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Preliminary validation of the Sexual Distress Scale-Short Form: Applications to Women, Men, and Prostate Cancer Survivors

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ABSTRACT

The Sexual Distress Scale (SDS) can be used to assess sexual distress in women, men, and prostate cancer (PCa) survivors. Despite its strong psychometric properties, researchers and clinicians could benefit from a short form of the scale. Two studies were conducted to develop (Study 1) and validate (Study 2) a short form of the SDS (SDS-SF) using samples of women, men, and PCa survivors from previous studies. Results of Study 1 suggested a 5-item SDS-SF. Study 2 showed that the SDS-SF items clustered in one factor with good fit across the three samples and excellent reliability. Sexual distress was associated with higher sexual bother, and poorer sexual satisfaction, sexual function, and relationship quality. The SDS-SF discriminated participants with and without distressing sexual problems. The SDS-SF facilitates the assessment of sexual distress in clinical settings by providing a quick way of screening patients with high levels of sexual distress.

KEYWORDS

Sexual distress; short version; validation; reliability; validity; prostate cancer; sexual dysfunction

Sexual well-being is a broad concept that encompasses physical, emotional, and social factors (Santos-Iglesias, Byers, & Moglia, 2016); however most medical outcomes research tends to focus largely on physical impairments in sexual function. Because sexual distress is a necessary criterion for the diagnosis of sexual dysfunction (according to the Diagnostic and Statistical Manual of Mental Disorders [DSM] 5th edition) (American Psychiatric Association, 2013), it is increasingly being included in sexual health research. Sexual distress, defined as a myriad of negative feelings (e.g., worry, frustration, concerns) that people have about their sex lives and sexual relationship(s) (Hayes, 2008; Santos-Iglesias, Mohamed, & Walker, 2018), is an important component of sexual health because it contributes to the state of emotional well-being about sexuality. In the context of prostate cancer (PCa) research, sexual distress is a relatively understudied variable (Nelson, Deveci, Stasi, Scardino, & Mulhall, 2010; Penson et al., 2005), with most sexual outcomes after PCa treatment focusing on erectile function (Fode, Serefoglu, Albersen, & Sønksen, 2017). This is an important omission, because prevalence estimates of sexual dysfunction need to include an assessment of sexual distress (Hayes, 2008). In fact, estimates of sexual dysfunction decrease when sexual distress is taken into account (Hayes, Dennerstein, Bennett, & Fairley, 2008). Ignoring sexual distress also implies that sexual function is the only relevant aspect of sexual well-being. Such an approach fails to consider how people feel about their sexual function, overlooking the

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biopsychosocial nature of sexual health and well-being (McCabe et al., 2010). Finally, previous studies suggest that sexual distress is a better indicator of quality of life than sexual function (Giesler, Miles, Cowen, & Kattan, 2000; Reeve, Potosky, & Willis, 2006); therefore, it is a critical outcome to include in clinical trials (Basson et al., 2000; Hayes, 2008).

Sexual health researchers typically rely on multi-component scales for the assessment of sexuality-related constructs (Heiman et al., 2011), however the number of items in these measures is often large, creating response burden in participants and reducing utility in research and clinical settings (Bowling, 2005). These long multi-component scales are also difficult to use in sexuality research settings, such as daily diary studies. In fact, researchers have selected a short number of valid items for daily diary studies, but such brief measures were not empirically-derived or validated (Glowacka, Bergeron, Delisle, & Rosen, 2019). In clinical and applied research settings, such as examining PCa treatment outcomes or conducting clinical trials, multi-component scales are too cumbersome and impractical (Bowling, 2005). The majority of PCa surgical outcomes research comes from retrospective analysis of minimal datasets that are collected as a part of routine urological care where time and resources are a constraint. Additionally, the gold standard questionnaire to assess sexual distress in PCa patients, the Expanded Prostate Cancer Index Composite (EPIC) - Sexual Bother subscale (Wei, Dunn, Litwin, Sandler, & Sanda, 2000), has several limitations. The EPIC sexual bother subscale is composed of four items that assesses distress specifically related to sexual function (sexual desire, erections, orgasm, overall sexual function). Therefore, it does not differentiate between or provide any information about participants who may be distressed by other aspects of their sexuality (e.g., relationship problems, sexual desire discrepancies, etc.) (Santos-Iglesias, Mohamed, Danko, & Walker, 2017, October). Furthermore, the sexual function and sexual bother items are so highly correlated that they may not actually assess different constructs (Santos-Iglesias, Mohamed, & Walker, 2018; Wei et al., 2000). Therefore, the addition of a short assessment scale that assesses sexual distress independently from sexual function is needed.

The Sexual Distress Scale

The Female Sexual Distress Scale (FSDS) (Derogatis, Rosen, Leiblum, Burnett, & Heiman, 2002) is a 12-item scale developed to assess sexual distress independent of specific domains of sexual function (e.g., erectile function, sexual desire). The FSDS was revised in 2008 (FSDS-R) to include one item that assesses distress about sexual desire (Derogatis, Clayton, Lewis-D'Agostino, Wunderlich, & Fu, 2008). This revision made the FSDS-R more sensitive to the presence of sexual desire problems; however, it also expanded the scope of the measure so that it now includes one item related to a specific aspect of sexual function. Both the FSDS and FSDS-R have been tested and validated in a series of studies demonstrating its reliability and validity to assess sexual distress in women with and without sexual dysfunction, its ability to discriminate women with and without sexual dysfunction, and its responsiveness to treatment (Derogatis, Clayton, et al., 2011; Derogatis, Pyke, McCormack, Hunter, & Harding, 2011; Derogatis et al., 2002; 2008). More recently, Carpenter et al. (2015) proposed that one item of the FSDS may be sufficient to assess sexual distress. However, single-item measures tend to be problematic because of the poor construct representation and difficulties with reliability estimations (Shrout & Lane, 2012).

Because of its lack of gender-specific content, the FSDS has been used in male samples (Glowacka, Bergeron, Dubé, & Rosen, 2018; Jern et al., 2008; O'Sullivan, Brotto, Byers, Majerovich, & Wuest, 2014; O'Sullivan, Byers, Brotto, Majerovich, & Fletcher, 2016; Park, Villanueva, Viers, Siref, & Feloney, 2011; Rancourt, Flynn, Bergeron, & Rosen, 2017), however, it was only recently validated in a sample of men, and also a sample of PCa survivors (Santos-Iglesias, Mohamed, Danko, & Walker, 2018; Santos-Iglesias & Walker, 2018). Similar to the studies in women, the FSDS, herein called the SDS, showed good reliability and validity for the

assessment of sexual distress in men with and without PCa, differentiating men with and without distressing sexual problems. Taken together, these results support the use of the SDS as an excellent scale for the assessment of sexual distress in both men and women (Santos-Iglesias, Mohamed, & Walker, 2018).

We argue that the SDS could be shortened from 12 items, in order to improve its usability. While applicable to sexuality research as a whole, one of the applications of this objective is in the realm of PCa. Further because much of the research in PCa involves a comparison of PCa survivors to other non-cancer populations (i.e., healthy controls, their male or female partners, or post-treatment to baseline pre-PCa treatment function), we thought it imperative to validate a tool that could be used for comparison across these samples. The overall goal of this paper—comprised of two studies—was to develop (Study 1) and validate (Study 2) a short form of the SDS to be used in samples of women, men, and PCa survivors.

Study 1

The aim of this study was to develop a short form of the SDS that could be used in women, men, and PCa survivors. Our reduction strategy was guided by three main goals: (1) Develop a short form of the SDS that assessed sexual distress independent of sexual function. The 12-item version of the SDS (Derogatis et al., 2002) was used for this reason, instead of the 13-item version (in which item 13 assesses distress related to sexual desire); (2) create a short form that allows for comparison between different samples. For this reason, we aimed to retain the same items in women, men and PCa survivors, and (3) retain the smallest number of items that provide accurate information on sexual distress, contribute most to reliability, and help differentiate those with and without distressing sexual problems.

Method

Participants

In order to collect a large sample of women, men, and PCa survivors, both with and without distressing sexual problems, data drawn from two studies were combined to create this study dataset. These included (1) 644 participants from Santos-Iglesias, Mohamed, Danko, and Walker (2018) and Santos-Iglesias and Walker (2018) that were initially recruited to validate the SDS in male samples (and comprised of 81 women, 319 men, and 244 PCa survivors); and (2) 212 participants from Brotto, Yule, and Gorzalka (2015) initially recruited for a study on asexuality (comprised of 150 women and 62 men who were not asexual).

The final dataset contained a total of 856 participants, of which 231 were women, 381 were men, and 244 were PCa survivors. Table 1 includes socio-demographic characteristics of these three groups. The group of women was the youngest, were in the shortest relationships, and had the largest proportion of bisexual participants. The group of men had the largest proportion of homosexual/gay participants. The PCa group was the oldest group, had the largest proportion of heterosexual participants and participants who were in a relationship, and were in the longest relationships. For PCa survivors, time since diagnosis ranged from 1 to 13 years. Most frequent treatments were surgery, followed by radiation and androgen deprivation therapy.

Participants from each study were classified as having distressing sexual problems using different but similar criteria for each of the aforementioned studies. These included: (1) if they experienced sexual difficulties and were either receiving or seeking treatment/help for those sexual difficulties (Santos-Iglesias, Mohamed, Danko, & Walker, 2018; Santos-Iglesias & Walker, 2018), as distress about sexual difficulties motivates individuals to seek treatment/help (Brotto & Basson, 2014; Evangelia et al., 2010); and (2) met DSM-IV-TR (American Psychiatric Association, 2000)

diagnostic criteria for hypoactive sexual desire disorder (HSDD) (Brotto, Yule, & Gorzalka, 2015). Based on these criteria 57 women, 111 men, and 120 PCa survivors, were classified as having distressing sexual problems, and 174 women, 270 men, and 124 PCa survivors were classified as free from distressing sexual problems (see Table 2 for a breakdown of the samples). The group of PCa survivors had the largest proportion of participants with distressing sexual problems (Table 1).

Procedure

Participants from Santos-Iglesias, Mohamed, Danko, and Walker (2018), and Santos-Iglesias and Walker (2018) were collected using: a) study advertisements posted in community programs, clinics and hospitals, sexual health or PCa newsletters and websites (e.g., The Digital Examiner, RCA Diagnostics); and b) physician referrals to the study coordinator present in clinic. Interested participants who gave their consent completed an anonymous online survey that assessed demographics, physical and sexual health, prostate cancer status and treatment, sexual function, sexual distress, sexual attitudes, and mood. This procedure was approved by the University of Calgary Conjoint Health Research Ethics Board.

Table 1. Sample characteristics and comparisons between women, men, and PCa survivors from Study 1.

	Women n = 231	Men n = 381	PCa survivors n = 244	χ^2 / F (η^2_p)
Age (M (SD))	32.56 (11.47)$_{ab}$	41.45 (15.35)$_{ac}$	64.57 (6.55)$_{bc}$	432.65*** (.51)
Sexual orientation				66.44***
Heterosexual	159 (68.8)$_a$	290 (76.1)$_b$	220 (90.9)$_{ab}$	
Homosexual/gay	14 (6.1)$_a$	50 (13.1)$_{ab}$	13 (5.4)$_b$	
Bisexual	48 (20.8)$_{ab}$	32 (8.4)$_a$	9 (3.7)$_b$	
Other	10 (4.3)$_a$	9 (2.4)$_b$	0 (0)$_{ab}$	
Current relationship	155 (67.1)$_a$	272 (71.4)$_b$	220 (90.2)$_{ab}$	40.75***
Relationship duration (years)	7.93 (9.02)$_{ab}$	14.57 (13.88)$_{ac}$	31.64 (13.76)$_{bc}$	180.11*** (.36)
Distressing sexual problem	57 (24.7)$_a$	111 (29.1)$_b$	120 (49.2)$_{ab}$	38.17***
Sexual distress	7.87 (5.21)	7.26 (5.14)	8.21 (5.49)	2.63 (.01)
PCa diagnosis year			2005–2017	
PCa treatment[a]				
Surgery			157 (64.3) / *127*	
Radiation			71 (29.1) / *29*	
ADT			31 (12.7) / *6*	
Active Surveillance			13 (5.3) / *13*	
Cryotherapy			6 (2.5) / *1*	
Other			18 (7.4) / *16*	
Hormonal treatment			47 (19.6)	

Note. Percentages and means with the same subscript within the same row are statistically different from each other. [a]The number in italics following the slash symbol represents the number of participants who received *only* that type of treatment. ADT: Androgen deprivation therapy.
***$p < .001$.

Table 2. Final sample breakdown for Study 1.

	Women		Men		PCa survivors		Total	
	Without DSP	With DSP	Without DSP	With DSP	Without DSP	With DSP	Without DSP	With DSP
Santos-Iglesias, Mohamed, Danko, and Walker (2018);	81		319		244		644	
Santos-Iglesias and Walker (2018)	64	17	220	99	124	120	408	236
Brotto, Yule, and Gorzalka (2015)	150		62				212	
	110	40	50	12			160	52
Total	231		381		244		856	
	174	57	270	111	124	120	568	288

Note. DSP: Distressing sexual problems.

Participants from Brotto, Yule, and Gorzalka (2015) were recruited online via a broad range of strategies (e.g., local websites, AVEN online web-community, online and in-clinic posting of sex therapists). Interested participants completed a web-based survey that assessed demographics, sexual health, sexual behaviors, sexual distress, asexual identity, mood, and social desirability. The procedure was approved by the university's behavioral research ethics board.

Measures

Participants completed different measures depending on the recruited sample. Here we only report on the measures/assessments that were used in the present study:

Background sociodemographic questionnaires were used to obtain information about gender, age, sexual orientation, relationship status, and relationship duration.

Information used to classify participants as experiencing *distressing sexual problems* were assessed differently depending on the sample source:

Santos-Iglesias and colleagues (Santos-Iglesias, Mohamed, Danko, & Walker, 2018; Santos-Iglesias & Walker, 2018) asked participants whether they had experienced sexual difficulties over the last three months and those who did were asked whether or not they were receiving or seeking help/treatment. Participants who responded affirmatively to these two questions were classified as having distressing sexual problems.

Brotto, Yule, and Gorzalka (2015) used the diagnostic criteria for HSDD as outlined by the DSM-IV-TR (American Psychiatric Association, 2000), and asked participants to self-report whether they had "experienced persistently or recurrently deficient (or absent) sexual fantasies and desire for sexual activity", whether "this deficiency/absence of sexual fantasies and desire causes me marked distress or interpersonal difficulty", and whether "this deficiency/absence of sexual fantasies and desire for sexual activity are not better accounted for by a mental health disorder (such as depression), a drug (legal or illegal), or some other medical condition". Participants who responded affirmatively to these questions were classified as having distressing sexual problems.

Sexual distress

All participants completed the 13-item SDS-R (Derogatis et al., 2008) as part of their respective studies, but only the first 12 items (i.e., SDS) were analyzed in this study. Participants respond to the items on a 5-point Likert scale about the frequency with which they experience sexual distress in the last four weeks, with higher scores indicating greater distress.

Data analysis

According to the third goal stated above, the following strategies were used to shorten the scale:

1. The SDS was analyzed using Item Response Theory (IRT)[1] in order to select items that accurately assessed sexual distress. Items that provided a large amount of information across the entire sexual distress continuum (i.e., high information curves and spread out location parameters) and that had a strong relationship to the underlying construct (i.e., large discrimination parameters) were retained (Edelen & Reeve, 2007).
2. Items whose linear combination contributed maximally to the proportion of variance of the latent sexual distress construct were retained. Items that contributed the least to the scale's

[1]To conserve space, details about the data analytic strategy and results about item and model fit are presented as supplemental materials.

maximal reliability and index of construct predictability (ICP) (Raykov, Gabler, & Dimitrov, 2016; Raykov, Rodenberg, & Narayanan, 2015) were removed iteratively until the scale reached a minimum acceptable ICP of 90%.

3. Following Koczkodaj et al. (2017), individual receiver operant characteristic (ROC) curves for each item were created and each item's area under the curve (AUC) was used to determine and select the items that best discriminated between participants with and without distressing sexual problems. Items were retained if their individual AUC was equal or greater than .70 (Streiner & Cairney, 2007).

All analyses were conducted and reported separately for the three groups that were the focus of this study (i.e., women, men, and PCa survivors). The analysis was conducted using IRTPRO 4.20 (Cai, Thissen, & du Toit, 2011), Mplus 6.12 (Muthén & Muthén, 1998-2011), R 3.6.2 (R Core Team, 2017), and SPSS 25 (IBM Corp. Released, 2017).

Table 3. Graded response model item parameter estimates for women, men, and PCa survivors.

	a	b_1	b_2	b_3	b_4
Women					
1	3.08	−1.08	−0.32	0.72	1.84
2	1.78	−1.16	−0.23	0.75	1.87
3	2.39	−0.58	0.07	0.78	1.87
4	3.32	−0.73	−0.16	0.53	1.40
5	3.18	−0.90	0.03	0.85	1.84
6	3.33	−0.30	0.36	0.99	1.88
7	3.14	−0.84	0.11	0.86	1.79
8	2.55	−0.44	0.25	0.87	1.76
9	1.31	−0.10	0.81	1.62	2.52
10	2.32	−0.27	0.40	1.12	2.12
11	2.00	−1.28	−0.36	0.54	1.53
12	2.15	0.09	0.69	1.22	2.19
Men					
1	2.68	−1.19	−0.29	0.90	1.99
2	2.06	−1.18	−0.27	0.76	1.88
3	2.68	−0.35	0.23	0.94	1.90
4	3.63	−0.55	0.10	0.65	1.64
5	3.27	−0.68	0.09	0.84	1.95
6	3.34	−0.07	0.53	1.15	1.87
7	3.59	−0.46	0.21	0.96	1.87
8	2.99	−0.35	0.27	0.95	1.84
9	1.54	0.26	0.81	1.69	2.68
10	2.79	−0.10	0.52	1.11	2.12
11	2.36	−1.06	−0.34	0.44	1.48
12	2.30	0.06	0.75	1.39	2.10
PCa survivors					
1	4.08	−1.26	−0.39	0.64	1.46
2	2.55	−1.27	−0.27	0.67	1.67
3	2.72	−0.51	0.15	0.95	1.84
4	4.72	−0.96	−0.29	0.49	1.38
5	4.48	−0.71	0.13	1.02	1.68
6	3.26	−0.19	0.54	1.09	1.74
7	3.44	−0.60	0.14	0.89	1.83
8	4.18	−0.58	−0.03	0.60	1.36
9	2.03	−0.19	0.44	1.13	1.80
10	2.89	−0.34	0.35	1.03	1.81
11	2.93	−1.14	−0.44	0.36	1.22
12	2.36	−0.08	0.62	1.24	1.97

Note. $N = 231$ women, 381 men, and 244 PCa survivors. a: slope/discrimination parameter; b_1–b_4: location parameters.

Results

Item response theory

Results of the item calibration are presented in Table 3. For women, discrimination parameters ranged from 1.31 to 3.33 indicating a considerable amount of discrimination. The location parameters ranged from -1.28 to 2.52, indicating that the items were most efficient at moderately low to moderately high levels of sexual distress. Items 6, 4, and 5 provided the most information, followed by 7, 1, and 8. Although item 1 provided less information than items 6, 4, 5 and 7, it provided information on a wider range of sexual distress, particularly the lower end of the continuum (see Figure 1). On the contrary, item 6 provided most information, however it provided information on a very narrow range of sexual distress concentrated in the mid-to-high sexual distress continuum.

For men, slope and location parameters ranged from 1.54 to 3.63 and from -1.19 to 2.68, respectively. Items 4, 7, and 6 provided the greatest amount of information followed by items 5 and 8. Again, item 1 provided the most information about low sexual distress. The information provided by item 6 was narrow and concentrated on the mid-to-high sexual distress range.

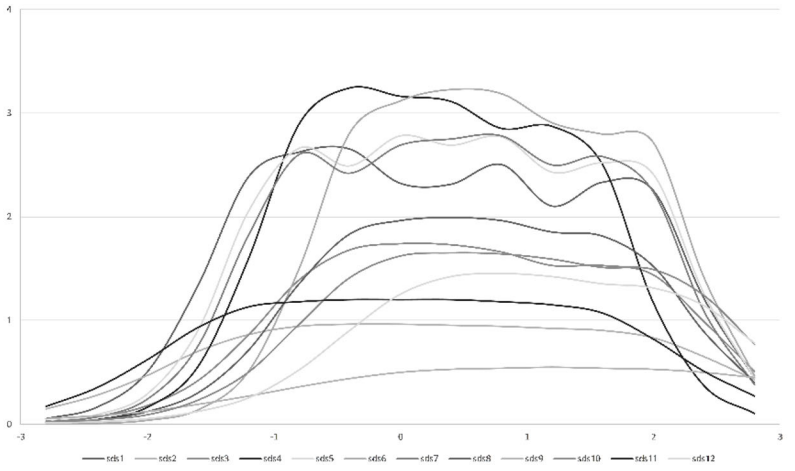
Regarding PCa survivors, slope parameters ranged from 2.03 to 4.72 and locations did so between -1.27 and 1.97. Items 4, 5, and 8, followed by 1 and 7 provided the most information. Item 1 was again the most informative on the lower end of the sexual distress range whereas items 5 and 7 were more informative about the higher end.

Examining all the results together, it appears that across the three samples (i.e., women, men, and PCa survivors) items 1, 4, 5, 6, 7, and 8 were the most appropriate to form the SDS-short form (SDS-SF). Items 1, 4, 5, and 7 were consistently strong candidates across the three samples. Item 8 worked well in men and PCa survivors, but not in women. Although item 6 showed a high slope parameter in both women and men, it provided only narrow information that largely overlapped with other better performing items (e.g., item 7). Therefore, we deemed item 8 to be a better candidate for the short version and therefore excluded item 6. The content of the selected items does not represent a particular threat to the validity of the scale, as they all refer to a negative feeling (e.g., distress, frustration, stress, worry) and also refer to sexuality in a broad sense (e.g., sex life, sex, sexual problems). Therefore, items 1, 4, 5, 7, and 8 are the best items to be retained from the IRT analyses.

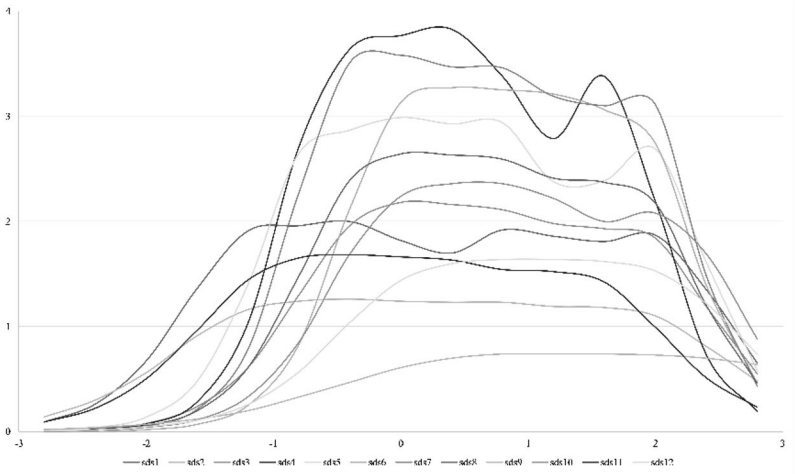
Maximal reliability and index of construct predictability

Table 4 shows the results of the optimal shortening analyses. The columns *estimate*, *S.E.* and *95% C.I.* include each item's contribution to the proportion of variance of the latent construct, standard error, and 95% confidence interval. Items with the lowest contribution to the latent variable show smaller parameters and smaller lower limit intervals. The optimal shortening procedure starts by identifying the item that contributes the least to the variance of the latent variable and then estimates the maximal reliability (i.e., an estimation of the scale's reliability based on a linear combination of items) and the ICP (e.g., the proportion of variance of the latent construct accounted by for the linear combination of items) after the item is deleted. Items are deleted iteratively until a minimum acceptable ICP is reached (90% in the present study).

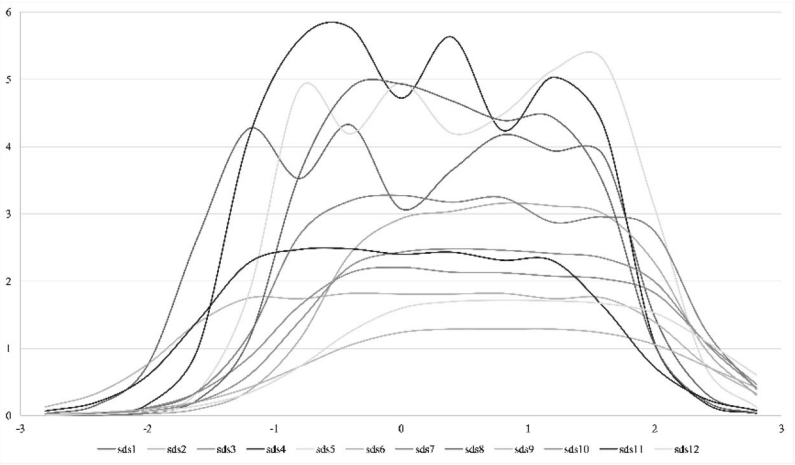
For women, all items except 1, 4, 5, 6, 7, and 8 could be deleted without affecting the scale's reliability. For men, all items except 1, 3, 4, 5, 7, and 8 could be deleted, and for PCa survivors all items except 1, 4, 5, and 8 could be deleted without affecting the scale's reliability. These results indicate that 5 items (2, 9, 10, 11, and 12) could be systematically deleted from the scale across the three samples, and that four items could not be deleted (1, 4, 5, and 8), leaving items 3, 6, and 7 to vary across samples. Of these, item 7 performed better than items 3 and 6; item 7



1a. Women



1b. Men



1c. PCa survivors

Figure 1. Item information curves for women (a), men (b), and PCa survivors (c).

Table 4. Estimates, maximal reliability values and index of construct predictability values for women, men, and PCa survivors.

	Estimate	S.E.	95% CI	MR_i	95% CI MR_i	ICP_i	95% CI ICP_i
Women							
1	2.110	0.392	1.34 – 2.88				
2	0.771	0.199	0.38 – 1.16	0.947	0.933 – 0.957	94.68	93.60 – 95.77
3	1.333	0.298	0.75 – 1.92	0.926	0.908 – 0.940	92.63	91.04 – 94.24
4	2.321	0.487	1.37 – 3.27				
5	2.295	0.463	1.39 – 3.20				
6	2.225	0.443	1.36 – 3.09				
7	2.168	0.456	1.27 – 3.06				
8	1.458	0.332	0.81 – 2.02	0.917	0.897 – 0.933	91.75	89.95 – 93.58
9	0.898	0.154	0.59 – 1.20	0.944	0.931 – 0.954	94.42	93.27 – 95.57
10	1.147	0.266	0.63 – 1.67	0.933	0.917 – 0.945	93.29	91.87 – 94.73
11	0.952	0.248	0.47 – 1.44	0.938	0.922 – 0.950	93.77	92.44 – 95.12
12	0.913	0.211	0.50 – 1.33	0.941	0.928 – 0.951	94.12	92.90 – 95.35
Men							
1	1.733	0.218	1.35 – 2.21				
2	0.510	0.136	0.30 – 0.86	0.945	0.934 – 0.954	94.51	93.59 – 95.44
3	1.612	0.216	1.23 – 2.09	0.914	0.896 – 0.928	91.36	89.76 – 92.98
4	2.369	0.291	1.86 – 3.01				
5	2.242	0.308	1.71 – 2.93				
6	1.524	0.245	1.11 – 2.08	0.924	0.909 – 0.936	92.41	91.05 – 93.78
7	2.493	0.374	1.85 – 3.34				
8	1.832	0.280	1.35 – 2.47				
9	0.727	0.100	0.55 – 0.95	0.944	0.933 – 0.953	94.36	93.39 – 95.33
10	1.093	0.248	0.70 – 1.70	0.937	0.924 – 0.947	93.73	92.64 – 94.82
11	0.930	0.143	0.68 – 1.25	0.940	0.929 – 0.949	93.99	92.93 – 95.04
12	1.192	0.155	0.92 – 1.53	0.933	0.920 – 0.943	93.31	92.14 – 94.49
PCa survivors							
1	3.418	0.494	2.57 – 4.53				
2	0.779	0.258	0.40 – 1.49	0.960	0.951 – 0.967	95.96	95.12 – 96.80
3	1.548	0.278	1.08 – 2.20	0.944	0.928 – 0.956	94.35	93.07 – 95-65
4	3.978	0.606	2.95 – 5.36				
5	3.577	0.565	2.62 – 4.87				
6	1.273	0.270	0.84 – 1.92	0.952	0.941 – 0.960	95.23	94.19 – 96.27
7	2.335	0.403	1.66 – 3.27	0.935	0.917 – 0.949	93.50	92.01 – 95.00
8	2.747	0.417	2.04 – 3.69	0.918	0.896 – 0.935	91.81	89.81 – 93.84
9	0.875	0.142	0.63 – 1.20	0.958	0.947 – 0.966	95.84	94.95 – 96.72
10	0.961	0.262	0.56 – 1.63	0.957	0.946 – 0.965	95.73	94.83 – 96.64
11	1.436	0.228	1.05 – 1.96	0.948	0.934 – 0.958	94.78	93.62 – 95.95
12	1.131	0.178	0.83 – 1.53	0.956	0.945 – 0.964	95.55	94.59 – 96.51

Note. $N = 231$ women, 381 men, and 244 PCa survivors. S.E.: Standard error; MR_i = Maximal reliability after deleting item; ICP_i = Index of construct predictability after deleting item.

Table 5. Item's and scale's area under the curve (AUC) for women, men, and PCa survivors.

Item	Women	Men	PCa survivors
1	**.72**	**.72**	**.70**
2	.64	.66	.60
3	**.78**	**.76**	.63
4	**.79**	**.82**	**.74**
5	**.74**	**.71**	**.70**
6	**.72**	**.73**	.66
7	**.77**	**.74**	**.72**
8	.69	**.78**	**.71**
9	.62	.67	.62
10	.67	**.75**	.64
11	.65	.68	.67
12	.63	.63	.60
SDS	.78	.79	.71
SDS-SF	.80	.81	.74

Note. $N = 231$ women, 381 men, and 244 PCa survivors. AUCs equal or greater than .70 in bold. SDS: Sexual Distress Scale (12-items); SDS-SF: Sexual Distress Scale-Short Form (5-items).

was suggested to be deleted once (PCa survivors), whereas items 3 and 6 were suggested to be deleted twice (women and PCa survivors, and men and PCa survivors, respectively).

ROC Curves

Individual ROC curves were created for each item with the corresponding AUCs. Table 5 includes the AUC for each item across samples. The results revealed that only four items consistently showed AUCs equal or greater than .70 across samples (items 1, 4, 5, and 7). The AUCs increased slightly for the SDS-SF compared to the SDS (Table 5).

Proposed structure of the 5-item SDS-SF

Items 1, 4, and 5 were consistently the strongest candidates to be part of the SDS-SF. Among items 6, 7, and 8, we decided to retain item 7 because it only failed the maximal reliability test in PCa survivors. That is, it could be deleted without affecting the overall reliability in only that sample. We decided to keep item 8 because it could not be deleted without severely affecting the overall reliability in any of the three samples. Item 6 was the weakest among them, showing limitations on the IRT (PCa survivors), maximal reliability (men with and without PCa), and ROC (PCa survivors) results, and as such was deleted. Therefore, the SDS could be shortened to a 5-item version composed of items 1 ("Distressed about your sex life"), 4 ("Frustrated by your sexual problems"), 5 ("Stressed about sex"), 7 ("Worried about sex"), and 8 ("Sexually inadequate"). These items showed greatest function at the item level, greatest contribution to the scale's reliability, and good capacity to discriminate between participants with distressing sexual problems and those without distressing sexual problems.

Study 2

The goal of Study 2 was to validate and assess the psychometric properties of the SDS-SF developed in Study 1 using different samples. In order to demonstrate that the scale assesses one domain, a unidimensional factor structure was tested. Evidence of validity based on the relations with other variables were examined. Based on previous research we predicted: (1) sexual distress would be strongly positively correlated with sexual bother (Santos-Iglesias, Mohamed, Danko, et al., 2018; Santos-Iglesias & Walker, 2018); (2) sexual distress would be strongly negatively correlated with sexual satisfaction (R. Rosen et al., 2009; Stephenson & Meston, 2010), moderately negatively correlated with sexual function (Azimi Nekoo et al., 2015; ter Kuile, Brauer, & Laan, 2006), and weakly negatively correlated with relationship quality (R. Rosen et al., 2009; Stephenson & Meston, 2010). Evidence of internal consistency and test–retest reliability was examined, and the SDS-SF and the SDS were compared in their ability to correctly classify participants with and without distressing sexual problems.

Method

Participants

Two new samples of 155 men and 275 PCa survivors that were recruited for a different study on sexuality after PCa treatment (Walker & Santos-Iglesias, 2020) were used to validate the SDS-SF in men and PCa survivors. Additionally, data from 313 women from (Vaillancourt-Morel, Rellini, Godbout, Sabourin, & Bergeron, 2019) were used to validate the SDS-SF in women. Table 6 presents the sociodemographic characteristics of the three samples. Women were the youngest, had the largest proportion of heterosexual participants, were in the shortest relationships, and

Table 6. Sample characteristics and comparisons between women, men, and PCa survivors from Study 2.

	Women n = 313	Men n = 155	PCa survivors n = 275	χ^2 / F (η^2_p)
Age (M (SD))	27.51 (6.47)$_{ab}$	49.88 (7.71)$_{ac}$	65.62 (7.53)$_{bc}$	2,093.20*** (.85)
Sexual orientation				15.25***
Heterosexual	299 (95.5)$_a$		248 (90.8)$_a$	
Homosexual/gay	14 (4.5)		12 (4.4)	
Bisexual	0 (0)$_a$		13 (4.8)$_a$	
Other	0 (0)		0 (0)	
Relationship	313 (100)$_{ab}$	113 (72.9)$_{ac}$	255 (92.7)$_{bc}$	100.17***
Relationship duration (years)	5.03 (4.52)$_{ab}$	18.06 (11.18)$_{ac}$	32.43 (14.93)$_{bc}$	464.05*** (.58)
Cohabitation	227 (72.5)$_{ab}$	100 (87.0)$_{ac}$	239 (94.5)$_{bc}$	49.45***
PCa diagnosis year			1985–2018	
PCa treatment[a]				
Surgery			193 (71.7) / *126*	
Radiation			104 (37.8) / *19*	
ADT			67 (25.9) / *1*	
Active Surveillance			44 (17.5) / *20*	
Cryotherapy			6 (2.4) / *0*	
Other			41 (16.2) / *16*	

Note. Percentages and means with the same subscript within the same row are statistically different from each other. [a]The number in italics following the slash symbol represents the number of participants who received *only* that type of treatment. ADT: Androgen deprivation therapy.
***$p < .001$.

were less likely to cohabit with their partners than men and PCa survivors. Men were less likely to be in a relationship than women and PCa survivors. Finally, PCa survivors were the oldest, most likely to cohabit with their partner, and were in the longest relationships compared to women and men. For PCa survivors, time since diagnosis ranged from 1 to 33 years. Most frequent treatments were surgery, followed by radiation and androgen deprivation therapy.

As part of the research design and protocol, only women and men were invited to complete the same survey again after 6 months. All women completed the survey after six months, but only a subsample of 112 (72.3%) men completed the survey again at follow-up. Men who did not complete the survey at follow-up did not differ on sexual distress and sexual function (F (6, 148) = 1.86, p = .09) from those who did.

Measures

Women, men, and PCa survivors completed a different set of measures as part of their respective study designs. Here, we will only include the measures that were used in this study:

Sexual distress

Sexual distress was assessed using the SDS-R (13-item version) (Derogatis et al., 2008). The psychometric properties of the SDS-SF developed in Study 1 (5-item version, comprised by items 1, 4, 5, 7, and 8 of the SDS) were examined. Higher scores indicate greater distress.

Sexual function

Women's sexual function was assessed with the Female Sexual Function Index (FSFI) (R. Rosen et al., 2000). The FSFI assesses six domains of women's sexual function: desire, arousal, lubrication, orgasm, satisfaction, and pain. Higher scores indicate better sexual function. In the present study, reliabilities ranged from .90 (desire) to .95 (satisfaction).

Men's sexual function was assessed using the International Index of Erectile Function (IIEF) (R. C. Rosen et al., 1997). The IIEF assesses 5 different domains: erectile function, orgasmic function, sexual desire, intercourse satisfaction, and overall satisfaction. Higher scores indicate better

Table 7. Goodness-of-fit indices for the three samples.

	χ^2 (5)	CFI	TLI	SRMR
Women	22.60***	0.965	0.929	0.031
Men	2.59	1	1	0.049
PCa survivors	14.19*	0.988	0.976	0.014

Note. $N = 313$ women, 155 men, and 275 PCa survivors.
***$p < .001$.

sexual function. In the present study, internal consistency reliabilities ranged from .83 to .95 in men, and from .45 to .95 in PCa survivors.

Sexual satisfaction

The Global Measure of Sexual Satisfaction (GMSEX) (Lawrance, Byers, & Cohen, 2011) was used to assess overall satisfaction with one's sexual relationship with their partner. Respondents rate their sexual relationship on five bipolar scales: *very bad–very good*; *very unpleasant–very pleasant*; *very negative–very positive*; *very unsatisfying–very satisfying*; *worthless–very valuable*. Higher scores indicate greater sexual satisfaction. Reliability values were .91 in women, .93 in men, and .97 in PCa survivors.

Relationship quality

Women completed the Couple Satisfaction Index (Funk & Rogge, 2007), which is a 32-item scale designed to measure one's global satisfaction in a relationship. One global item used a seven-point scale, whereas the other 31 used a variety of six-point scales. A total score of satisfaction with the relationship is obtained with higher scores indicating greater satisfaction. In the present study reliability was .95.

Men completed the Revised Dyadic Adjustment Scale (RDAS) (Busby, Christensen, Crane, & Larson, 1995). The RDAS is a 14-item questionnaire that provides a global score of dyadic adjustment, as well as scores on three subscales: consensus, satisfaction and cohesion. In this study only the global scale was used, with higher scores indicating greater adjustment. Reliability was .86 in men and .86 in PCa survivors.

Procedure

Women

Couples from Vaillancourt-Morel, Rellini, Godbout, Sabourin, and Bergeron (2019) were recruited via online advertisement (e.g., social media, classified advertisements), email lists, and posters and flyers distributed in different venues. Interested participants were screened for eligibility via telephone assessment, and those deemed eligible completed an online survey. Participants were contacted six months later by email to complete a Time 2 survey. Participants received a $10 gift card after each completion. The procedure was approved by the university's Institutional Review Board.

Men. Participants were recruited using Amazon's M-Turk (Casler, Bickel, & Hackett, 2013). Participants meeting the inclusion criteria (i.e., over age 40 and no history of cancer) and who provided informed consent were invited to complete the online survey. Six months later they were invited to complete a retest assessment. Compensation for survey completion was $2.00. The procedure was approved by the Health Research Ethics Board of Alberta - Cancer Committee.

PCa survivors. Cross-sectional data were collected using study advertisements posted in different community programs, clinics, hospitals, and online newsletters from PCa support groups. Interested participants followed a URL link to an anonymous online survey. Those who

consented completed the questionnaire package. The procedure was approved by the Health Research Ethics Board of Alberta - Cancer Committee.

Results

Confirmatory factor analysis

A one-factor confirmatory factor analysis on the 5-items of the SDS-SF was conducted on each sample. Data were fitted using a robust maximum likelihood estimator in women and PCa

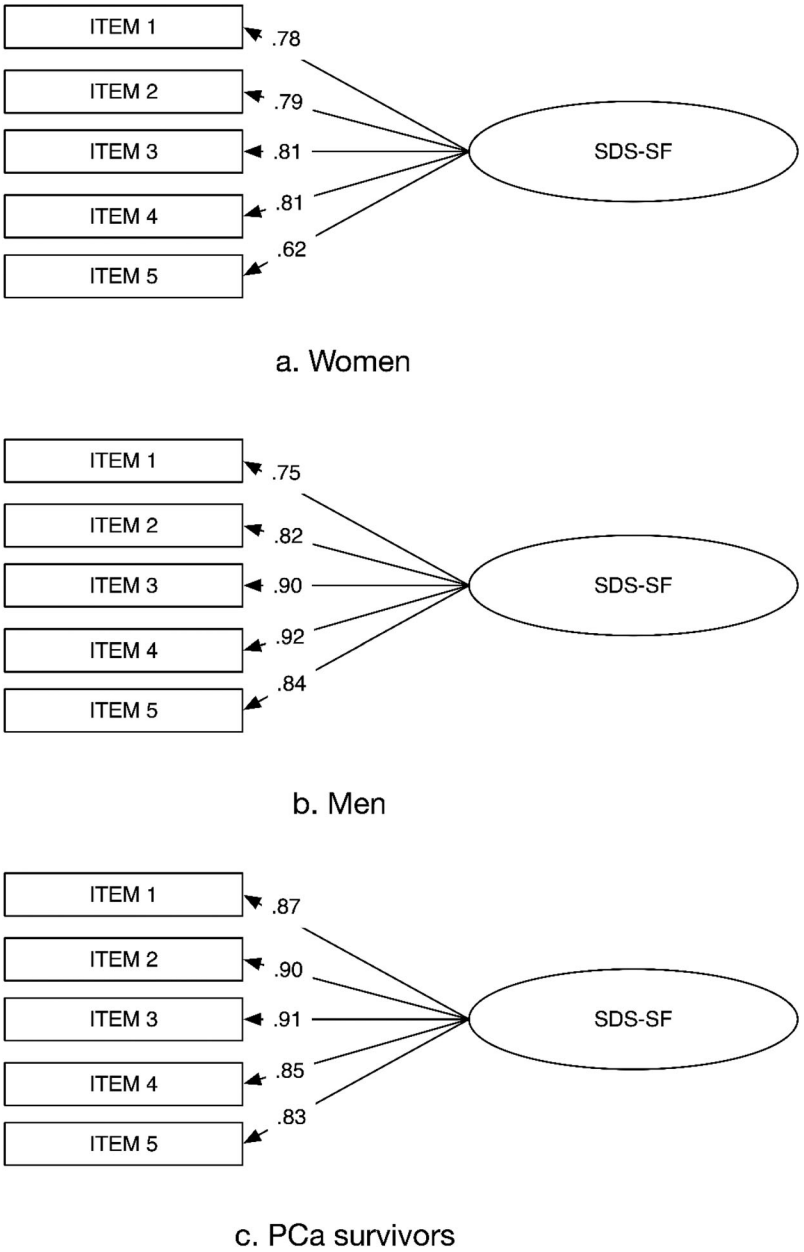


Figure 2. Path diagram of the one-factor structure of the SDS-5 in women (a), men (b), and PCa survivors (c). SDS-SF: Sexual Distress Scale-Short Form (5-items).

Table 8. Internal consistency and test-retest reliabilities.

	Internal consistency		
Samples	Omega	Omega's 95% CI	Test-retest
Women	.875	.847–.898	.590***
Men	.926	.892–.948	.719***
PCa survivors	.940	.926–.951	

Note. $N = 313$ women, 155 men, and 275 PCa survivors.
*** $p < .001$.

survivors, and a robust weighted least square estimator in men due to the smaller sample size. Values of CFI and TLI $> .90$ and $< .05$ on SRMR were indicators of good fit (Browne & Cudeck, 1993; Hu & Bentler, 1999). The results showed good fit across the three samples (see Table 7) with factor loadings greater than .62 (see Figure 2).

Reliability

Internal consistency reliability was estimated using McDonald's omega (ω) (McDonald, 1999). Omega, derived from a factor analytic framework, includes factor loadings in the estimation of reliability and, therefore, is suitable both under conditions of tau-equivalent (i.e., similar factor loadings of all test items) and congeneric models (i.e., different factor loadings of test items) (Trizano-Hermosilla & Alvarado, 2016). Revelle and Zinbarg (Revelle & Zinbarg, 2009) showed that omega is a better alternative to Cronbach's alpha estimation of reliability.

Internal consistency reliability was excellent for women, men and PCa survivors. Test–retest reliability after six months was good for men but did not reach acceptable levels in women (see Table 8).

Validity

Results were consistent with our predictions (see Table 9). Sexual distress was strongly positively correlated with sexual bother and strongly negatively correlated with sexual satisfaction. Sexual distress was moderately to strongly correlated with sexual function. The exception to this was the sexual desire domain in PCa survivors, which was not significantly correlated with sexual distress. Finally, the correlation between sexual distress and relationship quality was low to moderate and negative.

Comparison of the SDS-SF and the SDS

The procedure described in Orlando, Sherbourne, and Thissen (2000) was used to compare the SDS and the SDS-SF in their ability to classify participants with and without distressing sexual problems. The SDS and SDS-SF were simultaneously calibrated using a graded response model[2]. Based on the calibration parameters and using the cutoff scores from the SDS (15 in women, 18.5 in men and 15 in PCa survivors) (Derogatis et al., 2002; Santos-Iglesias, Mohamed, Danko, et al., 2018; Santos-Iglesias & Walker, 2018), we derived approximate cutoff scores for the SDS-SF. Participants were classified as having distressing sexual problems using the cutoff scores from both the SDS and SDS-SF and the results were cross-tabulated.

In women, the summed-score cutoff of 15 on the SDS corresponded to an IRT score of 0.456, which on the SDS-SF corresponded to a summed-score of 7. Table 10 shows the correspondence

[2]To conserve space, details about the data analytic strategy and results about item and model fit are presented as supplemental materials

Table 9. Correlations among sexual distress, sexual bother, sexual function, sexual satisfaction, and relationship adjustment.

	Women	Men	PCa survivors
Sexual bother		.60***	.68***
Sexual function			
Desire	−.41***	−.28**	−.05
Arousal	−.52***		
Lubrication	−.37***		
Orgasm	−.39***	−.33***	−.37***[a]
Satisfaction	−.60***	−.47***	−.58***
Pain	−.40***		
Erectile		−.48***	−.37***
Intercourse satisfaction		−.35***	−.24***
Sexual satisfaction	−.52***	−.58***	−.48***
Relationship adjustment	−.31***	−.16*	−.38***

Note. $N = 313$ women, 155 men, and 275 PCa survivors. [a]Correlation was corrected for attenuation due to low reliabilities.
*$p < .05$.
**$p < .01$.
***$p < .001$.

Table 10. Classification of women, men, and PCa survivors for distressing sexual problems according to the SDS and the SDS-SF cutoff scores.

	SDS-SF		
SDS	Without DSP	With DSP	
Women			
Without DSP	66.8	2.9	69.6
With DSP	2.2	28.1	30.4
Total	69.0	31.0	
Men			
Without DSP	76.1	2.6	78.7
With DSP	1.3	20.0	21.3
Total	77.4	22.6	
PCa survivors			
Without DSP	42.5	5.1	47.6
With DSP	0.4	52.0	52.4
Total	42.9	57.1	

Note. $N = 313$ women, 155 men, and 275 PCa men. SDS: Sexual Distress Scale (12-items); SDS-SF: Sexual Distress Scale-Short Form (5-items); DSP: Distressing sexual problems.

between participants classified as having distressing sexual problems based on the SDS and SDS-SF. Almost 95% of the women were correctly classified as having distressing sexual problems using the SDS-SF. The kappa coefficient of concordance was .88 and the correlation between the scores on the SDS and SDS-SF was .97 ($p < .001$).

For men, a summed-score of 18.5 on the SDS corresponded to an IRT score of -0.026, which was equivalent to a summed-score of 8 on the SDS-SF. This correctly classified 95% of the participants with distressing sexual problems, with a kappa statistic of .89. The correlation between the scores on the SDS and SDS-SF was .98 ($p < .001$).

In PCa survivors, a summed score of 15 on the SDS was equivalent to an IRT score of -0.289, which corresponded to a summed-score of 7 on the SDS-SF. This score correctly classified 91% of the participants identified as having distressing sexual problems using the SDS (kappa statistic of .80). The correlation between the SDS and SDS-SF was .97 ($p < .001$).

Discussion

This paper presents two studies aimed at developing and validating a short form of the Sexual Distress Scale (Derogatis et al., 2002). While specific objectives of this paper pertain to the PCa population, the results are also applicable for women and men who are not PCa survivors. Using

samples of women, men, and PCa survivors, three different shortening procedures were used to propose and test a 5-item Sexual Distress Scale-Short Form (SDS-SF). The validation study showed good psychometric properties for its use in all three samples.

Short form development (Study 1)

Results showed that five items are largely consistent as the strongest items to form the SDS-SF. These five items are the most accurate at assessing different levels of sexual distress. That is, they provide the most information from participants that vary widely in their level of sexual distress. Furthermore, these items also contribute the most to the reliability of the scale and are the ones that best differentiate participants with and without distressing sexual problems.

The construct representation appears unaffected by the item reduction. Similarly constructed, four of the five items included in the short form refer to a negative feeling (e.g., distress, frustration, stress, worry) about sexuality, and also refer to sexuality in a broad sense (e.g., sex life, sex, sexual problems). The fifth item ("Sexually inadequate") is somewhat unique in comparison in that it refers to an evaluative statement that respondents may make about themselves rather than to how they feel about their sexuality, which could in turn provoke negative emotions. Given this important difference, the nature and meaning of this item may need to continue to be explored in further research.

An advantage of this identified short form is the inclusion of two items with strong qualities supported within the literature. The first item –distress about "sex life"– is an ideal item, as the construct "sex life" is an encompassing term that refers to a wide variety of sexual aspects, activities, and even emotional aspects of sexual relationships (Fortune-Greely et al., 2009), and does not necessarily depend on sexual activity. As such, it aligns with the goal of assessing sexual distress broadly and independently of domains of sexual function. The second item refers to feelings of frustration about sexual problems. *Frustration* has been found to be the term PCa survivors chose most often to refer to negative feelings about their loss of sexual function (Flynn et al., 2011; Letts, Tamlyn, & Byers, 2010), therefore it seems to be an excellent descriptor of sexual distress.

Finally, two of the eliminated items from the SDS included "Unhappy about your sexual relationships", and "Dissatisfied with your sex life". These items have been criticized as potentially assessing sexual satisfaction rather than sexual distress (Santos-Iglesias & Walker, 2018). In fact, Carpenter et al. (2015) found that these same two items had the weakest correlations with the total sexual distress score and the strongest correlations with measures of sexual satisfaction. Taken together this may indicate that these two items better measure sexual satisfaction than sexual distress; therefore, their exclusion from the short form is warranted.

Short form validation (Study 2)

Results of the validation study (Study 2) were similar to previous validation studies of the SDS (Santos-Iglesias, Mohamed, Danko, et al., 2018; Santos-Iglesias & Walker, 2018). The SDS-SF assesses sexual distress in one domain and the internal consistency reliability was excellent. Test-retest reliability was acceptable in men but did not reach acceptable levels in women. This could be explained by women's greater sexual plasticity compared to men. That is, in comparison to men, women's sexual attitudes, feelings, behaviors, etc., are more malleable in response to situational factors and, thus, tend to be less stable over time (Baumeister, Catanese, & Vohs, 2001; Peplau, 2003). It is worth noting that retest assessments were conducted after six months, which may be an excessively long time to examine test-retest reliability for sexual distress. That is, it is likely that sexual distress could have changed drastically over this period for women. In fact, most retest assessments of sexual distress have been conducted between 1 and 4 weeks (Santos-

Iglesias, Mohamed, & Walker, 2018). Rather than speaking about the quality of the scale, these results speak about the usability of the scale scores and how it is not feasible to use the SDS-SF to compare women's sexual distress scores after a period of six months , as the scores contain too much time sampling error (Urbina, 2014). Further research is needed to examine whether changes in sexual distress over time may be different and/or influenced by gender.

Correlations with other variables were consistent with our predictions across the three samples. The strongest correlation was found between sexual distress and sexual bother, as found in previous validation studies with men (Santos-Iglesias, Mohamed, Danko, et al., 2018; Santos-Iglesias & Walker, 2018). That is, greater sexual distress was associated with greater sexual bother. Because sexual distress and sexual bother are similar constructs (Santos-Iglesias, Mohamed, Danko, et al., 2018), we anticipated a strong positive correlation between them. Similar to Stephenson and Meston (2010), we found that sexual distress and sexual satisfaction were strongly negatively correlated. In keeping with the Interpersonal Exchange Model of Sexual Satisfaction (Lawrance & Byers, 1995), sexual distress could be considered a sexual cost, which explains the negative correlation between sexual distress and sexual satisfaction. Finally, sexual distress was only weakly correlated with relationship quality, which is again supported in the literature on the general population (Blumenstock & Papp, 2017; Stephenson & Meston, 2010). In light of these findings, it appears that different factors, both sexual (e.g., sexual communication, sexual satisfaction) and non-sexual (e.g., coping mechanisms, emotional intimacy), may buffer the impact of sexual distress on the quality of the relationship, decreasing the strength of the relationship between these two variables.

Sexual distress and sexual function were moderately to strongly correlated, although there were a few variations across samples. The correlation between erectile function and sexual distress was stronger in PCa survivors than in men. It appears that PCa survivors are less distressed than other men about their erectile difficulties, perhaps because they attribute these difficulties to their PCa treatment. In fact, the finding that erectile difficulties may be more distressing for men than for PCa survivors has been reported before (Penson et al., 2003). While sexual desire was strongly correlated with sexual distress for women, it was either weakly or not correlated with sexual distress in men with and without PCa. This finding too, has been previously reported (Santos-Iglesias & Walker, 2018), and suggests that other aspects of sexual function or the sexual relationship(s) may be more distressing than levels of sexual desire.

Finally, the SDS-SF classified men with and without distressing sexual problems as well as the SDS and both versions were strongly correlated, which supports the equivalence between these two measures. Moreover, the short form preserves almost the same classification accuracy as the SDS. However, it is important to note that these analyses were only used as a way of comparing the SDS and SDS-SF. As such, the derived cutoff scores for the SDS-SF are only approximate and have not been confirmed as the optimal cutoff points to discriminate between groups. For these reasons, we strongly advise against using the derived cutoff scores for the SDS-SF as classification criteria. Future research should be conducted using samples of clinically diagnosed patients to develop optimal cutoff points for discrimination.

Strengths, limitations and future directions

This study has several strengths. The SDS-SF was developed using samples of women, men, and PCa survivors, using three different statistical reduction techniques. These techniques consistently found the same five items to work best across the three different groups. The SDS-SF was then comprehensively validated using a second sample of the three different groups, showing good to excellent psychometric properties. Therefore, the SDS-SF is likely a robust short scale for the assessment of sexual distress in women, men and PCa survivors.

Although both the SDS-SF and the single-item version (Carpenter et al., 2015) assess sexual distress in a broad sense (i.e., sex life in general, and not just related to sexual function), it is

clear that the SDS-SF has a better construct representation than the single-item version. Because of the complex nature of sexual distress, Vannier and Rosen (2017) suggested that single-item assessments should be followed-up with additional questions about feelings of guilt, frustration, or worry. The SDS-SF is a solution to that lack of construct coverage. Furthermore, the SDS-SF also retains the items that truly assess the construct of sexual distress and eliminates items that assess sexual satisfaction and distress about sexual function (i.e., sexual desire).

The SDS-SF overcomes the limitations found in sexual distress measures validated in the context of PCa; specifically, the EPIC-sexual bother subscale (Wei et al., 2000), which only assesses sexual distress related to sexual function (e.g., erectile function, sexual desire, etc.). Research has shown that PCa survivors often express feelings of distress about other aspects of their sexual relationships beyond sexual function (e.g., future of sexual life, use of erectile aids, penis size and shape, concerns for partner, etc.) (Walker & Santos-Iglesias, 2020).

Despite these strengths, some limitations are acknowledged. First, although the SDS-SF has been developed and validated using three samples of participants, these samples relied on different procedures for data collection (e.g., there was no retest assessment for PCa survivors), and thus included participants with different characteristics, which could affect the results. Similarly, the three groups were classified as having distressing sexual problems using different criteria, which may have affected the composition of the groups and therefore the results of reduction strategy based on ROC curves. Finally, participants in Study 2 came from previous studies and they had completed the full SDS-R instead of just the five items of the SDS-SF. It is possible that their responses to the items comprising the SDS-SF may have been affected by the other items in the SDS-R. However, it is also true that in order to compare the classification accuracy of the SDS-R and the SDS-SF, we needed participants to complete the full SDS-R. For these reasons, this study is presented as preliminary validation and future studies should replicate these findings to see if the same short form is supported. Additionally, the sample size for men in the validation study (Study 2) was not large, therefore these results, although promising, should be interpreted in light of this limitation. Because the SDS-SF was developed with the intention of conducting between-group comparisons, a next step would be to test the short form in order to ensure lack of measurement bias. Similarly, future studies should examine the applicability of the SDS-SF in other populations (e.g., other chronic illnesses, cancer types, sexually dysfunctional groups).

Conclusions

The SDS-SF is a short form of the SDS, previously validated for the assessment of sexual distress in women, men, and PCa survivors. Having a significantly shorter—and potentially stronger—version of the SDS, increases dramatically the usability of the scale in research and clinical settings where time and costs are a constraint. For example, adding this 5-item scale to the standard assessment battery for all PCa survivors pre- and post-treatment is likely quite feasible. In addition, as a criterion for a diagnosis of sexual dysfunction largely overlooked in the sexual health and PCa literature to date, adding sexual distress as an outcome, in addition to sexual function, will help to confirm the presence of sexual dysfunction in this population and others. This study shows support for a short form of the SDS that would facilitate increasing our knowledge about sexual distress and sexual dysfunction in the general population, but also in specific populations such as PCa, where sexual dysfunction is prevalent.

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