

Questionnaires to measure sexual quality of life

Renata Arrington¹, Joseph Cofrancesco² & Albert W. Wu^{2,3}

¹*Departments of Internal Medicine and Pediatrics, University of Cincinnati School of Medicine, and Children's Hospital Medical Center, Cincinnati, OH (E-mail: awu@jhsph.edu);* ²*Department of Medicine, School of Medicine, The Johns Hopkins University;* ³*Departments of Health Policy and Management, and Epidemiology, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, MD, USA*

Accepted in revised form 9 January 2004

Abstract

Context: Sex is important to quality of life. There are a number of questionnaires to measure sexual-function, but many lack applicability and usefulness to certain groups. *Objective:* To identify questionnaires measuring sexual function, determine the domains most commonly assessed, and examine evidence for their usefulness in different populations. *Data sources:* Computerized literature search using Medline, PubMed and PsychLit, reference lists, and unpublished reports, published in English between 1957 and 2001. MESH terms included sexual function, sexual dysfunction, sexual satisfaction, quality of life, and questionnaire. Articles were excluded if the questionnaire did not measure sexual function from the patient perspective. *Data extraction:* Questionnaires were grouped as general questionnaires that include a sexual function domain, and sexual-function-specific questionnaires. Questionnaires were evaluated for domains, applicability to different populations, and evidence for reliability, validity and responsiveness. *Data synthesis:* Literature search yielded 62 questionnaires, 57 which assessed sexual function from the patient perspective; 12 were general and 45 specific. Six domains were commonly represented, including interest and desire, satisfaction/quality of experience, excitement/arousal, performance, attitude/behavior, and relationship. Only 28% could be used in homosexual patients, and 52% were applicable to both genders; 57% were designed for use in chronic disease populations. Only nine questionnaires had evidence for both adequate reliability and validity. *Conclusions:* Current measures of sexual functioning often exclude important domains, lack applicability to gender and sexual preference groups, or lack adequate testing of validity and testing in important populations. Future questionnaires should take into account these concerns.

Key words: Quality of life, Questionnaire, Sexual dysfunction, Sexual function, Sexual satisfaction

'Sex, a great and mysterious force in human life, has indisputably been a subject of absorbing interest to mankind through the ages'.

Justice William J. Brennan,
Associate Justice, US Supreme Court

Introduction

Sex is a basic human function and a fundamental part of life. Sex involves physical, psychological and emotional factors and affects general well-

being and overall quality of life [1–3]. When it is good, sex can impart pleasure, contentment and emotional closeness. Studies have shown a relationship between sexual dysfunction and worse quality of life in patients with a variety of disorders [4–22]. Even short-term disruptions to sexual-functioning can create frustration and distress, and chronic disruption can lead to anxiety and depression, damage relationships with sexual partners, and disrupt functioning in other aspects of life.

Sexual dysfunction extends across all age groups. It has been estimated to affect 43% of

women and 31% of men in the US aged 18–59 years old [11–14, 16–18, 23]. After adulthood, increasing age is related to decreased desire, libido, sensitivity and pleasure [12–14, 20, 23–25]. The Massachusetts Male Aging Study group report estimated a crude incidence of erectile dysfunction (ED) in 2.4/100 men every year, with an estimated 900,000 new cases every year in the US. Sexual function decreases with increasing age among male veterans, despite sustained interest [13]. Nonetheless, studies have shown that a full sexual functioning is possible in advanced age [23, 24, 26].

Masters and Johnson [3] demonstrated that the human sexual response involves sequential stages of excitement-arousal, plateau, orgasm, and resolution. During sexual arousal, vasocongestion and muscular tension increase, primarily in the genitalia. If stimulation continues, the excitement intensifies into a plateau phase, accompanied by a high state of sexual interest. This plateau may be short or long, but culminates in a rapid release of vasocongestion and muscular tension, or the orgasm [27–29] coinciding with a subjective satisfaction. A variety of physiologic, medical and psychological factors can contribute to sexual dysfunction including illness [4, 6, 19, 20, 22, 30–37], pharmacologic agents [15, 21, 38–46], and psychosocial factors [18, 22, 47]. Physiologic abnormalities can result in inability to achieve or maintain an erection or in ejaculatory disorders in males, and decreased lubrication in females. In females, shortening of the vaginal vault, loss of rugal folds, thinning of the vaginal mucosa and lowered acidity of the vaginal secretions may give rise to dyspareunia [2, 16, 23, 24, 27, 48, 49]. Medications such as sedatives [50], selective serotonin uptake inhibitor antidepressants [21, 40–44], and antihypertensives [4, 46, 51–53] have a direct action on the nervous system and may increase anhedonia, or impair libido, orgasm and erection. Many diseases can adversely affect sexual function by affecting circulatory or neurologic function, hormonal balance or systemic health [54]. The mechanism of disruption is often multifactorial [5–9, 48, 55–57].

Despite the potential impact of medical illness on sexual functioning, some authors have postulated that the majority of sexual dysfunction arises from psychological processes [58–60]. Vaginismus can be a conditioned response engendered by

feelings of guilt, inadequacy or anxiety, as a result of a hysterectomy or mastectomy. Altered self-perception may be even more important in shaping sexual attitude in some individuals [61]. This can result in the inability to be aroused and achieve a climax, and can impact negatively on self-esteem, quality of life, and interpersonal relationships [12, 16–18]. These factors can result in fear of impotence, inability to discuss sexuality, and unwillingness to participate in sexual activity.

Patients are increasingly inclined to discuss sexual problems with their physicians [18]. Factors encouraging this may include increased adoption of patient-centered care, and the availability of effective treatments. Accompanying this, there has been greater attention to the assessment of sexual functioning as an outcome measure in clinical studies [21, 34, 43, 45, 46, 52, 62, 63].

Although there are a number of methods to assess sexual functioning, many are not well tested, and none are used in general clinical practice. The best way to measure sexual function is uncertain. Devices and laboratory tests are available to measure certain aspects of sexual functioning. Direct measures such as the Nocturnal Penile Tumescence (NPT) device, intracavernosal injection with prostaglandinE1, penile brachial pressure indices, doppler studies, and sacral evoked potentials are used to assess erectile function in men [62, 64]. In women, direct physiologic measurements include genital blood peak systolic velocity, vaginal pH, intravaginal compliance, and genital vibratory perception thresholds [20]. These direct measures are correlated with indirect measures such as levels of estrogen, LH, testosterone and prolactin. Self-report measures are used to assess many aspects of sexual function [65]. Kaplan suggested evaluating the psycho-physiological component of sex from the perspective of desire, while Levine recommended measuring sexual satisfaction. There are a number of questionnaires used to measure aspects of sexual function including: attitudes toward sex [66, 67]; arousability [68–70]; behavior [67, 71]; adjustment [72, 73]; and function [4, 74, 75]. There is no consensus in the literature about what methods are best, and for what purposes.

We conducted a structured literature review to identify specific questionnaires intended to measure sexual function, either independently or as a

dimension of patient reported overall health status. Our purpose was to make recommendations about available measures to researchers and health care providers involved in treating patients with sexual dysfunction. Our specific aims were: (1) to identify questionnaires that have been used clinically to measure sexual function, (2) to determine what domains have been most commonly assessed, and how they have been defined, and (3) to examine the evidence for the usefulness of the questionnaires in different populations.

Methods

Questionnaires available to measure sexual function were identified via a computerized literature search using Medline, PubMed and PsychLit. We used the MESH headings 'Sexual function,' 'quality of life,' 'sexual dysfunction,' 'questionnaires,' and 'sexual satisfaction.' We circulated abstracts of articles to researchers and clinicians interested in sexual functioning for additional citations and unpublished reports. All articles were reviewed to identify patient-reported sexual-function questionnaires.

Articles were included if they focused on patient-reported sexual function, or included sexual function as a component of a general or disease-specific quality of life questionnaire. We defined 'questionnaire' as one or more questions that described or evaluated one or more aspects of sexual function. All articles were published between 1957 and 2001 and were written in English. Articles were excluded if a questionnaire was not intended to measure sexual function, or if sexual function was not measured from the patient's perspective.

Assessment of the questionnaires

Questionnaires were divided into two groups: general questionnaires that included a sexual-function domain (General), and sexual function-specific (Specific) questionnaires designed solely to measure sexual function. Each questionnaire was evaluated with regard to sexual function domains it included, applicability to different populations, and evidence for reliability, validity and respon-

siveness. We organized the domains based on the first three of Masters and Johnson's [3] physiological stages of the sexual response (excitement-arousal, plateau, and orgasm) and by the most frequent domains in published reviews of available sexual-function questionnaires [65, 76].

Each questionnaire was categorized according to whether it was intended for use or had been used in chronic medical or general populations, and for applicability in heterosexual and homosexual males and females. In addition, questionnaires were reviewed for patient input in their development. We noted if instruments had undergone psychometric testing – defined as of tests of reliability (including test-retest reliability), internal consistency using Cronbach's α [77] or KR-20 (an α of >0.70 was considered to indicate adequate reliability); validity (content validity, construct validity, and criterion validity); and responsiveness (sensitivity to change). The operational definitions used are shown in Appendix 1. Questionnaires were grouped as having had (1) no evaluation; (2) an adequate evaluation, but low reliability (i.e., Cronbach's $\alpha < 0.70$); and (3) evidence for adequate reliability and validity.

Results

Identification of articles and instruments

The literature search yielded 139 citations addressing sexual function and dysfunction. We excluded 77 articles because they did not describe or use a patient-reported sexual-function questionnaire. Five of the remaining 62 questionnaires were excluded because sexual function was examined exclusively from the perspective of the spouse; of the 57 remaining questionnaires, 45 were sexual specific questionnaires and 12 were general questionnaires with a sexual-function domain (Table 1).

Overall, there was a secular trend in the design of the instruments. Instruments developed from the mid- 1950's to the early 1970's were designed to measure satisfaction with specific sexual activities, usually using simple behavioral checklists [59, 60, 86], but did not relate these activities to overall satisfaction. Sexual activities were defined either from the perspective of heterosexual couples, who

Table 1. Questionnaires to assess sexual functioning

Instrument	Interest/desire - Drive/Libido	Excitement/ arousal	Performance	Satisfaction/ quality	Change in behavior/ frequency	Importance of sexual activity in relationship	Medical use	Applications and usage
1. Brief Index of SF for Women [78]	Y	Y		Y				
2. Brief Sexual Function Questionnaire for Men [79]	Y		Y	Y	Y	Y	Y	NI
3. Derogotis Sexual Function Inventory [DSFI] [71]	Y	Y			Y			
4. Derogotis Interview for Sexual Function [59, 80]								
5. Female Sexual Arousability Index [SAI] [68]	Y	Y	Y		Y			
6. Florida Sexual History Questionnaire [FSHQ] [81]	Y			Y		Y	Y	NI
7. General Information Form [GIF] [82]		Y	Y		Y			NI
8. Golombok Rust Inventory of Sexual Satisfaction [GRISS] [74]			Y	Y	Y			
9. Hanson Assessment of Sexual Health [83]		Y			Y	Y	Y	NI
10. Heterosexual Behavioral Assessment Females [84]					Y			
11. Heterosexual Behavioral Assessment Males [85]					Y			
12. Heterosexual Scale [86, 87]		Y						
13. Homosexual Scale [86, 87]								
14. Hypogonadism and Sexual Function [88]		Y	Y	Y			Y	
15. Index of Sexual Satisfaction [ISS] [89]	Y	Y		Y		Y		NI
16. International Index of Erectile Function [IIEF] [90]	Y	Y	Y				Y	NI
17. JAMA Patient Page, Sexual Dysfunction [18]	Y	Y	Y				Y	NI
18. Jewish General Hospital Sexual Self-Monitoring Form [91]		Y		Y				
19. Leiden Impotence Questionnaire [52, 53]						Y	Y	NI
20. McCoy Female Sexuality Questionnaire [92]	Y			Y	Y			

Table 1. (Continued)

Instrument	Interest/desire - Drive/Libido	Excitement/ arousal	Performance	Satisfaction/ quality	Change in behavior/ frequency	Importance of sexual activity in relationship	Medical use	Applications and usage
43. Urge-Incontinence Impact Questionnaire [11Q] [106]		Y		Y			NI	NI
44. Vaginal changes and Sexuality in Women with Cervical CA [48]	Y	Y	Y	Y		Y	Y	NI
45. Watts Sexual Functioning Questionnaire [4]	Y	Y	Y	Y		Y	Y	

Explanation of boxed quadrants:

Hetero	Homo
Male	Female

Grey shaded = Yes
No color = No

NI = Not indicated
[] = Reference number.

were often married, or as a 'pathologic' case, defined as a homosexual male. In other instruments such as the Clark Sexual History Questionnaire [69] and the Sex Inventory used for screening of sex offenders [104] sexual activities were designed to serve as direct measures of sexual behavior and thereby indirect measures to functioning and satisfaction. In the early 1970's questionnaires began to incorporate a broader definition of sexual-function and satisfaction. This resulted in questionnaires designed to measure sexual function across genders and sexual preferences.

Domains

Aspects of sexual function assessed in the 57 questionnaires included satisfaction, interest, frequency, importance, performance, desire, worry, arousal, current behavior, orgasmic capacity, libido, urologic problems and feelings of femininity and masculinity (Table 1). Six domains were represented repeatedly: interest, desire and libido (grouped under interest/desire); satisfaction with quality of an erection, ejaculation or orgasm and pain/discomfort with sex (satisfaction/quality); physical evidence of an erection, including morning erections, excitement without an erection, and sufficient vaginal lubrication for intercourse (excitement/arousal) and the ability to maintain an erection in order to achieve an orgasm (performance); attitudes or behaviors of the respondent and his or her partner such as feelings of avoidance, embarrassment and change in frequency of sexual intercourse (attitude/behavior); and the impact of sexual functioning on the relationships (relationship). Most questionnaires included several of these domains.

Development of most of the specific instruments was based on clinical experience, literature review and previous questionnaires. The questions included in the general questionnaires were taken either from clinical experience or previously developed specific questionnaires. Three questionnaires used patient input in the development of the questions – a specific questionnaire, the International Index of Erectile Function (IIEF) [90] and two general questionnaires – the UCLA Prostate Cancer Index [8, 9] and the Medical Outcomes Study (MOS) sexual-function subscale [107].

Assessment of the questionnaires

Sexual functioning-specific questionnaires (Specific)

There were 45 specific questionnaires. Within these questionnaires, the excitement/arousal domain was most frequently included (71%). Interest/desire was included in 53%, while performance and satisfaction/quality, were included in 38 and 51%, respectively.

Fifteen questionnaires can measure sexual function in homosexuals: three exclusively in homosexuals and 12 in both homosexuals and heterosexuals. Overall, 11 could be used in homosexual women and 12 in homosexual men.

There were a few gender-specific questionnaires. Twenty-eight (62%) were designed for use in females, with five (11%) designed for use in females alone. Ten (22%) of these instruments had been designed for use among women with chronic medical illness. Of these, only three questionnaires were designed to measure sexual function in both homosexual and heterosexual females. Thirty-nine (87%) of the questionnaires could be used in men, with sixteen (36%) designed exclusively for use in males. Seventeen (38%) were intended for use in individuals with chronic disease. Four questionnaires were designed to measure sexual-function in both homosexual and heterosexual males.

Thirty-three (Table 2) of the specific questionnaires had undergone at least some psychometric testing. Content validity, a precursor to instrument development, had been evaluated in 15 of the specific measures. Construct validity was tested against NPT, testosterone levels, disease severity, clinician assessment, clinical data, and other measures of related concepts. For example, the IIEF [90] showed evidence for content validity from patient focus groups and construct validity from comparisons with responses from clinical interviews. The Sabbatsberg Rating Scale [16, 17], designed for women, was shown to have construct validity compared to scores for the SF-36 and the Hospital Anxiety and Depression scales. Overall 27 of the 33 questionnaires (82%) had been tested for reliability (39% demonstrated adequate reliability), 25 (76%) for validity, only 14 (42%) tested for both content and construct validity and 6% for responsiveness. Sixty-three percent [18] had undergone testing for

both reliability and validity and for 24% both were demonstrated to be adequate.

General questionnaires with a sexual-function domain

Sexual function was included as a component in 12 general quality of life questionnaires, all of which were designed for use in chronic diseases. Three questionnaires used a single item to assess sexual function, while the remaining nine used one or more multi-item scales. Interest/desire was measured most frequently (75%), excitement/arousal was included in 67%, performance in 50%, satisfaction/quality in 50% and importance in 42%.

Sexual preference and gender orientation varied among questionnaires. None of the questionnaires were designed exclusively for use in homosexual males. The HAT-QoL [112, 115] questionnaire examined sexual function in both homosexual (male and female) and heterosexual adults with HIV. None of the questionnaires was designed exclusively for use in homosexual males. Seven questionnaires (58%) could be used in females; none were designed for use in females alone.

Eight of the 12 general questionnaires were tested for reliability, validity or responsiveness. All eight tested for reliability and had undergone tests for validity, one tested for responsiveness and two had patient input into the development.

The UCLA Prostate Cancer Index [9] is an example of a disease-specific quality of life questionnaire that includes assessment of sexual functioning. Development incorporated focus groups to determine the areas of sexual function most important to patients. The questionnaire demonstrated adequate internal consistency and evidence for construct validity. Another, the MOS, Sexual Functioning Scale is a subscale of larger battery of questions [107]. This scale is useful for measuring sexual function in men and women, and has demonstrated good reliability (Cronbach's α coefficient for men 0.95 and women 0.84), construct validity, and responsiveness in the general population and patients with chronic disease.

Summary of testing

Overall, most questionnaires were not designed for use among homosexual males or females. Twenty-

Table 2. Evidence for Reliability and Validity of Sexual Functioning Questionnaires

Instrument	Evaluation test-retest	Reliability Cronbach's ≥ 0.70	Content validity	Construct validity	Responsiveness	Patient input
Brief Index of SF for Women [78]	Y	Over 1 month interval, Pearson correlation coefficient (range 0.68–0.78; internal consistency 0.83)		Y		
Brief Sexual Function Questionnaire for Men [79]	Y			Y		
Cancer Rehabilitation Evaluation Systems-Short Form [CARES-SF] [108]	Y	0.67–0.78		Y		
Derogotis Sexual Function Inventory [DSFI] [71]	Y	Cronbach 0.74–0.80; test-retest over 1 week interval 0.84–0.92		Y		
Female Sexual Arousal Index [68]	Y	0.92		Y		
Florida Sexual History Questionnaire [FSHQ] [81]	Y	0.90	Y	Y		
Functional Capacity Index [FCI] [109]	Y		Y	Y		
General Information Form [82]	Y		Y	Y		
Golombok Rust Inventory of Sexual Satisfaction [GRISS] [74]	Y		Y	Y		
Hanson Assessment of Sexual Health [83]	Y	0.60	Y	Y		
Health-Related Quality of Life Measure for Multiple Sclerosis [110]	Y	0.75–0.96		Y		
Health-Related Quality of Life Prostate Cancer [HRQoL] [111]	Y	≥ 0.74		Y		
Heterosexual Behavioral Assessment Males [85]	Y					
Heterosexual Scale [86, 87]	Y	0.52	Y	Y		
HIV/AIDS Targeted Quality of Life [HAT-QoL] [112]	Y			Y		
Homosexual Scale [86, 87]	Y			Y		
Index of Sexual Satisfaction (ISS) [89]	Y	0.93, 0.99, 0.92 (in one repeated sample) ≥ 0.73 for each and ≥ 0.91 for total	Y	Y	Y	Y
International Index of Erectile Function [90]	Y			Y		
Leiden Impotence Questionnaire [52, 53]	Y	0.83 (range 0.69–0.95 over 2 week interval); Cronbach's–0.77.	Y	Y		
McCoy Female Sexuality Questionnaire [92]	Y	Men: 0.95; Women: 0.84		Y		Y
Medical Outcomes Study [MOS] [107]				Y		Y

Table 2. (Continued)

Multiaxial problem-oriented diagnostic system of SF [78]		Not indicated		
Paraplegia [103]		0.96		
Positive Negative Evaluation [PNE] [111]		0.51–0.77	Y	
Sabatsberg Sexual Rating Scale Revised [16, 17]		0.61–0.87	Y	
Scalability of Sexual Experience [94]	Y			
Seagraves Sexual Symptomatology Interview [95]			Y	
Sexual Adjustment Questionnaire [SAQ] [96]	Y			
Sexual Dysfunction in Stroke Patients [113]		Not indicated		
Sexual Dysfunction Scale [50]		0.61–0.71		
Sexuality Experience Scale [98]		Not indicated		
Sexual History Questionnaire [SHQ] [69]	Y	0.90	Y	Y
Sexual Interaction System Scale [102]			Y	Y
Sexual Interest Questionnaire [SIQ] [66]	Y		Y	Y
Sexual Inventory [SI] [104]	Y	≥ 0.795	Y	Y
Sexual Orientation Method and Anxiety [SOMA] [105]	Y		Y	Y
Sexual Symptoms Distress Scale [52, 53]	Y	0.94	Y	Y
The SSES-E: A Measure of Sexual Self-Efficacy in Erectile Functioning [91]	Y		Y	Y
UCLA Prostate Cancer Index [114]	Y	0.93	Y	Y
Urge-Incontinence Impact Questionnaire [IIQ] [106]	Y	Internal consistency 0.91; test-retest reliability, content, criterion		Y
Watts Sexual Functioning Questionnaire [4]	Y	0.65	Y	Y

eight percent of the questionnaires were designed for use among homosexuals. Fifty-two percent of the questionnaires measured sexual function among both males and females, while only 9% were designed to measure sexual function in females alone. Only 57% of all questionnaires were designed for use in medical populations.

There was no uniformity of psychometric testing among questionnaires. Only 18 of the questionnaires (both sexual-function specific and generic questionnaires) had evidence of sufficient reliability (Cronbach's > 0.70). When validity was examined, convergent validity was tested most often. Only 17 questionnaires had evidence for content validity. Nine questionnaires, (including the Sabbatsberg Sexual Rating Scale, the IIEF and the UCLA Prostate Cancer Index) had evidence for adequate reliability, content and construct validity.

Discussion

This structured review of patient-reported questionnaires identified and evaluated measures of sexual functioning that are available for use in clinical research and practice. The 57 questionnaires identified tended to assess several common dimensions, including interest, desire, excitement/arousal, frequency, performance, importance and satisfaction. However, there was no apparent consensus on what domains were crucial, perhaps in part because few incorporated patient input in their design. Some were designed specifically to assess sexual functioning, while other included sexual function among in a battery of scales to measure health-related quality of life. Few questionnaires were applicable across genders and sexual preferences. Further complicating the picture, evidence for psychometric performance was patchy, with only few instruments demonstrating adequate reliability and validity. Little testing has compared questionnaire to other measures of sexual functioning.

There have been a few reviews of sexual-function questionnaires. In 1986 [65], Conte reviewed self-report questionnaires useful in measuring sexual function. Since that time, reviews have been included in the Handbook of Family Measurement Techniques [116], The Handbook of Sexuality-

Related Measures [76], Sexual Life: A Clinician's Guide [117], and Tools for Primary Care Research [118]. Similar to our findings, other reviews have found a variety of self-assessment questionnaires used to measure sexual function. However, most reviews have focused broadly, presenting questionnaires across populations, ranging from children and childhood sexual experience to condoms or have been limited to specific populations. In addition, some of the reviews did not examine the questionnaires or the evidence of psychometric performance.

Many of the commonly used instruments are aimed at a specific patient population. The strength of such questionnaires is their ability to reflect issues applicable to that group by being designed solely to quantify and to measure sexual function in a study population. A weakness is a lack of a clinical foundation for question application before evidence of psychometric testing.

Our review did not yield a single questionnaire universally useful for researchers or clinicians who wish to measure sexual function. No questionnaire can be applied to both genders, all sexual preferences, and both healthy and chronically ill populations. However, the Watts [4], the Sabbatsberg Sexual Rating Scale [16, 17], the International Index of Erectile Function [90], the UCLA Prostate Cancer Index [9] and Derogatis Interview for Sexual Function [59, 60, 80] all have advantages, each within a limited range of applications.

For patients with chronic disease, such as hypertension, the Watts Scale [4] has been used for both heterosexual and homosexual men and women. The Watts Scale was initially designed to measure sexual-function in individuals on therapy for hypertension. Content validity was established using a panel that incorporated patient input in designing items, and later via panel of experts. Internal consistency has been relatively low (0.65), limiting measurement precision, but the questionnaire has demonstrated construct validity. In addition, the questionnaire consists of 17 items in a simple format. It was developed for use among hypertensive clients on complex drug regimens and has been widely used.

The Sabbatsberg Sexual Rating Scale [16, 17] was designed to reflect sexual dysfunction among women with gynecological problems and has

shown good internal consistency. It has been used repeatedly among women with chronic gynecological conditions, with evidence for construct validity and adequate responsiveness. Unlike the Golombok and Rust Inventory of Sexual Satisfaction, the Sabbatsberg Sexual Self-Rating Scale is unintrusive and is relatively brief.

The International Index of Erectile Function [90] encompasses relevant domains for men with erectile dysfunction. The questionnaire is 15-items long, included patient input in its development, and it has been used in several studies of men with erectile dysfunction. It has been linguistically validated in 10 languages using a process that incorporated forward and backward translation of items. It has shown adequate test-retest reliability, an acceptable Cronbach's α , and content and construct validity, and it has been shown to be responsive to changes inspired by clinical interventions. The main limitation of this questionnaire is that it covers few domains.

For men with prostate cancer or those who have completed therapy for prostate cancer, the UCLA Prostate Cancer Index [9] has been useful to quantify sexual dysfunction. The questionnaire was designed from the perspective of the patients, using focus groups and patient surveys to determine the areas they deemed most important. It has shown adequate test-retest and internal consistency reliability, and construct validity by comparing sexual-function in patients with and without cancer. It is fairly long, even if not counting questions about the patients' job status, race and age.

The Derogatis Interview for Sexual Function [59, 60, 80] is a self-report questionnaire designed to measure sexual functioning across multiple populations, including males, females, heterosexual and homosexual populations. Norms have been developed which are gender specific for different sexual preference groups. In addition to adequately measuring reliability, this measure has been used among clinical practice for years. In a recent study of prostate disease [119], the Derogatis questionnaire detected differences between functional, marginally functional and impotent groups. A drawback of this instrument has been used primarily in company-sponsored clinical drug trials, making most of the data unavailable for evaluation.

The Brief Index of Sexual Function for women [90] is a brief, sexual specific questionnaire, measures a broad range of domains (desire, arousal, orgasm, satisfaction), while placing minimal burden on the tester. This questionnaire had performed well with respect to reliability and validity (both convergent and discriminant construct validity), but has yet to be used in a major study.

For patients with stroke, Monga and colleagues [73, 113] designed a questionnaire that includes a broad range of domains, including areas of general attitude about sexual functioning and fear of impotence, libido, frequency, erectile capacity, vaginal lubrication, satisfaction, and orgasmic ability. Some evidence for validity was provided by comparisons to the Geriatric Depression Scale (Table 3).

There are limitations to current measures of sexual quality of life and functioning. These questionnaires often do not include domains important in measuring sexual function, perhaps because of limited patient input in their development. General questionnaires tend not to address the entire concerns particular to that population and may not be as sensitive to change as specific measures. In addition, some questionnaires are lengthy and intrusive, limiting their usefulness, despite adequate psychometric properties. Finally, there are limitations inherent to sexological research, including the limited capacity for external validation, and the tendency of subjects to give socially desirable responses.

Although sex and sexual function are an integral part of human behavior, research in measuring sexual function is not far advanced. There are many populations in which sexual function has not been measured, e.g., pregnant or post-partum women, patients with organ transplant, obese patients, patients with end-organ disease such as individuals with end-stage liver disease, or adolescents and young adults and women with chronic illnesses. More research is needed to design questionnaires appropriate to various populations. When designing questionnaires to measure sexual function, we recommend the following: (1) the domains should be reflect current sexual functioning concerns; (2) the development of questionnaires should occur from the perspective of patients, by using patient input and (3) the

Table 3. Questionnaire name and reference number

Questionnaire name	Reference number
<i>Sexual Function – Specific</i>	
1. Brief Index for SF Form Women	[78]
2. Brief Sexual Function Questionnaire for Men	[79]
3. Derogatis Sexual Function Inventory (DSFI)	[71]
4. Derogatis interview for Sexual Function	[59, 80]
5. Female Sexual Arousability Index	[68]
6. Florida Sexual History Questionnaire (FSHQ)	[81]
7. General Information Form (GIF)	[82]
8. Golombok Rust Inventory of Sexual Satisfaction (GRISS)	[74]
9. Hanson Assessment of Sexual Health	[83]
10. Heterosexual Behavior Assessment Females	[84]
11. Heterosexual Behavior Assessment Males	[85]
12. Heterosexual Zuckerman	[86, 87]
13. Homosexual Zuckerman	[86, 87]
14. Hypogonadism and Sexual Function	[88]
15. Index of Sexual Satisfaction (ISS)	[89]
16. International Index of Erectile Function	[90]
17. Jewish General Hospital Sexual Self-Monitoring Form	[91]
18. Leiden Impotence Questionnaire	[52, 53]
19. McCoy Female Sexuality Questionnaire	[92]
20. Multiaxial Problem-oriented Diagnostic System of SF	[78]
21. Potency and Prostatectomy	[93]
22. Radical Prostatectomy Questionnaire	[120]
23. Sabbastberg Sexual Rating Scale (revised)	[16, 17]
24. Scalability of Sexual Experience	[121]
25. Seagraves Sexual Symptomatology Interview	[94]
26. Sexual Activity of Men presenting Prostatism and Prostatectomy	[95]
27. Sexual Adjustment Questionnaire (SAQ)	[96]
28. Sexual Dysfunction (Silence Hurts)	[18]
29. Sexual Dysfunction in HIV+ Men (assoc w/ neuropathy/CD4 count)	[56]
30. Sexual Dysfunction in HIV+ Men	[97]
31. Sexual Dysfunction in Schizophrenic Patients	[50]
32. Sexual Function Scale	[99, 100]
33. Sexual Interaction Inventory (SII)	[82, 101]
34. Sexual Interaction System Scale	[102]
35. Sexual Interest and Satisfaction Scale	[99]
36. Sexual Interest Questionnaire (SIQ)	[66]
37. Sexual Inventory (SI)	[104]
38. Sexual Orientation Method and Anxiety(SOMA)	[105]
39. Sexual Self-Efficacy Scale for Erectile Disorder (SSES-E)	[91]
40. Sexual Symptom Distress Scale	[52, 53]
41. Sexuality Experience Scale	[98]
42. The Clark Sexual History Questionnaire	[69]
43. Urge-incontinence Impact Questionnaire	[106]
44. Vaginal Changes and Sexuality in Women with Cervical CA	[48]
45. Watts Sexual Function Questionnaire	[4]
<i>QoL General Questionnaire with Sexual Function Domain</i>	
1. BPH-Specific Quality of Life Instrument	[32]
2. Cancer Rehabilitation Evaluation System - Short Form	[108]
3. Functional Capacity Index	[109]
4. Health Related Quality of Life measure for Multiple Sclerosis	[110]
5. Health Related Quality of Life Prostate Cancer	[111]
6. HIV/AIDS Targeted Quality of Life (HAT-QoL)	[112, 115]
7. Limb-sparring QoL Sarcoma Patients	
8. MOS Sexual Function Subscale	[107]
9. Positive Negative Evaluation	[111]
10. Sickness Index Profile/Nottingham Health Profile	[119]
11. Stroke Patients Questionnaire	[60, 121]
12. UCLA Prostate Cancer Index	[8, 9]

development process should incorporate evaluation of reliability, validity and responsiveness. While measuring sexual dysfunction in couples, the questionnaires should include the areas that affect both gender and sexual preference groups.

Human sexuality is a basic force that can affect every aspect of life. Sexual feelings, desires and activities extend from childhood through adolescence, adulthood, and old age. Sexual function can be closely coupled to quality of life. When sexual function is disrupted by medical therapy, illness, other stress or anxiety, quality of life worsens. Investigators may wish to include sexual function as an outcome in research, and clinicians may wish to quantify sexual function in practice. Future research should focus on adequate assessment of sexual function and the development of reliable and valid questionnaires, so that peoples' sexual lives can be improved.

Acknowledgement

We thank Jewel-Crum Freeman for assistance in the preparation of this manuscript.

Appendix 1

Reliability

Internal consistency establishes the extent to which items are associated around the domain of interest. The scores for the items within a domain are treated as repeated measures of the same concept and reliability is estimated by the relationships among these scores. Often assessed using Cronbach's α or KR-20.

Test-retest reliability is a measure of temporal stability; it demonstrates the degree to which scores achieved at a particular time of assessment correlate with scores achieved on subsequent assessment occasions.

Validity

Content validity depends on the extent to which an empirical measurement reflects a specific domain of content and how appropriate it is relative to its intended use.

Criterion validity measures the correlation of scores with an external criterion, a 'gold standard' or previously validated measure of the concept of interest.

Construct validity accounts for the variance that accounts for the agreement there is between different measures meant to measure the same concept and for the disagreement from those intended to measure different concepts.

Responsiveness

Sensitivity of instrument to change over time.

References

1. Kaiser FE. Sexuality and impotence in aging men. *Clin Geriatr Med* 1991; 7: 63–72.
2. Kaiser FE, Morley JE. Menopause and beyond. In: Cassel CK, Walsh JR (eds), *Geriatr Med* 3, New York: Springer-Verlag, 1984.
3. Masters WH, Johnson VE. *Human Sexual Response*. Boston: Little Brown, 1966.
4. Watts RJ. Sexual Functioning, health beliefs, and compliance with high blood pressure medications. *Nurs Res* 1982; 31(5): 278–282.
5. Zoszein J. Diagnosis and management of endocrine disorders of erectile dysfunction. *Urol Clin North Am* 1995; 22(4): 789–802.
6. Cummings MH, Alexander WD. Erectile dysfunction in patients with diabetes. *Hosp Med* 1999; 60(9): 638–644.
7. Jannini EA, Screponi E, Carosa E, et al. Lack of sexual activity from erectile dysfunction is associated with a reversible reduction in serum testosterone. *Int J Androl* 1999; 22(6): 385–392.
8. Litwin M, Hays R. Quality of life outcomes in men treated for localized prostate cancer. *JAMA* 1995; 273(2): 129–135.
9. Litwin MS, Nied RJ, Dhanani N. Health-related quality of life in men with erectile dysfunction. *J Gen Intern Med* 1998; 13(3): 159–166.
10. Pinnock CB, Stapleton AM, Marshall VR. Erectile dysfunction in the community: A prevalence study. *Med J Aust* 1999; 171(7): 353–357.
11. NIH consensus Conference. Impotence. NIH consensus development panel on impotence. *JAMA* 1992; 10: 1–31.
12. NIH consensus Conference. Impotence. NIH consensus development panel on impotence. *JAMA* 1993; 270(1): 83–90.
13. Mulligan J, Moss CR. Sexuality and aging in male veterans: A cross-sectional study of interest, ability and activity. *J Arch Sex Behav* 1991; 20: 17–25.
14. Slag MF, Morley JE, Elson K, et al. Impotence in medical clinic outpatients. *JAMA* 1983; 249: 1736–1740.
15. Keene LC, Davies PH. Drug-related erectile dysfunction. *Adverse drug react Toxicol Rev* 1999; 18(1): 5–24.
16. Garratt AM, Torgerson DJ, Wyness J, et al. Measuring Sexual-functioning in premenopausal women. *Br J Obst Gyn* 1995; 102: 311–316.
17. Garratt A. Measuring sexual-functioning in premenopausal women. *Br J Obst Gyn* 1999; 102(311): 316.
18. Hwang MY, Glass RM, Molter J. Silence about sexual problems can hurt relationships. *JAMA* 1999; 281(6): 584.
19. Barni S, Mondin R. Sexual dysfunction in treated breast cancer patients. *Ann Oncol* 1997; 8(2): 149–153.
20. Berman JR, Berman LA, Werbin TJ, et al. Clinical evaluation of female sexual December 23, 2003 function: Effects of age and estrogen status on subjective and physiologic sexual responses. *Int J Impot Res* 1999; 11 (Suppl 1): S31–S38.
21. Michelson D, Bancroft J, Targum S, et al. Female sexual dysfunction associated with antidepressant administration:

- A randomized, placebo-controlled study of pharmacologic intervention. *Am J Psychiatry* 2000; 157(2): 239–243.
22. Korpelainen JT, Nieminen P, Myllylä VV. Sexual-functioning among stroke patients and their spouses. *Stroke* 1999; 30(4): 715–719.
 23. Gelfand MM. Sexuality among older women. *J Women's Health Gen Based Med* 2000; 9 (Suppl): 15–20.
 24. Gould D. The menopause: Sexually-related problems. *Nurse Stand* 1998; 12(25): 49–54.
 25. Diokno AC, Brown MB, Herog R. Sexual function in the elderly. *Arch Int Med* 1990; 150: 197–200.
 26. Kinsberg SA. The psychological impact of aging on sexuality and relationships. *J Women's Health Gen Based Med* 2000; 9 (Suppl): 33–38.
 27. Rebar RW, Erikson GF. Menstrual cycle and fertility. In: Goldman L, Claude BJ, (eds), *Cecil Textbook of Medicine*, 21st ed. Philadelphia, PA: WB Sanders Company, 2000, pp. 1327–1340.
 28. Lue TF. Physiology of penile erection dysfunction and priapism. In: Walsh P, Retick A, Vaughn E, Wein A (eds), *Campbell's Urology*, 7th ed. Philadelphia, PA: WB Saunders, 1998, p. 1164.
 29. Swerdloff RS, Wang C. The testis and male Sexual-function. In: Goldman L, Claude BJ, (eds), *Cecil Textbook of Medicine*, 21st ed. Philadelphia, PA: WB Sanders Company, 2000, pp. 1306–1317.
 30. Ellenberg M. Sexual aspects of the female diabetic. *Mt Sinai J Med* 1977; 44: 495–500.
 31. Crosignani PG, Vercellinini P, Apolone G, et al. Endometrial resection versus vaginal hysterectomy for menorrhagia: Long-term clinical and quality of life outcomes. *Am J Obst Gyn* 1997; 177: 95–101.
 32. Da Silva F, Marquis P. Relative importance of sexuality and quality of life in patients with prostatic symptoms. *Euro Urol* 1997; 31: 272–280.
 33. Katz S, Aloni R. Sexual dysfunction of persons after traumatic brain injury: Perceptions of professionals. *Int J Rehabil Res* 1999; 22(1): 45–53.
 34. El Rifaie OE, Bener A, Abuzeid MS, et al. Sexual dysfunction among type II diabetic men: A controlled study. *J Psychosom Res* 1997; 43(6): 605–612.
 35. Zivandinov R, Zorzon M, Bosco A, et al. Sexual Dysfunction in Multiple Sclerosis II. Correlation Analysis. *Mult Scler* 1999; 5(6): 428–431.
 36. Rabkin JG, Wagner GJ, Rabkin R. A double-blind, placebo-controlled trial of testosterone therapy for HIV-positive men with hypogonadal symptoms. *Arch Gen Psychiatry* 2000; 57(2): 141–147.
 37. Enzlin P, Mathieu C, Vanderwhueren D, et al. Diabetes mellitus and female sexuality: A review of 35 years' research. *Diabet Med* 1998; 15(10): 809–815.
 38. Croog S, Levine S, Testa M, et al. The effects of antihypertensive therapy on the quality of life. *NEJM* 1986; 314(26): 1657–1664.
 39. Hindmarch I. The behavioural toxicity of antidepressants: Effects on cognition and sexual function. *Int Clin Psychopharmacol* 1998; 6: S5–S8.
 40. Labbate LA, Broderick PS, Nelson RP, et al. Effects of bupropion sustained-release on sexual functioning and nocturnal erections in healthy men. *J Clin PsychoPharm* 2001; 21(1): 99–103.
 41. Labbate LA, Grimes JB, Arana GW. Serotonin reuptake antidepressant effects on Sexual-function in patients with anxiety disorders. *Bio Psych* 1998; 43(12): 904–907.
 42. Labbate LA, Rubey RN. Gabapentin-induced ejaculatory failure and anorgasmia. *Am J Psych* 1999; 156(6): 972.
 43. Coleman CC, Cunningham LA, Foster VJ, et al. Sexual dysfunction associated with the treatment of depression: A placebo-controlled comparison of bupropion sustained release and sertraline treatment. *Ann Clin Psychiatry* 1999; 11(4): 205–215.
 44. Croft H, Settle E Jr, Houser T, et al. A placebo-controlled comparison of the antidepressant efficacy and effects on sexual functioning of sustained-release bupropion and sertraline. *Clin Ther* 1999; 21(4): 643–658.
 45. Fogari R, Zoppi A, Corradi L, et al. Sexual function in hypertensive males treated with lisinopril or atenolol: A cross-over study. *Am J Hypertens* 1998; 11(10): 1244–1247.
 46. Grimm RH Jr, Gandits GA, Prineas RJ, et al. Long-term effects on sexual function of five antihypertensive drugs and nutritional hygienic treatment in hypertensive men and women. *Treatment of Mild Hypertension Study. Hypertension* 1997; 29(1 Pt 1): 8–14.
 47. Feldman HA, Goldstein I, Hatzchristou G, et al. Impotence and its medical psychosocial correlates: Results of the Massachusetts Male Aging Study. *J Urol* 1994; 151: 54–61.
 48. Bergmark K, Lundqvist EA, Dickman PW, et al. Vaginal changes and sexuality in women with a history of cervical cancer. *NEJM* 1999; 340: 1383–1389.
 49. Kaufman SA. Limited relationship of maturation index to estrogen therapy for menopausal symptoms, an analysis of 200 patients. *Obstet Gynecol* 1967; 30(3): 399–407.
 50. Ghadirian AM, Chouinard G, Annable L. Sexual dysfunction and plasma prolactin levels in neuroleptic-treated schizophrenic outpatients. *J Nervous Mental Disease* 1982; 170(8): 463–467.
 51. Fogari R, Zoppi A, Corradi L, et al. Sexual function in hypertensive males treated with lisinopril or atenolol: A cross-over study. *Am J Hypertens* 1998; 11(10): 1244–1247.
 52. Testa M, et al. Quality of life and antihypertensive therapy in men: A comparison of captopril and enalapril. *NEJM* 1993; 323(13): 907–913.
 53. Testa MA, Hollenberg NK, Anderson RB, et al. Assessment of quality of life by patient and spouse during antihypertensive therapy with atenolol and nifedipine gastrointestinal therapeutic system. *Am J Hypertens* 1991; 4: 363–373.
 54. Levine S, Croog SH. What constitutes quality of life? A conceptualization of the dimensions of life quality in healthy populations and patients with cardiovascular disease. In: Wegner NK, Mattson ME, Furberg CD, et al. (eds), *Assessment of Quality of Life in Clinical Trials of Cardiovascular Therapies*, New York: LeJacq, 1984: 46–58.
 55. Jeremy JY, Mikhailidis DP. Cigarette smoking and erectile dysfunction. *J R Soc Health* 1998; 118(3): 151–155.

56. Rogstad KE, Shah R, Tesfaladet G, et al. Sexual dysfunction in patients with HIV infection and its association with autonomic neuropathy and CD4 count. *Int Conf AIDS* 1998; 12: 545.
57. Gilbert DG, Hagen RL, D'Agostino JA. The effects of cigarette smoking on human sexual potency. *Addict Behav* 1986; 11: 431-434.
58. Kaplan HS, Fyer AJ, Novick A. The treatment of sexual phobias the combined use of antipanic medication and sex therapy. *J Sex Marital Ther* 1982; 8(1): 3-28.
59. Derogatis L, Meyer J, King K. Psychopathology in individuals with sexual dysfunction. *Am J Psych* 1991; 138(6): 757-762.
60. Derogatis L, Meyer J. A psychological profile of the sexual dysfunctions. *Arch Sex Behav* 1997; 8(3): 201-223.
61. Duffy J. Sexual healing. *Hopkins Medical News/Winter* 1999; 20-25.
62. Kaplan SA, Reis RB, Kohn IJ, et al. Combination therapy using oral alpha-blockers and intracavernosal injection in men with erectile dysfunction. *Urology* 1998; 52(5): 739-743.
63. Rabkin JG, Wagner GJ, Rabkin R. A double-blind, placebo-controlled trial of testosterone therapy for HIV-positive men with hypogonadal symptoms. *Arch Gen Psychiatry* 2000; 57(2): 141-147.
64. Giorgi PM, Canale D, Turchi P, et al. Recent diagnostic and therapeutic aspects in male sexual impotence. *Recenti Prog Med* 1992; 83(11): 614-620.
65. Conte HR. Development and use of self-report techniques for assessing sexual functioning: A review and critique. *Arch Sex Behav* 1986; 12(6): 555-576.
66. Harbison J, Graham P, Quinn J, et al. A questionnaire measure of sexual interest. *Arch Sex Behav* 1974; 3: 357-365.
67. Lief HI. Self-evaluation of sexual behavior and gratification. In: HI Lief (ed.), *Sexual Problems in Medical Practice*, Monroe, WI: American Medical Association, 1981; 389-399.
68. Hoon EF, Hoon PW, Wincze JP. An inventory for the measurement of female sexual arousability: The Sexual Arousability Index. *Arch Sex Behav* 1976; 5(4): 291-300.
69. Paitich D, Langevin R, Freeman R, et al. The Clarke SHQ: A clinical sex history questionnaire for males. *Arch Sex Behav* 1977; 6(5): 421-436.
70. Abel GG, Blanchard EB, Barlow DH. Measurement of sexual arousal in several paraphilias: The effects of stimulus modality, instructional set and stimulus content on the objective. *Behav Res Therapy* 1981; 19(1): 25-33.
71. Derogatis LR. *Derogatis Sexual Functioning Inventory*. Baltimore: Johns Hopkins University, 1975 (Revised ed., 1978).
72. Levine SB. Conceptual suggestions for outcome research in sex therapy. *J Sex Marital Ther* 1980; 6(2): 102-108.
73. Monga TN, Tan G, Ostermann HJ, et al. Sexuality and sexual adjustment of patients with chronic pain. *Disabil Rehabil* 1998; 20(9): 317-329.
74. Rust J GS. The GRISS: A psychometric instrument for the assessment of sexual dysfunction. *Arch Sex Behav* 1999; 15(2): 157-165.
75. Ganz PA, Schag CAC, Lee JJ, et al. The CARES: A generic measure of health-related quality of life for patients with cancer. *Qual Life Res* 1992; (1): 19-29.
76. Davis CM, Yarber WL, Bauserman R, et al. *The Handbook of Sexuality-Related Measures*, Thousand Oaks, California: Sage, 1998.
77. Cronbach J. Coefficient alpha and the internal structure of tests. *Psychometrika* 1951; 16: 297-334.
78. Schofer LR, Friedman JM, Weiler SJ, et al. Multiaxial problem-oriented diagnostic system for sexual dysfunctions. *Arch Gen Psych* 1982; 39: 614-619.
79. Reynolds CF, Frank E, Thase ME, et al. Assessment of sexual function in depressed, impotent and healthy men. *Psych Res* 1988; 24(3): 231-250.
80. Derogatis LR. Symptom checklist 90 revised: Administration, scoring and procedures and manual I. *Clin Psychom Res Baltimore*, 1977.
81. Geisser M, Jefferson TW, Spevak M, et al. Reliability and validity of the Florida sexual history questionnaire. *J Clin Psych* 1991; 47(4): 519-527.
82. Nowinski J, LaPiccolo J. Assessing sexual behavior in couples. *J Sex Marital Ther* 1999; 5(3): 225-243.
83. Hanson EI. Effects of chronic lung disease on life in general and on sexuality: Perceptions of adult patients. *Heart Lung* 1982; 11(5): 435-441.
84. Bentler PM. Heterosexual behavior assessment-females. *Behav Res Therapy* 1968; 6(21): 27-30.
85. Bentler PM. Heterosexual behavior assessment-males. *Behav Res Therapy* 1968; 6(21): 21-25.
86. Podell L, Perkins JC. A Guttman scale for sexual experience-a methodological note. *J Abnorm Psychol* 1957; 54: 420-422.
87. Zuckerman M. Scales for sex experience for males and females. *J Consult Clin Psych* 1973; 41(1): 27-29.
88. McCutchan A, Jacobson D, Robinson R, et al. Impact of hypogonadism on sexual function in HIV/AIDS. *Int Conf AIDS* 1993; 9(1): 66.
89. Hudson W, Harrison D, Crosscup P. Short form scale to measure sexual discord in dyadic relationships. *J Sex Res* 1981; 17(2): 157-174.
90. Rosen RC, Riley A, Wagner G, et al. The international index of erectile function (IIEF): A multidimensional scale for assessment of erectile dysfunction. *Urology* 1997; 49(6): 822-830.
91. Libman E, Rothenberg I, Fitchen CS, et al. The SSES-E: A measure of sexual self-efficacy in erectile functioning. *J Sex Marital Ther* 1983; 11(4): 233-245.
92. McCoy NL. Estrogen levels in relation to self-reported symptoms and sexuality in perimenopausal women. In: Flint M, Kronenberg F, Utian W (eds), *Multidisciplinary Perspectives in Menopause*, Annals of the New York Academy of Sciences, 592, 450-452.
93. Hargreave T, Stephenson T. Potency and prostatectomy. *Br J Urol* 1977; 49: 683-688.
94. Segraves KA, Segraves RT, Schoenberg RT. Use of sexual history to differentiate organic from psychogenic impotence. *Arch Sex Behav* 1987; 16: 125-137.

95. Vereecken RL. Sexual activity of men presenting with prostatism: Effect of prostatectomy. *Euro Urol* 1989; 16: 328–332.
96. Waterhouse J, Metcalfe MC. Development of the Sexual Adjustment Questionnaire. *Onc Nurs Form* 1986; 13(3): 53–59.
97. Meyer-Bahlburg HF, Dolezal C, Stern Y, et al. Sexual dysfunction in homosexual HIV+ men: Associations with immune function, endocrine, neurologic and psychiatric factors. *Int Conf AIDS* 1993; 9(1): 417.
98. Duncan S. Antiepileptic drug therapy and sexual function in men with epilepsy. *Epilepsia* 1999; 40(2): 197–204.
99. McCabe MP. Childhood, adolescent and current psychological factors associated with sexual dysfunction. *Sex Marital Ther* 1994a; 9: 267–276.
100. McCabe MP. The influence of the quality of relationship on sexual dysfunction. *Australian J Marriage Family* 1994b; 15: 2–8.
101. LaPiccolo J, Steger J. The sexual interaction inventory: A new instrument for assessment of sexual dysfunction. *Arch Sex Beh* 1974; 3(6): 585–595.
102. Woody JD, D'Souza HJ. The Sexual Interaction System Scale: A new inventory for assessing sexual dysfunction and sexual distress. *J Sex Marital Therapy* 1994; 20: 210–228.
103. Siosteen A, Lundqvist C, Blomstrand C, et al. Sexual ability, activity attitudes and satisfaction as part of adjustment in spinal cord-injured subjects. *Paraplegia* 1990; 28: 285–295.
104. Thorne FC. The sex inventory. *J Clin Psych* 1966; 22: 367–374.
105. Patterson DG, O' Gorman EC. The SOMA – a questionnaire measure of sexual anxiety. *Br J Psych* 1986; 149: 63–67.
106. Shumaker SA, Wyman JF, Uebersax JS, et al. Health-related quality of life measures for women with urinary incontinence: The Incontinence Impact Questionnaire and the Urogenital Distress Inventory. *Continence Program in Women (CPW) Research Group. Qual Life Res* 1994; 3(5): 291–306.
107. Stewart AL, Ware JE. *Measuring Functioning and Well-being the Medical Outcomes Study Approach*. Durham, NC: Duke University Press, 1992.
108. Shag CAC, Ganz PA, Heinrick RL. Cancer Rehabilitation Evaluation System Short Form (Cares-SF): A cancer-specific rehabilitation and quality of life instrument. *Cancer* 1991; 68: 1404–1413.
109. MacKenzie EJ, Damiano A, Miller T, et al. The development of functional capacity index. *J Trauma: Inj Inf Crit Care* 1996; 41(5): 799–807.
110. Vickrey BG, Hays RD, Harooni R, et al. A health related quality of life measure for multiple sclerosis. *Qual Life Res* 1995; 4: 187–200.
111. Amir M, Bar-On D, Penso R. Positive–Negative Evaluation (PNE) Scale: A new dimension of the subjective domains of quality of life measure. *Qual Life Res* 1996; 5: 73–80.
112. Holmes WC, Shea JA. A new HIV/AIDS-targeted quality of life (HAT-QoL) instrument: Development, reliability, and validity. *Med Care* 1998; 36(2): 138–154.
113. Monga TN, Lawson JA, Inglis J. Sexual dysfunction in stroke patients. *Arch Phys Med Rehab* 1986; 67(1): 19–22.
114. Cleary PD, Morrissey G, Oster G. Health related quality of life in patients with advanced prostate cancer; multinational perspective. *Qual Life Res* 1995; 4: 207–220.
115. Holmes W, Shea J. Performance of a new, HIV/AIDS targeted quality of life (HAT-QoL) instrument in asymptomatic seropositive individuals. *Qual Life Res* 1999; 6: 561–571.
116. Toulitatos, J, Perlmutter BF, Strauss MA, (eds), *Handbook of Family Measurement Techniques*, Newbury Park, CA: Sage, 1990.
117. Levine SB. *Sexual Life: A Clinician's Guide*. New York. Plenum Press, 1992.
118. Stewart F, Tudiver F, Bass MJ, Dunn EV, Norton PG, (eds), *Tools for Primary Care Research*. Thousand Oaks, Ca: Sage, 1992, pp. 229–270.
119. Bulpitt CJ. The measurement of quality of life in hypertensive patients: A practical approach. *Br J Clin Pharm* 1990; 30: 353–364.
120. Koukouras D, Spiliotis J, Scopa CD, et al. Radical consequence in the sexuality of male patients operated for colorectal carcinoma. *Eur J Surg Oncol* 1991; 17: 285–288.
121. Brady JP, Levitt EE. Scalability of sexual experience. *Psychol Record* 1965; 15(2): 275–279.
122. Michelson D, Bancroft J, Targum S, et al. Female sexual dysfunction associated with antidepressant administration: A randomized, placebo-controlled study of pharmacologic intervention. *Am J Psychiatry* 2000; 157(2): 239–243.
123. Kaplan HS. *Disorders of Sex Desire*. New York: Brunner/Mazel, 1979.
124. Rosen RC, Taylor JF, Leiblum SR. Brief index of sexual-function for women: Results of a survey study of 329 women in an outpatient gynecological clinic. *J Sex Marital Ther* 1993; 19: 171–188.
125. Speckens AE. Discrimination between psychogenic and organic erectile dysfunction. *J Psychoso Res* 1993; 37(2): 135–145.

Address for correspondence: Albert W. Wu, Health Services Research and Development Center, 624 North Broadway, Baltimore, MD 21205, USA
 Phone: +1-410-955-6567; Fax: +1-410-955-0470/425-740-1650
 E-mail: awu@jhsph.edu