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Sexual Function and Depressive Symptoms Among Female North American Medical Students

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Abstract

Introduction—Depression and sexual dysfunction are often comorbid.

Aim—We explored the relationship between sexuality, sexual dysfunction, and depressive symptoms in female medical students in North America.

Main Outcome Measure—Female North American medical students were invited to participate in an internet survey. The CES-D was utilized to screen for depressive symptoms and an abbreviated Spielberger State-Trait Anxiety Index (STAI) was used to quantify anxiety symptoms.

Methods—Subjects completed an ethnodemographic survey, a sexuality survey, and modified instruments for the quantification of sexual function (the Female Sexual Function Index [FSFI] and the Index of Sexual Life [ISL]). Multivariable logistic regression was used to explore the relationship between sexuality and depressive symptoms.

Results—There were 1,241 female subjects with complete data on CES-D and STAI. Mean age was 25.4 years. Depressive symptoms (CES-D > 16) were present in 46% of respondents and were more common in subjects with anxiety symptoms. Subjects who were Caucasian, younger than 28, heterosexual, and in a relationship were least likely to report depressive symptoms. High risk of female sexual dysfunction (HRFSD) was significantly associated with greater likelihood of depressive symptoms (odds ratio [OR] 2.25, $P < 0.001$). After adjusting for ethnodemographic and sexual history factors, HRFSD remained significantly positively associated with depressive symptoms (OR 1.85, $P < 0.001$). Analysis of FSFI and ISL domains indicated that depressive symptoms were most directly associated with worse orgasmic function, interference in sex life from stress and lack of partner, and lower general life satisfaction ($P < 0.05$). Interestingly, greater ISL-sexual satisfaction was associated with greater odds of depressive symptoms (OR 1.40, $P = 0.01$).

Conclusion—Depressive symptoms are common in female medical students. HRFSD is associated with depressive symptoms, although the relationship is complex when psychosocial factors are included in the multivariate model. Attention to sexuality factors from student health providers may enhance quality-of-life, academic achievement, and patient care.

Keywords

Female Sexual Dysfunction; Medical Students; Depression; Depressive Symptoms; Anxiety; Sexuality

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Introduction

Depression and anxiety are prevalent in medical students at rates higher than in the general population [1]. A recent study of first-year medical students reported a prevalence of depression and anxiety similar to the general population [2], implying that at enrollment students are not at higher risk of psychological stress. Studies have indicated that attending medical school tends to precipitate increases in psychological stress, although it must be borne in mind that personality characteristics of many medical students may intrinsically predispose them to psychological distress [3–5]. Furthermore, female students appear to be at higher risk of depressive symptoms, general anxiety, and negative appraisal of stressful life events compared with male students [1,6–9].

Depressive symptoms have a number of potential ramifications for sexual health. It has been reported that approximately 40% of women with a sexual complaint involving decreased desire, arousal, and/or orgasmic function have concurrent depression [10]. Recent studies have linked depressive symptoms to a greater likelihood of low scores on validated instruments for the assessment of sexual function [11]. A satisfying sexual life has been linked to better overall quality of life in women [12], although this finding must be considered in light of other studies that have suggested that sexual “problems” may not be distressing for many women [13,14].

Although sexual wellness in medical students was a topic of particular interest during the sexuality curriculum reform that occurred in 1960s American medical schools [15], it has received scant attention since that time. A recent single institution study suggested that sexual problems may occur in up to 60% of contemporary female medical students [16]. This prior study was limited in that there was no investigation into psychological morbidity; therefore, the psychological associations of sexuality and sexual health in contemporary female medical students remain unknown.

The purpose of the current study was to ascertain the prevalence of depression and anxiety in a population of female North American medical students. Furthermore, we sought to examine the interrelationship between sexual function and depression in this population. Finally, we investigated the role that sociodemographic factors (age, ethnicity, etc.) play in influencing psychological and sexual life of female medical students. We hypothesized that depression and anxiety would be prevalent in female medical students and that sexual problems would tend to be comorbid with depressive symptoms in this population.

Methods

Study Population

Medical students in North American medical schools were invited to participate in an internet-based survey. Invitations were extended via postings on the American Medical Student Association (AMSA) list-serves, the Student-Doctor Network, and a news story posted on Medscape.com. The survey was posted at QuestionPro.com (Survey Analytics LLC, Seattle, WA, USA) and was available from February 22, 2008 until July 31, 2008. Approval for this study and the survey instrument was granted by the Committee for Human

Research at our institution. Implied consent was assumed by subject participation in, and completion of, the survey instrument.

Primary Outcome Measures

Subjects were asked to complete the Center for Epidemiological Studies Depression Scale (CES-D), a 20-item instrument designed to assess presence and severity of depressive symptoms [17]. A CES-D score greater than 16 was utilized as evidence for clinically significant depressive symptoms [18]. A six-item short form of the Spielberger State-Trait Anxiety Index (STAI) was utilized to screen for anxiety symptoms [19]. We elected to divide STAI scores into quartiles for subsequent analysis; cut-off values for clinically significant anxiety have been developed for the long-form STAI [20] but have not been adequately evaluated for use with this abbreviated instrument.

Exposure Variables

Sociodemographic and Sexual Experience

The remainder of the survey consisted of a questionnaire that assessed demographic characteristics such as age (continuous), race/ethnicity (Asian, black, Caucasian, Hispanic, and other), sexual relationship status (yes/no), maternity status (yes/no), medical school location (Canada and seven regions within the United States), and year in medical school (first, second, third, fourth, research). A sexuality survey assessed variables such as sexual orientation (heterosexual, homosexual, bisexual, asexual, other), age at first intercourse (if any), number of lifetime and recent partners (continuous), and sexual activities in which the subject had engaged.

Sexual Quality of Life

Subjects completed the Female Sexual Function Index (FSFI), a 19 item validated questionnaire for the assessment of six domains of female sexual function (desire, arousal, lubrication, orgasm, satisfaction, and pain) [21]. Each individual domain of the FSFI is scored on a scale of 0–6 (with the exception of sexual desire, which is graded on a scale of 1.2–6) with higher scores indicative of higher/better domain specific functioning. The FSFI-total is calculated by summing all the individual domains (range 2–36). In this study, only those women who completed all questions were included in the calculation of total FSFI score. A total score of 26.55 or less on the FSFI (score range 2–36) was utilized as a cut-off value for “high risk” of female sexual dysfunction (HRFSD) [22]. Female subjects who were in relationships were asked to complete the Index of Sexual Life (ISL), an 11 item validated instrument for the assessment of relationship quality, sexual desire, and overall quality of life in women [23]. The ISL also assesses interference in sexual life from feelings of excessive tiredness, stress, disease, gynecological problems, and lack of partner; these interfering variables were analyzed.

The sexuality specific instruments were not designed to assess sexuality in individuals who have not engaged in sexual intercourse; for this reason, subjects who had never engaged in sexual intercourse (as they defined it) were excluded from analyses based on these instruments. Furthermore, these instruments were initially developed and validated for use in subjects engaging in heterosexual coitus, although the FSFI has been validated for use in lesbian subjects [24]. To make this study as inclusive as possible, minor modifications to instructions and wording were made to the sexuality instruments so as to maximize their applicability to subjects whose primary means of sexual expression is not heterosexual coitus (i.e., homosexual subjects as well as heterosexual/ bisexual subjects who frequently engage in noncoital intercourse). These changes consisted primarily of: (i) removing gender specific terms for the subject’s partner and replacing them with gender neutral pronouns/

nouns; and (ii) expanding the scope of what constitutes “sexual intercourse” to include “vaginal intercourse and/or stimulation of the genitalia with hands or mouth with the intent of producing orgasm (not as part of foreplay)” for the FSFI. These modifications were deemed important so as to obtain data that was as inclusive of all subjects as possible; however, these changes may have altered the content validity of these instruments.

Statistical Analysis

Descriptive statistics (e.g., counts, means, standard deviation) were used to characterize the study population. We report odds ratios (ORs) and 95% confidence intervals to estimate the association between subject characteristics and depression (CES > 16). Multivariable logistic regression models were developed with a priori selected predictor variables to assess the relationship between HRFSD and significant depressive symptoms (CESD score > 16). The variables for age, race, sexual orientation, prior children, anxiety (STAI divided in quartiles), lifetime sexual partners, monthly sexual frequency, number of sexual partners in the past 6 months, and being in a sexual relationship were included in the primary model. It was deemed important to include anxiety assessment in this model as depressive symptoms and anxiety, while often comorbid, are distinct psychological constructs. To explore the role that relationship factors play in the association between female sexual function and depression, in a secondary model we adjusted for FSFI and ISL domains, excluding the HRFSD metric to limit the risks of introducing artifact from colinearity. ISL scores were rescaled from 1-unit increments to 0.5 standard deviation increments to improve their interpretability. Statistical significance was set at $P < 0.05$ and all tests were two-sided. STATA 10 (Statacorp, College Station, TX, USA) was used for all analysis.

Results

There were a total of 1241 female respondents who had complete data for both CES-D and STAI; these subjects constituted the study group. Mean age was 25.4 (standard deviation [SD] 3.4). Significant depressive symptoms (CES-D > 16) were reported by 569 (45.9%) of respondents. Ethnodemographic characteristics (dichotomized by presence or absence of significant depressive symptoms) of the population are presented in Table 1.

Sexuality specific information is presented in Table 2. The majority of our non-virgin respondents had at least one sexual partner in the past 6 months (985/1,076, 92%). Slightly more than 50% met criteria for HRFSD. Interference in sexual life from tiredness and stress was reported by 74% and 66% of respondents, respectively.

Bivariate analysis for ethnodemographic associations of depressive symptoms is presented in Table 3. Women older than 28 were at greater odds of depressive symptoms relative to women younger than 22. Women of Hispanic or “other” race were at greater odds of depressive symptoms relative to Caucasian women. Bisexual women had greater odds of depressive symptoms relative to heterosexual women. Lastly, progressively greater degrees of anxiety (based on STAI scores) were associated with greater odds of depressive symptoms.

The odds of significant depressive symptoms was lower in individuals who had engaged in oral sex (odds ratio [OR] 0.75 and 0.63 for giving or receiving oral sex, respectively), whereas the odds of significant depressive symptoms were slightly higher among those who had restrained others or been restrained for sexual pleasure (OR 1.37 and 1.32, respectively). No other specific sexual behaviors that were assessed (masturbation, vaginal sex, anal receptive sex, anal insertive sex, sex acts with a partner of the opposite gender, sex acts with a partner of the same gender, giving or receiving pain for sexual pleasure) were significantly associated with depressive symptoms. Being in a sexual relationship, higher sexual

frequency, and better FSFI and ISL domain scores were associated with lower odds of depressive symptoms on bivariate analysis (Table 4). HRFSD (FSFI-total < 26.55) was associated with a greater odds of depressive symptoms, as was interference in sexual life from tiredness, stress, and disease.

After adjusting for age, race, sexual orientation, having children, anxiety, lifetime sexual partners, sexual frequency, number of partners in last 6 months, and being in a sexual relationship, HRFSD remained significantly associated with depressive symptoms (Table 5, OR 1.85, 95% 1.31–2.61). Relative to the lowest quartile of STAI scores, each higher quartile was independently associated with greater and increasing odds of depressive symptoms; no other sociodemographic factors or history of specific sexual practices were significantly associated with depressive symptoms after multivariable adjustment.

On multivariate analysis of FSFI and ISL domain scores, every 0.5 SD improvement in FSFI-orgasm and FSFI-satisfaction domain scores was associated with a 27% (OR 0.73, 95% confidence interval [CI] 0.59–0.89) and 20% (OR 0.64, 95% CI 0.64–0.99) reduction, respectively, in the odds of significant depressive symptoms. In this same analysis, ISL—interference in sexual life from stress and lack of partner were independently associated with a 68% and 57% respective increase in the odds of depressive symptoms (OR 1.68, 95% CI 1.01–2.79 and OR 1.57, 95% CI 0.99–2.48, respectively). Further, every 0.5 SD improvement in ISL—general life satisfaction scores was associated with a 45% reduction in the odds of depressive symptoms (OR 0.55, 95% CI 0.47–0.65). Surprisingly, better ISL—sexual life satisfaction scores were independently associated with a 40% increase in the odds of depressive symptoms (OR 1.38, 95% CI 1.08–1.76).

Discussion

A prior study of 634 medical students at a large U.S. medical school reported a 42% incidence of depression and/or anxiety in female students [25]. These results are similar to the prevalence of depressive symptoms in our cohort and suggest a consistent rate of depressive symptoms in this population. The CES-D has been utilized in a variety of studies investigating the burden of depressive symptoms in other population groups. Although there are some substantial variations between these studies and ours with respect to subject demographics and means of data collection, the percentage of young female adults (18–40) in North American countries with CES-D scores greater than 16 has been reported to range between 12 and 33% [26–28]. Socioeconomic factors have been noted to drive important differences between groups [26–28]. Although direct comparison is not advisable because of differences in study methods, it is apparent that students in our cohort have a burden of depressive symptoms that is at least as great if not greater than would be predicted by population norms.

Both intrinsic and extrinsic factors may contribute to the severity and impact of depressive symptoms in medical students [5,29,30]. While these symptoms are important concerns in their own right, they are of particular concern in a medical student population as they may impair scholastic aptitude and patient care [5]. Stress, depression, and anxiety are some of the greatest potential negative influences on academic performance [9,31,32]. In a less tangible but no less significant finding, Thomas et al. determined that student psychological well-being and overall quality of life correlates with their capacity for empathy, although it must be borne in mind that causality is unclear and it may be that empathic students are more prone to psychological well-being rather than vice versa [33]. Most concerning, depressive symptoms have been clearly linked to higher risk of suicidal ideation in medical students [34].

To our knowledge there has been no recent research on the role of sexuality as it pertains to depressive symptoms in female medical students. In the current study, sexuality specific factors were found to be related to risk of depressive symptoms in a number of interesting ways. On bivariate analysis, greater sexual frequency and better scores on all domains of sexual function assessed by the FSFI and ISL, and FSFI total score consistent with low risk for sexual dysfunction were all associated with lower odds of depressive symptoms; our results are similar to what other authors have reported based on FSFI total scoring [11].

Orgasmic function (as a specific domain of sexual function) and overall sexual satisfaction appeared to have particularly robust associations with depressive symptoms based on our second multivariate model. Depressive symptoms are thought to be associated with decreased sexual arousability in both men and women [35]. Frohlich and Meston reported that orgasmic function and overall sexual satisfaction were generally better in women with low to no depressive symptoms relative to women with depressive symptoms [36]. Similarly, Davison et al. reported that subjective sexual dissatisfaction in women is associated with lower psychological well-being [12]. The FSFI-satisfaction domain is a proxy measure of satisfaction so this report is in agreement with our data. Given the importance of psychological state in the phenomenon of orgasm and overall sexual function, it is not surprising that better/higher orgasmic function and sexual satisfaction are associated with less significant depressive symptoms.

Based on ISL results, greater odds of depressive symptoms were reported by women who endorsed lower general life satisfaction and interference in sexual life from stress and lack of partner. These findings are not unexpected; however, the ISL-sexual life satisfaction domain showed an interesting and counterintuitive relationship with depressive symptoms in our multivariable analysis, with higher domain scores associating with greater odds of depressive symptoms on multivariate analysis. This is of particular interest in that better scores on this domain were associated with lower odds of depressive symptoms on bivariate analysis and that the FSFI-sexual satisfaction domain had the opposite relationship (i.e., a significant negative association with odds of depressive symptoms). However, the ISL-sexual life satisfaction domain includes a broad assessment of sexual life (including frequency of intercourse satisfaction, overall enjoyment of intercourse, orgasmic frequency, and relationship status) whereas the FSFI-sexual satisfaction domain is more tightly focused on satisfaction with sexual activity. Furthermore, only those women in relationships completed the ISL and this may have influenced our results. It may be postulated that some women with depressive symptoms see sexual expression with their partner as an important outlet for depressive stress and thereby value it (i.e., find satisfaction) to a greater extent. This is of course strictly a speculation and attempt to account for this unexpected finding; it is possible that an unidentified confounding factor or a Type I error underlies this observation. Clearly, the relationship between depressive symptoms and sexual satisfaction in women in general vs. women in relationships needs additional careful study.

It is also important to distinguish between subjective assessment of sexual function and objective measurement of “risk of sexual problems” based on objective criteria such as the FSFI. In a sample of over 31,000 U.S. women, Shifren et al. reported that although 43% of U.S. women reported a sexual problem, subjective distress was present in just 22%; coincident sexual problems and sexual distress was present in just 12% of respondents [14]. When taken in context with our results, it must be understood that association does not imply causation and problems in sexual life (whether intrinsic to the woman or partner-related) may not be perceived as major impediments for some women, the report from Davison et al. notwithstanding [12]. The question of whether or not nondistressing sexual problems merit evaluation and treatment is beyond the scope of this paper.

Limitations of our data-set include a limited population of respondents that may not be representative of the total medical student body of North America; specifically, Caucasian students were overrepresented. Furthermore, subjects who are willing to participate in an online sexuality survey may not be representative of the overall medical student body. This cross-sectional means of data collection permits investigation into association but causality cannot be inferred from these data; it is likely that depressive symptoms and sexual problems are linked in a cyclic fashion with one contributing to the other but it is not clear from these data which “came first” in our subject population. We did not gather data on medical treatments; it must be considered that some of our subjects may have been on anti-depressant treatment, which may have confounded accurate assessment of potential reasons for sexual dysfunction in respondents with depressive symptoms. A number of variables were assessed and the possibility of type I error must be considered. The FSFI and ISL instruments have not been extensively utilized in non-heterosexual populations and therefore the modifications we introduced so as to optimize inclusiveness may have compromised the validity of the original instruments. Finally, the survey was limited in scope and important contributors to psychological/sexual morbidity may have been missed; although a great deal of data was collected it was deemed necessary to truncate some aspects of the research so as to preserve response rate.

Despite these limitations, we believe our study indicates that sexual dysfunction is associated with a greater burden of depressive symptoms in medical students and is therefore an important and potentially overlooked component of psychological well-being in this population. In the absence of a clinical trial it cannot be definitively stated that attention to improved sexual functioning and mental health will improve medical student welfare and performance; however, it is an intriguing concept and worthy of further attention by those involved with and concerned for medical student well-being and educational achievement.

Additional research on means and mechanisms to alleviate both psychological and sexual distress in this population is warranted. These may take the form of therapeutic trials of counseling for depressive symptoms in this population, intensive interviews of students with depression, or studies to determine the mental health impact of increased attention to sexuality as an important aspect of student health services. Regardless of the intervention planned, attention and address of biological, psychological, and interpersonal concerns is most likely to produce durable improvements in student quality of life [37].

Conclusion

Psychological morbidity is common in female North American medical students. High risk of HRFSD is associated with greater odds of depressive symptoms, with orgasmic problems seeming to account for much of this association. Such findings warrant further investigation as psychological disease in medical students may lead to problems not just for the individual but also for their social network, colleagues, and patients.

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Statement of Authorship

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Table 1

Demographic, educational, and psychological characteristics of female subjects (N = 1,241)

		<u>Overall</u>		<u>No depressive symptoms</u>		<u>Depressive symptoms</u>	
		N	%	N	%	N	%
Age	22	338	27.3	186	55.0	152	45.0
	23–25	422	34.1	237	56.2	185	43.8
	26–27	245	19.8	139	56.7	106	43.3
	28	234	18.9	109	46.6	125	53.4
Race	White	836	69.8	473	56.6	363	43.4
	Hispanic	77	6.4	32	41.6	45	58.4
	Black	45	3.8	22	48.9	23	51.1
	Asian	149	12.4	80	53.7	69	46.3
	Other	91	7.6	41	45.1	50	55.0
Year in school	1	327	26.5	170	52.0	157	48.0
	2	348	28.2	186	53.5	162	46.6
	3	284	23.0	157	55.3	127	44.7
	4	228	18.5	135	59.2	93	40.8
	Research year	49	4.0	20	40.8	29	59.2
Married or in a domestic partnership		383	45.9	266	58.9	186	41.2
Have children		67	5.4	36	53.7	31	46.3
Significant depressive symptoms (CESD = 16)		569	45.9				
Anxiety (quartiles)	<10 (<25th%)	316	25.5	272	86.1	44	13.9
	10–12 (25–50th%)	236	19.0	172	72.9	64	27.1
	13–16 (50–75th%)	409	33.0	194	47.4	215	52.6
	17+ (75th%+)	280	22.6	34	12.1	246	87.9

Table 2

Sexuality characteristics of female subjects

		<u>Overall</u>		<u>No depressive symptoms</u>		<u>Depressive symptoms</u>	
		N	%	N	%	N	%
Sexual orientation	Heterosexual	1,101	89.2	613	55.7	488	44.3
	Homosexual	62	5.0	32	51.6	30	48.4
	Bisexual	71	5.8	26	36.6	45	63.4
Virgin (have not had intercourse)		162	13.1	83	51.2	79	48.8
In a sexual relationship		859	69.2	495	57.6	364	42.4
Six or more lifetime partners		425	39.7	229	53.9	196	46.1
Number of sexual partners, last 6 months	0	91	8.5	43	47.3	48	52.8
	1	819	76.1	462	56.4	357	43.6
	2+	166	15.4	82	49.4	84	50.6
Sexual frequency in last month (percentile)	0–2 (<25th%)	335	31.4	158	47.2	177	52.8
	3–5 (25–50th%)	238	22.3	138	58.0	100	42.0
	6–10 (50–75th%)	272	25.5	149	54.8	123	45.2
	11+ (>75th%)	223	20.9	141	63.2	82	36.8
HRFSD	No (FSFI > 26.55)	530	50.1	339	64.0	191	36.0
	Yes (FSFI ≤ 26.55)	528	49.9	233	44.1	295	55.9
Number reporting interference in sexual life from specific causes (ISL)	Tiredness	634	73.8	348	54.9	286	45.1
	Stress	566	65.9	275	48.6	291	51.4
	Disease	54	6.3	22	40.7	32	59.3
	Gynecological problems	130	15.1	66	50.8	64	49.2
	Lack of partner	262	30.5	142	54.2	120	45.8
		Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
FSFI	Total	24.0	8.7	25.5	8.4	22.3	8.8
	Desire	3.7	1.2	3.8	1.1	3.6	1.3
	Arousal	3.8	2.0	4.0	2.0	3.4	2.0
	Lubrication	4.2	2.1	4.4	2.1	3.9	2.2
	Orgasm	3.6	2.1	3.9	2.1	3.2	2.1
	Satisfaction	4.0	1.6	4.4	1.5	3.5	1.6
	Pain	4.0	2.3	4.2	2.2	3.8	2.3
ISL	Total	35.6	8.7	37.7	7.9	32.6	8.9
	Sex life satisfaction	21.8	5.2	23.0	4.7	20.1	5.3
	Sex drive	6.1	2.8	6.3	2.7	5.8	2.9
	General life	7.9	1.7	8.5	1.3	6.9	1.7

HRFSD = high risk of female sexual dysfunction; ISL = Index of Sexual Life; FSFI = Female Sexual Function Index.

Table 3

Bivariate relationship between sociodemographic characteristics, anxiety, and depressive symptoms

		OR	95% CI		P value
Age	22	1.00	Ref		Ref
	23–25	0.96	0.72	1.27	0.76
	26–27	0.93	0.67	1.30	0.68
	28	1.40	1.00	1.96	0.05
Race	White	1.00	Ref		Ref
	Hispanic	1.83	1.14	2.94	0.01
	Black	1.36	0.75	2.48	0.31
	Asian	1.12	0.79	1.59	0.51
	Other	1.59	1.03	2.46	0.04
Year in school	1	1.00	Ref		Ref
	2	0.94	0.70	1.28	0.70
	3	0.88	0.64	1.21	0.42
	4	0.75	0.53	1.05	0.09
	Research year	1.57	0.85	2.89	0.15
Sexual preference	Heterosexual	1.00	Ref		Ref
	Homosexual	1.18	0.71	1.97	0.53
	Bisexual	2.17	1.32	3.57	0.002
Married or in domestic partnership		1.09	0.83	1.44	0.52
Have children		1.02	0.62	1.67	0.94
Anxiety (quartiles)	<10 (<25th%)	1.00	Ref		Ref
	10–12 (25–50th%)	2.30	1.50	3.53	<0.001
	13–16 (50–75th%)	6.85	4.72	9.95	<0.001
	17+ (75th%+)	44.73	27.69	72.25	<0.001

Table 4

Bivariate relationship between sexuality specific traits and depressive symptoms

		OR	95% CI	P Value	
Virgin		1.14	0.82	1.59	0.43
Currently in a sexual relationship		0.63	0.50	0.81	<0.001
Six or more lifetime partners		1.05	0.82	1.34	0.71
Number of partners last 6 months	0	1.00	Ref		Ref
1	0.	.69	0.45	1.07	0.10
	2+	0.92	0.55	1.53	0.74
Sexual frequency in past month (percentile)	0–2 (<25th%)	1.00	Ref		Ref
	2–5 (25–50th%)	0.65	0.46	0.90	0.01
	5–10 (50–75th%)	0.74	0.53	1.02	0.06
	10+ (>75th%)	0.52	0.37	0.73	<0.001
ISL	Tired	1.55	1.13	2.12	0.01
	Stress	3.19	2.33	4.36	<0.001
	Disease	2.07	1.18	3.63	0.01
	Gynecological problems	1.39	0.95	2.02	0.09
	Lack partner	1.22	0.91	1.64	0.18
HRFSD	Yes (FSFI 26.55)	2.25	1.76	2.88	<0.001
FSFI (per 0.5 SD change)	Total	0.83	0.78	0.88	<0.001
	Desire	0.93	0.88	0.99	0.02
	Arousal	0.86	0.81	0.91	<0.001
	Lubrication	0.89	0.84	0.95	<0.001
	Orgasm	0.85	0.80	0.90	<0.001
	Satisfaction	0.73	0.69	0.78	<0.001
	Pain	0.91	0.86	0.96	0.001
ISL (per 0.5 SD change)	Total	0.73	0.68	0.79	<0.001
	Sex life satisfaction	0.74	0.69	0.80	<0.001
	Sex drive	0.91	0.85	0.98	0.01
	General life	0.55	0.50	0.61	<0.001

CI = confidence interval; HRFSD = high risk of female sexual dysfunction; ISL = Index of Sexual Life; FSFI = Female Sexual Function Index; OR = odds ratio.

Table 5

Multivariate relationship between sexual dysfunction, anxiety, sociodemographic characteristics, and significant depressive symptoms

		OR	95% CI		P value
a. Female sexual dysfunction and depression *					
HRFSD	No	1.00	Ref		Ref
	Yes	1.85	1.31	2.61	0.00
b. Depression with FSFI and ISL *					
FSFI score (per 0.5 SD change)	Desire	0.92	0.79	1.07	0.26
	Arousal	1.17	0.86	1.61	0.32
	Lubrication	1.11	0.87	1.41	0.39
	Orgasm	0.73	0.59	0.89	0.002
	Satisfaction	0.80	0.64	0.99	0.04
	Pain	0.86	0.70	1.05	0.14
ISL	Tired	0.99	0.59	1.67	0.98
	Stress	1.68	1.01	2.79	0.05
	Disease	1.33	0.57	3.12	0.51
	Gynecological problems	1.46	0.82	2.58	0.20
	Lack partner	1.57	0.99	2.48	0.05
	Sex life satisfaction	1.38	1.08	1.76	0.01
ISL (per 0.5 SD change)	Sex drive	1.13	0.96	1.34	0.15
	General life	0.55	0.47	0.65	<0.001

* Adjusted for age, race, sexual orientation, prior children, anxiety, lifetime sexual partners, sexual frequency, number of partners in last 6 months, and current sexual relationship. Anxiety was strongly and independently associated with depression in all models. No other variables were independently associated with depression. Sexual relationship (yes/no) was excluded from the model that included ISL domains because of significant co-linearity between these variables.

CI = confidence interval; HRFSD = high risk of female sexual dysfunction; ISL = Index of Sexual Life; FSFI = Female Sexual Function Index; OR = odds ratio.