

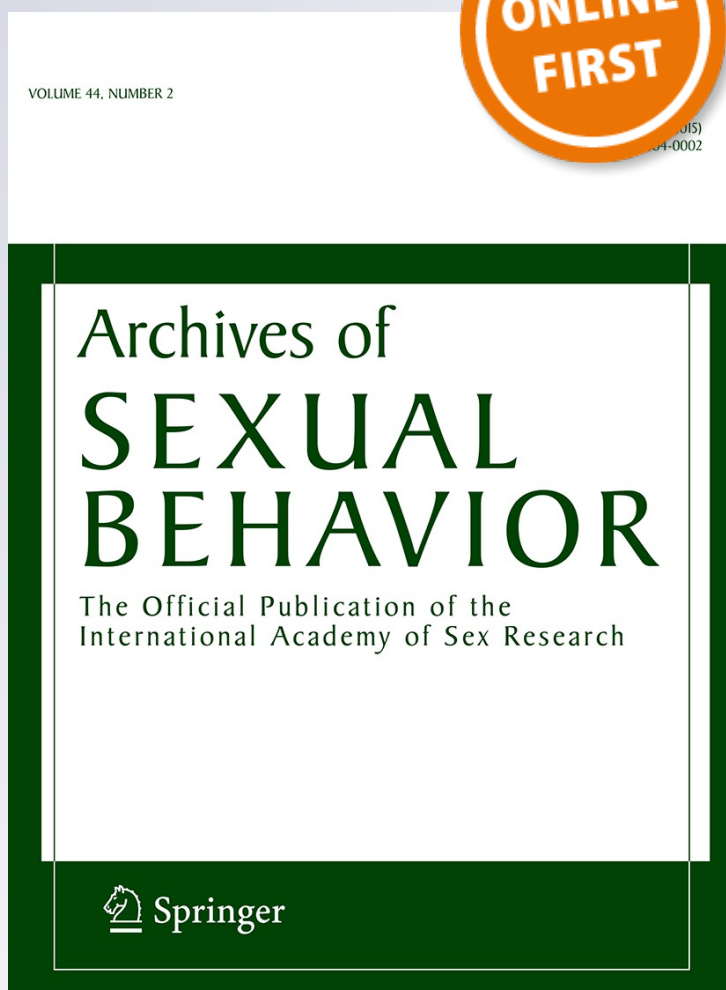
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Abstract Penile dysmorphic disorder (PDD) is shorthand for men diagnosed with body dysmorphic disorder, in whom the size or shape of the penis is their main, if not their exclusive, preoccupation causing significant shame or handicap. There are no specific measures for identifying men with PDD compared to men who are anxious about the size of their penis but do not have PDD. Such a measure might be helpful for treatment planning, reducing unrealistic expectations, and measuring outcome after any psychological or physical intervention. Our aim was, therefore, to validate a specific measure, termed the Cosmetic Procedure Screening Scale for PDD (COPS-P). Eighty-one male participants were divided into three groups: a PDD group ($n = 21$), a small penis anxiety group ($n = 37$), and a control group ($n = 23$). All participants completed the COPS-P as well as standardized measures of depression, anxiety, social phobia, body image, quality of life, and erectile function. Penis size was also measured. The final COPS-P was based on nine items. The scale had good internal reliability and significant convergent validity with measures of related constructs. It discriminated between the PDD group, the small penis anxiety group, and the control group. This is the first study to develop a scale

able to discriminate between those with PDD and men anxious about their size who did not have PDD. Clinicians and researchers may use the scale as part of an assessment for men presenting with anxiety about penis size and as an audit or outcome measure after any intervention for this population.

Keywords Body dysmorphic disorder · Penis size · Small penis syndrome · Penile dysmorphic disorder

Introduction

Small penis anxiety (also known as “small penis syndrome”) is found in men who have a normal-sized penis but are excessively anxious about its size. The definition excludes men who have a micropenis (Wylie & Eardley, 2007). A micropenis has been defined as a penis <7.5 cm in the erect length or <4 cm in the flaccid state (Wessells, Lue, & McAninch, 1996). This is based on 2.5 *SD* below the mean for age. Thus, in a series of 250 men who complained of a small penis, 98 % had normal penile measurements, two (0.8 %) patients had a buried penis and only two (0.8 %) had a true micropenis (Ghanem et al., 2007).

Some men with small penis anxiety may be diagnosed with body dysmorphic disorder (BDD) (American Psychiatric Association, 2013). Individuals with BDD are preoccupied with a perceived defect or flaw in their physical appearance that is not observable to others or appears only slight. To fulfil the diagnostic criteria for BDD, they should be preoccupied for at least an hour a day (Phillips, 1996) and must also experience clinically significant distress or impairment in social, occupational, or other important areas of functioning. Individuals with BDD are frequently preoccupied with several features of the face or body. Occasionally, in men, it is focussed on their genitals (Phillips, Menard, Fay, & Weisberg, 2005b; Veale et al., 1996a, 2015). It is important to identify BDD, as it may be

D. Veale · S. Miles · J. Read · A. Troglia
Institute of Psychiatry, Psychology and Neuroscience, Kings
College London and South London and Maudsley NHS Foundation
Trust, London, UK

D. Veale (✉)
Centre for Anxiety Disorders, The Maudsley Hospital, Denmark
Hil, London SE5 8AZ, UK
e-mail: David.Veale@kcl.ac.uk

L. Carmona · C. Fiorito · H. Wells · G. Muir
Kings College Hospital NHS Foundation Trust, London, UK

K. Wylie
Porterbrook Clinic, Sheffield, UK

associated with a high rate of psychiatric hospitalization, suicide ideation, and completed suicide (Phillips et al., 2005a). It is often poorly identified because of shame and stigma, as patients do not often reveal their problem or they may present with symptoms of depression, social anxiety or obsessive–compulsive disorder when their main problem is BDD (Phillips, Nierenberg, Brendel, & Fava, 1996). BDD can also be effectively treated with cognitive behavior therapy (CBT) (Veale et al., 1996a, b, 2014a, b; Wilhelm et al., 2014) and SSRIs (Phillips, Albertini, & Rasmussen, 2002).

It is not known how many men with small penis anxiety also meet the criteria for BDD. A number of surgical studies have described men seeking phalloplasty as having penile dysmorphia but these were not reported as based on any structured diagnostic interview for BDD or a validated screening scale (Li et al., 2006; Perovic et al., 2006; Shamloul, 2005; Spyropoulos et al., 2005). We use the term “penile dysmorphic disorder” (PDD) in this study as a problem description for men diagnosed with BDD, in whom the size or shape of the penis is their main, if not their exclusive, preoccupation causing significant distress and shame or handicap. A similar problem description exists with “muscle dysmorphia,” a form of BDD in which patients (mainly men) are preoccupied with their muscles being too puny and are significantly distressed and handicapped (Pope, Gruber, Choi, Olivardia, & Phillips, 1997). This is now coded in DSM-5 as a separate sub-type of BDD.

In clinical practice, sexual health physicians, urologists, counsellors, and psychotherapists may counsel men whose penis size is within the normal range, but who may be seeking a procedure to increase the length or girth of their penis. Cosmetic phalloplasty is still regarded as experimental without any adequate outcome or evidence of safety (Ghanem, Glina, Assalian, & Buvat, 2013). The diagnosis of BDD may be associated with poor outcome in most cosmetic procedures (Crerand, Menard, & Phillips, 2010; Phillips, Grant, Siniscalchi, & Albertini, 2001; Tignol, Biraben-Gotzamanis, Martin-Guehl, Grabot, & Aouizerate, 2007; Veale, De Haro, & Lambrou, 2003). Therefore, a urologist who offers phalloplasty to men with PDD would be unwise but it might be used as an experimental intervention in men without BDD. There have also not been any trials of standard treatments (e.g., CBT, SSRIs) in men with PDD as clinically they may be more difficult to engage and treat compared to other appearance concerns with BDD in both sexes.

Most men with small penis anxiety are too ashamed to seek help and may instead seek solutions on the Internet. These include visiting sites that promote lotions, pills, exercises or penile extenders. There is one case series of a penile extender for men (Gontero et al., 2009) that used the Erectile Function subscale of the International Index of Erectile Function and a non-validated satisfaction questionnaire at post-treatment only. There are no case series or controlled trials of any psychological intervention for men with small penis anxiety, with or without PDD, other than an outcome of preventing surgery to increase

size (Ghanem et al., 2007; Shamloul, 2005). One problem is that there are no adequate outcome measures for interventions. Using non-validated measures is problematic for several reasons: first, comparisons of findings between studies are difficult or impossible. Second, inadequate psychometric data make assessment of the effect size of any treatment difficult.

The aim of the current study was to develop (1) a screening questionnaire that was brief, free to download, and could identify men with PDD who may require specialist assessment, (2) a research tool that might predict either dissatisfaction with a surgical intervention or no change or deterioration in overall symptoms of BDD, and (3) a measure that is potentially sensitive to change after any intervention and can be used for future audits and controlled trials in the treatment of men with anxieties about the size of their penis.

Method

Participants

Participants were categorized as (1) men with small penis anxiety with PDD, (2) men with small penis anxiety without PDD, and (3) a control group of men unconcerned with their penis size. All men were recruited from one of three sources: (1) staff and students at King’s College London ($n = 38$), (2) the Mind Search database of volunteers at the Institute of Psychiatry, Kings College London ($n = 4$), and (3) a link on the website for a popular television series “Embarrassing Bodies” (<http://www.channel4embarrassingillnesses.com>). It raises awareness of body image and illness concerns while allowing members of the public to understand their own embarrassing bodily concerns ($n = 39$). In total, 81 participants were included in the study. The demographic data are shown in Table 1.

Measures

All participants completed the following questionnaires online.

Demographic Information

Information was obtained on age, marital status, ethnic origin, education, sexual orientation, and employment status.

Cosmetic Procedure Screening Scale for PDD (COPS-P)

This questionnaire was based on the original COPS for general appearance concerns and is a 9-item self-report scale (Veale et al., 2013). This is validated as a screening questionnaire for identifying BDD. We modified the wording to focus on worries about the penis (see Table and Appendix for final version). Participants respond on a Likert scale ranging from 0 (“Not at all”) to 8 (“Extremely”). Questions 1 and 3 are reverse scored.

Table 1 Demographic variable comparisons between men with PDD, men with small penis anxiety, and the control group

	PDD <i>n</i> (%)	SPA <i>n</i> (%)	Controls <i>n</i> (%)	Statistics
<i>n</i>	21 (26)	37 (46)	23 (28)	
Age <i>M</i> (<i>SD</i>)	39.29 (11.30)	31.14 (10.92)	30.55 (12.31)	$H(2) = 9.99, p = .007,$ PDD \times SPA $U = 564.00, Z = 2.84,$ $p = .004, d = 0.80$ PDD \times Controls $U = 342.50, Z = 2.71,$ $p = .007, d = 0.91$ SPA \times Controls $U = 433.50, Z = .416,$ $p = .677, d = 0.11$ $\chi^2(2) = 1.90$
Marital status				
Single	12 (57.1)	27 (73.0)	13 (59.1)	
Married/in a relationship	9 (42.9)	10 (27.0)	9 (40.9)	
Employment				$\chi^2(2) = < 1$
Unemployed	3 (15.0)	4 (10.8)	3 (13.6)	
Employed/student self-employed	17 (85.0)	33 (89.2)	19 (86.4)	
Education				$\chi^2(2) = 1.10$
Secondary	7 (33.3)	9 (24.3)	8 (36.4)	
Tertiary	14 (66.7)	28 (75.7)	14 (63.6)	
Ethnicity				$\chi^2(2) = 1.27$
White	17 (81.0)	28 (80.0)	20 (90.9)	
Other	4 (19.0)	7 (20.0)	2 (9.1)	
Sexual orientation				$\chi^2(2) = < 1$
Heterosexual	15 (71)	26 (70)	16 (73)	
Bisexual/Homosexual	6 (29)	11 (30)	6 (27)	

A total score was calculated by summing all items. Higher scores reflect increased preoccupation and distress over the shape or size of the penis and therefore the likelihood of a diagnosis of BDD.

Beliefs About Penis Size (BAPS) (Veale et al., 2014b)

The BAPS is a 10-item self-report scale that measures beliefs about masculinity and shame about penis size. Two of the items measure internal self-evaluative beliefs, such as feeling abnormal (e.g., “I will never feel just right”). Three items describe a social cognitive component with predictions such as “Others will talk about my penis or laugh at it.” There are four items on anticipated consequences of a small penis size, such as having to avoid situations where they may be naked (e.g., “I will not be able to be naked in front of women”). Lastly, there are two items on extreme self-consciousness (e.g., “Others will be able to see the size or shape of my penis even when I have my trousers on”).

The participant was asked to rate how strongly he agreed or disagreed with each statement, using a 5-point Likert scale from 0 (“Strongly disagree”) to 4 (“Strongly agree”). Total scores ranged from 0 to 40. A higher score therefore represents a greater

level of insecurity and shame about penis size. Cronbach’s alpha for the scale was .95, indicating strong internal reliability.

Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983)

The 14 items corresponding to the depression and anxiety subscales from the HADS were used to examine the severity of these symptoms. Each subscale was comprised of seven items and the possible range of scores was from 0 to 21 on each subscale. Higher scores represent increased severity of anxiety and depression. Cronbach’s alpha for the anxiety subscale was .86 and Depression subscale was .83.

Social Phobia Inventory (SPIN) (Connor et al., 2000)

The SPIN is a 17-item self-report scale that measures the severity of performance and social anxiety. None of the items is specific to sexual situations. The participant rated each item on a 5-point Likert scale. The possible range of scores was from 0 (not at all) to 4 (extremely). Higher scores represent increased severity of social phobia and has a cut-off score of >19. Cronbach’s alpha was .95.

Body Image Quality of Life Inventory (BIQLI) (Cash & Fleming, 2002; Hrabosky et al., 2009)

The BIQLI is a 19-item self-report scale that measures the impact of body image concerns on a broad range of life domains (e.g., social functioning, sexuality, emotional well-being). Each item was rated by the participant on a 7-point Likert Scale, ranging from -3 (very negative effect) to $+3$ (very positive effect). The BIQLI is scored as an average numeric score of the 19 items where a more negative score reflects a more negative body image. Cronbach's alpha was .97.

International Index of Erectile Function (IIEF) (Rosen et al., 1997)

The IIEF is a 15-item self-report scale that has five subscales: erectile function (range 0–30), orgasmic function (range 0–10), sexual desire (range 0–10), intercourse satisfaction (range 0–15), and overall satisfaction (range 0–10). Across all five subscales, a higher score indicates higher erectile function and satisfaction. Cronbach's alpha for erectile function was .94, orgasmic function .89, sexual desire .87, intercourse satisfaction .94, and overall satisfaction .89.

Procedure

We sought in our email to recruit men to a study that was interested in their beliefs and fears about their penis size. They had to be aged 18 years or older and proficient in English in order to provide consent and complete the questionnaires online. All participants were interviewed by a trained research worker using the BDD Module in the Structured Clinical Interview for DSM-IV disorders (SCID) (First, Spitzer, Gibbon, & Williams, 1995). This was to see whether or not their preoccupation with their penis size met criteria for a diagnosis of BDD. Criteria for meeting diagnosis according to the SCID are being preoccupied by the feature of concern for an hour or more per day, and if the preoccupation causes significant distress and impairment in social or occupational functioning. In addition, the symptoms must not be accounted for by another mental disorder. Those who met all of the criteria were classified in the PDD group. If they were anxious about penis size and did not have BDD, then they were categorized in the SPA group. Participants were measured (flaccid and erect, length and girth) by a urologist in a hospital outpatient clinic. On arrival, participants completed a consent form and were then given privacy in an air-conditioned consulting room at a constant temperature (21 °C) at sea level. Using a disposable tape measure, each participant had three parameters measured: circumference (girth) of the penile mid shaft; length from suprapubic skin to distal glans

(skin-to-tip); and pubis to distal glans (bone-to-tip). The three measurements were recorded in the stretched flaccid state, grasping the glans and exerting a stretching force until the participant felt mild discomfort to obtain maximum stretch.

After the flaccid measurements were taken, each participant was offered the chance to watch pornography on a provided laptop. Watching pornography was either accepted and chosen privately and anonymously or declined. At this point, the urologist left the room. Participants pressed a digital bell to alert the urologist when they were erect and ready to repeat the measurements. Three men were unable to achieve full erection and they received an intra-cavernous injection of 10 micrograms of Prostaglandin E1, administered by a urologist. The three measurements were then repeated in the fully erect state without stretching. Participants were given a £10 shopping voucher to thank them for participating in each part of the study.

Statistical Analysis

The three groups were initially compared on demographic variables. The groups were then compared on COPS-P item scores. As scores were significantly different to a normal distribution, Kruskal–Wallis and post hoc Mann–Whitney *U* tests were used to determine which items of the COPS-P were most sensitive at discriminating between the PDD group and those with small penis anxiety, without PDD. The most sensitive items were used to form the final questionnaire. Receiver operating characteristics (ROC) analysis was used to assess sensitivity and specificity of the COPS-P in discriminating between the PDD and small penis anxiety group. To determine the optimal cut-off value of the COPS-P for the identification of men with PDD, kappa coefficients were computed for different cut-off scores. The internal consistency was evaluated using Cronbach's alpha. Spearman's rho correlation was used between the COPS-P and the HAD Depression, HAD Anxiety, BAPS, SPIN, BIQL, IIEF subscales, overall satisfaction score, and importance attached to penis size and actual penis size to test convergent validity. In order to test for group theoretical differences, COPS-P scores from the control group were compared to participants with PDD and participants with small penis anxiety. Where multiple comparisons were conducted, Bonferroni corrections were applied so all post hoc effects are reported at a .0167 level of significance. To reduce missing data from partially completed questionnaires, the average score was computed for questionnaires where only one item was missing. This value was then entered for unanswered questions. Where more than one item was missing from a questionnaire, the average score was not computed and total scores were not included in the analyses.

Results

Demographics

Men with PDD were significantly older than the small penis anxiety and control group participants (Table 1).

Item Response

Items that showed a significant difference between the groups and had an effect size (Cohen's *d*) of at least 1.25 were retained

in the item discriminatory analysis. This effect size was considered very strong and we chose it, as we hoped to keep the scale to nine items, as this was the length of the original COPS (Veale et al., 2011). Nine items met these criteria and were used to form the final questionnaire (see Table 2). Two items that featured in the original COPS for general appearance concerns (Veale et al., 2011) did not meet criteria to be included in the COPS-P. These items were items (1) frequency of checking and (6) interference with relationships or dating. These two items were, therefore, removed and were replaced by two items with higher effect size items (7) interference in sexual relationships and (11) interference in leisure activities.

Table 2 Comparing men with PDD to men with small penis anxiety and controls on the original items of the COPS-P

Original COPS-P items	Group			Statistical analysis	
	PDD <i>M</i> (<i>SD</i>)	SPA <i>M</i> (<i>SD</i>)	Control <i>M</i> (<i>SD</i>)	Comparison	Post-hoc comparisons
1. How often do you deliberately check your penis? (Not accidentally catch sight of it.) Please include looking at your penis in a mirror or other reflective surfaces or looking at it directly and feeling it with your fingers	3.72 (2.35)	2.33 (1.99)	0.90 (1.00)	$H(2) = 21.01, p < .001$	PDD × SPA $U = 509.50, Z = 2.23, p < .05, d = 0.61$ PDD × Controls $U = 399.50, Z = 4.17, p < .001, d = 1.65$ SPA × Controls $U = 595.50, Z = 3.31, p < .01, d = 0.96$
2. To what extent do you feel the size or appearance of your penis is defective or unattractive?	5.78 (2.31)	3.09 (2.17)	0.43 (0.75)	$H(2) = 43.32, p < .001$	PDD × SPA $U = 563.50, Z = 3.64, p < .001, d = 1.25$ PDD × Controls $U = 433.50, Z = 5.53, p < .001, d = 3.14$ SPA × Controls $U = 710.00, Z = 5.15, p < .001, d = 1.83$
3. To what extent does the size or appearance of your penis currently cause you distress?	6.28 (1.81)	2.91 (2.26)	0.71 (1.77)	$H(2) = 38.76, p < .001$	PDD × SPA $U = 623.00, Z = 4.09, p < .001, d = 1.29$ PDD × Controls $U = 441.00, Z = 5.26, p < .001, d = 2.69$ SPA × Controls $U = 654.50, Z = 4.26, p < .001, d = 1.35$
4. How often does the size or appearance of your penis currently lead you to avoid situations or activities?	5.72 (1.93)	2.21 (2.38)	0.57 (1.78)	$H(2) = 37.65, p < .001$	PDD × SPA $U = 637.00, Z = 4.33, p < .001, d = 1.40$ PDD × Controls $U = 439.50, Z = 5.28, p < .001, d = 2.71$ SPA × Controls $U = 615.50, Z = 3.75, p < .001, d = 1.13$
5. To what extent does thinking about the size or appearance of your penis currently preoccupy you? That is, you think about it a lot and it is hard to stop thinking about it	5.83 (1.69)	2.15 (1.94)	0.24 (0.54)	$H(2) = 47.76, p < .001$	PDD × SPA $U = 658.00, Z = 4.68, p < .001, d = 1.58$ PDD × Controls $U = 459.00, Z = 5.78, p < .001, d = 3.73$ SPA × Controls $U = 678.50, Z = 4.75, p < .001, d = 1.60$
6. If you have a partner, how much does your penis currently have an effect on your relationship with an existing partner? If you do not have a partner, how much does it have an effect on dating or developing a relationship?	5.50 (2.55)	2.39 (2.33)	0.14 (0.48)	$H(2) = 36.42, p < .001$	PDD × SPA $U = 524.50, Z = 3.80, p < .001, d = 1.22$ PDD × Controls $U = 385.50, Z = 5.40, p < .001, d = 2.90$ SPA × Controls $U = 567.00, Z = 4.03, p < .001, d = 1.25$

Table 2 continued

Original COPS-P items	Group			Statistical analysis	
	PDD <i>M (SD)</i>	SPA <i>M (SD)</i>	Control <i>M (SD)</i>	Comparison	Post-hoc comparisons
7. If you have a regular partner, to what extent do your concerns about the size or appearance of your penis currently have an effect on an existing sexual relationship? (e.g. enjoyment of sex, frequency of sexual activity). If you do not have a regular partner, to what extent do your concerns about your penis currently stop you from developing a sexual relationship?	6.11 (2.30)	2.30 (2.26)	0.76 (1.70)	$H(2) = 33.77, p < .001$	PDD × SPA $U = 558.00, Z = 4.42, p < .001, d = 1.53$ PDD × Controls $U = 374.50, Z = 4.96, p < .001, d = 2.31$ SPA × Controls $U = 532.50, Z = 3.21, p < .01, d = 0.93$
8. How much do your concerns about the size or appearance of your penis currently interfere with your ability to work or study? (Please rate this even if you are not working or studying; we are interested in your ability to work or study)	3.44 (2.48)	0.39 (1.03)	0 (0)	$H(2) = 50.08, p < .001$	PDD × SPA $U = 704.00, Z = 5.66, p < .001, d = 2.22$ PDD × Controls $U = 440.00, Z = 5.60, p < .001, d = 3.28$ SPA × Controls $U = 473.00, Z = 1.97, p < .05, d = 0.53$
9. To what extent do your concerns about the size or appearance of your penis currently interfere with your social life? (with other people, e.g. going to parties, pubs, clubs, outings, visits)	4.17 (2.88)	0.91 (1.81)	0 (0)	$H(2) = 37.55, p < .001$	PDD × SPA $U = 645.50, Z = 4.46, p < .001, d = 1.44$ PDD × Controls $U = 429.00, Z = 5.38, p < .001, d = 2.87$ SPA × Controls $U = 528.00, Z = 2.79, p < .01, d = 0.79$
10. To what extent do your concerns about the size or appearance of your penis currently interfere with leisure activities? (for example being in a public changing room)	5.50 (2.28)	2.00 (1.98)	0.14 (0.48)	$H(2) = 46.81, p < .001$	PDD × SPA $U = 678.50, Z = 4.75, p < .001, d = 1.60$ PDD × Controls $U = 460.50, Z = 5.90, p < .001, d = 4.12$ SPA × Controls $U = 660.00, Z = 4.34, p < .001, d = 1.39$
11. How much do you feel the size or appearance of your penis is the most important aspect of who you are?	5.11 (1.91)	2.27 (2.00)	0.67 (1.02)	$H(2) = 36.23, p < .001$	PDD × SPA $U = 641.50, Z = 4.14, p < .001, d = 1.30$ PDD × Controls $U = 452.00, Z = 5.46, p < .001, d = 3.01$ SPA × Controls $U = 610.50, Z = 3.29, p < .01, d = 0.96$
12. How does your penis compare to others of the same age, sex, and ethnic group?	5.67 (1.82)	3.18 (2.23)	0.81 (1.25)	$H(2) = 41.31, p < .001$	PDD × SPA $U = 624.00, Z = 3.85, p < .001, d = 1.17$ PDD × Controls $U = 454.00, Z = 5.52, p < .001, d = 3.12$ SPA × Controls $U = 693.50, Z = 4.57, p < .001, d = 1.50$
13. How noticeable do you feel your penis is to other people (if you do not camouflage yourself e.g. with clothes, padding and/or makeup and the feature has not been pointed out to them)?	5.39 (2.36)	3.39 (2.62)	2.14 (2.01)	$H(2) = 16.57, p < .001$	PDD × SPA $U = 562.00, Z = 2.84, p < .01, d = 0.80$ PDD × Controls $U = 396.50, Z = 4.07, p < .001, d = 1.58$ SPA × Controls $U = 504.00, Z = 1.53, d = 0.41$

ROC Analysis of the COPS-P

ROC analysis was conducted to explore cut-off scores, sensitivity, and specificity. Figure 1 represents the ROC curve for men with PDD compared to men with SPA. The area under the curve (AUC) was good (0.95, 95 % CI 0.90–1). To determine an

optimal cut-off value, kappa coefficients were computed for each cut-off score. The highest kappa coefficient indicated the optimal sensitivity and specificity for cut-off values. As shown in Table 3, a cut-off score of 40 yielded the highest kappa coefficient, sensitivity, and specificity ($k = 0.82$), based on the discrimination between those with PDD and those with small

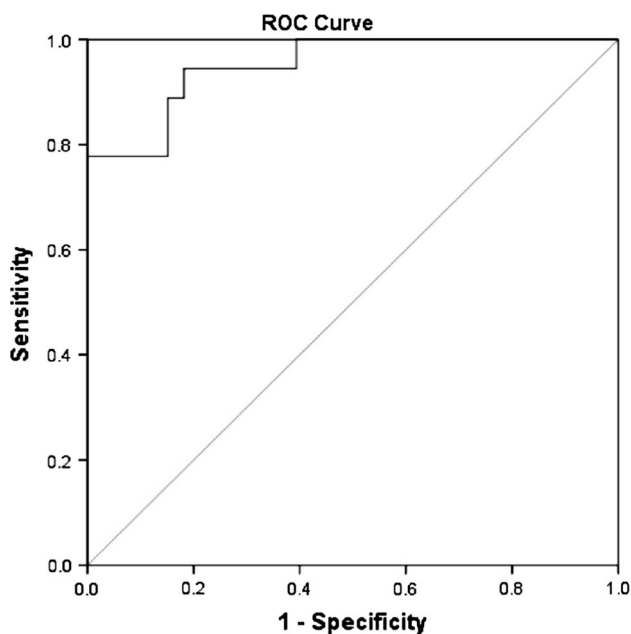


Fig. 1 Receiver operating characteristics plot for COPS-P scores of men with PDD compared to men with small penis anxiety

Table 3 Sensitivity and specificity of cut-off scores for 9 item COPS-P scores to identify men with BDD

Cut off score	Sensitivity	Specificity	1-Specificity	Kappa co-efficient (<i>k</i>)
35	0.82	0.88	0.12	0.66, <i>p</i> < .001
36	0.82	0.94	0.06	0.74, <i>p</i> < .001
37	0.82	0.94	0.06	0.74, <i>p</i> < .001
38	0.82	0.97	0.03	0.78, <i>p</i> < .001
39	0.82	1	0	0.82, <i>p</i> < .001
40	0.82	1	0	0.82, <i>p</i> < .001
41	0.72	1	0	0.77, <i>p</i> < .001
42	0.67	1	0	0.72, <i>p</i> < .001
43	0.61	1	0	0.67, <i>p</i> < .001
44	0.61	1	0	0.67, <i>p</i> < .001
45	0.61	1	0	0.67, <i>p</i> < .001

penis anxiety. On the basis of this cut-off score, 14 (78 %) cases of PDD were correctly classified. Table 4 shows the sensitivity, specificity, and kappa coefficients, for a range of COPS-P cut-off scores designed to discriminate between men with and without PDD.

Reliability and Internal Consistency

Internal consistency for the 9-item COPS-P was calculated. Cronbach’s alpha was .94 for all the participants, indicating good internal consistency. There were no items whose removal would improve the reliability of the measure.

Concurrent Validity

Concurrent validity was analyzed through Spearman’s rho correlations with related measures. We examined the relationship between the COPS-P and the BAPS, HADS Depression, HADS Anxiety, SPIN, BIQL, and IIEF subscales (see Table 4). The COPS-P measure was significantly correlated with all the other measures (except the IIEF Sexual Desire subscale), indicating strong concurrent validity. There was a strong positive correlation with the BAPS. There was moderate correlation with HADS Anxiety and HADS Depression, SPIN, BIQL and IIEF subscales of erectile function, intercourse satisfaction and overall satisfaction. The weakest correlation was with IIEF orgasmic function.

The COPS-P scores were not significantly correlated with penis length in a flaccid bone to tip non-stretched measure ($r_s = .08, R^2 = 0.7\%$). Scores were weakly negatively correlated with length measurements when the penis was in an erect state ($r_s = -.29, R^2 = 8\%, p < .05$). The COPS-P scores were not significantly correlated with penis girth in a flaccid ($r_s = -.19, R^2 = 4\%$) or erect state ($r_s = -.15, R^2 = 2\%$).

Validity: Group Differences

Total 9-item COPS-P scores significantly differed between the three groups (see Table 5). COPS-P scores from the PDD group were significantly higher than those from the SPA group and the control group with large effect sizes. Additionally, COPS-P scores for those with SPA were significantly higher than control group scores.

Discussion

This is the first study to develop a scale that was able to discriminate between those who had small penis anxiety with BDD and those who did not. We were able to demonstrate that the 9-item measure had good internal consistency with high internal reliability. The scale correlated significantly with the HADS Depression, HADS Anxiety, Body Image Quality of Life, Social Phobia, and all but one of the IIEF scales. Of note is that the weakest correlation of the COPS-P was with two IIEF subscales, “Orgasmic Function” and “Sexual Desire,” which would not be expected to be affected by worries about penis size. The COPS-P was not correlated with girth or non-erect penis length (and only weakly with erect size). This is consistent with previous research in body image that has found that there is no relationship between objective unusualness of a body feature and psychological distress (Moss, 2005; Ong et al., 2007).

The COPS-P is potentially part of an assessment of men presenting with small penis anxiety along with the beliefs about penis size (Veale et al., 2014b). Urologists and psychosexual counsellors can use such scales to help determine whether their patient may be best referred to a specialist psychiatric setting if

Table 4 Spearman's rho correlations indicating concurrent validity of the COPS-P with other measures

<i>n</i> = 81	BAPS	HAD Anxiety	HAD Depression	SPIN	BIQL	IIEF erectile dysfunction	IIEF orgasmic dysfunction	IIEF sexual desire	IIEF intercourse satisfaction	IIEF overall satisfaction	IIEF total
COPS-P	0.83 <i>p</i> < .001	0.53 <i>p</i> < .001	0.51 <i>p</i> < .001	0.56 <i>p</i> < .001	-.63 <i>p</i> < .001	-.41 <i>p</i> < .001	-.27 <i>p</i> < .001	-.05	-.38 <i>p</i> < .001	-.47 <i>p</i> < .001	-.42 <i>p</i> < .001

Table 5 Group differences in 9 item COPS-P scores

Group	Independent comparison			Post-hoc tests
PDD <i>M</i> (<i>SD</i>)	SPA <i>M</i> (<i>SD</i>)	Control <i>M</i> (<i>SD</i>)		
47.94 (14.02)	18.24 (10.98)	3.52 (3.46)	$H(2) = 49.67, p < .001$	PDD × SPA $U = 565.00, Z = 5.29, p < .001, d = 2.21$ PDD × Controls $U = 378.00, Z = 5.34, p < .001, d = 3.30$ SPA × Controls $U = 619.50, Z = 4.83, p < .001, d = 1.74$

they have possible BDD or can be treated by a sexual or health psychologist attached to the clinic. The COPS-P might be expected to correlate with the frequency of avoidance (e.g., of sexual situations or changing rooms); safety seeking behaviors (e.g., covering the genital area or use of objects to increase the bulk of the genital area) and cognitive processes (such as worry and self-focussed attention).

Limitations and Future Directions

The main limitation of this study was the use of a non-clinical convenience population. Therefore, bias in the results may occur with confounding variables linked to participants who are willing to partake in research in comparison to those with more extreme symptoms of small penis anxiety or PDD who would not be comfortable participating in the research. However, our participants in the PDD or SPA groups reported feeling too ashamed to seek help from normal routes of referral. In addition, it was initially necessary to recruit a large enough sample to investigate the psychometric properties of the scale. Furthermore, while the sample were a non-clinical population, they did have the opportunity to simultaneously take part in a randomized controlled trial investigating the efficacy of a treatment for small penis anxiety.

The self-report questionnaires being used to differentiate the control group may be limited by desirability bias and less reliable due to their inclusion of Likert scales, which can cause difficulty when operationalizing measures.

We did not expect our sample to be conducted in a relatively large proportion of homosexual men. It may be that homosexuality is a risk factor for concern with penis size because homosexual men might have more opportunity to compare their size to other men. Those who are homosexual may also be more likely to search the recruitment website or be willing to take part in related research. Existing qualitative research in men worried by penis

size has suggested that homosexual men are subject to a number of stereotypes relating to penis size, such as a larger size is both more satisfying and portrays masculinity, which are thought to be influenced by Western culture (Drummond & Filiault, 2007).

Additionally, while the relationship did not reach significance, frequencies did suggest that more men with PDD were married in comparison to men with SPA. This may be related to the older age of the PDD group. Further research would need to investigate whether this is a true difference. For example, the influence of a partner's opinion on genitalia or existing marital problems may have contributed to the development of BDD.

A further limitation was that no test retest reliability was conducted and so we are unable to conclude that the scale has external reliability. However, the original COPS for general appearance concerns (Veale et al., 2011) was tested for re-test reliability after 1 week and found that the measurement outcomes were consistent over time and strongly correlated ($r = .87, p < .01$). Future studies will be required to validate the scale in a clinical setting such as a urology or psychosexual clinic, and conduct test–retest reliability.

The scale has not yet been validated for sensitivity to change after any treatment. However, it was able to differentiate between those men who had PDD and those who did not. Future studies will need to validate the scale in men who are undergoing any intervention to determine whether it is effective in reducing symptoms of BDD. Lastly, it will be important to determine the characteristics of men with PDD and small penis anxiety to understand the phenomenology and the risk factors in the development of the problem.

Conclusions

The current study was an initial validation on a brief self-report scale that can be used by clinicians and researchers to screen for

BDD and potentially for audit and outcome research in all men worried about their penis size.

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Appendix

This questionnaire is about the way you feel about the size or appearance of your penis. Please read the questions carefully and circle the number which best describes the way that you feel about your penis. Please read the labels carefully to ensure you are circling the number that reflects how you feel, as some of the answers are worded in a reverse order. Please answer for how you feel over the past week.

1) To what extent do you feel the size or appearance of your penis is defective or unattractive?

0	1	2	3	4	5	6	7	8
----- ----- ----- ----- ----- ----- ----- -----								
Very defective	Markedly defective		Moderately defective		Slightly defective		Not at all defective	

2) To what extent does the size or appearance of your penis **currently** cause you distress?

0	1	2	3	4	5	6	7	8
----- ----- ----- ----- ----- ----- ----- -----								
Not at all distressing	Slightly distressing		Moderately distressing		Markedly distressing		Extremely distressing	

3) How often does the size or appearance of your penis **currently** lead you to avoid situations or activities?

0	1	2	3	4	5	6	7	8
----- ----- ----- ----- ----- ----- ----- -----								
Always avoid	Avoid about three quarters of the time		Avoid about half of the time		Avoid about a quarter of the time		Never	

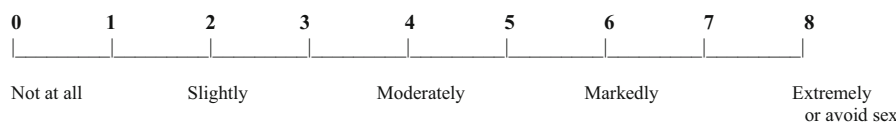
4) To what extent does thinking about the size or appearance of your penis **currently** preoccupy you? That is, you think about it a lot and it is hard to stop thinking about it.

0	1	2	3	4	5	6	7	8
----- ----- ----- ----- ----- ----- ----- -----								
Not at all preoccupied	Slightly preoccupied		Moderately preoccupied		Very preoccupied		Extremely preoccupied	

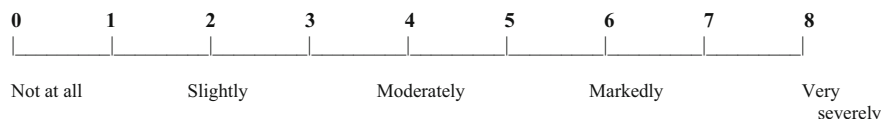
5) If you have a regular partner, to what extent do your concerns about the size or appearance of your penis currently have an effect on an existing sexual relationship? (e.g. enjoyment of sex, frequency of sexual activity). If you do not have a regular partner, to what extent do your concerns about your penis currently stop you from developing a sexual relationship?

0	1	2	3	4	5	6	7	8
----- ----- ----- ----- ----- ----- ----- -----								
Not at all	Slightly		Moderately		Markedly		Extremely or avoid sex	

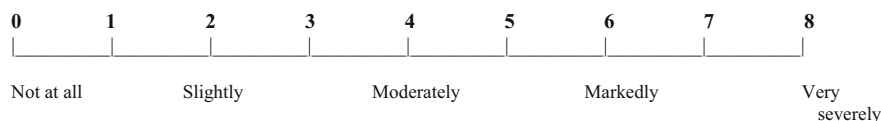
6) How much do your concerns about the size or appearance of your penis currently interfere with your ability to work or study? (Please rate this even if you are not working or studying; we are **interested in your ability to work or study**).



7) To what extent do your concerns about the size or appearance of your penis currently interfere with your social life? (with other people, e.g. going to parties, pubs, clubs, outings, visits)



8) To what extent do your concerns about the size or appearance of your penis currently interfere with leisure activities? (for example being in a public changing room).



9) How much do you feel the size or appearance of your penis is the most important aspect of who you are?



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