

## Chapter 21

# Validated Questionnaires in Female Sexual Function Assessment

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**Keywords** Questionnaires • Psychometrics • Validation • Validity • FSFI • SVQ • DISF • DSFI • BSFI-W • GRISS • CSFQ • MSFQ • GMSEX • ISS • PSSI • FSDS • SSS-W

### Introduction

Cancers and their treatments are associated with significant sexual dysfunction in both genders [1], but female cancer patients are significantly less likely than males to seek or receive treatment for their sexual concerns [2]. One study found that even though the majority of health care providers on oncology teams thought their patients would experience a sexual problem arising from treatment or advancement of the disease, only a quarter of oncologists and a fifth of nurses discussed these concerns with their patients. The health care professionals cited lack of knowledge about diagnosis and treatment as a large component of the barrier in addressing their patient's sexual dysfunction [3]. Crucial to closing this gap in the diagnosis and treatment of female sexual dysfunction is the development and validation of psychometrically sound instruments for diagnosing dysfunctions and monitoring sexual symptoms.

To this end, there is currently available a number of well-established instruments for assessing sexual function and satisfaction in women. In this chapter, we review the relative strengths and weaknesses of nine measures of sexual function and five measures of sexual satisfaction/distress for which the psychometric properties are well established. Where available, we provide information on the use of these measures in female cancer patients. We review measures of sexual function and satisfaction separately given recent findings suggesting sexual satisfaction in women is a particularly complex, multifaceted construct that is separate from sexual functioning [4–6].

### Using Psychometrics to Evaluate an Instrument

When choosing an appropriate measure, one must consider what is known about that measure's psychometric properties, or the characteristics of the measure that contribute to its validity and reliability. A reliable measure has very little to no measurement error; any variation in measurements reflects true variation in the population. Reliability can be compared across instruments with reliability coefficients that range from 0 (measurements are entirely due to error) to 1 (measurements are entirely free from error). There are two kinds of reliability that are of particular interest for self-report FSD instruments. *Internal consistency* refers to the degree to which items are endorsed

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together, and reflects how well an instrument (or a factor of an instrument) captures one specific construct. *Test-retest reliability* refers to the degree to which the same input (the same testing conditions in the same population) will consistently replicate the same output (the same measurement). *Test-retest reliability* is generally measured using repeated administrations of an instrument in the same sample over the course of 2–4 week intervals. In the case of clinician-rated instruments, one must also consider *inter-rater reliability* – the degree to which there is agreement between clinicians on outcome measures.

*Validity* relates to an instrument's accuracy in measuring what it is thought to measure. The most commonly used index of validity is *face validity*, or the extent to which the items of an instrument appear to address the construct of interest. Related is *convergent validity*, which refers to how closely the results of an instrument are to other already established measure of the same (or very similar) construct. *Divergent validity*, on the other hand, refers to the dissociation of the instrument's scores from measures of related but theoretically different constructs. For example, a measure of self-reported lubrication should be convergent with measures of genital throbbing or heat but divergent with measures of marital satisfaction. Finally, *discriminant validity* pertains to how well an instrument can identify a particular population. In the case of FSD instruments, discriminant validity generally refers to whether or not a measure can differentiate between clinical and nonclinical populations. Establishing *discriminant validity* is often an ongoing process, as the generalizability of the instrument's properties requires reevaluation for each new population of interest.

In addition to evaluating the overall reliability and validity of an assessment questionnaire, clinicians and researchers selecting an instrument for assessing sexual function and satisfaction in cancer populations might also consider whether the measure has been used in the cancer population of interest, and whether it has been validated in a cancer population, or only in a noncancer population. Below we review publicly available measures of sexual function and satisfaction that have demonstrated acceptable reliability and validity.

## Female Sexual Function Assessment Instruments (Tables 21.1–21.4)

### Sexual Activity Questionnaire (SAQ)

The Sexual Activity Questionnaire (SAQ) [7] is a 14-item self-report inventory which assesses the level of sexual activity, reasons for current sexual inactivity, and sexual functioning. It was designed specifically for use in clinical trials in cancer populations. One element of the SAQ which is unique amongst the measures reviewed in this chapter is a section assessing reasons for the lack of sexual activity, which offers a list of reasons pertaining to the patient ("too tired") as well as his/her partner ("my partner is not interested in sex"). The sexual functioning section has three subscales supported by factor analyses: pleasure (including items assessing sexual desire and satisfaction), discomfort (including items assessing problems of sexual arousal and pain), and habit (assessing changes in sexual frequency). Notably missing from the sexual functioning section are items assessing orgasm or aspects of arousal other than vaginal lubrication. Validation of the SAQ was conducted in a sample of 528 women (447 with high risk for breast cancer and 81 with low risk; age range 35–65 years) recruited for a clinical trial of tamoxifen [7]. The validation study established 2-week test-retest reliability and internal consistency in the good to excellent range, and discriminant validity in differentiating pre- and postmenopausal women on the sexual activity subscale and discomfort factor of the sexual functioning subscales. Norms and standardized percentile scores are available for a community sample of 1,165 women (age range 20–69 years) [8]. Face validity was established in a group of 638 women with gynecological disorders; compliance and response rates ranged from 77 to 82%, with the lowest compliance in the oldest group of women. The SAQ takes approximately 5–10 min to administer, and is available in English and Norwegian [8]. Norms have also been established in lesbian women with recent cancer diagnoses [9].

Table 21.1

Inventory  
name

SAQ

SVQ

BISF-W

CSFQ

DISF/  
DISF-SR

FSFI

GRIS

DSFI

MFSQ

**Table 21.1** Measurement characteristics for indices of female sexual functioning

Inventory name	# Items	Standardization sample	Administration time/modality	Domains measured
SAQ	14	447 with high risk for breast cancer and 81 with low risk (35–65 years)	10 min Self-report Women only	Sexual activity/reasons for inactivity, sexual pleasure, sexual discomfort
SVQ	27	257 women with cervical cancer (23–80 years)	Unknown administration time Self-report Women only	Sexual functioning, partner's sexual problems, body image, vaginal changes
BISF-W	22	225 healthy women (20–55 years); 104 surgically menopausal women with impaired sexual function (21–55 years)	15–20 min Self-report Women only	Thoughts/desire, arousal, frequency of sexual activity, receptivity, pleasure/orgasm, relationship satisfaction, problems affecting sexuality
CSFQ	35	122 male and female medical students (22–35 years) and 33 psychiatry residents (25–43 years)	15–20 min Interview Male and female versions	Sexual pleasure, sexual desire/frequency, sexual desire/interest, arousal, orgasm
DISF/ DISF-SR	25	399 community members (19–69 years)	10–15 min Interview and self-report Male and female versions	Sexual cognition and fantasy, arousal, sexual behavior and experience, orgasm, sexual drive, and relationship
FSFI	19	131 normal women (21–68 years); 128 women with FSAD (21–69 years)	10–15 min Self-report Female only	Desire, arousal, lubrication, orgasm, satisfaction, pain
GRISS	28	88 sex therapy clients (males and females)	15–20 min Self-report Male and female versions	Anorgasmia, vaginismus, impotence, premature ejaculation, avoidance, dissatisfaction, nonsensuality, infrequency, noncommunication
DSFI	254	230 male and female college students (mean age: 32 years)	>30 min Self-report Male and female versions	Information, experiences, drive, attitudes, psychological symptoms, affect balance, gender role definition, fantasy, body image, sexual satisfaction
MFSQ	19	364 women (18–26 years)	10–15 min Self-report Female only	Sexual interest, satisfaction with sexual activity frequency, vaginal lubrication, sex partners, orgasm

**Table 21.2** Measurement characteristics for indices of female sexual satisfaction

Inventory name	# Items	Standardization sample	Administration time/modality	Domains measured
GMSEX	5	99 undergraduates in long-term romantic relationships	Unknown administration time Self-report Male and female	Sexual satisfaction
ISS	25	100 men and women seeking treatment for relationship problems (mean age: 32.7 years)	5–7 min Self-report Male and female	Sexual satisfaction
PSSI	24	275 undergraduate women (17–24 years)	Unknown administration time Self-report Female only	General sexual satisfaction, satisfaction with partner
FSDS	12	60 nurses without sexual problems; 18 female patients with FSD (mean age: 48 years)	Unknown administration time Self-report Female only	Frequency, intensity
SSS-W	30	181 women in romantic relationships (18–56 years)	5–10 min Self-report Female only	Contentment, communication, compatibility, relational concern, personal concern

The strengths of the SAQ include items that assess the individual and partner's sexual dysfunction or disinterest, reasons for sexual inactivity, and changes in habitual level of sexual frequency. Weaknesses include a lack of items assessing orgasm functioning, a definition of arousal limited to lubrication, and an unknown level of construct validity.

### Use in Cancer Populations

Of all of the assessment instruments reviewed here, the SAQ is the most widely used in cancer research, with dozens of studies published utilizing the measure in various gynecological cancer populations. Generally, the SAQ identifies about half of all cancer populations – both patients and survivors – as sexually inactive. Most studies using the SAQ indicate greater sexual dysfunction (higher discomfort and lower pleasure scores) in cancer populations than for controls.

In the breast cancer literature, there are norms available for patients receiving tamoxifen, chemotherapy, a combination, or none of these treatments [10], as well as survivors of a wide age

range (25–51 years), broken into groups [11]. The SAQ has been shown to be sensitive to changes in sexual activity and pleasure following high dose and conventional chemotherapy for breast cancer, both in the short term (6 months) and longer term (5 years) [12]. Norms have also been established for women at high risk for breast cancer who received prophylactic mastectomies, both pre- and postmenopausal and with and without reconstruction [13], and the sexual pleasure dimension has been shown to differentiate between women who received breast reconstruction from those who did not [14]. While some studies have suggested that the SAQ is sensitive to changes in sexual pleasure following prophylactic mastectomies [15], others have suggested no difference in SAQ scores between women who did and did not accept surgery [16]. The SAQ did not detect any treatment-related changes in sexual functioning in a trial of venlafaxine and clonidine for treatment of hot flashes in breast cancer patients [17].

Among women with ovarian cancer, norms have been published for populations who are and are not receiving treatment [18] as well as survivors of ovarian germ cell tumors [19].

**Table 21.3** Reliability coefficients and validity correlations for sexual functioning indices

Inventory	Test-retest reliability	Internal consistency reliability	Concurrent validity	Divergent validity	Discriminant validity	Clinical cut-offs
SAQ	0.65–1.00	0.97–0.99	N/A	N/A	Cancer from noncancer populations; patients who are and are not receiving treatments for cancer	N/A
SVQ	N/A	0.46–1.00	$R = 0.52$ – $1.00$ to expert observer scores	N/A	Cancer patients from noncancer patients	N/A
BISF-W	0.68–0.78	0.39–0.83	$R = 0.46$ – $0.69$	N/A	N/A	N/A
CSFQ	0.45–1.00	–0.08–0.72	$R = 0.42$ – $0.76$ CSFQ subscale to comparable subscales of DISF	N/A	Depressed from nondepressed patients	N/A
DISF	0.80–0.90	0.74–0.80	N/A	N/A	Sexually functional from dysfunctional	N/A
FSFI	0.79–0.88	0.89–0.97	N/A	$R = 0.53/0.22$ to marital adjustment for control and FSAD groups, respectively	FSAD, FOD, and HSDD from controls	26.55
GRISS	0.47–0.82	0.61–0.83	$R = 0.56$ ; female total score to therapists ratings of problem severity	N/A	Sexual treatment seeking from medical treatment seeking	N/A
DSFI	0.58–0.96	0.60–0.97	N/A	N/A	N/A	N/A
MFSQ	0.69–0.95	0.74	N/A	N/A	Premenopausal from postmenopausal and oral contraceptive users from nonusers	N/A

**Table 21.4** Reliability coefficients and validity correlations for sexual satisfaction indices

Inventory	Test-retest reliability	Internal consistency reliability	Concurrent validity	Divergent validity	Discriminant validity	Clinical cut-offs
GMSEX	0.78–0.84	0.90–0.96	$R = 0.63$ GMSEX to ISS	Relationship of GMSEX (sexual satisfaction) to GMREL (relational satisfaction): $R = .50$	N/A	N/A
ISS	0.93	0.92	N/A	More effective than Index of Marital Satisfaction at differentiating between women with and without FSD ( $R = .76$ vs. $R = .52$ , respectively)	Individuals with sexual problems from controls	13
PSSI	N/A	0.92	$R = 0.68/0.37$ PSSI to ISS/orgasm consistency	N/A	N/A	N/A
FSDS	0.80–0.92	0.86–0.90	N/A	$R = 0.59/0.58$ FSDS to measure of depression/negative affect	FSD from controls	15
SSS-W	0.58–0.79	0.74–0.9	$R = 0.22$ – $0.70$ ; SSS-W subscales to satisfaction scale of the FSFI	Relationship between subscales and Marital Adjustment Test range from $R = .19$ (personal concern) to $R = .57$ (communication)	FSD from controls	N/A

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### Sexual Function Questionnaire

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The sexual activity and pleasure domains have been shown to differentiate between community participants and survivors of ovarian germ cell tumors [20] as well as epithelial cancers [21]. Like in the breast cancer literature, it has been shown that scores on the sexual pleasure and discomfort domains of the SAQ can differentiate between women who underwent prophylactic salpingo-oophorectomy from those simply receiving screenings for ovarian cancer [22], although these effects may drop out after 6 months postsurgery [23]. The sexual activity domain does not appear to differentiate between women who have undergone oophorectomy and those who have not [22]. Similarly, SAQ activity domain scores are not significantly different between women who did and did not go on hormone replacement therapy (HRT) following oophorectomy [24].

The SAQ norms for long-term cervical cancer survivors have been published [25, 26]. Some reports demonstrate that the sexual pleasure and discomfort domains can differentiate cervical cancer survivors from matched controls [26] while others suggest only the discomfort domain differs between the groups [25]. There appears to be no difference between 1-year postsurgery SAQ scores of women who received subtotal or total hysterectomies [27]. Also, there is no difference in 2-year postsurgery SAQ scores between women who received either hysterectomy or uterine artery embolization [28].

### ***Sexual Function – Vaginal Changes Questionnaire (SVQ)***

The Sexual Function – Vaginal Changes Questionnaire (SVQ) [29] is a self-report inventory with 20 core items that measure current sexual functioning and 7 additional items which can be used to assess changes in functioning after cancer diagnosis. The measure was designed to supplement the SAQ in assessing orgasmic and vaginal problems following treatments for gynecological cancers. Validation was conducted in a sample of 257 women with cervical cancer (age range 23–80

years); in this sample, internal consistency was good, and qualitative data suggested that the patients interpreted the items as they were intended. The measure demonstrated discriminant validity in differentiating women with cervical cancer from age-matched controls [30]. Item-level norms for women with and without cervical cancer are available [31]. To date, the measure is only available in English. The approximate time of administration has not been reported.

The relative strengths of the SVQ are its inclusion of specific items relating to vaginal changes and its public availability. Its relative weakness is a lack of research regarding its validity and test–retest reliability.

### **Use in Cancer Populations**

As noted above, the SVQ has been used mainly to assess sexual functioning in women with cervical cancer. One study found that SVQ scores were significantly associated with time since diagnosis and negative sexual self-schema [30]. Another study found that although patients who had received hysterectomies initially reported significantly lower sexual interest scores on the SVQ than did age-matched controls, this difference abated after a year [32]. However, in another longitudinal study, patients with recurrent or persistent cervical cancer reported significant worsening of all SVQ-assessed domains of sexual functioning over the course of 2 years [31].

### ***The Female Sexual Function Index (FSFI)***

The Female Sexual Function Index (FSFI) [33] is a 19-item self-report measure with six statistically and theoretically supported factors as well as a total global score. The factors are as follows: desire (2 items), arousal (4 items), lubrication (4 items), orgasm (3 items), satisfaction (3 items), and pain (3 items). The original validation study by Rosen et al. [33] was performed in a sample of 131 sexually healthy control women (age



range 21–68 years) and 128 age-matched women (age range 21–69 years) with diagnosed female sexual arousal disorder (FSAD). This study established the reliability of the FSFI in both healthy controls and sexually dysfunctional patients, with good levels of internal consistency both at the factor and total score levels and strong 2–4 week test–retest reliability. It also established divergent validity with weak correlations to a test of marital satisfaction, the Locke-Wallace Marital Adjustment Test. Further studies have also shown that the FSFI has discriminant validity in differentiating sexually healthy controls and women with FSAD [33], female orgasmic disorder (FOD) [34], hypoactive desire disorder (HSDD) [34], and vulvodynia [35]; norms in all of these populations are available at the factor and total score level. The FSFI has an established clinical cutoff score of  $\leq 26.55$  [36]. Norms have also been established in a community sample of gay women [37].

The FSFI takes approximately 15 min to administer, and is available on the web at [www.fsfi-questionnaire.com](http://www.fsfi-questionnaire.com). Translated versions of the FSFI have been validated in Spanish [38], Chinese [39], French [40], Italian [41], Portuguese [42], German [43], Korean [44], Malay [45], Turkish [46], and Dutch [47].

The relative strengths of the FSFI are a wide base of research from independent research teams supporting its reliability and validity, wide use in the sexual health literature, established clinical norms and cutoffs, and many publicly validated translations.

### Use in Cancer Populations

The FSFI has been used in a number of cancer populations, with published norms for most of the gynecological cancers. Frumovitz et al. [48] established norms for cervical cancer patients who received radiation treatment and those who had radical hysterectomies; they further found that radiation patients reported significantly lower FSFI scores than do those who underwent hysterectomies and healthy controls, who did not differ significantly from each other. Speer

et al. [49] similarly established norms for breast cancer survivors and found that survivors did not differ from historical FSAD patients. A more recent study has established norms in breast cancer survivors who did and did not receive chemotherapy [50]. Furthermore, Brotto et al. [51] showed that the FSFI was sensitive to treatment-related changes for a psychoeducational intervention for sexual dysfunction in women with gynecological cancer. Published norms are also available for women with rectal cancer [52] and sexually active and inactive women with leukemia or Hodgkin's disease [53].

### Derogatis Interview for Sexual Functioning (DISF/DISF-SR)

The Derogatis Interview for Sexual Functioning (DISF) [54] is a 25-item measure that is available both as a semistructured interview and a self-report form. In addition to the global summary score, there are five domains supported by factor analysis: sexual cognition/fantasy (5 items), sexual arousal (5 items), sexual behavior/experience (5 items), orgasm (6 items), and sexual drive/relationship (4 items). Both versions of the DISF have good internal consistency and 1-week test–retest reliability; the interview version has good to excellent inter-rater reliability [54]. Although norms for sexual dysfunctional women are not currently available, community sample norms in both genders have been published for the DISF and DISF-SR. These norms have been standardized into T-scores for a large community sample ( $n = 399$  with an age range of 19–64) with a mean of 50 and a standard deviation of 10; as 90% of sexually healthy participants scored above a T-score of 63, this is taken to be the normalcy cutoff [54].

The DISF/DISF-SR takes approximately 15 min to administer and is available in a number of translations including French, German, Finnish, Polish [55], Danish, Dutch, Italian, Spanish, and Norwegian. The DISF is copyrighted and thus available exclusively by purchase through Clinical Psychometric Research, Inc.

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### Use in Cancer

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The relative strengths of the DISF and DISF-SR are a standardized scoring system that allows comparison of individual profiles to a norm and to itself over time, three separate levels of interpretable data (item, domain, and global composite), and flexibility of both self-report and interview forms. The latter may be of particular use among researchers and clinicians working in populations where the rate of literacy is low (or unknown). Its relative weakness is its proprietary nature, which necessitates purchase of both the measure and its scoring system.

### Use in Cancer Populations

As the DISF uses a standardized scoring system, studies using the DISF allow direct comparison between cancer patients and the normative population. Marks et al. [56] followed men and women with a mixed group of cancers (majority leukemia) before and after receiving bone marrow transplants (BMT). The authors found that about half of the patients reported clinically significant sexual dysfunction pre-BMT (i.e., DISF scores below 63). After the treatments, one third of patients reported a significant increase in sexual function (of 10 points, or one standard deviation) but an equal reported equally significant decreases in functioning; thus, the overall population change was nonsignificant. In another longitudinal study, male and female lung cancer patients receiving either chemotherapy alone or chemotherapy plus radiation therapy were followed for 4 months. All but three of the patients had DISF scores below the norm (below 50) at baseline and there was a nonsignificant trend towards decreasing over the three time points. The two treatment groups did not differ significantly from each other, but women reported significantly lower sexual functioning than did the men [57].

A recent clinical trial of a clitoral therapy device (the Eros device) for irradiated cancer patients used both the FSFI and DISF to measure intervention-related changes [58]. The two measures complemented each other's strengths and weaknesses: while FSFI allowed the authors to

mark participants as clinical or nonclinical based on the clinical cutoff, the Derogatis Sexual Functioning Inventory (DSFI) allowed the authors to track individual standardized profiles using the percentile scores (i.e., observe which participants improved most within a group of individuals all expected to improve). The authors observed significant improvement in all of the subscales of the DSFI as well as a group trend towards normalcy (i.e., mean T-scores near 63); and as the patients reported a mean FSFI score of greater than the clinical cutoff, the authors were able to confirm their nonclinical status.

### Derogatis Sexual Functioning Inventory (DSFI)

The DSFI [59] is a broad measure of ten domains relevant to sexual function, including sexual attitudes, sexual knowledge, past and current sexual activity or behavior, types and level of fantasy, sexual drive, gender role definition, affective balance, psychological symptoms, body image and satisfaction, for a total of 254 items. Due to its length, the measure is rarely used in full solely to measure sexual functioning; however, researchers may use specific domains to track constructs of interest such as changes in sexual activity from previous behaviors. Internal consistencies of individual domains have been shown to be in the acceptable to good range, as is the 1-week test-retest reliability [59]. The global score has divergent validity with weak correlations to the Locke-Wallace Marital Adjustment Test and Dyadic Adjustment Scale [60]. Norms for a community sample of sexually healthy women ( $n=143$ , mean age of 32 years) are available for all subscales, as are norms for women with anorgasmia [61]. The sexual drive and satisfaction subscales have been shown to differentiate diabetic women from matched controls [62]; similarly, the satisfaction subscale has been shown to differentiate women with spinal chord injuries from a sexually healthy population [63].

The DSFI takes about half an hour to complete in its entirety, and is available in French [64], Chinese [65], Greek [66], and Finnish [67] language translations. Like the DISF, the DSFI is a proprietary measure available through Clinical Psychometric Research, Inc.

The relative strengths of the DSFI are its long history (and thus broad base of research utilizing the measure), and the wide variety of subscales that offer a comprehensive assessment of sexual function and related constructs. The relative weaknesses include a length that may be prohibitive in some settings and its proprietary nature.

### Use in Cancer Populations

As noted above, research using the DSFI most often uses one or a few subscales of interest. One of the most comprehensive uses of the DSFI in cancer patients was conducted in breast cancer patients who were receiving chemotherapy or other treatments. In this study, scores for the patients receiving chemotherapy on the body image, affect, psychological symptoms, sexual drive, and sexual satisfaction subscales were significantly lower than those in other treatments [68]. Current sexual activity subscale norms have been established in women who have received mastectomies with and without reconstruction [69]; a similar report established sexual activity norms in mastectomy patients with and without sexual partners [70]. The activity and satisfaction subscales were used to assess the differences between breast cancer patients who were disease free and those who had experienced recurrences: while there were no significant differences between groups on sexual satisfaction or frequency of kissing, the recurrence group reported significantly lower intercourse frequency [71]. In a related study, the satisfaction subscale in women who were 5-year disease free survivors was not significantly different from never-ill age-matched controls [72]. Findings on the body image subscale in cancer populations are mixed, with some reports suggesting cancer patients score significantly lower than healthy women [73] while others find no difference [74].

### Brief Index of Sexual Functioning – Women (BISF-W)

The Brief Index of Sexual Functioning – Women (BISF-W) [75] includes 22 items assessing sexual functioning and satisfaction in women. The first validation study was conducted in a sample of 269 women (age range of 20–73) and established 1-month test-retest reliability and convergent validity with the DSFI [59]. The original version was found to have three statistically supported factors: sexual interest/desire, activity, and satisfaction [75]; however, a new conceptually based scoring procedure has been developed which allows the BISF-W to be used more easily in clinical trials [76]. In addition to the total score, this new scoring algorithm has seven domains, including sexual thoughts/desire, arousal, frequency of sexual activity, receptivity/initiation, pleasure/orgasm, relationship satisfaction, and problems affecting sexual function. Of these, some domains have internal consistencies that are in the acceptable range (e.g., desire) while others proved to be relatively poor (e.g., arousal). Norms for the total score, as well as the seven domains of the new scoring system, have been published for sexually healthy women with and without regular sex partners [76].

The BISF-W takes 15–20 min to complete. Translations exist for Korean [77], Italian [78], German [79], and French [80]. The relative strength of this measure includes a long history and detailed system of seven domains; the relative weaknesses include lack of information on validity of the new scoring system as well as poor reliability in some domains.

### Use in Cancer Populations

Despite its wide use in sexuality research as a whole, there is relatively little work using the BISF-W in cancer populations. Using the new scoring system, Mazer et al. [76] established norms for the BISF-W in women who had undergone cancer surgery which induced early menopause (salpingo-oophorectomy) and found that

these lower both in Shifre oophorectomy and quality of life compared to treatment with tamoxifen. The first validation study was conducted in a sample of 269 women (age range of 20–73) and established 1-month test-retest reliability and convergent validity with the DSFI [59]. The original version was found to have three statistically supported factors: sexual interest/desire, activity, and satisfaction [75]; however, a new conceptually based scoring procedure has been developed which allows the BISF-W to be used more easily in clinical trials [76]. In addition to the total score, this new scoring algorithm has seven domains, including sexual thoughts/desire, arousal, frequency of sexual activity, receptivity/initiation, pleasure/orgasm, relationship satisfaction, and problems affecting sexual function. Of these, some domains have internal consistencies that are in the acceptable range (e.g., desire) while others proved to be relatively poor (e.g., arousal). Norms for the total score, as well as the seven domains of the new scoring system, have been published for sexually healthy women with and without regular sex partners [76].

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these surgically menopausal women reported lower functioning than sexually healthy women, both in composite scores and in separate domains. Shifren et al. [81] found that in a group of oophorectomized women, two of the seven sexuality domains of the BISF-W as well as the total composite score demonstrated sensitivity to treatment-related changes of transdermal testosterone treatments vs. placebo. A similar study conducted among Korean women who were posthysterectomy and who received HRTs revealed lower scores of sexual problems on the BISF-W than those who did not receive HRT [82]. A recent trial of a couples-focused coping intervention in early stage breast or gynecological cancer patients and their partners demonstrated that the Sexual Intimacy domain of the BISF-W was sensitive to intervention-related changes; however, this was not also true of any of the other domains nor the total score [83]. Included in the report on this trial are baseline norms for a mixed group of breast and gynecological cancer patients.

### **Changes in Sexual Functioning Questionnaire (CSFQ)**

The Changes in Sexual Functioning Questionnaire (CSFQ) [84] is a clinician administered structured interview with 35 items that capture changes in sexual functioning related to illness, medication, or treatments. There are five domains in the CSFQ, including sexual desire (frequency; 2 items), sexual desire (interest; 3 items), sexual pleasure (1 item), sexual arousal (3 items), and orgasm (3 items), with additional items regarding degree and extent of change in sexual functioning over time as well as the possible causes of the changes. Each domain, as well as the total score, has been shown to have discriminant validity in differentiating clinically depressed patients and non-clinical controls [85]. The standardization sample for the CSFQ was 122 medical students (68 men and 54 women of an age range of 22–35 years) and 33 psychiatry residents

(17 men and 16 women with an age range of 25–43 years). In these samples, internal consistency and both 1-week and 1-month test-retest reliability of the CSFQ were good. Furthermore, the CSFQ has proved to have convergent validity the *Derogatis Index of Sexual Function (DISF)* [85]. While there are norms for depressed patients and the standardization sample [85], there are not currently norms published for women with diagnosed FSD.

The CSFQ takes approximately 20 min to administer and is easy to score. Publicly available translations include Spanish [86] and Chinese [87], with many more available through [www.proqolid.org](http://www.proqolid.org). There is also a validated short form available, the CSFQ-14 [88]; however, due to its more recent development, little validation research is currently available.

The relative strengths of the CSFQ are a focus on changes in sexual function which differentiate long-standing sexual problems from those that arise out of illness or treatment, available norms for depressed populations, flexibility of self-report and interview versions, and a wide research base in the psychopharmacological literature base. The relative weakness is the unknown level of validity in using the CSFQ as a diagnostic tool for sexual dysfunction.

### **Use in Cancer Populations**

The CSFQ has been used in efficacy studies measuring the effects of interventions for sexual dysfunction following cancer treatments such as radiation or surgery. Norms are available as baseline (i.e., presexual health intervention but postcancer treatment) scores for patients in a mixed group of several cancers [89, 90]. The treatment outcome literature using the CSFQ in cancer populations is mixed, with some studies reporting changes in CSFQ scores after interventions such as group sexual therapy [89] and others reporting no changes following treatments such as transdermal testosterone [90] or estrogen replacement therapy [91].

## ***Golombok-Rust Inventory of Sexual Satisfaction (GRISS)***

Despite its name, the Golombok-Rust Inventory of Sexual Satisfaction (GRISS) is primarily a measure of sexual functioning. It was the product of collaboration at a sexual health clinic "think tank" and was designed to assess both a (heterosexual) couple's relationship quality and each individual partner's sexual functioning. The GRISS has 56 items (28 items for males and 28 for women) that fall into 12 domains (5 for women, 5 for men, and 2 common to both genders). It is possible to transform the individual domains to stanine (ranked order) scores to plot profiles of sexual functioning. These transformations are normed to a clinical sample but can also be used in nonclinical populations. A global score can be computed for both the couple and the individual. The seven domains in the female version of the GRISS are anorgasmia (4 items), vaginismus (4 items), avoidance (4 items), nonsensuality (4 items), dissatisfaction (4 items), frequency of sexual contact (4 items), and noncommunication (4 items). The original validation was conducted on a sample of 88 clients from sex therapy clinics (i.e., 88 men and women presenting together in a clinical setting); in this sample, internal consistency of each domain and the global measure were acceptable to good. The factor analysis supporting the domains has also been conducted in a nonclinical sample [92]. Test-retest reliabilities were calculated from a different sample of 41 couples in sex or marital therapy: even with significant changes over the course of therapy, the reliability of the GRISS was still good for most domains (with the exception of dissatisfaction) [93]. Discriminant validity has been established with the five female domains differentiating between sexually functional ( $n=30$ ) and dysfunctional ( $n=42$ ) women [92]. The GRISS is sensitive to treatment-related changes in sexual functioning in a study of 30 couples receiving sex therapy; also in this sample, the convergent validity between blind clinician ratings and GRISS scores was acceptable to good [92].

The GRISS takes approximately 15 min to administer, and is available in Dutch [94–96], Turkish [94], and Chinese [97]. The GRISS is a proprietary measure available through Psychcorp, a subsidiary of Pearson Assessments.

Strengths of the GRISS include a broad base of research on its validity and reliability and potential for use as a measure for both a couple and each individual. Its relative weaknesses include some outdated language in the items and its proprietary nature.

### **Use in Cancer Populations**

The GRISS was used to investigate an educational intervention to protect sexual function of intestinal cancer patients who were to receive permanent stoma. The GRISS scores in the control group indicated a slow decline in sexual function over time, while in the intervention group, there were no changes in the satisfaction, avoidance, and anorgasmia subscales (as well as the total scores), indicating that sexual function in these domains had been preserved [98]. The GRISS was also used to investigate sexual function in breast cancer patients who had undergone mastectomies with and without breast reconstruction. Although the GRISS norms for both groups were lower than healthy controls, this difference was not statistically significant [99].

## ***McCoy Female Sexuality Questionnaire (MSFQ)***

The McCoy Female Sexuality Questionnaire (MSFQ) [100] is a 19-item self-report inventory developed to track longitudinal changes in women's sexual functioning due to menopause. The first twelve questions assess general sexuality and interest; the final seven questions assess functioning during heterosexual intercourse. While the items assess separate domains of functioning, it has been validated only at the item and total score level. Reliability was established in a student sample of 318 women (age range 17–70

years); intratest-retest [101]. The differentialia women [11] nonusers [1 treatment i [103–105]. Experienced adapted fr [106, 107]. nity sampl years); in within fact alpha coeff for the ove separate st nant validit ing for trea clinics and convergent correlations DISF-SR [1 The MS and has b Norwegian Italian [109 are its adap not experie only the firs a validated low reliabil and lack of

### **Use in Cancer**

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years); internal consistency was good and 2-week test-retest reliability was acceptable to good [101]. The MFSQ has been shown to reliably differentiate between pre- and postmenopausal women [102] and oral contraceptive users and nonusers [100], and is sensitive to hormonal treatment induced changes in sexual functioning [103–105]. A short-form version, the Personal Experiences Questionnaire (PEQ), has been adapted from nine questions from the MFSQ [106, 107]. The PEQ was validated in a community sample of 438 women (age range 45–55 years); in this sample, the internal consistency within factors was poor (with some Cronbach's alpha coefficients as low as 0.38) but consistency for the overall scale was adequate [108]. In a separate study, the PEQ demonstrated discriminant validity in differentiating women presenting for treatment at sex therapy or psychiatric clinics and women at family planning clinics; convergent validity was also found with high correlations to the relevant domains of the DISF-SR [106].

The MSFQ takes about 10 min to complete, and has been validated in Swedish [103], Norwegian and Dutch [104], French [105], and Italian [109]. The relative strengths of the MSFQ are its adaptability to use in women who have not experienced sexual intercourse (i.e., using only the first twelve items) and the availability of a validated short form. Its weaknesses include low reliability of some items in the short form and lack of separate validated factors.

### **Use in Cancer Populations**

The MSFQ has been used in cancer populations, to track changes in sexual functioning due to hormonal changes, either from treatment for cancer (e.g., after surgical menopause) or hormone replacement treatments. In the former case, several studies have followed women who received hysterectomy and/or oophorectomy pre- and postsurgery. One study showed that 1-year postsurgery, women who had undergone hysterectomy reported significantly lower functioning in two items of the MSFQ (sexual

enjoyment and coital frequency) as well as the total score; however, for women who had undergone both hysterectomy and oophorectomy, scores at 1-year follow-up did not differ significantly from presurgery scores [110]. A follow-up study found that although androgen levels in both groups had declined, this decline was not associated with scores on the MSFQ [111]. On the other hand, an intervention study investigating the effects of androgen and estrogen replacement therapies on sexual function of hysterectomy and oophorectomy patients found opposite results: the authors found that over a 24-week intervention, as the women's serum testosterone significantly increased, so did their MSFQ scores [112]. In a study conducted among women who underwent either abdominal or laparoscopic hysterectomies, MSFQ scores after a 1-year follow-up did not differ between groups [113].

### **Other Measures of Female Sexual Functioning**

There are a number of other measures of female sexual functioning available; however at the present time there is not adequate research to assess their utility in cancer populations. Examples include the Brief HSDD Screener [114], the Decreased Sexual Desire Screener [115], the Sexual Interest Desire Inventory [116], the Profile of Female Sexual Functioning [117], and the Gynaecologic Leiden Questionnaire [118]. Of interest is the Gynaecologic Leiden Questionnaire, which was developed to measure the sexual functioning of female cancer patients.

### **Sexual Satisfaction Assessment Instruments**

Sexual satisfaction is generally understood as an individual's affective response to the subjective evaluation of his or her sexual experiences; hence, its distinction from sexual function per se.

Additionally, while little research has been done on the relationship between sexual satisfaction and sexual distress, recently experts in the field of human sexuality have suggested that these constructs are not necessarily opposite poles on the same continuum, but may instead be independent factors [119, 120]. In other words, distress might not simply be the absence of satisfaction, or satisfaction the absence of distress. While few studies on female sexual dysfunction have included measures of sexual distress [121], the DSM-IV-TR guidelines require either marked distress or interpersonal difficulty as prerequisites to a diagnosis of sexual dysfunction [122]. Sexual distress has recently been measured as a distinct construct in a number of studies [121, 123, 124] and validated measures of sexual distress [120, 125] are available. This distinction between satisfaction and distress should be considered when deciding precisely which variables are of interest in any particular study. Researchers focusing on patients' general sexual well-being would likely include measures of sexual satisfaction whereas those focusing on diagnosable sexual dysfunction (sexual difficulties with resultant personal distress as per DSM-IV-TR criteria) may be better served by a scale measuring sexual distress specifically.

The most common method of assessing sexual satisfaction is with a single self-report item that asks participants to rate how satisfying they find sexual activity "in general" or within some specified time frame. Similarly, sexual distress is often assessed with a single item such as "During the past 4 weeks, how much distress or worry has you're your own sexuality caused you?" [123]. Single-item measures are limited in that they are rarely independently validated, and they are less reliable than multi-item scales because lone items are more likely to be skipped or misread by participants and are less resilient to day-to-day fluctuations in responding. Also, the range of responses possible for a single item leads to a restricted variance in scores, and most traditional statistical techniques (regression and ANOVA) assume the presence of a normally distributed, continuous outcome variable.

Sexual satisfaction is also commonly assessed using subscales within measures of sexual functioning. While these subscales may avoid some of the problems inherent in single-item measures, their validity may be compromised by the fact that, while full-scale scores are often validated against relevant external criteria, this is rarely the case for specific subscale scores. As such, claiming that a satisfaction subscale from within a measure of functioning is a validated measure of sexual satisfaction may be inaccurate. Sexual distress, being a recently described construct, is rarely assessed in this way.

Below, we describe five multi-item, validated and reliable measures of sexual satisfaction or distress and summarize the minimal research that has been conducted using these measures in cancer populations.

### ***The Global Measure of Sexual Satisfaction (GMSEX)***

The Global Measure of Sexual Satisfaction (GMSEX) [126] is a 5-item self-report measure of sexual satisfaction meant to measure one's overall satisfaction with the sexual aspects of a relationship. The GMSEX was developed as an outcome measure for the interpersonal exchange model of sexual satisfaction using a sample of 52 female and 47 male undergraduate students in long-term romantic relationships (duration 3–36 months). Norms are available in the initial validation study. Scores on the GMSEX are related to multiple indicators of sexual and relational functioning including relative balance of sexual costs and rewards [127] and relationship satisfaction [128]. Internal consistency and test-retest reliabilities are within the acceptable range. The GMSEX takes less than 5 min to administer. Unpublished data from use with breast cancer survivors is available from the scale's authors.

The GMSEX's strengths are that it is reliable, valid, very brief, and shows no overlap with measures of sexual functioning. Its limitations are that it is one-dimensional (with no measure of distress), has not been used with

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clinical populations, and assumes that the participant is in a stable romantic relationship and, thus, cannot assess sexual satisfaction in single women.

### ***The Index of Sexual Satisfaction (ISS)***

The Index of Sexual Satisfaction (ISS) [129] is made up of 25 self-report items and provides a single sexual satisfaction score. The ISS was developed using a sample of 100 men and women (mean age of 32.7 years) seeking treatment for relationship problems. The scale, with norms, is not available for public use, but may be purchased through its authors. Scores on the ISS are related to marital satisfaction and general contentment. The ISS can reliably discriminate between individuals judged by therapists to have and not have sexual problems. Internal consistency and test-retest reliabilities are within the acceptable range. Divergent validity has been established using the Index of Marital Satisfaction [130] and the Sexual Attitude Scale [129, 131]. The ISS was more effective at differentiating between patients with and without sexual problems than either the Index of Marital Satisfaction or the Sexual Attitude Scale. This suggests that the ISS is tapping sexual satisfaction specifically, and does so more precisely than scales of different, but related constructs (marital satisfaction and sexual attitudes). The ISS takes approximately 5–7 min to administer. The scale has been used to measure satisfaction in patients with polycystic ovary syndrome [132].

The strengths of the ISS are that it is reliable, valid, and brief; norms are available; and clinical cut-off points have been established. Its limitations are that it is one-dimensional, scoring procedures and norms are not publicly available, some items overlap with sexual functioning, and it makes no differentiation between satisfaction and distress. Additionally, it assumes that the participants are in a romantic relationship.

### ***The Pinney Sexual Satisfaction Inventory (PSSI)***

The Pinney Sexual Satisfaction Inventory (PSSI) [133] is a self-report measure of female sexual satisfaction that includes 24 items and provides scores on two domains of satisfaction as well as a total score. The domains assessed have been confirmed using factor analyses and are general sexual satisfaction (14 items) and satisfaction with partner (10 items). The PSSI was developed on a female sample of 275 women in an introduction to psychology course (age range 17–24 years). Ninety-seven percent of these women were single. Norms for the subscale and full-scale scores can be computed using the initial validation study. The PSSI is related to other established measure of sexual satisfaction, orgasm consistency, and frequency of intercourse. Internal consistency and test-retest reliabilities are within the acceptable range. The administration time of the PSSI has not been reported. To our knowledge, the PSSI has not been used with a cancer population.

The strengths of the PSSI are that it is reliable, valid, and brief; norms are available; it assesses two distinct components of satisfaction; and that it can be used by participants not currently in romantic relationships. Its limitations are that it has not been used in clinical populations, some items overlap with sexual functioning, and it makes no differentiation between satisfaction and distress.

### ***The Female Sexual Distress Scale (FSDS)***

The Female Sexual Distress Scale (FSDS) [125] includes 12 self-report items and provides scores on two domains of sexual distress as well as a total score. The domains assessed are frequency of distress (6 items) and intensity of distress (6 items). Factor analysis has shown that scores on the FSDS represent a single underlying factor. The FSDS was developed on a female sample of



60 nurses with no reported sexual problems and 18 patients with a variety of sexual problems (mean age of 48 years). Community norms are available in the initial validation study. The FSDS has been shown to reliably discriminate women with sexual problems from control patients on each of domain scores as well as the full-scale score. Internal consistency and test-retest reliabilities are within the acceptable range. Divergent validity has been established using measures of somatization, depression, and negative affect. Correlations between the FSDS and these measures were moderate in magnitude (0.28, 0.59, and 0.58 for somatization, depression, and negative affect, respectively). These relationships demonstrate that scores on the scale do not solely reflect these related but conceptually different factors. The administration time of the FSDS has not been reported. The scale has been used to measure changes in sexual distress in response to cancer treatment [51].

The FSDS's strengths are that it is reliable, valid, and brief; norms are available; clinical cut-offs are established; it is available in multiple languages; it clearly differentiates between satisfaction and distress (measuring distress only); it does not assume the participant is in a romantic relationship; and there is minimal overlap with measures of sexual functioning. Its limitation is that it measures only sexual distress (as opposed to a broader conceptualization of sexual satisfaction).

### **The Sexual Satisfaction Scale for Women (SSS-W)**

The Sexual Satisfaction Scale for Women (SSS-W) [120] is a 30-item self-report measure of female sexual satisfaction that provides scores on three domains of sexual satisfaction and two of sexual distress, as well as a total score. The domains assessed have been confirmed using factor analyses and include contentment, communication, compatibility, relational concern, and personal concern (each with 6 items). The SSS-W was developed on a female sample of 79 normal controls (age range 18–53 years) and 102

participants who met DSM-IV-TR criteria for female sexual dysfunction (age range 18–56 years). Norms are available for control and women diagnosed with sexual dysfunction at the item level, the domain level, and the full-scale score in the initial validation study. The SSS-W full-scale score and each of the domain scores have been shown to reliably discriminate between women with and without sexual dysfunction. Internal consistency and test-retest reliabilities are within the acceptable range. Divergent validity has been established using the *Locke-Wallace Marital Adjustment Test*. Correlations between the SSS-W subscales and the Locke-Wallace were moderate in magnitude, with only the relational domains showing a significant relationship. This shows that the SSS-W measures sexual satisfaction specifically, and not the related construct of marital satisfaction. The SSS-W takes approximately 5–10 min to administer. To our knowledge, the SSS-W has not been used with a cancer population.

The SSS-W's strengths are that it is reliable, valid, and brief; norms are available; it is multifaceted; there is minimal overlap with sexual functioning; and it clearly differentiates and measures both satisfaction and distress. Its limitation is that it requires participants to be in a romantic relationship.

### **Summary**

This chapter has provided a review of 9 measures of sexual function and 5 measures of sexual satisfaction. All of the measures reviewed have acceptable reliability and validity for assessment in women. Most of the sexual functioning measures reviewed have been used extensively in research among cancer populations. Only 2 of the 5 measures of sexual satisfaction/distress (the GMSEX and the ISS) have been used for assessment among women cancer patients. Which of these questionnaires should be selected for use for a particular study will necessarily depend on the specific sexual domains of interest (e.g., desire, arousal, orgasm, pain, satisfaction), the amount of time available for participant

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assessment (the scales range from 5 to 254 items), and the hypotheses and goals of the study. In the last case, if the goals include a comprehensive examination of sexual functioning among cancer patients, then the best measures would include the GRISS and the DSFI. If the goal includes measuring treatment outcomes, then appropriate measures would include the CSFQ, MSFQ, and BISF-W. If it were necessary to use the measure as a diagnostic tool, the FSFI would be well suited. And finally, if the goal included comparing results to literature on other cancers, the best measure might be the SAQ, which has a broad base of previous cancer research, or the DISF/DISF-SR, which has a standardized scoring system. Regardless of the measure used, however, it is important to note that these instruments can only offer one piece of a larger context of health and sexuality: no amount of research on a measure's psychometric properties can allow it to fully capture the complex story of women's sexual experiences during and after a battle with cancer.

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