

EPIDEMIOLOGY/RISK FACTORS

Comorbidities Among Sexual Problems in Men: Results From an Internet Convenience Sample

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ABSTRACT

Introduction: Men suffering from one sexual problem sometimes report having another sexual problem, but few studies have determined concordance rates among dysfunctions in non-clinical samples.

Aim: This study determined comorbidities among sexual dysfunctions based on an internet convenience sample of 4432 men from Hungary, the USA, and other world regions that visit social media fora.

Method: Participants completed an online 55-item questionnaire that included questions assessing erectile dysfunction (ED), premature ejaculation (PE), delayed ejaculation (DE), and lack of sexual interest (LSI).

Main Outcome Measures: Concordance rates and odds ratios among sexual dysfunctions.

Results: Approximately 8% of men suffered from two or more sexual problems; men with a severe sexual problem were significantly more likely to suffer from a second sexual problem; concordance between PE and erectile dysfunction ranged from 23–29%, with subtypes of lifelong vs acquired PE showing patterns similar to one another; and most men with delayed ejaculation reported minimal problems with LSI, although LSI was generally key to understanding all other dysfunctions.

Conclusion: The percentage of men with one sexual problem having a second sexual problem was substantial, ranging from 23–40%. These findings will help clinicians better understand the intertwined nature of sexual problems and assist them in developing management protocols that address concomitant inadequacies in sexual response. **Rowland DL, Oosterhouse LB, Kneusel JA, et al. Comorbidities Among Sexual Problems in Men: Results From an Internet Convenience Sample. Sex Med 2021;9:100416.**

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Key Words: Sexual Dysfunction; Concordance; Comorbidity; Erectile Dysfunction; Premature Ejaculation; Lack of Sexual Interest; Delayed Ejaculation

INTRODUCTION

Sexual behavior in men presupposes multiple dimensions or phases, including the presence of sexual desire, sexual arousal, and ejaculation/orgasm.^{1–3} Sexual desire is a motivation-related psychological construct intended to explain the likelihood and strength of a sexual response and, broadly speaking, represents the man's interest

in and/or psychological readiness to engage in sexual activity. Sexual arousal is a cerebral and peripheral process induced not only through various modes of sensory stimulation, but also, in the absence of external stimuli, through self-generated fantasy which can provoke an autonomic arousal (eg, erectile) response.³ The third phase, ejaculation, involves a two-stage cerebral-spinal process of semen emission and expulsion, with local sensory information coursing to the brain to mediate the subjective experience of orgasm.

Interdependence of the Phases of the Sexual Response Cycle in Men

The phases of sexual response are considered interdependent and contiguous, with each potentially affecting, and being affected by, the other. Thus, in men, sexual desire and interest are likely to influence the man's arousal level, which in turn affects the likelihood of ejaculation. Furthermore, each process is likely to feedback

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prospectively to the other, for example, sexual desire and arousal may subsequently be influenced by recent positive or negative experiences related to ejaculation and orgasm.⁴ Distinctions among phases are important for multiple reasons. First, the neurological substrates and psychological processes for each of these phases are distinct. Second, these phases give rise to the nosology and classification of sexual dysfunctions^{5,6} which, in men, include a lack of sexual interest or desire (LSI); problems with arousal (usually erectile dysfunction [ED]); and problems with ejaculation, that is, typically ejaculating before desired (premature ejaculation [PE]) or having difficulty reaching ejaculation (delayed ejaculation [DE]). Third, treatment strategies for different phase-related sexual problems may involve different approaches and/or sets of options.⁷

Comorbidities Among Sexual Problems

An extensive research literature has demonstrated a myriad of biological, psychological, and relationship factors that increase the risk of experiencing a sexual problem.^{8–11} Because the phases of sexual response are interrelated, dysfunction within one phase may present a risk for a sexual problem/dysfunction in another phase, as is the case, for example, when LSI results in insufficient sexual-psychological arousal to produce an erection sufficient for intercourse. However, a problem in one phase of the sexual response cycle can also occur independently of responses in other phases: for example, a man may experience a strong level of sexual interest but, for any number of biological and/or psychological reasons, be unable to attain and/or sustain an adequate erection. Understanding such concurrences—or comorbidities—among sexual problems is important for multiple reasons. First, it provides guidance to the sexual healthcare specialist regarding the sexual domains that should be investigated when responding to a patient's sexual complaint, and second, it may guide the management of the sexual problem, particularly if one problem can be identified as primary—constituting the root cause of the problem—and the other as secondary, that is, one that occurs as a by-product of the other.¹²

Only a handful of studies have actually determined the prevalence of sexual comorbidities in men, that is, the extent to which having one sexual problem serves as a risk factor for having a second (or even third) sexual problem. Of the possible sexual comorbidities, the concurrence of PE and ED is best documented. For example, the rate of having combined PE and ED has been reported from 1% to over 75%, depending on the severity of the ED, the probability level of having PE, the PE subtype (lifelong vs acquired), and the diagnostic criteria applied.^{13,14} Using a slightly different approach, meta-analysis investigating concomitant ED and PE has suggested that PE is associated with over a threefold increased risk of ED,¹⁵ and more specific PE analysis on PE subtypes has suggested greater ED comorbidity in men having acquired (vs lifelong) PE.¹⁶ Thus, the understanding of the concurrence of PE and ED—although not complete—has at least received cursory attention and documentation.

In contrast, comorbidities among most other sexual dysfunctions are less well documented. For example, we identified only one study demonstrating the concurrence of LSI and ED. Specifically,

Salonia and colleagues¹⁷ reported that 4% of men with LSI also reported ED, but this rate was determined in men seeking medical help for a dysfunction and not in a non-patient sample. And perhaps not unexpectedly, delayed or absent ejaculation was found to be quite common among clinical samples of men reporting ED.¹⁸ Generally, however, for comorbidities among dysfunctions other than PE and ED, reliable data based on large-scale community samples are sparse. As a result, the probability of specific concomitant dysfunctions remains at best only partly/poorly documented, affording sexual healthcare specialists little guidance regarding an efficient investigatory path within a time-limited clinical visit.

AIMS

In an attempt to increase the database—and thus our understanding—of the prevalence of sexual comorbidities in men, we assessed concurrence rates and odds ratios among sexual dysfunctions in a large internet convenience sample of men. Specifically, we (1) determined the prevalence of each of the sexual dysfunctions: LSI, ED, DE, and PE (including lifelong and acquired); (2) determined concordance rates (CR) and odds ratios (OR) among pairs of sexual dysfunctions; (3) carried out a sub-analysis to determine CRs and ORs for specific PE subtypes—lifelong and acquired; and (4) determined percentages of men having more than two sexual dysfunctions. Due to the data-driven approach of this study, we did not formulate formal hypotheses but approached our analyses with several expectations based on the research literature, including the assumptions that ED would show significant comorbidity with both PE and DE, that comorbidity between PE and ED would be higher for men with acquired PE than lifelong PE, and that few men would exhibit more than two sexual dysfunctions.^{13–18}

METHODS

Participants

Participants were recruited through voluntary self-selection to complete a survey on sexual health. The survey completion rate was 81% of those who initially opened the survey (n = 6011). After exclusion of men who had never had a sexual partner (n = 420) or who showed inconsistency in responding (n = 9), the final internet convenience sample consisted of 4432 men at least 18 years of age (mean = 39.2, SD = 13.3; range = 18–85).

Data were obtained through two approaches. The first consisted of men predominantly from the USA (as well as from several other English language countries) recruited through the research homepage, online postings on the forums of reddit.com, and unpaid public and social media (eg, Facebook) announcements (n = 793). The second consisted of men predominantly from Hungary visiting comparable online posting sites in Hungary, visiting the Hungarian research homepage, and through unpaid public and social media (eg, Facebook) announcements (n = 3639). A third group of men attending a major university in Hungary volunteered to take a pencil-and-paper version of the survey (n = 134) for the exclusive purpose of

enabling test-retest reliability analysis on selected response items (see Procedure); their data were not included in the analyses.

Questionnaire

As part of the survey development, a pilot was conducted with seven focus groups, two from the USA ($n = 10$, mean age = 32.4), and five from Hungary, these latter groups comprised mainly of university students across a variety of professional and non-professional disciplines ($n = 79$, mean age = 20.7). Groups reviewed survey items, commented on their relevance, suggested wording clarifications and response categories, appraised overall item face-validity, and assessed the time required for survey completion. For Hungarian participants, the survey was translated to Hungarian by a professional translator and then back-translated to English by a second professional translator to ensure preservation of meaning.

The 55-item survey took about 20–25 minutes to complete. Participants were guaranteed anonymity, and safeguards were implemented to prevent multiple submissions. In addition, several items were used as “attention checks,” such that cases having inconsistent or contradictory responses on these items were dropped from the analysis.

Two sections of the survey were used in this analysis. The first gathered information about demographics, lifestyle behaviors, medications, and medical and sexual history, including questions regarding pornography use, sexual orientation, gender identity, partner status, overall relationship and sexual satisfaction, and frequency of masturbation and partnered sex. The second section assessed the phases of sexual response during partnered sex—sexual desire/interest, erectile response, and ejaculatory function (premature and delayed); for these items, the past 12 months and/or the current/most recent sexual relationship were used as the reference point.

Procedure

Ethics approval was obtained from the Institutional Review Boards of the authors' universities in the USA and Hungary. Informed consent was obtained from participants, with their needing to check boxes attesting (1) to being at least 18 years of age and (2) to their informed consent before accessing the survey, with the stated option of ending participation at any point by closing the webpage. As a reliability check, participants taking the pencil-and-paper version of the survey were assigned an anonymous code and retested 4–6 weeks later for reliability analysis.

Defining Dysfunctional Categories and the Overall Analytical Strategy

Dysfunctional Categorizations. To assess ED and PE, items from the IIEF-5 and PEDT were embedded in the larger survey; these psychometrically-validated instruments have been used extensively in research studies on sexual dysfunction.^{19,20}

Delayed ejaculation (DE) was evaluated with one item about difficulty reaching orgasm/ejaculation in conjunction with participants estimated ejaculatory latency (EL) during partnered sex. Lack of sexual desire/interest (LSI) was evaluated by combining ratings on two items: the “importance of sex” and “interest in sex.”

Specifically, for each dysfunction, we created three categories based on men's sexual response during partnered sex: no/low, moderate/probable, and severe/definite dysfunction. As noted, for PE and ED, these categorizations relied on questions drawn from the IIEF-5 and PEDT, selecting only those questions most relevant to the construct/definition of the dysfunction under question.¹ Thus, for the four selected IIEF items (scaled 1–5, with lower scores representing greater ED), scores of 4–9 represented “moderately-severe to severe ED,” 10–13 represented “moderate ED,” and 14–20 represented “mild to no ED.” In presenting the results, this scale was reverse-scored so greater levels of all dysfunctions were represented by higher scores, enabling easier interpretations of comorbidities. For determining PE based on the three PEDT items (scaled 1–5, with higher scores representing greater probability of PE), scores 13–15 represented “definite PE,” 9–12 represented “probable PE,” and <9 represented “no PE.”

We used similar strategies to represent the two other male sexual dysfunctions, DE and LSI. DE was based on an experimenter-derived question about difficulty reaching orgasm (scaled 1–5, with higher scores representing greater severity). Specifically, 1–3 represented “no/mild DE,” 4 represented “moderate DE,” and 5 represented “severe DE.” For those falling into the “severe” category (ie, 5), we stipulated a second condition of an estimated EL ≥ 20 minutes (including not ejaculating at all) during partnered sex. Men indicating “5” but not meeting the EL ≥ 20 minute-criterion and men indicating “4” comprised the “moderate” category as long as the men in either group met a second condition of an estimated EL ≥ 15 (and <20) minutes. The selection of these EL criteria was based on recent data suggesting 15 and 20 minutes as plausible secondary criteria for probable and definite DE.²¹ For LSI, we used question #12 from the IIEF (rate your sexual desire/interest), and supplemented it with a second question regarding the “importance of sex.” As these questions were correlated ($r_s = 0.71$)—and thus tapping into the same general construct—we combined them to generate a composite variable (LSI). Specifically, scores for this composite variable ranged from 2–10; those with scores of 2–4 represented “no lack of interest;” 5–7 represented “moderate lack of interest;” and 8–10 represented “strong lack of interest.” In summary, each new variable had three categories of dysfunction (no/mild, moderate, severe dysfunction), with higher scores representing greater dysfunction. For three dysfunction variables—cumulative IIEF, cumulative PEDT, and

¹We did not include all items from the IIEF-5 or the PEDT, as one item from the IIEF-5 focused on satisfaction during intercourse and would have compromised the measure of erectile function, and two items from the PEDT focused on distress/bother rather than ejaculatory control, the central component of premature ejaculation.²²

composite LSI—test-retest correlations were 0.850, 0.850, and 0.750 respectively, indicating a reasonably high degree of reliability for these survey items.

Concordance Rates and Odds Ratios. We established concordance rates (CR) and odds ratios (OR) for men having severe/definite levels of each dysfunction, by calculating the percentage (and related OR) of men who reported having moderate/probable and severe/definite levels of another dysfunction. Determining CRs among dysfunctions using this strategy requires that one of the sexual dysfunctions under investigation serve as the reference group. For example, the CR between ED and LSI may be investigated in two ways: Specifically, for those men with severe/definite ED, we can ask what percentage also showed moderate and/or severe LSI, or we can ask, for those men showing severe/definite LSI, what percentage also showed moderate and/or severe/definite ED. In our analysis, we investigated both options, based on the rationale that men with severe levels of dysfunction (vs mild or moderate) would more likely seek treatment, and thus be encountered in a clinical situation.²³

In an ancillary analysis of PE, we further divided men into those reporting lifelong vs acquired PE. In a final analysis, we determined the percentage of men reporting three concomitant dysfunctions. All analyses were carried out with SPSS v.25 (IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0 Armonk, NY).

RESULTS

Description of the Sample (Aim 1)

Table 1 provides basic demographic and sexual characteristics of the sample, including age, education, sexual orientation, current sexual partner status, and the percent having ongoing anxiety/depression and an ongoing (chronic) medical condition considered a risk factor for sexual dysfunction. Table 2 shows the numbers and percentages of men having each dysfunction, for both severe/definite and moderate/probable categories. The combined (moderate plus severe) percentage for ED was 14%; for DE, 14%; and for LSI, 27%.

For PE, the combined percentage was 28.0%. Of those specifying a PE-subtype, 70% (about 16% of the total sample) indicated a lifelong problem while 30% (about 8.0% of the total sample) indicated the problem was acquired later in life; a number of men (24%) categorized with PE did not specify either subtype. When these men were included, the percent of men indicating lifelong PE was approximately 53% of the total PE group; those indicating acquired PE was 21%.

Two-Way CRs and ORs Across Sexual Dysfunctions (Aim 2)

Two-way CRs and ORs are reported for each of the following pairs of sexual dysfunctions in Table 3: PE and LSI; PE and ED;

Table 1. Demographics of study participants.

Age	N = 4432 (%)
18–21	328 (7.4)
22–30	1,064 (24)
31–40	1,108 (25)
41–50	1,068 (24)
51–60	532 (12)
61–70	270 (6.1)
71+	62 (1.4)
Education	
Less than high school	186 (4.2)
High school	1,197 (27)
Post-high school	620 (14)
Some college	798 (18)
Bachelor's degree	709 (16)
Graduate degree	931 (21)
Sexual orientation	
Asexual/Non-sexual	9 (0.20)
Only/primarily attracted to women	3,856 (87)
Bisexual	66 (1.5)
Only/primarily attracted to men	488 (11)
Current sexual partner	
No sexual partner	931 (21)
One sexual partner	3,058 (69)
Multiple sexual partners	443 (10)
Anxiety/Depression	
No	3,590 (81)
Yes	842 (19)
Ongoing medical issues	
No	3,457 (78)
Yes	975 (22)

LSI and ED; ED and DE; and DE and LSI. CRs and ORs were not generated for DE and PE, as these conditions presumably represent mutually exclusive dysfunctions. ORs ranged from 1.08 to 4.83, with all but two pairs reaching $P < .05$, and 5 of the 10 reaching $P < .01$.

We also determined percentages of concurrence relative to the overall sample, using the same procedure as that used for determining CRs and ORs. For the overall sample, 0.75–1.8% of men reported comorbid PE and LSI; 1.0–1.3% reported comorbid PE and ED; 0.41–1.3% reported comorbid LSI and ED; 1.7–1.9% reported comorbid ED and DE; and 0.4–1.5% reported comorbid DE and LSI. The cumulative estimated probability of a man having any two concomitant sexual problems was estimated at 7.8%.

CRs and ORs for PE Subtypes: Lifelong and Acquired (Aim 3)

Men with PE were subdivided into lifelong and acquired. For these analyses, only the definite PE subgroups were used as reference groups (ie, used as the denominator in calculations) (Table 3).

Table 2. Percentages of men reporting no/mild, moderate/probable, and severe/definite sexual problems.

(N = 4432)	PE	ED	DE	LSI
None to Mild	3,235 (73%)	3,812 (86%)	3,856 (87%)	3,235 (73%)
Moderate/Probable	887 (20%)	421 (9.5%)	377 (8.5%)	1,020 (23%)
Severe/Definite	310 (7.0%)	199 (4.5%)	199 (4.5%)	177 (4.0%)
Combined Moderate/Severe	1,240 (28%)	620 (14%)	620 (14%)	1,197 (27%)

ED = erectile dysfunction; DE = delayed ejaculation; LSI = lack of sexual interest; PE = premature ejaculation.

Table 3. CRs and ORs (with *P*-values) of men with severe sexual dysfunctions who also have another moderate or severe sexual dysfunction.

For men reporting. . .		% of men also having. . .			
		Moderate/ Severe PE	Moderate/ Severe DE	Moderate/ Severe ED	Moderate/ Severe LSI
Severe PE	Combined %	-	-	23%	31%
	Partitioned %	-	-	15%/7.6%	28%/2.3%
	Odds-ratio	-	-	2.04	1.33
	<i>P</i> -value	-	-	.001	.043
Severe DE	Combined %	-	-	31%	28%
	Partitioned %	-	-	20%/11%	25%/3.0%
	Odds-ratio	-	-	3.93	1.08
	<i>P</i> -value	-	-	.001	.7
Severe ED	Combined %	29%	38%	-	37%
	Partitioned %	17%/12%	23%/16%	-	34%/3.2%
	Odds-ratio	1.21	4.83	-	1.78
	<i>P</i> -value	.3	.001	-	.001
Severe LSI	Combined %	39%	40%	23%	-
	Partitioned %	32%/7.1%	21%/19%	17%/6.3%	-
	Odds-ratio	1.90	1.73	1.97	-
	<i>P</i> -value	.005	.05	.01	-

Notes: "-" because severe PE and severe DE represent mutually exclusive categories, CRs and ORs are not presented. *P*-values in bold are < .05.

Comorbidity With ED. Of the men having definite lifelong PE, 9.1% also had severe ED and 17% had moderate ED. Of the men having definite acquired PE, 7.1% also had severe ED and 16% had moderate ED.

Comorbidity With LSI. Of the men having definite lifelong PE, 3.0% also had a severe/definite LSI and 28% had moderate/probable LSI. Of the men having definite acquired PE, 1.7% also had severe/definite LSI and 35% had a moderate/probable LSI.

ORs indicated that men with definite PE, whether lifelong or acquired, were more likely to show moderate/severe ED than those with no/probable PE, but only the lifelong group reached significance ($P = .02$). Men with lifelong vs acquired PE showed divergent concurrence patterns with LSI: those with lifelong PE showed decreased odds of LSI, whereas those with acquired PE showed increased odds of LSI. However, neither reached significance.

Three-Way Concordances (Aim 4)

Percentages of men reporting three concomitant sexual dysfunctions were also determined. We first assessed three-way concordances only for men in the severe/definite categories for each of the three dysfunctions. We then assessed them for men in both severe/definite and moderate/probable categories for each of the three dysfunctions.

Having three severe dysfunctions was rare: 1 participant reported concomitant severe DE, ED, and LSI, and 2 reported concomitant severe PE, ED, and LSI. When restrictions were eased to include those having severe *and* moderate dysfunctions, 54 men reported concomitant moderate-to-severe DE, ED, and LSI, a number representing 1.3% of the total sample, and 15% of those of the DE-ED-LSI subgroups. In addition, 54 participants reported concomitant moderate-to-severe PE, ED, and LSI, a number representing 1.3% of the total sample, and 27% of the PE-ED-LSI subgroups.

Table 4. CRs and ORs (with *P*-values) of men with severe lifelong or acquired PE who also have another moderate/severe sexual dysfunction.

For men reporting...		% of men also having...	
		Moderate/Severe ED	Moderate/Severe LSI
Severe Lifelong PE	<i>Combined %</i>	26%	31%
	<i>Partitioned %</i>	17%/9.1%	28%/3.0%
	<i>Odds-ratio</i>	1.59	0.98
	<i>P-value</i>	.02	.9
Severe Acquired PE	<i>Combined %</i>	23%	36%
	<i>Partitioned %</i>	16%/7.1%	35%/1.7%
	<i>Odds-ratio</i>	1.15	1.42
	<i>P-value</i>	.7	.2

Note: *P*-values in bold < .05.

DISCUSSION

This study provides new data and insights into comorbidities across various sexual dysfunctions. Highlighted by this analysis—and mentioned repeatedly in other reports—is that substantial variation in prevalences and comorbidities results from the specific criteria used to define the dysfunctional groups, with stricter criteria yielding lower prevalences and concordance rates. In our analysis, we explored two criterion levels—severe/definite and moderate/probable—such that the effects of criterion stringency could be compared. We also viewed comorbidities using each “severe” dysfunction as the reference group, as the way the question is phrased impacts the CRs and ORs among dysfunctions.

General Baseline Rates of Sexual Dysfunctions and Sexual Comorbidities

Prevalence rates for each of the dysfunctions were generally consistent with those reported in the literature. For example, the prevalence for “definite” PE was 7.5%, a rate that aligns well with several other community-based samples.^{8,24–26} When men with “probable” PE were included, the combined prevalence of 27% was consistent with early research suggesting about a 30% prevalence based on less stringent criteria, for example, a single item querying about “climaxing too early”.^{8,27} Regarding PE subtypes, not all men classified themselves as either lifelong or acquired, but of those that did, about a 2:1 ratio was found for lifelong to acquired. This distribution differs from other studies which have indicated approximately equal percentages for lifelong and acquired PE. However, many of those studies included only patient groups and thus may have been compromised by treatment-seeking bias.^{28–30} Ours is one of the few studies to assess such percentages in a community sample that includes men with and without dysfunctions.

The prevalence rate for men with severe ED was 4.1%, and when moderate ED was included, the combined prevalence rose to 14%, close to the rate of 11% reported by Rosen et al³¹ and consistent with rates summarized by others^{8,27} for men in their 30's and 40's.

Severe DE prevalence in our sample was 5%, under the 9% reported by Laumann et al²⁷ using a dichotomous categorization for “unable to achieve orgasm,” but falling within the 1–10% summarized by Lewis et al.⁸ When men with moderate DE were added, the combined percentage rose to 13%.

The prevalence for severe LSI in our sample was 3.6%, and when combined with moderate LSI, the rate rose to 26%, substantially higher than reported in one study,²⁶ yet similar to other studies indicating about 25% LSI in men ranging in age from 16–80.⁸

Thus, prevalences for all dysfunctions in our sample—not only those for which standardized procedures exist (eg, PE and ED) but also those lacking consensus criteria (eg, LSI and DE)—were generally well within the ranges of other studies, establishing a foundation of both credibility and confidence for the CRs and ORs reported for comorbidities.

CRs and ORs Across Sexual Dysfunctions

The comorbidity rate for any two sexual problems *within the overall sample* was quite low, ranging from a low of 0.41% to a high of nearly 2% for various pairs of sexual problems. However, a cumulative percent derived across comorbidity pairs suggests that about 8% of the overall sample experienced two or more concurrent sexual problems.

The most consistent finding regarding sexual comorbidities can be summarized by the following: all but two ORs were significant at the 0.05 level, indicating that for nearly all sexual dysfunctions defined as severe, the probability of having a second moderate-to-severe dysfunction was significant (that is, higher than for those men having no or moderate levels of the dysfunction). Even with a more stringent alpha, 5 of the 10 ORs were significant.

Several specific comorbidity patterns deserve further comment and interpretation. The first pattern is the relationship between PE and ED, one that has garnered considerable attention in the past.^{13–16,32–34} The concordance between these two dysfunctions in our sample ranged from 23–29% (depending

on which group was selected as the reference), with a significant OR of 2.04. In other words, men having definite PE were twice as likely to show moderate to severe ED as men having no or probable PE. To provide context within the research literature, our CR was slightly higher than the approximately 20% reported in two Asian observational studies,^{14,16} yet our OR was slightly lower than the 3.35–3.70 reported in Corona *et al.*'s meta-analysis.¹⁵ The correlation (not presented in the Results) between the included PEDT and IIEF items in our sample was 0.34, substantially lower than the 0.64 reported by Brody and Weiss.³³ As noted previously, however, many of the studies in the meta-analysis¹⁵ included only treatment-seeking patients, either for a sexual problem or another medical disorder, with self-selection for treatment representing a significant source of bias. Such men, for example, would typically fit a profile of being older and less healthy, or of having a lower threshold for treatment-seeking. We believe our results add a less biased comorbidity estimate to the growing evidence indicating that men with PE have a higher-than-average probability of also suffering from ED, while circumventing the self-selection and compromised-health bias inherent in patient-based samples (see also the discussion about PE subtypes). While our data do not enable us to address questions regarding the specific etiologies of PE and ED when they occur concomitantly, as suggested by Jannini³⁴ and indicated by others,^{12,14} they do support the idea that in men with severe PE—who report greater concordance of ED than vice versa—sexual arousal may be moderated intentionally (eg, through distraction) or inadvertently (eg, through anxiety), thus resulting in a less-than-adequate erection. Alternatively, the concurrent PE and ED could result from an underlying third variable, as yet unidentified, that compromises the integrity of both erectile and ejaculatory systems.

Second, men who report severe DE generally have a low concordance with LSI, suggesting that for most men with DE, the problem is *not* an issue with lack of sexual interest. In contrast, ED and DE occurred together quite frequently—nearly 40% of the time—although the primary vs secondary status of these dysfunctions was not discernible from our analysis. Clearly, men with severe ED are not likely to reach orgasm easily, and thus may suffer from difficulty or delayed ejaculation as well.¹⁸ At the same time, our data indicate that over 60% of these men reported DE in the absence of erectile problems. For this subset of men, a lack of sexual psychological arousal rather than a lack of erectile capacity appears to be the more salient factor in explaining the DE.^{35,36}

Third, men who report strong LSI are likely to report significant comorbidities with all other sexual dysfunctions. Whereas comorbidity between LSI on the one hand, and ED and DE on the other, are readily explained, the fact that similar comorbidity was found with PE suggests the critical role that LSI has on all aspects of sexual responding and, as recommended by others,³⁷ further highlights the importance of assessing sexual interest/desire in any man or couple seeking help for a sexual problem.

Finally, three-way comorbidities have rarely been reported for sexual dysfunctions.³⁸ In our sample, three-way comorbidities were rare, though less so when restrictions were eased to include both moderate and severe dysfunctions. Even then, the prevalence of three-way comorbidities in the overall sample was only slightly above 1%. We surmise that men who suffer from two dysfunctions such as PE and ED, or ED and DE, may—partly out of frustration—also lose their general appetite for sex, thus exhibiting at least some degree of LSI. Such an assumption remains to be empirically tested.

PE Subtypes and Concordance Patterns

Men with either lifelong or acquired PE showed higher probabilities of having ED than those with no or probable PE. In contrast with an observational study in Asia¹⁶ which reported a much higher concordance for men with acquired PE, our lifelong and acquired subgroups showed similar CRs and ORs (acquired, 23% vs lifelong, 26%); indeed, even the percentages across severity levels of ED (moderate to severe) were similar for these subtypes (16/17% and 7.1/9.1% respectively). Future research needs to reconcile these contrasting results and identify potential explanatory variables. For example, men with acquired PE in the Asian study¹⁶ were older, weighed more, and were characterized by higher levels of psychological and chronic somatic health problems than men with lifelong PE; and these known risk factors, rather than PE status per se, may have been responsible for the higher rate of ED in their men with acquired PE. In contrast, in our study, ad hoc analysis comparing the lifelong and acquired PE groups on age, chronic medical disorders related to ED, and ongoing/persistent anxiety revealed a high degree of homogeneity on these variables. Thus, the differences between concordance patterns across studies in men with acquired PE may well be due to health and aging-related issues in Gao's acquired PE group, rather than to PE status per se.³⁹ These same general health issues may explain the higher LSI seen in men with acquired (vs lifelong) PE.^{37,40}

Limitations

As with any studies determining comorbidities, the quality of the data, the strategy for categorizing dysfunctional status, and the selection of “severe/definite” dysfunction as the reference group all play critical roles in generating credible CRs and ORs. Regarding the quality of our data, although we implemented precautions such as guaranteeing anonymity, attention checks which eliminated participants responding inconsistently across the survey, and prevention of multiple submissions, online surveys that rely largely on recruiting via public and social media are subject to biases in education, class, social media access, and other factors. Given that ours was not a probability sample and likely unrepresentative of the population, prevalence rates need to be qualified and interpreted accordingly. Regarding classification of dysfunctional status, we used categorizations based on IIEF and PEDT questions—as well as on experimenter-derived questions

for DE and LSI—that captured three broad levels for each of the dysfunctions under investigation (no/mild, moderate, and severe) and thus enabled us to investigate various combinations of these in order to generate concordance rates. Furthermore, we chose to use the severe category of a dysfunction as the reference group, based on the premise that such individuals would more likely be encountered at a medical clinic. In contrast with our system of classification, other studies have relied on different standardized assessment instruments and/or methods for defining sexual dysfunctions, so direct comparisons need to be taken cautiously. Our intention in providing such methodological detail is to encourage others—whether or not they agree with our categorization strategy—to contribute not only to the effort of building a sexual comorbidity database, but also to the larger conversation surrounding their relevance to diagnosis and treatment. Finally, we recognize that not all possible male sexual dysfunctions were analyzed (eg, sexual aversion disorder) and, further, that simply knowing comorbidity rates provides only limited insight into possible etiological pathways. In fact, careful probing by the healthcare provider is critical to establishing primary, secondary, sequential, and concomitant problems for establishing an appropriate management or treatment protocol.

CONCLUSIONS

First, we note that all sexual dysfunctions reliably showed comorbidity with other sexual dysfunctions. Second, the highest comorbidity occurred between DE and ED (31–38%). Third, comorbidity between PE and ED was about 23–29%, consistent with other reports in the literature. Fourth, lack of sexual interest was consistently associated with all other dysfunctions. Fifth, in our sample, where ages in men reporting lifelong vs acquired PE were equivalent, the comorbidity with ED did not differ. And finally, three-way comorbidities were rare. Nevertheless, the general pervasiveness of sexual comorbidities in our sample should inform the clinical diagnostic and treatment process for any man seeking assistance for a sexual complaint.^{7,41}

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STATEMENT OF AUTHORSHIP

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