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Dyspareunia in Puerto Rican Middle-aged Women

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Abstract

Dyspareunia appears to be a common sexual dysfunction. There is a lack of studies that address female sexual dysfunction (FSD) in Puerto Rico. The present cross- sectional study characterized dyspareunia in a sample of Puerto Rican women aged 40–59 years and evaluated the relationship between reported dyspareunia with demographic, lifestyle and health factors. Nine-hundred and twenty Puerto Rican women participated in health fairs conducted in 22 municipalities between May 2000 and November 2001 where they filled out a questionnaire. Contingency table and chi-squarestatistics were used to evaluate the bivariate associations of dyspareunia with demographic, lifestyle and health factors. Crude and multivariate logistic regression model were used to estimate the magnitude of the association between dyspareunia and demographic, lifestyle and health factors. The overall prevalence of dyspareunia in this population was 18%. Dyspareunia was somewhat lower among women aged 40–49 years (17%) than among those aged 50–59 years(21%), not reaching statistical significance. Dyspareunia was associated to educational attainment, employment status, menopausal status, current hormone therapy use, genitourinary symptoms, and loss of libido ($p < 0.05$). Current cigarette smoking, body mass index, physical activity, alcohol use, parity, and ever use of oral contraceptives were not associated with dyspareunia in bivariate analysis ($p>0.05$). In the multivariate analysis, incontinence (POR=1.67, 95% CI=1.02–2.73), vaginal dryness (POR=3.97, 95% CI=2.49–6.31), vaginal itching (POR=2.44, 95% CI=1.55–3.83), loss of libido (POR=3.08, 95% CI=1.92–4.94) and partnership (POR=2.22, 95% CI=1.29–3.82) remained associated with dyspareunia. Our results agree with prior studies. Additional studies of FSD in Puerto Rican women are highly warranted.

Keywords

Dyspareunia; Puerto Rican Women; Biopshycosocial Factors

INTRODUCTION

Female sexual dysfunction is a multicausal and multidimensional problem that combines sexual, physiological, physical, psychological, and interpersonal determinants, having a major impact on interpersonal relationships and quality of life.[1,2] Data from the National Health and Social Life Survey found that sexual dysfunction is highly prevalent in women (43%).[2,3,4] Community-based studies indicate a prevalence of sexual dysfunction among all women between 25% and 63%, [2,3,5] while the prevalence of sexual dysfunction in post menopausal

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women varies from 68% to 87%.[3,6] Among the sexual dysfunctions described in females, dyspareunia appears to be common, with a prevalence of 7% in a national probability sample assessing sexual dysfunction in the United States.[2] In a more recent meta-analysis of subtypes of chronic pelvic pain sponsored by the World Health Organization (WHO), the prevalence of dyspareunia varied from 1% in Sweden to 45% in the United States, and ranging from 8% to 21%, when high quality studies with representative samples were analyzed.[7,8]

Dyspareunia is defined by the American College of Obstetricians and Gynecologists (ACOG) [9] as genital pain experienced just before, during, or after sexual intercourse. The Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) describes dyspareunia as recurrent or persistent vaginal pain associated with sexual intercourse in either a male or a female.[10] Historically, dyspareunia has been classified as a sexual disorder involving pain.[1,10] Other studies classify dyspareunia into a pain syndrome resulting in sexual dysfunction.[11–14] Dyspareunia can be subdivided into two groups, superficial/entry/introital dyspareunia and deep dyspareunia, with different etiologies and treatment options.[8,11,15] The Report of the International Consensus Development Conference on Female Sexual Dysfunction evaluated and revised existing definitions and classifications of female sexual dysfunction. As part of this revision, a new category of noncoital sexual pain was added that recognizes that sexual activity for women does not necessarily involve penile vaginal intercourse and may apply to non-heterosexual women engaging in alternative sexual behaviors.[1] Sexual pain is also characterized by vulvodynia, classified as any type of vulvar pain, and vulvar vestibulitis syndrome (VVS), a subcategory of vulvodynia and a diagnosis of exclusion.[15] According to Friedrich, VVS is defined as severe pain with vestibular touch or attempted vaginal entry, tenderness to cotton swab pressure localized to the vulvar vestibule, and physical findings confined to various degrees of vestibular erythema.[8] Vaginismus, classified in the DSM-IV as a sexual pain disorder is defined as recurrent or persistent involuntary contraction of the perineal muscles surrounding the outer third of the vagina when vaginal penetration with penis, finger, tampon, or speculum is attempted.[10] There is marked overlap in the definitions of dyspareunia, VVS, and vaginismus, making the diagnosis and treatment of these conditions a challenge for clinicians.

A number of factors have been consistently described in the literature to be associated with dyspareunia, including lower educational attainment, interpersonal relationships, depressive symptoms, menopause, low sexual desire, and pelvic floor disorders.[2,8,11,13, 15–24] In addition, differences in ethnicity and cultural beliefs have been shown to influence the occurrence and reporting of sexual dysfunction.[2,25] Laumann et al. reported lower rates of sexual problems in Hispanic women in the US than in whites and blacks.[2] Nonetheless, recent studies conducted in Hispanic populations in their native countries have reported high rates of female sexual dysfunction.[25,26] There is a lack of studies that address female sexual dysfunction in Puerto Rican women living in Puerto Rico. To our knowledge, this is the first study conducted in this population that intends to describe health and life-style factors associated with dyspareunia. The present cross-sectional study characterized dyspareunia, defined as pain or discomfort when having sexual relationships, in a sample of middle-aged (40–59 years) Puerto Rican women; and evaluated the relationship between reported dyspareunia and demographic, lifestyle and health factors.

METHODS

Study participants and data collection

Between May 2000 and November 2001, the *Centro Mujer y Salud* of the School of Medicine of the University of Puerto Rico hosted 73 health fairs in 22 municipalities across Puerto Rico. The data collection instrument, a self-administered history questionnaire, obtained information on demographic characteristics, lifestyle practices, obstetric and gynecologic history, including

menstrual status, the use of oral contraceptives, hormonal therapy (HT) use and symptom experience, and sexual problems. Additional details about the study design and data collection have been previously described elsewhere.[27, 28] A total of 3,258 women attended these fairs, although 777 did not fill out the questionnaire. Seventy women did not sign the informed consent, 711 women were outside the eligible age group of 40–59 years, and 39 were not from a Puerto Rican ethnic background. Among the 1,661 eligible women, 350 did not provide responses to demographic and reproductive sections of the questionnaire, 39 did not identify cessation of menses or provide sufficient information to determine current status of HT use and 352 women did not provide information about symptom experience, including dyspareunia. Thus, among age eligible study participants, 920 (55%) women were eligible for this analysis. This study was approved by the Institutional Review Board (IRB) from the University of Puerto Rico, Medical Sciences Campus.

Measurement of study variables

Dyspareunia was defined as pain or discomfort when having sexual relationships experienced during the two months previous to answering the questionnaire. Demographic variables included: age, defined as a categorical variable (40–49 and 50–59 years); educational level attained, categorized into two levels (≤ High-school/Technical course and ≥ Associate Degree); current employment status (employed/unemployed); and relationship status [partner (married/living together) or no partner (single, widowed, divorced, separated)]. Lifestyle characteristics considered included: current cigarette smoking (yes/no), physical activity defined as exercising at least twice a week (yes/no), and any alcohol consumption (yes/no). The health factors considered were: body mass index (BMI), obstetric and gynecologic history, and genitourinary and sexual symptoms. BMI was determined using self reported height and weight and classified into three categories [<25 kg/m^2 (underweight/normal), 25–29.9 kg/m^2 (overweight), and ≥30 kg/m^2 (obese)]. Obstetric history included parity measured as number of live births and categorized as: 0, 1–2, and ≥3 children. Gynecologic history included menopausal status and use of HT, and was defined as follows: pre-menopausal, post-menopausal without current use of HT, and post-menopausal with current use of HT. Women were defined to be premenopausal if their menses had occurred within the last 12 months previous to the interview. Post-menopause was defined as natural menopause, menses stopping for at least 12 months without surgery, pregnancy, or other obvious cause, and surgical menopause, menses stopping as a result of hysterectomy and/or bilateral oophorectomy. Lifetime use of oral contraception (OC) was also gathered (never/ever). Genitourinary and sexual symptoms were described by: vaginal itching (yes/no), vaginal dryness (yes/no), incontinence (yes/no), and loss of libido (yes/no).

Statistical analysis

Bivariate analyses were performed using contingency tables in order to assess the relationship between dyspareunia and the following variables: demographic, lifestyle, and health factors. Chi-square tests were used in each contingency table to explore how individual factors affected dyspareunia.[29]

To determine the magnitude of the association between dyspareunia and demographic, life-style and health factors, the prevalence odds ratio (crude and adjusted) were estimated with 95% confidence intervals using logistic regression models.[30] Those variables associated ($p<0.05$) in bivariate analysis to dyspareunia where included in the multivariate regression model; in addition, we adjusted for the potential confounding effects of age. Interaction terms in the multivariate logistic regression model were analyzed using the Likelihood Ratio Test (LRT) [30] No interaction was found ($X^2 = 29.13$, $p = 0.61$). Data were analyzed using SAS version 8 (SAS Institute Inc., Cay, NC).

RESULTS

Of 920 women in the study sample, 169 (18%) reported dyspareunia. Dyspareunia was somewhat lower among women aged 40–49 years (17%) than among those aged 50–59 years (21%), but it did not reach statistical significance. Dyspareunia was associated to educational attainment and working status; being less reported among women with higher educational attainment (22% vs. 14%) and less reported among those currently working (15% vs. 22%). Meanwhile, dyspareunia was higher among women with a partner (24%) than among those without a partner (8%) (Table 1). Among those categorized as having no partner, the specific prevalence of dyspareunia in each subgroup was 8% for single women, 5% among widowed women and 9% among those separated/divorced (data not shown

Among gynecologic characteristics, menopausal/HT status was associated with dyspareunia (premenopause: 14%, postmenopause using HT: 25%, postmenopause not using HT: 19%; p=0.0037). In addition, dyspareunia was more common in women with urinary incontinence (29%), vaginal dryness (37%), and those with vaginal itching (34%) than in women not reporting these symptoms (16%, 8% and 14%, respectively) (p<0.0001). No association of parity and OC use with dyspareunia was observed (p > 0.05). In addition, none of the lifestyle characteristics studied (current cigarette smoking, BMI, physical activity, and alcohol use) were associated with dyspareunia in bivariate analysis (p > 0.05) (Table 1).

Multivariate analysis

In the multivariate analysis, incontinence (POR=1.67, 95% CI=1.02–2.73), vaginal dryness (POR=3.97, 95% CI=2.49–6.31), vaginal itching (POR=2.44, 95% CI=1.55–3.83) and loss of libido (POR=3.08, 95% CI=1.92–4.94) were associated to dyspareunia. In addition, women who reported having a partner were 2.22 times as likely as those without a partner to report dyspareunia (POR=2.22, 95% CI=1.29–3.82). Menopausal status/current HT use, educational attainment, and employment status were no longer associated to dyspareunia in the multivariate analysis (Table 2).

DISCUSSION

This cross-sectional study characterized the relationship of dyspareunia with lifestyle and health characteristics in a sample of middle-aged Puerto Rican women aged 40–59 years living in Puerto Rico. Overall, 18% of the study sample reported having experienced dyspareunia during the two months previous to the interview. Although we do not expect this result to be representative of the prevalence of dyspareunia in Puerto Rican women, the frequency of dyspareunia observed in our study sample falls within the range (8%–21%) recently reported by the World Health Organization (WHO) in a meta-analysis of subtypes of chronic pelvic pain.[7,8] However, the proportion of women with dyspareunia in our study sample (18%) is higher than the one reported in a national probability sample assessing sexual dysfunction (7%) in the United States.[2] Differences in age groups included for analysis, other population characteristics, the time frame used to define prevalence, the method of data-collection used (self-administered questionnaires or interviews), and the differences in definitions of dyspareunia and pelvic pain, may account for some of these differences.

Consistent with previous studied[31,32], we found no association between age and dyspareunia. Nonetheless, the association between age and dyspareunia has not always been consistent. Age has also been found to be a protective factor against dyspareunia, with the prevalence of dyspareunia decreasing with increasing age.[2, 23, 24] Laumann et al. (1998) found that young women are more likely to be single, with a higher turnover of partners leading to instability and inexperience, thus generating stressful sexual encounters and consequently suffering from

sexual pain.[2] On the contrary, a study by Nappi et al. (2002) did find an association with dyspareunia and increasing age.[18]

Meanwhile, relationship status was found to have a significant association with dyspareunia in multivariate analysis, with women with a partner having 2.3 times the possibility of having dyspareunia than those without a partner, a result not consistent with previous studies.[2, 33] This variation may be due to differences in how relationship status is defined. In our population, only those women married or living in a consensual relationship were considered as having a partner, while single, divorced, widowed, and women separated from their husbands were considered as not having a partner. Thus, it may be possible that some of the women categorized as without a partner may indeed have a stable relationship with a partner. Also, the amount of current and lifetime sexual partners might influence a woman's sexual intimacy with a partner. Thus, these and other factors affecting a couple's relationship such as, the quality of the interpersonal relationship and adjustment with the partner, the partner's psychological and physical state, the couple's sexual habits and the frequency of intercourse, should be evaluated in order to establish if the marital relationship of Puerto Rican women is being affected by the dysfunction or the dysfunction appeared as a consequence of the relationship.

Regarding education, our results show no association between educational attainment and dyspareunia in multivariate analysis. This is consistent with a study conducted by Jamieson et al. However, other studies support the association that having a greater educational attainment reduces the likelihood of dyspareunia. [20, 23, 24, 32].

Parity and OC pills were not found to be associated with dyspareunia in our population. Jamieson et al. [31] reported no significant association between dyspareunia and parity while Sobhgol et al. [32] did find a significant relation, owing it mostly to the impairment of pelvic floor functioning during pregnancy and delivery. The mode of delivery and its complications and the use of OC pills, which has been implicated in adverse sexual response, [39] should be further evaluated in this population, as these two factors could influence the prevalence of dyspareunia.

There is conflicting data as to whether the menopausal transition increases the risk of dyspareunia. In our study, menopausal status/current HT use was associated to dyspareunia in the bivariate analysis, with post-menopausal women using HT (25%) reporting more dyspareunia than post-menopausal women not using HT (19%) and than premenopausal women (14%). However, in multiple regression analysis, the association was no longer present. Some studies show that dyspareunia increases throughout the menopausal transition,[16,18,22, 24,33,34] while others show no association.[23,35,36] Estradiol levels are negatively associated with dyspareunia;[35,36] while estrogen therapy has been found to reduce dyspareunia.[22,24] In the US, the percentage of postmenopausal women using HT is approximately 38%, higher than that of our study population, which was 24%. In our study, we could not show that dyspareunia increases with post-menopausal status or that HT improves dyspareunia. This could be due to the small number of postmenopausal women currently using HT, the type, dose, and route of HT used, and the compliance with treatment.

Vaginal dryness and vaginal itching, common symptoms of vaginal atrophy, can also cause pain with sexual activity.[16,35,37] Vaginal atrophy is a consequence of urogenital aging and affects 50% of menopausal women.[38] It occurs as a result of a decrease in estrogen levels and its prevalence markedly increases from early to late perimenopause and then to postmenopause. [16,34] In our study, women with vaginal itching and women with vaginal dryness were 2 to 4 times (respectively) as likely than those without these symptoms to have dyspareunia, supporting the relationship between vaginal atrophy and dyspareunia. Sexual pharmacology is the mainstay of treatment for many sexual female complaints as is the use of topical estrogen

and nonmedicated, nonhormonal vaginal moisturizers and lubricants.[15, 37–39] These treatment modalities have been used to relieve symptoms of vaginal atrophy successfully, showing improvement or prevention of dyspareunia, with the possibility of establishing a causal relationship between vaginal atrophy and dyspareunia.

Loss of libido as a result of dyspareunia has been documented [37] and dyspareunia has been associated with more sexual function impairment.[13,15] In this study, women with loss of libido had higher possibility of having dyspareunia than women without desire problems. Women with dyspareunia have been found to have lower levels of desire and arousal and less orgasmic response with oral stimulation and intercourse[2, 15] Vaginal atrophy causing dyspareunia can lead to loss of interest in sex.[37] However, some studies have proposed that dyspareunia might reflect a sexual arousal problem, masked by the symptoms of vaginal atrophy, rather than a direct consequence of the symptoms.[18,37] Further research is needed to address this issue.

Urinary tract symptoms, including urinary incontinence have also been associated with dyspareunia in previous studies. [2,16,19,20] Consistent with these studies, women in our study with incontinence were 70% more likely to have dyspareunia than those without incontinence. Thus, the severity and type of incontinence should be evaluated in this population, as this could influence the prevalence of dyspareunia in our population.

Several study limitations need to be considered when interpreting our results. Our results may be affected by selection bias, as only women who attended the health fairs were recruited into the study. Since one of the main focuses of the health fairs was to provide information on menopause and HT, women recruited into the study might have been those most affected by symptoms, thus selection bias might account for the high prevalence of symptoms observed among our study sample. To assess the potential of this selection bias, previous comparisons of our study sample with data from the Puerto Rico Public Use Microdata Sample (5%) from the Census 2000 and the 2000 Behavioral Risk Factor Surveillance Survey for women aged 40–59 have been made.[27] Overall, our study sample was similar to the Census 2000 in the distribution of marital status, although a larger proportion of women aged 45–49 (30%) and a smaller proportion of women aged 55–59 (17%) were included in the study as compared with the census (26% and 21%, respectively). Study participants were also more likely to be employed (56%) than in the census (41%) and had higher educational attainment. Another source of selection bias could be the fact that 21% of eligible women (n=352) did not answer the section of symptoms of the questionnaire. As a result, women with symptoms could have been less likely to answer this section of the survey, potentially underestimating the prevalence of dyspareunia in the study population. Nonetheless, information on dyspareunia was collected as part of a section that assessed information on 22 symptoms related to women's health. Thus, the missing information was not selective to dyspareunia, as women who did not provide information on this condition did so because they left the complete symptoms section blank, not providing information on any of the symptoms. To assess the potential for this selection bias, we compared the demographic characteristics of the study population (n=920) with that of those eligible women excluded from the analysis because they did not provide information on dyspareunia (n=352). Results showed that these groups did not differed in educational attainment, relationship or working status ($p > 0.05$); although a higher proportion of women aged 40–49 years did not answer the symptoms section of the survey (36.2%) as compared to those aged 50–59 (18.6%) $p < 0.0001$).

Our results may also be affected by information bias, as the definition of dyspareunia and other characteristics studied were based on self-reports, and not based on official diagnostic definitions. According to the DSM-4, dyspareunia is defined as recurrent or persistent genital pain associated with sexual intercourse in either a male or a female. Although the symptoms of sexual pain reported by the women in this study are mostly included in the definition of

dyspareunia, the onset of symptoms, the length of time of symptom duration since its onset, the frequency of symptoms, the previous sexual functioning of study participants, and the impact of the sexual complaint on quality-of-life was not assessed in the questionnaire. In addition, the type of dyspareunia, superficial/entry/introital or deep, was not described. A medical evaluation was also not performed in which to exclude other forms of sexual pain such as vaginismus and vulvodynia.

This study constitutes the first attempt to characterize health and life-style factors associated with dyspareunia in a middle-aged sample of Puerto Rican women living in Puerto Rico. Female sexual dysfunction is a complex disorder including sexual well-being, physiological, and psychosocial factors poorly studied in our population. Nonetheless, our results agreed with prior studies regarding the potential association between health and life-style factors and dyspareunia. Given the high complexity and the recent biopsychosocial approach given to the study of female sexual dysfunction, along with the high prevalence of self-reported dyspareunia observed in our study population, additional studies of female sexual dysfunction and its association with biopsychosocial factors are highly warranted, as well as studies focused on determining additional independent factors associated with other sexual symptoms and dysfunctions in Puerto Rico. The studies should recruit population-based samples of Puerto Rican women; in order to provide unbiased estimates of the prevalence of dyspareunia and its risk factors in our population; and should employ appropriate diagnostic tools, in order to correctly measure dyspareunia and reduce the potential for misclassification bias. In addition, future research should include a thorough personal history on socio-demographic matters, a past psychosexual history, including history on traumatic sexual acts during childhood or adolescence, along with a complete obstetric and gynecologic history detailing reproductive matters such as mode of delivery and its complications and breastfeeding practices, surgical history, surgical sterilization and hysterectomy, and pelvic floor disorders. All of these factors were not analyzed in our study, and could also be associated with sexual symptoms and dysfunctions in Puerto Rican women.

Sexual dysfunction and its implications in the quality of life of women are relevant areas of women's health, still not openly discussed in women in general,[40] that require further attention within our health care setting. Clinicians must consider the need to inquire and orient patients about the presence of sexual matters when at clinics in order to increase the patients' awareness of sexual health problems and to assess the effect of these problems on their quality of life. This will be essential for developing appropriate intervention strategies, including a broad-spectrum diagnosis and treatment approach that promotes and maintains the sexual health of female populations.

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References

1. Basson R, Berman J, Burnett A, et al. Report of the International Consensus Development Conference on Female Sexual Dysfunction: Definitions and Classifications. J Urol 2000;163:888–893. [PubMed: 10688001]

2. Laumann EO, Paik A, Rosen RC. Sexual Dysfunction in the United States: Prevalence and Predictors. JAMA 1999;281(6):537–544. [PubMed: 10022110]
3. Addis IB, Van Den Eeden SK, Wassel-Fyr CL, Vittinghoff E, Brown JS, Thom DH. Reproductive Risk Factors for Incontinence Study at Kaise Study Group. Sexual Activity and Function in Middle-Aged and Older Women. Obstet Gynecol 2006;107(4):755–764. [PubMed: 16582109]
4. Laumann, EO.; Gagnon, JH.; Michael, RT.; Michaels, S. The social organization of sexuality: sexual practices in the United States. Chicago, IL: University of Chicago Press; 1994.
5. Rosen RC, Taylos JF, Lieblum SR, Bachmann GA. Prevalence of sexual dysfunction in women: results of a survey study of 329 women in an outpatient gynecological clinic. J Sex Marital Ther 1993;19:171–88. [PubMed: 8246273]
6. Sarrel PM, et al. Sexuality and Menopause. Obstet Gynecol 1990;75:26S–35S. [PubMed: 2179787]
7. Latthe P, Latthe M, Say L, Gülmezoglu M, Khan KS. WHO systematic review of prevalence of chronic pelvic pain: a neglected reproductive health morbidity. BMC Public Health 2006;6:177–183. [PubMed: 16824213]
8. MacNeill C. Dyspareunia. Obstet Gynecol Clin N Am 2006;33:565–577.
9. American College of Obstetrics and Gynecology. Technical Bulletin no. 211. Washington, D.C: ACOG; 1995. Sexual Dysfunction.
10. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. Vol. 4 text revision. Washington, D.C: American Psychiatric Press; 2000.
11. Binik YM, Meana M, Berkley K, Khalife S. The sexual pain disorders: Is the pain sexual or the sex painful? Annu Rev Sex Res 1999;10:210–235. [PubMed: 10895253]
12. Meana M, Binik YM, Khalife S, Cohen DR. Dyspareunia: Sexual Dysfunction or Pain Syndrome? J Nerv Ment Dis 1997;185(9):561–569. [PubMed: 9307618]
13. Meana M, Binik YM, Khalife S, Cohen DR. Biopsychosocial Profile of Women with Dyspareunia. Obstet Gynecol 1997;90(4 part 1):583–589. [PubMed: 9380320]
14. Merskey, H.; BoGDuK, N. Classification of chronic pain. Vol. 2. Seattle, WA: IASP Press; 1994.
15. Heim LJ. Evaluation and Differential Diagnosis of Dyspareunia. Am Fam Physician 2001;63(8): 1535–1544. [PubMed: 11327429]
16. Graziottin A, Leiblum SR. Biological and Psychosocial Pathophysiology of Female Sexual Dysfunction during the Menopausal Transition. J Sex Med 2005;3:133–145. [PubMed: 16422790]
17. Walsh K, Berman JR. Sexual Dysfunction in the Older Women: An Overview of the Current Understanding and Management. Drugs Aging 2004;21(10):655–675. [PubMed: 15287824]
18. Nappi R, Baldaro Verde J, Polatti F, Genazzani AR, Zara C. Self-Reported Sexual Symptoms in Women Attending Menopause Clinics. Gynecol Obstet Invest 2002;53:181–187. [PubMed: 12053104]
19. Lewis RW, Fugl-Meyer KS, Bosch R, et al. Epidemiology/Risk Factors of Sexual Dysfunction. J Sex Med 2004;1(1):35–39. [PubMed: 16422981]
20. Handa VL, Harvey L, Cundiff GW, Siddique SA, Ljerulff KH. Sexual Function among women with urinary incontinence and pelvic organ prolapse. Am J Obstet Gynecol 2004;191:751–756. [PubMed: 15467535]
21. Handa VL, Cundiff G, Chang HH, Helzlsover KJ. Female Sexual Function and Pelvic Floor Disorders. Obstet Gynecol 2008;111(5):1045–1052. [PubMed: 18448734]
22. Dennerstein L, Alexander JL, Kotz K. The Menopause and Sexual Functioning: A review of the population-based studies. Annu Sex Res 2003;14:64–82.
23. Safarinejad MR. Female sexual dysfunction in a population-based study in Iran: Prevalence and associated risk factors. Int J of Impot Res 2006;18:382–395. [PubMed: 16395324]
24. Castelo-Branco C, Blumel JE, Araya H, Riquelme R, Castro G, Haya J, Gramegna G. Prevalence of sexual dysfunction in a cohort of middle-aged women: influences of menopause and hormone replacement therapy. J Obstet Gynaecol 2003;23(4):426–430. [PubMed: 12881088]
25. Yanez D, Castelo-Branco C, Hidalgo LA, Chedraui PA. Sexual Dysfunction and related risk factors in a cohort of middle-aged Ecuadorian women. J Obstet Gynaecol 2006;26(7):682–686. [PubMed: 17071440]

26. Abdo CHN, Oliveira WM, Moreira ED, Fittipaldi JAS. Prevalence of sexual dysfunctions and correlated conditions in a sample of Brazilian women-results of the Brazilian study on sexual behavior (BSSB). Int J Impot Res 2004;16(2):160–166. [PubMed: 14961047]
27. Ortiz, AP. Dissertation Doctor of Philosophy (Epidemiological Science). University of Michigan; 2004. Timing and characteristics of the menopausal transition among Puerto Rican women living in Puerto Rico: age at menopause, symptoms and bone profiles; p. 37-38.
28. Ortiz AP, et al. Age at natural menopause and factors associated with menopause state among Puerto Rican women aged 40–59 years, living in Puerto Rico. Menopause 2006;13(1):116–124. [PubMed: 16607107]
29. Rosner, B. Fundamental of Biostatistics. Vol. 5. Duxbury; California, USA: 2000.
30. Hosmer, D., et al. Applied Logistic Regression. New York, NY: A Wiley-Interscience Publication, John Wiley & Sons Inc; 2000.
31. Jamieson DJ, Steege JF. The Prevalence of Dysmenorrhea, Dyspareunia, Pelvic Pain, and Irritable Bowel Syndrome in Primary Care Practices. Obstet Gynecol 1996;87(1):55–58. [PubMed: 8532266]
32. Sobhgol SS, Charndabee MA. Rate and related factors of dyspareunia in reproductive age women: a cross sectional study. Int J Impot Res 2007;19:88–94. [PubMed: 16791280]
33. Gracia CR, Freeman EW, Sammel MD, Lin H, Mogul M. Hormones and Sexuality During Transition to Menopause. Obstet Gynecol 2007;109(4):831–840. [PubMed: 17400843]
34. Dennerstein L, Hayes RD. Confronting the Challenges: Epidemiological Study of Female Sexual Dysfunction and the Menopause. J Sex Med 2005;2(3):118–132. [PubMed: 16422789]
35. Avis NE, Stellato R, Crawford S, Johannes C, Longcope C. Is there an association between menopause status and sexual functioning? Menopause 2000;7(5):297–309. [PubMed: 10993029]
36. Dennerstein L, Dudley EC, Hopper JL, Burger H. Sexuality, hormones and the menopausal transition. Maturitas 1997;26:83–93. [PubMed: 9089557]
37. Katz A. When Sex Hurts: Menopause-Related Dyspareunia. A J Nurs 2007;107(7):34–39.
38. Kelley C. Estrogen and Its Effect on Vaginal Atrophy in Post-Menopausal Women. Urol Nurs 2007;27 (1):40–45. [PubMed: 17390926]
39. Krychman, ML. Female Sexual Dysfunction: A Clinical Update. [Accessed June 12, 2008]. Available at: http://www.medscape.com/viewprogram/14727_pnt
40. Frank JE, Mistretta P, Will J. Diagnosis and Treatment of Female Sexual Dysfunction. Am Fam Physician 2008;77(5):635–642. [PubMed: 18350761]

Table 1

Distribution of demographic, lifestyle and health characteristics of Puerto Rican females aged 40–59 years, by dyspareunia (n=920).

	Dyspareunia				p-value
	Yes		No		
	n	%	n	%	
Demographic characteristics					
Age groups (n=920)					0.1151
40–49 years	83	16.53	419	83.47	
50–59 years	86	20.57	333	79.43	
Relationship status (n=915)					<.0001
Partner	142	23.87	453	76.13	
No partner	26	8.13	294	91.88	
Educational attainment (n=919)					0.0009
≤ High school/technical course	112	22.27	391	77.73	
≥ Associate Degree	57	13.70	359	86.30	
Employment Status (n=897)					0.0060
Employed	76	15.14	426	84.86	
Unemployed	88	22.28	307	77.72	
Lifestyle					
Current cigarette smoking (n=875)					0.0782
Yes	8	10.81	66	89.19	
No	153	19.10	648	80.90	
Body mass index (kg/m^2) (n=869)					0.9364
< 25	34	18.99	145	81.01	
25– 29.9	67	18.66	292	81.34	
≥ 30	59	17.82	272	82.18	
Physical Activity (n=865)					0.2512
Yes	46	15.92	243	84.08	
No	110	19.10	466	80.90	
Alcohol use (n=866)					0.8911
Yes	38	18.27	170	81.73	
No	123	18.69	535	81.31	
Obstetrics/Gynecologic History					

	Dyspareunia				p-value
	Yes		No		
	n	%	n	%	
Parity (n=893)					0.8598
0 children	16	21.05	60	78.95	
1–2 children	69	18.35	307	81.65	
≥3 children	83	18.82	358	81.18	
Use of oral contraceptives (n=877)					
Never	59	18.10	267	81.90	0.9314
Ever	101	18.33	450	81.67	
Menopausal Status and current HT use (n=804)[†]					0.0037
Pre-menopause	64	14.22	386	85.78	
Post-menopause not using HT	30	18.87	129	81.13	
Post-menopause using HT	49	25.13	146	74.87	
Genitourinary/Sexual symptoms					
Incontinence (n=920)					<.0001
Yes	53	29.28	128	70.72	
No	116	15.70	623	84.30	
Vaginal Dryness (n=920)					<.0001
Yes	120	36.47	209	63.53	
No	49	8.29	542	91.71	
Vaginal Itching (n=920)					<.0001
Yes	73	33.64	144	66.36	
No	96	13.66	607	86.34	
Loss of libido (n=919)					<.0001
Yes	124	33.07	251	66.93	
No	45	8.27	499	91.73	

[†]52 women were excluded from this analysis as they reported current HT use and to be menstruating, thus, menopausal status could not be accessed.

Table 2

Crude and adjusted prevalence odds ratios (and 95% confidence intervals) for the association between dyspareunia and health and lifestyle factors in Puerto Rican women aged 40–59 years.

Characteristic	Crude Model POR	95% CI	Adjusted Model POR	95% CI	p-value
Age					
40–49 years	1.00		1.00		
50–59 years	1.31	0.94–1.83	0.75	0.46–1.21	0.2336
Relationship Status					
Partner	3.54	2.28–5.52	2.22	1.29–3.82	0.0038
No-partner	1.00		1.00		
Educational attainment					
< High School/technical course	1.80	1.27–2.56	1.47	0.92–2.35	0.1081
≥ Associate degree	1.00		1.00		
Employment Status					
Employed	0.62	0.44–0.88	1.18	0.73–1.90	0.5016
Unemployed	1.00		1.00		
Menopausal Status/Current HT Use					
Pre-menopause	1.00		1.00		
Post-menopause HT−	1.39	0.86–2.25	1.00	0.54–1.83	0.6849
Post-menopause HT+	2.08	1.37–3.18	1.24	0.72–2.14	0.3769
Incontinence					
Yes	2.25	1.49–3.42	1.67	1.02–2.73	0.0403
No	1.00		1.00		
Vaginal dryness					
Yes	6.33	4.26–9.42	3.97	2.49–6.31	<.0001
No	1.00		1.00		
Vaginal itching					
Yes	3.19	2.16–4.71	2.44	1.55–3.83	0.0001
No	1.00		1.00		
Loss of libido					
Yes	6.41	4.21–9.76	3.08	1.92–4.94	<.0001
No	1.00		1.00		