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A short form of the Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire (PISQ-12)

Received: 2 August 2002 / Accepted: 7 March 2003 / Published online: 25 July 2003
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Abstract The aim of this study was to develop the short form of a condition-specific, reliable, validated and self-administered instrument to evaluate sexual function in women with pelvic organ prolapse and/or urinary incontinence. The Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire –12 (PISQ-12) was developed from the data of 99 of 182 women surveyed to create the long form (PISQ-31). An additional 46 patients were recruited for further validation. All subsets regression analysis identified 12 items likely to predict PISQ-31 scores. Short form scores underwent correlation analysis with long form, Incontinence Impact Questionnaire – 7 (IIQ-7), Sexual History Form –12 (SHF-12) and Symptom Questionnaire (SQ) scores. Test–retest reliability was checked with a subset of 20 patients. All subsets regression analysis with $R > 0.92$ identified 12 items that predicted PISQ-31 scores. Short form scores were highly correlated with long form scores ($R = 0.75–0.95$). Correlations of the PISQ-12 with SHF-12 ($R = -0.66$ and -0.68) and IIQ-7 ($R = -0.38$ and -0.54) scores were similar to correlation of the PISQ-31 with these other measures. Reliability was moderate to high, with weighted κ values from 0.56 to 0.93. PISQ-12 scores were lower in patients with low sexual function as measured on the SHF-12 ($P < 0.001$), and lower in women with depression as measured on the SQ

($P < 0.001$). The PISQ-12 is a validated and reliable short form that evaluates sexual function in women with urinary incontinence and/or pelvic organ prolapse and predicts PISQ-31 scores. It is able to distinguish women with poor sexual function as measured on the SHF-12.

Keywords Pelvic organ prolapse · Sexual function · Urinary incontinence

Introduction

Condition-specific questionnaires to evaluate quality of life changes in women with urinary incontinence and/or pelvic organ prolapse are important to assess the efficacy of surgical and medical interventions. We have previously developed a condition-specific, self-administered, valid and reliable scale evaluating sexual function in patients with incontinence and/or uterovaginal prolapse, the Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire (PISQ-31) [1]. Although long forms of questionnaires are helpful for research, short forms may have wider applicability in clinical and research settings where it is important to minimize respondent burden and cost. We present a validated and reliable short form of the Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire that accurately predicts long form scores, the PISQ-12.

Materials and methods

The development of the Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire has already been described in detail. Briefly, the PISQ is a 31-item questionnaire with items selected through review of the literature, expert opinion and review of non-validated or generic questionnaires [1]. Responses are graded on a 5-point Likert scale from ‘never’ to ‘always’. Participating women completed the long-form PISQ, the Incontinence Impact Questionnaire-7 (IIQ-7), which measures the impact of incontinence on the patient’s social functioning [2]; the Sexual History Form-12 (SHF-12), a non-specific validated questionnaire that evaluates sexual functioning and which served as a gold standard with which to compare our questionnaire [3]; and the Symptom Questionnaire

Study supported by NCCR-GCRC Grant # M01 RR00997 Presented at American Urogynecologic Society annual meeting in Hilton Head, South Carolina, USA, 2000

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(SQ), which evaluates patients' wellbeing, including scales on depression, somatization, anxiety and hostility [4]. Factor analysis of the long-form questions identified three subscales which we named Behavioral Emotive (15 items), Physical (10 items) and Partner Related (6 items). The internal consistency scores for the subscales and total were 0.86, 0.77, 0.43 and 0.85, respectively. Validity was verified in a number of ways, including correlation with other quality of life instruments, and demographic information obtained from the patients. Test-retest reliability was checked within a 2-week period for 20 patients and good agreement with weighted κ values for items ranging from 0.56 to 0.93.

The short form was developed using data from 99 of the original 182 women used in constructing the long-form questionnaire who completed the final validated version.

Site 1: Women participating from Site 1 were recruited from the general gynecology and urogynecology clinics at the University of New Mexico Health Sciences Center as well as from a database of women who had been involved with gynecological research from the Research Division of the Department of Obstetrics and Gynecology. Forty-six women from a private urogynecology clinic (Scott and White clinic in Temple, Texas) were also recruited. *Site 2:* The additional site was included in order to further validate the performance of the questionnaire in a different population.

The inclusion criteria included women over the age of 21 in a heterosexual relationship who could read English. All women complained of urinary incontinence and/or pelvic organ prolapse. Analyses were performed on the data from the long form to determine which group of questions best predicted long-form scores. The study was approved by the Human Research Review committees at both sites and all women gave informed consent.

Factor assignment for questions from the PISQ-31 were retained in the PISQ-12. Item selection for the PISQ-12 was performed using all subsets regression analyses to find items that best predicted PISQ-31 scores. In order to decide which questions would make up the final questionnaire, questions underwent a matrix evaluation which ranked them according to Cronbach's α values, age, IIQ-7 scores, and scores on questions evaluating sexual satisfaction. When analysis appeared to give equal value to questions, final decisions were made by two of the authors, RGR and CQ, and were based on item content.

Correlations between long and short forms as well as the IIQ-7 and SHF-12 scores were performed, to evaluate how well PISQ-12 scores predicted PISQ-31 scores. Additionally, short-form scores were compared between women who had poor or high sexual functioning on the SHF-12 (SHF-12 score >56 indicates poor sexual function) to establish whether short-form scores identified women with poor sexual function [5]. PISQ-12 scores were then compared between women with high versus low depression scores as measured on the SQ (SQ depression score >10 indicates severe depression) [4]. The incidence of sexual dysfunction is high in women with depression and we predicted that short-form scores in women with depression would be significantly lower than in those who were not depressed.

All subsets regression analysis was used to select items for the short form of the questionnaire. Pearson's correlations were used to compare PISQ-12 scores with PISQ-31 scores, as well as with IIQ-7, SHF-12 and SQ subscale scores. Paired *t*-tests and κ statistics were used to evaluate test-retest reliability. The weights used for the weighted κ calculations are due to Cicchetti-Allison, which is default in SAS [6]. κ values were evaluated as poor (<0.4), fair to good (0.4–0.75) or excellent (>0.75) [7]. A sample size of 20 for reliability testing was adequate to distinguish an effect size of 0.66. With a moderate correlation of 0.7 for the repeat measures in a paired *t*-test, a difference of means equal to 50% of the common standard deviation was detectable with 80% power and $\alpha=0.05$.

Results

The demographic data describing the two populations are given in Table 1. The two sites were similar in patient

Table 1 Demographic data

	Site 1 <i>n</i> =99 (%)	Site 2 <i>n</i> =46 (%)	<i>P</i> value
Age*	53 ± 10	54 ± 12	NS
Parity*	2.9 ± 1.7	2.6 ± 1.2	NS
Ethnicity (%)			<0.002
Non-Hispanic white	53 (55)	33 (72)	
Hispanic	34 (35)	4 (9)	
Other	10 (10)	9 (10)	
IIQ-7 scores	25 ± 28	40 ± 27	0.005
Marital status (%)			
With partner	77 (79)	41(91)	NS
Single	20 (21)	4 (9)	
Income < \$25,000 year (%)	48 (52)	10 (22)	<0.001
HRT	51 (53)	21 (53)	NS

*Means ± standard deviations

age, parity, and use of hormone replacement therapy. The women at Site 2 were more likely to be Caucasian, in a higher income bracket, and scored higher on IIQ-7 questionnaires than the women from Site 1.

All subsets regressions analysis with $R > 0.92$ identified 12 items that predicted long-form scores in the three factors. The short form provides a single sexual function score. Although each factor is represented (behavioral emotive factor with items 1–4, physical factor with items 5–9 and the partner related factor with items 10–12; see Appendix) the PISQ-12 is reportable on only a total or per item basis. Validity is retained with up to two missing values on the short form. If more than two of the 12 values are missing, then the short form no longer predicts long-form scores. In the analysis for the present paper we do separate the three subscales; however, we recommend that the PISQ-12 be reported on only a total or per item basis. Missing values in any of the factors significantly decreases the correlation of the short-form factors with long-form factors.

PISQ-12 scores revealed good to excellent correlation with PISQ-31 scores and are reported in Table 2. Correlations between the three factor subscales on the short and the long form ranged from $R=0.95$ to $R=0.75$, indicating that the short form is representative of the separate factor subscales at both sites. Total short-form scores from both sites were highly correlated with long-form scores. The SHF-12 correlated with the behavioral emotive factor subscale and the IIQ-7 more (negatively) correlated with the physical factor, similar to correlations noted previously between long-form scores and SHF-12 and IIQ-7 scores [1].

PISQ-12 scores were different between women who had high or low depression scores on the SQ. Women with depression on the SQ had significantly lower PISQ-12 scores than women with low depression scores. Similarly, women who scored poorly on the SHF-12, as reported in Table 3, also had poorer sexual functioning on the PISQ-12 ($P < 0.001$) No differences in SHF-12 or depression scores existed between sites (all $P > 0.08$).

Table 2 Correlation of short with long form scores, IIQ scores and SHF-12 scores for domain and total scores by site

Short form	Behavioral emotive	Physical	Partner-related	Total
	Site 1 (<i>n</i> = 99)			
Long form	0.91	0.95	0.86	0.92
IIQ-7	-0.18*	-0.54	-0.25	-0.45
SHF-12	-0.66	-0.15*	-0.41*	-0.55
	Site 2 (<i>n</i> = 46)			
Long Form	0.75	0.95	0.78	0.87
IIQ-7	-0.04*	-0.38	0.10*	-0.26
SHF-12	-0.68	0.02*	-0.21*	-0.16

**P* > 0.05, all else *P* < 0.05.

Higher PISQ scores indicate better sexual function. Lower SHF-12 and IIQ scores represent better social/sexual function; therefore,

negative correlations are expected. The magnitude (not the sign) of the correlation is indicative of agreement

Table 3 Comparison of Short form Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire (PISQ-12), Symptom Questionnaire (SQ) and Sexual History Form-12 (SHF-12) Scores

	SQ* high depression score (≥ 10) <i>n</i> = 27	SQ low depression score (< 10) <i>n</i> = 116	<i>P</i> value	SHF-12 low score (< 56) <i>n</i> = 117	SHF-12 high score (> 56) <i>n</i> = 25	<i>P</i> value
Sites 1 and 2 (<i>n</i> = 145) Means \pm SD	31.4 \pm 6.3	36.8 \pm 5.2	< 0.001	37.0 \pm 4.6	31.1 \pm 7.6	< 0.001

*High SQ scores represent more depression

Reliability testing with test-retest evaluation had 12 weighted κ values, four of which were in the good ranges and eight in the excellent range, and all paired *t*-test *P* values were > 0.15, indicating a lack of bias. The good to high agreement we found supports the conclusion that answers to the questionnaire are reproducible.

Discussion

Urinary incontinence and pelvic organ prolapse are common in women. Studies of the effect of these disorders on the quality of life of women have focused on global evaluation, with little emphasis or focus on sexual function. We have previously developed a condition-specific questionnaire to evaluate sexual function in women with urinary incontinence or prolapse, the PISQ-31. Here we report the evaluation of a short form of the PISQ, which accurately predicts long-form scores and is in keeping with the length of other short-form quality-of-life questionnaires [2].

Our validation of the PISQ-12 demonstrates excellent correlation with the PISQ-31, at the level of both factor scores and total scores, with *R* values all greater than 0.7. The PISQ-12 had a pattern of correlation that mimicked the correlations seen with the analyses performed with the long form; as expected, the behavioral emotive factor correlated strongly with the SHF-12, and the physical factor with the IIQ-7. Although these correlations were not as high as those found with the long-form analyses, they are in keeping with correlations

found in the analysis of other short-form questionnaires [2]. Furthermore, the PISQ-12 was able to distinguish between women with low or high sexual functioning scores as measured by the SHF-12, a validated sexual function questionnaire that serves as a gold standard. Finally, we again demonstrate that women with high depression scores on the SQ have poorer sexual function scores on the PISQ-12, a finding that we previously noted with PISQ-31 scores [1].

We validated our questionnaire by analyzing its performance not only in the population in which it was created, but also in another population of women with urinary incontinence and/or pelvic organ prolapse. Correlation of the short-form scores with long-form scores remained high at both sites, as did factor correlations with the SHF-12 and IIQ-7, indicating that the questionnaire performs well in another population. Correlations between PISQ-12 and PISQ-31 totals and factors are comparable to correlations for other short-form quality-of-life measures [2].

Short forms are useful in the clinical setting because they reduce the time and burden to the patient and provide the clinician with objective means of evaluating functional outcomes of either medical or surgical interventions. In the research setting a short form is useful when quality-of-life analysis is part of the armamentarium used to evaluate outcomes and compare results.

The PISQ-12 is a validated and reliable short form that evaluates sexual function in heterosexual women with urinary incontinence and/or pelvic organ prolapse and predicts long-form scores.

Appendix

Pelvic Organ Prolapse/Urinary Incontinence Sexual Function Questionnaire (PISQ-12)

Instructions: Following are a list of questions about you and your partner's sex life. All information is strictly confidential. Your confidential answers will be used only to help doctors understand what is important to patients about their sex lives. Please check the box that best answers the question for you. While answering the questions, consider your sexuality over the past six months. Thank you for your help.

1. How frequently do you feel sexual desire? This feeling may include wanting to have sex, planning to have sex, feeling frustrated due to lack of sex, etc.
 Always Usually Sometimes Seldom Never
2. Do you climax (have an orgasm) when having sexual intercourse with your partner?
 Always Usually Sometimes Seldom Never
3. Do you feel sexually excited (turned on) when having sexual activity with your partner?
 Always Usually Sometimes Seldom Never
4. How satisfied are you with the variety of sexual activities in you current sex life?
 Always Usually Sometimes Seldom Never
5. Do you feel pain during sexual intercourse?
 Always Usually Sometimes Seldom Never
6. Are you incontinent of urine (leak urine) with sexual activity?
 Always Usually Sometimes Seldom Never
7. Does fear of incontinence (either stool or urine) restrict your sexual activity?
 Always Usually Sometimes Seldom Never
8. Do you avoid sexual intercourse because of bulging in the vagina (either the bladder, rectum or vagina falling out?)?
 Always Usually Sometimes Seldom Never
9. When you have sex with your partner, do you have negative emotional reactions such as fear, disgust, shame or guilt?
 Always Usually Sometimes Seldom Never
10. Does your partner have a problem with erections that affects your sexual activity?
 Always Usually Sometimes Seldom Never
11. Does your partner have a problem with premature ejaculation that affects your sexual activity?
 Always Usually Sometimes Seldom Never
12. Compared to orgasms you have had in the past, how intense are the orgasms you have had in the past six months?
 Much less intense Less intense Same intensity More intense Much more intense

Scoring:

Scores are calculated by totaling the scores for each question with 0=never, 4=always. Reverse scoring is used for items 1,2,3 and 4. The short form questionnaire can be used with up to two missing responses. To handle missing values the sum is calculated by multiplying the number of items by the mean of the answered items. If there are more than two missing responses, the short form no longer accurately predicts long form scores. Short form scores can only be reported as total or on an item basis. Although the short form reflects the content of the three factors in the long form, it is not possible to analyze data at the factor level. To compare long and short form scores multiply the short form score by 2.58 (12/31).

References

1. Rogers RG, Kammerer-Doak D, Villarreal A, Coates K, Qualls C (2001) A new instrument to measure sexual function in women with urinary incontinence and/or pelvic organ prolapse. *Am J Obstet Gynecol* 184:552–558
2. Uebersax JS, Wyman JF, Shumaker SA, McClish DK, Fantl JA, and the Continence Program for Women Research Group (1995) Short forms to assess life quality and symptoms distress for urinary incontinence in women: the incontinence impact questionnaire and the urogenital distress inventory. *Neurourol Urodyn* 14:131–139
3. Creti L, Fichten CS, Brender W (1998) Functioning. In: Davis CM, Yaber WH, Bauserman R, Schreer G, Davis SL (eds) *Handbook of sexuality-related measures*, 2nd edn. Sage, Thousand Oaks, pp 261–267
4. Kellner R, Sheffield BF (1973) A self-rating scale of distress. *Psych Med* 3:88–100
5. Weber AM, Walters MD, Schover LR, Mitchinson A (1995) Sexual function in women with uterovaginal prolapse and urinary incontinence. *Obstet Gynecol* 85:483–487
- 6 SAS Institute Inc.(1999) *SASSTAT User's Guide*, Version 8. : SAS Institute, Cary, NC, 1310
7. Fleiss JL (1981) *Statistical methods for rates and proportions*, 2nd edn. John Wiley and Sons, New York, p 218

Editorial comment

For decades, clinicians and researchers have described treatment ‘success’ in our field as resolution of either anatomic defects or of urinary or fecal leakage. We have all had patients with perfect anatomic support after a prolapse operation who were unhappy because of problems with pain, leakage, defecation or sexual function. Yet, considering these and other quality of life issues as part of the definition of treatment success is a recent development. The emphasis on the importance of assessing various quality of life indicators is snow-balling, yet our efforts to do so have been hampered by the absence of good, easy to administrate, reliable and valid tools. The short form of the PISQ is an eagerly awaited tool that fills this void. From a research prospective, information derived from responses to this questionnaire will allow us to understand the effect of various treatments on sexual function, arguably one of the most important and least investigated domains of quality of life. When completed by patients in a clinical setting, the PISQ-12 provides a template for clinicians to discuss sexuality with patients, and to suggest appropriate interventions. In developing the long and short forms of this instrument, the authors have set a high standard for others developing quality of life instruments to strive for.