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Predictors of Impact of Vaginal Symptoms in Postmenopausal Women

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Abstract

Objective—To identify factors associated with greater impact of vaginal symptoms on functioning and well-being in postmenopausal women.

Methods—Postmenopausal women who reported vaginal dryness, itching, irritation, or pain with sexual activity completed the multidimensional Day-to-day Impact of Vaginal Aging (DIVA) questionnaire and underwent assessment of multiple socio-demographic and clinical factors having the potential to influence the impact of vaginal symptoms.

Multivariable linear regression analyses examined relationships between selected participant characteristics and DIVA scale scores assessing symptom impact on activities of daily living, emotional well-being, self-concept/body image, and sexual functioning.

Results—Among the 745 symptomatic participants, mean age was 56 (±9) years, and 66% were racial/ethnic minorities. Women with comorbid depression reported greater impact of vaginal symptoms on all dimensions of functioning and well-being measured by DIVA (11%–22% estimated increase in impact scores associated with each 3-point increase in Hospital and Anxiety Depression Scale scores). Women with urinary incontinence also reported greater impact of vaginal symptoms on activities of daily living, emotional well-being, and self-concept/body image (27%–37% estimated increase in impact scores). Age, partner status, sexual activity frequency, general health, and body mass index also predicted greater impact in at least one domain.

Conclusions—Findings suggest that special efforts should be made to identify and treat vaginal symptoms in postmenopausal women known to have depression or urinary incontinence, as these

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women may experience greater impact of vaginal symptoms on multiple domains of functioning and quality of life.

Keywords

vaginal dryness; vulvovaginal atrophy; depression; urinary incontinence; menopausal symptoms

INTRODUCTION

Up to a third of postmenopausal women experience vaginal dryness, soreness, itching, irritation, pain with sexual intercourse, and other symptoms associated with genitourinary syndrome of menopause.[1–4] The magnitude of impact of these symptoms on functionality and wellbeing is not well understood, although previous research from the CLOSER, REVEAL, and REVIVE surveys has suggested that these symptoms may be associated with a negative impact on sexual activity, body image, and psychological wellbeing.[2,5–10]. Variations in perceptions of menopause and aging have been observed in differing racial and ethnic groups,[11,12] and these perceptions may influence how vaginal symptoms are experienced. However, much of the work that has been done to date has involved primarily White women, and, as a result, little is known about how their experiences may differ from women of other groups.

One reason why research on the impact of menopause-related vaginal symptoms has been limited is that, until recently, there were no patient-reported measures of impact that were validated across diverse populations. To address this need, our research team developed a structured, self-administered questionnaire to measure the impact of vaginal symptoms (such as dryness, irritation, itching, soreness, and pain) on multiple dimensions of functioning and wellbeing. Using data from a large, racially and ethnically diverse sample of postmenopausal women who reported at least one vaginal symptom, we sought to identify demographic and clinical factors associated with greater impact of vaginal symptoms on functioning and wellbeing as measured by this questionnaire. Our goal was to provide clinicians and patients with new insights into factors that are associated with postmenopausal women suffering negative impacts on quality of life from vaginal symptoms. This knowledge could be used to guide development of strategies to identify and treat women who are at greatest risk.

METHODS

Study Population

This research was conducted as an ancillary study to the Reproductive Risks of Incontinence Study at Kaiser (RRISK), a multiethnic cohort study of risk factors for urinary tract dysfunction in community-dwelling middle-aged and older women.[13–15] Participants were female enrollees in Kaiser Permanente Northern California (KPNC), an integrated health care delivery system serving approximately 25% to 30% of the northern California population. To be eligible for the parent RRISK cohort, women had to have enrolled in KPNC by 21 years of age and to have had at least half of any childbirth events at a KPNC facility. Additionally, women from racial/ethnic minorities were oversampled to achieve a

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target composition of 40% Non-Latina White, 20% Latina/Hispanic, 20% African-American, and 20% Asian/Asian-American. Approximately 20% of all participants were recruited from the KPNC Diabetes Registry to ensure robust participation by women with diabetes. No symptoms or complications of diabetes were required, nor were women required to have any symptoms of urinary tract dysfunction.

Data for this study were collected from November 2008 to April 2012 through study visits with 2,016 women conducted in participants' homes during the third wave of RRISK (RRISK3). During RRISK3 study visits, women who reported at least 6 months of spontaneous amenorrhea or who had undergone bilateral oophorectomy were asked if they had experienced vaginal dryness, soreness, itching, irritation, or pain with sexual intercourse in the past month. For this ancillary study focusing on the impact of vaginal symptoms on functioning and wellbeing in postmenopausal women, only those women reporting at least one vaginal symptom were included in analyses. Informed consent was obtained from all participants prior to data collection, and all study procedures were approved by the institutional review boards of both the University of California San Francisco and the Kaiser Foundation Research Institute.

The DIVA Instrument

The multidimensional impact of vaginal symptoms on functioning and well-being was assessed using a structured, validated, self-administered instrument, the Day-to-day Impact of Vaginal Aging (DIVA) questionnaire. The DIVA instrument is designed to be a self-administered, paper-based questionnaire, and has been validated in this same self-administered paper form. Development and evaluation of the psychometric properties of the DIVA instrument have been described in detail elsewhere.[16] Briefly, questionnaire items were developed based on qualitative findings from focus groups in diverse symptomatic women, and then refined based on one-on-one cognitive pretesting interviews. After field-testing in a larger sample of symptomatic postmenopausal women and exploratory and confirmatory factor analysis to confirm measure structure, the refined DIVA instrument consisted of four multi-item domain scales addressing major dimensions of functioning and well-being affected by postmenopausal vaginal symptoms: (1) activities of daily living (five items), (2) emotional wellbeing (four items), (3) self-concept and body image (five items), and (4) sexual functioning (nine items for a long version appropriate for sexually active women, and five items for a shorter version appropriate for women without a recent history of sexual activity). The questionnaire addresses symptom impact in the four weeks prior to survey self-administration. Each scale was designed to be scored from 0 to 4, with higher scores indicating greater impact of symptoms on the relevant domain. Women participating in the RRISK3 data collection wave who reported being postmenopausal and having at least one vaginal symptom were asked to complete the DIVA questionnaire at their RRISK3 study visit; 745 (98.4%) of the 757 eligible participants completed the instrument. Because the term "genitourinary syndrome of menopause" was not in widespread currency at the time of the study, the instrument did not use this term, but instead referred to "vaginal dryness, itching, irritation, soreness, and pain during sexual activity."

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Measurements

Data collected from the RRISK3 cohort included multiple demographic, clinical, and contextual factors that had the potential to influence the impact of vaginal symptoms on functioning and wellbeing as measured by the DIVA instrument. Demographic characteristics such as race/ethnicity, marital/partner status, and educational attainment were assessed by self-administered questionnaires. Specifically, race/ethnicity was determined by asking participants to characterize themselves as Non-Latina White, Latina or Hispanic, Black/African-American, Asian/Asian-American, or other.

Spouse/partner status was assessed by asking women if they had a spouse or sexual partner. Education level was categorized as “some college or less” or “completed college.”

Clinical characteristics such as general health status, co-morbid conditions associated with vaginal symptoms, and body mass index were assessed through a combination of interviewer-and self-administered questionnaires, medical record review, and physical examination. To assess general state of health, interviewers asked participants to rate their overall health status as excellent, very good, good, fair, or poor.[17] Diabetes was assessed based on participant report of a past clinical diagnosis of diabetes; this information was supplemented with a review of abstracted clinical records from KPNC indicating use of glycemic control medication or a fasting blood glucose of at least 126 mg/dL.[18] To assess urinary incontinence, interviewers asked participants if they had experienced any urine leakage in the past month; those reporting leakage were further asked to clarify whether they had at least weekly versus less frequent leakage. Depression symptoms were measured using the Hospital Anxiety and Depression Scale (HADS), a validated self-administered questionnaire assessing feelings of anxiety and depression in the past 4 weeks, including a 7-item depression subscale scored from 0 to 21.[19] Hot flashes were assessed by asking participants whether they had experienced hot flashes in the previous month; women reporting hot flashes were further prompted to rate the bothersomeness of their symptoms on a 5–point Likert scale ranging from “not at all” to “extremely.” Bilateral oophorectomy was assessed by asking participants whether they had had both their right and left ovaries removed. To determine body mass index (BMI), participants underwent brief physical examination including measurement of weight and height by a trained study coordinator.

Self-administered questionnaires were also used to assess sexual activity, defined inclusively to include both partnered and unpartnered sexual activity. Participants were first asked, “During the past 3 months, have you had any sexual activity, that is any activity that is arousing to you, including masturbation?” Women reporting any sexual activity in the past 3 months were further asked about the frequency of their activity in the past 3 months. For this analysis, participants were categorized as being “not sexually active,” “active less than weekly,” “active weekly or more.”

Use of medications with a significant likelihood of affecting vaginal symptoms, including vaginal and systemic estrogens and selective serotonin reuptake inhibitors (SSRIs), were assessed by abstraction and review of electronic KPNC pharmacy data for participants who reported filling at least 80% of their prescriptions through a KPNC pharmacy. For

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participants reporting filling less than 80% of their prescriptions through a KPNC pharmacy, medication use was ascertained by a self-administered questionnaire.

Statistical Analyses

Means, standard deviations, and percentages were calculated to describe the demographic and clinical characteristics of participants in the analytic sample. DIVA domain scales were described by means, standard deviations, observed ranges, and interquartile ranges (IQRs). Univariable and multivariable linear regression models were then developed to examine associations between *a priori* selected demographic and clinical characteristics with scores on each of the DIVA domain scales. All models included the demographic variables of race/ethnicity (Non-Latina White, Latina or Hispanic, Black/African-American, or Asian); age (analyzed in 5 year intervals); sexual activity (not sexually active, active less than weekly, active weekly or more); spouse/partner status (yes or no); completed college (yes or no). Clinical variables included self-assessment of overall health (fair-poor vs. good), BMI (≤25, 25–29, ≥30), bilateral oophorectomy (yes or no), Hospital Anxiety and Depression Scale score (analyzed in 3 unit intervals), SSRI use (yes or no), diabetes diagnosis (yes or no), urinary incontinence (weekly occurrence, yes or no); moderate or severe hot flashes (yes or no), current use of systemic estrogen (yes or no), current use of vaginal estrogen (yes or no). Because scores on each of the DIVA scales had skewed distributions, we log transformed them in the linear regressions to meet the normality assumption. We reported unstandardized regression coefficients multiplied by 100 to provide an estimate of the percent change in DIVA domain scores associated with each participant characteristic in the model.

For analyses focusing on the “activities of daily living,” “emotional well-being,” and “self-image and body concept” scales, models included all DIVA respondents. For analyses focusing on sexual function, models were stratified by sexual activity status. We developed one set of models that were restricted to sexually active women and used the 9-item longer version of the DIVA sexual functioning scale, and we developed another set of models that were restricted to non-sexually active women and used the shorter 5-item version of the scale. All analyses were implemented by SAS 9.3 (SAS Institute Inc, Cary, NC).

RESULTS

The mean ± standard deviation (SD) age of participants was 56 ± 8.5 years, with a range of 41 to 81 years (Table 1). The participants formed a racially and ethnically diverse population (21 % were African American, 25% were Latina, and 20% were Asian). Less than half (40%) had completed college. Seventy-seven percent either had a spouse or sex partner, and 62% reported being sexually active either with a partner or alone. Twenty percent rated their overall health as fair or poor. The majority of the women in this study were overweight or obese. Six percent had undergone bilateral oophorectomy. The mean HADS depression subscale score was 3.4. Twenty-seven percent had been diagnosed with diabetes. Thirty-seven percent reported at least weekly urinary incontinence. Twenty-six percent reported that they were at least moderately bothered by hot flashes. Almost 18% took SSRIs, 9% used systemic estrogen, and 16% used vaginal estrogen.

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In this community-based sample of women, the mean scores for all of the DIVA domain scales were less than 1.0 (on a scale of 0–4), reflecting relatively low impact of vaginal symptoms on women's functioning and well-being (Table 2). The lowest mean scores were assigned to the "activities of daily living" and "emotional well-being" scales (0.3 ± 0.5) and 0.3 ± 0.6, respectively, while the highest scores were assigned to the "self-concept and body image" scale (0.9 ± 1.0). Among sexually active participants (N = 462), the mean score on the extended 9-item "sexual functioning" domain scale score was 0.9 ± 0.9; among non-sexually active participants, the mean score on the shorter 5-item "sexual functioning" scale was 0.7 ± 1.0.

In multivariable analyses, DIVA domain scale scores reflecting the impact of vaginal symptoms on activities of daily living were higher among women who reported only fair or poor overall health, had higher BMIs, had higher HADS depression subscale scores, or who were experiencing urinary incontinence on at least a weekly basis (Table 3). Scores on the DIVA emotional wellbeing impact scale were lower among women with a spouse or sexual partner and higher among women who did not have a college degree, had higher HADS depression subscale scores, or experienced urinary incontinence on at least a weekly basis. Scores on the DIVA self-concept and body image scale were lower among Latina/Hispanic women (compared with Non-Latina White women), older women, and women with diabetes, but higher among women who had higher HADS depression subscale scores and weekly incontinence.

Among women who were sexually active, scores on the long form of the DIVA sexual function impact scale were lower among Latina/Hispanic women (compared to those who were Non-Latina White), but higher among women who reported less than weekly sexually activity, had higher HADS depression subscale scores, or reported at least moderately bothersome hot flashes (Table 4). Among women who reported no sexual activity in the past 3 months, scores on the short form of the DIVA sexual function impact scale were lower among women who were older and higher among women with a spouse or sexual partner.

DISCUSSION

In this large, racially/ethnically diverse, community-based sample of postmenopausal women with vaginal symptoms, we found that women experiencing depression or urinary incontinence reported greater impact of their vaginal symptoms on their functioning and well-being, compared to women without these comorbidities. These findings suggest that depression and urinary incontinence may magnify the effects of vaginal symptoms on women's activities, feelings, and relationships, and that postmenopausal women suffering from these comorbid problems may be in special need of evaluation and treatment.

Given that depression has been shown to intensify the quality-of-life impact of a wide variety of chronic health conditions (including urinary incontinence)[20–22], it is not surprising that it should also magnify the quality-of-life impact of postmenopausal vaginal symptoms. Nevertheless, it is of interest that depression was not only associated with greater impact of vaginal symptoms on women's emotional well-being, but also impact on other domains such as activities of daily living that have less direct ties to emotional status. These findings

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suggest that comorbid depression has the potential to fundamentally change women's experience of symptoms such as vaginal dryness, such that treatment of depression may as important as treatment of vaginal symptoms in improving condition-specific quality of life.

In at least one prior study, vaginal symptoms such as dryness, itching, and irritation have been linked with urinary incontinence in postmenopausal women.[23] While this may reflect the contribution of lower estrogen levels to both of these syndromes, it may also be that women who simultaneously experience vaginal symptoms and urinary incontinence tend to suffer a greater quality-of-life burden from the cumulative effects of these problems. This suggests that treatment of incontinence may also be an important component of treatment of vaginal symptoms.

Despite prior research suggesting more severe vaginal symptoms, including painful intercourse, among diabetic women[3], diabetes was not associated with higher impact scores on any of the DIVA domain scales in our multivariable models. With regard to sexual function, our findings are consistent with other studies that found women with and without diabetes to have similar levels of perceived sexual problems in spite of possible reduced vascular flow or neuropathy that might impact sexual function.[24,25] It has been proposed that diabetic women have a decreased interest in sexual activity for other reasons,[25] which might mask the specific impact of vaginal symptoms on their sexual function. Another possible explanation is that any effect of diabetes on the impact of vaginal symptoms may be mediated through other comorbid conditions such as depression or incontinence that were independently assessed in our models. In univariate analyses, we did detect significant associations between diabetes and DIVA scores in the activities of daily living and emotional well-being domains (i.e., an estimated 36% and 23% increase in impact scores, respectively); however, these associations did not persist in multivariable models that adjusted for other demographic and clinical factors, including comorbid depression and incontinence.

Among women who reported no recent sexual activity, older age was associated with lower sexual function impact scores, indicating that older women who are not sexually active may be less bothered by the impact of vaginal symptoms on their sexual function than younger women who are not sexually active. This may reflect decreased expectations of regular sexual activity among older versus younger postmenopausal women. Nevertheless, sexually inactive women with a spouse or sexual partner had higher scores on the DIVA sexual function scale than those without a spouse or partner, suggesting that cessation of sexual activity due to vaginal symptoms may be seen as more of a problem when a spouse or sexual partner is affected.

Women who were sexually active on at least a weekly basis reported lower impact of their vaginal symptoms on two domains: self-concept/body image and sexual function. On the one hand, frequent sexual activity may help protect postmenopausal women against developing more severe vaginal symptoms, including dyspareunia, for a variety of reasons such as improved clitoral and vulvar circulation supporting the "use it or lose it" exhortation first voiced by Masters and Johnson.[26] Alternatively, this finding may simply indicate

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women with more bothersome vaginal symptoms may have less frequent sexual activity precisely *because* they are bothered.

Interestingly, Latina women tended to have lower impact scores in the DIVA self-concept and body image as well as sexual function domains compared to Non-Latina White women. There has been very little study of the burden of vaginal symptoms in postmenopausal women of diverse backgrounds, and it is difficult to know whether these findings are attributable to the severity of vaginal atrophy, perceptions or expectations about vaginal symptoms, or discomfort in expressing the impact of symptoms. While one prior study reported a lower prevalence of vaginal symptoms in Latina postmenopausal women, another reported higher prevalence in comparison to Non-Latina White women; however, neither of them explored differences in the perceived impact of symptoms on functioning or well-being.[27,28]

We did not detect significant associations between the use of vaginal or systemic estrogen and any DIVA scale scores in this cohort. In an observational, cross-sectional study such as this one, the beneficial effects of a therapy may be masked by the phenomenon of confounding by indication, in which participants who are most bothered by symptoms are more likely to be prescribed treatment than those who are less bothered. For this reason, our findings cannot be interpreted as evidence that vaginal or systemic estrogen therapy does not improve the impact of vaginal symptoms on condition-specific functioning or well-being.

Limitations of this study include its cross–sectional design, which prevented us from examining longitudinal relationships between participant characteristics and symptom impact over time. Additionally, overall DIVA impact scores were low in this community-based population of women, and our results may not be representative of women with very severe vaginal symptoms. Participants in this study did not undergo physical examination or laboratory testing to evaluate their vaginal symptoms, and we cannot know whether a woman's symptoms were the result of postmenopausal vaginal atrophy or a pathologic process. Also, we were unable to take into account the premenopausal sexual histories of participants, i.e., histories that might predict sexual function after menopause.[29]

Our study population also consisted of long-time female enrollees in an integrated health care system in northern California whose members have been shown to under represent the very poor and the very wealthy and to be slightly better educated than the northern California population at large[15], but are otherwise similar to the population of the geographical area. The study population was enriched with women from racial/ethnic minorities, which may affect generalizability of findings to women in other settings. Lastly, the study population was enriched with diabetic women, resulting in a prevalence of diabetes of 27% compared to 16% in those 45–63 years old and 26% in those 65–74 years old.[30] Therefore the overall distribution of vaginal symptoms may be slightly different in this sample than in the general northern California population, although the fundamental relationships between depression, incontinence, and vaginal symptoms would be expected to be similar to the population at large.

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CONCLUSIONS

Postmenopausal women commonly experience vaginal symptoms, and many fail to discuss their complaints with healthcare providers for a variety of reasons.[10,24] Our research suggests that special efforts should be made to identify and treat vaginal symptoms in women already known to have depression or urinary incontinence, as these women may experience greater impact of their symptoms on functioning and quality of life.

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Table 1

Demographic and Clinical Characteristics of Symptomatic Postmenopausal Participants

Characteristic	Total Sample of Symptomatic Postmenopausal Women N=745	Sexually Active Symptomatic Postmenopausal Women[a] N=462
Demographic		
Age (years)*	56.2 (±8.5)	54.7 (±7.9)
Non-Latina White	250 (34%)	167 (36%)
Latina/Hispanic	187 (25%)	115 (25%)
Black/African-American	155 (21%)	80 (17%)
Asian/Asian-American	153 (20%)	100 (22%)
College degree	295 (40%)	213 (46%)
Relationship		
Current spouse/sex partner	568 (77%)	420 (91%)
Any sexual activity in the past 3 months	462 (62%)	462 (100%)
At least weekly sexual activity	200 (27%)	200 (43%)
Clinical		
Fair/poor self-reported health	148 (20%)	69 (15%)
Body mass index (kg/m^2)		
< 25	206 (28%)	140 (30%)
25–29	225 (30%)	142 (31%)
≥ 30	311 (42%)	177 (39%)
Bilateral oophorectomy	42 (6%)	24 (5%)
Hospital Anxiety and Depression Scale-depression subscale score	3.4 (±3.1)	2.9 (±2.8)
Diabetes mellitus	200 (27%)	113 (24%)
Weekly urinary incontinence	265 (37%)	153 (33%)
Hot flashes[b]	190 (26%)	120 (26%)
Medications		
Any estrogen use	183 (25%)	122 (27%)
Systemic estrogen use	69 (9%)	50 (11%)
Vaginal estrogen use	114 (16%)	72 (16%)
Selective serotonin reuptake inhibitor use	130 (18%)	71 (16%)
Vaginal Symptoms		
Dryness	567 (76%)	375 (82%)
Irritation	214 (29%)	127 (28%)
Itching	317 (43%)	165 (36%)
Soreness	106 (14%)	66 (14%)
Pain during sex	220 (30%)	184 (40)

Data are presented as number (percentage) or as mean (±SD).

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[*] Age range was 41–81 years.

[a] Women were considered to be sexually active if they reported some sexual activity, either with or without a partner, in the past 3 months.

[b] Women were considered to have hot flashes if they reported being at least “moderately” bothered by hot flashes in the past month.

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Table 2

Score Distribution for the Day-to-Day Impact of Vaginal Aging (DIVA) Domain Scales.

Domain Scale	Number of Items	Participant Sample	Mean (SD) Score	Observed Score Range	Inter-quartile Range
Activities of daily living	5	745	0.3 (0.5)	0–4	0–.4
Emotional well-being	4	745	0.3 (0.6)	0–4	0–.5
Self-concept and body image	5	742	0.9 (1.0)	0–4	0–1.2
Sexual functioning (longer form*)	9	462	0.9 (0.9)	0–4	0.2–1.4
Sexual functioning (short form*)	5	265	0.7 (1.0)	0–4	0–1.2

*Scores on the long form of the sexual functioning domain scale were calculated for sexually active women, while scores on the short form of the scale were calculated for non-sexually active women.

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Table 3

Estimated Percent Differences in Day-to-Day Impact of Vaginal Aging (DIVA) Impact Scores for Activities of Daily Living, Emotional Well-Being, and Self-Concept/Body Image Domains Associated with Participant Characteristics.

Subscale Domain	Estimated % Difference in DIVA Scale Scores (95%CI)*		
	Activities of Daily Living Domain N=715	Emotional Well-Being Domain N=715	Self Concept/Body Image Domain N=714
Latina/Hispanic vs. Non-Latina White	−11.2 (−29.1, 6.7)	−13.4 (−33.4, 6.7)	**−40.9 (−63.1, −18.6)**[c]
Black/African-American vs. Non-Latina White	1.3 (−17.9, 20.5)	−12.3 (−33.8, 9.2)	−22.1 (−45.9, 1.8)
Asian/Asian-American vs. Non-Latina White	9.9 (−9.2, 28.9)	17.2 (−4.2, 38.5)	−11.1 (−34.8, 12.7)
Age (per each 5 year increase)	−0.8 (−4.9, 3.4)	−4.0 (−8.6, 0.7)	**−5.4 (−10.5, −0.2)**[a]
Less than weekly sexual activity	1.9 (−15.1, 18.8)	9.7 (−9.3, 28.7)	**37.7 (16.6, 58.8)**[c]
Current spouse/sex partner	−4.3 (−22.0, 13.3)	**−24.2 (−44.0, −4.5)**[a]	1.6 (−20.3, 23.5)
No college degree	13.1 (−1.4, 27.7)	**16.3 (0.04, 32.6)**[a]	−4.8 (−22.9, 13.3)
Fair/poor general self-reported health	**20.2 (2.0, 38.5)**[a]	−02.8 (−23.2, 17.7)	14.0 (−8.6, 36.6)
Body mass index (per each 1 unit increase)	**2.0 (1.0, 3.1)**[c]	0.4 (−0.8, 1.5)	−0.9 (−2.2, 0.4)
Bilateral oophorectomy	15.1 (−14.3, 44.5)	24.8 (−8.1, 57.8)	27.9 (−8.7, 64.4)
Hospital Anxiety and Depression Scale-depression subscale (per each 3 unit increase)	**11.4 (4.4, 18.5)**[b]	**21.8 (13.9, 29.7)**[c]	**20.8 (12.0, 29.5)**[c]
Selective serotonin reuptake inhibitor use	3.4 (−15.4, 22.2)	8.9 (−12.1, 30.0)	−1.0 (−24.4, 22.4)
Diabetes mellitus	9.3 (−7.0, 25.5)	5.9 (−12.3, 24.1)	**−35.2 (−55.4, −15.0)**[c]
Weekly urinary incontinence	**34.1 (19.8, 48.4)**[c]	**36.8 (20.8, 52.8)**[c]	**26.7 (8.9, 44.5)**[b]
Hot flashes[d]	14.3 (−1.8, 30.5)	6.8 (−11.2, 24.9)	7.9 (−12.1, 28.0)
Systemic estrogen use	18.1 (−5.4, 41.6)	−7.6 (−34.0, 18.7)	−19.3 (−48.7, 10.2)
Vaginal estrogen use	0.6 (−18.2, 19.3)	3.7 (−17.3, 24.8)	21.1 (−2.2, 44.4)

*Values greater than 0 indicate increased symptom impact associated with the predictor. Adjusted estimated % difference obtained from multivariable regression model controlling for all predictors listed in the table.

[a]indicates p < .05

[b]indicates p < .01

[c]indicates p < .001

[d]Women were considered to have hot flashes if they reported being at least “moderately” bothered by hot flashes in the past month.

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Table 4

Estimated Percent Differences in Day-to-Day Impact of Vaginal Aging (DIVA) Impact Scores For Sexual Function Domain Associated with Participant Characteristics, Stratified by Sexual Activity Status.

Subscale Domain	**Estimated % Difference (95%CI)***	
	Sexual Function Domain Scale (long version for sexually active women) N=447	**Sexual Function Domain Scale (short version for sexually inactive women) N=261**
Latina/Hispanic vs. Non-Latina White	**−35.3 (−61.6, −9.0)**[b]	−25.5 (−67.8, 16.7)
Black/African-American vs. Non-Latina White	−25.4 (−54.0, 3.1)	−27.3 (−72.0, 17.3)
Asian/Asian-American vs. Non-Latina White	−10.3 (−37.1, 16.5)	−15.4 (−63.1, 32.3)
Age (per each 5-year increase)	−2.4 (−8.8, 3.9)	**−17.4 (−26.6, −8.2)**[c]
Sexually active < weekly vs. sexually active ≥ weekly	**35.9 (16.1, 55.6)**[c]	NA
Current spouse/sex partner	1.9 (−31.6, 35.3)	**36.2 (3.4, 69.1)**[a]
No college degree	3.1 (−17.5, 23.7)	11.0 (−25.2, 47.2)
Overall health fair/poor	−2.6 (−32.4, 27.2)	1.6 (−35.6, 38.8)
Body mass index (per each 1 unit increase)	−1.0 (−2.6, 0.7)	−0.2 (−2.5, 2.1)
Bilateral oophorectomy	21.7 (−24.0, 67.3)	49.4 (−16.0, 114.7)
Hospital Anxiety and Depression Scale-depression subscale score (per each 3 unit increase)	**16.2 (5.2, 27.2)**[b]	9.2 (−6.1, 24.4)
Selective Serotonin Reuptake Inhibitor use	7.5 (−21.0, 36.1)	−15.3 (−57.6, 27.0)
Diabetes mellitus	−16.9 (−41.3, 7.5)	−19.8 (−57.5, 17.8)
Weekly urinary incontinence	19.0 (−2.5, 40.4)	20.8 (−11.5, 53.2)
Hot flashes[d]	**26.5 (3.1, 49.8)**[a]	11.1 (−27.8, 50.1)
Systemic estrogen use	−12.0 (−44.4, 20.4)	−11.2 (−77.5, 55.1)
Vaginal estrogen use	15.4 (−11.6, 42.4)	37.8 (−6.7, 82.4)

*Values greater than 0 indicate increased symptom impact associated with the predictor. Adjusted estimated % difference obtained from multivariable regression model controlling for all predictors listed in the table.

[a]indicates $p < .05$

[b]indicates $p < .01$

[c]indicates $p < .001$

[d]Women were considered to have hot flashes if they reported being at least “moderately” bothered by hot flashes in the past month.