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Prevalence of Sexual Dysfunctions: A Systemic Approach

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1. Introduction

This chapter is intended to provide an evidence-based overview of the worldwide epidemiology of sexual dysfunction since the 1990s in general populations of different countries, allowing for the generalization of findings at the given population level. The descriptive and analytic literature on sexual function was identified through searching conventional databases, literature surveys and references. This chapter is organized as follows: we first review epidemiological concepts focusing on the issue of determining prevalence; then, we review the female and male sexual dysfunctions prevalence.

Since only recently sexual function and sexual problems have been openly discussed in most societies and cultures (Tiefer, 2001), few epidemiologic data exist until the middle of the twentieth century. The large population-based study of normative data on female sexuality was published by Kinsey and coworkers in 1953. Recent studies, however, have presented a more accurate picture of sexual dysfunction prevalence.

2. The epidemiology of sexual dysfunction

Epidemiology is a scientific study of the distribution and determinants of diseases in populations. Epidemiological data are the basis for assessing the overall impact of a condition on a given society (Prins et al., 2002). These data are needed for public health systems in order to recognize the impact of the studied condition in the population and organize screening, diagnostic and treatment strategies. One of the basic epidemiological measures of outcome occurrence is *prevalence* which is defined as the proportion of a population exhibiting a health condition during a specific time interval (Simons et al. 2001). Moreover, prevalence is characterized by the proportion of a given population which has the condition at a given time. While prevalence can refer to any time period, researchers typically distinguish among point, period and lifetime prevalence. An important conceptual issue is to define sexual dysfunction which is used when it is clinically diagnosed. Another

issue is to select the study sample. Community-based samples are the most appropriate ones which define the potential number of patients sustaining the disorder/condition who might benefit from treatment. The study sample must be a representative of the studied population in terms of social, cultural and health status. And, the last one is to select the tools used for screening.

In this chapter, the criterion was the prevalence estimate for general populations, which included a representative sample of community with overall methodological quality. The internal validity of the study was assessed by data collection procedures, measurement instruments, defining health conditions and informative content of reported prevalence. External validity was assessed by the generalizability of the study and source of population, sampling, eligibility of criteria and response rate (Tsai et al, 2011).

The second important issue is that sexual dysfunction may be best conceptualized as the global inhibition of sexual response due to interpersonal factors (Hartmann et al, 2002) because many cases of sexual dysfunction can be regarded as the adaption to sexual relationship problems. In other words, sexual dysfunction must be seen in a multi-faceted socio-psycho-biologic context. Therefore, there are different scales for defining and classifying sexual dysfunction including the American Psychiatric Association's Diagnosis and Statistical Manual for Mental Disorder, 4th text revision (DSM-III or IV-TR), the World Health Organization's International Classification of Diagnosis (ICD-10), Profile of Female Sexual Function (PFSF), Female Sexual Function Index (FSFI), Golombok Rust Inventory of Sexual Satisfaction (GRISS), International Index of Erectile Function (IIEF), Sexual Function Questionnaire (SFQ) and other researcher-made validated questionnaires. Clearly, the type of applied definition affects the prevalence estimate of sexual problems. Although the database in both groups is rapidly growing, in this chapter, we tried to include all the recent studies of the field.

We focused on epidemiologic studies on sexual problems, sexual disorders or sexual distress which have estimated prevalence of one or more sexual problems for general populations in the world. Thus, we excluded studies with a small sample size and studies in special populations like specific health conditions.

In this review, we searched MEDLINE, SCIENCEDIRECT, PUBMED, GOOGLE SCHOLAR, JSTORE and JSTORE PROQUEST using the following key words: epidemiology, prevalence plus sexual dysfunction, sexual function disturbance, sexual disorder, dyspareunia, vaginismus, anorgasmia, lack of lubrication, sexual arousal, sexual desire, hypoactive sexual desire disorder, sexual aversion disorder, orgasmic disorder, erectile dysfunction, early ejaculation and premature ejaculation.

3. Prevalence of female sexual dysfunction

Despite increasing scientist interest in female sexual difficulty and dysfunction, the true prevalence of female sexual dysfunctions (FSD) in the general population remains a contentious issue. One reason is the great deal of variation in the published prevalence estimates of female sexual difficulties/ dysfunctions. This variation may be due, in part, to real differences among populations, and the way FSD is measured (Lindau et al., 2007). Lack of standardization of outcome measures is an important issue in the FSD literature which has been raised by previous authors. Also, different time frames have influenced the prevalence rate. If the period of study increases, prevalence increases, too (Mercer et al., 2003).

The prevalence of female sexual dysfunctions, as reported in reasonably valid descriptive investigations, are showed in Tables 1-4. There are currently four international data sets with some information about women's sexual problem; five studies in Africa, eleven studies in Asia, eleven studies in Europe and eleven studies in America.

3.1 Sexual interest/desire disorders

Table 1 show that the low level of sexual desire prevails in 11.2%-66.4% of subjects in different age strata. This indicates that sexual arousal dysfunction with this large variation is a worldwide problem at different ages. In several countries, there is a clear decline in sexual interest at advanced ages.

3.2 Arousal/lubrication disorders

There are genital and psychological aspects for arousal disorders. But, they are not explicitly separated. Insufficient lubrication generally appears in almost 49% of women. Also, it seems that this problem is more common in two ends of reproductive ages.

3.3 Orgasm disorders

The prevalence of orgasmic dysfunction varies considerably within and between different geographic areas and some researchers believe that this problem may or may not be age-dependent. The highest report belongs to India in which more than 86% of women report this problem. Also, this problem is very common among African women.

3.4 Dyspareunia

The manifest of genital pain during intercourse has been also reported by a large number of women all over the world. Overall, high prevalence of about 64% has been found in Asia and Africa.

Vaginismus is another painful condition during intercourse with high prevalence in Asia. But, it appears that there is clear lack of investigation of this problem in the world.

4. Prevalence of male sexual dysfunction

Male sexual dysfunction includes erectile dysfunction (ED), ejaculation disorders, orgasmic dysfunctions and disorders of sexual interest/desire. Epidemiologic studies have supported the high prevalence of male sexual dysfunction worldwide; however, the data are limited. Many of the epidemiologic studies are old and related to poor methodology. In this chapter, we reviewed 29 multiethnic studies about these problems. Tables 1-4 show validated studies on the prevalence of male sexual dysfunction.

4.1 Erectile dysfunction (ED)

Erectile dysfunction (ED) is defined as the consistent or recurrent inability of a man to attain and/or maintain penile erection sufficiently for a sexual activity. A 3-month minimum duration is accepted for the establishment of the diagnosis. Several studies have provided data on the prevalence of ED. The prevalence of ED on a worldwide basis has a great deal of variation around 9%-69%. And, there is a clear increase of this disorder at older ages. In all studies, ED has a rather high rate from 20% to 40% for the ages 60 to 69 years old, some increasing after the age of 65 years old.

4.2 Ejaculation disorders

Ejaculation disorders include early ejaculation, delayed ejaculation and anejaculation. The term early ejaculation is used to replace premature ejaculation, a term considered relatively inaccurate and pejorative. Early ejaculation is the ejaculation that occurs sooner than desired, either before or shortly after penetration, over which the sufferer has minimal or no control. Like all or most other dysfunctions, this is primarily a self-reported diagnosis. Delayed ejaculation is the undue delay in reaching a climax during sexual activity. Anejaculation is the absence of ejaculation during orgasm (Althof et al, 2006).

The major problem in assessing the prevalence of early ejaculation is lack of an accurate (validated) definition. It can be defined by time of ejaculation, in the context of the sufferer's or partner's satisfaction, the number of penile thrusts after intromission or even in the context of the amount of sexual stimulation. Similarly, there is lack of definition for the delayed ejaculation. The highest prevalence rate of 31% (men aged 18-59 years old) was given by the NHSLs study in the United States (Laumann et al., 1999). In the sub-groups aged 18 to 29, 30 to 39, 40 to 49 and 50 to 59 years old, the prevalence was 30%, 32%, 28% and 55%, respectively. These high prevalence rates may be a result of the dichotomous scale (yes/no) in a single question asking whether the ejaculation occurred too early or not.

4.3 Orgasmic dysfunction

Orgasmic dysfunction is the inability in achieving orgasm, markedly diminished intensity of orgasmic sensations or marked delay of orgasm during conscious sexual activity. There is a self-report of high sexual arousal/excitement in this disorder. Prevalence data on orgasmic dysfunction are scarce and report 5%-33% of all men in the world. One simple reason explaining the difficulty of assessing the prevalence of orgasmic dysfunction is that some men may be unable to distinguish between ejaculation and orgasm.

4.4 Sexual interest/desire dysfunctions

Sexual interest/desire dysfunctions are diminished or no feelings of sexual interest or desire, no sexual thoughts or fantasies and lack of responsive desire. This problem has been neglected in epidemiologic studies to some extent; but it is quite commonly seen in clinical practices. The prevalence rate of sexual interest disorders is 11%-28% around the world. The highest prevalence rate of sexual interest disorders was reported in a study conducted in Asia in men aged 40 to 80 years old. It seems that there is not any pronounced age effect on this problem. However, more research would shed more light on this issue.

	Problem or question	Sample size	Scale	Cohort age (year)	Prevalence (%)
Female					
Amidu et al, 2011	Overall sexual problems	301	GRISS	18-58	72.8
	Anorgasmia				72.4
	Sexual infrequency				71.4
	Dissatisfaction				77.7
	Vaginismus				68.1
	Avoidance of sexual intercourse				62.5

Laumann et al, 2005	Lack of sexual interest Inability to reach orgasm Orgasm too quickly Pain during sex Lubrication difficulties	967	Ad hoc questionnaire	40-80	43.4 23 10 21 23
Elnashar et al, 2007	Dyspareunia Decreased sexual desire Difficult arousal Anorgasmia	936	Ad hoc questionnaire	16-49	31.5 49.6 36 16.9
Kadri et al, 2002	Overall sexual dysfunction Hypoactive sexual desire disorder Sexual aversion disorder Orgasmic disorder Sexual arousal disorder Dyspareunia Vaginismus	728	DSM-IV	20-80	26.6 18.3 15 12 8.3 7.5 6.2
Hassanin et al, 2010	Overall sexual dysfunction Low sexual desire Dyspareunia Sexual dissatisfaction Lack of lubrication Low sexual arousal Orgasmic disorder	601	Ad hoc questionnaire	18-60	76.9 66.4 64 54 53 57 61
Male					
Seyam et al, 2003	Erectile dysfunction	805	Ad hoc questionnaire	20+ 50-59 60-69 70-79	10.3 26 49 52
Amidu et al, 2011	Overall sexual dysfunction Premature ejaculation Impotency No sensuality Avoidance	255	GRISS	19+	66 64.7 59.6 59.2 49

GRISS: Golombok Rust Inventory of Sexual Satisfaction

DSM-IV: Diagnosis and Statistical Manual for Mental Disorder, 4th

Table 1. Characteristics of African studies of sexual dysfunction

	Problem or question	Sample size	Scale	Cohort age (year)	Prevalence (%)
Female					
Shifren et al, 2008	Low desire	31581	CSFQ-14	18+	37.7

	Low arousal Low orgasm Any (desire, arousal or orgasm)				25.3 21.1 43.1
Lindau et al, 2007	Low desire Difficulty with vaginal lubrication Inability to climax	1550	Ad hoc questionnaire	57-85	43 39 34
Laumann et al, 2005	Lack of sexual interest Inability to reach orgasm Orgasm too quickly Pain during sex Pain during sex	1845	Ad hoc questionnaire	40-80	32.9 25.2 10.5 14 27.1
Bancroft et al, 2002	Lubrication problems Pain disorders No orgasm	987	DSM-IV	20-65	31 3 9
Addis et al, 2006	Overall sexual dysfunction	2109	Ad hoc questionnaire	40-69	24
Laumann et al, 2008	Lacked interest in sex	1550	Ad hoc questionnaire	57-64	45.4
				65-74	37.6
				75-85	49.3
	Unable to achieve orgasm			57-64	35
				65-74	33.4
				75-85	38.2
	Experienced pain during sex			57-64	18.2
				65-74	18.9
				75-85	11.8
Abdo et al, 2004	Lack of sexual desire Pain during sexual intercourse Orgasmic dysfunction	1219	Ad hoc questionnaire	18+	26.7 23.1 21
Laumann et al, 1999	Overall sexual dysfunction	1749	DSM-IV	18-59	43
	Lacked Interest in Sex			18-29	32
				30-39	32
				40-49	30
				50-59	27
	Unable to Achieve Orgasm			18-29	26
				30-39	28
				40-49	22
				50-59	23
	Experienced Pain During Sex			18-29	21
				30-39	15
				40-49	13
50-59		8			
Difficulty in Lubricating	18-29	19			
	30-39	18			
	40-49	21			
	50-59	27			

West et al, 2008	Low Sexual Desire Hypoactive Sexual Desire Disorder	2207	PFSF	30-70	36.2 8.3
Junior et al, 2005	Lubrication difficulties Lack of sexual interest	728	Ad hoc questionnaire	40-80	23.4 22.7
Male					
Lindau et al, 2007	Erectile difficulties	1455	Ad hoc questionnaire	57-85	37
Laumann et al, 2005	Lack of sexual interest Inability to reach orgasm Early ejaculation Pain during sex Erectile difficulties	2205	Ad hoc questionnaire	40-80	17.6 14.5 27.4 3.6 20.6
Laumann et al, 2008	Lacked interest in sex	1550	Ad hoc questionnaire	57-64	27.8
				65-74	28.7
				75-85	24.4
	Unable to achieve orgasm			57-64	16.1
				65-74	22.9
				75-85	33
	Experienced pain during sex			57-64	3
				65-74	3.2
				75-85	1
Derby et al, 2000	Erectile dysfunction	505	IIEF BMSFI	50-70	18 8
Ansong et al, 2000	Erectile dysfunction	5198	Ad hoc questionnaire	50-76 50-54 55-59 60-64 65-69 70-76	46.3 26 34.9 46.9 57.8 69.4
Moreira et al, 2001	Erectile dysfunction	1286	Ad hoc questionnaire	18+	46.2
Saigal et al, 2006	Erectile dysfunction	3566	Ad hoc questionnaire	20+	12.3
				20-29	4.7
				30-39	3.4
				40-49	7
				50-59	19.9
				60-69	27
				70-74	38
≥75	30				
Johannes et al, 2000	Erectile dysfunction	1156	Ad hoc questionnaire	40-69 40-49 50-59 60-69	25.9 12.4 29.8 46.4

Laumann et al, 1999	Overall sexual dysfunction	1410	DSM-IV	18-59	31
	Lacked interest in sex			18-29 30-39 40-49 50-59	14 13 15 17
	Unable to achieve orgasm			18-29 30-39 40-49 50-59	7 7 9 9
	Climax too early			18-29 30-39 40-49 50-59	30 32 28 31
	Trouble maintaining or Achieving an erection			18-29 30-39 40-49 50-59	7 9 11 18

CSFQ-14: Changes in Sexual Functioning Questionnaire short-form

DSM-IV: Diagnosis and Statistical Manual for Mental Disorder, 4th

PFSF: Profile of Female Sexual Function

IIEF: International Index of Erectile Function

BMSFI: Brief Male Sexual Function Inventory

Table 2. Characteristics of American studies of sexual dysfunction

	Problem or question	Sample size	Scale	Cohort age (year)	Prevalence (%)
Female					
Chen et al, 2003	Dyspareunia	112	Ad hoc questionnaire	40-55	44
Lau et al, 2005	Pain disorder Lubrication problems No orgasm No pleasure	3257	DSM-IV	18-59	11.4 23.7 13.1 16.2
Laumann et al, 2005	Lack of sexual interest Inability to reach orgasm Orgasm too quickly Pain during sex Lubrication difficulties	2106	Ad hoc questionnaire	40-80	39 36.7 21.9 30.4 36
Safarinejad 2006	Overall female sexual dysfunction Orgasmic disorder Orgasmic disorder Arousal disorders Pain disorders	2626	FSFI	20-60	31.5 37 35 30 26.7

Najafabady et al, 2011	Anorgasmia	1200	FSFI	20-40	26.3
Hisasue et al, 2005	Orgasmic disorder	5042	Ad hoc questionnaire	17-40	15.2
	Sexual desire disorder			17-40	32.2
	Arousal disorder			17-40	27.7
	Lubrication disorder			17-40	57.9
	Orgasmic disorder			40-70	29.7
	Sexual desire disorder			40-70	57.9
	Arousal disorder			40-70	12.5
	Lubrication disorder			40-70	51.2
Singh et al, 2009	Difficulties with desire	149	FSFI	18+	77.2
	Arousal disorder				91.3
	Lubrication problem				96.6
	Orgasmic disorder				86.6
	Pain disorder				64.4
Moreira et al, 2001	Lack of sexual pleasure	426	Ad hoc questionnaire	40-80	37
	Inability to reach orgasm				31
	Lubrication difficulties				29.4
	Pain during sex				28.1
	Lack of sexual interest				26.9
Sidi et al, 2007	Lack of orgasms	230	FSFI	18-70	59.1
	Low sexual arousal				60.9
	Lack of lubrication				50.4
	Sexual dissatisfaction				52.2
	Sexual pain				67.8
Sobhgol et al, 2007	Dyspareunia	319	Ad hoc questionnaire	15-49	54.5
Goshtasebi et al, 2009	Overall sexual dysfunction	1456	Ad hoc questionnaire	15+	52
	Desire difficulty				19.3
	Arousal difficulty				18.6
	Lubrication difficulty				11.9
	Orgasmic difficulty				21.3
	Pain difficulty				18.2
	Satisfaction difficulty				19.4
Male					
Lau et al, 2005	Pain disorder	1516	DSM-IV	18-59	3.4
	Erectile problems				9.6
	Premature orgasm				29.7
	No orgasm				7.2
Laumann et al, 2005	Lack of sexual interest	2701	Ad hoc questionnaire	40-80	23.8
	Inability to reach orgasm				19.1
	Early ejaculation				29.8
	Pain during sex				8.9
	Erectile difficulties				27.6
Nicolosi et al 2003	Erectile dysfunction	600	Ad hoc questionnaire	40-70	34

Junior et al, 2005	Early ejaculation Inability to reach orgasm Erectile difficulties Lack of sexual interest	471	Ad hoc questionnaire	40-80	30.3 14 13.1 11.2
Moreira et al, 2001	Early ejaculation Erectile difficulties Lack of sexual interest Inability to reach orgasm Sex not pleasurable	546	Ad hoc questionnaire	40-80	32.7 31.9 28.3 19.3 18.1
Kongkanand et al, 2000	Erectile difficulties	1259	Ad hoc questionnaire	40-70	37.5
Marumu et al, 2001	Erectile difficulties	1517	IIEF	23-29 30-39 40-49 50-59 60-69 70-79	19.2 2.3 9.5 15.7 34.4 53.4

DSM-IV: Diagnosis and Statistical Manual for Mental Disorder, 4th

FSFI: Female Sexual Function Index

IIEF: International Index of Erectile Function

Table 3. Characteristics of Asian studies of sexual dysfunction

	Problem or question	Sample size	Scale	Cohort age (year)	Prevalence (%)
Female					
Dennerstein et al, 2006	Hypoactive sexual desire disorder	2467	PFSF	50-70	12
Laumann et al, 2005	Lack of sexual interest Inability to reach orgasm Orgasm too quickly Pain during sex Lubrication difficulties	3494	Ad hoc questionnaire	40-80	27.6 20.9 9.6 10.4 17.2
Weiss et al, 2009	Arousal Disorder	1000	Ad hoc questionnaire	15-88	10.3
Ponholzer et al, 2004	desire disorders arousal disorders orgasmic problems Pain disorders	703	Ad hoc questionnaire	20-80	22 35 39 12.8
Hayes et al, 2008	hypoactive sexual desire disorder sexual arousal disorder (lubrication) orgasmic disorder dyspareunia	356	SFQ	20-70	16 7 8 1
Mercer et al, 2003	Lack of interest in sex	11161	ICD-10	16-44	40.6

	Unable to experience orgasm Premature orgasm Painful intercourse Trouble lubricating				14.4 1.3 11.8 9.2
Štulhofer et al, 2005	experienced sexual problems inhibited desire Inhibited arousal inhibited orgasm Dyspareunia	547	Ad hoc questionnaire	20-60	33.8 11.2 12.1 18.4 6.4
Dunn et al, 1998	Orgasmic Dysfunction Dyspareunia Vaginal Dryness problem with arousal inhibited enjoyment	979	Ad hoc questionnaire	18-75	27 18 18 17 18
Oksuz et al, 2006	overall sexual dysfunction desire problem arousal problem lubrication problem orgasm problem pain problem	518	FSFI	18-55	48.3 48.3 35.9 40.9 42.7 42.9
Danielsson et al, 2003	Dyspareunia	3017	Ad hoc questionnaire	20-60 20-29 30-39 40-49 50-60	9.3 13 10 8.6 6.5
TrÆen et al, 2010	Reduced sexual desire Problem achieving orgasm Genital pain	744	Ad hoc questionnaire	18-67	37 26 9
Male					
Braun et al, 2000	erectile dysfunction	4489	Ad hoc questionnaire	30-80 30-39 40-49 50-59 60-69 70-80	19.2 2.3 9.5 15.7 34.4 53.4
Laumann et al, 2005	Lack of sexual interest Inability to reach orgasm Early ejaculation Pain during sex Erectile difficulties	4311	Ad hoc questionnaire	40-80	12.7 10.6 21.1 3.6 13.1
Nicolosi et al 2003	erectile dysfunction	600	Ad hoc questionnaire	40-70	17
Mercer et al, 2003	Lack of interest in sex Unable to experience orgasm Premature orgasm	11161	ICD-10	16-44	17.1 5.3 11.7 17

	Painful intercourse Unable to achieve or maintain erection				5.8
Akkus et al, 2002	erectile dysfunction	1982	Ad hoc questionnaire	40+	69.2
Dunn et al, 1998	Difficulty getting erection Difficulty maintaining erection erectile dysfunction Premature ejaculation inhibited enjoyment	789	Ad hoc questionnaire	18-75	21 24 26 14 9
Giuliano et al, 2002	erectile dysfunction	1004	IIEF-5	40+ 40-49 50-59 60-69 ≥70	31.6 32.2 27 19.7 21
Parazzini et al, 2000	Erectile Dysfunction	2010	Ad hoc questionnaire	18+ 18-29 30-39 40-49 50-59 60-70 >70	12.8 2.8 1.9 4.8 15.7 26.8 48.3
Blanker, M et al, 2001	Erectile dysfunction Ejaculatory dysfunction	1688	ICS male sex questionnaire	50-54 55-59 60-64 65-69 70-78 50-54 55-59 60-64 65-69 70-78	3 5 11 19 26 3 5 11 21 35
TrÆen et al, 2010	Reduced sexual desire Problem achieving orgasm Genital pain	873	Ad hoc questionnaire	18-67	13 6 2
Martin-Morales et al, 2001	Erectile dysfunction	2476	IIEF Simple question	25-70	18.9 12.1

PFSF: Profile of Female Sexual Function

SFQ: Sexual Function Questionnaire

ICD-10: International Classification of Diagnosis-10

FSFI : Female Sexual Function Index

IIEF-5: International Index of Erectile Function-5

IIEF: International Index of Erectile Function

Table 4. Characteristics of European studies of sexual dysfunction

5. Conclusions

Existing epidemiologic data on sexual dysfunction support high prevalence of these problems worldwide. However, the data are limited and the prevalence data on male sexual dysfunction, except for ED, are too limited. Widely accepted definitions of disorders and scales are primary prerequisites to make prevalence comparisons possible and describe the severity of the problem.

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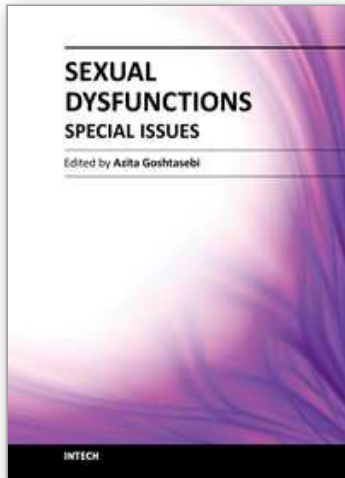
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