

# Epidemiology of female sexual dysfunction

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## Abstract

**Objective:** To review the epidemiology and comorbidity of female sexual dysfunctions.

**Method:** The prevalence of each sexual dysfunction is indicated via a literature review conducted in Medline (1969-2008). The most prevalent diseases will be explained as well as the most important drugs that cause these diseases.

**Results:** Explaining the epidemiology of female sexual dysfunction is difficult due to the fact that it has not been studied extensively and because different classification systems exist. Moreover, it is difficult to distinguish between different types of sexual dysfunction and possible comorbidities. In general, 40% of women experience some form of sexual problem, although only in 12% to 25% is it associated with personal distress. The diseases which cause sexual dysfunction are those which affect mobility and activity, as well as body image and feeling attractive.

**Conclusions:** The prevalence of female sexual problems is very high and personal distress is less common but an important factor. However, more research is necessary in order to determine the prevalence of each sexual dysfunction in different populations and the relation these dysfunctions have to different diseases and drugs. Sexual dysfunction is often the first symptom of a disease or an adverse reaction to a drug.

**Keywords:** female sexual dysfunction, prevalence, comorbidity, physical disease, mental disease, gynaecological disease.

## Introduction

Studies which have analyzed the epidemiology of different sexual functions are conclusive in the following: sexual dysfunctions are more common among women, which could be related to socio-demographic factors such as age, education, social and cultural impact, and poor physical and mental health [1,2].

We would like to point out how difficult it is to provide data on the prevalence of sexual dysfunctions. This is due to the fact that these dysfunctions are rarely analyzed. Furthermore, the data that have been collected in literature are unclear because there is more than one accepted classification system. At present, there are six different systems of classification [3]. However, the four major categories of sexual dysfunction are disorders of sexual desire/interest, arousal, orgasm and sexual pain.

Diseases which affect mobility and physical activity reduce sexual desire [4]. Body image and feeling attractive are modified by these diseases and aging resulting in decreased interest in sexual activity [5]. In addition, pain or minor physical problems such as reduced flexibility, minor arthritis and urinary incontinence can increase discomfort or difficulties during sexual activity [1,4,6].

A recent study on the prevalence of sexual problems made it clear that, in order to understand sexual problems it is necessary to question not only physical health, but also psychosocial health and satisfaction during sexual intimacy [5]. Sexual problems are often the first sign of disease, to the extent that many diseases and drugs add to increasing the prevalence of sexual problems.

In general and considering all sexual problems as a whole, it seems feasible that 40% of the female population is affected by sexual problems, with a higher prevalence of 50% among perimenopausal and postmenopausal women [7]. However, the rate of women with sexual problems associated with personal distress is much lower, ranging from 12% to 25% [2,8].

We have reviewed the literature appearing in English in Medline (1969-2008). Although we have separated the four categories of sexual dysfunction, like other medical problems, we should take into consideration that most sexual problems are multi-factorial and cannot be either labeled under or considered unique to one category or specific physical disorder.

### **Sexual desire disorder**

Published studies analyzing the prevalence of this disorder demonstrate that this type of disorder is more common among

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women than men. Various issues can complicate sexual desire disorder prevalence data such as considering whether or not a significant decrease in sexual desire exists or whether there is a lack of mutual interest between both partners. A dysfunction can occur not because of a lack of desire itself, but rather because the level of desire present is not as much as the partners need. Sometimes, confusion with other diagnoses, such as arousal disorders and even sexual aversion, prevent accurate data from being collected.

There is a very broad range of prevalence data. In general, these disorders are thought to affect approximately 20% to 30% of the population. Laumann has indicated that sexual dysfunction is present to some extent in 43% of American women between the ages of 18 and 59 years, with decreased sexual desire being the most common disorder, affecting 32% [1]. Laumann has also found that 27% of European women suffer from sexual dysfunctions, with lack of sexual desire being the most common disorder [9]. In addition, he indicated age was one of the main factors associated with sexual difficulties. Dennerstein et Al. reached similar findings based upon data from the "Women's International Sexuality and Health Survey" (WISHeS), a mail survey involving 1,356 women between the ages of 20 and 70 from Germany, the United Kingdom, France and Italy. From this survey it was concluded that 29% of women suffer from this dysfunction [10].

A study involving 703 Austrian women between the ages of 20 and 80 years showed that 9.1% had no desire to engage in sexual activity in the four weeks preceding the study, while 46.1% responded that they rarely or occasionally did. Thirty-three percent of women did report a frequent desire to engage in sexual activity; these women were primarily between the ages of 20 and 40 years [11].

The prevalence of this disorder is related to age. A study on risk factors related to sexual desire disorders revealed that risk increases with age because, while 10% of women up to the age of 49 years experience some form of dysfunction, in women between 50 and 65 years this figure increases to 22% and doubles once again to 47% among those between 66 and 74 years of age [4].

Prevalence also seems to vary with race. In the "Study of Women's Health Across the Nation" (SWAN), examining 2,400 women of different ethnicities (Caucasian, Hispanic, African American, Chinese, Japanese) between the ages of 42 and 52 years (premenopausal or early menopausal), 40% of women had never or had infrequently had sexual desire. Chinese women reported the least desire, followed by Japanese women, and then by Caucasians, African Americans and Hispanics, which had similar values [12].

Surgical menopause has also been associated with a higher incidence of desire disorders than natural menopause [10]. Disorders occur in 9% of naturally menopausal women and in 26% of women who undergo surgical menopause at a young age. Disorders of this kind are significantly more frequent among surgically menopausal women between the ages of 20 and 49 years than among premenopausal women in the same age bracket. Nonetheless, there were no significant differences in the prevalence between surgical menopause and natural menopause for the 50 to 70 year age bracket [13].

In the largest study population to date [2], out of 31,581 women over 18 years in the U.S., 40% reported sexual problems, this rate being very similar to the data found so far [1,8]. However, sexual problems associated with personal distress were much less common (12%) than previously found [14]. Furthermore, the results of this study showed that personal distress was more frequent in middle-aged women than in younger or older women.

### **Sexual arousal disorder**

There is not much epidemiological data which specifically analyses the prevalence of sexual arousal disorder. It is rare for women to report arousal problems to their physician. Sexual arousal disorder usually leads to decreased desire and problems achieving orgasm. Therefore, collecting real data on this disorder is difficult.

Overall, literature indicates that 15% of the population suffers from this type of disorder, which depends on and increases with age. The European study on Austrian women indicates that 20% of women between 20 and 40 years of age suffer from this disorder. The problem is more frequent in older women, with a prevalence above 70% among women in the 60 to 69 year age bracket [11]. The "Women's International Sexuality and Health Survey" (WISHeS) indicates that this frequency is 22% [13].

### **Orgasmic disorder**

In general, this disorder is thought to affect approximately 25% of women. Laumann has indicated a prevalence of 29% of American women [1] affected by this disorder and a slightly lower prevalence of 20% of European women [9], similar to the prevalence of 19% indicated by the WISHeS study [13]. Age is related to disorder prevalence, with those in the 50 to 59 year age bracket experiencing a higher occurrence [15].

### **Sexual pain disorders**

Sexual pain disorders are divided into dyspareunia, recurrent or persistent genital pain associated with sexual intercourse that causes personal distress, and vaginismus, recurrent or persistent involuntary spasm of the musculature of the outer

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third of the vagina which interferes with vaginal penetration and causes personal distress [16].

The literature on sexual pain disorders reveals great variations in prevalence, possibly due to differences in the methodology used and in the populations included in the different studies.

There is a negative correlation with age. Women aged between 18 and 29 experience 3 times more pain during sexual relations than women aged from 50-59. Also, women with health problems are 3 times more likely to experience sexual pain than healthy women [1]. The following risk factors were found to be associated with sexual pain: poor level of education, low economic status, stress or emotional problems and prevalence of urinary tract symptoms. Lastly, the presence of sexual pain is associated with a clear deterioration in quality of life [1].

Other data therefore appear to be contradictory when they indicate a higher prevalence of dyspareunia in women over 50 than in young women [17,18], although these discrepancies may be explained by the methodology and concept used in each study, as well as by the relationship between age and a reduction in lubrication and increase in atrophic vaginitis. In the SWAN study we can see that response distribution varies based on coital pain. Seventeen percent of premenopausal women complain of constant or occasional coital pain, compared with 24% of postmenopausal women [18].

Reviewing the psychosocial mechanisms, both for dyspareunia and vaginismus, shows how difficult it is to differentiate between the factors which bring on the pain, and therefore the etiology; the factors which influence the degree of pain, and therefore make it worse; and lastly, the factors deriving from the pain itself and the woman's experience of it. More specific studies are therefore necessary to analyze the physical, social and affective data in order to be able not only to accurately determine prevalence, but also comorbidities.

The incidence and prevalence of vaginismus is not completely known, however, disparate numbers of around 6% of the general population and 25% of the population seen in sexology clinics have been put forward [19]. Vaginismus is the main reason for unconsummated marriages.

## **Diseases that cause sexual dysfunction**

It is evident from many studies that there is a clear relationship between physical health and sexual activity [1,5,20]. Moreover, there is no decline in the frequency of sexual activity in older people, physical health being more important here than age [20]. Thus the importance of detecting sexual problems in people with health problems and vice versa.

There are numerous medical conditions associated with increased risk of sexual dysfunction, including poor general health; diabetes mellitus; cardiovascular disease; hypertriglyceridaemia; arterial hypertension; neurological disease; spinal cord injury; endocrine failure; genitourinary disease; psychiatric/psychological disorders such as anxiety, depression and other chronic diseases; benign gynaecological conditions and gynaecological surgery for both benign and malignant conditions including breast cancer; alcoholism; addiction to tobacco and other drugs; and socio-demographic conditions [4].

Drugs are another frequent and important cause of sexual dysfunction and can affect arousal, orgasm, or both. Drugs may act directly on the physiological mechanisms of normal sexual functioning or indirectly via concomitant changes in mood, mental alertness or social interaction [21].

Drugs that cause sexual dysfunction should be avoided when possible. Decreasing dosage or changing a prescription could become necessary. Stopping the use of tobacco and the consumption of alcohol should be recommended in order to maintain or improve health and sexual function. Patients who have dysfunction secondary to reversible diseases can respond to treatments specific to the underlying disease, such as kidney transplants for renal failure [22]. In the text that follows, we will discuss the diseases and drugs that are most connected to female sexual dysfunction. It is necessary to recall that sexual dysfunction is often the first sign of a disease [23].

### **Physical Diseases**

**Diabetes:** The prevalence of sexual dysfunction is high in women with diabetes, especially among older women with little education. The cause is often related to vascular or neurological damage. Prevalence of sexual dysfunction among diabetic women is 75% vs 30,6% in the control group ( $p < 0.001$ ) [24]. A decrease in desire, orgasmic dysfunction and decreased lubrication are universally associated with diabetes [24]. Some recent studies have found that diabetes mellitus affects all areas of female sexuality and this condition is independent of depression [25].

**Cardiovascular disease:** Cardiovascular disease causes morbidity in old age and is often associated with sexual dysfunction, for various reasons. Coronary heart disease is often associated with hypertension, obesity and metabolic syndrome. Patients with severe cases of this disease, namely those with reduced mobility, are the ones that are most affected even though any degree of disease severity and the drugs used to treat it can affect sexuality. Some studies show reduced frequency of sexual activity in 40% to 50% of patients following myocardial infarction [25]. There are various reasons why cardiovascular disease leads to a decrease in physical activity. These reasons include depression, anxiety resulting from disease recurrence, physical symptoms such as angina and dyspnea with sexual activity and, if a coronary event occurs, fear of dying during coitus if the event repeats itself. Vascular disease associated with diabetes can prevent adequate arousal and cardiovascular disease can inhibit sexual activity, secondary to dyspnea.

In addition, being elderly in itself constitutes a risk factor for vascular dysfunction, even in the absence of other risk

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factors. It is necessary that vascular and neurological systems are functioning properly in order for a woman to experience normal arousal. The importance of endothelial function and the release of nitric oxide (NO) in sexual function have been demonstrated. Sexual function is affected when there is an endothelial dysfunction. In any case, eliminating cardiovascular risk factors decreases the risk of sexual dysfunction. Men with sexual dysfunction suffer from cardiovascular disease, after considering age at the onset of erectile dysfunction (ED) and known risk factors [26]. This risk increases with age. These studies were carried out on male subjects and less information is available about women.

**Blood pressure:** A rise in blood pressure, which causes endothelial dysfunction, is associated with sexual dysfunction. There are publications on the connection between women with hypertension and decreased lubrication and orgasmic dysfunction [27].

Sexual dysfunction was found in 42.1% of hypertensive women compared with 19.4% of normotensive women. Successful control of hypertension was related to lower prevalence of female sexual dysfunction [28].

Antihypertensive agents can cause sexual dysfunction. However, there is a great deal less information on women in comparison to men since most studies were carried out entirely or mostly in male subjects. Nonetheless, female vaginal lubrication is the counterpart to an erection in males and, therefore, vaginal dryness is a probable consequence.

The relationship between antihypertensive drugs and sexual dysfunction has been thoroughly reviewed and it has been concluded that adrenergic blocking agents, diuretics, vasodilators, monoamine-oxidase inhibitors, antiarrhythmic agents, lipid-lowering agents and digitalis can affect sexual response, with the most important effects pertaining to the first group. Non-selective beta-blockers (e.g., propranolol) affect sexual function in a dose-dependent manner. The beta<sub>1</sub>-selective blockers (e.g., atenolol) are less likely to cause dose-dependent sexual dysfunction. Among thiazidic diuretics, indapamine is rarely associated with sexual dysfunction. The angiotensin-converting enzyme inhibitors (ACEIs) slightly interfere with sexual function in a dose-dependent manner. ACEIs and calcium channel blockers are safe and can be a good alternative for patients with sexual dysfunction caused by other antihypertensives. These aspects have recently been reviewed [28,29].

**Chronic rheumatic diseases:** Chronic rheumatic diseases, including rheumatoid arthritis, lupus, osteoarthritis, fibromyalgia, and chronic pain affect sexuality. Rheumatoid arthritis is one of the main causes of disability, especially among elderly women, though men also suffer from pain and stiffness. It can cause discomfort or difficulty and can lead to a dysfunction or decrease in sexual activity.

**Spinal cord injury:** The seriousness of the injury determines certain changes in sensitivity that affects feeling and orgasm. Female fertility is not affected.

### **Mental Diseases**

Depression is characterized by loss of interest, lack of energy, low self-esteem, difficulty in experiencing pleasure, social problems and irritability. All these symptoms lead to obvious difficulties in maintaining sexual relationships.

The relationship between depressive disorders and sexual dysfunction has been clearly demonstrated for many years [30]. The Prospective Zurich cohort study [31] found the prevalence of sexual problems in people with depression to be double that of controls (50% vs. 24%). Moreover, in women with major depression treated with SSRI or SNRI, the prevalence of sexual dysfunction is 95.6% in at least one of the phases of the sexual response cycle [32].

Almost all psychotropic drugs used for treating depression have been associated with inhibition of sexual function. In a study by the Spanish Working Group for the Study of Psychotropic-Related Sexual dysfunction, the incidence of sexual dysfunction was 59.1% when all antidepressants were considered together [33]. There were relevant differences when the incidences with different drugs were compared. The incidence of sexual dysfunction with selective serotonin reuptake inhibitors (SSRIs) and venlafaxine was high (58% to 73%) in comparison with serotonin-2 (5-HT<sub>2</sub>) blockers (nefazodone, 24.4%; mirtazapine, 8%), moclobemide (3.9%) and amineptine (6.9%).

Since female sexual dysfunction is a common adverse effect associated with all types of antidepressants, many strategies have been devised to manage this effect. Approaches include dose reduction, a temporary medication break, substitution of a different antidepressant and use of another related drug therapy to reverse the effect [34].

In short, the specific sexual dysfunction needs to be identified and the patient should be treated according to his/her psychopathology, drug therapy and interpersonal relationships [35].

### **Gynaecological Diseases**

**Urinary incontinence:** as for incontinent women, 46.5 % suffered female sexual dysfunction vs. 35.2% of the continent woman [36].

Symptoms of the lower urinary tract are common in both elderly men and women and are often associated with sexual dysfunction. These symptoms can represent a specific age-related pathology, be a sign of a systemic disease, or the result of medications used for existing comorbidities.

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**Pelvic pain:** Chronic pelvic pain, with a wide range of causes such as endometriosis, chronic pelvic inflammatory disease, adhesions and non-gynaecological causes such as spastic colon syndrome, interstitial cystitis and urethral syndrome, can affect sexual function in women.

**Hysterectomy:** Some studies have suggested that a hysterectomy in itself is not generally detrimental to sexuality, though the impact can vary significantly from person to person [37]. In a study of 102 patients, Virtanen found a significant decrease in sexual desire in women with dyspareunia who had undergone a hysterectomy for benign conditions (30% of patients) but did not observe changes in the ability to achieve orgasm [38]. In a literature review, Goldstein found that 33% to 37% of women reported a decrease in sexual response after a hysterectomy [37]. Sexual differences are found in a majority of studies when a hysterectomy is accompanied by an oophorectomy [39,40]. Current data suggest that a hysterectomy in women who suffer from pain or experience bleeding tends to improve sexual function, while sexual function can worsen in women with depression or sexual problems preoperatively.

**Malignant gynaecological diseases:** Malignant gynaecological diseases can also have a negative impact on sexuality. Tharanov monitored patients at different intervals following endometrial, cervical or ovarian cancer [41]. He found that sexual desire was lacking or very low in 74% of these patients. Among the sexually active patients, 40% experienced dyspareunia. Some studies suggest that sexual dysfunction is related to chemotherapy or secondary hypoestrogenism in connection with ovarian failure [42].

Preoperative advice, including an explanation of postoperative anatomy and its potential effects on sexuality, as well as postoperative advice, are essential in this population. In addition, an early diagnosis and treatment of sexual difficulties can also help these patients to maintain satisfactory sexual activity.

Cancer and its treatment causes true physical and psychological trauma. This fact is especially evident in breast cancer cases, as the organ in question is greatly damaged, very visible, and is widely viewed as a symbol of femininity. As a result, female sexuality is negatively affected by breast cancer and its treatment: 21% to 39% of patients who survive from breast cancer reported sexual dysfunction [36] and a third of those who underwent a mastectomy had not resumed sexual activity after 6 months [43].

## Conclusion

The prevalence of female sexual problems is around 40% and even higher in postmenopausal women [1,2,7]. The most common disorder in North American and European women is sexual desire disorder [1,10]. The prevalence of this disorder is related to age [11], ethnicity [12] and surgical menopause [13]. Collecting data on sexual arousal, orgasmic and pain sexual disorder is difficult. Organic disorders affect approximately 19% to 29% of women [1,13], dyspareunia affects 15% to 25% of sexually active women [11] and vaginismus affects 6% [19]. 12% to 22% of women have some type of distressing sexual problem [2,14]. There are numerous medical risk factors with a high prevalence of female sexual dysfunction: physical diseases such as diabetes, cardiovascular diseases or chronic rheumatic diseases; mental diseases, the most common of which is depression and its treatment; and gynecological diseases such as urinary incontinence, pelvic pain, hysterectomy and breast and gynecological cancer.

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