Differences in Pain Subtypes Between Hispanic and Non-Hispanic White Women with Chronic Vulvar Pain

Ruby H.N. Nguyen, PhD, Robyn L. Reese, and Bernard L. Harlow, PhD

Abstract

Objectives: Compared with non-Hispanic Whites, Hispanic women have significantly higher prevalence of chronic vulvar pain (CVP), which is known to have heterogeneous subtypes. However, it is not known whether subtypes differ by ethnicity, and improved understanding of subtypes may allow for targeted clinical assessment and therapies. We examined subtypes to determine whether they differed by ethnicity.

Methods: Data were from 1,551 women who reported chronic vulvar pain consistent with vulvodynia in a population-based, cross-sectional study of women from the Minneapolis/St. Paul metropolitan area, during the years 2010–2013, who returned a validated screener survey about vulvar pain.

Results: Among women with CVP, Hispanics reported more primary vulvodynia (adjusted [adj.] risk ratio = 1.47; $p < 0.01$), defined as pain with first intercourse or tampon use, and tended to be more likely to describe a burning pain (adj. risk ratio = 1.45; $p = 0.06$). Hispanic women with CVP were 17% more likely than non-Hispanic Whites with CVP to have their pain alleviated with some type of behavior/remedy ($p = 0.01$); for example, among the subgroup of women with CVP who used yeast cream, Hispanics more often reported benefit to their pain (adj. risk ratio = 1.51; $p < 0.01$).

Discussion: We examined women with CVP and found that in comparison to their non-Hispanic White counterparts, Hispanic women are more likely to report a burning sensation and more likely to have primary vulvodynia, a subtype that is associated with great burden on the lives of affected women.

Introduction

MORE THAN 100 MILLION AMERICANS suffer from chronic pain,¹ with 8% of women experiencing chronic vulvar pain by the time they are 40 years old.² There is an annual incidence of 3% of chronic vulvar pain,³ with up to 18% of women meeting criteria for a vulvodynia diagnosis at some point in their lives.⁴ Vulvodynia is a debilitating chronic pain of the external genitalia in women whose diagnosis is made in the absence of other clinically explained findings for the pain.⁴ Clinical management focuses on treatments to reduce or eliminate pain, although there is no particular treatment known to work in all cases. In fact, remission from vulvar pain can occur spontaneously in some women.

Multiple population-based studies have found that in comparison to non-Hispanic White women, Hispanic women have significantly higher rates of chronic vulvar pain.^{2,5,6} These higher rates of chronic vulvar pain have been observed in multiple geographic locations throughout the United States

and have ranged from a 40% increased risk in Minnesota,² to 80% increased risk in the Boston area,⁶ to a risk greater than two times that of non-Hispanic White women in Michigan.⁵ No other single race or ethnicity has been found to have increased rates compared with non-Hispanic White women, and in fact, African American women have been found to have similar risk⁶ or even significantly reduced risk⁵ of vulvodynia.

Vulvodynia is known to be comprised of heterogeneous subtypes that may underscore etiologic differences and prognoses, while it is not known whether Hispanics present with specific symptomology and etiology that may differ from other ethnicities. For example, women with “primary vulvodynia,” defined as vulvar pain onset with first provocation such as intercourse or tampon insertion, have different histological features compared with women who have later onset after a period of pain-free intercourse (called “secondary vulvodynia”), such as greater expression of estrogen receptor alpha,⁷ and this subtype may be less likely to improve over time.⁸ Increased understanding of symptoms may

Division of Epidemiology & Community Health, School of Public Health, University of Minnesota, Minneapolis, Minnesota.
This study was presented in part at the 33rd Annual Scientific Meeting of the American Pain Society, April 30 to May 3, 2014, Tampa, Florida.

elucidate underlying biopsychosocial mechanisms and ultimately allow for targeted therapies.

In the current analysis, we add to the sparse literature by determining whether vulvar pain symptoms differ among Hispanic versus non-Hispanic White women reporting pain histories consistent with vulvodynia. Our findings will better inform the field as to whether differences in subtype may explain the disparate rates of chronic vulvar pain in Hispanic women and may lead to improved understanding of biopsychosocial mechanisms that may explain these differences, with the ultimate goal of improving therapy.

Methods

Main study

Details of the parent study from which this analysis is based have been published elsewhere.^{2,9} In brief, data are from a community-based cross-sectional study of 29,552 women in Minneapolis/St. Paul during 2010–2013 who returned a mailed screener inquiring about demographics, medical history, presence, and description of vulvar pain. Surveys were available in Spanish and English. The sampling frame from which women were selected was the administrative database from outpatient clinics of a healthcare organization that provides services to about a quarter of the Minneapolis/St Paul metropolitan area population. Women aged 18–40 years old who were seen at any of these clinics within 2 years for any medical visit or service were invited to participate in the study by completing the survey. This study was approved by the University of Minnesota Institutional Review Board.

Race and ethnicity

On the survey, women self-reported their race as White, Black, Asian, or Other, and their ethnicity as Hispanic or non-Hispanic. For this analysis, women who reported that they were non-Hispanic White represented the comparison group, and Hispanics of any race were the index group. All other races were excluded for the purposes of this analysis due to insufficient power to examine multiple differences between races.

Chronic vulvar pain consistent with a vulvodynia diagnosis

We assessed the presence of current chronic vulvar pain (CVP), defined as vulvar pain that limited or prevented intercourse for a period of 3 months or longer. This definition has been found to have high sensitivity and specificity.¹⁰

Vulvar pain subtypes

We examined six non-mutually exclusive vulvar pain subtypes defined from participants' responses on the survey: (1) Primary vulvodynia was defined as pain with first intercourse; if a woman had not had intercourse, she was defined using the presence of pain (some or great pain) with the first few attempts of tampon insertion. (2) We also examined a descriptor of pain. Women provided information on whether they had ever experienced a burning pain sensation. Burning pain was defined as endorsing the statement that she had experienced burning in the vulvar area that persisted for 3 months or longer. (3) Presence of widespread vulvar pain was

defined as endorsement of widespread vulvar pain upon touching or pain in only one area of the vulva. (4) Provoked was defined as endorsement of the question, "Is there an event that brings on the pain?" and was compared to women who reported that the pain comes on by itself or in both situations. (5) Dyspareunia was defined as having the vulvar pain around intercourse only. (6) Constant pain was defined as an ever-present vulvar pain versus a vulvar pain that comes and goes.

Chronic overlapping pain conditions

Several chronic overlapping pain conditions that are frequently associated with vulvodynia^{11–13} were assessed in the survey. Assessed comorbid pain conditions included chronic fatigue syndrome, fibromyalgia, irritable bowel syndrome, interstitial cystitis, and temporomandibular joint disorder. We define these five conditions as chronic overlapping pain conditions (COPCs). A woman was classified as having a COPC if she reported ever having received a diagnosis of one of the COPCs. Due to known barriers in receiving diagnoses for these conditions, particularly among ethnic minorities, women who suspected they may have had one or more COPCs were also classified positively. For analyses, the number of COPCs was categorized into 0, 1, 2, 3, or ≥ 4 .

Gynecologic conditions

Dysmenorrhea was examined in three categories: minor (medication seldom), moderate (medication usually needed), and severe cramping (medication and bed rest usually required).

Statistical analyses

Univariate analyses were conducted using Student's *t*-test for the differences between means of continuous variables, and the Chi-square test for differences in proportions of dichotomous or categorical variables. Results from univariate analyses as well as previous study findings informed us regarding variables to include in multivariable models. Our categorical outcomes of vulvodynia subtypes were frequent (greater than 15%) and therefore use of the logistic regression was not appropriate; instead, we used binary regression models. Generalized linear models with log link and binomial family allowed estimation of the adjusted relative risks that are presented. We adjusted all analyses for duration of time with vulvar pain, COPCs, and dysmenorrhea; in most models we used the number of COPCs as dummy variables to determine whether this factor exhibited a dose-response association. All analyses were performed in STATA /SEv.12.1 (College Station, TX).

Results

Of the 29,552 returned surveys, 1,687 (5.71%) were defined as having CVP within the last 6 months. Two women with CVP were missing information on their race leaving 1,685, whereas 134 women were excluded from the analyses because they were not non-Hispanic White or Hispanic. Of the 1,551 women with chronic vulvar pain, 1,481 were White and 70 were Hispanic.

Demographic characteristics and medical history of women with CVP are provided in Table 1 by ethnic group. There

TABLE 1. CHARACTERISTICS OF 70 HISPANIC AND 1,481 NON-HISPANIC WHITE WOMEN WITH A HISTORY CONSISTENT WITH CHRONIC VULVAR PAIN IN THE MINNEAPOLIS/ST. PAUL METROPOLITAN AREA

Characteristic	Hispanic (n = 70)		Non-Hispanic White (n = 1,481)		p value
	No.	%	No.	%	
Mean age (SD)	29.2 (6.1)	29.39 (5.61)	0.77		
Age categories (years)					0.20
18–24	19	27.0	331	22.35	
25–29	20	28.6	428	28.90	
30–34	12	17.4	411	27.75	
35–40	19	27.0	311	21.00	
Marital status					0.91
Single	25	35.7	559	37.82	
Married/partnered	40	57.1	839	56.77	
Separated/divorced	5	7.2	79	5.35	
Widowed	0	0	1	0.07	
Education					<0.01
Less than high school	6	8.7	19	1.29	
High school	11	15.9	142	9.61	
Some college	26	37.7	346	23.41	
Associates degree	9	13.0	204	13.80	
Bachelor's degree	13	18.8	504	34.10	
Graduate degree	4	5.8	263	17.79	
Body mass index					0.14
<18.5	3	4.4	56	3.84	
18.5–24.9	28	40.6	799	54.80	
25.0–29.9	21	30.4	324	22.22	
≥30.0	17	24.6	279	19.14	
Age at menarche (years)					0.44
≤10	8	11.7	96	6.53	
11	11	16.2	226	15.40	
12	22	32.4	407	27.72	
13	14	20.6	410	27.93	
14	5	7.3	177	12.06	
≥15	8	11.8	152	10.36	
Missing variable	2	—	13	—	
Dysmenorrhea					0.41
No cramps or pain	3	4.35	60	4.05	
Mild cramps	19	27.54	522	35.27	
Moderate cramps	29	42.03	617	41.69	
Severe cramps	18	26.09	281	18.99	
Missing variable	1	—	1	—	
Tampon insertion					<0.01
No difficulty	6	8.57	282	19.12	
Difficulty, no pain	11	15.71	282	19.12	
Difficulty, some pain	33	47.14	644	43.66	
Difficulty, great pain	13	18.57	247	16.75	
Never tried	7	10.00	20	1.36	
Missing variable	0	—	6	—	
Vulvar pain duration <5 years	33	48.5	705	48.45	0.99
History of depression	28	40.0	687	46.61	0.28
History of anxiety	25	35.7	567	38.28	0.67
Individual COPCs					
Temporomandibular joint disorder	9	13.0	300	20.35	0.14
Irritable bowel syndrome	4	5.9	322	21.82	<0.01
Fibromyalgia	3	4.4	73	4.95	0.82
Interstitial cystitis	2	2.9	46	3.13	0.90
Chronic fatigue syndrome	10	14.2	154	10.46	0.31
Number of COPCs					0.02
0	51	77.3	854	58.53	
1	7	10.6	397	27.21	
2	7	10.6	158	10.83	
3	0	0	39	2.67	
4 or 5	1	1.5	11	0.76	
Missing ^a	4	—	22	—	

^aMissing data are not accounted for in *p* value calculations.

COPC, chronic overlapping pain condition, including fibromyalgia, chronic fatigue syndrome, irritable bowel syndrome, interstitial cystitis, and temporomandibular joint disease; SD, standard deviation.

TABLE 2. SEPARATE MULTIVARIABLE MODELS DETERMINING WHETHER HISPANIC ETHNICITY WAS ASSOCIATED WITH ANY ONE OF THE SIX SUBTYPES LISTED AMONG 70 HISPANIC AND 1,481 NON-HISPANIC WHITE WOMEN WITH CHRONIC VULVAR PAIN

Chronic vulvar pain subtype																		
	Primary			Burning			Widespread			Provoked			Dyspareunia			Constant		
	Adj. RR 95% CI	p		Adj. RR 95% CI	p		Adj. RR 95% CI	p		Adj. RR 95% CI	p		Adj. RR 95% CI	p		Adj. RR 95% CI	p	
Hispanic	1.47 1.18–1.83	0.001		1.45 0.98–2.1	0.06		1.04 0.78–1.38	0.78		0.96 0.75–1.24	0.77		1.02 0.80–1.31	0.86		0.84 0.36–2.0	0.70	
No. COPS																		
1	1.07 0.91–1.25	0.43		1.34 1.08–1.67	0.01		1.22 1.08–1.39	0.002		0.92 0.81–1.04	0.16		0.87 0.77–0.99	0.04		1.33 0.93–1.90	0.12	
2	1.08 0.88–1.33	0.46		1.47 1.11–1.95	0.01		1.18 0.99–1.41	0.06		0.76 0.62–0.93	0.01		0.74 0.59–0.92	0.01		1.61 1.01–2.55	0.05	
3	1.16 0.82–1.65	0.40		1.91 1.25–2.92	0.003		1.52 1.20–1.92	0.001		0.26 0.11–0.58	0.001		0.40 0.20–0.78	0.01		1.83 0.84–3.98	0.13	
≥4	1.55 1.24–1.94	<0.001		1.62 0.73–3.58	0.23		1.30 0.80–2.11	0.29		0.51 0.19–1.36	0.18		0.55 0.21–1.46	0.23		2.00 0.55–7.34	0.29	
< 5 years of CVP	0.53 0.46–0.62	<0.001		0.82 0.67–0.99	0.04		0.79 0.70–0.89	<0.001		1.15 1.04–1.27	0.01		1.25 1.12–1.39	<0.001		0.95 0.69–1.30	0.76	
History of dysmenorrhea	1.20 1.03–1.39	0.02		1.02 0.84–1.24	0.82		1.06 0.94–1.20	0.31		0.92 0.83–1.02	0.13		0.90 0.81–1.00	0.06		0.95 0.69–1.30	0.73	

All models are adjusted for all other variables listed.

Five years is the median time with vulvar pain in this sample of women.

Adj. RR, adjusted risk ratio; CI, confidence interval; CVP, chronic vulvar pain.

TABLE 3. BELIEFS REGARDING EFFECTIVENESS OF TREATMENT AMONG 70 HISPANIC AND 1,481 NON-HISPANIC WHITE WOMEN WITH CHRONIC VULVAR PAIN

	<i>Hispanic</i>		<i>Non-Hispanic White</i>		<i>Adj. RR</i>	<i>95% CI</i>	<i>p</i>
	<i>n</i>	<i>%</i>	<i>N</i>	<i>%</i>			
Beliefs							
Something reduces the pain	59	84.3	1032	69.7	1.17	1.04–1.31	0.01
Tried yeast cream	25	36.2	472	32.0	1.25	0.90–1.72	0.18
<i>Restricted to women who have tried yeast cream (n=497)</i>							
Yeast cream helps to lessen the pain	20	87.0	297	63.5	1.51	1.39–1.64	<0.01

All models adjusted for the number of COPCs (as a continuous variable, 0–5), duration with vulvar pain, and dysmenorrhea.

were no appreciable differences between the two ethnicities, with the exception of level of education attained by time of the survey. The mean age of the participants who reported CVP was 29 years old, and just over half were married or in a similar type of relationship. There was some indication that Hispanic women may be more likely to report higher BMI but this difference was not statistically significant ($p=0.14$). There were no significant differences between the women on key gynecologic issues such as age at menarche or dysmenorrhea; however, Hispanic women were more likely to report that they experienced pain with their first tampon insertion.

Table 2 shows that compared with non-Hispanic White women with CVP, Hispanics with CVP were 47% more likely (adj. risk ratio=1.47; $p<0.01$) to report primary vulvodynia after accounting for the duration of vulvar pain, the number of COPCs, and dysmenorrhea. There was a dose-response trend in the risk of having primary vulvodynia with each additional COPC. Additionally, Hispanics with CVP were 45% more likely than Whites to describe a burning pain, however, the finding was of borderline significance ($p=0.06$). (Table 2)

We examined additional common types of subtypes in vulvodynia. No differences between the two ethnicities were found for provoked pain versus spontaneous, generalized vulvar pain versus localized, intermittent versus constant vulvar pain, nor pain only with sex (dyspareunia) versus pain with sex and otherwise (Table 2). In these models, we also observed that the number of COPCs, duration with vulvar pain symptoms, and a history of dysmenorrhea were often independently associated subtype, but their directionality differed by subtype.

We were interested in understanding if Hispanic women found relief from any type of remedy or treatment that they had used (Table 3). Unlike their non-Hispanic White counterparts with CVP, Hispanics with CVP were 17% more likely to report that they are able to alleviate the pain ($p=0.01$). Some women ($n=497$) had reported that they had used yeast cream to address their vulvar pain. Among this subgroup who had vulvar pain and used yeast cream, Hispanics were more likely to report that it helped to some degree (adj. risk ratio=1.51; $p<0.01$) (Table 3).

Discussion

We observed that among women with chronic vulvar pain, Hispanic women significantly more often reported primary

onset of their chronic vulvar pain, and this finding was independent of other highly associated factors such as comorbid pain, length of time with vulvar pain, and dysmenorrhea. Hispanic women have been documented to have high rates of cramping during menses and dysmenorrhea,^{14,15} and dysmenorrhea has been shown to be independently associated with primary vulvodynia.¹⁶ Granot and colleagues have found that having dysmenorrhea increased the risk of primary vulvodynia by 2.8 times.¹⁶ While we found dysmenorrhea also to be independently associated with primary vulvodynia, it did not fully explain the difference between Hispanics and non-Hispanic White women in our multivariable models, as both ethnicity and dysmenorrhea had independent effects on increasing the estimated risk of having primary vulvodynia.

Our novel finding that Hispanic women were more likely to have primary onset is of particular interest due to the burden of primary vulvodynia, such as its early onset¹⁷ and long duration,¹⁸ have higher pain score reporting¹⁶ and tendency to be more difficult to treat than secondary onset.⁸ Interestingly, and against this supposition of a worse prognosis for women with primary vulvodynia, is that Hispanic women in our study were more likely than White women with CVP to report that treatments—home remedies or otherwise—were more likely to help alleviate pain. These findings suggest two plausible mechanisms. First, that yeast infections may be misclassified as chronic vulvar pain despite using a validated screening survey with high sensitivity and specificity to determine classification; or secondly, that the cream or ointment used, regardless of formulation, in fact alleviated vulvar friction thus improving symptoms to an extent.

What we failed to find is an association between Hispanic women and other subtypes of vulvar pain such as widespread pain throughout the vulva, constant versus intermittent pain, spontaneous versus provoked vulvar pain, and pain only around intercourse.

In a previous study we found that women with comorbid idiopathic pain syndromes were more likely to have widespread vulvar pain.¹¹ Here we observed that the number of COPCs was associated with each of the studied subtypes thus supporting the need to adjust the analyses for such conditions. Interestingly, for provoked pain and dyspareunia, there was an inverse association. We were able to build upon our previous finding for only widespread vulvar pain by examining several additional subtypes in a greater number of women.

It has been postulated that within individuals with COPCs, a unifying underlying mechanism may be present, such as

sensitivity to centralized pain disorders.¹⁹ However, Hispanic women are not at increased risk for other chronic pain conditions, particularly not those that are known to overlap with vulvodynia.

Strengths and limitations

The strength of this study is that our sampling methodology represented the demographic composition of the women in the Minneapolis/St. Paul metropolitan area. Therefore, our study is less subject to the underrepresentation of minorities, including Hispanics, which may be present with clinic-based studies.²⁰ This is a particularly important point for studies of vulvodynia, as half of women with symptoms do not seek medical care for their vulvar pain.^{2,5,9}

Our study was based on a population-based study in a metropolitan area, but despite some statistically significant findings differentiating Hispanic women with CVP from non-Hispanic White women with CVP, we acknowledge that we had few Hispanic women in this study. We were underpowered to examine some of the associations that found no difference between the groups. Therefore, our findings, particularly those that are not statistically significant, should be interpreted with this limitation in mind. Future studies that sample from the population should be developed to include sufficient numbers of Hispanic women to determine if differences truly exist.

Another limitation of our study is that it is based solely on surveys with no clinical exams. First, this limitation affects our ability to concretely define subtype and to rule out other causes of vulvar discomfort, such as yeast infection. Clinical examination is the standard for many of the subtypes that we investigated, such as generalized and provoked. However, it should be noted that detailed patient histories, similar to what was done in this study, are commonly included in standard clinical definitions and are exclusively used for classification of primary vulvodynia. Second, our survey finding that Hispanic women were more likely to report relief from yeast cream treatment introduces the possibility of misclassification of vulvar burning as an indicator of vulvar pain, when in fact the burning could have been due to a vulvovaginal infection such as yeast. These limitations would support clinical examinations in future studies.

Conclusion

In conclusion, we found that among women with chronic vulvar pain certain subtypes were more common among Hispanics than among non-Hispanic Whites. These differences in subtype prevalence may indicate different biological mechanisms or an increased burden of disease for the affected Hispanic women.

Acknowledgments

This study was funded by a grant from the National Institutes of Health (NIH/NICHD R01-HD058608).

Disclosure Statement

No competing financial interests exist.

References

1. IOM (Institute of Medicine). *Relieving pain in America: A blueprint for Transforming Prevention, Care, Education, and Research*. Washington, DC: The National Academies Press, 2011.
2. Harlow BL, Kunitz CG, Nguyen RH, Rydell SA, Turner RM, Maclehose RF. Prevalence of symptoms consistent with a diagnosis of vulvodynia: Population-based estimates from 2 geographic regions. *Am J Obstet Gynecol* 2014;210:40.e1–e8.
3. Reed BD, Payne CM, Harlow SD, Legocki LJ, Haefner HK, Sen A. Urogenital symptoms and pain history as precursors of vulvodynia: A longitudinal study. *J Womens Health (Larchmt)* 2012;21:1139–1143.
4. Bachmann GA, Rosen R, Pinn VW, et al. Vulvodynia: A state-of-the-art consensus on definitions, diagnosis, and management. *J Reprod Med* 2006;51:447–456.
5. Reed BD, Harlow SD, Sen A, et al. Prevalence and demographic characteristics of vulvodynia in a population-based sample. *Am J Obstet Gynecol* 2012;206:170.e1–e9.
6. Harlow BL, Stewart EG. A population-based assessment of chronic unexplained vulvar pain: have we underestimated the prevalence of vulvodynia? *J Am Med Womens Assoc* 2003;58:82–88.
7. Leclair CM, Goetsch MF, Korcheva VB, Anderson R, Peters D, Morgan TK. Differences in primary compared with secondary vestibulodynia by immunohistochemistry. *Obstet Gynecol* 2011;117:1307–1313.
8. Heddini U, Bohm-Starke N, Nilsson KW, Johannesson U. Provoked vestibulodynia: Medical factors and comorbidity associated with treatment outcome. *J Sex Med* 2012;9:1400–1406.
9. Nguyen RH, Turner RM, Rydell SA, Maclehose RF, Harlow BL. Perceived stereotyping and seeking care for chronic vulvar pain. *Pain Med* 2013;14:1461–1467.
10. Harlow BL, Vazquez G, MacLehose RF, Erickson DJ, Oakes JM, Duval SJ. Self-reported vulvar pain characteristics and their association with clinically confirmed vestibulodynia. *J Womens Health (Larchmt)* 2009;18:1333–1340.
11. Nguyen RH, Veasley C, Smolenski D. Latent class analysis of comorbidity patterns among women with generalized and localized vulvodynia: preliminary findings. *J Pain Res* 2013;6:303–309.
12. Reed BD, Harlow SD, Sen A, Edwards RM, Chen D, Haefner HK. Relationship between vulvodynia and chronic comorbid pain conditions. *Obstet Gynecol* 2012;120:145–151.
13. Arnold LD, Bachmann GA, Rosen R, Kelly S, Rhoads GG. Vulvodynia: characteristics and associations with comorbidities and quality of life. *Obstet Gynecol* 2006;107:617–624.
14. Deuster PA, Powell-Dunford N, Crago MS, Cuda AS. Menstrual and oral contraceptive use patterns among deployed military women by race and ethnicity. *Womens Health* 2011;51:41–54.
15. Banikarim C, Chacko MR, Kelder SH. Prevalence and impact of dysmenorrhea on Hispanic female adolescents. *Arch Pediatr Adolesc Med* 2000;154:1226–1229.
16. Granot M, Friedman M, Yarnitsky D, Tamir A, Zimmer EZ. Primary and secondary vulvar vestibulitis syndrome: systemic pain perception and psychophysical characteristics. *Am J Obstet Gynecol* 2004;191:138–142.

17. Bornstein J, Maman M, Abramovici H. "Primary" versus "secondary" vulvar vestibulitis: One disease, two variants. *Am J Obstet Gynecol* 2001;184:28–31.
18. Brotto LA, Sadownik LA, Thomson S, et al. A Comparison of demographic and psychosexual characteristics of women with primary versus secondary provoked vestibulodynia. *Clin J Pain* 2013;30:428–435.
19. Murphy SL, Lyden AK, Phillips K, Clauw DJ, Williams DA. Subgroups of older adults with osteoarthritis based upon differing comorbid symptom presentations and potential underlying pain mechanisms. *Arthritis Res Ther* 2011;13:R135.
20. Aponte-Rivera V, Dunlop BW, Ramirez C, et al. Enhancing Hispanic participation in mental health clinical research: Development of a Spanish-speaking depression research site. *Depress Anxiety* 2014;31:258–267.

Address correspondence to:

Ruby H.N. Nguyen, PhD

Division of Epidemiology and Community Health

1300 S. 2nd Street, Suite 300

Minneapolis, MN 55454

E-mail: Nguyen@umn.edu