



Patient-reported outcome measures which assess body image in urogynaecology patients: a systematic review

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Abstract

Aim Urogynaecological conditions can have a significant impact on body image. Patient-reported outcome measures (PROMs) are widely used in urogynaecology to assess symptoms and their impact on quality of life.

This systematic review aimed to identify currently available PROMs used to assess body image within a urogynaecological population and to identify the most psychometrically robust and appropriate PROM tools to use in this context.

Methods Ovid Medline, AMED, CINAHL, Cochrane Collaboration, EMBASE and Web of Science databases were searched from January 1966 to November 2018 to identify studies that had administered a PROM to assess body image to patients diagnosed with a urogynaecological condition. The information extracted and critically appraised included study setting, PROM instrument used and the reported psychometric properties of the PROM.

Results Seventeen studies were included from 3207 screened articles. Seven different PROMs used to assess body image in a urogynaecological population were identified. Two of these PROMs (Genital Self-Image Scale-20 and Body Image in Pelvic Organ Prolapse questionnaire) had good psychometric evidence for use, but this was only in the context of women with prolapse. Evidence for validity and reliability was limited for the other five PROMs identified.

Conclusion Further development and psychometric testing of PROMs to assess body image in urogynaecology, for both research purposes and clinical practice, are required. Further research is also required to investigate the relationship between body image and urogynaecological symptomatology, and developing valid, reliable and functional PROMs will be integral to this.

Keywords Body image · Patient report outcome measures · Surveys and questionnaires

Introduction

Patient-reported outcome measures (PROMs) are well established in urogynaecology and are utilised as both clinical and research tools. PROMs provide patients' perspectives on their conditions, without interruption or influence from the

clinician, and can include assessments of condition-specific symptomatology and impact on health-related quality of life (HRQoL) [1]. Evaluation of PROMs through psychometric testing is deemed important for each population on which the specific tool is to be used to ensure reliable and valid results.

PROMs are particularly valuable in urogynaecology, where conditions are often of a sensitive nature. PROMs are clearly shown to help self-expression, discussion and the disclosure of embarrassing or intimate conditions [2, 3]. Although the assessment of the impact of urogynaecological conditions on both sexual function and HRQoL is increasingly well understood, understanding the relationships, impact and outcomes of these conditions in relation to body image is a relatively new area of research within the subspecialty.

'Body image' refers to the mental picture that an individual has of themselves, which depicts not only details available to objective investigation by others (e.g. height, weight, hair

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colour etc.), but also details that have been learned about themselves from either personal experiences or by internalising the judgments of others [4].

In addition, the term ‘genital self-image’ has also been used to describe the internal mental picture (body image) that an individual has of his or her external genitalia [4] and may include components such as appearance, attractiveness, scarring, function and the perceptions of others (including partners, family and healthcare professionals).

Urogynaecological conditions including prolapse, urinary incontinence and perineal trauma [5–9] have been shown to have a negative effect on body image as a whole, and specifically on genital self-image [10, 11]. Previous qualitative studies have also found that a significant proportion of new patients attending urogynaecology outpatient clinics have body image concerns [8, 12].

The aim of this systematic review was to identify from the existing literature the PROMs that have been used to assess body image within a urogynaecological population and also to identify the most psychometrically robust and appropriate PROM(s) to use in this context.

Methods

A systematic review of the literature using well-established methodology [13] was undertaken. This followed the PRISMA guidelines [14] and was designed to capture studies where a population of women specifically with urogynaecology conditions had been administered a PROM which assessed body image. This systematic review was registered prospectively on the PROSPERO database (registration no. CRD42017084710).

The study population was women with urogynaecological conditions. In particular, this covered the following conditions: pelvic organ prolapse, urinary incontinence, faecal incontinence and sexual dysfunction.

The intervention studied was any PROM which assessed body image concerns. The comparison was the reported psychometric properties of the identified instruments in the included studies.

Ovid Medline, AMED, CINAHL, Cochrane Library, dissertations and theses (PhD only), EMBASE, PSYCHInfo and Web of Science databases were searched using medical subject heading (MeSH) theme “body image”, combined with Boolean AND operators with the MeSH themes “patient reported outcome measures”, “surveys and questionnaires”, “urinary incontinence”, “pelvic organ prolapse”, “sex” and “faecal incontinence” for studies published between January 1966 and November 2018 (inclusive). Studies included were limited to adult female human subjects and were restricted to English language publications.

In addition, the following journals were hand searched for relevant studies:

- International Urogynaecology Journal
- Neurourology and Urodynamics
- American Journal of Obstetrics and Gynaecology
- BJOG: an international journal of obstetrics and gynaecology
- Quality of Life Research

Three reviewers (TGG, RS and KS) independently reviewed all the abstracts identified by the literature search to identify papers of potential interest. All papers of potential interest to the review were obtained and read by three reviewers (TGG, RS and KS) to identify those that were relevant. Studies were included only with the agreement of all three reviewers following evaluation of full manuscripts. Any disparities were resolved by consensus and, if required, arbitration by a fourth and fifth reviewer (SCR and SJ). A manual search of the reference list of each manuscript was also conducted by the reviewers to identify further studies of relevance to the systematic review.

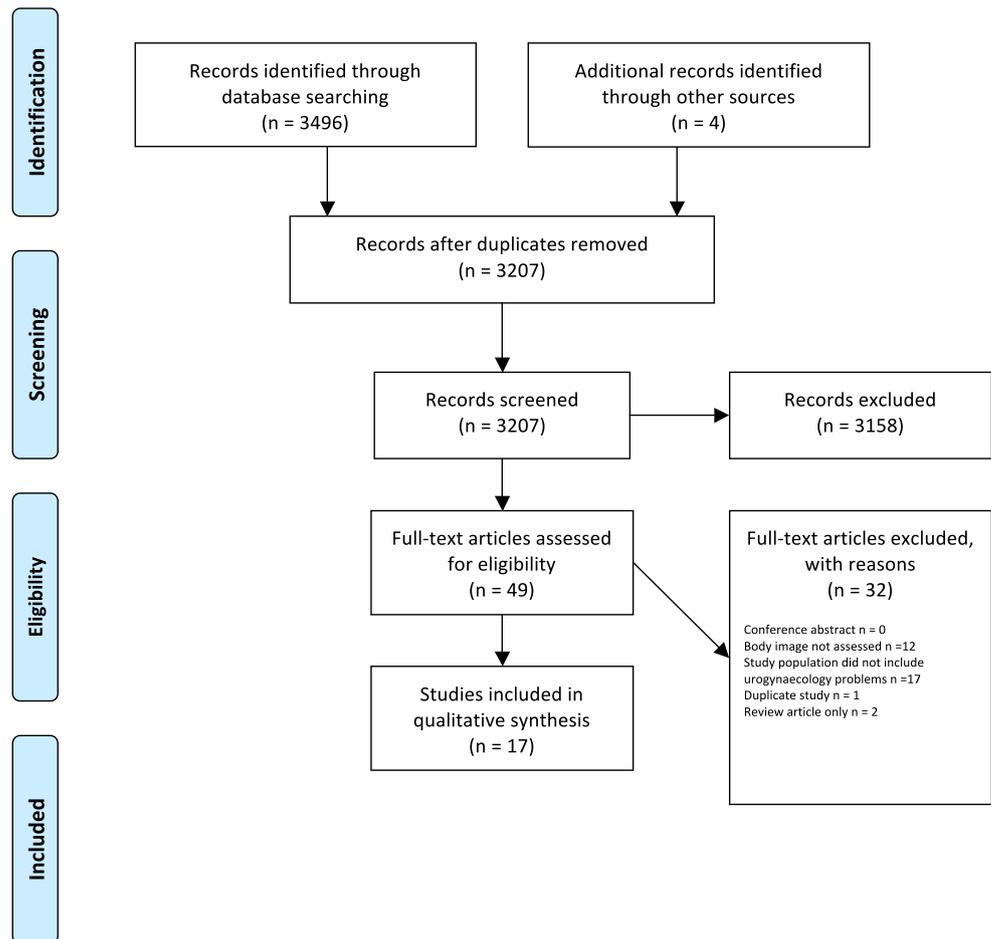
The same reviewers (TGG, RS and KS) independently extracted data from the included studies onto an electronic data collection form adapted from previous reviews of the psychometric properties of PROMs [13, 15]. The information extracted included study setting, population, PROM instrument used, the domains included in the PROM and the psychometric properties of the PROM. These were compared and a summary table of consensus data compiled.

Only studies that specifically included women with urogynaecological conditions or studies in which this group was identified separately within the results of the study were included. The following were excluded: papers reporting clinician completed questionnaires or proformas, review articles or interim reports superseded by full reports. The primary outcome was the number of PROM tools used to assess body image in urogynaecological conditions. Secondary outcomes were evidence of reliability, validity and responsiveness of these tools in a urogynaecology population.

Psychometric properties including reliability and validity provide a level of evidence that an instrument works effectively and measures what it has been designed to measure. For this systematic review the psychometric properties of the identified PROMs were assessed using data from studies where the instrument had been used within a urogynaecology population, providing evidence for its potential validity in this setting.

Reliability assesses the extent to which a PROM tool yields consistent and reproducible results [16]. Both internal consistency and test-retest reliability were assessed as measures of reliability in this review.

Fig. 1 PRISMA diagram showing selection of articles for review



Validity describes the extent to which an instrument (PROM) measures what it purports to measure [17]. This is absolutely specific to the population and setting. Therefore, for example, a PROM designed to assess body image in cancer patients may not be reliable in a urogynaecology population. Construct validity describes the relationship of a construct to other variables [17]. This is often explored using correlation coefficients, whereby > 0.5 indicates adequate convergent validity and < 0.5 indicates adequate divergent validity [15, 17]. Other methods used to assess validity were evidence of criterion validity, where a correlation between the PROM and another (usually validated and well-established) PROM had been assessed. Content validity assessing the extent to which the PROM topic (or domain) had been described by the items (individual questions) with it, and usually involving patient groups, was also measured. Information on responsiveness (change before and after an intervention) was also collected.

Functionality, or details on practical properties, of each PROM was assessed by data reported on the acceptability, feasibility and reading level of the administration of the PROM. Details of the type, size and range of the populations in which the identified PROMs were administered were

collected, as well as domains and scoring, to identify the most psychometrically robust PROM tools available to assess body image in urogynaecology patients.

Results

A total of 3207 studies (excluding duplicates) were identified for screening with 3158 being discarded on title and abstract alone. Of the remaining studies, 49 manuscripts were reviewed in full with 17 studies identified as meeting the inclusion criteria (Fig. 1). This resulted in seven PROMs being identified that had been used in a urogynaecology population. A full summary of the seven PROMs is presented in Table 1 and a full summary of the psychometric properties presented in each of the 17 studies is presented in Table 2.

In terms of population, 15 studies included women with pelvic organ prolapse [21, 21, 21, 18–29], one study also included patients with perineal trauma following childbirth as well as patients with prolapse [21], one study included patients with overactive bladder [30] and one study included patients attending a urogynaecology clinic but did not specify their symptomatology [11]. Two identified studies utilised two

Table 1 Summary of the content and scope of the seven PROMs identified in this systematic review

| PROM name | Population for use | Number of times used in review | Number of items | Summary |
|--|---|--------------------------------|-----------------|--|
| The modified Body Image Scale | Condition specific-prolapse | 11 | 10 | Uses the same 10 questions as the Body Image Scale but substitutes “disease or treatment” for “vaginal prolapse” to make it more relevant to its patient cohort. Answers graded from “Not at all” to “Very much” in four steps |
| Genital Self-Image Scale-20 | Generic to women | 3 | 20 | 20 questions assessing body image regarding female genitalia. Scored from 0 to 40 with an increased score indicating positive genital body image. 10 questions are scored 0–3 (graded) and 10 are 0–1 (yes/no) |
| Body Exposure During Sexual Activities Questionnaire | Condition specific-sexually active women only | 2 | 28 | A 28-item questionnaire assessing body image during sexual activities. Included genitalia-specific questions. Answers graded from “never” to “always or almost always” in 5 steps |
| Body Esteem Scale | Generic to women | 1 | 30 | A measure of “overall” body image. Divided into 3 categories—appearance, weight and attribution with 12, 9 and 9 items respectively. The items are graded in 5 steps from “never” to “always” |
| The Body Image Quality of Life Inventory | Generic to women | 1 | 19 | Assesses the impact body image has on quality of life. It uses 19 items each scored from –3 to +3 giving an overall mark between –54 and + 54 with a higher score indicating a higher quality of life |
| Body Image in Pelvic Organ Prolapse questionnaire | Condition specific-prolapse | 1 | 10 | A 10-item questionnaire that assesses how pelvic organ prolapse directly affects how women perceive their body image. 5-step grading from strongly agree to strongly disagree |
| Vaginal Changes Sexual and Body Esteem | Generic to women | 1 | 10 | 10 questions with Likert scale responses ranging from 1 (strongly agree) to 5 (strongly disagree) |

PROMs within their study design [10, 27]. A full summary of study setting and participants is reported in Table 3.

Two of the PROMS identified (modified Body Image Scale-mBIS and Body Image in Pelvic Organ Prolapse-BIPOP) were condition specific, each only able to be used in women with pelvic organ prolapse as the questions relate directly to this condition. One PROM (Body Exposure during Sexual Activities Questionnaire-BESAQ) was specific to a population of women who were currently sexually active. The remaining four PROMs (Genital Self-Image Scale-20-GSIS-20, Body Esteem Scale-BES, Body Image Quality of Life Inventory-BIQLI and the Vaginal changes, Sexual and Body Esteem questionnaire-VSBE) were all generic instruments which could be to be used in any population of women, regardless of condition.

The seven PROMs identified varied considerably in their length, the domains covered and how they were scored. The number of items varied from 10 to 30, resulting in variations in the scope of the PROMs identified and in different completion times, all of which affect the acceptability, value and burden of a PROM.

Information on the psychometric properties of the identified PROMs was assessed following the methodology of the Oxford PROMS group [13] and replicated the methodology employed in previous systematic reviews [31]. This is a subjective method of appraisal, but is arguably a useful and helpful indicator of how comprehensively the psychometric

properties have been assessed and provides an indication of the level of evidence for each PROM tool [31]. Table 4 presents an appraisal of the psychometric properties and functionality of the identified PROMs, which helps to indicate which tools can be best recommended for use in clinical practice within a urogynaecology setting.

Two of the PROMs (BIPOP and GSIS-20) identified had undergone formal psychometric testing in a population with pelvic organ prolapse and/or perineal trauma [21, 28]. Body Image in Pelvic Organ Prolapse is a 10-item PROM scored out of 50, which assesses how pelvic organ prolapse directly affects body image perception. Good evidence in favour of reliability, content validity, construct validity and criterion validity was presented for the Body Image in Pelvic Organ Prolapse questionnaire (BIPOP). However, no data on responsiveness or acceptability were presented. The Genital Self-Image Scale-20 is a longer 20-item PROM scored out of 40 and relates to body image in relation to genitalia. It has undergone formal psychometric testing in a population of women with pelvic organ prolapse and/or perineal trauma and good evidence in favour of reliability, content validity, construct validity, criterion validity, responsiveness and acceptability was presented [28].

None of the other five instruments identified (mBIS, BESAQ, BIQLI, VSBE and BES) had such comprehensive evidence of reliability or validity within a urogynaecological population (Table 4). Two of these instruments (VSBE and

Table 2 Summary of the psychometric properties reported for each PROM in the 17 included studies in this systematic review

| Instrument/ study | Reliability | Validity | | |
|---|---|---|---|--|
| | Cronbach's alpha, interclass correlation/ Pearson's (<i>r</i>) | Construct validity | Content/criterion validity | Responsiveness |
| The modified Body Image Scale (mBIS) | | | | |
| Jelovsek et al. (2006) | Cronbach's alpha 0.91 | Body image correlated moderately ($r = 0.4$) with quality of life and prolapse ($r = 0.3$) and urinary ($r = 0.4$) scores of the PFDI-20 | Not reported | Not assessed |
| Barber et al. (2007) | Not reported | Not demonstrated | Not reported | Not demonstrated |
| Lowenstein et al. (2009) | Not reported | mBIS scores correlated moderately with POPDI scores ($r = 0.37$) and PISQ scores (0.34) | Not reported | Not assessed |
| Lowenstein et al. (2010) | Not reported | Improvement in mBIS scores was significantly correlated with improvement in symptoms of prolapse ($r = 0.27$) Patients with higher body image scores also had higher sexual function scores | Not reported | Significant change in mBIS scores following treatment |
| Patel et al. (2010) | Cronbach's alpha 0.89 | mBIS scores improved significantly following the use of pessary for prolapse management | Not reported | Significant change in mBIS scores following treatment |
| Crisp et al. (2013) | Not reported | mBIS scores significantly improved post-surgical management of prolapse and this was sustained at 24 weeks | Not reported | Significant change in mBIS scores following treatment |
| Levin et al. (2014) | Not reported | Statistically significant improvement in mBIS scores following treatment of OAB with Interstim | Not reported | Significant change in mBIS scores following treatment |
| Meriwether et al. (2015) | Not reported | Changes in mBIS scores were significantly associated with BMI, comorbidity indices and satisfaction with pessary for management of prolapse | Not reported | Significant change in mBIS scores following treatment |
| Crisp et al. (2016) | Not reported | mBIS scores showed significant improvement post-op | Not reported | Significant change in mBIS scores following treatment |
| Lucacz et al. (2016) | Not reported | Statistically significant improvement in mBIS scores postoperatively at 6, 12 and 24 months | Not reported | Significant change in mBIS scores following treatment |
| Weidner et al. (2017) | Not reported | Not demonstrated | Not reported | Not demonstrated |
| Genital Self-Image Scale-20 (GSIS-20) | | | | |
| Zielinski, Kane-Low et al. (2012) | Cronbach's alpha 0.79–0.89 | Known group approach: significant correlation of GSIS-20 scores with partici- pants considering genital cosmetic surgery | User group involvement. Clinician expert panel. Content validity index scores calculated | Pearson's correlation for test-retest reliability = 0.88 |
| Zielinski et al. (2012) | Cronbach's alpha 0.89 | GSIS-20 scores significantly lower (worse) than in patients not diagnosed with prolapse | Positive correlation with BES scores ($r = 0.38$) | Not assessed |
| Handezalts et al. (2017) | Cronbach's alpha 0.85 | GSIS scores significant associated with sexual function scores (FSFI) | Not reported | Not assessed |
| Body Exposure during Sexual Activities Questionnaire (BESAQ) | | | | |

Table 2 (continued)

| Instrument/ study | Reliability | Validity | | |
|---|---|---|--|--|
| | Cronbach's alpha, interclass correlation/ Pearson's (<i>r</i>) | Construct validity | Content/criterion validity | Responsiveness |
| Lowder et al. (2010) | Cronbach's alpha 0.95 | Statistically significant improvement in BESAQ scores following prolapse surgery Age significantly associated with BESAQ score | Not reported | Significant change in BESAQ scores following treatment |
| Body Esteem Scale (BES) | | | | |
| Zielinski et al. (2012) | Not reported | Positive correlation between sexual function scores (FSFI) and BES ($r = 0.34$) | Positive correlation with GSIS-20 ($r = 0.38$) | Not assessed |
| The Body Image Quality of Life Inventory (BIQLI) | | | | |
| Lowder et al. (2010) | Cronbach's alpha 0.97 | No statistically significant change in BIQLI scores | Not reported | Not demonstrated |
| Body Image in Pelvic Organ Prolapse questionnaire (BIPOP) | | | | |
| Lowder (2014) | Cronbach's alpha 0.92 Interclass correlation 0.80 | Strong correlation ($r = 0.38$ and $r = 0.45$) with scores for pelvic organ prolapse symptoms (PFDI-20, PFIQ-7) | Patient user group involvement and good evidence of face validity Strong correlation ($r = 0.70$ and $r = 0.36$) with Body Exposure during Sexual Activity (BESAQ) and Body Image Quality of Life inventory (BIQLI) | Not assessed |
| Vaginal Changes Sexual and Body Esteem (VSBE) | | | | |
| Zielinski (2009) | Not reported | Strong correlation ($r = 0.59$) between severity of prolapse and VSBE | Not reported | Not assessed |

BES) had no evidence of reliability in a urogynaecological population presented and none of these five instruments had evidence of content validity for their use within a urogynaecological population. However, apart from the Body Image Quality of Life Inventory-BIQLI, all the tools identified had some good evidence in favour of construct validity in a urogynaecological population and all had some favourable evidence for acceptability presented.

Discussion

This systematic review of PROMs used within a urogynaecology population has identified seven instruments used for the assessment of body image. Of these, two instruments have been identified as suitable for use in women with pelvic organ prolapse (GSIS-20 and BIPOP) [21, 28]. Suitable PROMs to assess body image in other areas of urogynaecology, including urinary and faecal incontinence or as part of a comprehensive PROM tool, were not identified.

The nature of urogynaecology, which includes a spectrum of related conditions such as urinary incontinence, pelvic organ prolapse, faecal incontinence and sexual dysfunction, often occurring concurrently, makes identifying a single PROM for use to assess body image across the whole subspecialty

challenging. Issues to consider include the scope, length (and therefore burden) of the tools available and rationale for their administration in a urogynaecology population. Also, considering which aspects of body image to assess within a urogynaecological population is important. Whether this is an assessment of global body image satisfaction or specifically in relation to genital self-image or sexual function would impact on the choice of PROM.

The rationale for administration of PROMs in a clinical setting includes supporting individualised care as part of routine use in clinical practice, as well as service evaluation and research [32]. For this reason, it is essential to establish psychometric evidence of reliability, validity and feasibility of use of the tool intended for this purpose, especially if data are to be used for research purposes. The seven instruments identified in this systematic review have been developed for use in clinical practice and not purely as research tools. Only one of the PROMs identified has been developed specifically for a urogynaecology population (BIPOP) [28].

The body image in pelvic organ prolapse questionnaire (BIPOP) has been specifically developed and validated in a population of women with pelvic organ prolapse [28]. The study reported clear evidence of content validity, internal consistency reliability, construct validity, criterion validity and

Table 3 Summary details of the study populations for each included study

| Instrument/study | Number of women in study | Study population |
|---|--------------------------|--|
| The modified Body Image Scale (mBIS) | | |
| Jelovsek et al. (2006) | 47 | Patients with advanced pelvic organ prolapse |
| Barber et al. (2007) | 70 | Patients undergoing surgery for pelvic organ prolapse |
| Lowenstein et al. (2009) | 384 | Patients with stage 2 or greater pelvic organ prolapse |
| Lowenstein et al. (2010) | 239 | Patients with stage 2 or greater pelvic organ prolapse |
| Patel et al. (2010) | 54 | Patients with pelvic organ prolapse managed by pessary |
| Crisp et al. (2013) | 87 | Patients with prolapse undergoing colpoctiesis |
| Levin et al. (2014) | 28 | Patients with overactive bladder |
| Meriwether et al. (2015) | 127 | Patients with pelvic organ prolapse managed with a pessary |
| Crisp et al. (2016) | 81 | Patients with prolapse undergoing colpoctiesis |
| Lucacz et al. (2016) | 307 | Patients undergoing surgery for pelvic organ prolapse |
| Weidner et al. (2017) | 283 | Patients with pelvic organ prolapse stage 2 or greater |
| Genital Self-Image Scale-20 (GSIS-20) | | |
| Zielinski, Kane-Low et al. (2012) | 277 | Patients with stage 2 or greater prolapse ($n = 34$). Patients with perineal trauma ($n = 51$) |
| Zielinski et al. (2012) | 74 | Patients with prolapse ($n = 13$), surgery for prolapse ($n = 24$) and controls ($n = 37$) |
| Handezalts et al. (2017) | 107 | Patients attending a urogynaecology clinic |
| Body Exposure during Sexual Activities Questionnaire (BESAQ) | | |
| Lowder et al. (2010) | | Patients with pelvic organ prolapse stage 2 or greater |
| Body Esteem Scale (BES) | | |
| Zielinski et al. (2012) | 74 | Patients with prolapse ($n = 13$), surgery for prolapse ($n = 24$) and controls ($n = 37$) |
| The Body Image Quality of Life Inventory (BIQLI) | | |
| Lowder et al. (2010) | 64 | Patients with pelvic organ prolapse stage 2 or greater |
| Body Image in Pelvic Organ Prolapse questionnaire (BIPOP) | | |
| Lowder (2014) | 201 | Patients with pelvic organ prolapse symptoms |
| Vaginal Changes Sexual and Body Esteem (VSBE) | | |
| Zielinski (2009) | 13 | Patients with pelvic organ prolapse |

acceptability, though no assessment of responsiveness was presented.

The Genital Self-Image Scale-20 (GSIS-20) was not initially developed for use within a urogynaecological population, but has now undergone formal validation in a population of women with perineal trauma or pelvic organ prolapse [21]. The study reports good evidence for content validity, internal consistency reliability, construct validity, criterion validity, responsiveness and acceptability.

All of the other five PROMs identified in this systematic review have been developed and validated in different patient settings and all their published formal validation has been in non-urogynaecological populations. The most frequently used instrument identified was the modified Body Image Scale (mBIS), which was used in 11 studies [5, 6, 18–20, 22–26, 30]. This PROM was initially developed to assess body image concerns in relation to medical conditions or treatment in

cancer patients and was adapted for use in patients with pelvic organ prolapse.

This was achieved by changing questions regarding ‘disease or treatment’ from Hopwood’s original body image scale [33] to questions regarding ‘prolapse’. This tool can therefore only be utilised in populations where patients with pelvic organ prolapse symptoms are assessed. No evidence has been provided for the content validity of this tool in a urogynaecology population and the available evidence for its reliability and construct validity is very limited, despite it being the most widely used PROM to assess body image in a urogynaecology setting. Following its initial use in a urogynaecology population by Jelovsek et al. in 2006 [5], ten further studies have utilised mBIS. However, for this tool to be considered valuable for research and use in clinical practice, further psychometric testing within a urogynaecology population is required.

Table 4 Psychometric properties of PROMS identified by the systematic review, scored according to Preston et al. (2015). Key to scoring: 0 not reported; – no evidence in favour; + some limited evidence in favour; ++ some good evidence in favour; +++ good evidence in favour

| PROM | Number of studies used in | Reliability | Construct validity | Content validity | Criterion validity | Responsiveness | Acceptability |
|--|---------------------------|-------------|--------------------|------------------|--------------------|----------------|---------------|
| The modified Body Image Scale (mBIS) | 11 | ++ | ++ | 0 | 0 | ++ | ++ |
| Body Exposure during Sexual Activities Questionnaire (BESAQ) | 1 | ++ | ++ | 0 | 0 | ++ | ++ |
| Body Image in Pelvic Organ Prolapse questionnaire (BIPOP) | 1 | +++ | ++ | ++ | +++ | 0 | 0 |
| The Body Image Quality of Life Inventory (BIQLI) | 1 | ++ | 0 | 0 | 0 | 0 | ++ |
| Genital Self-Image Scale–20 (GSIS-20) | 3 | +++ | +++ | +++ | +++ | +++ | +++ |
| Vaginal Changes Sexual and Body Esteem (VSBE) | 1 | 0 | ++ | 0 | 0 | 0 | + |
| Body Esteem Scale (BES) | 1 | 0 | ++ | 0 | ++ | 0 | ++ |

The other four tools identified in this review, the Body Exposure during Sexual Activities Questionnaire (BESAQ), Body Esteem Scale (BES), Body Image Quality of Life Inventory (BIQLI) and Vaginal changes/Sexual and Body Esteem (VSBE) questionnaire, are each used in only one study, each time in a population of patients with pelvic organ prolapse. None of these four tools has been developed in a urogynaecology population and there is no evidence for content validity for these tools in a urogynaecology setting. There is some limited evidence for reliability for BESAQ [27] and BIQLI [27] and some good evidence for construct validity for BESAQ [27], VSBE [29] and BES [10]. However, more comprehensive formal psychometric testing in a urogynaecology population is recommended prior to using these instruments in clinical practice or research.

We did not identify any studies where a PROM tool was used to assess body image in patients with stress urinary incontinence or faecal incontinence and only one study in which body image was assessed in patients with overactive bladder [30]. The relationship between conditions including stress urinary incontinence, overactive bladder, faecal incontinence *and* body image is clearly an area for further research. This requires the development and psychometric testing of appropriate PROMs to assess this. The interplay between body image, sexual function and quality of life within urogynaecology populations is also an important area of future research.

Whilst the relationship between body image and pelvic organ prolapse is now becoming well established, there are still significant questions about how patients who report negative body image should be advised and managed. There is some evidence that body image improves following surgical intervention for prolapse [18, 22, 27] or the use of pessaries [20, 23], though studies which evaluate the value of counselling or cognitive behavioural therapy in this context are also needed, again demanding psychometrically robust PROMs which assess body image in the relevant urogynaecological setting.

The main strength of this systematic review is the rigorous and transparent search strategy employed, which has identified the relevant studies, allowing identification of seven PROM tools used in a urogynaecology population. We have been able to identify the most psychometrically robust tools available for use to assess body image within a urogynaecology setting.

The limitations of this systematic review are that the data are only as good as those provided in the included studies. Not all the psychometric testing for each PROM may be included, especially details about content validity, criterion validity and responsiveness, which were often not reported. To minimise the risk of bias and subjectivity with using the Oxford PROM group's appraisal system, each reviewer independently extracted data on the quality of the psychometric properties and functionality of the included PROMs. The use of a search strategy which excluded papers not published in English may have also resulted in missing both instruments and related studies potentially relevant to this systematic review.

Conclusions

This systematic review aimed to identify the most psychometrically robust patient-reported outcome measures which could be used to assess body image in a urogynaecology population. Two of the identified PROMs (GSIS-20 and BIPOP) [21, 28] can be recommended for use in clinical practice, service evaluation and research for patients with pelvic organ prolapse. Development of a PROM/PROM(s) to identify and measure body image issues in other areas of urogynaecology including urinary incontinence and faecal incontinence is required.

Further research is required to investigate the relationship between body image and urogynaecological symptomatology, quality of life and sexual function and changes after interventions, which would valuably utilise such tools.

Compliance with ethical standards

Conflicts of interest Mr. Stephen Radley is a director and shareholder of ePAQ Systems Limited, an NHS spin-out technology company, largely owned by Sheffield Teaching Hospitals NHS Foundation Trust. Mr. Radley did not collect or analyse the data included in this systematic review.

The other authors have no financial or commercial interests in ePAQ Systems Ltd. or other conflicts of interest to declare.

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