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The prevalence of hypoactive sexual desire disorder in surgically menopausal women: an epidemiological study of women in four European Countries

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Abstract

Introduction. Insufficient documentation exists regarding the prevalence of hypoactive sexual desire disorder (HSDD) in surgically menopausal (SM) women in European countries. Women who have undergone hysterectomy and bilateral oophorectomy experience a loss of ovarian hormones. Inclusion of these women in an epidemiological study provided the opportunity to study biological and cultural impacts on sexual function.

Aim. To compare the prevalence of HSDD among SM women in France, Germany, Italy, and the UK, as well as the relationship between low sexual desire and sexual activity or behavior and sexual or partner relationship satisfaction.

Methods. Cross-sectional survey of a convenience sample of 427 SM women aged 20 – 70 years.

Main Outcomes Measures. Desire domain of the Profile of Female Sexual Function[®] (PFSF[®]) to identify women with low sexual desire, Personal Distress Scale[®] (PDS[®]) to measure distress due to low sexual desire, and a sexual activities measure. Women with low sexual desire who were distressed were classified as having HSDD.

Results. SM women having low sexual desire ranged from 35% (UK) to 44% (Italy), of these women 16% (Germany) to 56% (France) were distressed due to their low sexual desire. Overall, SM women classified with HSDD ranged from 7% (Germany) to 22% (France).

A strong positive correlation was observed between sexual desire and arousal, orgasm, and sexual pleasure in all countries ($P < 0.001$). Low sexual desire lead to less sexual activity, more dissatisfaction with sex life and partner relationship, and more negative emotional or psychological states, than normal desire in each country.

Conclusions. A similar percentage of SM women with low sexual desire were found across countries suggesting the role of biological factors (i.e., losing ovarian hormones) in determining sexual desire. Differences in the percentage of SM women with HSDD suggest a role for cultural factors in determining how low sexual desire is perceived.

Introduction

Definitions of women's sexual dysfunction have been refined over the last two decades. The DSM-IV-TR definition of hypoactive sexual desire disorder (HSDD) states that the essential feature of HSDD is a deficiency or absence of sexual fantasies and desire for sexual activity¹. HSDD was later defined by the International Consensus Development Conference on Female Sexual Dysfunction as the "persistent or recurrent deficiency of sexual fantasies/thoughts, and/or desire for, or receptivity to, sexual activity that causes personal distress"². Greater attention to women's sexual experiences of low desire has led to further modifications of this definition. A more recent definition states that women with HSDD experience absent or diminished feelings of sexual interest or desire, absent sexual thoughts or fantasies, and a lack of responsive desire (desire triggered by a sexual partner and/or by positively perceived foreplay when a woman accepts sexual intimacy starting from a "neutral" sexual state)³. Motivations (defined as reasons or incentives) for attempting to have sexual arousal are scarce or absent. The lack of interest is considered to be beyond the normative

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decrease expected with aging and relationship duration^{4,5}. Emotional or relational factors that determine “sexual motivation,” as well as physical factors that are modulated by hormones and health-related conditions (“sexual drive”), together contribute to “sexual interest.” Personal distress (lack of interest in sex that is concerning or distressing to a woman) is recognized as an important component of the last 2 definitions and must be present before a diagnosis of HSDD can be concluded.

Sexual interest may vary according to the stage of life, personal relationship factors, context-related factors, such as economic circumstances or living arrangements, or biologically modulated changes. Biologically modulated changes include age, one of the strongest predictors of change in desire during the life span⁶, and health-related problems, either general (e.g., diabetes and other endocrine diseases, cardiovascular diseases, depression, multiple sclerosis or other neurological diseases)⁷⁻¹¹ or genital (e.g., vaginal atrophy, vaginal dryness, dyspareunia, recurrent cystitis, genital mutilation, post-traumatic and/or iatrogenic factors contributing to genital/perineal pain)^{12,13}. All of these factors affecting the quality of genital arousal and sexual feedback to the brain may cause or contribute to a secondary loss of sexual desire¹⁰.

Women who have undergone hysterectomy and bilateral oophorectomy (surgical menopause) are at further increased risk for HSDD because of the sudden loss of ovarian hormones. Bilateral oophorectomy leads to the loss of almost 100% of estradiol and progesterone^{14,15} and an approximately 50% decrease in the circulating levels of testosterone in both premenopausal and postmenopausal women¹⁶. As a consequence, these women may experience additional adverse effects on sexual functioning due to the combined loss of estradiol and testosterone compared with nonoophorectomized women. However, personal- and partner-related factors may modulate the motivational component of sexual desire and the relative impact of the loss of hormones on the ultimate perception of desire¹⁷. This modulation and related variability in the meaning of sexual desire for each woman at a particular stage of life may help explain why not all surgically menopausal (SM) women have HSDD.

Until recently, hormone therapy (HT) for SM women included only estrogen replacement (along with progesterone or progestin in women with an intact uterus). Ovarian testosterone loss remained almost totally unaddressed in clinical practice despite pioneering studies assessing the therapeutic role of testosterone in women's sexuality¹⁸⁻²³. This may be due to the lack of epidemiological data regarding the impact of surgical menopause on women's sexual functioning, particularly sexual desire, and the lack of clinical awareness regarding the role of testosterone in modulating the sexual drive in women.

Aim

The aim of this study was to examine the sexual functioning of SM women in order to provide epidemiological data on this population's sexual health. Specifically, we compared the prevalence of HSDD and the frequency of sexual activity, sexual behavior, and relationship or sexual satisfaction associated with HSDD among SM women in 4 western European countries using validated instruments to identify women with HSDD.

Methods

Study Design

Data were made available from the Women's International Study of Health and Sexuality (WISHeS), a large cross-sectional self-report study that included questions on general, menopausal, and sexual health. WISHeS was conducted in 1999-2000 among 4517 women, aged 20-70 years old, who resided in the United States, France, Germany, Italy, and the United Kingdom. This article will focus on women from the 4 European countries (total of 2467 women), specifically, SM women who had current sexual partners (N = 427). Details regarding the overall study design are described elsewhere²⁴.

Study Population

SM women aged 20 –70 years who had all undergone hysterectomy and bilateral oophorectomy and resided in France, Germany, Italy, or the United Kingdom were recruited from large market research databases to participate in the European WISHeS survey. Women registered in these national databases had agreed to be contacted regarding research opportunities. Women were sent a letter about the survey then contacted by telephone to determine their interest in

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participating in the research. Those who qualified and agreed to participate were sent the survey to complete and return by mail. In Italy, women were contacted randomly door-to-door to determine their interest and eligibility. The survey was left with those women who qualified and agreed to participate, and was collected at their homes at a later date.

Outcome Measures

All questionnaires were supplied in the primary language of the country concerned. The questionnaire consisted of 3 sections (general, menopausal, and sexual health) each containing at least 1 validated quality of life instrument or scale. Data from Section II (used to classify women as SM) and Section III (used to report sexual functioning) are described here. Section III included questions on several parameters of sexual functioning: (1) frequency of sexual activities, (2) satisfaction with partner relationships and sex life in the past 30 days, (3) the Profile of Female Sexual Function[®] (PFSF[®]), and (4) the Personal Distress Scale[®] (PDS[®]). The latter two instruments were self-report, validated questionnaires designed to assess sexual desire and related domains of women's sexual response (PFSF[®]) and distress due to lack of sexual desire (PDS[®]) over the last 30 days. Both have been described in detail elsewhere²⁵⁻²⁷. Clinically derived cutoff scores for the desire domain of the PFSF (with scores ranging from 0 to 100 for each domain and a score of less than 40 in the sexual desire domain indicating low sexual desire) and the PDS (with scores ranging from 0 to 100 and a score of less than 60 optimally classifying women with low desire as distressed) were used, sequentially, to classify women as having low sexual desire and to further classify these women with low desire as distressed or nondistressed²⁴. Women classified as having low sexual desire and who were distressed by their low desire were classified as having HSDD.

Statistical Analysis

The analysis population consisted of SM women aged 20 - 70 years who returned the survey and reported that they had a current sexual partner. Demographic characteristics across the 4 countries were summarized using descriptive statistics.

Clinically derived cutoff scores for the desire domain of the PFSF and the PDS were used, sequentially, to classify women as having low sexual desire and to further classify these women with low desire as distressed or nondistressed. Women who had low sexual desire and were distressed by their low desire were classified as having HSDD. Fisher's exact tests were used to compare the percentages of women classified as having low desire, distress due to low desire, and HSDD across the four countries.

The relationship between sexual desire and sexual arousal, orgasm, and pleasure within each of the 4 countries was assessed visually using scatter plots. The Pearson product-moment correlation coefficient was calculated and linear regression lines were superimposed over the scatter plots in order to quantify the association and evaluate the relationships across countries.

The impact of having low sexual desire on the frequency of sexual activity during the last 30 days was examined by calculating descriptive statistics for each country. Within each country, the difference in sexual activity between SM women with and without low sexual desire was compared using a Wilcoxon rank-sum test. Additionally, comparisons across countries within the low sexual desire group were made using a Kruskal-Wallis test.

The impact of having HSDD on a woman's satisfaction with her sex life, satisfaction with the partner relationship, and whether or not a woman experienced various emotional or psychological states was assessed using descriptive (number and percent) and formal statistics (Fisher's exact test).

All statistical analyses were performed using SAS statistical software, version 8.02 (SAS Institute Inc, Cary, NC, USA). For all tests, $P < 0.05$ was deemed statistically significant.

Results

Study Population Demographics

A total of 427 SM European women, 20 – 70 years of age, who reported having a current sexual partner and returned the survey were included in this analysis. Table 1 summarizes the demographic characteristics of these women from each of the 4 countries.

The mean age of the women was similar among the 4 countries (54 ± 9.2 years overall). A lower percentage of German women were married (and a higher percentage were single, divorced, or widowed) compared with women in the other countries ($P = 0.001$ for overall differences across countries based on Fisher's exact test). German women also reported the shortest length of time with their current sexual partners (24.5 years; overall $P = 0.008$ based on 1-way ANOVA) and the shortest length of time since both ovaries had been removed (11 years; overall $P = 0.653$) compared with women in the other countries. The majority of women (69% overall) reported using HT (i.e., estrogen) in the 3 months prior to completing the survey.

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Prevalence of Low Sexual Desire, Distress, and HSDD

The percentage of SM women classified as having low sexual desire ranged from 35% in the United Kingdom to 44% in Italy, with no statistically significant differences observed among the countries (Table 2).

SM women with low desire were further classified as distressed or non-distressed using a cut-off score on the PDS to determine the percentages of women in each country with low sexual desire who were also distressed. The prevalence of HSDD was then determined from the number of SM women with low desire who were distressed as compared to the total number of SM women in each country. The percentage of SM women with low desire classified as distressed ranged from 16% in Germany to 56% in France, with 34% overall across all 4 countries. From the percentage of women with low sexual desire and the percentage of these women distressed by their low desire, it was determined that the percentage of SM women classified with HSDD ranged from 7% in Germany to 22% in France, with an overall prevalence of 14% across all 4 countries.

Correlation of Sexual Desire and Arousal, Pleasure, and Orgasm Scores on the PFSF

A strong positive statistically significant relationship was observed between the desire score and each of these other domains in all 4 countries (Pearson correlation coefficients ranging from 0.49 to 0.90; all $P < 0.001$). Similar relationships were seen in the linear regression plots for each country (data not shown).

Sexual Desire Status and Frequency of Sexual Activity

Table 3 summarizes the frequency of various sexual activities reported in the past 30 days by SM women with low or normal sexual desire in each of the countries. SM women with low sexual desire reported significantly less frequent self-initiated sex, partner-initiated sex, intercourse, and orgasm than women with normal levels of sexual desire in each of the countries ($P \leq 0.035$), with the exception of France where no statistically significant difference in partner-initiated sexual activities was seen between women with low desire and normal desire ($P = 0.105$). In women with low sexual desire, no statistically significant differences in the frequencies of various sexual activities were observed across countries (frequency of: self-initiated activity, $p=0.125$; partner-initiated activity, $p=0.541$; intercourse activity, $p=0.851$; and orgasms, $p=0.436$).

Association of HSDD with Lower Sexual and Relationship Satisfaction

The associations between HSDD and a woman's perceived satisfaction with her sex life and her relationship with her partner were explored in each of the countries (Table 4). Although SM women with normal desire were satisfied with their sex lives and their partner relationships, SM women with HSDD were significantly more likely to feel greater dissatisfaction with their sex life than SM women with normal desire in each of the countries ($P \leq 0.0003$). In fact, the odds of a greater level of dissatisfaction in women with HSDD was 26 times the odds in normal desire women (odds ratio [OR] = 26.2; confidence interval [CI] = 13.0, 53.5). Although no statistically significant differences were noted across countries and for all countries a low (~13%) but similar percentage of HSDD women were satisfied with their sex life, it is interesting to note that a large percentage of German women with HSDD were neither satisfied nor dissatisfied with their sex life than was observed in the other countries.

SM women with HSDD were also more likely to feel a greater level of dissatisfaction with their relationship than SM women with normal desire in each of the countries (OR = 6.7; CI = 3.2, 14.1). The differences between SM women with HSDD and those with normal desire reached statistical significance in Italy and the United Kingdom ($P \leq 0.006$).

Negative Emotional and Psychological Statements Endorsed by Women with HSDD

SM women with HSDD were more likely than women with normal desire to endorse negative emotional or psychological states in each of the countries (Figure 1).

Despite the small sample sizes, the differences between SM women with HSDD and those with normal desire reached statistical significance across nearly all emotional or psychological states in all countries, with the exception of feeling low self-esteem in Germany. The most frequently endorsed statement by HSDD women is that of "letting my partner down", indicative of their concern about the negative effects that low desire can have on the couple's intimate relationship.

Discussion

SM women are more likely to have both low sexual desire and associated distress and are therefore more likely to meet the criteria for HSDD than their relevant reproductive aged counterparts²⁴. The present study compared the prevalence of HSDD among SM women in 4 western European countries using validated measures of sexual functioning and distress due to low sexual desire.

The percentage of SM women classified with low sexual desire was similar across 4 western European countries, ranging from 35% in the United Kingdom to 44% in Italy. In contrast, significant intercountry variation has been observed in

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women with normal ovarian function (aged 20-49 years) classified with low desire²⁸. This suggests that with normal ovarian function, cultural factors unique to each country may contribute both to feelings of low sexual interest and the perception or reporting of it as a problem. The results presented here on the absence of significant differences across countries among SM women who no longer have functioning ovaries suggest that biological factors, i.e., acute loss of sexual hormones, typical of bilateral oophorectomy, may override cultural factors. Further research is needed to understand the role and relative significance of biological and cultural factors in sexual interest or desire.

In order for women with low desire to be classified as having HSDD, they must experience distress due to low sexual desire. Using the validated PDS scale, the percentage of SM European women with HSDD ranged from 7% in Germany to 22% in France. These data may suggest that cultural factors take on greater significance in determining how vulnerable these women are to feelings of distress due to low sexual desire. Specifically, cultural factors may help to explain variation among women with regard to: 1) the impact of low sexual desire on personal well-being and quality of life; 2) the significance of sexual desire in modulating self-perception and self-esteem; and 3) the impact of the loss of sexual desire on a couple's relationship and may reflect attitudes toward and/or importance attributed to sexual activity in the context of a sexual relationship that vary from one culture to the next; and/or they may express a different perception of "distress" when the impact of loss of sexual desire is considered. However, the sample sizes of women who were classified as being distressed within the individual countries are small and hence, further research is needed to better understand the basis for these differences.

Additionally, previous data for the total population of EU women have shown that, although there is an increase in low sexual desire with age, the prevalence of HSDD decreases due to decreasing concern with increasing age²⁴. Although we hypothesize that the same tendency occurs within each country, these analyses were not repeated due to the limited sample sizes.

While this paper has focused on the desire domain, there was significant correlation of desire with other domains of female sexual functioning, including sexual arousal, orgasm, and sexual pleasure in each of the 4 countries. SM women with low desire are highly likely to experience low arousal, pleasure, or orgasmic difficulties. This supports the concept of a close interdependence among different aspects of sexual functioning, which is important in clinical practice both from a diagnostic and therapeutic perspective. A thorough clinical history should investigate all of the domains of sexual function (desire, arousal, orgasm, and sexual satisfaction) and dysfunction (desire, aversion, arousal and orgasmic disorders, dyspareunia, and vaginismus) to assess sexual comorbidity¹⁰. Improvement in these domains can be expected when treatment addresses key etiological factors of the dysfunction stemming from biological, psychosexual, and/or relational causes, as demonstrated in placebo-controlled clinical studies of the positive impact of testosterone therapy on sexual desire, arousal, orgasm, and sexual pleasure in SM women with HSDD^{29,30}.

Women with low sexual desire in each of the countries reported significantly less frequent self-initiated sex, partner-initiated sex, intercourse, and orgasm than women with normal levels of sexual desire, except for partner-initiated sex in France. This absence of significant differences in France suggests that the receptivity component of sexual interest² may be modulated by culturally related differences in the dynamics of initiation and acceptance of sex.

HSDD is associated with detrimental effects on a couples' satisfaction with their sex life and relationship. SM women with HSDD were significantly more likely to feel dissatisfied with their sex life and their relationship than women with normal desire, particularly in Italy and the United Kingdom. These country differences may be due to cultural factors that modulate sexual and relationship satisfaction.

SM women with HSDD were also more likely than women with normal desire to endorse negative emotions or psychological states because of their loss of sexual desire in each of the countries. Increasing evidence supports the role of ovarian hormones, specifically estrogen and testosterone, in the modulation of both the dopaminergic system, which plays a role in regulating sexual drive, vital energy, assertiveness, and well-being, among others, and the serotonergic system, which modulates mood and associated feelings³¹. Sexual desire is complex and depends on biological, psychological, and contextual factors. Depression as an independent psychological factor may lead to a reduction of initiative and pleasure, combined with negative impressions of oneself and a tendency to retract from interpersonal contact. A potential negative sexual self image may then contribute to the depressive condition. In such cases, the two problems may aggravate each other. When sexual dysfunction is secondary to clinical depression, treatment plans should include addressing the underlying depression. This may explain the high comorbidity between desire disorders and mood disorders, including major depression. Current understanding of the relationship between sexual hormones and psychological well-being suggests that there is a dynamic interplay between these factors. There is evidence to suggest that psychological factors can modulate the neurochemistry of the brain and its emotional correlates, and that hormone and neurochemical factors can modulate the perception of emotions^{32,33}. Clinical studies in depressed postmenopausal women have shown that HT and antidepressants have a better therapeutic effect than antidepressants alone³⁴.

Of particular interest is the large proportion of women who perceive an additional "burdening" affecting their emotional well-being that is reflected by their endorsement of the statement that they feel that they are letting their partner down *because of* their HSDD. This emphasizes the importance of the couple's relationship to these women and that women

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with HSDD feel their low sexual desire has deleterious effects on this intimate relationship. This additional emotional "burden" may contribute to mood disorders and comorbidity between depression and HSDD.

There are some limitations of the study that should be noted. As a cross-sectional study, the results of the WISHeS survey can not be used to establish causal relationships. In addition, the study population was not a population sample but a convenience sample of women who were willing to take part in marketing surveys, which might limit generalizations that can be made from the data. Also, there were some differences in recruiting methods among countries. In Italy, women were recruited in-person at their homes, whereas women in the other countries were contacted by telephone. Differences between participants and nonparticipants were not examined.

Overall, the results show that many SM women with HSDD have a very different sexual experience than SM women without HSDD across all 4 countries. HSDD is significantly associated with dissatisfaction with sex life and with the partner relationship across all 4 countries. These findings indicate that restoring a woman's sexual desire may help to improve satisfaction with her own sexual functioning, help improve her relationship with her sexual partner, and, as a result, improve the quality of life for both.

Conclusions

The percentage of SM women classified with low sexual desire was similar across 4 western European countries; however, there were some variations across countries in the percentage of SM women classified as distressed by their low desire or as having HSDD. The specific role of biological factors (i.e., losing ovarian hormones) is evident in the similar percentages of SM women with low sexual desire in the 4 countries examined. Differences across countries in the percentage of SM women who were distressed or with HSDD suggest a role for cultural factors in determining how low sexual desire is perceived or experienced by these women. Many SM women with HSDD in all 4 countries reported diminished sexual functioning that included decreased sexual activity, lower satisfaction with sex life and relationship, and negative emotional or psychological states. This highlights the importance of a thorough evaluation for women who report having "low desire." Special attention should be devoted to diagnosing medical co-morbidities, other sexual dysfunctions, and various emotional states that may be evoked by or associated with HSDD.

References

1. American Psychiatric Association (US). Diagnostic and statistical manual of mental disorders, 4th edition. (DSM-IV-TR). Washington, DC: APA; 2000.
2. Basson R, Berman J, Burnett A, Derogatis L, Ferguson D, Fourcroy J, Goldstein I, Graziottin A, Heiman J, Laan E, Leiblum S, Padma-Nathan H, Rosen R, Segraves K, Segraves RT, Shabsigh R, Sipski M, Wagner G, Whipple B. Report of the international consensus development conference on female sexual dysfunction: definitions and classifications. *J Urol* 2000; 163: 888-93.
3. Basson R. Rethinking low sexual desire in women. *BJOG* 2002; 109: 357-63.
4. Basson R, Leiblum SL, Brotto L, Derogatis L, Fourcroy J, Fugl-Myer K, Graziottin A, Heiman JR, Laan E, Meston C, Schover L, van Lankveld J, Schultz WW. Definitions of women's sexual dysfunctions reconsidered: advocating expansion and revision. *J Psychosom Obstet Gynecol* 2003; 24: 221-9.
5. Basson R, Leiblum S, Brotto L, Derogatis L, Fourcroy J, Fugl-Meyer K, Graziottin A, Heiman JR, Laan E, Meston C, Schover L, van Lankveld J, Schultz WW. Revised definitions of women's sexual dysfunction. *J Sex Med* 2004; 1: 40-8.
6. Hayes RD, Dennerstein L, Bennett CM, Koochaki PE, Leiblum SR, Graziottin A. Relationship between hypoactive sexual desire disorder and aging. *Fertil Steril* 2007; 87: 107-12.
7. Bhasin S, Enzlin P, Coviello A, Basson R. Sexual dysfunction in men and women with endocrine disorders. *Lancet* 2007; 369: 597-611.
8. Rees PM, Fowler CJ, Maas CP. Sexual function in men and women with neurological disorders. *Lancet* 2007; 369: 512-25.
9. Basson R, Schultz WW. Sexual sequelae of general medical disorders. *Lancet* 2007; 369: 409-24.
10. Dennerstein L, Alexander JL, Graziottin A. Sexual desire disorders in women. In: Porst H, Buvat J, eds. *Standard Practice in Sexual Medicine*. Oxford, UK: Blackwell Publishing; 2006: 315-19.
11. Alexander JL, Dennerstein L, Burger H, Graziottin A. Testosterone and libido in surgically and naturally menopausal women. *Women's Health* 2006; 2: 459-77.
12. Graziottin A. Sexual pain disorders: dyspareunia and vaginismus. In: Porst H, Buvat J, eds. *Standard Practice in Sexual Medicine*. Oxford, UK: Blackwell Publishing; 2006: 342-50.

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13. Graziottin A. Iatrogenic and post-traumatic female sexual disorders. In: Porst H, Buvat J, eds. *Standard Practice in Sexual Medicine*. Oxford, UK: Blackwell Publishing; 2006: 351-61.
14. Lobo R. *Treatment of postmenopausal women*. Boston, MA: Lippincott; 1999.
15. Burger HG. Androgen production in women. *Fertil Steril* 2002; 4: S3-5.
16. Judd HL, Judd GE, Lucas WE, Yen SS. Endocrine function of the postmenopausal ovary: concentration of androgens and estrogens in ovarian and peripheral vein blood. *J Clin Endocrinol Metab* 1974; 39: 1020-4.
17. Dennerstein L, Leher P, Burger H. The relative effects of hormones and relationship factors on sexual function of women through the natural menopausal transition. *Fertil Steril* 2005; 84: 174-80.
18. Sherwin BB, Gelfand MM, Brender W. Androgen enhances sexual motivation in females: a prospective, crossover study of sex steroid administration in the surgical menopause. *Psychosom Med* 1985; 47 (4): 339-51.
19. Burger H, Hailes J, Nelson J, Menelaus M. Effect of combined implants of oestradiol and testosterone on libido in postmenopausal women. *Br Med J (Clin Res Ed)* 1987; 294 (6577): 936-7.
20. Sherwin BB, Gelfand MM. Sex steroids and affect in the surgical menopause: a double blind, cross-over study. *Psychoneuroendocrinology* 1985; 10: 325-35.
21. Sherwin BB, Gelfand MM. The role of androgen in the maintenance of sexual functioning in oophorectomized women. *Psychosom Med* 1987; 49: 397-409.
22. Davis SR, McCloud P, Strauss BJG, Burger H. Testosterone enhances estradiol's effects on postmenopausal bone density and sexuality. *Maturitas* 1995; 21: 227-36.
23. Myers LS, Dixen J, Morrissette D, Carmichael M, Davidson, JM. Effects of estrogen, androgen and progestin on sexual psychophysiology and behaviour in postmenopausal women. *J Clin Endocrinol Metab* 1990; 70: 1124-31.
24. Dennerstein L, Koochaki P, Barton I, Graziottin A. Hypoactive sexual desire disorder in menopausal women: a survey of western European women. *J Sex Med* 2006; 3: 212-22.
25. Derogatis L, Rust J, Golombok S, Bouchard C, Nachtigall L, Rodenberg C, Kuznicki J, McHorney CA. Validation of the Profile of Female Sexual Function (PFSF) in surgically and naturally menopausal women. *J Sex Marital Ther* 2004; 30: 25-36.
26. McHorney C, Rust J, Golombok S, Davis S, Bouchard C, Brown C, Basson R, Sarti CD, Kuznicki J, Rodenberg C, Derogatis L. Profile of Female Sexual Function: a patient based, international psychometric instrument for the assessment of hypoactive sexual desire in oophorectomized women. *Menopause* 2004; 11: 474-83.
27. Derogatis L, Rust J, Golombok S, Kuznicki J, Rodenberg C, McHorney C. A patient-generated, multinational inventory to measure distress associated with low desire. *Proceedings of the Annual Meeting of the International Society for the Study of Women's Sexual Health* 2004; p. 206.
28. Graziottin A. Prevalence and evaluation of sexual health problems – HSDD in Europe. *J Sex Med* 2007; 4: 211-9.
29. Buster JE, Kingsberg SA, Aguirre O, Brown C, Breaux JG, Buch A, Rodenberg CA, Wekselman K, Casson P. Testosterone patch for low sexual desire in surgically menopausal women: a randomized trial. *Obstet Gynecol* 2005; 105: 944-52.
30. Simon J, Braunstein G, Nachtigall L, Utian W, Katz M, Miller S, Waldbaum A, Bouchard C, Derzko C, Buch A, Rodenberg C, Lucas J, Davis S. Testosterone patch increases sexual activity and desire in surgically menopausal women with hypoactive sexual desire disorder. *J Clin Endocrinol Metab* 2005; 90: 5226-33.
31. Alexander JL, Kotz K, Dennerstein L, Kutner SJ, Wallen K, Notelovitz M. The effects of postmenopausal hormone therapies on female sexual functioning: a review of double-blind, randomized controlled trials. *Menopause* 2004; 11: 749-65.
32. Panksepp J. *Affective Neuroscience: The Foundations of Human and Animal Emotions*. Oxford, UK: Oxford University Press; 2004.
33. Solms M, Turnbull O. *The brain and the inner world*. London: Karnac Books; 2002.
34. Zanardi R, Rossini D, Magri L, Malaguti A, Colombo C, Smeraldi E. Response to SSRIs and role of the hormonal therapy in post-menopausal depression. *Eur Neuropsychopharmacol* 2007; 17: 400-5.

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DRAFT COPY – PERSONAL USE ONLY**Table 1.** Demographic characteristics of the study population

| | France N = 68 | Italy N = 108 | Germany N = 112 | United Kingdom N = 139 | Overall N = 427 |
|--|------------------|------------------|--------------------|---------------------------|--------------------|
| Age (years)—mean (SD) | 56 (8.5) | 53 (8.8) | 53 (9.3) | 54 (9.6) | 54 (9.2) |
| Marital status—n (%) [*] | | | | | |
| Married | 61 (90) | 100 (93) | 87 (78) | 128 (92) | 376 (89) |
| Single | 0 (0) | 5 (5) | 9 (8) | 0 (0) | 14 (3) |
| Divorced | 3 (4) | 3 (3) | 8 (7) | 9 (6) | 23 (5) |
| Widowed | 2 (3) | 0 (0) | 8 (7) | 1 (1) | 11 (2) |
| HT use in past 3 months—n/N (%) | 36/54 (67) | 30/50 (60) | 45/67 (67) | 88/118 (75) | 199/289 (69) |
| OC use in past 3 months—n (%) | 0 (0) | 1 (1) | 0 (0) | 1 (1) | 2 (0) |
| Time with current sexual partner (years) [*] —mean (SD) | 30.4 (11.9) | 28.1 (11.6) | 24.5 (14.1) | 29.0 (12.5) | 27.8 (12.8) |
| Time since both ovaries removed (years)—(SD) | 16 (18.3) | 13 (15.2) | 11 (12.0) | 17 (19.5) | 9 (8.0) |

Proportions are based on the number of patients for whom data are available.

HT = hormone therapy (i.e., estrogen); N = total number of respondents; OC = oral contraceptives.

^{*} Statistically significant differences across countries observed in proportion of married women (Fisher's exact p-value = 0.001) and time with current sexual partner (ANOVA p-value = 0.008)

Table 2. Percentage of surgically menopausal with current sexual partners who had low sexual desire, distress about their low sexual desire, and HSDD

| | France N = 68 n/N (%) | Italy N = 108 n/N (%) | Germany N = 112 n/N (%) | United Kingdom N = 139 n/N (%) | Overall N = 427 n/N (%) |
|--------------------------------|-----------------------------|-----------------------------|-------------------------------|--------------------------------------|-------------------------------|
| Low sexual desire ^a | 24/62 (39) | 40/90 (44) | 45/105 (43) | 48/137 (35) | 157/394 (40) |
| Distress ^b | 13/23 (56) | 12/40 (30) | 7/44 (16) | 21/48 (44) | 53/155 (34) |
| HSDD ^c | 13/60 (22) | 12/90 (13) | 7/103 (7) | 21/134 (16) | 53/387 (14) |

^a Profile of Female Sexual Function desire domain score less than 40.

^b Percentage of women with low sexual desire who were distressed. Personal Distress Scale score less than 60

^c Profile of Female Sexual Function desire domain score less than 40 and Personal Distress Scale score less than 60.

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Table 3. Relationship between sexual desire and frequency of sexual activity*

| | France | | Italy | | Germany | | United Kingdom | | Overall | |
|-----------------------|------------|---------------|------------|---------------|------------|---------------|----------------|---------------|------------|---------------|
| | Low Desire | Normal Desire | Low Desire | Normal Desire | Low Desire | Normal Desire | Low Desire | Normal Desire | Low Desire | Normal Desire |
| Self-initiated sex | | | | | | | | | | |
| N | 23 | 33 | 32 | 45 | 45 | 51 | 43 | 76 | 143 | 205 |
| Mean (SD) | 1.1 (2.24) | 3.5 (4.00) | 0.2 (0.45) | 3.9 (4.31) | 0.6 (1.69) | 4.4 (4.34) | 1.2 (4.09) | 4.2 (4.89) | 0.8 (2.61) | 4.1 (4.47) |
| Median (SD) | 0 | 2 | 0 | 3 | 0 | 3 | 0 | 3 | 0 | 3 |
| | | $P = 0.006$ | | $P < 0.0001$ | | $P < 0.0001$ | | $P < 0.0001$ | | $P < 0.0001$ |
| Partner-initiated sex | | | | | | | | | | |
| N | 23 | 34 | 37 | 45 | 45 | 52 | 42 | 76 | 147 | 207 |
| Mean (SD) | 6.4 (8.26) | 8.1 (6.53) | 3.1 (3.29) | 7.6 (4.02) | 2.8 (2.91) | 6.4 (4.75) | 4.9 (6.68) | 6.2 (6.21) | 4.1 (5.46) | 6.9 (5.52) |
| Median (SD) | 4 | 5.5 | 2 | 8 | 2 | 5 | 3 | 5 | 2 | 5 |
| | | $P = 0.105$ | | $P < 0.0001$ | | $P < 0.0001$ | | $P = 0.035$ | | $P < 0.0001$ |
| Intercourse | | | | | | | | | | |
| N | 23 | 32 | 36 | 45 | 45 | 58 | 43 | 80 | 147 | 215 |
| Mean (SD) | 5.3 (7.36) | 10.7(9.44) | 3.2 (3.44) | 12.0(7.22) | 3.1 (3.35) | 12.0(8.84) | 3.7 (4.66) | 4.1 (5.46) | 3.7 (4.60) | 10.9 (8.48) |
| Median (SD) | 2 | 9 | 2.5 | 10 | 3 | 10 | 2 | 7 | 2 | 10 |
| | | $P = 0.021$ | | $P < 0.0001$ | | $P < 0.0001$ | | $P < 0.0001$ | | $P < 0.0001$ |
| Orgasm | | | | | | | | | | |
| N | 23 | 32 | 33 | 45 | 43 | 57 | 43 | 78 | 142 | 212 |
| Mean (SD) | 2.7 (4.76) | 8.2 (7.63) | 1.0 (1.45) | 10.9(7.75) | 1.6 (2.09) | 9.7 (7.38) | 2.1 (2.59) | 9.0 (8.00) | 1.8 (2.76) | 9.5 (7.72) |
| Median (SD) | 1 | 6 | 0 | 10 | 1 | 8 | 1 | 7 | 1 | 8 |
| | | $P = 0.001$ | | $P < 0.0001$ | | $P < 0.0001$ | | $P < 0.0001$ | | $P < 0.0001$ |

* Women classified as low or normal sexual desire based on cutoff score on PFSF desire domain.

Frequency of sexual activity statistically compared between women with low desire and women with normal desire within each country using a Wilcoxon rank-sum test.

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| Table 4. Relationship between HSDD status and sexual or marital/relationship satisfaction | | | | | | | | | | |
|--|------------------|------------------------------|------------------|------------------------------|-----------------|------------------------------|------------------|------------------------------|------------------|-------------------------------|
| | France | | Italy | | Germany | | United Kingdom | | Overall | |
| | HSDD (N = 13) | Normal Desire (N = 38) | HSDD (N = 12) | Normal Desire (N = 50) | HSDD (N = 7) | Normal Desire (N = 60) | HSDD (N = 21) | Normal Desire (N = 89) | HSDD (N = 53) | Normal Desire (N = 236) |
| | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) |
| Satisfaction with sex life | | | | | | | | | | |
| Dissatisfied | 6 (46) | 4 (11) | 6 (50) | 0 (0) | 1 (14) | 2 (3) | 10 (48) | 6 (7) | 23 (43) | 12 (5) |
| Neither satisfied nor dissatisfied | 5 (38) | 4 (11) | 4 (33) | 3 (6) | 5 (71) | 5 (8) | 9 (43) | 6 (7) | 23 (43) | 18 (8) |
| Satisfied | 2 (15) | 30 (79) | 2 (17) | 47 (94) | 1 (14) | 53 (88) | 2 (10) | 76 (86) | 7 (13) | 206 (87) |
| | $P = 0.0003$ | | $P < 0.0001$ | | $P = 0.0003$ | | $P < 0.0001$ | | $P < 0.0001$ | |
| Satisfaction with marriage/relationship | | | | | | | | | | |
| Dissatisfied | 0 (0) | 2 (5) | 2 (17) | 1 (2) | 1 (14) | 1 (2) | 4 (20) | 2 (2) | 7 (13) | 6 (3) |
| Neither satisfied nor dissatisfied | 4 (31) | 3 (8) | 3 (25) | 1 (2) | 1 (14) | 4 (7) | 4 (20) | 4 (5) | 12 (23) | 12 (5) |
| Satisfied | 9 (69) | 32 (86) | 7 (58) | 48 (96) | 5 (71) | 54 (92) | 12 (60) | 81 (93) | 33 (63) | 215 (92) |
| | $P = 0.314$ | | $P = 0.006$ | | $P = 0.088$ | | $P = 0.0002$ | | $P < 0.0001$ | |

 P -values based on Fisher's exact test.

Proportions are based on the number of women for whom data were available.

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Figure 1.

Percentage of women responding that they experienced the following emotional or psychological states often, very often, or always HSDD was defined on the basis of low sexual desire (PFSF desire domain score < 40) and associated distress (PDS score < 60).

Each statement was answered using a 6-point categorical scale, corresponding to never, seldom, sometimes, often, very often, or always.

