexual functioning items and various eating disorder descriptors and personality variables. Age was entered into all models as a covariate. Eating disorder subtype was entered as a covariate into the models for loss of libido and sexual anxiety. Chi-square and p-value after applying FDR to correct for multiple testing are presented.

Variable	Loss of Libido	Sexual Anxiety	Sexual Relationship*
	Structured Interview for Anorexic and Bulimic Disorders		
Age of Onset	0.06 (.833)	0.33 (.653)	12.70 (.002)
Highest Lifetime BMI	0.13 (.759)	3.15 (.141)	4.52 (.080)
Lowest Lifetime BMI	13.44 (.001)	18.63 (<.001)	25.09 (<.001)
Age at Menarche	0.02 (.888)	1.01 (.425)	2.48 (.191)
Body Image Disturbance	2.89 (.156)	4.46 (.080)	0.39 (.628)
Low Self Esteem	6.36 (.035)	14.65 (<.001)	4.07 (.093)
	Eating Disorder Inventory		
Asceticism	11.09 (.004)	7.71 (.021)	1.78 (.273)
Body Dissatisfaction	1.58 (.293)	1.63 (.289)	0.30 (.653)
Bulimia	3.16 (.141)	3.56 (.117)	0.13 (.759)
Drive for Thinness	1.69 (.282)	1.75 (.276)	0.15 (.759)
Ineffectiveness	24.26 (<.001)	38.53 (<.001)	4.41 (.080)
Interoceptive Awareness	17.59 (<.001)	14.71 (<.001)	0.56 (.567)
Interpersonal Distrust	5.24 (.056)	11.33 (.003)	3.01 (.148)
Impulse Regulation	18.02 (<.001)	21.73 (<.001)	0.04 (.864)
Maturity Fears	6.23 (.037)	3.10 (.143)	4.26 (.084)
Perfectionism	6.72 (.030)	4.41 (.080)	5.86 (.044)
Social Insecurity	11.49 (.003)	23.94 (<.001)	3.98 (.095)
	State-Trait Anxiety Inventory Form Y		
Trait anxiety	17.62 (<.001)	23.53 (<.001)	1.97 (.250)
	Temperament and Character Inventory		
Harm avoidance	16.35 (<.001)	25.99 (<.001)	3.83 (.103)
Novelty seeking	5.29 (.056)	7.64 (.021)	7.40 (.022)
Reward dependence	0.61 (.561)	0.07 (.833)	0.44 (.611)
Persistence	0.86 (.470)	1.06 (.420)	2.22 (.212)
Cooperativeness	0.32 (.653)	0.14 (.759)	3.37 (.128)
Self-directedness	12.66 (.002)	20.45 (<.001)	0.01 (.904)
Self-transcendence	2.69 (.171)	1.04 (.420)	0.50 (.586)
	Multidimensional Perfectionism Scale		
Concern over mistakes	13.84 (.001)	21.14 (<.001)	4.46 (.080)
Doubts about actions	9.15 (.012)	16.15 (<.001)	0.78 (.494)
Personal standards	5.24 (.056)	0.56 (.567)	6.37 (.035)
Organization	2.72 (.171)	0.55 (.567)	1.81 (.273)

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Variable	Loss of Libido	Sexual Anxiety	Sexual Relationship*
Parental criticism	2.19 (.219)	7.07 (.026)	0.43 (.611)
Parental expectations	2.19 (.219)	0.30 (.653)	0.28 (.660)

* For Sexual Relationship–significant differences are between the group that had relationships with intercourse and the group with no relationship for age of onset, EDI perfectionism, and personal standards. For lowest lifetime BMI and novelty seeking, both groups with relationships (intercourse and no intercourse) were significantly different from the no relationship group, but were not different from each other.