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Factor Structure, Reliability, and Validity of the Malay version of the Sexual Desire Inventory-2 (SDI-2-BM) in a Sample of Lower Urinary Tract Symptoms (LUTS) and Healthy Individuals

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Abstract

Objective: We examined the factor structure, reliability, and validity of the Malay version of the Sexual Desire Inventory-2 (SDI-2-BM) in a sample of 72 lower urinary tract symptoms (LUTS) patients and 70 healthy individuals. Methods: All participants completed the SDI-2-BM and the Malay version of International Index of Erectile Function 15 (Mal-IIEF-15). Results: We reported a two-factor model for the SDI-2-BM in the present sample: Dyadic Sexual Desire (alpha = .93) and Solitary Sexual Desire (alpha = .88) for the SDI-2-BM. Significant correlations between the SDI-2-BM and IIEF-BM Sexual Desire subscale scores were obtained, lending support for concurrent validity. Normal healthy men had significantly reported higher SDI-2-BM scores as compared to individuals with BPH. Evidence of discriminant validity for the SDI-2-BM was established. Conclusion: In conclusion, the SDI-2-BM can be used as a reliable and valid tool in assessing sexual desire among men in local outpatient setting.

Keywords: Sexual Desire Inventory-2, Sexual Desire, International Index of Erectile Function, Lower Urinary Tract Symptoms

Introduction

Defined as libido, sexual drive, sexual motivation, sexual interest, and sexual appetite, sexual desire does not only capture behavioural domain but it also involves cognitive domains such as thoughts [1].

Such thoughts can motivate individuals to seek out or to be receptive to sexual opportunities. In this regard, its measurement should not be limited by only examining sexual behaviours such as intercourse and masturbation, suggesting that appropriate measurement of strength

and frequency of sexual thoughts should be included [2].

Although the International index for erectile function (IIEF) is one of the most commonly used measures of sexual functioning, it has been found to be biased especially in those subjects who has no partner. The IIEF is also not specifically developed to measure sexual desire. As opposed to other existing measures, sexual desire was quantified by counting how many sexual activities the individual performed that led to orgasm as defined under the "drive" construct of the Derogatis Sexual Functioning Inventory [3, 4].

Lower urinary tract symptoms (LUTS) include difficulty urinating, urgency with leaking or dribbling, and nocturia. LUTS can adversely affect sexual functioning [5] and are usually caused by Benign Prostatic hyperplasia (BPH). BHP is described as proliferative growth of the glandular and stromal cells of the prostate [5]. BPH is a common disease in men, after age of 60. Up to date, the most studied sexual dysfunctions among BPH are erectile dysfunction and ejaculatory disorders. Previous study has shown that men with more severe LUTS have significantly lower libido than men with less severe LUTS [6]. Little is known about the sexual desire of the men who clinically diagnosed LUTS. Thus, there exists a need for sexual desire assessment in LUTS patients.

Like other self-assessment tools, the SDI-2 has limitations in terms of language barrier. To help foster its ease of use among patients in local settings, we sought to translate the SDI-2 into Bahasa Malay, a primary and national language used in Malaysia. We examined the factor structure, reliability, and validity of the Malay version of the Sexual Desire Inventory-2 (SDI-2-BM). The

present sample included 72 patients with LUTS and a control group comprising of 70 healthy individuals with no LUTS.

Methods

Study Design

To examine the psychometric properties of the SDI-2-BM, we implemented a 3-phase study.

Phase 1: Early Development of the SDI-2-BM. We contacted the original author of the SDI-2 for permission to use the scale. A copy of permission letter was sent to the editor of this journal. Two bilingual clinical psychologists translated the original scale to Malay. A back translation was performed by a bilingual language expert. Through discussion, discrepancies between the original version and the back translated version were resolved. After making adjustments, we obtained an initial version of the SDI-2-BM. This version of the scale was further finalized by an expert panel of psychiatrists and family physicians.

Phase 2: Refinement of the SDI-2-BM. In this phase, a pilot study was conducted to redefine the initial version of the SD1-2-BM. Thirty native Malay-speaking health personnel were invited to complete the scale. We addressed their concerns over the adequacy of items. A psychiatric consultant was invited to review the scale to ensure satisfactory face, semantic, criterion, conceptual, and cultural equivalence. When this was done, the final version of the SDI-2-BM (henceforth referred to as the SDI-2-BM) was obtained.

Phase 3: Validation of the SDI-2-BM. We obtained ethical approval from the Medical Ethics Committee (MEC) of the University Malaya Medical Centre. Along with

information sheet, a consent form was distributed to participants. All information gathered in this study was kept strictly confidential. The study was conducted from September until December 2016. The inclusion criteria for LUTS subjects were: (a) aged 18 years old and above, (b) agreeable to participate in the study, (c) seeking LUTS treatment at the Urological Outpatient Clinic, University Malaya Medical Centre at the time of recruitment, (d) not in the acute medical illness, (e) not having major psychiatric illnesses, and (f) able to understand English and Malay language. Individuals without LUTS were health personnel from the same medical centre. Their participation was based on the inclusion criteria as indicated above with the exception of (c).

Participants

A rule of thumb in determining a priori sample size, as noted by [7] is based on the subject to item ratio of 5:1. In this regard, it seems statistical appropriate to recruit a minimum sample size of 70 participants per group. All participants were selected via systematic sampling technique. Once these patients had given their consent prior to the interview, they were given the following questionnaires to complete a socio-demographic sheet, the Malay version of the SDI-2 (SDI-2-BM), and the Malay version of International Index of Erectile Function 15 (Mal-IIEF-15).

Instruments

Socio-Demographic Sheet. We used a socio-demographic sheet to record information on age, ethnic group, and marital status. Participants were instructed to complete the sheet by filling in the blanks and by selecting one response that best described them.

The Malay version of the Sexual Desire Inventory-2 (SDI-2-BM). The Malay version of the Sexual Desire Inventory-2 (SDI-2-BM) is a 14-item self-report measure of sexual desire encompassing dyadic and solitary sexual desire. For frequency items, participants rate four items on an 8-point Likert scale ranging from 0 (not at all) to 7 (more than once a day). For intensity items, participants rate 10 items on a 9-point Likert scale ranging from 0 (no desire) to 8 (strong desire). The SDI-2 yields two domain scores: Dyadic Sexual Desire and Solitary Sexual Desire. The former refers to individuals' interest in engaging in sexual activity with another person, whereas the latter individual's interest in engaging in sexual behavior by oneself.

The Malay version of International Index of Erectile Function 15 (Mal-IIEF-15). The 15-item International Index of Erectile Function 15 (Mal-IIEF-15) is a self-report measure of male sexual function in the past 4 weeks [8]. Each item has a Likert scale ranging from 0 to 5. The five domains include erectile function (items 1, 2, 3, 4, 5, and 15), orgasmic function (items 9 and 10), sexual desire (items 11 and 12), intercourse satisfaction (items 6, 7, and 8), and overall satisfaction (items 13 and 14). Higher score reflecting a better sexual function. Mal-IIEF-15 has been validated among Malaysian male population with Cronbach's alpha value of 0.74 and intra-class correlation coefficient is of 0.59 [9].

Statistics

We used the Statistical Package for the Social Sciences (SPSS) version 20.0 and Analysis of Moment Structure (AMOS) for statistical analyses. Descriptive statistics were computed for the baseline characteristics of the participants. In particular, we examined the factor structure

of the SDI-2-BM with confirmatory factor analysis. As recommended by Byrne (1994), an acceptable model fit is indicated by its CFI, TLI, and IFI statistics (all should fall above .80) and a $\chi2/df$ below 3.0. The Cronbach's alpha was used to assess the reliability of the SDI-2-BM subscales. To establish concurrent validity, we examined the correlations between the Mal-IIEF-15 and the SDI-2-BM Dyadic/Solitary Sexual Desire scores. Cohen's d was calculated between Mal-IIEF-15 sexual desire subscale and SDI-2-BM Dyadic/Solitary Sexual Desire scores. To examine whether individuals with and without LUTS would differ significantly in terms of the SDI-2-BM subscale scores, we performed a one-way Multivariate Analysis of Variance (MANOVA). The MANOVA findings would provide evidence for discriminant validity of the SDI-2-BM.

Results

Sociodemographic characteristics

We studied 142 participants in two groups: 72 were BPH patients with a mean age of 67.87 years (SD = 8.79) and 70 were healthy control individuals with a mean of 39.23 years (SD = 8.29) (Table 1.)

Table 1. Baseline sociodemographic and sexual function of all male participants (N=142)

Variables	LUTS (n=72)	Control (n=70)	df	$\chi2$, Z,t	p value
Age, y, mean ± SD	67.87± 8.79	39.23 ± 8.29	138	28.64	<0.01**
Ethnic Group, n (%)					
Malay	20(28.2)	61(87.1)	3	51.22	<0.01**
Chinese	26(36.6)	4(5.7)			
Indian	22(21.0)	3(4.3)			
Others	3(4.2)	2(2.9)			
Religion, n (%)					
Islam	25(35.2)	61(87.1)	3	42.12	<0.01**
Christian	11(15.5)	5(7.1)			
Buddha	18(252.4)	2(2.9)			
Hindu	14(9.9)	2(2.9)			
Others	3(4.2)	0			
Education Level, n (%)					
No formal education	1(1.4)	0	3	2.06	0.56
Primary	3(4.2)	1(1.4)			
Secondary	36(50.7)	36(50.7)			
Tertiary	31(43.7)	33(47.1)			
Employment, n (%)	36(90.0)	33(87.5)	1	0.13	1.00
Mal-IIEF-15 domain, mean ± SD					
Erectile function	12.30±10.09	25.20±5.42	140	-9.44	<0.01**
Orgasmic function [1]	3.81±3.80	8.16±2.24	140	-8.34	<0.01**
Sexual desire	5.00±2.37	7.00 ±1.44	140	-6.10	<0.01**
Intercourse satisfaction	4.74±4.44	10.34±2.69	140	-9.13	<0.01**
Overall satisfaction	5.93±2.58	8.10±1.87	140	-5.75	<0.01**

Total	31.94±20.40	58.80±11.52	140	-9.64	<0.01**
SDI-2-BM, mean ± SD					
DSD	21.18±14.73	33.60±10.29	140	-12.42	<0.01**
SSD†	3.99±5.63	5.51± 5.59	140	-2.23	0.02*
Total	32.59±23.06	48.73±16.27	140	-4.81	<0.01**

*p <0.05, **p<0.01

†Based on Mann Whitney test

LUTS, Lower Urinary Tract Symptoms; Mal-IIEF-15, Malay version of the International Index of Erectile Function 15; SDI-2-BM, Malay version of the sexual desire inventory-2; DSD, Dyadic sexual desire; SSD, Solitary sexual desire; df, degrees of freedom; SD, standard deviation; t, t-test; χ^2, chi-square test; Z, z-test.

Factor Structure of the SDI-2-BM

Following the original work by Spector et al. (1996)[1], we tested a 2-factor structure of the SDI-2-BM. The results for this 2-factor model indicate a marginal fit to the data, χ^2 (43, N = 142) = 214.94, p < 0.001, CFI = 0.87, TLI = 0.84, IFI = 0.88, χ^2/df = 4.99. An acceptable model fit is indicated by CFI, TLI, and IFI statistics that above .80 and a χ^2/df below 3.0 [10]. Modification indices suggested that the fit of the model could be improved by allowing the error terms to covary. Where the need for conceptual distinctness is paramount, only error terms associated with items that loaded on the same factor should be allowed to covary [11]. Items 1 and 2, and items 4 and 5 were all loaded on the Dyadic Sexual Desire factor. Given the clear theoretical relatedness of these items as briefly described above, we performed the CFA again by allowing the error terms of these items to covary. The final model fit the data slightly better, χ^2 (41, N = 142) = 105.23, p < 0.001, CFI = 0.95, TLI =0 .94, IFI = 0.95, χ^2/df = 2.57 (Figure 1). Evidence for factor structure of the SDI-2-BM was established.
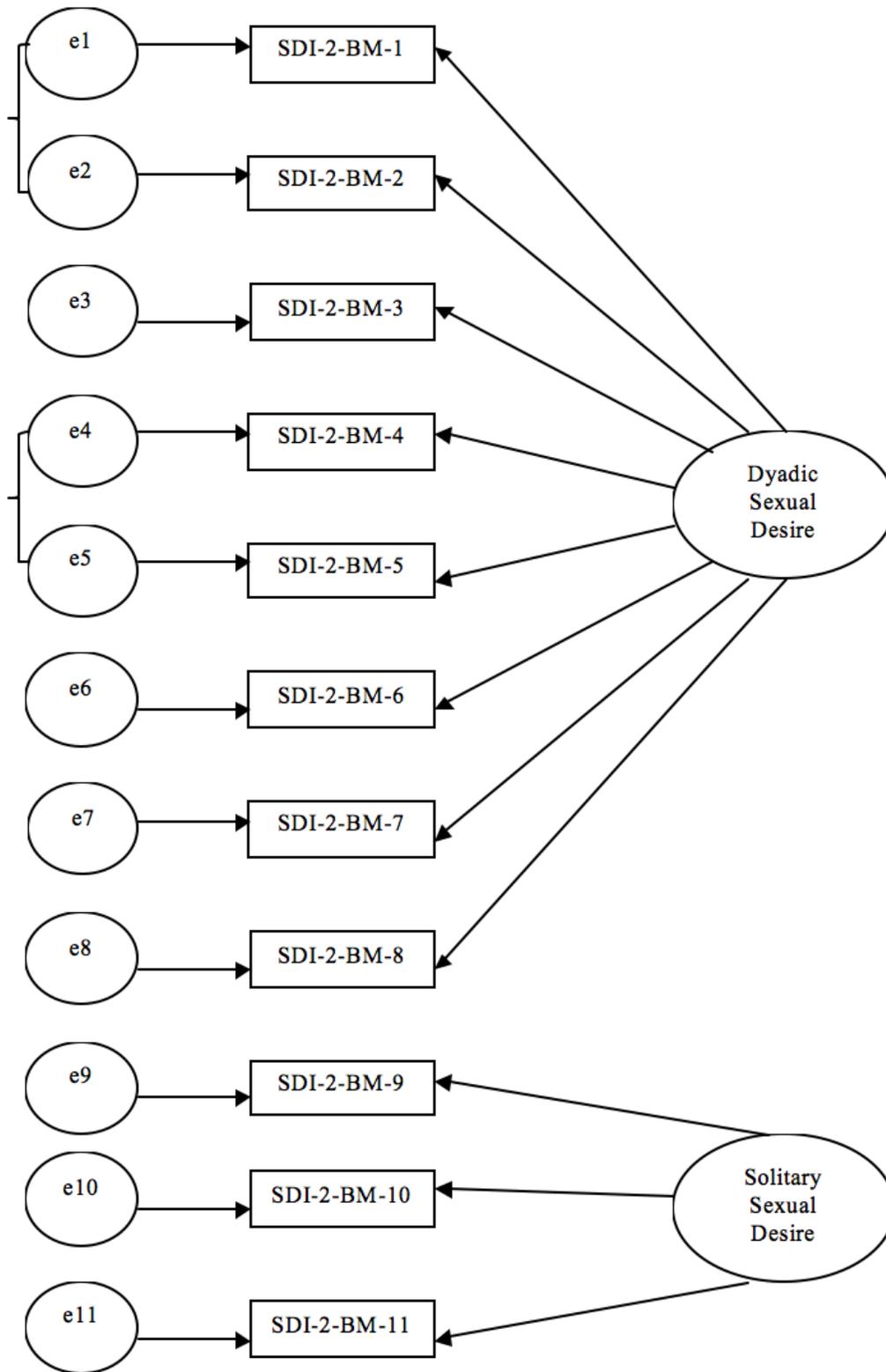
Figure 1. Final measurement model of the Malay version of the Sexual Desire Inventory-2 (SDI-2-BM)

The Cronbach's alpha estimates for the present study were as follows: Dyadic Sexual Desire (0.93) and Solitary Sexual Desire (0.88). Evidence for reliability of the SDI-2-BM was established.

Concurrent validity of the SDI-2-BM

The Mal-IIEF-15 Sexual Desire subscale scores were significantly correlated with SDI-2-BM Dyadic Sexual Desire (r = 0.63, p < 0.01, Cohen's d = 1.62) scores and with SDI-2-BM Solitary Sexual Desire scores (r = 0.34, p < 0.001, Cohen's d = 0.72) scores. Evidence for concurrent validity of the SDI-2-BM was established (Table 2.)

Table 2. Correlation between Mal-IIEF-15 and SDI-2-BM

	Erectile function	Orgasmic function	Sexual desire	Intercourse satisfaction	Overall satisfaction	Total
Total	0.58**	0.57**	0.62**	0.59**	0.37**	0.61**
DSD	0.64**	0.58**	0.63**	0.64**	0.41**	0.66**
SSD	0.20*	0.26**	0.34**	0.20*	0.09	0.23**

*p <0.05, **p<0.01

Mal-IIEF-15, Malay version of the International Index of Erectile Function 15; SDI-2-BM, Malay version of the sexual desire inventory-2; DSD, Dyadic sexual desire; SSD, Solitary sexual desire.

Discriminant validity of the SDI-2-BM

We performed a one-way Multivariate Analysis of Variance (MANOVA) to examine whether normal healthy men would have significantly higher scores on the SDI-2-BM domain scales vis-à-vis LUTS patients. The MANOVA was significant, F (3, 137) = 11.29, p < 0.05; Wilk's Λ = 1.71, partial η2 =0 .83. Univariate tests showed that there were significant differences across two groups on SDI-2-BM Dyadic Sexual Desire, F (1, 139) = 32.35, p < .01, partial η2 = 0.199 and on SDI-2-BM Solitary Sexual Desire, F (1, 139) = 8.51, p < 0.01, partial η2 = 0.058. In particular, normal healthy men had higher levels of all SDI-2-BM domains scores (M = 33.6, SD = 10.29 for Dyadic Sexual Desire; M = 5.51, SD = 5.59 for Solitary Sexual Desire) as

compared to LUT patients (M = 21.48, SD = 14.73 for Dyadic Sexual Desire; M = 3.99, SD = 5.63 for Solitary Sexual Desire). Evidence for discriminant validity of the SDI-2-BM was established.

Discussion

The current study, to the best of our knowledge, is the first to present factor structure, reliability, and validity evidence of the 14-item SDI-2-BM. As evident in the present study, the SDI-2-BM has demonstrated sound psychometric properties. Four major psychometric findings were obtained. Firstly, in this study, we reported a two-factor model for the SDI-2-BM in the present sample. The SDI-2-BM could be explained in two-factor model: Dyadic Sexual Desire and Solitary Sexual

Desire. Hence, our findings lend further support to the original SDI-2 [1].

Secondly, we reported evidence for reliability of the SDI-2-BM. The Cronbach's alpha coefficient estimates were .93 for Dyadic Sexual Desire and .88 for Solitary Sexual Desire. What we have reported here is comparable to that of the original SDI-2-BM. Cronbach's alpha coefficient estimates were .86 for Dyadic sexual desire and .96 for Solitary Sexual Desire in [1].

Thirdly, we found preliminary evidence for concurrent validity of the SDI-2-BM by demonstrating significant correlations between the Mal-IIEF-15 Sexual Desire subscale and the SDI-2-BM Dyadic Sexual Desire scores and between the Mal-IIEF-15 Sexual Desire subscale and the SDI-2-BM Solitary Sexual Desire scores. Lastly, preliminary evidence for discriminant validity for the SDI-2-BM was established. We compared the scores on SDM-2-BM between normal healthy men and LUTS patients. Our MANOVA findings showed that normal healthy men significantly reported higher SDI-2-BM scores as compared to individuals with LUTS. The SDI-2-BM scores are discriminable from normal healthy men and LUTS patients.

A few limitations of this study should be noted. First, given the cross-sectional nature of this study, we were unable to assess the predictive validity of the SDI-2-BM. Second, our sample was recruited from an outpatient clinic in a tertiary hospital thus the issue of generalizability should be noted. Third, to determine the factor structure of a 14-item interest, the sample should be 140 or more. Due to its unique clinical presentations, we only recruited 72 patients with LUTS Fourth, the mean age of the LUTS clinical sample was higher than that of the controls (67.87 vs. 39.23 years old).

Previous studies have shown that sexual desire decreases linearly with age [12]. In order to compare sexual desire between healthy controls and LUST patients, a matching procedure for age and sociodemographic could be applied for the control group in future studies.

In conclusion, despite its limitations, the findings and its psychometric properties showed that the SDI-2-BM could be a valid and reliable clinical instrument to routinely assess sexual desire among men in our local outpatient setting.

Competing interests

The authors declare that they have no conflict of interest.

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