Preoperative quality of life at time of gynecologic surgery: considerations for postoperative management

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BACKGROUND: Patients presenting for gynecologic surgery are a heterogeneous group. Preoperative quality of life may be a useful tool to guide postoperative management.

OBJECTIVE: This study aimed to examine the key drivers of preoperative quality of life to improve counseling and postoperative management.

STUDY DESIGN: This study analyzed preoperative survey results from 154 participants using the following surveys: National Institutes of Health Toolbox Global Health v1.2, Gastrointestinal: Gas and Bloating v1.1 13a, Gastrointestinal: Diarrhea v1.0 6a, and Sexual Function and Satisfaction Brief Profile (Female) v2.0, Perceived Stress Scale, the Vaginal Assessment Scale, and the Vulvar Assessment Scale. Survey results in the form of T-scores were compared in patients with endometrial cancer and patients with benign gynecologic conditions using the Kruskal-Wallis test. The multivariate analysis was performed using linear regression to adjust the comparisons for age, body mass index, and comorbidity.

RESULTS: Of the 154 patients, preoperative diagnosis was benign in 66% (n=102) and endometrial cancer in 34% (n=52). Patients with endometrial cancer were more likely to be older, non-White, in lower income brackets, have higher body mass index, and be postmenopausal ($P<.05$). Although preoperative global health scores were similar between benign and malignant cases ($P>.05$), when adjusted for age, the differences in global health quality of life between patients with benign gynecologic conditions and those with endometrial cancer became significant, because the endometrial cancer group was older than the benign group ($P<.05$). However, when adjusting for age, body mass index, and comorbidities (hypertension and diabetes), the differences were no longer significant ($P>.05$). Sexual interest was decreased in the patients with endometrial cancer both in the unadjusted and adjusted model; and vulvar complaints became significantly different between the groups when controlling for body mass index, age, and comorbidities ($P<.05$).

CONCLUSION: Despite substantial differences in preoperative diagnosis, preoperative quality of life is highly influenced by age, body mass index, and comorbidities. Therefore, these factors should be explored in surgical outcomes and postoperative management trials.

Key words: endometrial cancer, hysterectomy, National Institutes of Health Toolbox Global Health, Patient Reported Outcome Measurement System survey, Perceived Stress Scale, preoperative, Sexual Function and Satisfaction Brief Profile, uterine fibroids, Vaginal Assessment Scale, Vulvar Assessment Scale

Introduction

Gynecologic surgeries, benign and malignant, are some of the most commonly performed surgeries in the United States. Previous reports have shown that half of all women of reproductive-age suffer from benign gynecologic conditions[1,2] such as uterine fibroids, abnormal uterine bleeding, chronic pelvic pain (CPP), pelvic organ prolapse, and endometriosis; and all of these conditions have deleterious effects on quality of life (QOL). For example, CPP is one of the most frequently reported symptoms in women of

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AJOG Global Reports at a Glance

Why was this study conducted?

This study aimed to examine preoperative quality of life at the time of hysterectomy for a variety of diagnoses.

Key findings

At the time of hysterectomy, patients have quality of life changes such as bloating and vaginal symptoms. Although these concerns could be related to their preoperative diagnosis, they should be monitored postoperatively.

Preoperative body mass index, age, and comorbidities impact quality of life regardless of diagnosis.

Sexual function as well as vulvar and vaginal complaints are related to preoperative diagnosis regardless of known confounding factors.

What does this add to what is known?

At the time of hysterectomy, patients with both benign and malignant conditions experience reduced quality of life, and in some cases, these changes are primarily related to age, body mass index, and comorbidities.

reproductive-age and its effects extend into their social, marital, and professional lives.[3] Abnormal uterine bleeding has been shown to affect up to a third of women of reproductive-age.[4–7] "Benign" conditions are detrimental to the well-being of women and have been repeatedly shown to pose a significant economic and healthcare burden.[8]

Endometrial cancer is one of few cancers that is increasing in the United States, with 66,200 new cases anticipated in 2023 (American Cancer Society). Longitudinal studies have demonstrated that after diagnosis, patients with endometrial cancer have been shown to experience a reduction in physical activity,[9] pelvic floor dysfunction[10] and worsened mental health.[9,11–14] However, the well-being of these patients at the time of hysterectomy remains largely understudied.

The benefit of understanding QOL preoperatively in patients undergoing gynecologic surgery is a strategy to drive improvements in postoperative care and follow-up. Without understanding the baseline QOL status in these patients, we will not be able to adequately understand the quality and impact of the care we give. This exploratory analysis examines QOL and the factors that may influence this in patients with benign and malignant gynecologic conditions at the time of hysterectomy.

Materials and Methods

This study was approved by the University of Arizona Institutional Review Board (UA IRB #1708726047). Patients were recruited, consented, and administered the surveys before hysterectomy.

Patients with endometrial cancer were compared with patients with benign conditions. Patients self-reported relevant medical history as well as demographic and socioeconomic information. Charts were reviewed for operative reports and obstetrical and gynecologic history.

The surveys included 4 Patient Reported Outcome Measurement System (PROMIS) surveys: National Institutes of Health Toolbox Global Health v1.2, Gastrointestinal: Gas and Bloating v1.1 13a, Gastrointestinal: Diarrhea v1.0 6a, and Sexual Function and Satisfaction Brief Profile (Female) v2.0. The Perceived Stress Scale (PSS-10), developed by Cohen et al.[15] and the Vaginal Assessment Scale (VAS) and Vulvar Assessment Scale (VuAS) were also included. Final scores were expressed as T-scores, which were calibrated with item response theory. A question was inadvertently omitted from the PSS-10; however, a final score was obtained using item response theory to adjust for the omission. The clinical notes and operative reports were retrospectively reviewed for each patient with benign conditions to determine the priority indication for hysterectomy.

Data were deidentified before analysis. All individual questions as well as aggregate T-scores were compared across the 2 groups: patients with benign gynecologic conditions and patients with endometrial cancer. Comparisons between groups were performed using the Kruskal-Wallis test. Multivariate analysis was performed using linear regression to adjust the comparisons for potential differences in age, body mass index (BMI), and comorbidities (diabetes and hypertension). All statistical analyses were performed using SAS 9.4 (SAS Institute Inc., Cary, NC). Tests were considered to be significant at a P value of .05.

Results

Survey results were analyzed from 154 participants: 102 with benign conditions and 52 with endometrial cancer. Response rates varied between surveys, including demographics (n=154), global health (n=139), perceived stress (n=131), gastrointestinal health (n=125 for gas and bloating and n=112 for diarrhea, respectively), sexual health characteristics (n=114), as well as vaginal and vulvar symptoms (n=102).

Demographic differences between patients with benign and cancerous conditions are presented in Table 1. The mean age was significantly greater in women with cancer (60.06 years) than in women with benign conditions (45.07 years; $P<.0001$). Average BMI was significantly higher in patients with endometrial cancer (39.57 kg/m^2) than in patients with benign conditions (30.06 kg/m^2; $P<.0001$), even after adjusting for age as a continuous variable ($P<.0001$). The benign group had a significantly greater income ($P=.0001$), were more likely to have a history of CPP ($P=.0005$) and were more often premenopausal ($P<.0001$), when compared with the endometrial cancer group.

There was often more than 1 benign preoperative indication for hysterectomy recorded in the medical records. The most common benign reason for hysterectomy was irregular bleeding

(43.3%), followed by pelvic pain and dysmenorrhea (23.17%), enlarged uterus and fibroids (22.68%), pelvic organ prolapse (5.15%), other causes (3.09%), and cancer prophylaxis (2.06%). Postoperative diagnoses included fibroids (34.5%), adenomyosis (23.6%), other (23.6%), endometriosis (10.8%), endometrial hyperplasia/dysplasia (5.4%), abnormal uterine bleeding not otherwise specified (0.9%), BRCA positive status (0.5%), and pelvic organ prolapse (0.5%).

When comparing global health T-scores in univariate analysis, there were no significant differences in mental health, general health, and social activity between benign and cancerous conditions (Table 2), although the benign group had a greater but not significantly different score. The physical health score for the benign group was marginally significantly greater than that of the cancer group (P=.05). There were no significant differences in these T-scores in univariate analysis related to menopausal status.

There were no differences in self-reported overall stress (Table 3) between the 2 groups. When evaluating individual stress symptoms, the cancer group felt less able to control the important things in their lives (P=.02) and became upset from unexpected events more often (P=.04) compared with the benign group. Perceived stress did not differ by menopausal status (P=.47).

Gastrointestinal, vulvar and vaginal symptoms, and sexual function were explored in these groups. In univariate analysis diarrhea T-scores did not significantly differ between the benign and cancer groups overall, or by menopausal status or postsurgery diagnosis in benign patients (Tables 4−6). However, individual symptoms did differ between groups; patients with cancer more often felt the need to empty their bowels (P=.04) and were more bothered by loose stools (P=.02) but had less gastrointestinal gas and bloating (P=.001) than patients with benign conditions (Tables 7−8).

Sexual health characteristics significantly differed between the disease groups (Table 9). Patients with benign conditions had more sexual activity (P<.0001), sexual activity interest (P<.0001), and desire (P<.0001) than patients with endometrial cancer. In benign patients who were sexually active, there was significantly more dyspareunia than in patients with cancer (P=.045), although they had higher sexual satisfaction T-score than patients with cancer (P=.006).

Patients with benign conditions had significantly higher VAS scores than patients with cancer (P=.03, Table 10), indicating that patients with benign conditions had more vaginal dryness, soreness, irritation, and dyspareunia overall. At an individual symptom level, the benign group had more dyspareunia (P=.03) and more vaginal dryness (P=.01) compared with the endometrial cancer group. There was not a significant difference in VuAS scores between the disease groups. There were also no significant differences in vaginal or vulvar symptoms by menopausal status or type of benign condition.

To better understand these preoperative differences in the patient cohorts, we examined the effect of age, BMI, and comorbidities (hypertension and diabetes) on patient-reported outcomes in multivariate analysis. When adjusting for age in the model, the differences in global health scores (physical, mental, general, and social) became significant between the groups, because of the older age of patients in the endometrial cancer group (P<.05) However, if BMI and comorbidities were also included in the model, the difference in the groups was not significant (Supplemental Table 1). This was also true for gas/bloating, diarrhea, and perceived stress (P>.05, Supplemental Tables 2−4). Differences in VAS scores became less statistically significant (P>.05), but differences in VuAS scores became statistically significant (P<.05) after adjustment (Supplemental Table 5). Sexual interest was decreased in the patients with endometrial cancer both in the unadjusted and adjusted models (P<.05), and vulvar complaints became significantly different between the groups when controlling for BMI, age, and comorbidities (P<.05; Supplemental Table 6).

Discussion

Principal findings

Preoperative QOL may differ among patients depending on not only indication for surgery but perhaps more importantly on age, BMI, and preexisting conditions. Depending on the realm of QOL explored, global QOL vs gastrointestinal complaints, pain, or sexual function, patient factors may have a varied impact on QOL score.

Results

To date, studies have focused on QOL following cancer treatment,[11,16−19] within particular benign conditions, such as endometriosis[6,20−22] CPP[23−26] and fibroids,[7] as well as between different benign conditions.[1,3] To add to the literature, our survey results examine QOL in a heterogeneous patient population in an urban setting undergoing hysterectomy, which is typical of a large center for gynecologic care. The opportunity to enhance postoperative care and better understand baseline preoperative QOL is useful. Challenges with mental health have been documented for patients with benign conditions, including endometriosis,[20,21,23,27] CPP,[23,25,28] and fibroids;[7] nevertheless, our study took into consideration potential confounders such as BMI, age, and comorbidities (hypertension and diabetes mellitus).

It has been shown that the existence of pain, even when comparing within the same benign gynecologic condition, can contribute to worsened mental health[21,25,27] and worsened QOL.[1] Given that stress levels were similar between the benign and cancer groups, similar mental health levels could be expected. Because multidimensional QOL factors have been previously shown to influence one another,[14,21,29−31] it is possible that the physical and mental-emotional QOL factors measured in this study also interrelate. It is compelling that patients with benign and cancerous conditions in this sample report similar mental health and general stress levels before hysterectomy.

In our study, when controlling for age, patients with endometrial cancer reported greater stress than patients

TABLE 1
The association of demographics with disease status

Demographic	All (n=154)	Benign (n=102)	EMC (n=52)	*P* value
Age, mean (SD)	50.13 (12.54)	45.07 (9.70)	60.06 (11.55)	<.0001
Race				
American Indian/Alaskan	13 (8.44)	5 (4.90)	8 (15.38)	.01
Asian/Far East/South East	4 (2.60)	4 (3.92)	0 (0.00)	
Asian/Indian	0 (0.00)	0 (0.00)	0 (0.00)	
Native Hawaiian/Pacific Islander	1 (0.65)	0 (0.00)	1 (1.92)	
White	110 (71.43)	74 (72.55)	36 (69.23)	
Black or African American	12 (7.79)	11 (1078)	1 (1.92)	
Middle Eastern/North African	1 (0.65)	0 (0.00)	1 (1.92)	
Mixed or multiracial	9 (5.84)	7 (6.86)	2 (3.85)	
Not specified, other	4 (2.60)	1 (0.98)	3 (5.77)	
Ethnicity				
Non-Hispanic	115 (74.68)	72 (70.59)	43 (82.69)	.10
Hispanic	39 (25.32)	30 (29.41)	9 (17.31)	
Education (n=151)				
Less than high school	6 (3.97)	3 (2.94)	3 (6.12)	.73
High school diploma or GED	31 (20.53)	20 (19.61)	11 (22.45)	
Some college	36 (23.84)	23 (22.55)	13 (26.53)	
Associate degree/technical certification	32 (21.19)	21 (20.59)	11 (22.45)	
Bachelor's degree	29 (19.21)	22 (21.57)	7 (14.29)	
Master/doctoral degree	17 (11.26)	13 ((12.75)	4 (8.16)	
Income ($) (n=144)				
<10,000	8 (5.56)	3 (3.13)	5 (10.42)	.0004
10,000–25,000	17 (11.81)	10 (10.42)	7 (14.58)	
25,000–50,000	31 (21.53)	12 (12.50)	19 (39.58)	
50,000–75,000	30 (20.83)	23 (23.96)	7 (14.58)	
75,000–100,000	15 (10.42)	14 (14.58)	1 (2.08)	
>100,000	27 (18.75)	23 (23.96)	4 (8.33)	
Do not know/refused	16 (11.11)	11 (11.46)	5 (10.42)	
pH, n (%)				
≤4.5	91 (59.09)	77 (75.49)	14 (26.92)	<.0001
>4.5	63 (40.91)	25 (24.51)	38 (73.08)	
BMI (mean [SD])	33.27 (9.72)	30.06 (7.23)	39.57 (10.89)	<.0001
BMI				
<25	28 (18.18)	23 (22.55)	5 (9.62)	<.0001
25–29	43 (27.92)	38 (37.25)	5 (9.62)	
30–34	27 (17.53)	18 (17.650)	9 (17.31)	
≥35	56 (36.36)	23 (22.55)	33 (63.46)	
Menopausal status				
Premenopausal	102 (66.23)	88 (86.27)	10 (19.23)	<.0001
Postmenopausal	52 (33.77)	14 (13.73)	42 (80.77)	

BMI, body mass index; *EMC*, endometrial cancer; *SD*, standard deviation.

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TABLE 2
The association of the global health (T-score) with disease status

	All (n=139)	Benign (n=90)	EMC (n=49)	*P* value
Physical health				
Mean (SD)	43.69 (8.06)	44.63 (8.44)	41.96 (7.06)	.05
Median	44.20	44.30	41.60	
Mental health				
Mean (SD)	48.89 (7.88)	49.72 (8.10)	47.36 (7.30)	.17
Median	48.80	49.80	46.70	
General health				
Mean (SD)	3.19 (0.94)	3.28 (0.91)	3.04 (0.99)	.12
Median	3.00	3.00	3.00	
Carry out social activities				
Mean (SD)	3.72 (0.93)	3.82 (0.93)	3.54 (0.92)	.10
Median	4.00	4.00	4.00	

EMC, endometrial cancer; *SD*, standard deviation.

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TABLE 3
Association of PSS-10 T-score with disease status

	All (n=131)	Benign (n=86)	EMC (n=45)	*P* value
Mean (SD)	52.66 (8.68)	50.63 (8.81)	52.64 (8.15)	.05
Median	51.00	49.00	53.00	

EMC, endometrial cancer; *PSS-10*, Perceived Stress Scale; *SD*, standard deviation.

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with benign conditions. However, the effect of including BMI and comorbidities diminished these differences. Moreover, our study illustrates that patients with cancer may feel less able to cope with stress; patients with cancer reported that they felt less able to control important things and became more upset from unexpected events, 2 measures of coping.

Our study highlights the gastrointestinal symptomatology in the benign group and supports the literature in demonstrating that gas and bloating symptoms may be common among benign and malignant gynecologic conditions.[32,33] Studies demonstrate that patients with CPP have a higher prevalence of fibromyalgia and irritable bowel syndrome than the general population,[33] and that patients with endometriosis experience gas and bloating.[32] Endometriosis often causes bowel obstruction,[34] intraabdominal adhesions,[35] and pelvic pain.[36,37] Specifically, this pelvic pain can be associated with stretching movements or organ distension.[38] Notably, it has been shown that gas and bloating symptoms vary with menstruation regardless of irritable bowel syndrome presence,[39] illustrating that the reproductive and gastrointestinal systems may, in fact, be linked. However, the impact of BMI, age, and comorbidities on gastrointestinal symptoms may be more impactful than the diagnosis driving hysterectomy.

TABLE 4
Association of gastrointestinal diarrhea T-score with disease status

	All (n=112)	Benign (n=80)	EMC (n=32)	*P* value
Mean (SD)	47.98 (7.93)	47.13 (7.03)	50.05 (9.65)	.29
Median	44.40	44.40	52.25	

EMC, endometrial cancer; *SD*, standard deviation.

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Surprisingly, patients with benign conditions had significantly more vaginal pain, vaginal dryness, and dyspareunia, and yet reported more sexual activity, satisfaction, and interest than patients with cancer. This became more significant when controlling for age, BMI, and comorbidities, indicating that patients undergoing hysterectomy for benign reasons should be screened for vaginal symptoms preoperatively and follow-up should be documented on recovery. The differences in vaginal pain can be explained by the symptomatology of benign conditions and endometrial cancer. Benign conditions are often associated with pelvic pain[20,40] and dyspareunia,[41] whereas pelvic pain does not typically present with endometrial cancer until late stages.[42] It is known that benign gynecologic conditions are associated with dyspareunia either because of the inflammatory nature of conditions such as endometriosis and adenomyosis,[25] or the mass effect of conditions such as uterine fibroids.[43] Although it might be assumed that differences in sexual interest between groups can be explained by age, because the benign group tended to be younger than the cancer group, the differences between groups remained after adjusting for age. Therefore, there may be disease-related factors driving this difference. Despite increased pain

TABLE 5
Association of gastrointestinal diarrhea T-score with menopausal status in benign patients

	All (n=80)	Premenopausal (n=69)	Postmenopausal (n=11)	*P* value
Mean (SD)	47.13 (7.03)	46.43 (7.61)	47.24 (6.98)	.70
Median	44.40	44.40	44.40	

SD, standard deviation.

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TABLE 6
Association of gastrointestinal diarrhea score with postoperative diagnosis in benign patients

Postoperative diagnosis	n	Mean (SD)	*P* value
Abnormal uterine bleeding			
Yes	1	39.90	.25
No	79	47.22 (7.02)	
Endometriosis			
Yes	12	45.70 (5.61)	.59
No	68	47.38 (7.26)	
Adenomyosis			
Yes	28	47.22 (6.51)	.91
No	52	47.08 (7.35)	
Fibroids			
Yes	48	46.02 (6.70)	.12
No	32	48.81 (7.28)	

SD, standard deviation.

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at baseline with intercourse, women with benign conditions in our study were more satisfied with their sexual activity; however, this difference was not significant when controlling for age, BMI, and comorbidities. Previous findings have indicated that women with endometriosis and CPP experienced reduced sexual activity and sexual satisfaction,[3] when compared with healthy controls, and this could be confounded by BMI, age, and/or comorbidities. Finally, greater sexual well-being has been shown to correlate with better psychological well-being for patients with endometrial cancer,[14] illustrating the multifactorial aspects of QOL.

TABLE 7
Association of gastrointestinal gas and bloating T-score with disease status

	All (n=125)	Benign (n=84)	EMC (n=41)	*P* value
Mean (SD)	56.29 (9.43)	58.35 (8.67)	52.07 (9.61)	.001
Median	56.90	58.90	52.20	

EMC, endometrial cancer; *SD*, standard deviation.

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Clinical implications

The focus of this study was to describe patient-reported QOL in a preoperative setting to better understand areas to focus on during postoperative care. Given that surgical interventions are considered a "teaching point" in a patient's life, this critical event is an opportunity to improve the future health of the patient and to impact not only physical but also social, functional, and emotional health. In perioperative care, there may be a link between patient-reported QOL and patient satisfaction.[47–49] If the needs and expectations of the patient are met with the surgical experience, this could contribute to higher levels of satisfaction. Satisfaction may influence overall well-being and perceived QOL. However, if a patient is dissatisfied with their surgical care, this may negatively affect their QOL by causing distress, anxiety, or physical discomfort.

Research implications

Our results have illuminated the morbid symptomatology of patients with benign and malignant conditions, and therefore should encourage improvements in timely diagnosis, clinical interventions, and quality of care for these patients. Given the recent push for mental health reform and awareness,[44] this study reveals that clinical considerations could be made preoperatively and addressed postoperatively.[20,45] At the same time, preexisting factors such as BMI and comorbidities may impact QOL regardless of the diagnosis driving the decision for hysterectomy. The association of patient satisfaction with QOL in perioperative care could be explored in future studies.

Strengths and limitations

The strengths of our study include the use of validated survey tools that assess a broad range of QOL characteristics. In addition, given our diverse population, this study has large potential for generalizability and thus clinical application

TABLE 8
Association of gastrointestinal gas and bloating T-score with menopause status in benign patients

	All (n=84)	Premenopause (n=72)	Postmenopause (n=12)	*P* value
Mean (SD)	58.35 (8.67)	59.23 (7.99)	53.11 (10.95)	.04
Median	58.90	59.45	55.30	

SD, standard deviation.

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TABLE 9
Association of sexual function characteristics with disease status

	All (n=114)	Benign (n=80)	EMC (n=34)	*P* value
Sexual activity interest (past 30 d)				
Not at all	42 (38.53)	17 (22.08)	25 (78.13)	<.0001
A little bit	20 (18.35)	16 (20.78)	4 (12.50)	
Somewhat	26 (23.65)	25 (32.47)	1 (3.13)	
Quite a bit	13 (11.93)	12 (15.58)	1 (3.13)	
Very	8 (7.34)	7 (9.09)	1 (3.13)	
Want to have sexual activity (past 30 d)				
Never	24 (22.64)	9 (11.69)	15 (51.72)	.0001
Rarely	27 (25.47)	21 (27.27)	6 (20.69)	
Sometimes	32 (30.19)	26 (33.77)	6 (20.69)	
Often	21 (19.81)	20 (25.97)	1 (3.45)	
Always	2 (1.89)	1 (1.30)	1 (3.45)	
Any sexual activity (past 30 d)				
Yes	57 (56.44)	52 (72.22)	5 (17.24)	<.0001
No	44 (43.56)	20 (27.78)	24 (82.76)	
If NO to sexual activity in past 30 d				
Reasons for no sexual activity (past 30 d)				
No interest in sexual activity	21 (47.73)	10 (50.00)	11 (45.83)	.99
Vagina dryness or pain	4 (9.09)	4 (0.00)	0 (0.00)	.03
Difficulties with orgasm	2 (4.55)	1 (5.00)	1 (4.17)	.99
Not enjoy sexual activity	1 (2.27)	0 (0.00)	1 (4.17)	.99
No partner	13 (29.55)	2 10.00)	11 (45.83)	.02
Partner was away	5 (11.36)	4 (20.00)	1 (4.17)	.16
Partner was not interested in sexual activity	3 (6.82)	1 (5.00)	2 (8.33)	.99
If YES to sexual activity in past 30 d				
Lubricated during sexual activity				
Almost always	25 (45.45)	22 (44.00)	3 (60.00)	.76
Most times	12 (21.82)	10 (20.00)	2 (40.00)	
Sometimes	10 (18.18)	10 (20.00)	0 (0.00)	

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TABLE 9
Association of sexual function characteristics with disease status *(continued)*

	All (n=114)	Benign (n=80)	EMC (n=34)	*P* value
A few times	5 (9.09)	5 (10.00)	0 (0.00)	
Almost never	3 (5.45)	3 (6.00)	0 (0.00)	
Difficult to maintain lubrication				
Extremely difficult	0 (0.00)	0 (0.00)	0 (0.00)	.17
Very difficult	5 (9.09)	5 (10.00)	0 (0.00)	
Difficult	5 (9.09)	5 (10.00)	0 (0.00)	
Slightly difficult	19 (34.55)	19 (38.00)	0 (0.00)	
Not difficult	26 (47.27)	21 (42.00)	5 (100.00)	
Discomfort felt inside your vagina				
None	17 (32.08)	14 (29.17)	3 (60.00)	.50
A little bit	12 (22.64)	10 (20.83)	2 (40.00)	
Some	7 (13.21)	7 (14.58)	0 (0.00)	
Quite a bit	10 (18.87)	10 (20.83)	0 (0.00)	
A lot	7 (13.21)	7 (14.58)	0 (0.00)	
Pain felt inside your vagina				
None	19 (35.85)	14 (29.17)	5 (100.00)	.08
A little bit	12 (22.64)	12 (25.00)	0 (0.00)	
Some	9 (16.98)	9 (18.75)	0 (0.00)	
Quite a bit	8 (15.09)	8 (16.67)	0 (0.00)	
A lot	5 (9.43)	5 (10.42)	0 (0.00)	
Discomfort in your labia				
None	38 (71.70)	33 (68.75)	5 (100.00)	.82
A little bit	7 (13.21)	7 (14.58)	0 (0.00)	
Some	4 (7.55)	4 (8.33)	0 (0.00)	
Quite a bit	3 (5.66)	3 (6.25)	0 (0.00)	
A lot	1 (1.89)	1 (2.08)	0 (0.00)	
Discomfort in your clitoris				
None	38 (71.70)	33 (68.75)	5 (100.00)	.74
A little bit	10 (18.87)	10 (20.83)	0 (0.00)	
Some	3 (5.66)	3 (6.25)	0 (0.00)	
Quite a bit	2 (3.77)	2 (4.17)	0 (0.00)	
A lot	0 (0.00)	0 (0.00)	0 (0.00)	
Been able to have an orgasm/climax				
Have not tried	0 (0.00)	0 (0.00)	0 (0.00)	.50
Never	4 (7.41)	4 (8.16)	0 (0.00)	
Rarely	3 (5.56)	3 (6.12)	0 (0.00)	
Sometimes	24 (44.44)	23 (46.94)	1 (20.00)	
Often	12 (22.22)	10 (20.41)	2 (40.00)	
Always	11 (20.37)	9 (18.37)	2 (40.00)	

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TABLE 9
Association of sexual function characteristics with disease status *(continued)*

	All (n=114)	Benign (n=80)	EMC (n=34)	*P* value
Satisfying orgasms/climax				
Not had an orgasm/climax	2 (3.70)	2 (4.08)	0 (0.00)	.99
Not at all	4 (7.41)	4 (8.16)	0 (0.00)	
A little bit	6 (11.11)	6 (12.24)	0 (0.00)	
Somewhat	11 (20.37)	10 (20.41)	1 (20.00)	
Quite a bit	20 (37.04)	17 (34.69)	2 (60.00)	
Very	11 (20.37)	10 (20.14)	1 (20.00)	
Satisfied with your sex life				
Not at all	7 (12.73)	6 (12.00)	1 (20.00)	.89
A little bit	8 (14.55)	8 (16.00)	0 (0.00)	
Somewhat	15 (27.27)	13 (26.00)	2 (40.00)	
Quite a bit	11 (20.00)	10 (20.00)	1 (20.00)	
Very	14 (25.45)	13 (26.00)	1 (20.00)	
Pleasure your sex life has given you				
None	3 (5.45)	3 (6.00)	0 (0.00)	.99
A little bit	10 (18.18)	9 (18.00)	1 (20.00)	
Some	18 (32.73)	16 (32.00)	2 (40.00)	
Quite a bit	13 (23.64)	12 (24.00)	1 (20.00)	

EMC, endometrial cancer.

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to larger populations. Limitations include a small sample size for some benign conditions, which reduces generalizability within specific benign gynecologic conditions. In addition, because of the use of surveys in this study, self-reporting bias[46] could also be present. Finally, postoperative QOL was not collected and therefore QOL change over time cannot be assessed.

TABLE 10
Association of Vaginal Assessment Scale and Vulvar Assessment Scale with disease status

	All (n=102)	Benign (n=74)	EMC (n=28)	*P* value
Vaginal Assessment Scale[a]				
Mean (SD)	2.14 (2.27)	2.43 (2.35)	1.35 (1.85)	.03
Median	1.00	2.00	1.00	
Vulvar Assessment Scale[b]				
Mean (SD)	1.23 (1.84)	1.37 (1.88)	0.85 (1.72)	.16
Median	0.00	0.00	0.00	

EMC, endometrial cancer; SD, standard deviation.

[a] Vaginal Assessment Scale=sum of responses for vaginal dryness, vaginal soreness, vaginal irritation, and dyspareunia; [b] Vulvar Assessment Scale=sum of responses for vulvar dryness, vulvar soreness, vulvar irritation, and painful to touch.

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Conclusions

According to the results of our preoperative surveys, women who underwent a hysterectomy for benign and malignant reasons have preoperative QOL changes that could be more related to BMI, age, and comorbidities than the actual diagnosis calling for hysterectomy. The impact of these factors on postoperative recovery is also likely to be strong in both benign and malignant groups. Therefore, gynecologists have a potentially influential impact on the future physical, emotional, and social health of their patients at the time of hysterectomy. A comprehensive approach to treating patients with benign conditions and cancer is warranted, given the reduced QOL that both groups

experience in physical and mental-emotional health. ■

Supplementary materials

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.xagr.2023.100275.

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