

## WOMEN'S SEXUAL HEALTH

# Sexual Health, Mental Health, and Beliefs About Cancer Treatments Among Women Attending a Gynecologic Oncology Clinic



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## ABSTRACT

**Introduction:** Sexual health is an important, yet overlooked, aspect of quality of life for gynecologic oncologic patients. Although patients with gynecologic cancer frequently report sexual health concerns, there are limited efforts to address these problems. A comprehensive understanding of the relationship between mental health and sexual health needs to be prioritized.

**Aim:** To examine multiple components of sexual health in patients with gynecologic cancer.

**Methods:** For the present study, sexual health concerns (ie, sexual frequency, desire, response, and satisfaction; orgasm; and pain during sex; independent variables), beliefs about cancer treatments affecting sexual health (dependent variable), and mental health (ie, anxiety and depressive symptoms; dependent variables) of patients at a US gynecologic oncology clinic were assessed.

**Main Outcome Measures:** Demographics; cancer diagnosis; positive screening results for cancer; sexual health histories including sexual frequency, desire, pain, orgasm, responsiveness, and satisfaction; and mental health including depression and anxiety symptoms.

**Results:** Most women reported experiencing at least one sexual health concern, and half the women screened positive for experiencing symptoms of depression and anxiety. Forty-nine percent of participants reported having no or very little sexual desire or interest in the past 6 months. Further, in mediation analyses, pain during sex was significantly and positively correlated with depressive symptoms ( $r = 0.42$ ,  $P < .001$ ), and this relationship was fully mediated by believing that cancer treatments affected one's sexual health ( $B = 0.16$ , 95% confidence interval = 0.01–0.48,  $P < .05$ ).

**Conclusion:** Findings emphasize the need to further address and incorporate sexual and mental health into standard care for patients attending gynecologic oncology clinics. Screening women for whether and to what extent they perceive cancer treatments affecting their sexual health could provide a brief, easily administrable, screener for sexual health concerns and the need for further intervention. Intervention development for patients with gynecologic cancer must include mental health components and addressing perceptions of how cancer treatments affect sexual health functioning. **Eaton L, Kueck A, Maksut J, et al. Sexual Health, Mental Health, and Beliefs About Cancer Treatments Among Women Attending a Gynecologic Oncology Clinic. *Sex Med* 2017;5:e175–e183.**

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**Key Words:** Sexual Health; Mental Health; Gynecologic Oncology; Cancer Treatment

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## INTRODUCTION

Although the topic of sexual health for gynecologic oncologic patients has garnered more interest in recent years, intervention work to address this aspect of quality of life often remains overlooked and not incorporated into standard of care.<sup>1–3</sup> Sexual health is an area of interest and concern for many women who are currently undergoing, or who have undergone, gynecologic oncology treatments. According to Abbott-Anderson and

Kwekkeboom,<sup>4</sup> most survivors of gynecologic cancer experience physical sexual dysfunction. However, intervention resources for women with sexual health needs are limited.<sup>4–6</sup> In addition to the social and emotional effects of coping with a cancer diagnosis and managing intensive cancer treatment regimens, gynecologic cancer treatments can—and often do—directly affect a patient's physical and emotional capacity to engage in sexual activity.<sup>7,8</sup> As a result of these realities, sexual health research in these patients and intervention development must be prioritized.

Sex health morbidities in patients with gynecologic cancer are common and can persist for years after their treatment has completed.<sup>6,9–14</sup> Reports of dyspareunia (ie, pain during intercourse), lack of interest in sexual activity, and difficulties with arousal and orgasm are common in women during and after treatment, regardless of the amount of time since diagnosis. For example, Lindau et al<sup>15</sup> found that, although long-term vaginal and cervical cancer survivors engage in sexual behaviors at rates similar to the general population, they are more than twice as likely to experience sexual health problems. Further, they report that their sexual health care is significantly poorer than their overall cancer treatment care.

One area of sexual health that deserves further attention is its relation to psychological well-being.<sup>16,17</sup> Sexual health has a history of being treated as a separate entity, not understood within a larger social-ecologic framework. In Abbott-Anderson and Kwekkeboom's<sup>4</sup> review of sexual health concerns in gynecologic cancer survivors, they noted many studies addressing physical changes and needs, but not addressing psychological- and social-related concerns regarding sexual health. Levin et al<sup>18</sup> found that sexual health concerns are a robust and reliable predictor of psychological adjustment in gynecologic cancer survivors. Interestingly, this study noted a lack of association between disease diagnosis or treatment type and psychological adjustment. This finding suggests that understanding how treatments affect sexual health is more complicated than simply assessing the direct impact of the treatment-derived physical changes.

The beliefs one holds regarding whether cancer treatment will affect one's sexual health could be a critical component to assess when evaluating the short- and long-term effects of cancer treatments. This notion is directly in line with the Integrated Theory of Health Behavior Change (ITHBC).<sup>19</sup> The ITHBC is a framework that depicts health behavior change as the result of three main tenets: increased knowledge and health beliefs, self-regulation skills and abilities, and enhanced social facilitation. This theoretical approach posits that knowledge about treatments affects beliefs and behaviors in response to treatments. Fostering positive health beliefs directly affects the self-regulation skills and abilities of the individual; this includes the management of emotional responses related to symptoms of depression and anxiety. Similarly, social and emotional support provided by loved ones and health professionals is essential to the development of positive short- and long-term outcomes of the patient's health.<sup>19</sup> The ITHBC demonstrates the strong association that

exists between health beliefs and treatment outcomes specifically related to sexual health outcomes.

## STUDY OBJECTIVES

The present study examined multiple components of sexual health in patients with gynecologic cancer. There were three main study objectives: (i) describe areas of sexual health including sexual desire, response, and satisfaction; orgasm; and pain during sex; (ii) assess the associations between sexual health and mental health (ie, depressive and anxiety symptoms); and (iii) evaluate the relations among sexual health concerns, cancer treatment and sexual health beliefs, and mental health symptoms.

## METHODS

### Participants and Setting

Patients attending appointments at a gynecologic cancer treatment center in the Northeastern United States from April 2014 through August 2014 were approached to participate in this study. Women in need of treatment for cervical, uterine, ovarian, and other cancers related to female reproductive health attend the clinic. All patients were eligible for the study regardless of diagnosis or treatment status, with the exception of patients too physically sick or emotionally distraught as determined by medical staff. Participants were approached in clinic examination rooms by a female researcher and were informed that the study would take approximately 10 minutes to complete, that it was anonymous, and that it was in no way linked to any care that they might or might not receive. Further, participants were told that the survey would ask about their health screenings and diagnoses, mental health, and sexual health. Research staff provided the participant with informed consent, and verbal consent was obtained before survey administration. The assessment was conducted by Audio Computer Assisted Self Interviewing (ACASI), which is often used to allow participants to answer survey questions related to sensitive personal material. The ACASI was delivered by electronic tablet. A research staff member provided instruction on using the ACASI assessment and was available to the participant to answer any questions throughout the study. The participant completed the survey in a private office at the clinic. Approximately 85% of women approached agreed to participate. All study procedures were approved by the institutional review board at the University of Connecticut Health Center.

## MAIN OUTCOMES MEASURES

The assessment included measures of demographics; cancer diagnosis; positive screenings for cancer; sexual health histories including sexual frequency, desire, pain, orgasm, responsiveness, and satisfaction; and mental health including depression and anxiety symptoms.

### Demographics

Participants were asked to answer questions regarding their age, educational level, ethnicity, marital or partner status, and income level.

### Sexual Health (Independent Variables)

A battery of measures adapted from the Women's Sexual Interest Diagnostic Interview<sup>20,21</sup> was used. Questions concerned multiple areas about sexual health. Sexual desire was assessed using three items (eg, "How much sexual desire or interest in sexual activity have you had?"). Responses included none, very little, a moderate amount, quite a bit, and a great deal. The sexual desire items were averaged and demonstrated internal consistency (Cronbach  $\alpha = 0.74$ ). Sexual response was measured using the following items: "How naturally wet or lubricated did you usually become during sexual stimulation?" and "How mentally or emotionally excited (turned on) did you become during sexual stimulation?" Responses included no lubrication/not at all, hardly at all, a little, a moderate amount, quite a bit, and extremely. The sexual response items were averaged and demonstrated internal consistency (Cronbach  $\alpha = 0.72$ ). Orgasm was measured using a single item, "Have you usually been able to have an orgasm or climax during sexual stimulation or intercourse?" Response set was a dichotomous yes or no. Pain during sex was measured using three items (eg, "How much pain and/or discomfort do you usually have during vaginal penetration or intercourse?"). Responses included no pain, hardly any, a little, moderate, quite a bit, and extreme. Pain during sex items were averaged and demonstrated internal consistency (Cronbach  $\alpha = 0.94$ ). Sexual satisfaction was measured by asking a single item, "Over the past few months, have you been satisfied with your sexual interest or desire?" Response set was a dichotomous yes or no. Beliefs about cancer treatments affecting sexual health was assessed by asking a single item, "How much have your cancer treatments had an effect on your sexual health?" Response set included not at all, a little, somewhat, and a lot.

### Cancer Diagnoses and Treatments (Dependent Variables)

Participants were asked whether they had been diagnosed with cancer, when they had been diagnosed, stage of the cancer at the time of diagnosis, and what type of cancer (vulvar, cervical, uterine or endometrial, vaginal, ovarian or fallopian, peritoneal, breast, or having had a positive screening result for gynecologic cancer). To assess treatments received (current and ever), participants were asked to report on their use of hormones for cancer treatment and whether they had received internal radiation, external radiation, surgery, radical hysterectomy, hysterectomy, unilateral oophorectomy, or bilateral oophorectomy. Participants also were asked whether they were perimenopausal or menopausal, and participants who responded yes to either question were asked whether it was due to naturally occurring processes or whether it was medically induced.

### Mental Health Status (Dependent Variables)

A brief screening scale for anxiety and depression symptoms, the Patient Health Questionnaire for Depression and Anxiety-4,<sup>22</sup> was used. This four-item scale has been associated

with functional impairment and has demonstrated convergent validity with other constructs known to be related to depression and anxiety. Consistent with prior work,<sup>22,23</sup> the depression and anxiety subcomponents were investigated separately. Example items included, "How often have you felt nervous, anxious, or on edge?" (anxiety subcomponent) and "How often have you felt down, depressed, or hopeless?" (depression subcomponent). The timeframe for the items included the past 2 weeks and the response set was not at all, a few days, more days than not, and nearly every day. Scales demonstrated internal consistency for the anxiety subcomponent (Cronbach  $\alpha = 0.84$ ) and for the depression subcomponent (Cronbach  $\alpha = 0.82$ ).

### Data Analysis

Eighty-nine women were assessed during their appointment at a gynecologic cancer clinic in 2014. Criteria for study participation were that they had to be at least 18 years of age, they had to have an appointment at the clinic, and they had to consent to the study procedures. Of the 89 women assessed, 19 women answered that they had not had sex in the past 6 months, that they had no desire to have sex, and that they were not at all bothered by a lack of desire in sex. These women were removed from further data analyses, because the present study focused on women who were interested in sexual health and/or were sexually active. Analyses demonstrated that women who were excluded were more likely to be older ( $t_{87} = 5.01$ ,  $P < .001$ ), more educated ( $t_{87} = 4.92$ ,  $P < .001$ ), and report higher incomes ( $t_{87} = 4.13$ ,  $P < .001$ ) than women retained in the analyses. Of the 70 remaining women, descriptive data including mean and SD or number and percentage for all variables are provided. For the bivariate and multivariate models, generalized linear modeling was used to assess the relations between sexual health morbidities (independent variables) and beliefs about cancer treatments, depression symptoms, and anxiety symptoms (dependent variables). Beliefs about cancer treatments were considered predictor variables based on the concepts set forth by the ITHBC<sup>19</sup> involving health beliefs having an effect on the management of emotional responses. For bivariate and multivariate models, analyses controlled for age and partner status (ie, married or in stable relationship for the past 3 months). Variables were entered into the multivariable models if they were significant ( $P < .05$ ) in the bivariate models. A mediation analysis that assessed only a subset of participants who were diagnosed with cancer ( $n = 50$ ), as opposed to having had a positive screening test result for cancer ( $n = 20$ ), was conducted. The mediation analysis used the analytical framework of ordinary least squares for estimating direct and indirect effects. Bootstrapping methods were applied to estimate confidence intervals (CIs). Bias-corrected CIs and 5,000 bootstrap samples were used. Mediator model steps using procedures outlined by Preacher and Hayes<sup>24</sup> and Baron and Kenny<sup>25</sup> were followed. There were less than 5% missing data for any given variable. For all analyses, a  $P$  value less than .05 was used to define statistical significance.

**Table 1.** Demographic characteristics of women attending a gynecologic cancer clinic

Age (y), mean (SD)	53.0 (13.1)
Education (y), mean (SD)	2.34 (.8)
Ethnicity, n (%)	
Asian	1 (1.4)
Black	4 (5.7)
Hispanic	5 (7.2)
White	58 (80.0)
Multi-ethnicity	2 (2.9)
Married or in stable relationship for at least the past 3 mo, n (%)	47 (67.0)
Income	
<\$31,000	17 (24.3)
\$31,000–\$59,000	16 (23.5)
>\$59,000	35 (51.5)
Cancer diagnosis (some women reported multiple sites), n (%)	
Vulvar	4 (5.7)
Cervical	13 (18.6)
Uterine or endometrial	17 (24.3)
Vaginal	1 (1.4)
Ovarian or fallopian	17 (24.3)
Peritoneal	0 (0)
Breast	7 (10.0)
Positive screen result for gynecologic cancer	20 (25.7)
Gynecologic cancer treatments received (ever; some women reported multiple treatments), n (%)	
Hormones	2 (2.9)
Internal radiation	5 (7.1)
External radiation	7 (10.0)
Chemotherapy	19 (27.1)
Surgery	40 (57.1)
Gynecologic cancer treatments received (current; some women reported multiple treatments), n (%)	
Hormones	2 (2.9)
Internal radiation	0 (0)
External radiation	0 (0)
Chemotherapy	6 (8.7)
Surgery	6 (8.7)
Time since diagnosis	
<1 y	11 (22.5)
1–5 y	17 (34.7)
>5 y	21 (42.6)
Unsure	1 (0.02)
Cancer stage at diagnosis, n (%)	
Precancerous	9 (12.9)
Stage I	17 (24.3)
Stage II	8 (11.4)
Stage III	7 (10.0)
Stage IV	4 (5.7)
Don't know	5 (7.1)

(continued)

**Table 1.** Continued

Have you had any of the following procedures?, n (%)	
Total or radical hysterectomy	20 (28.6)
Uni- or bilateral oophorectomy	4 (5.7)
Hysterectomy and oophorectomy	19 (27.1)
Currently in menopause, n (%)	
Yes, medically caused	13 (18.5)
Yes, naturally caused	20 (28.6)
Medically and naturally caused	4 (5.7)

PASW Statistics 18.0 (SPSS Inc, Chicago, IL, USA) was used for all analyses.

## RESULTS

### Demographics

The women's average age was 53 years (SD = 13.1), and most women had at least some college education (mean = 2.34, SD = 13.1; [Table 1](#)). Eighty percent of participants were of white ethnicity, with fewer participants of Hispanic (7.2%) and black (5.7%) ethnicity. More than half the women reported being married or in a stable relationship (n = 47, 67%) and making more than \$59,000 (n = 35, 52%). Uterine or endometrial and ovarian or fallopian cancer diagnoses composed 48.6% of the cancer diagnoses and were the most frequently diagnosed cancers in this sample. Twenty-six percent of the sample (n = 20) had a positive screening test result for gynecologic cancers; in these women, concern was most prevalent for cervical cancer (n = 9, 47%). Most of the sample had undergone surgical treatments for cancer (n = 40, 57.1%) and 19 (27.1%) had received chemotherapy. Internal or external radiation was limited to 17.1% of the sample.

### Sexual Health

Across participants, different rates of sexual activity frequency were observed ([Table 2](#)). For sexual health morbidities, 48.6% of the sample reported having no or very little sexual desire or interest in the past 6 months. The remaining women reported having at least a moderate amount of interest. Findings were similar for how often a participant reported sexual fantasies or thoughts. Fifty-four percent of the sample reported feeling reluctant to engage in sex when they had the opportunity to, and 46% reported not being reluctant at all. For sexual response, 43% of women reported not being naturally lubricated and 34% reported not being mentally excited during sexual stimulation. Most participants typically could reach orgasm during sexual stimulation or intercourse (71%). Thirty-four percent of the sample responded that they experienced pain or discomfort during vaginal penetration; of women who experienced pain, 71% responded being at least moderately bothered by this

**Table 2.** Sexual health status of women attending a gynecologic cancer clinic

	n	%
<b>Sexual frequency</b>		
<b>In the past 6 mo:</b>		
How many times did you engage in sexual activity alone or with a partner?		
Never	23	32.9
1–2 times	15	21.4
3–4 times	5	7.1
5–6 times	4	5.7
≥7	23	32.9
<b>Sexual desire</b>		
<b>In the past 6 mo:</b>		
How much sexual desire or interest in sexual activity have you had?		
None	6	8.6
Very little	28	40.0
A moderate amount	29	41.4
Quite a bit	4	5.7
A great deal	3	4.3
How often have you had sexual thoughts or fantasies about sexual activity?		
Not at all	21	30.0
Less than once a week	16	22.9
Occasionally	21	30.0
Quite a lot	6	8.6
Very often	5	7.1
How reluctant have you been to engage in sexual activity when you had the opportunity?		
Extremely reluctant	9	12.9
Very reluctant	7	10.0
Moderately reluctant	8	11.4
Slightly reluctant	14	20.0
Not at all reluctant	32	45.7
<b>Sexual response</b>		
<b>In the past 6 mo:</b>		
How naturally wet or lubricated did you usually become during sexual stimulation?		
No lubrication	30	42.9
Hardly at all	1	1.4
A little	10	14.3
Moderate amount	22	31.4
Quite a bit	7	10.0
Extreme amount	0	0
How mentally or emotionally excited (turned on) did you become during sexual stimulation?		
Not at all	24	34.3
Hardly at all	0	0
A little	6	8.6
Moderately	20	28.6
Quite a bit	17	24.3
Extremely	3	4.3

(continued)

**Table 2.** Continued

	n	%
<b>Orgasm</b>		
<b>In the past 6 mo:</b>		
Have you usually been able to have an orgasm or climax during sexual stimulation or intercourse?		
Yes	50	71.4
No	20	28.5
<b>Pain during sex</b>		
<b>In the past 6 mo:</b>		
How much pain and/or discomfort do you usually have during vaginal penetration or intercourse?		
No pain	46	65.7
Hardly any	2	2.9
A little	4	5.7
Moderate	8	11.4
Quite a bit	7	10.0
Extreme	3	4.3
How bothered are you by pain during vaginal penetration or intercourse?		
Hardly at all	49	70.0
A little	6	8.6
Moderate	5	7.1
Quite a bit	6	8.6
Extreme	4	5.7
How much pain do you usually expect to have during vaginal penetration or intercourse?		
No pain or almost none	55	78.6
A little	2	2.9
Moderate	6	8.6
Quite a bit	6	8.6
Extreme	1	1.4
<b>Sexual satisfaction</b>		
Over the past few months, have you been satisfied with your sexual interest or desire?		
Yes	42	60.0
No	28	40.0
<b>Sexual health and cancer treatment (n = 50)</b>		
How much have your cancer treatments had an effect on your sexual health?		
Not at all	26	52.0
A little	8	16.0
Somewhat	9	18.0
A lot	7	14.0

experience (n = 15 of 21). Forty percent of participants reported not being satisfied with their sexual interest or desire. Of women with cancer diagnoses (n = 50), 48% believed that cancer treatments had an effect on their sexual health.

## Mental Health

Scores on the mental health screener demonstrated a mean score of 3.11 (SD = 3.12, based on a composite of all four items; Table 3); this average is consistent with mild experiences of depression and anxiety symptoms. Fifty percent of women scored at the cutoff (ie, score  $\geq 3$ ) indicating the need for further depression-anxiety screening. Sensitivity analyses showed that depression and anxiety were highly correlated ( $r = 0.76$ ,  $n = 70$ ,  $P < .001$ ), yet demonstrated variable patterns with the sexual health status items; therefore, these constructs were treated separately.

## Bivariate and Multivariate Analyses

For factors associated with depression, pain during intercourse and believing that cancer treatments have an effect on sexual health were positively related to depression, whereas sexual satisfaction was negatively related to depression (Tables 3 and 4). In multivariate analyses, with the three significantly associated bivariate independent variables, believing that cancer treatments affect sexual health remained significantly and positively associated with depression. For factors associated with anxiety, pain during sex and believing that cancer treatments have an effect on sexual health were positively related to anxiety. These factors did not remain significant in the multivariate analysis. All analyses controlled for age and partner status.

## Mediation Models

To further understand the multivariate analyses examining independent variables associated with depression, a mediation analysis was conducted (Figure 1). Specifically, this study focused on better understanding the significant findings observed among beliefs about cancer treatments, pain during sex, and depression and anxiety symptoms. Pain during sex was significantly and positively correlated with depression ( $B = 0.42$ ,  $t_4 = 3.00$ ,  $P < .01$ ) and the mediator variable, believing that cancer treatments affect sexual health ( $B = 0.30$ ,  $t_4 = 3.29$ ,  $P < .01$ ). The mediator variable also was associated with the outcome variable, depression ( $B = 0.51$ ,  $t_4 = 2.29$ ,  $P < .05$ ). When the variable beliefs about cancer treatments affecting sexual health was entered into the model, the relation between pain during sex and depression became non-significant ( $B = 0.27$ ,  $t_4 = 1.80$ ,  $P = .08$ ). Therefore, a significant indirect effect of pain during sex predicting depression through believing cancer treatments affect sexual health was observed; the model was fully mediated ( $B = 0.16$ ,  $CI = 0.01-0.48$ ). Mediation analyses with anxiety symptoms as the dependent variable also were completed; however, mediation was non-significant ( $B = 0.39$ ,  $CI = -0.06$  to 1.48).

## DISCUSSION

Overall, the data indicate that sexual health morbidities affect a substantial proportion of patients with gynecologic cancer.

**Table 3.** Mental health symptoms of women attending a gynecologic cancer clinic

Mental health screener	n	%
Anxiety symptoms		
In the past 2 wk:		
How often have you felt nervous, anxious or on edge?		
Not at all	27	38.6
A few days	28	40.0
More days than not	9	12.9
Nearly every day	6	8.6
How often have you <i>not</i> been able to stop or control worrying?		
Not at all	34	48.6
A few days	20	28.6
More days than not	8	11.4
Nearly every day	8	11.4
Depression symptoms		
In the past 2 wk:		
How often have you felt down, depressed or hopeless?		
Not at all	32	45.7
A few days	27	38.6
More days than not	6	8.6
Nearly every day	5	7.1
How often have you had little interest or pleasure in doing things?		
Not at all	38	54.3
A few days	27	38.6
More days than not	2	2.9
Nearly every day	3	4.3

In addition, these findings highlight the interplay between psychosocial and sexual health concerns for these women, namely significant relations among sexual health morbidities, negative beliefs about cancer treatments, and depressive symptoms. These findings support the need to further examine and better understand the synergy between sexual health and mental health. Our results also demonstrate the importance of assessing patients' beliefs about how their cancer treatments affect their sexual health, because this finding appears to be important in explaining the relation between some sexual health and mental health items. These analyses have important implications for the development of future sexual health screenings and psychosocial health interventions for this population, because understanding patients' perceptions of treatment could be an effective and practical way to screen for sexual health morbidities in this population.

Consistent with prior work in sexual health,<sup>12,15,26</sup> findings from the present study shed light on the need to comprehensively address sexual health concerns in gynecologic oncologic patients. Many women reported no or little interest in or fantasizing about sexual activities in the past 6 months. Most women reported being reluctant to engage in partnered sexual activities when they had the chance, and a substantial minority of women reported

**Table 4.** Sexual health factors associated with depression and anxiety symptoms in women attending a gynecologic cancer clinic\*

	Depression symptoms		Anxiety symptoms	
	Bivariate	Multivariate	Bivariate	Multivariate
1. Sexual desire	1.01 (0.90–1.14)		1.04 (0.91–1.19)	
2. Sexual response	0.96 (0.74–1.24)		1.06 (0.78–1.44)	
3. Orgasm	0.77 (0.32–1.84)		1.24 (0.44–3.52)	
4. Pain during sex	1.28 (1.02–1.60) <sup>†</sup>	1.31 (0.95–1.79)	1.38 (1.06–1.80) <sup>†</sup>	1.33 (0.93–1.91)
5. Sexual satisfaction	0.44 (0.20–0.94) <sup>†</sup>	1.11 (0.40–3.13)	0.48 (0.18–1.24)	
6. Cancer treatments affect sexual health (n = 50)	2.00 (1.35–2.94) <sup>‡</sup>	1.77 (1.08–2.90) <sup>†</sup>	1.69 (1.08–2.64) <sup>†</sup>	1.57 (0.91–2.71)

\*All analyses controlled for age and partner status.

<sup>†</sup> $P < .05$ ; <sup>‡</sup> $P < .01$ .

not being physically or emotionally aroused during sexual activity. However, most women reported usually reaching orgasm and being satisfied with their sex lives. Overall, the diversity observed in sexual health responses suggests that, for some women, this area is not a primary concern; however, the substantial numbers of women endorsing items consistent with negative sexual health experiences and expectations warrant further attention and greater resources allotted to sexual health intervention.

These findings expand what is currently understood about sexual and mental health by including beliefs about cancer treatments. Believing that cancer treatments affected one's sexual health was more strongly associated with depression and anxiety than any single measure of sexual health morbidity. Further, pain during sex—one of the most frequently reported side effects related to gynecologic cancer treatments<sup>26–28</sup>—was positively correlated with believing that cancer treatments affected one's sexual health, and these two variables were found to be related to depression. In our mediation model, it was found that the relation between pain during sex and depression was fully mediated by negative beliefs regarding cancer treatments. This finding is novel for two primary reasons. First, screening women for how they believe cancer treatments will affect their sexual health could provide a brief, clinically administrable, guideline for possible sexual health morbidities. Second, this area could be an important focus for psychosocial-sexual health intervention development; specifically, understanding how patients perceive

treatment side effects might offer an important segue into addressing drivers of sexual health morbidities.

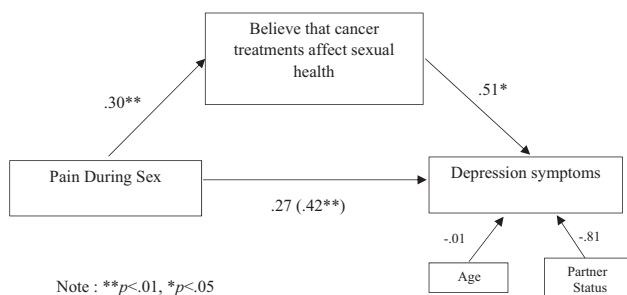
## LIMITATIONS

The present data relied on self-report of sexual health histories—an area vulnerable to stigmatization; therefore, responses might have been biased in the direction of being under-reported or subject to social acceptability bias. Our measurement of beliefs about cancer treatments affecting sexual health was limited to a single item; further measurement development in this area is needed. This study relied on a convenience sample of participants, which limited the generalizability of the findings to broader populations of women attending gynecologic oncology care centers. Given the sample size, comparisons among type of gynecologic cancer, sexual health morbidities, and depression and anxiety symptoms were not assessed. Relying on a small sample to test study hypotheses might have resulted in inadequate statistical power to detect some meaningful associations as statistically significant, particularly when controlling for confounding variables. Some items included dichotomized responses, decreasing the variability of the data and, therefore, possibly study power. The present results are limited to the women surveyed at the clinic where the study was conducted. Our focus on women seeking cancer treatments prevented comparisons with women not seeking cancer treatments. The extent to which sexual health concerns and their relations to mental health differ between these groups is unknown.

Based on prior work<sup>18</sup> and our theoretical approach, we hypothesized that sexual health morbidities preceded mental health outcomes. However, underlying mental health morbidities could have led to a greater likelihood of experiencing negative sexual health outcomes, or the relation between mental health morbidities and negative sexual health outcomes might be reciprocal. Further research is needed to understand temporal relations between variables.

## CONCLUSIONS

In addition to the aforementioned areas of future research, further investigation into how sexual health might or might not



**Figure 1.** Mediation analysis examining the relations among reporting pain during sexual intercourse, believing that cancer treatments affect sexual health, and depression symptoms.

be associated with cancer-related health outcomes is recommended. Although there appears to be an important relation between sexual health and mental health, less is known about the direct impact of sexual health on cancer prognosis, adherence to medical regimens, retention in care, etc, yet mental health is known to be associated with these factors.<sup>29–32</sup> Given the relation between mental health and sexual health, sexual health also might be related to important clinical outcomes. In sum, prior research and findings from the present study emphasize the need to incorporate sexual health care into standard care for patients with gynecologic cancer.

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