SEXUAL MEDICINE REVIEWS

REVIEW

Sexual Performance Anxiety

Robert E. Pyke, MD, PhD

ABSTRACT

Introduction: Sexual performance anxiety (SPA) is one of the most prevalent sexual complaints; yet, no diagnosis is recognized for either gender. Thus, research into treatment has been minimal.

Aim: Review the prevalence of SPA and its relation to sexual dysfunctions and anxiety disorders. Compare SPA to (non-sexual) performance anxiety and social anxiety (PA/SA). Apply pharmacologic principles to the known properties of drugs and phytotherapies to hypothesize treatments for SPA.

Methods: Review SPA and PA/SA through PubMed searches for relevant literature from 2000 to 2018.

Main Outcome Measure: Prevalence was estimated using population-representative surveys. For treatment results, controlled clinical trial results were prioritized over open-label trial results.

Results: SPA affects 9–25% of men and contributes to premature ejaculation and psychogenic erectile dysfunction (ED). SPA affects 6–16% of women and severely inhibits sexual desire. Cognitive behavior therapy and mindfulness meditation training have been proven effective for PA/SA and are recommended for SPA, but controlled studies are lacking. Phosphodiesterase type 5 inhibitors are effective for psychogenic ED and premature ejaculation, both of which include SPA as a major element. Drugs proven for PA/SA have adverse sexual and sedative effects, but serotonergic anxiolytics with prosexual effects (buspirone ± testosterone, trazodone ± bupropion) may have potential, and sage, passionflower, L-theanine, and bitter orange are anxiolytic. Nitric oxide boosters (L-citrulline, L-arginine, *Panax ginseng*) have the potential for increasing genital tumescence and lubrication, and plant-based alpha-adrenergic antagonists may aid sexual arousal (yohimbine/yohimbe, *Citrus aurantium*/*p*-synephrine).

Conclusion: SPA causes or maintains most common sexual dysfunction. No treatments are well proven, although cognitive behavior therapy, mindfulness meditation training, and serotonergic anxiolytics (buspirone, trazodone, gepirone) have potential, and phosphodiesterase type 5 inhibitors are effective for psychogenic ED and premature ejaculation. Several phytotherapies also appear to have potential. **Pyke RE. Sexual Performance Anxiety. J Sex Med 2020;8:183–190.**

Copyright © 2019, International Society for Sexual Medicine. Published by Elsevier Inc. All rights reserved.

Key Words: Sexual Performance Anxiety; Anxiety Disorders; Premature Ejaculation; Erectile Dysfunction; Hypoactive Sexual Desire Disorder; Sexual Arousal Disorder

INTRODUCTION

Sexual performance anxiety (SPA) is among the most common of sexual complaints, yet SPA is anomalous. Unlike the other common sexual complaints, no current treatment for SPA exists or seems to be under development. As will be explained below, SPA was recognized over 50 years ago—and treated—before the modern diagnoses of sexual dysfunctions were created, but now it is not recognized as a diagnosis at all. Earlier, SPA was considered superordinate to the behavioral aspects of sexual problems. Today, it is considered merely a symptom, and behavioral sexual problems (eg, premature ejaculation, female sexual arousal disorder)—or a few anxiety disorders (especially social anxiety disorder and panic disorder)—are considered superordinate to SPA. Did the 20th-century pioneers in sexual medicine get it wrong? Is sexual performance anxiety an anachronism? Or has the pendulum swung too far in sexual medicine from what might be called emotion-based diagnoses to behavior-based diagnoses?

Anecdotes and medical opinions abound on the internet claiming that SPA is a destructive, self-perpetuating problem unto itself in men and in women.[1–4] The question remains, however, whether it is a treatment-worthy entity or merely a symptom of other mental and/or sexual problems. A well-referenced review in *Psychiatric Times* in 2007 concluded, “Anxiety represents the final common pathway by which social, psychological, biological, and moral factors converge to impair

Received May 23, 2019. Accepted July 18, 2019.

Pykonsult, LLC, New Fairfield, CT

Copyright © 2019, International Society for Sexual Medicine. Published by Elsevier Inc. All rights reserved.
https://doi.org/10.1016/j.sxmr.2019.07.001

Downloaded from https://academic.oup.com/smr/article/8/2/183/6880285 by guest on 25 February 2023

sexual response."[5] However, research on SPA and its treatment lags far behind the study and development of treatments for the currently recognized diagnostic entities in sexual medicine. Thus, any review of SPA can at best offer only suggestive rather than definitive evidence. Still, this work attempts to review the prevalence of SPA and to determine its place among sexual conditions. Due to a paucity of proof of efficacy for existing treatments, approaches will be recommended from research on (non-sexual) performance anxiety and social anxiety.

METHODS

PubMed searches were made for sexual performance anxiety, premature ejaculation, psychogenic erectile dysfunction (ED), performance anxiety, anxiety disorders, social anxiety disorder, panic disorder, and generalized anxiety disorder. Works from 2000 to December 2018 were primarily considered. Results of published reviews were prioritized over individual study results. Except for prevalence data, qualitative rather than quantitative results were synthesized, eliminating the need for new (meta-) analyses.

RESULTS

Place in Diagnostic Criteria and Among Symptoms of Sexual Dysfunction

There is no diagnostic entity of SPA in any of the current or upcoming diagnostic schema; yet, SPA is familiar to most in the field of sexual medicine, usually as simply one of many factors associated with sexual dysfunction. For example, "worried about sex" is the 7th of 13 symptoms in the standard Female Sexual Distress Scale-Revised, amid items about distress, guilt, frustration, regrets, dissatisfaction, anger, dysphoria, and feelings of inferiority or inadequacy.[6] However, research into the dual control model of sexual response has produced Sexual Excitation and Inhibition Scales in which SPA appears to be the predominant factor in sexual inhibition. The original version with 45 items and a later 14-item revision both have a 3-factor structure. One factor is on sexual excitation and 2 are on sexual inhibition. Of the latter, one is on loss of arousal due to distracting thoughts or pressure to perform, and the other is on anticipated adverse consequences. These scales have shown that women and men with high sexual inhibition related to performance concerns and distractibility during sex report lower sexual function.[7] Whether "performance concerns" and "anticipated adverse consequences" equate completely to SPA is debatable, but the similarity is obvious.

Of importance for practitioners and distressed patients, the International Classification of Diseases does include a diagnostic category that is potentially applicable: F52.8 Other sexual dysfunction not due to a substance or known physiological condition. Its "approximate symptoms" include "psychosexual dysfunction associated with inhibited sexual excitement."[8] This would apparently allow third-party reimbursement for treatment of SPA.

Relation to Anxiety Disorders

Official recognition of SPA lags. The prevalent attitude toward SPA among psychiatrists has been expressed as, "You're getting anxious about sex, but what's the real diagnosis?"[3] That is, SPA is seen by psychiatrically oriented diagnosticians not as an entity but as a symptom of a broader anxiety disorder. SPA may have been barred from DSM-V because of support for this contention. A new exclusion criterion was added for all sexual dysfunction disorders, in that the disorder should not be better explained by a "nonsexual mental disorder, a consequence of severe relationship distress (e.g., partner violence) or other significant stressors." As a result, the subtypes for etiological factors (due to psychological or combined factors) were dropped.[9]

Evidence for the contention that SPA is only part of a broader anxiety disorder comes from studies of sexual dysfunction in patients with anxiety disorders. Social anxiety disorder, also called social phobia, is one of the common anxiety disorders possibly associated with sexual dysfunction. When sexual problems in 40 drug-free outpatients with social anxiety disorder (SAD) were compared to those in 40 mentally healthy controls, the sexual problems of men with SAD were mainly sexual performance problems: moderate impairment in sexual arousal, orgasm, enjoyment, and satisfaction.[10] In contrast, women with SAD had severe, pervasive impairment in sexual desire, arousal, activity, and satisfaction, and they significantly ($P < .05$) lacked sexual partners.[10] In a larger study in which 106 individuals with SAD were compared to 164 people with sexual dysfunction and 111 healthy controls, men with SAD were found to be less sexually active but just as satisfied as healthy male controls. Women with SAD did not differ significantly in sexual function from healthy female controls.[11]

Another study found a closer association of sexual dysfunction with another common anxiety disorder, panic disorder. Researchers compared 30 people with SAD and 28 people with panic disorder and found that significantly more of those with panic disorder had a sexual disorder (75% vs 33% of those with SAD; $P < .01$). Unlike the general population, sexual aversion disorder was the most common sexual dysfunction overall (36% in male and 50% in female panic disorder patients). Premature ejaculation was the most common sexual dysfunction in male SAD patients (48%).[12] Thus, panic disorder seems highly related to sexual dysfunction, whereas SAD may or may not be. One explanation for the close relationship of panic disorder to SPA might be that panic attacks tend to be triggered by increased physiologic arousal. Stimulants are known to precipitate panic attacks,[9,13] as is exercise.[14] Thus, the physiologic components of sexual arousal such as flushing, tachycardia, and tachypnea could be expected to serve as triggers for panic attacks in predisposed patients.

SPA, however, cannot simply be an expected symptom of an underlying anxiety disorder, because the prevalence of anxiety disorders differs markedly from that of SPA. Figure 1 shows the results of assuming that social anxiety disorder, generalized

Downloaded from https://academic.oup.com/smr/article/8/2/183/6880285 by guest on 25 February 2023

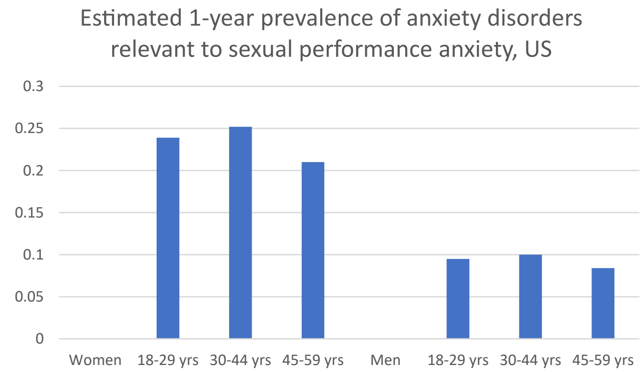

Figure 1. Estimated 1-year prevalence of generalized anxiety disorder, panic disorder, and/or social anxiety disorder in the United States as of 2001–2002.[15] Figure 1 is available in color online at www.smr.jsexmed.org.

anxiety disorder, and panic disorder are the relevant anxiety disorders and adding their prevalences from a survey of the US population to estimate the 1-year prevalence by age group, after making an appropriate correction (×0.60) for the fact that patients tend to have more than one anxiety disorder. Comparing Figure 1 to Figure 2, it can be seen that the prevalence of relevant anxiety disorders in men is less than half the prevalence of SPA. The prevalence of relevant anxiety disorders in women is about twice that of SPA, and it has a different relationship to age, as the prevalence of relevant anxiety disorders is almost constant for ages 18 to 59, but the prevalence of SPA drops precipitously with older age.[15]

A large study comparing attitudes in sexually functional and dysfunctional men and women (343 subjects) found that the main factors related to all types of sexual dysfunction in both genders were performance anxiety, attitudes toward sex, and relationship issues (for men, conflict in their relationship; for women, relationship quality). The authors concluded that SPA had a central role in either the development or maintenance of sexual dysfunction among both men and women.[16] A review by 2 leaders in the field of psychotherapy for anxiety makes much the same point.[17] SPA does specific harm to sexual function by creating a vicious cycle of anxiety begetting sexual malfunction, which begets sexual performance anxiety, which worsens sexual function further.[5,18] Thus, in men and women, SPA contributes to the most common forms of sexual dysfunction.[19–22]

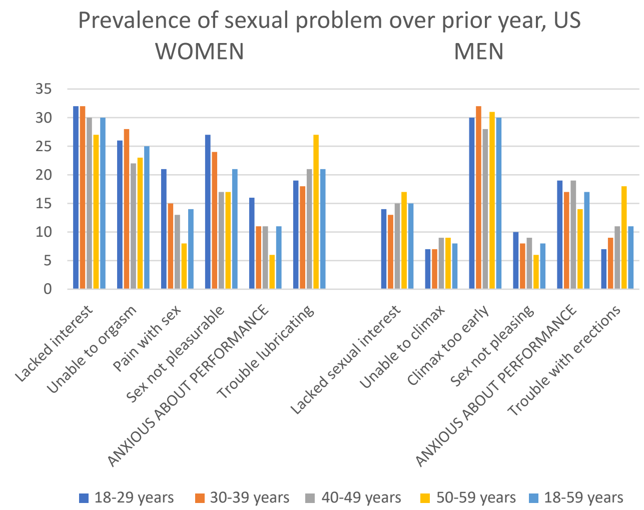

Figure 2. Prevalence of sexual performance anxiety compared to other common sexual problems in the United States.[22] Figure 2 is available in color online at www.smr.jsexmed.org.

Distracting thoughts in general impair sexual arousal in men.[20] Male sexual performance anxiety is also a major cause of acquired premature ejaculation,[21] which affects 30% of men.[22] In women, distracting thoughts during sexual activity, especially worry about body image, are a major cause of low sexual desire.[19,23]

Prevalence

An authoritative compendium on the worldwide epidemiology of female sexual dysfunction in 2005 included 97 surveys of the frequency of sexual problems, but only 3 such surveys asked about SPA.[24] Yet, SPA is among the most prevalent of sexual problems (Table 1). Figure 2 provides results from the US National Health and Social Life Survey (NHSLS) of about 1500 men and 1700 women in the United States, a population-representative survey.[22] The figure shows the age distribution of SPA relative to each of the most frequently diagnosed sexual problems. The survey shows that younger men and women, up to the age of 29, are frequently, and about equally, beset by SPA (16% vs 19%, respectively). The prevalence declines sharply with age in women but not in men. In women, SPA and arousal problems are about equal in prevalence in young adulthood, and with increasing age SPA decreases. In men, in contrast, SPA remains relatively constant in prevalence with increasing age.

The only other US population-representative survey available is that of 57- to 85-year-old US residents which was published in 2007. For the sake of comparability to the NHSLS, Figure 3 includes only the 57- to 64-year-old subgroup (528 men and 492 women). Much like the NHSLS survey, this newer survey

Table 1. Prevalence of feeling anxious about sexual performance for at least 1 month over the past year

Population	Age range (y)	Number surveyed	Yearly prevalence
Women			
United States[22]	18–59	1,789	6–16%
United States[25]	57–64	492	10.4%
United Kingdom[26]	16–44	4,826	6.7%
US gynecology clinics[27]	18–73	329	38%*
Men			
United States[22]	18–59	1,410	14–19%
United States[25]	57–64	528	25.1%
United Kingdom[26]	16–44	3,980	9%

*Anxiety or inhibition during sexual activity lasted at least 1 month in past year.

Downloaded from https://academic.oup.com/smr/article/8/2/183/6880285 by guest on 25 February 2023

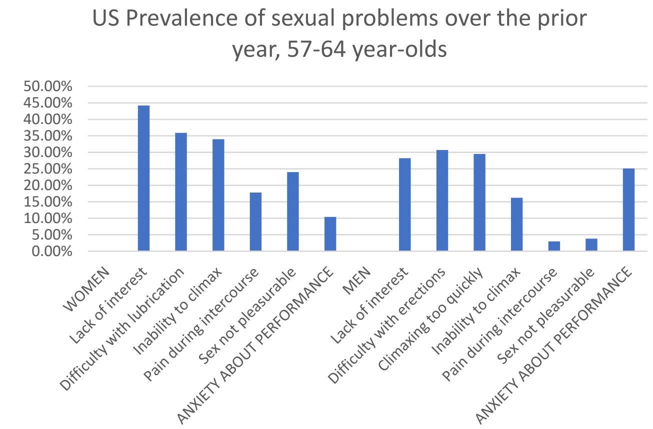

Figure 3. Prevalence of sexual problems over the prior year for 57- to 64-year-olds in the United States.[25] Figure 3 is available in color online at www.smr.jsexmed.org.

found that 25.1% of men and 10.4% of women were anxious about sexual performance for several months or more during the previous 12 months.[25]

One European population has been surveyed for SPA via a nationally representative survey of 16- to 44-year-olds in the United Kingdom patterned after the NHSLS studies. Figure 4 shows the frequency of the surveyed sexual problems that lasted at least 1 month in the past year. Like the US study of younger people (Figure 2), the UK survey showed that SPA was among the top 5 most frequent sexual problems in women (6.7%) and top 3 sexual problems in men (9.0%).[26]

The prevalence of SPA was even higher in the only study available on sexual problems in gynecology clinics. In a survey of 329 women ages 18 to 73 in a women's wellness clinic, SPA was the most frequent problem, found in 38% with "anxiety or inhibition during sexual activity."[27] This frequency might seem anomalously high and may include lack of sexual desire (sexual inhibition might have been understood by surveyed patients as a synonym for low sexual desire), but the survey's values seem

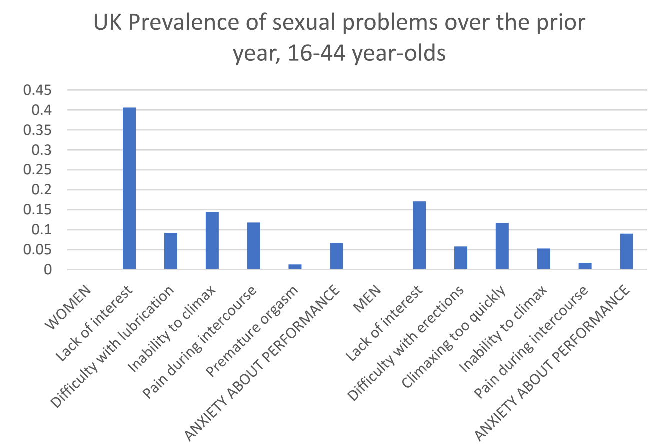

Figure 4. Prevalence of sexual problems over the prior year for 16- to 44-year-olds in the United Kingdom.[8] Figure 4 is available in color online at www.smr.jsexmed.org.

representative. The prevalence of another sexual problem, lack of lubrication, was 13.6%, not dissimilar to the finding in the NHSLS (18–27%).[22]

Psychotherapy

Systematic desensitization (a la Masters and Johnson), which can be seen as a behavioral approach to reducing SPA, was originally proposed as an effective treatment for sexual arousal disorders but later was found to be of only temporary benefit and not well suited to disorders of sexual desire or female cognitive arousal.[17] No controlled or even substantial uncontrolled studies of psychotherapy for SPA are available. Cognitive behavior therapy[28] (also called exposure and cognitive restructuring)[29] is well proven for social anxiety and its component of performance anxiety (PA/SA). Mindfulness-based interventions, also known as acceptance-based treatments, are less well proven for PA/SA.[30] Both psychotherapies have been recommended for SPA nonetheless. Cognitive behavior therapy and mindfulness-based interventions have been found effective in women with hypoactive sexual desire disorder (HSDD) and sexual pain disorders. These treatments are proposed to reduce "anxious arousal," a phenomenon explained above for panic disorder, which inhibits focusing on sexual desire, sexual arousal, and orgasm and is strongly linked to sexual pain.[19]

Pharmacotherapy

Selective serotonin reuptake inhibitors, venlafaxine, monoamine oxidase inhibitors, and some anticonvulsants[31] have been proven effective for PA/SA but cannot be recommended for SPA because of a dearth of efficacy studies and because of known prominent antisexual and other adverse effects. Treatment with some serotonergic agents might be effective, such as those with known anxiolytic effects and reputed prosexual effects. Trazodone is untested in patients with primary anxiety disorders but was found to relieve anxiety scale scores significantly in 1 week in a large antidepressant trial.[32] In a Phase 2a crossover study, a proprietary combination of trazodone with bupropion called Lorexys was more effective than bupropion alone for relieving sexual distress in female patients with HSDD[33] and was associated with a decrease of unparalleled magnitude in the median score of the Female Sexual Distress Scale-Revised, from 27.0 to 13.0 in 4 weeks (n = 25; unpublished data, S1 Biopharma, Inc). Regarding men, trazodone has been studied for ED in 6 trials; a review found that the drug was more effective in men with psychogenic ED,[34] a problem in which performance anxiety is a well-known component.[35]

Buspirone, long approved for treating generalized anxiety, has only been tested in a single published trial for performance anxiety or social anxiety; it was found to be ineffective for performance anxiety in a study of 15 musicians.[36] Prosexual effects for buspirone have been found in an open-label trial of selective serotonin reuptake inhibitor users[37] and a 10-patient open-label trial in patients with generalized anxiety.[38] Buspirone is recommended to treat HSDD in women.[39] In a Phase 2 trial, relief of

Downloaded from https://academic.oup.com/smr/article/8/2/183/6880285 by guest on 25 February 2023

HSDD occurred but only in combination with a sublingual dose of testosterone.[40]

Gepirone-ER showed anxiolytic efficacy in placebo-controlled antidepressant trials,[41] and significantly improved sexual dysfunction in the men and women in these studies.[42,43] Flibanserin has not been reported to have anxiolytic effects, despite at least 9 antidepressant trials; this is probably relevant because anxiety is extremely closely related to depression,[44] and, as shown with trazodone and gepirone earlier, outpatients in antidepressant trials are very likely to have treatment-responsive anxiety symptoms.

Phosphodiesterase type 5 (PDE5) inhibitors, although not tested for SPA, are effective for psychogenic ED, illustrating the same principle as for cognitive behavior therapy: Cognitions can interact with physiology in a virtuous cycle that replaces negative mood states, especially anxiety and depression, with positive states, as positive events/behaviors (erections, in this case) are repeated and become more predictable.[45,46] Similarly, premature ejaculation may have a component of performance anxiety and has responded significantly to a PDE5 inhibitor.[47]

DISCUSSION

How can one characterize something so subjective and with so many possibilities of variation as what is termed "sexual performance anxiety" in this paper? The studies asking sample populations whether they were "anxious about sexual performance" did not define their terms to the subjects or in their publications. No doubt, there is room for discussion and improvement of our understanding of the theme. It remains unclear whether sexual performance anxiety is a syndrome, although it is a frequently reported complaint. More research is needed to establish that such symptoms or feelings are related exclusively to sexual performance before or during sexual activity. Alternatively, this emotional response to sexual activity could be related, for example, to low self-esteem, cultural and gender differences in gender-role beliefs, or history of repression during emotional development.

Still, the ways SPA causes or perpetuates sexual dysfunction in both genders appears to make it an important focus of treatment in many cases of sexual dysfunction. Indeed, work long ago, preceding DSM-III, by Wolpe, by Kaplan, and by Masters and Johnson concentrated on the centrality of treating SPA to relieve sexual problems.[17] More recent versions of the DSM,[9,13] and the various iterations of the International Classification of Diseases,[8] however, have concentrated on phases of the sexual response cycle to the exclusion of accepting SPA as a diagnosis or even as a criterion for sexual dysfunctions. What gets recognized is what gets treated, so SPA has been eclipsed. But that does not mean it can be evaded if treatment is to be successful. This may help rationalize the fact that virtually every successful pharmacologic treatment tested for the various forms of sexual dysfunction has been associated with a response rate of about 50%; that is, treatments limited to the phase-specific aspects of sexual dysfunction fail half the time.

SPA should not replace the current diagnostic systems, but this review shows that sexual dysfunction has more than one important dimension. SPA is neither subordinate to diagnosis nor superordinate; rather, it is coordinate, with regard to identifying the phases of sexual dysfunction for developing diagnostic and treatment frameworks. Authoritative bodies consistently stress that sexual dysfunctions are biopsychosocial disorders and that attention should be paid to addressing each of these aspects in order to treat the whole patient.[24,39,48] Similarly, urogynecologic and other diseases and relationship problems cause and/or perpetuate sexual problems, as do depressive disorders.

The current diagnostics of depression, in fact, provide a relevant analogy. DSM-IV and DSM-V pay scant attention to anxiety as comorbid with depression, relegating it to a specifier, "with anxious distress."[9,13] Yet, anxiety is virtually inherent in depression. Experts estimate an 85−90% overlap between anxiety and depression,[49] and patients with the various forms of anxiety have been found to have a highly elevated risk of major depressive disorder.[50,51] Psychiatric pioneer Emil Kraepelin found anxiety so fundamental to all psychiatric illnesses that he decided anxiety should not be diagnosed as a separate entity.[17] To this very day, in DSM-V, the criteria for anxiety disorders prohibit the diagnosis of an anxiety disorder if symptoms are better explained as a mood disorder.[9] Thus, diagnostic standards steer psychiatrists away from recognizing anxiety in depressed patients. However, psychiatrists cannot treat patients with mood disorders comprehensively without considering concomitant anxiety, nor, this review posits, can practitioners treat patients with sexual disorders comprehensively unless they consider sexual performance anxiety.

This review has shown that anxiety disorders are not the sole cause of, or the underlying proxy for, SPA; however, in a larger sense, anxiety is too pervasive in Western society not to be considered an inescapable factor in SPA. The same US national survey that showed a 19.1% 12-month prevalence of any anxiety disorder also found that the lifetime prevalence of any anxiety disorder was 31.2%.[15] Among others (those not diagnosable with an anxiety disorder), subsyndromal anxiety and depression and mixed anxiety-depression may be even more prevalent.[52] This still underestimates the prevalence of anxiety because it neglects those with other psychiatric disorders that subsume anxiety diagnoses (eg, substance and maladaptive "process" abuse), best estimated as having a collective prevalence of 47%[53] and which are likely to be motivated as self-medication for depressive (and thus anxious) feelings.[54] We may still underestimate the prevalence of mental distress unless we also consider the impact of physical, psychological, and sexual abuse, which, at least in the United States, has victimized about half of the population.[55]

This adds potent fuel to the arguments for teaching ways to allay existential anxiety not only to those suffering from sexual dysfunction but to all. Mindfulness training has been found to be effective for improving emotional regulation and stress hardiness among school children.[56,57] Prominent multidisciplinary medical groups have developed efficient ways for adults to practice

Downloaded from https://academic.oup.com/smr/article/8/2/183/6880285 by guest on 25 February 2023

anxiety reduction through various types of mindfulness training, with positive effects on anxiety and depression.[58] Three of the operating premises are that the usual egoic state overvalues past difficulties, stressing one's present state; that egoic attempts to control the future cause needless anxiety because the future is unknown and uncontrollable; and that egoic undervaluation of the present as merely a means to a future goal closes one off psychically and emotionally from experiencing the fullness of life. Thus, sexual performance anxiety can be understood as a product of the usual egoic state, existential anxiety is incompatible with sexual pleasure, and sexual dysfunction can serve as a telltale symptom of existential anxiety.

Because of the absence of studies supporting psychotherapy or pharmacotherapy for SPA, the question remains unanswered about whether SPA is a primary or secondary condition. Would any benign intervention be worthwhile for SPA, whether it is a disorder, a condition, or merely a symptom? Especially, could any harmless *phytotherapy* be recommended for potential benefit for the anxiety component and for direct prosexual effects to help jump start sexual activity? Sage, passionflower, bitter orange (*Citrus aurantium*), and lavender have been found to be rapid-acting, non-sedating anxiolytics, usually in single-dose clinical paradigms of (non-sexual) performance anxiety.[59–65]

Earlier, it was noted that PDE5 inhibitors are effective for psychogenic erectile dysfunction. Similarly, phytotherapy for SPA might be augmented by direct prosexual effects. The main efficacy pathway-related activities (and relevant natural agents) cited in the literature for improving sexual dysfunction directly are to increase brain dopamine (L-theanine)[66,67] for sexual desire, to increase nitric oxide levels for genital tumescence and lubrication (L-citrulline, L-arginine, *Panax ginseng*),[68,69] and to suppress alpha-adrenergic receptors for sexual arousal (yohimbine/yohimbe, *C aurantium*/*p*-synephrine).

Yohimbine is an alpha-2 adrenergic antagonist, the only such agent to have been tested in women with sexual dysfunction. Two controlled trials have been published. Yohimbine was ineffective in a small study of women with HSDD.[70] However, when combined with L-arginine, yohimbine HCl (6 mg) increased objective sexual arousal compared to placebo in postmenopausal women with sexual arousal disorder.[71] A review of 7 controlled trials in men with ED concluded that yohimbine is substantially effective.[72] Thus, several phytotherapies are supported by clinical trials for performance anxiety or sexual dysfunction, although the evidence includes no studies of SPA per se.

CONCLUSIONS

Sexual performance anxiety may not be recognized diagnostically, but it may cause, aggravate, or maintain most common sexual dysfunctions. No treatment modalities are proven, although cognitive behavior therapy, mindfulness training, and pharmacotherapy with serotonergic anxiolytics (buspirone ± testosterone, gepirone, trazodone ± bupropion) have potential, and PDE5 inhibitors appear effective for 2 male problems tied to performance anxiety: psychogenic erectile dysfunction and premature ejaculation. Several phytotherapies appear to also have potential.

ACKNOWLEDGMENT

I would like to thank Joe Gillotti, Rich Strilowich, and Dr. Phyllis Reid Headley for their helpful insights on existential anxiety and how to cope with it.

Corresponding author: Robert E. Pyke, MD, Pykonsult, LLC, 23 Eastview Dr, New Fairfield, CT 06812. Tel: 203-399-2390; E-mail: robertepyke@gmail.com

Conflict of Interest: R.E.P. is a shareholder in S1 Biopharma, consultant to Sprout Pharma and Gedeon Richter, president of Pykonsult, LLC, and he does business as drpykessupplements.com.

Funding: None.

STATEMENT OF AUTHORSHIP

Category 1

(a) Conception and Design
Robert E. Pyke
(b) Acquisition of Data
Robert E. Pyke
(c) Analysis and Interpretation of Data
Robert E. Pyke

Category 2

(a) Drafting the Article
Robert E. Pyke
(b) Revising It for Intellectual Content
Robert E. Pyke

Category 3

(a) Final Approval of the Completed Article
Robert E. Pyke

REFERENCES

1. Johnson J. Overcoming sexual performance anxiety. Available at: https://www.medicalnewstoday.com/articles/320574.php. Accessed December 20, 2018.
2. WedMD. Sexual performance anxiety: causes, symptoms, and treatment. Available at: https://www.webmd.com/sexual-conditions/guide/sexual-performance-anxiety-causes-treatments#1. Accessed December 20, 2018.
3. Booth S. Performance anxiety doesn't mean the end of your sex life … here's why. Available at: https://www.healthline.com/health-news/performance-anxiety-doesnt-mean-end-of-sex-life#1. Accessed December 20, 2018.
4. Cohen ED. Some tips on overcoming sexual performance anxiety: the problem may not be in your erogenous zone!. Available at: https://www.psychologytoday.com/us/blog/what-would-aristotle-do/201105/some-tips-overcoming-sexual-performance-anxiety. Accessed December 20, 2018.

Downloaded from https://academic.oup.com/smr/article/8/2/183/6880285 by guest on 25 February 2023

5. Corretti G, Baldi I. The relationship between anxiety disorders and sexual dysfunction. Psychiatric Times 2007;24:16-21.
6. Derogatis L, Clayton A, Lewis-D'Agostino D, et al. Validation of the female sexual distress scale-revised for assessing distress in women with hypoactive sexual desire disorder. J Sex Med 2008;5:357-364.
7. Velten J. The dual control model of sexual response: relevance of sexual excitation and sexual inhibition for sexual function. Curr Sex Health Reports 2017;9:90-97.
8. WHO. International statistical classification of diseases and related health problems. 10th revision. Geneva, Switzerland: World Health Organization; 1992.
9. APA. Diagnostic and statistical manual of mental disorders. fifth edition. Arlington, VA: American Psychiatric Association; 2013.
10. Bodinger L, Hermesh H, Aizenberg D, et al. Sexual function and behavior in social phobia. J Clin Psychiatry 2002; 63:874-879.
11. Munoz V, Stravynski A. Social phobia and sexual problems: a comparison of social phobic, sexually dysfunctional and normal individuals. Br J Clin Psychol 2010;49:53-66.
12. Figueira I, Possidente E, Marques C, et al. Sexual dysfunction: a neglected complication of panic disorder and social phobia. Arch Sex Behav 2001;30:369-377.
13. APA. Diagnostic and statistical manual of mental disorders. fourth edition. Washington, DC: American Psychiatric Association; 1994.
14. Broocks A, Bandelow B, Pekrun G, et al. Comparison of exercise, clomipramine and placebo in the treatment of panic disorder. Am J Psychiatry 1998;155:603-609.
15. Harvard Medical School. National comorbidity survey (NCS). Available at: https://www.hcp.med.harvard.edu/ncs/index.php. Accessed December 20, 2018.
16. McCabe MP. The role of performance anxiety in the development and maintenance of sexual dysfunction in men and women. Int J Stress Manag 2005;12:379-388.
17. Bruce TJ, Barlow DH. The nature and role of performance anxiety in sexual dysfunction. In: Leitenberg H, ed. Handbook of social and evaluation anxiety. Boston, MA: Springer; 1990.
18. Masters WH, Johnson VE. Human sexual inadequacy. Boston, MA: Little Brown & Co; 1970.
19. Basson R, Gilks T. Women's sexual dysfunction associated with psychiatric disorders and their treatment. Womens Health (Lond) 2018;14:1745506518762664.
20. Oliveira C, Laja P, Carvalho J, et al. Predictors of men's sexual response to erotic film stimuli: the role of affect and self-reported thoughts. J Sex Med 2014;11:2701-2708.
21. Rajkumar RP, Kumaran AK. The association of anxiety with the subtypes of premature ejaculation: a chart review. Prim Care Companion CNS Disord 2014;16(4).
22. Laumann EO, Paik A, Rosen RC. Sexual dysfunction in the US: prevalence and predictors. JAMA 1999;281:537-544.
23. Dosch A, Ghisletta P, Van der Linden M. Body image in dyadic and solitary sexual desire: the role of encoding style and distracting thoughts. J Sex Res 2015;53:1193-1206.
24. Goldstein I, Meston CM, Davis S, et al. eds. Women's sexual function and dysfunction: study, diagnosis and treatment. Boca Raton, FL: CRC Press; 2005.
25. Lindau ST, Schumm P, Laumann EO, et al. A study of sexuality and health among older adults in the United States. N Engl J Med 2007;357:762-774.
26. Mercer CH, Fenton KA, Johnson AM, et al. Sexual function problems and help seeking behavior in Britain: national probability sample survey. Brit Med J 2003;327:126-127.
27. Rosen RC, Taylor JF, Leiblum SR, et al. Prevalence of sexual dysfunction in women: results of a survey study of 329 women in an outpatient gynecological clinic. J Sex Marital Ther 1993;19:171-188.
28. Otto MW. Cognitive-behavioral therapy for social anxiety disorder: model, methods, and outcome. J Clin Psychiatry 1999; 60(Suppl 9):14-19.
29. Stravynski A, Greenberg D. The treatment of social phobia: a critical assessment. Acta Psychiatr Scand 1998;98:171-181.
30. Norton AR, Abbott MJ, Norberg MM, et al. A systematic review of mindfulness and acceptance-based treatments for social anxiety disorder. J Clin Psychol 2014;71:283-301.
31. Van Ameringen M, Mancini C, Patterson B, et al. Pharmacotherapy for social anxiety disorder: an update. Isr J Psychiatry Relat Sci 2009;46:53-61.
32. Rickels K, Downing R, Schweizer E, et al. Antidepressants for the treatment of generalized anxiety disorder: a placebo-controlled comparison of imipramine, trazodone, and diazepam. Arch Gen Psychiat 1993;50:884-895.
33. Pyke RE, Katz M, Segraves RT, et al. Phase IIa study of a proprietary combination of bupropion and trazodone for hypoactive sexual desire disorder (HSDD) in premenopausal women: novel responder and remitter results. Paper presented at: Annual Meeting of the American Society of Clinical Psychopharmacology. June 22–25 2015. Miami, FL.
34. Fink HA, MacDonald R, Rutks IR, et al. Trazodone for erectile dysfunction: a systematic review and meta-analysis. BJU Int 2003;92:441-446.
35. Nguyen HMT, Gabrielson AT, Hellstrom WJG. Erectile dysfunction in young men-a review of the prevalence and risk factors. Sex Med Rev 2017;5:508-520.
36. Clark DB, Agras WS. The assessment and treatment of performance anxiety in musicians. Am J Psychiatry 1991; 148:598-605.
37. Landén M, Eriksson E, Agren H, et al. Effect of buspirone on sexual dysfunction in depressed patients treated with selective serotonin reuptake inhibitors. J Clin Psychopharmacol 1999; 19:268-271.
38. Othmer E, Othmer SC. Effect of buspirone on sexual dysfunction in patients with generalized anxiety disorder. J Clin Psychiatry 1987;48:201-203.
39. Goldstein I, Kim NN, Clayton AH, et al. Hypoactive sexual desire disorder: International Society for the Study of Women's Sexual Health (ISSWSH) expert consensus panel review. Mayo Clin Proc 2017;92:114-128.

Downloaded from https://academic.oup.com/smr/article/8/2/183/6880285 by guest on 25 February 2023

40. Tuiten A, van Rooij K, Bloemers J, et al. Efficacy and safety of on-demand use of 2 treatments designed for different etiologies of female sexual interest/arousal disorder: 3 randomized clinical trials. J Sex Med 2018;15:201-216.

41. Alpert JE, Franznick DA, Hollander SB, et al. Gepirone extended-release treatment of anxious depression: evidence from a retrospective subgroup analysis in patients with major depressive disorder. J Clin Psychiatry 2004;65:1069-1075.

42. Fabre LF, Clayton AH, Smith LC, et al. The effect of gepirone-ER in the treatment of sexual dysfunction in depressed men. J Sex Med 2012;9:821-829.

43. Fabre LF, Brown CS, Smith LC, et al. Gepirone-ER treatment of hypoactive sexual desire disorder (HSDD) associated with depression in women. J Sex Med 2011;8:1411-1419.

44. Merino H, Senra C, Ferreiro F. Are worry and rumination specific pathways linking neuroticism and symptoms of anxiety and depression in patients with generalized anxiety disorder, major depressive disorder and mixed anxiety-depressive disorder? PLoS One 2016;11e0156169.

45. Salonia A, Rigatti P, Montorsi F. Sildenafil in erectile dysfunction: a critical review. Curr Med Res Opin 2003; 19:241-262.

46. Fusco F, Razzoli E, Imbimbo C, et al. A new era in the treatment of erectile dysfunction: chronic phosphodiesterase type 5 inhibition. BJU Int 2010;105:1634-1639.

47. Aversa A, Pili M, Francomano D, et al. Effects of vardenafil administration on intravaginal ejaculatory latency time in men with lifelong premature ejaculation. Int J Impot Res 2009; 21:221-227.

48. Kingsberg SA, Althof S, Simon JA, et al. Female sexual dysfunction-medical and psychological treatments, committee 14. J Sex Med 2017;14:1463-1491.

49. Möller H-J, Bandelow B, Volz HP, et al. The relevance of 'mixed anxiety and depression' as a diagnostic category in clinical practice. Eur Arch Psychiatry Clin Neurosci 2016;266:725-736.

50. Kaufman J, Charney D. Comorbidity of mood and anxiety disorders. Depress Anxiety 2000;12(Suppl 1):69-76.

51. Hettema JM, Prescott CA, Kendler KS. The effects of anxiety, substance use and conduct disorders on risk of major depressive disorder. Psychol Med 2003;33:1423-1432.

52. Zinbarg RE, Barlow DH, Liebowitz M, et al. The DSM-IV field trial for mixed anxiety-depression. Am J Psychiatry 1994; 151:1153-1162.

53. Sussman S, Lisha N, Griffiths M. Prevalence of the addictions: a problem of the majority or the minority? Eval Health Prof 2011;34:3-56.

54. Weiss RD, Griffin ML, Mirin SM. Drug abuse as self-medication for depression: an empirical study. Am J Drug Alcohol Abuse 1992;18:121-129.

55. Ybarra ML, Espelage DL, Langhinrichsen-Rohling J, et al. Lifetime prevalence rates and overlap of physical, psychological, and sexual dating abuse perpetration and victimization in a national sample of youth. Arch Sex Behav 2016;45:1083-1099.

56. Hoge EA, Bui E, Marques L, et al. Randomized controlled trial of mindfulness meditation for generalized anxiety disorder: effects on anxiety and stress reactivity. J Clin Psychiatry 2013;74:786-792.

57. Mindfulschools.org. Research on mindfulness. Available at: https://www.mindfulschools.org/about-mindfulness/research/#reference-9. Accessed May 14, 2019.

58. Janssen M, Heerkens Y, Kuijer W, et al. Effects of mindfulness-based stress reduction on employees' mental health: a systematic review. PLoS One 2018;13:e0191332.

59. Kennedy DO, Pace S, Haskell C, et al. Effects of cholinesterase inhibiting sage (*Salvia officinalis*) on mood, anxiety and performance on a psychological stressor battery. Neuropsychopharmaocology 2006;31:845-852.

60. Dantas LP, Oliveira-Ribeiro A, de Almeida-Souza LM, et al. Effects of *Passiflora incarnata* and midazolam for control of anxiety in patients undergoing dental extraction. Med Oral Patol Oral Cir Bucal 2017;22:e95-e101.

61. Sarris J, McIntyre E, Camfield DA. Plant-based medicines for anxiety disorders, part 2: a review of clinical studies with supporting preclinical evidence. CNS Drugs 2013;27:301-319.

62. Perry R, Terry R, Watson LK, et al. Is lavender an anxiolytic drug? A systematic review of randomised clinical trials. Phytomedicine 2012;19:825-835.

63. Akhlaghi M, Shabanian G, Rafieian-Kopaei M, et al. Citrus aurantium blossom and preoperative anxiety. Bras J Anesthesiol 2011;61:702-712.

64. Pimenta FC, Alves MF, Pimenta MG, et al. Anxiolytic effect of *Citrus aurantium* L. on patients with chronic myeloid leukemia. Phytother Res 2016;30:613-617.

65. Shara M, Stohs SJ, Mukattash TL. Cardiovascular safety of oral *p*-synephrine (bitter orange) in healthy subjects: a randomized placebo-controlled cross-over clinical trial. Phytother Res 2016;30:842-847.

66. Lardner AL. Neurobiological effects of the green tea constituent theanine and its potential role in the treatment of psychiatric and neurodegenerative disorders. Nutr Neurosci 2014;17:145-155.

67. Yamada T, Terashima T, Okubo T, et al. Effects of theanine, r-glutamylethylamide, on neurotransmitter release and its relationship with glutamic acid neurotransmission. Nutr Neurosci 2005;8:219-226.

68. Appleton J. Arginine: clinical potential of a semi-essential amino acid. Altern Med Rev 2002;7:512-522.

69. West E, Krychman M. Natural aphrodisiac: a review of selected sexual enhancers. Sex Med Rev 2015;3:279-288.

70. Piletz JE, Segraves KB, Feng YZ, et al. Plasma MHPG response to yohimbine treatment in women with hypoactive sexual desire. J Sex Marital Ther 1998;24:43-54.

71. Meston CM, Worcel M. The effects of yohimbine plus l-arginine glutamate on sexual arousal in postmenopausal women with sexual arousal disorder. Arch Sex Behav 2002;31:323-332.

72. Ernst E, Pittler MH. Yohimbine for erectile dysfunction: a systematic review and meta-analysis of randomized clinical trials. J Urol 1998;159:433-436.

Downloaded from https://academic.oup.com/smr/article/8/2/183/6880285 by guest on 25 February 2023