

Mediators of Sexual Functioning and Marital Quality in Chronically Depressed Adults with and Without a History of Childhood Sexual Abuse

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ABSTRACT

Introduction. Sexual dysfunction is common among depressed adults. Childhood sexual abuse (CSA) and depressive symptomology are among the risk factors for sexual dysfunction, and these factors may interact to predict adult relationship functioning. Several models have been developed postulating interactions between these variables.

Aim. We tested models of the effects of CSA and elucidate the associations between CSA, sexual dysfunction, depression severity, anxiety, and relationship quality in chronically depressed adults.

Methods. Baseline data from 808 chronically depressed outpatients enrolled in the Research Evaluating the Value of Augmenting Medication with Psychotherapy study were evaluated using structural equation modeling.

Main Outcome Measures. The Inventory of Depressive Symptomology, self-report version (IDS-SR) assessed depression severity, and the Mood and Anxiety Symptom Questionnaire Anxious Arousal subscale assessed anxiety. Sexual function was assessed with the Arizona Sexual Experiences Scale (ASEX), and the Quality of Marriage Index (QMI) assessed relationship quality for patients in stable relationships.

Results. CSA scores predicted depression severity on the IDS-SR, as well as lower relationship quality and sexual satisfaction. ASEX scores were significantly associated with depression severity but were not correlated with the QMI. Two models were evaluated to elucidate these associations, revealing that (i) depression severity and anxious arousal mediated the relationship between CSA and adult sexual function, (ii) anxious arousal and sexual functioning mediated the association between CSA and depression symptoms, and (iii) when these models were combined, anxious arousal emerged as the most important mediator of CSA on depression which, in turn, mediated associations with adult sexual satisfaction and relationship quality.

Conclusions. Although CSA predicts lower relationship and sexual satisfaction among depressed adults, the long-term effects of CSA appear to be mediated by depressive and anxious symptoms. It is important to address depression and anxiety symptoms when treating patients with CSA who present with sexual dysfunction or marital concerns. **Dunlop BW, Hill E, Johnson BN, Klein DN, Gelenberg AJ, Rothbaum BO, Thase ME, and Kocsis JH. Mediators of sexual functioning and marital quality in chronically depressed adults with and without a history of childhood sexual abuse. J Sex Med **;**.***-**.**

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Introduction

Satisfactory sexual function is an important contributor to quality of life, mental health, and relationship stability [1–3]. Sexual dysfunction may arise in any of three primary components of sexuality: reduced libido, difficulty with arousal, and absent or delayed orgasm. Approximately 40–45% of adult women and 20–30% of adult men endorse at least one frequently present form of sexual dysfunction [4].

Sexual function is commonly impaired in people suffering from psychiatric disorders, particularly major depressive disorder (MDD). Depressed adults are 50–70% more likely than nondepressed to develop some form of sexual dysfunction, and sexual dysfunction itself may act as a risk factor for the development of MDD [5]. Reduced sexual function may contribute to feelings of guilt about a person's role function with his or her partner, and avoidance of sexual activity may contribute to a loss of intimacy, thus exacerbating depressive symptoms [6]. The presence of MDD has a more negative effect on sexual functioning among women than men [7].

Childhood sexual abuse (CSA) is an established risk factor for adult sexual dysfunction. Roughly 25–30% of adult women report experiencing some form of CSA, compared with only 5–10% of men [8–10]. Women with CSA are more likely than men with CSA to report sexual dysfunction as adults [11,12], with trauma severity being the most significant trauma variable associated with impaired sexual function [13]. Furthermore, CSA contributes to relationship dysfunction in adulthood. Across several studies of clinical and nonclinical populations, CSA survivors endorsed lower levels of marital satisfaction than adults who were not abused as children [14–17].

In addition to contributing to adult sexual dysfunction, a history of CSA is an established risk factor for depressive symptoms and MDD in adults [18–23]. A chronic course of MDD develops in roughly 20% of depressed adults and is associated with experiencing early life adversity [24]. Greater severity of CSA is associated with greater levels of depression severity [18,21], and greater frequency of sexual trauma during childhood increases the probability of depression becoming chronic, even when controlling for posttraumatic stress disorder (PTSD) [25]. Some work suggests that depression severity does not differ by gender among CSA survivors [26] and has identified trauma-related negative cognitions and dissocia-

tion, rather than CSA severity per se, as the best predictors of depression severity [25,26].

Several models have been posited connecting the associations between CSA, depressive symptoms, sexual functioning, and relationship satisfaction. Barlow's model of sexual dysfunction hypothesizes that various cognitions and affective states may prevent healthy sexual arousal or performance [27]. Research utilizing this model suggests that certain cognitive and emotional associations (such as the presence or absence of fear and anxiety) linked to sexual activity are the key factors differentiating individuals with healthy sexual functioning and those with impairment [28,29]. Similarly, Beck's cognitive theory of depression suggests that negative life events, such as childhood abuse, lead to depression through altered cognitions [30,31]. Taken in tandem, these models suggest that CSA may negatively affect adult sexual functioning through the mediators of a depressed affective state and increases in anxiety.

Finkelhor and Browne's traumagenic dynamics model [32] implicates certain direct results of CSA as mediating steps in the outcome of depressive symptom presentation. Traumagenic dynamics are maladaptive views of the environment that form out of sexually traumatic experiences [33]. Traumatic sexualization, for example, which refers to altered views of sexuality and sexual behavior occurring after sexual abuse, has been shown to predict both anxiety and depression in CSA survivors [34]. Furthermore, traumagenic dynamics may determine levels of adult functioning [33,35]. However, the specific pathways of traumagenic dynamics may differentially predict adult psychological outcomes. For example, beliefs of betrayal predict interpersonal problems, whereas self-blame predicts interpersonal problems, depression, anxiety, and low self-esteem [36]. This emphasizes the need for further quantitative analyses of variables mediating the relationship between CSA and adult functioning.

To summarize, previous research has firmly established that CSA is an independent risk factor for both MDD and sexual dysfunction, that MDD contributes to sexual dysfunction, and that impaired sexual functioning may lead to depression and anxiety symptoms. However, the specific predictive and mediating interactions between CSA, impaired sexual functioning, depressive symptoms, anxiety, and relationship quality are unknown. We sought to test the above models through a *post hoc* analysis of the baseline (pretreatment) data of a large clinical study of patients with

chronic forms of depression. Although definitively establishing linear chronological progressions among these variables is not possible with cross-sectional data, our aim was to elucidate potential predictive associations between the variables of interest. We hypothesized that higher levels of CSA would be associated with greater depression severity and greater impairments of sexual function among this sample of depressed patients. We also tested whether symptoms of depression and anxiety mediated the relationship between CSA and sexual functioning, as in Barlow's model of sexual dysfunction, or whether sexual impairments instead mediated the relationship between CSA and depression, consistent with Finkelhor and Browne's traumatic dynamics model. Finally, we sought a theoretically and statistically sound overarching model including each of the aforementioned variables of interest.

Materials and Methods

Study Design

The Research Evaluating the Value of Augmenting Medication with Psychotherapy (REVAMP) study enrolled 808 outpatients across eight academic sites between 2002 and 2006. The study was conducted in accordance with the Declaration of Helsinki and was approved by the institutional review boards at each academic site. All participants signed a written informed consent form for participation. The primary aim of the study was to compare medication and psychotherapy approaches for the treatment of chronically depressed adults who did not remit to a course of medication monotherapy. A full description of the REVAMP study has been published previously [37].

Subjects

English-speaking adults aged 18–75 were eligible if they met Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) criteria for a major depressive episode (MDE) of at least 4 weeks' duration and had significant depressive symptoms that were present for at least the previous 2 years without a period of remission. Patients could meet these criteria through having: (i) a chronic MDE; (ii) double depression (i.e., current MDE superimposed on preexisting dysthymia); or (iii) recurrent MDD of at least 2 years' duration, with incomplete recovery between episodes. Patients also had to have a score of ≥ 20 on the 24-item Hamilton Depression Rating Scale (HAM-D) [38,39] at the screening and baseline visits.

Exclusion criteria included pregnancy, bipolar disorder, dementia, current psychotic disorder, unstable medical illness, and a primary diagnosis of posttraumatic stress disorder, obsessive-compulsive disorder, anorexia, or bulimia nervosa. Patients with antisocial, schizotypal, or severe borderline personality disorders were excluded, as were those with current substance dependence (except nicotine). Patients who had failed to respond to four or more medications in the pharmacotherapy algorithm used in REVAMP or who were unwilling to discontinue other forms of treatment were excluded. All patients were off antidepressant medication at the baseline visit.

Assessments

Demographic data were collected from self-report forms. Psychiatric diagnoses were determined using the Structured Clinical Interview for DSM-IV Axis I Disorders, Patient Edition [40], confirmed by a psychiatrist's evaluation. Depressive symptom severity was assessed using the Inventory of Depressive Symptoms, self-report version (IDS-SR) [41]. The HAM-D was not used in these analyses due to the strong positive skew in the sample that resulted from the measure being used as an inclusion criterion (i.e., patients with HAM-D < 20 were not eligible for randomization).

A history of CSA was ascertained from the five-item sexual abuse subscale of the short-form of the Childhood Trauma Questionnaire (CTQ-SA) [42]. This self-report measure asks about the frequency of sexual abuse on a 1–5 scale, representing the range of "never true" to "very often true" (range 5–25). Categorical ratings of abuse severity are based on the scores: 5 = No abuse; 6–7 = Low; 8–12 = Moderate; ≥ 13 = Severe [42]. The sexual abuse subscale of the CTQ has the highest reliability of the questionnaire's five subscales ($\alpha = 0.94$) [43]. Although frequency alone can be used to measure CSA [18], information collected on the CTQ-SA is indicative of the interaction between frequency and severity of trauma [42].

Sexual functioning was measured using the Arizona Sexual Experiences Scale (ASEX) [44]. This 5-item self-report instrument gathers information on both physiological and subjective arousal. The ASEX asks patients to report on core elements of sexual function, including sexual drive, arousal, penile erection/vaginal lubrication, ability to reach orgasm, and satisfaction with orgasm. However, as previous research indicates that self-report measures of sexual dysfunction cannot accurately discriminate between subtypes of sexual

disorders (i.e., genital vs. subjective) [45], we did not evaluate differences between different types of sexual dysfunction on the ASEX. Each ASEX item is rated from 1 to 6, (range 5–30), with higher scores representing more severe impairment. A total score ≥ 19 on the ASEX correlates highly with clinician-diagnosed sexual dysfunction [44]. The scale has excellent internal consistency ($\alpha = 0.91$) [44] and has been shown to be an accurate measure of sexual dysfunction even in the absence of a current sexual partner [44].

The Quality of Marriage Index (QMI) [46] is a self-report measure of relationship health. It includes five items (e.g., “My relationship with my partner is very stable”) rated on a seven-point Likert scale (1 = very strong disagreement; 7 = very strong agreement), and a sixth item (“All things considered, what degree of happiness best describes your relationship?”) using a 10-point scale (1 = very unhappy; 10 = perfectly happy). The final score is the items’ summation (range 6–45). A score ≤ 29 indicates relationship distress [47]. Internal consistency is high for both men and women ($\alpha = 0.96$) [48]. In REVAMP, only people currently married or in a “serious relationship” completed the QMI.

The Mood and Anxiety Symptom Questionnaire (MASQ) [49] assessed frequency of comorbid anxiety symptoms for the prior week. We used the 17-item Anxious Arousal subscale of the MASQ (MASQ-A), which rates symptoms of somatic anxiety on a five-point Likert scale (1 = Not at all; 5 = Extremely). Prior literature has found anxious arousal to be highly associated with CSA [50]. The MASQ-A shows high internal consistency in clinical populations ($\alpha = 0.90$) [49].

Data Analysis

Only 17 (2.1%) patients had a CTQ-SA score of 6–7, so mild and moderate abuse categories from the CTQ-SA were collapsed into one category of moderate abuse, where 5 = no abuse, 6–12 = moderate abuse, and ≥ 13 = severe abuse. Pearson product-moment correlation coefficients were used to analyze the associations between the measures of interest separately by gender. Logistic regression was used to analyze associations between the CTQ-SA categories of sexual abuse and ASEX total and subscale clinical threshold scores, controlling for gender and relationship status. The significance of the effect of the level of CTQ-SA on the level of ASEX was evaluated with Wald χ^2 tests [51]. We used logistic regression to assess the interaction between gender and

CTQ-SA in predicting ASEX score. Linear regression was used to evaluate the association of CTQ-SA with IDS-SR, controlling for gender and relationship status, as well as to assess the interaction between gender and CTQ-SA in predicting IDS-SR and QMI. Finally, we used one-way analysis of variance to examine for differences in CTQ-SA, ASEX, QMI, IDS-SR, and MASQ-A by age, gender, race, ethnicity, and marital status.

Structural Equation Modeling (SEM)

Barlow’s and Finkelhor and Browne’s models were evaluated using SEM [52]. Both models were created based on theory, then revised based on model modification indices, producing a final model. The two final models were then combined and evaluated using SEM. Males and females were analyzed as distinct groups using multigroup SEM. Only individuals in significant relationships who completed the IDS-SR, CTQ-SA, ASEX, MASQ-A, and QMI were used in the SEM. In the analysis, the strength of hypothesized relationships between variables was tested using standardized regression coefficients generated by maximum likelihood estimation.

Several goodness of fit indices were used to examine how well the data fit the models. Chi-square statistic tests with a *P* value greater than 0.05 indicate that the observed data do not differ significantly from the proposed model. Values for the comparative fit index (CFI) greater than 0.95 suggest good model fit [53]. The standardized root mean square residual (SRMR) and the root mean square error of approximation (RMSEA) should have values less than 0.10 for an acceptable model fit and less than 0.05 for a good model fit [54]. SAS software (version 9.4, SAS Institute Inc., Cary, NC, USA) was used to carry out all analyses [54]. All significance tests were evaluated using a two-sided alpha level of 0.05.

Results

Of the 808 enrolled patients, 706 (87.4%) completed the IDS-SR, 781 (96.7%) completed the CTQ-SA, 741 (91.7%) completed the ASEX, and 773 (95.7%) completed the MASQ-A. Patients who reported being either married or in a serious relationship comprised 401 (49.6%) of the total sample and therefore also completed the QMI.

The sample had a mean age of 44.2 ± 12.4 years and was predominantly female (55.9%), white (84.9%), and non-Hispanic (91.2%). Mean severity of depression was 37.9 ± 10.1 for the IDS-SR.

Table 1 Correlations among self-reported symptom variables

Male (<i>n</i> = 140)					
	1	2	3	4	5
1. CTQ-SA	1.000				
2. IDS-SR	0.153	1.000			
3. ASEX	0.036	0.274*	1.000		
4. QMI	-0.106	-0.056	-0.079	1.000	
5. MASQ	0.243*	0.523**	-0.065	0.079	1.000
Mean	6.69	36.18	15.79	25.43	25.8
SD	3.95	10.35	4.90	9.82	7.85
Female (<i>n</i> = 191)					
	1	2	3	4	5
1. CTQ-SA	1.000				
2. IDS-SR	0.165*	1.000			
3. ASEX	0.071	0.296**	1.000		
4. QMI	-0.144*	-0.326**	-0.066	1.000	
5. MASQ	0.143*	0.529**	0.189*	-0.196*	1.000
Mean	8.89	38.64	20.60	25.51	27.52
SD	5.90	10.26	5.34	9.78	8.65

Note. Data were generated using Pearson product-moment correlation analyses

*Significant at the 0.05-level, two-sided test

**Significant at the <0.001-level, two-sided test

Mean CTQ-SA score was 7.9 ± 5.3 , with 465 (57.6%), 190 (23.5%), and 126 (15.6%) being categorized as having no, moderate, or severe abuse, respectively; 27 (3.3%) patients had missing data. Mean ASEX score was 18.9 ± 5.8 , with 372 (46.0%) patients scoring ≥ 19 . Of patients married or in a serious relationship, the mean QMI score was 25.3 ± 9.7 with 263 (65.6%) scoring in the relationship distress range. Table 1 presents the correlations between the five outcome variables of interest. ASEX and IDS-SR, MASQ-A and CTQ-SA, and MASQ-A and IDS-SR were significantly correlated for both men and women. IDS-SR and CTQ-SA, QMI and CTQ-SA, QMI and IDS-SR, MASQ-A and ASEX, and MASQ-A and QMI were only significantly correlated for women.

CSA was significantly greater among women, blacks, and Hispanics ($P \leq 0.001$ – 0.002 ; Table 2). Moderate and severe levels of CSA were associated with higher depressive symptom severity scores on the IDS-SR ($F_{2,687} = 12.43$, $P \leq 0.001$) and with lower QMI scores ($F_{2,388} = 3.33$, $P = 0.037$), even when controlling for gender and relationship status (IDS-SR: $F_{2,685} = 8.67$, $P \leq 0.001$; QMI: $F_{2,386} = 3.25$, $P = 0.040$). There was no significant interaction between gender and abuse levels for either IDS-SR or QMI. ASEX total score was significantly associated with depression severity as measured by the IDS-SR ($\beta = 0.134$, $F_{1,662} = 35.79$, $P < 0.001$). The ASEX was not significantly asso-

ciated with the QMI ($\beta = -0.16$, $F_{1,384} = 3.45$, $P = 0.064$). ASEX scores were higher among women, blacks, patients >40 years of age, and patients who were either married or cohabitating (Table 2).

CTQ-SA score was significantly associated with both ASEX ($\beta = 0.209$, $F_{1,728} = 27.44$, $P < 0.001$) and QMI ($\beta = -0.222$, $F_{1,389} = 6.33$, $P = 0.012$). Strong and consistent associations between level of abuse (CTQ-SA scores >5) and significant current sexual dysfunction (ASEX scores ≥ 19) were evident from the increase in ASEX total and subscale scores with increasing level of CSA (Table 3). All primary aspects of sexual function (drive, arousal, and orgasm) were negatively associated with degree of CSA. However, these significant associations were present only among females; no significant associations were present among males (Table 3).

Barlow's Model of Sexual Dysfunction

Barlow's model assumed direct effects of CTQ-SA on MASQ-A, CTQ-SA on IDS-SR, MASQ-A on IDS-SR, and IDS-SR on ASEX. Removing the nonsignificant direct effect of CTQ-SA on IDS-SR and including the indirect effect of MASQ-A on ASEX according to model modification indices resulted in a better model fit to the data (Figure 1). The chi-square was not significant ($\chi^2 = 2.7$, $df = 4$, $P = 0.613$), SRMR was 0.027, RMSEA was 0, and CFI was 1. There were no significant differences between the direct effects of males and females, except for MASQ-A scores on the ASEX ($P = 0.007$). The proportion of variance (R^2) in MASQ-A, IDS-SR, and ASEX accounted for by the remaining components of the model was 0.059, 0.274, and 0.135 for males, and 0.020, 0.280, and 0.089 for females, respectively. Table S1 shows the direct and indirect effects between the variables in this model.

Finkelhor and Browne's Traumagenic Dynamics Model

Our first version of Finkelhor and Browne's model assumed direct effects of CTQ-SA on MASQ-A, MASQ-A on IDS-SR, CTQ-SA on ASEX, and ASEX on IDS-SA. Adding a direct effect from MASQ-A to ASEX resulted in a better model fit to the data (Figure 2). The chi-square was not significant ($\chi^2 = 1.90$, $df = 2$, $P = 0.387$), SRMR was 0.020, RMSEA was 0, and CFI was 1. There were no significant differences between the direct effects of males and females, except for the MASQ-A on the ASEX ($P = 0.022$). The proportion of variance

Table 2 Relationships between demographic characteristics and self-reported clinical variables

	IDS-SR			QMI			ASEX			CTQ-SA			MASQ		
	n	Mean (SD)	F (P)	n	Mean (SD)	F (P)	n	Mean (SD)	F (P)	n	Mean (SD)	F (P)	n	Mean (SD)	F (P)
Age															
<40	269	37.72 (9.94)	0.11 (0.743)	137	25.93 (9.42)	0.93 (0.336)	277	18.05 (5.97)	9.10 (0.003*)	289	8.25 (5.77)	1.94 (0.164)	285	27.15 (8.42)	2.12 (0.146)
>40	435	37.98 (10.15)		262	24.95 (9.88)		463	19.38 (5.71)		489	7.7 (5.06)		485	26.26 (8.12)	
Gender															
Female	391	39.27 (9.62)	16.79 ($<0.001^{**}$)	234	25.11 (9.55)	0.22 (0.638)	401	20.95 (5.75)	128.70 ($<0.001^{**}$)	431	9.12 (6.2)	54.0 ($<0.001^{**}$)	430	27.30 (8.64)	6.69 (0.010*)
Male	315	36.19 (10.34)		167	25.57 (9.55)		340	16.44 (4.94)		350	6.39 (3.47)		343	25.76 (7.63)	
Ethnicity															
Hispanic	53	39.64 (9.23)	1.79 (0.182)	29	23.07 (8.52)	1.74 (0.188)	55	18.85 (6.43)	0.0 (0.981)	58	10 (6.42)	10.07 (0.002*)	54	27.13 (7.79)	0.22 (0.639)
Non-Hispanic	645	37.72 (10.12)		367	25.54 (9.81)		677	18.87 (5.78)		713	7.72 (5.17)		709	26.59 (8.23)	
Race															
Black	48	40.71 (11.44)	1.86 (0.136)	27	23.11 (7.45)	0.60 (0.612)	54	21.33 (5.33)	4.60 (0.003*)	56	10.66 (7.36)	7.14 ($<0.001^{**}$)	57	28.37 (9.41)	1.28 (0.281)
Asian	20	36.9 (9.31)		12	26.8 (7.26)		23	16.52 (3.94)		25	7.64 (4.41)		24	27.58 (9.78)	
Other	30	39.83 (10.84)		16	24.69 (9.89)		32	19 (5.63)		34	9.62 (5.55)		35	27.49 (8.83)	
White	608	37.61 (9.91)		346	25.45 (9.93)		632	18.75 (5.89)		666	7.59 (5.07)		657	26.38 (8.03)	
Marital status															
Married or Cohabiting	279	38.08 (10.14)	1.24 (0.269)	296	26.2 (9.54)	5.38 (0.005*)	306	19.52 (5.73)	3.69 (0.026*)	311	8.21 (8.21)	2.17 (0.115)	308	26.85 (8.29)	1.51 (0.222)
Previously married	188	38.6 (10.2)		55	22.98 (8.79)		194	18.66 (5.87)		208	8.08 (8.08)		205	27.10 (8.62)	
Never married	234	37.1 (9.84)		49	22.24 (10.71)		237	18.18 (5.88)		257	7.32 (7.32)		255	25.88 (7.82)	

Note. Data were generated using one-way analysis of variance

*Significant at the 0.05-level, two-sided test

**Significant at the <0.001 -level, two-sided test

Table 3 Prevalence of adult sexual dysfunction among each gender-childhood abuse level

Adult Sexual Dysfunction (ASEX)	Gender & level of childhood sexual abuse						Test statistics for childhood abuse vs. adult sexual dysfunction					
	Male			Female			Not controlling for gender or relationship		Controlling for gender and relationship [†]		Interaction between gender and abuse [‡]	
	Low (CTQ-SA: 5)	Moderate (CTQ-SA: 6–12)	High (CTQ-SA: ≥13)	Low (CTQ-SA: 5)	Moderate (CTQ-SA: 6–12)	High (CTQ-SA: ≥13)	χ^2	P	χ^2	P	χ^2	P
Total (≥19), (n = 730)	76 (31.67)	26 (36.11)	7 (28.00)	120 (61.22)	71 (66.36)	65 (72.22)	12.83	0.002*	2.52	0.284	1.56	0.458
Sex drive (≥5), (n = 772)	87 (34.66)	28 (38.89)	10 (40.00)	134 (63.81)	82 (70.69)	67 (68.37)	11.48	0.003*	2.21	0.330	1.12	0.944
Arousal (≥5), (n = 768)	44 (17.53)	14 (19.44)	3 (12.00)	98 (46.89)	52 (45.61)	49 (50.52)	6.19	0.045*	0.13	0.938	1.06	0.589
Erection/lubrication (≥5), (n = 742)	30 (12.15)	13 (18.06)	5 (20.00)	62 (31.31)	36 (33.03)	35 (38.46)	10.27	0.006*	3.10	0.212	0.83	0.660
Ease of orgasm (≥5), (n = 746)	33 (13.41)	12 (16.67)	3 (12.00)	85 (42.08)	47 (43.12)	49 (53.26)	14.37	<0.001**	2.82	0.244	1.04	0.594
Satisfaction of Orgasm (≥5), (n = 738)	24 (9.92)	13 (18.06)	3 (12.00)	68 (34.00)	28 (25.93)	36 (39.56)	8.29	0.016*	2.14	0.343	5.64	0.060

Note. Data were generated using Wald χ^2 tests

*Significant at the 0.05-level, two-sided test

**Significant at the <0.001-level, two-sided test

[†]Gender has a significant association with each adult sexual dysfunction category when controlling for childhood abuse ($P < 0.001$). Relationship status is only significant when predicting Erection/Lubrication dysfunction ($P = 0.030$)

[‡]Controlling for relationship status

(R^2) in ASEX, MASQ-A, and IDS-SR accounted for by the remaining components of the model was 0.007, 0.059, and 0.369 for males, and 0.038, 0.020, and 0.319 for females, respectively. Table S1 shows the direct and indirect effects between the variables in this model.

Combination Model

We first evaluated a version of the combination model that assumed direct effects of CTQ-SA on MASQ-A, MASQ-A on IDS-SR, CTQ-SA on ASEX, IDS-SR on ASEX, ASEX on IDS-SR, and ASEX on QMI. We then removed the nonsignificant direct effects from CTQ-SA to ASEX and ASEX to QMI and added a direct effect from IDS-SR to QMI, resulting in a better model fit to the data (Figure 3). The chi-square was not significant ($\chi^2 = 9.5$, $df = 10$, $P = 0.488$). The SRMR was 0.043, the RMSEA was 0, and CFI was 1. There were significant differences between the direct effects of males and females of IDS-SR on ASEX ($P = 0.020$), ASEX on IDS-SR ($P = 0.007$), and IDS-SR on QMI ($P = 0.013$). The proportion of variance (R^2) in MASQ-A, IDS-SR, ASEX, and QMI accounted for by the remaining components of the model was 0.059, 0.363, -0.083 , and 0.003 for males, and 0.02, 0.248, 0.084, and 0.106 for females, respectively. Table S1 shows the direct and indirect effects between the variables in this model.

Discussion

Our primary hypotheses were partially supported by this analysis of chronically depressed adults. First, CSA was associated with self-reported ratings of depression severity, consistent with previous studies examining this relationship [18–22]. Second, CSA was strongly correlated with all components of current sexual dysfunction in women but not men. Furthermore, this relationship lost statistical significance once incorporated into the structural equation model testing Barlow's sexual dysfunction theory, indicating that depression and anxiety symptoms largely explain the relationship between childhood abuse and current sexual functioning. Both the model of sexual dysfunction proposed by Barlow and Finkelhor and Browne's traumagenic dynamics model showed good fit to the data.

Barlow's model [27] here suggests that both depression and anxiety symptoms mediate the relationship between CSA and adult sexual functioning. One possible explanation for the mediational effects of depression and anxiety symptoms

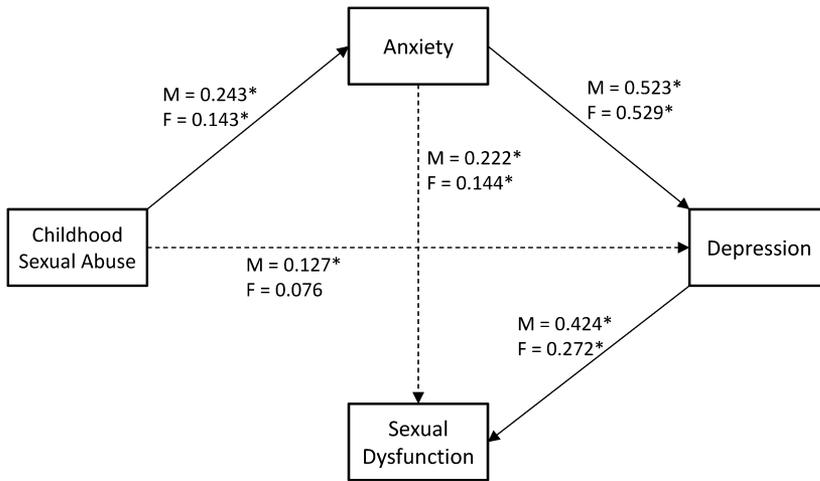


Figure 1 Structural equation model representing Barlow's model of sexual dysfunction, including standardized path coefficients (β). Solid lines indicate direct effects between variables in the direction of the arrow. Dashed lines indicate indirect effects. Asterisks (*) indicate relationships significant at the 0.05 level. M = male; F = female.

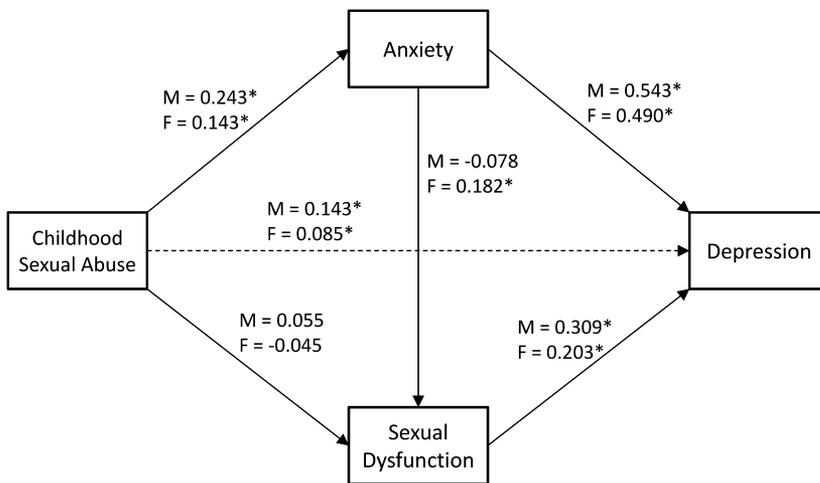


Figure 2 Structural equation model representing Finkelhor and Browne's traumagenic dynamics model, including standardized path coefficients (β). Solid lines indicate direct effects between variables in the direction of the arrow. Dashed lines indicate indirect effects. Asterisks (*) indicate relationships significant at the 0.05 level. M = male; F = female.

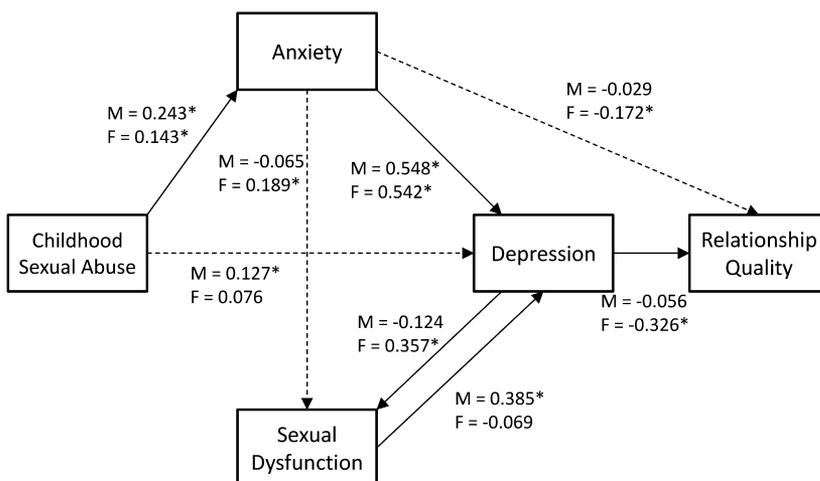


Figure 3 Structural equation model representing the overall combined model, including standardized path coefficients (β). Solid lines indicate direct effects between variables in the direction of the arrow. Dashed lines indicate indirect effects. Asterisks (*) indicate relationships significant at the 0.05 level. M = male; F = female.

is that both depression and anxiety directly result from CSA, in turn leading to detrimental sexual function in adulthood. Another possible explanation is that a patient's assessment of their sexual and marital functioning is impacted more by their current symptoms of depression or anxiety than by past CSA.

Finkelhor and Browne's theoretical traumagenics model [32] was also supported by these data. Both sexual functioning and levels of anxious arousal mediated the effect of childhood trauma on adult depressive symptoms. The increase in model fit after including anxious arousal as a predictor of impaired sexual functioning suggests that level of anxiety may be the most important intermediary variable connecting CSA with adult depression symptoms. Previous research has found associations between CSA and both anxiety symptoms and sexual impairments [35] and that these symptoms are associated with increased levels of depression [36]; our study supports these findings in a sample of chronically depressed adults.

A combined model of the two aforementioned theoretical models further elucidates the relationships among these variables (Figure 3). When including both genders in analyses, anxious arousal appears to be the foremost mediator between CSA and depression, which in turn mediates the relationship between CSA and both marriage quality and sexual functioning. Furthermore, sexual impairment appears to have a reciprocal predictive relationship with depression symptoms, such that both interact to exacerbate the other. However, the associations between depression symptoms and both sexual functioning and relationship quality appear to differ between genders. Although anxiety is a strong mediator of depression for both men and women, depression symptoms mediate the association between anxiety and both sexual dysfunction and relationship quality only for women. Conversely, sexual dysfunction has a direct predictive relationship with depression symptoms for men but not women.

These findings present several important clinical implications. First, according to Barlow's model, treatment providers attempting to improve adult sexual functioning in those with any form of childhood sexual trauma must focus on intermediary symptoms of both depression and anxiety as these precursors may be fueling the detrimental effects of childhood abuse on adult sexual health. CSA is an historical factor that puts one at risk, so it is important to know and to assess its impact. Furthermore, in line with the traumagenic dynamics theory,

addressing anxiety and sexual functioning in the treatment of depression in victims of CSA may promote improvements in mood. Finally, treatment of chronic depression should incorporate anxiety symptoms, especially in those with a history of CSA, in order to maximize outcomes.

Limitations of this study include its post hoc analysis and absence of a comparison group of nonchronically depressed participants. It is possible that other unmeasured factors impact sexual function and relationship quality, which could reduce the significance of the findings reported here. For patients who were married or in serious relationships, we did not obtain the partner's perception of relationship quality, which would have provided a more thorough measure of relationship distress. Furthermore, the cross-sectional design of the study makes it difficult to determine the longitudinal predictive value of these findings. Although CSA precedes and therefore can predict the other variables in these analyses, whether depression symptoms precede or follow sexual functioning impairments and poor relationship quality requires exploration through longitudinal research. Although this study examined several different forms of sexual dysfunction, dyspareunia was not measured as part of REVAMP and thus could not be included in analyses. Future research should examine this debilitating condition and its possible connections to sexual and relationship functioning in depressed adults. A final limitation was that REVAMP did not assess nonsexual forms of childhood trauma or cases of complex trauma, both important areas for further research.

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Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's website:

Table S1 Direct, indirect, and total effects for variables included in structural equation models.