

## Prevalence of Female Sexual Dysfunction Among Premenopausal Women: A Systematic Review and Meta-Analysis of Observational Studies



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### ABSTRACT

**Introduction:** Epidemiologic research in female sexual dysfunction (FSD) has gained momentum in recent years, particularly in clinical populations and in menopausal women. However, sexual dysfunction also affects premenopausal women in general populations. Previous literature reviews have been unable to quantify the burden of FSD in general populations. This has been due in part to different definitions of dysfunction, heterogeneous study design, and the wide variety of measurement tools used.

**Aim:** To provide a meta-analytical estimate of the prevalence of FSD in premenopausal women.

**Methods:** Observational studies that assessed the prevalence of FSD in premenopausal women were systematically sought in relevant databases (January 2000 through July 2014). Publications that reported the prevalence rate for at least one domain of FSD were included. A meta-analysis of prevalence rates was performed and a meta-regression was used to analyze factors of study design.

**Main Outcome Measures:** Estimated prevalence rates of FSD and its domains (hypoactive sexual desire disorder, sexual aversion disorder, female sexual arousal disorder, lubrication difficulties, female orgasmic disorder, and pain disorders).

**Results:** After screening 9,292 results, 440 publications were retrieved for full-text review. Of these, 135 studies were included in the systematic review. Ninety-five of these studies were assessed further in a meta-analysis. There was substantial heterogeneity among studies. The prevalence of FSD in premenopausal women was estimated to be 40.9% (95% CI = 37.1–44.7,  $I^2 = 99.0\%$ ). Prevalence rates of individual sexual disorders ranged from 20.6% (lubrication difficulties) to 28.2% (hypoactive sexual desire disorder). Further analyses showed significantly higher rates of FSD in studies in Africa, studies that used non-validated assessment tools, and studies without pharmaceutical funding.

**Conclusion:** Prevalence estimates of FSD vary substantially. Nonetheless, results show that FSD is a significant public health problem that affects 41% of premenopausal women around the globe. More research and improved standardization are needed in this field.

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**Key Words:** Epidemiology; Female Sexual Dysfunction; Female Sexual Difficulties; Meta-Analysis; Prevalence; Systematic Review

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### INTRODUCTION

Sexual function is an essential component of life. For this reason, sexual dysfunction can have a negative impact on the well-being of an individual. Sexual dysfunctions are a heterogeneous group of disorders that are typically characterized by a clinically significant disturbance in a person's ability to respond sexually or to experience sexual pleasure, according to the *Diagnostic and Statistical Manual of Mental Disease, Fourth Edition, Text Revision (DSM-IV-TR)*.<sup>1</sup> Sexual dysfunction in women includes hypoactive sexual desire disorder, sexual aversion disorder, female sexual arousal disorder, female orgasmic disorder,

and pain disorders.<sup>1</sup> Female sexual dysfunction (FSD) is related to age, progressive, and highly prevalent, affecting 30% to 50% of women.<sup>2</sup>

Although still far behind research on male sexual dysfunction, research on FSD has attracted more interest in the past few decades.<sup>3,4</sup> Several studies have examined the prevalence of sexual dysfunction in women with cancer,<sup>5</sup> diabetes,<sup>6</sup> and depression.<sup>7</sup> Older women also have been a major focus of research owing to increased interest in therapies that might decrease menopausal symptoms.<sup>8</sup> However, sexual dysfunction is not limited to clinical settings or to women going through menopause. It is an important health issue that affects younger women in general populations.

Several literature reviews have been performed in the past 30 years, yet none has been able to quantify the overall number of premenopausal women who report sexual dysfunction.<sup>9–11</sup> In 1986 Nathan<sup>9</sup> performed an epidemiologic analysis of 22 studies (1929–1981) that assessed sexual dysfunction in men and women in the general population. In the 19 studies that included women, prevalence rates for inhibited desire (in women) ranged from 1% to 35% and from 5% to 15% for inhibited female orgasm. No estimate could be given for inhibited sexual excitement (or arousal) because none of the studies inquired about adequate stimulation and the presence of lubrication problems. The sexual pain disorders, vaginismus and dyspareunia, had not been assessed in general populations until that point. In her analysis, Nathan struggled not only with limited epidemiologic data but also with a wide variety of tools that used heterogeneous definitions for sexual dysfunction.

The 1990 critical review from Spector and Carey<sup>10</sup> (1948–1990) identified 20 studies that measured FSD in various populations of women (minimum age = 11 years, maximum age = 85 years). Community samples indicated a prevalence of 5% to 10% for inhibited female orgasm, yet no stable estimates could be determined for female sexual arousal disorder, vaginismus, or dyspareunia. Spector and Carey encountered similar problems as Nathan did and encouraged future researchers to use a common classification system for sexual dysfunction “so that professionals can better compare and evaluate the literature using a common argot. (pg 406)”

In 2004, West et al<sup>11</sup> performed a systematic literature review (1966–2004) and identified 40 studies focusing on FSD (minimum age = 18 years, maximum age = 75 years). They found rates of sexual dysfunction that ranged from 1% to 50% for desire disorders, 4% to 48% for arousal disorders, 3% to 50% for anorgasmia, and 1% to 75% for dyspareunia. Like Nathan<sup>9</sup> and Spector and Carey,<sup>10</sup> West et al were unable to provide an overall prevalence estimate for FSD owing to the different definitions of dysfunction and the lack of standardized, valid assessment tools.

Currently, there is no global estimate of the prevalence of FSD in general populations of premenopausal women. Currently, the most frequently cited statistic for the prevalence of FSD stems

from a 1999 study published in the *Journal of the American Medical Association*.<sup>12</sup> The prevalence rate of generalized FSD was estimated to be 43% in a U.S. population 18 to 59 years old.<sup>13</sup> However, to have a valid estimate of the global prevalence of a particular disease or disorder, a single study of a single population is not sufficient.

A robust epidemiologic analysis of prevalence rates of FSD is valuable not only for statistical purposes but also, more importantly, for its clinical relevance. Quantifying an illness is the first step in finding a possible cure for that illness, and this is true for FSD.<sup>9</sup> Establishing the prevalence of sexual dysfunction in premenopausal and menopausal women allows practitioners and administrators to use these data to determine the resources (eg, more research, improved training, etc) needed to alleviate a given disorder.<sup>10</sup> Thus, the aim of this systematic review was to provide a meta-analytical estimate of the prevalence of FSD in general populations of premenopausal women and to examine the factors that might affect these prevalence rates.

## METHODS

### Protocol and Registration

The methods for this systematic review and meta-analysis were developed according to recommendations from the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statements.<sup>14</sup> This protocol has been registered with the International Prospective Register of Systematic Reviews (PROSPERO; CRD42014009526) and is available in published form.<sup>15</sup>

### Search Strategy and Selection Criteria

Data for this review were identified by searches of Medline, Embase, PsycINFO, Web of Science, and other relevant databases using the terms *sexual dysfunction*, *female*, and *epidemiology*. Searches were limited to studies of humans, to the English language, and from January 1, 2000 until July 10, 2014. The search was performed by an experienced medical research librarian (H.K.). A list of search terms that were used can be requested from the corresponding author. All titles and abstracts were screened for their relevance (M.E.M.). If there was any uncertainty about an abstract's relevance at this stage, the article remained included until the full text was reviewed. Articles identified through hand searches were considered for inclusion based on their titles.

A standard form was designed and used to evaluate the full-text publications for inclusion (see [Supplementary Material](#)). Two investigators (M.E.M. and A.Z.) independently assessed each publication for eligibility and compared their results. If there was a discrepancy in their assessment, a final decision was taken based on discussions with a third reviewer (C.A.). For multiple publications based on a single study, the most current and/or inclusive study was selected. A second hand search was

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