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Incidence and Prevalence of Sexual Dysfunction in Women and Men: A Consensus Statement from the Fourth International Consultation on Sexual Medicine 2015

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ABSTRACT

Introduction: The incidence and prevalence of various sexual dysfunctions in women and men are important to understand to designate priorities for epidemiologic and clinical research.

Aim: This manuscript was designed to conduct a review of the literature to determine the incidence and prevalence of sexual dysfunction in women and men.

Methods: Members of Committee 1 of the Fourth International Consultation on Sexual Medicine (2015) searched and reviewed epidemiologic literature on the incidence and prevalence of sexual dysfunctions. Key older studies and most studies published after 2009 were included in the text of this article.

Main Outcome Measures: The outcome measures were the reports in the various studies of the incidence and prevalence of sexual dysfunction among women and men.

Results: There are more studies on incidence and prevalence for men than for women and many more studies on prevalence than incidence for women and men. The data indicate that the most frequent sexual dysfunctions for women are desire and arousal dysfunctions. In addition, there is a large proportion of women who experience multiple sexual dysfunctions. For men, premature ejaculation and erectile dysfunction are the most common sexual dysfunctions, with less comorbidity across sexual dysfunctions for men compared with women.

Conclusion: These data need to be treated with caution, because there is a high level of variability across studies caused by methodologic differences in the instruments used to assess presence of sexual dysfunction, ages of samples, nature of samples, methodology used to gather the data, and cultural differences. Future research needs to use well-validated tools to gather data and ensure that the data collection strategy is clearly described.

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INTRODUCTION

There is very limited literature on the incidence of sexual dysfunctions, particularly in women. There is a substantial body of literature that has examined the prevalence of erectile dysfunction (ED) and, more recently, premature ejaculation (PE). However, there is limited literature on the prevalence of interest and desire disorders in men and most aspects of female sexual dysfunction (FSD). In addition to limited data on the incidence and prevalence for many aspects of sexual dysfunction, there are substantial problems with the interpretation of the studies that have been conducted. It is difficult to compare findings because of the different ways sexual dysfunctions are determined (eg, tick box, diagnostic interviews, non-validated assessment measurements, validated assessment measurements), the population from which the sample is drawn (eg, general

population, clinical population presenting for treatment of sexual dysfunction, other types of clinical populations, those who have access to the Internet), and the age, medical history, and socioeconomic and cultural background of participants. All these factors and many more are likely to affect incidence and prevalence rates. These issues are drawn out further as we describe the incidence and prevalence of sexual dysfunction in women and men in this article.

Incidence is defined as the number of new cases of a certain condition during a specific period in relation to the size of the population studied. *Prevalence* characterizes the proportion of a given population that at a given time has a particular condition.

For incidence studies, a younger baseline age should be expected to result in a population that is on average healthier and more sexually active. Surveys conducted as home interviews might result in a baseline population that is less healthy than a study in which the participants have to make an effort to visit a health center or clinic. An eligibility criterion such as involvement with a sexual partner theoretically results in a potentially healthier baseline population. Differences in socioeconomic status among studies also have probably played an important role in the variance in incidence rates. These factors and biases can work in one direction or the other, making it very difficult to compare studies in which at least one factor or bias might be at work.

INCIDENCE OF SEXUAL DYSFUNCTION IN WOMEN

Studies on the incidence of sexual dysfunction in women are scarce and there is a dearth of data available on this topic. The description of methodology also is limited or questionable, making the data difficult to interpret. In a recent study from the United Kingdom, Burri and Spector[1] found that 5.8% of women reported symptoms that constituted a diagnosis of FSD and 15.5% reported lifelong FSD. Hypoactive sexual desire was the most prevalent recent and lifelong sexual complaint (21.4% and 17.3%, respectively). Furthermore, 11.4% reported recent arousal, 8.7% reported lubrication, 8.8% reported orgasm, 10.4% reported satisfaction, and 6.0% reported sexual pain problems. The generalizability of this study is limited because it is a sample of volunteers rather than a random sample and the response rate was 50%.

Kontula and Haavio-Mannila[2] studied sexual dysfunction in Finnish women 18 to 74 years old. In their 5-year incidence study, they found that 45% of women reported decreased sexual desire, with an incidence of approximately 20% in women younger than 25 years and an incidence of 70% to 80% in women 55 to 74 years old. A similar 5-year incidence of 40% was found in a Swedish study from the 1990s by Fugl-Meyer.[3]

Results from an Australian study found that 36% of women reported at least one new sexual difficulty during the previous 12 months.[4] Lacking interest in having sex had the highest incidence of 26%, followed by taking too long to orgasm (11%), being unable to come to orgasm (10%), trouble with vaginal dryness (9%), not finding sex pleasurable (8%), feeling anxious about the ability to perform sexually (6%), experiencing physical pain during intercourse (5%), and coming to orgasm too quickly (2%). Interestingly, women in their 20s and 30s were just as likely as older women to develop two new sexual difficulties in the 12-month study period, namely lack of interest in having sex and not finding sexual pleasurable.

INCIDENCE OF SEXUAL DYSFUNCTIONS IN MEN

There are few epidemiologic surveys addressing the incidence, as opposed to prevalence, of sexual disorders in men and there are large differences among existing studies. These differences can be explained by variations in study design, populations studied, and definitions of sexual dysfunctions. Because of these variations, it is impossible to specify the incidence of sexual dysfunctions in men. Most research has been conducted on ED. The most important common theme of the studies is that the incidence of sexual dysfunctions increases with age but that sexual concern in men older than 60 and certainly older than 70 is generally less, explaining the decreasing incidence of what might be called clinically relevant ED.

An important new study of ED incidence is the Florey Adelaide Male Ageing Study, an Australian study of men 35 to 80 years old published in 2014.[5] Of 179 men who were normal at baseline, 31.7% developed ED at 5-year follow-up. Another important study on the incidence of ED is the Olmsted County Study in the United States.[6] In this study of men 40 to 79 years old, those who had ED at baseline showed smaller decreases in all sexual function domains compared with men who did not have ED at baseline. Other baseline characteristics, including education level, smoking status, and presence of diabetes, hypertension, or coronary heart disease, were not significantly associated with the rate of decrease in sexual function. Change in erectile function was significantly correlated with change in all other sexual function domains. Correlations among changes in erectile function, sexual drive, and ejaculatory function were consistent across age groups. An interesting finding derived from the longitudinal results of the Massachusetts Male Aging Study (MMAS)[7] was that a submissive personality type was associated with the subsequent development of ED. The crude incidence of ED varies among various studies, from 4 to 66 cases per 1,000 man years.[5–13] The most important conclusion that can be drawn from these studies is that incidence is strongly associated with age.

PREVALENCE OF WOMEN'S SEXUAL DYSFUNCTION

There is not sufficient space in this article to outline all aspects of the studies on the prevalence of women's sexual dysfunction. An overview of the reasonably valid studies on the prevalence of women's sexual dysfunctions can be found in a report by

McCabe et al[14] on the Fourth International Consultation on Sexual Dysfunction.

There were pronounced methodologic differences among these studies. Seventeen used face-to-face interviews, eight used mail questionnaires, and telephone interviews of varying length were used in six studies. Another difficulty is the difference in the age strata studied. Some studies focused only on elderly women, whereas others covered an age range from the teens to old age. Further, although some studies described lifelong prevalence, others addressed the past year or even briefer periods (eg, 3 months or past month). Definitions and classifications of severity also varied considerably, ranging from the third, fourth, and prospectively fifth editions of the *Diagnostic and Statistical Manual of Mental Disorders.* Regardless of the method used, there appears to be reasonable consensus that the prevalence of women who report at least one manifest sexual dysfunction is in the order of approximately 40% to 50%, irrespective of age.

Interest and Desire

Using different methods and scaling, descriptive epidemiologic investigations found that the prevalence of low level of sexual interest varies from 17% in 35- to 59-year-old women in the United Kingdom[15] through 33% to 35% (18–59 years old in United States, 18–74 years old in Sweden, 20–60 years old in Iran)[16–18] and up to 55% in Australia in women 16 to 59 years old.[19] There was no age dependency to the age of approximately 60 to 65.[16,17] A major difference between the United States and Sweden in this respect was that the oldest Swedish women had a considerably higher prevalence of low sexual desire than the 18- to 59-year-old American women but clearly a lower prevalence among the youngest women. According to the Global Study of Sexual Attitudes and Behaviors[20] based on a sample of 27,500, approximately half of whom were women 40 to 80 years old, women's lack of interest in sex varied from 17% in Northern Europe to 34% in Southeast Asia.

Low sexual desire was reported in Puerto Rico in 41% of 40- to 59-year-old women.[21] Low desire dysfunction was reported in 39% in a large-scale investigation of American women 18 to 102 years old[22] and in 35% of Finnish women 18 to 74 years old.[2] Shifren et al[22] found desire dysfunction to be more prevalent in the 45- to 64-year-old cohorts. In this study, 15% to 25% of women younger than 55 years had low desire, but the prevalence increased to approximately 50% in women 55 to 74 years. In comparison, lower levels of desire dysfunction of approximately 10% were reported from Sweden, France, the United States, and Australia.[23–27] Hayes et al[28] found that 16% of Australian women had manifest desire dysfunction and a Danish study[29] found that 19% of women 16 to 67 years old had a desire dysfunction.

Overall, the prevalence rates are mostly in the 40% to 50% range among women older than 65 years in recent studies. However, the study by Amidu et al[30] from a regional study in Ghana found that the prevalence of low sexual interest and desire was 61.5% but was severe in only 12% of participants. The limitations of this study included a small sample (301 women) and lack of information on whether the scale was translated to the local language. Because we lack studies on sexual dysfunction from Sub-Saharan Africa (and, actually, from the entire African continent), further studies are needed to elucidate whether this is just an accidental finding partly explainable by the limitations of this study or whether the prevalence and incidence of FSD in Sub-Saharan Africa is really higher than in some other parts of the world.

Arousal

There are considerable differences among epidemiologic data. Laumann et al[16] and Richters et al[19] determined that self-report levels of lubrication dysfunction were present in 21% to 28% of sexually active women. Safarinejad[18] found lubrication dysfunction in 34% of Iranian women. Öberg et al[24] found that 49% of Swedish women 18 to 65 years old had mild (sporadically occurring) lubrication insufficiency. Some studies found that with increasing age, in particular older than 50 years, lubrication insufficiency became more prevalent,[24–26] whereas others found no age dependency in this respect.[16] The Global Study of Sexual Attitudes and Behavior[20] reported the prevalence of lubrication problems ranged from 12% in Southern Europe and the Middle East to 28% in East and Southeast Asia.

Similar to the area of interest and desire, data from newer studies do not present information much different from previous studies. The only study by Lindau et al[31] presenting a relatively higher prevalence of arousal difficulties (ie, lubrication) of 41.9% was conducted in patients with diagnosed and undiagnosed diabetes. Thus, interpretation of the results of this study is difficult, because diabetes a risk factor for sexual dysfunction.

Orgasm

The prevalence of manifest orgasmic dysfunction varies considerably in epidemiologic reports. Nevertheless, in Australia,[19] Sweden,[17] the United States,[16,22,31] and Canada[32] the prevalence of orgasmic dysfunction seems to be approximately 16% to 25% and in Iran seems to be as high as 37%.[18] In most of these countries, age dependency was not evaluated, but in Australia, 50- to 59-year-old women were more likely to report orgasmic dysfunction than those 16 to 49 years old. Orgasmic dysfunction also was higher for older women in the Iranian and U.S. samples. A somewhat higher prevalence of orgasmic dysfunction (30%) was reported from Finland.[2] In other studies,[16,18,19,26,27,32] the prevalence of orgasmic dysfunction was much lower (11%–16%), whereas that of mild orgasmic dysfunction was remarkably high (approximately 60%) in two Nordic countries, where identical methodology was used. Thus, in these two countries, more than 80% of all sexually active women 18 to 74 years old reported some degree of orgasmic dysfunction. The prevalence of inability to have orgasm in the Global Study of Sexual Attitudes and Behavior[20] ranged

from 10% in Northern Europe to 34% in Southeast Asia. A much higher prevalence was found in a recent study conducted in Ghana,[30] with 72.4% of women experiencing orgasmic problems, but these were severe in only 8% of participants.

Dyspareunia and Vaginismus

Most studies of these two conditions indicate that they are less prevalent in the general population and newer studies do not differ much from the previous ones. In total, 6% of Moroccan[33] and Swedish[17] women reported some degree of vaginismus, which did not appear to be related to age. The prevalence of dyspareunia was reported as low as 1% in Australian women[34] and 2% in elderly British women,[35] whereas other studies found that dyspareunia was present in as many as 14% to 27% of women.[16,18,19,26,27,32] Several investigations described increasing dyspareunia with increasing age.[17,36] The Global Study of Sexual Attitudes and Behavior[20] reported pain during sexual intercourse to range from 5% in Northern Europe to 22% in Southeast Asia.

There are two studies suggesting a higher prevalence of dyspareunia and vaginismus. Amidu et al[30] reported the prevalence of vaginismus to be 68.1%, but it was severe in only 6% of participants. In a study by Ghanbarzadeh et al,[36] 54% of women felt pain during intercourse.

PREVALENCE OF MEN'S SEXUAL DYSFUNCTIONS

There are many publications on the prevalence of ED and PE, but few on the prevalence of other forms of male sexual dysfunction. These publications report very wide ranges of prevalence for these conditions. The reasons for the wide ranges of prevalence are the wide ranges of definitions of sexual dysfunction, populations studied, and study designs used in these publications. This review is intended to give a general, although imprecise, sense of the prevalence of sexual dysfunctions in men.

Desire and Interest

Twenty-four epidemiologically valid reports on the prevalence of men's interest and/or desire were identified. In different geographic locations and patient ages, the prevalence of decreased interest or desire was reported in the range of 15% to 25%[16,17,19,20,37–39] up to approximately 60 years of age, after which a sharp increase in prevalence occurred.[40] In general, dysfunction of sexual desire or drive was less prevalent than dysfunction of interest. Levels of sexual interest appeared quite stable from the late teens to approximately 60 of age, after which it decreased markedly.

Erectile Dysfunction

It is beyond the scope of this review to cover the details of the many individual studies performed in single nations or regions (see Fourth International Consultation on Sexual Medicine report of Committee 1 for a more detailed summary of these studies[14]). However, there are six international studies, each of which used consistent methods and definitions within each study in multiple international locations. It is useful to review the salient features of these six studies.

The study by Rosen et al[41] included the United States and six European countries. The prevalence rates were stratified for three decades beginning with 50 through 80 years of age and were approximately 31%, 55%, and 76%, respectively. The overall rates were similar for all countries and Europe only. Nicolosi et al[42] compared prevalence rates in Brazil, Italy, and two Asian regions in men 40 to 70 years of age. These were not stratified by age. The prevalence rates of 15% and 17% were similar for Brazil and Italy and were higher in Asia, at 22.4% in Malaysia and 34% in Japan. Rosen et al[43] in a second worldwide study compared prevalence rates in the United States, Brazil, Mexico, and five European countries. Including all these countries, the prevalence rates for ED were stratified by five decades and a single 6-year group of 70 to 75 years of age. Rates were in the teens for the three decades beginning with 20 through 49 years of age. For the next two decades, beginning at 50 to 69 years, prevalence rates of 22% and 30% were reported, with a prevalence rate of 37% for the 6 years of 70 to 75. The overall prevalence rate was 16% and the individual rates from the seven countries except the United States were below this rate, with the overall prevalence rate of ED in the United States being 22%.[41] In a second study from Nicolosi et al,[20] regional prevalence rates for 40 to 80 years of age from around the world were reported. Rates were stratified for age for all the countries and were low before 60 years of age, 15.2% for the seventh decade of life, and 22% for older than 70 years. The regional prevalence rates were similar for all regions and ranged from 8% to 15% except for Southeast Asia, where the prevalence rate was almost double to 22%. In 2005, Shabsigh et al[44] reported prevalence rates for ED from a large number of men who were not stratified by age from the United States and five European countries. The rates for France, Italy, and Spain were similar at 12% or 13%, whereas those for the United Kingdom, Germany, and the United States were higher at 19%, 22%, and 25%, respectively. In the same year, Laumann et al[45] reported prevalence rates in a large number of men from various regions of the world. The rates were 13% to 14% in Northern Europe, Southern Europe, Central and South America, and the Middle East. In the non-European West, the rate was higher at 21% but, as reported in the studies by Nicolosi et al,[20,42] the highest prevalence rates for ED were in two regions in Asia (27% in East Asia and 28% in Southeast Asia).

Since 2009, five new studies on the prevalence of ED that meet Prins score criterion of at least 10 have been published. These are two studies from Australia, one from Hong Kong, one from the Middle East, and one from Malaysia.[5,46–49] In the Chinese study, only 30.7% of 1,566 men 65 to 92 years old in Hong Kong were sexually active. Of the sexually active men, the overall prevalence of ED was 88%, with 4% having mild ED, 7.4% having moderate ED, and 77% having severe ED.[46] In the study from the Middle East, which was an online study offered to Middle Eastern Web surfers, the prevalence was 43.4% in men 18 to 39, 45.6% in men 40 to 49, and 66.7% in men 50 to 59 years old and the overall prevalence was 45.1% among the 804

men who completed the survey.[47] In the Malaysian study, the prevalence was 2.8% for men 40 to 49, 6.0% for men 50 to 59, 18.5% for men 60 to 69, and 29.5% for men 70 to 79 years old.[48] In the 2013 Australian study of 108,477 men at least 45 years old, the overall prevalence of ED was 61%, consisting of 25% with mild ED, 19% with moderate ED, and 17% with complete ED. Thirty-nine percent of men had no ED.[49] In the 2014 Australian study from Adelaide of 810 men 35 to 80 years old, the overall prevalence was 23.3% at baseline. Of the men with normal erectile function at baseline, 31.7% developed ED at 5-year follow-up but 29.0% had remission of ED at 5-year follow-up.[5]

It is especially important to note that there are great variances in the designs, methodologies, and definitions of ED in many studies. These variances are responsible for the disparities in prevalence in the different studies and they make comparison of studies difficult or impossible. The one consistent finding is that all studies that were stratified by age showed increasing prevalence of ED with increasing age.

An important issue to be addressed in future research is the validity and reliability of self-report data on ED generated in response to a single question compared with results from the validated, multi-item International Index for Erectile Function (IIEF),[50] which also is based on self-reports. The question of which of the two methods is more useful and accurate for large population studies remains controversial. A good correlation of each criterion in population samples has been reported.[51] A single self-assessment direct question to evaluate ED was applied to the population-based samples of the MMAS follow-up evaluation, in addition to the Brief Male Sexual Function Inventory (BMSFI) and the IIEF. Prevalence was similar to that determined on the IIEF, agreement was moderate (0.56–0.58), and association with previously identified risk factors was similar for each classification. The single question correlated well with these other measures ($r = 0.71$ to 0.78, $P < .001$). However, the incidence of subjects not classified because of missing data was 9% on the MMAS single question, 8% on the BMSFI, and 18% on the IIEF. Based on these data, the direct self-assessment question might be a practical tool for population studies, in which detailed clinical measurements of ED are impractical.

In summary, the prevalence of ED on a worldwide basis shows a great deal of variation. The way the information is collected, the way the population is selected and sampled, the tools used for the survey, and, most importantly, the way ED is defined vary greatly. To generalize from all studies, it is reasonable to estimate that in those younger than 40 years, the prevalence is 1% to 10%. In the decade from 40 to 49, the prevalence ranges from 2% to 15%. The 50- to59-year-old group showed the greatest range of reported prevalence rates, with an average falling between rates for men in their 40s and men in their 60s. Most studies show rates from 20% to 40% for 60 to 69 years of age. Almost all reports show prevalence rates of 50% to 100% for men in their 70s and 80s.

Ejaculation Dysfunctions

Before 2010, 22 descriptive epidemiologic investigations of ejaculatory disturbances were located. One of the problems with surveys regarding PE is the inconsistency of how the condition has been defined. There can be a considerable difference between the percentage of men who ejaculate before they wish and the percentage of men who find this bothersome enough to seek therapy.

The prevalence of PE varies from 8% to 30% for all age groups, except for 55% in 50- to 59-year-old men in one U.S. study[16] and 3.7% in men 18 to 75 years old in London.[52] In more recent studies, higher prevalence rates for PE from around the world, particularly from Asia and Latin America, have been shown. An exception is a study from China in which the rate of persistent PE for longer than 2 months was 8%, whereas a rate of 69% for any occurrence of ejaculatory abnormality within the previous year was found. In a Korean study, Ahn et al[53] reported on 1,570 men 40 to 79 years of age. A prevalence rate of 24.9% was found for not being able to control their ejaculation time.

After 2009, studies using stopwatch measurements of IELT and/or studies using the International Society for Sexual Medicine definition of PE have been reported from several countries in Asia.[54–57] Lee et al[54] used the Premature Ejaculation Diagnostic Tool (PEDT) and stopwatch measurements of IELT in the same study population and demonstrated the correlation and efficacy of these two diagnostic tools. The overall prevalence of self-reported PE was 19.5%. When the PEDT score was used, 11.3% and 15.6% of the 2,081 subjects were diagnosed with definite and possible PE, respectively. The IELT of 1,035 subjects was measured with a stopwatch. Of men with PE, 3.0% had an IELT no longer than 1 minute, 13.6% had an IELT of 1 to 2 minutes, 40.9% had an IELT of 2 to 5 minutes, and 22.7% had an IELT of 5 to 10 minutes. The remainder had IELTs longer than 10 minutes.

McMahon et al[57] evaluated and compared the prevalence of PE in 4,497 men in nine locations in the Asia-Pacific region including Australia and New Zealand, China, Hong Kong, Indonesia, Malaysia, Philippines, South Korea, Taiwan, and Thailand. McMahon et al also measured self-reported PE and ED in the same population. They concluded that PE was more prevalent than ED in the Asia-Pacific countries surveyed. However, only 40% of men with PEDT-diagnosed PE self-reported PE.

There is a paucity of reliable data on DE. Few investigators have reported on the prevalence of DE.[17,23,37,41,58] Rates for this disorder vary from 1% to 10%. It is speculated that the prevalence of DE or anejaculation in elderly men, many of whom are no longer sexually active, could be much higher.

Orgasm

It is difficult to assess the prevalence of orgasmic dysfunction because many men cannot distinguish between ejaculation and orgasm. In the United States, 8% of men reported that they had been unable to achieve orgasm during the past year.[16] In the epidemiology report from the 2009 International Consultation on Sexual Medicine, 16 of the 31 published prevalence datasets reported orgasm problem analysis in their surveys. Most studies reported prevalence rates in the range of 11.8% to 19.4%. The worldwide report of Nicolosi et al[20] showed a prevalence of 5% to 8% for all areas of the world except for East and Southeast Asia, where the prevalence was 10% to 15%. Other surveys have reported lower rates, ranging from 1.8% to 5.6%.[41,52,59–61]

Dyspareunia

The prevalence of genital pain in men during intercourse has been little studied. Nickel et al[62] reported a prevalence rate of painful ejaculation in a world survey of 16.8%. With this low prevalence, it is hardly surprising that no age dependency of men's dyspareunia has been found.

SEXUAL FUNCTION IN ADOLESCENTS AND YOUNG ADULTS

Sexual function in Canadian men 16 to 21 years old was reported in 2014.[63] One hundred fourteen men completed the IIEF and PEDT. Fifty one percent reported a sexual problem and 50% reported significant distress associated with the problem. Most problems occurred in relationship contexts. Based on IIEF scores, 15.8% reported mild to moderate ED (IIEF scores = 16–25), 8.8% reported moderate ED (IIEF scores = 11–15), and 1.8% reported severe ED (IIEF scores $\leq$ 10). ED and low desire were the most common problems and occurred in 23.7%. More years of sexual experience was associated with better erectile function and being in a sexual relationship was associated with better orgasm function.

In an Italian study,[64] 26% of 439 patients first presenting with a diagnosis of ED were no older than 40 years. The mean age of these men was 32.4 years. These younger patients had a lower rate of comorbid conditions, a lower mean body mass index, and higher mean total testosterone, but a higher rate of PE. They more frequently showed habits of cigarette smoking and use of illicit drugs.

In a cross-sectional study in Brazil where a questionnaire in public places was completed by 1,947 men 18 to 40 years (mean age = 28 years), ED prevalence was 35% (73.7% mild and 26.3% moderate to complete).[65] A greater frequency of ED was found in those participants who never had information about sex, experienced difficulties in the beginning of sexual life, had never masturbated, and had lower levels of education. ED was not associated with reported race, sexual orientation, employment, marital status, smoking, alcoholism, obesity, sedentary life, diabetes, hypertension, cardiovascular disease, hyperlipidemia, depression, or anxiety in these younger men. ED caused a negative impact in self-esteem, interpersonal relationships, work and leisure activities, and sexual life satisfaction.

In a cross-sectional study gleaned from a larger nationwide survey, sexual function problems were examined in 367 men who were active duty service members in the United States (age range = 21–40 years, average age = 31.43 years).[66] ED was assessed by the IIEF, sexual dysfunction by the Arizona Sexual Experiences Scale–Male, and quality of life by the World Health Organization Quality of Life–Brief. ED was present in 33.24% of participants. Those 36 to 40 years old, unmarried, non-white, and of lower educational attainment reported the highest rates of sexual function problems. Military personnel with poor physical and psychosocial health presented the greatest risk for ED. Sexual function problems were associated with a decreased quality of life.

CONCLUSION

The studies outlined in this article describe the incidence and prevalence of sexual dysfunctions in women and men. They demonstrate substantial variability in their findings. This is due to different factors: variations in the definition of sexual dysfunctions, sampling of the population, method of determining the presence of the dysfunction, age, cultural background, and method of data collection. However, they do demonstrate that most sexual dysfunctions increase with age, except for PE. In women, there is a high level of overlap among the different dysfunctions, whereas in men, the dysfunctions are more likely to occur with a discrete aspect of sexual functioning. Future research needs to build on these findings and use standardized, validated tools with clinical cutoff scores to classify dysfunction. Where possible, it is important to determine whether multiple dysfunctions are present, because this will inform treatment strategies. Cultural background, age, source of the sample, and methodology need to be described clearly. In this way, it will be possible to use the same methodology across multiple samples, so that a more accurate representation of the incidence and prevalence of female and male sexual dysfunction can be obtained.

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REFERENCES

1. Burri A, Spector T. Recent and lifelong sexual dysfunction in female UK population sample: prevalence and risk factors. **J Sex Med 2001; 8:2420.**
2. Kontula O, Haavio-Mannila E. Sexual pleasures. Enhancement of sex life in Finland. 1971–1992. Aldershot: Dartmouth; 1995.
3. Fugl-Meyer KS. Sexual disabilities and sexual problems. In: Fugl-Meyer KS, ed. Sex in Sweden. Stockholm: Swedish National Institute of Health; 2000. pp. 199.
4. Smith AMA, Lyons A, Ferris JA, et al. Incidence and persistence/recurrence of women's sexual difficulties: findings from the Australian Longitudinal Study of Health and Relationships. **J Sex Marital Ther 2012; 38:378.**
5. Martin SA, Atlantis E, Lange K, et al, members of the Florey Adelaide Male Ageing Study. Predictors of sexual dysfunction incidence and remission in men. **J Sex Med 2014; 11:1136.**
6. Gades NM, Jacobson DJ, McGree ME, et al. Longitudinal evaluation of sexual function in a male cohort: the Olmsted County Study of Urinary Symptoms and Health Status among Men. **J Sex Med 2009; 6:455.**
7. Johannes CB, Araujo AB, Feldman HA, et al. Incidence of erectile dysfunction in men 40–69 years old: longitudinal results from the Massachusetts Male Aging Study. **J Urol 2000; 163:460.**
8. Moreira ED, Lbo CF, Diament A, et al. Incidence of erectile dysfunction in men 40 to 69 years old: results from a population-based cohort study in Brazil. **Urology 2003; 61:431.**
9. Schouten BW, Bosch JL, Bernsen RM, et al. Incidence rates of erectile dysfunction in the Dutch general population. Effects of definition, clinical relevance and duration of follow-up in the Krimpen Study. **Int J Impot Res 2005; 17:58.**
10. Shiri R, Koskimaki J, Hakama M, et al. Effect of chronic diseases on incidence of erectile dysfunction. **Urology 2003; 62:1097.**
11. Shiri R, Koskimaki J, Hakama M, et al. Effect of life-style factors on incidence of erectile dysfunction. **Int J Impot Res 2004; 16:389.**
12. Wei M, Macera CA, Davis DR, et al. Total cholesterol and high density lipoprotein cholesterol as important predictors of erectile dysfunction. **Am J Epidemiol 1994; 140:930.**
13. Kaye JA, Jick H. Incidence of erectile dysfunction and characteristics of patients before and after the introduction of sildenafil in the United Kingdom: cross sectional study with comparison patients. **BMJ 2003; 326:424.**
14. McCabe MP, Sharlip ID, Lewis R, et al. Proceedings from the 4th International Consultation on Sexual Medicine—committee 1: current definitions, classification and epidemiology of sexual dysfunction in women and men. **2015.**
15. Osborn M, Hawton K, Gath D. Sexual dysfunction among middle-aged women in the community. **BMJ 1988; 296:959.**
16. Laumann EO, Paik A, Rosen RC. Sexual dysfunction in the United States: prevalence and predictors. **JAMA 1999; 281:537.**
17. Fugl-Meyer AR, Sjögren Fugl-Meyer K. Sexual disabilities, problems and satisfaction in 18—74 year-old Swedes. **Scand J Sexol 1999; 2:79.**
18. Safarinejad MR. Female sexual dysfunction in a population-based study in Iran: prevalence and associated risk factors. **Int J Impot Res 2006; 18:382.**
19. Richters J, Grulich AE, de Visser RO, et al. Sex in Australia: sexual difficulties in a representative sample of adults. **Aust N Z J Public Health 2003; 27:164.**
20. Nicolosi A, Laumann EO, Glasser DB, et al. Sexual behavior and sexual dysfunctions after the age 40: the Global Study of Sexual Attitudes and Behaviors. **Urology 2004; 64:991.**
21. Avellanet YR, Ortiz AP, Pando JR, et al. Relationship between loss of libido and signs and symptoms of depression in a sample of Puerto Rican middle-aged women. **P R Health Sci J 2008; 2:85.**
22. Shifren JL, Monz BU, Russo PA, et al. Sexual problems and distress in United States women: prevalence and correlates. **Obstet Gynecol 2008; 112:970.**
23. Groupe ACSF. In: Spira A, Bajos N, eds. Comportements sexuels et sida en France. Paris: Les Editions INSERM; 1998.
24. Öberg K, Fugl-Meyer AR, Sjögren Fugl-Meyer K. On categorization and quantification of women's sexual dysfunction. An epidemiological approach. **Int J Impot Res 2004; 16:261.**
25. Dennerstein L, Guthrie JR, Hayes RD, et al. Sexual function, dysfunction, and sexual distress in a prospective, population-based sample of mid-aged Australian-born women. **J Sex Med 2008; 5:2291.**
26. Johannes CB, Avis NE. Gender differences in sexual activity among mid-aged adults in Massachusetts. **Maturitas 1997; 26:175.**

27. Johnson SD, Phelps DL, Cottler LB. The association of sexual dysfunction and substance use among a community epidemiological sample. **Arch Sex Behav 2004; 33:55.**
28. Hayes RD, Dennerstein L, Bennett CM, et al. What is the 'true' prevalence of female sexual dysfunctions and does the way we assess these conditions have an impact? **J Sex Med 2008; 5:777.**
29. Eplov L, Giraldi A, Davidsen M, et al. Sexual desire in a nationally representative Danish population. **Int Soc Sex Med 2007; 4:47.**
30. Amidu N, Owiredu W, Woode E, et al. Incidence of sexual dysfunction: a prospective survey in Ghanaian women. **Reprod Biol Endocrinol 2010; 8:106.**
31. Lindau ST, Schumm PL, Laumann EO, et al. A Study of sexuality and health among older adults in the United States. **N Engl J Med 2007; 357:762.**
32. Gruszecki L, Forchuk C, Fisher WA. Factors associated with common sexual concerns in women: new findings from the Canadian Contraception Study. **Can J Hum Sex 2005; 14:1.**
33. Kadri N, Mchichi Alami KH, Mchakra T. Sexual dysfunction in women: Ppopulation based epidemiological study. **Arch Womens Ment Health 2002; 5:59.**
34. Smith AMA, Rissel CE, Richters J, et al. Sex in Australia: the rationale and methods and rationale of the Australian Study of Health and Relationships. **Aust N Z J Public Health 2003; 27:106.**
35. Barlow DH, Cardozo LD, Francis RM, et al. Urogenital ageing and its effect on sexual health in older British women. **Br J Obstet Gynaecol 1997; 104:87.**
36. Ghanbarzadeh N, Nadjafi-Semnani M, Ghanbarzadeh M-R, et al. Female sexual dysfunction in Iran: study of prevalence and risk factors. **Arch Gynecol Obstet 2013; 287:533.**
37. Nolazco C, Bellora O, Lopez M, et al. Prevalence of sexual dysfunctions in Argentina. **Int J Impot Res 2004; 16:69.**
38. Moreira ED Jr, Kim SC, Glasser D, et al. Sexual activity, prevalence of sexual problems, and associated help-seeking patterns in men and women aged 40–80 years in Korea: data from the Global Study of Sexual Attitudes and Behaviors (GSSAB). **J Sex Med 2006; 3:201.**
39. Corona G, Petrone L, Mannucci E, et al. The impotent couple: low desire. **Int J Androl 2005; 28(Suppl. 2):46.**
40. Korfage IJ, Roobol M, de Koning HJ, et al. Does "normal" aging imply urinary, bowel, and erectile dysfunction? A general population survey. **Urology 2008; 72:3.**
41. Rosen R, Altwein J, Boyle P, et al. Lower urinary tract symptoms and male sexual dysfunction: the Multinational Survey of Aging Male (MSAM-7). **Eur Urol 2003; 44:637.**
42. Nicolosi A, Moreira ED Jr, Shirai M, et al. Epidemiology of erectile dysfunction in four countries: cross-national study of the prevalence and correlates of erectile dysfunction. **Urology 2003; 61:201.**
43. Rosen RC, Fisher WA, Eardley I, et al. Men's Attitudes to Life Events and Sexuality (MALES) study: I. Prevalence of erectile dysfunction and related health concerns in the general population. **Curr Med Res Opin 2004; 20:601.**
44. Shabsigh R, Perelman MA, Lockhart DC, et al. Health issues of men: prevalence and correlates of erectile dysfunction. **J Urol 2005; 174:662.**
45. Laumann EO, Nicolosi A, Glasser DB, et al. Sexual problems among women and men aged 40–80 y: prevalence and correlates identified in the Global Study of Sexual Attitudes and Behaviors. **Int J Impot Res 2003; 17:39.**
46. Wong SYS, Leung JCS, Woo J. Sexual activity, erectile dysfunction and their correlates among 1,566 older Chinese men in Southern China. **J Sex Med 2009; 6:74.**
47. Shaeer O, Shaeer K. The Global Online Sexuality Survey (GOSS): erectile dysfunction among arabic-speaking internet users in the Middle East. **J Sex Med 2011; 8:2152.**
48. Tan WS, Ng CJ, Khoo EM, et al. The triad of erectile dysfunction, testosterone deficiency syndrome and metabolic syndrome: findings from a multi-ethnic Asian men study (the Subang Men's Health Study). **Aging Male 2011; 14:231.**
49. Weber MF, Smith DP, O'Connell DL, et al. Risk factors for erectile dysfunction in a cohort of 108,477 Australian men. **Med J Aust 2013; 199:107.**
50. Rosen RC, Riley A, Wagner G, et al. The International Index of Erectile Function (IIEF): a multidimensional scale for assessment of erectile dysfunction. **Urology 1997; 49:822.**
51. Derby CA, Araujo AB, Johannes CB, et al. Measurement of erectile dysfunction in population-based studies: the use of a single question self-assessment in the Massachusetts Male Aging Study. **Int J Impot Res 2000; 12:197.**
52. Nazareth I, Boynton P, King M. Problems with sexual function in people attending London general practitioners: cross sectional study. **BMJ 2003; 327:423.**
53. Ahn TJ, Park JK, Lee SW, et al. Prevalence and risk factors for erectile dysfunction in Korean men: results of an epidemiological study. **J Sex Med 2007; 4:1269.**
54. Lee SW, Lee JH, Sung HH, et al. The prevalence of premature ejaculation and its clinical characteristics in Korean men according to different definitions. **Int J Impot Res 2012; 25:12.**
55. Hwang I, Yang D-O, Park K. Self-reported prevalence of and attitudes toward premature ejaculation in a community-based study of married couples. **World J Mens Health 2013; 31:70.**
56. Zhang H, Yip AW, Fan S, et al. Sexual Dysfunction among Chinese married men aged 30–60 years: a population-based study in Hong Kong. **Urology 2013; 81:334.**
57. McMahon C, Lee G, Park J, et al. Premature ejaculation and erectile dysfunction prevalence and attitudes in the Asia-Pacific Region. **J Sex Med 2012; 9:454.**
58. Corona G, Jannini EA, Mannucci E, et al. Different testosterone levels are associated with ejaculatory dysfunction. **J Sex Med 2008; 5:1991.**
59. Enzlin P, Mak R, Kittel F, et al. Sexual functioning in a population-based study of men aged 40–69 years: the good news. **Int J Impot Res 2004; 16:512.**
60. Moreira ED Jr, Hartmann U, Glasser DB, et al. A population survey of sexual activity, sexual dysfunction and associated help-seeking behavior in middle-aged and older adults in Germany. **Eur J Med Res 2005; 10:434.**

61. Parish WL, Luo Y, Stolzenberg R, et al. Sexual practices and sexual satisfaction: a population based study of Chinese urban adults. **Arch Sex Behav 2007; 36:5.**

62. Nickel JC, Elhilali M, Vallancien G. Benign prostatic hyperplasia (BPH) and prostatitis: prevalence of painful ejaculation in men with clinical BPH. **BJU Int 2005; 95:571.**

63. O'Sullivan LF, Brotto LA, Byers ES, et al. Prevalence and characteristics of sexual functioning among sexually experienced middle to late adolescents. **J Sex Med 2014; 11:630.**

64. Capogrosso P, Colicchia M, Ventimiglia E, et al. One patient out of four with newly diagnosed erectile dysfunction is a young man—worrisome picture from the everyday clinical practice. **J Sex Med 2013; 10:1833.**

65. Martins FG, Abdo CHN. Erectile dysfunction and correlated factors in Brazilian men aged 18—40 years. **J Sex Med 2010; 7:2166.**

66. Wilcox SL, Redmond S, Hassan AM. Sexual functioning in military personnel: preliminary estimates and predictors. **J Sex Med 2014; 11:2537.**