

# Questionnaires to evaluate pelvic floor dysfunction in the postpartum period: a systematic review

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**Background:** Pelvic floor dysfunctions (PFDs) affect the female population, and the postpartum period can be related to the onset or aggravation of the disease. Early identification of the symptoms and the impact on quality of life can be achieved through assessment instruments.

**Objective:** The purpose of this systematic review is to evaluate questionnaires used to assess PFD in the postpartum period.

**Methods:** A systematic review study was conducted, following Preferred Reporting Items for the Systematic Reviews and Meta-Analyses (PRISMA) criteria, using the databases: PubMed, Biblioteca Virtual de Saúde (BVS), Web of Science, and Scopus, and the keywords PFD or pelvic floor disorders, postpartum or puerperium, and questionnaire. Articles published up till May 2018 were included, searching for articles using validated questionnaires for the evaluation of PFDs in postpartum women. The articles included were evaluated according to a checklist, and the validation studies and translated versions of the questionnaires were identified.

**Results:** The search of the databases resulted in 359 papers, and 33 were selected to compose this systematic review, using nine validated questionnaires to assess PFDs in the postpartum period: International Consultation on Incontinence Questionnaire – Vaginal Symptoms (ICIQ-VS), Pelvic Floor Distress Inventory 20 (PFDI-20), Pelvic Floor Impact Questionnaire (PFIQ-7), PFDI-46, Pelvic Floor Impact Questionnaire (PFIQ-31), Pelvic Floor Bother Questionnaire (PFBQ), Female Pelvic Floor Questionnaire, electronic Personal Assessment Questionnaire – Pelvic Floor, and PFD questionnaire specific for pregnancy and postpartum. The most frequently reported questionnaires included PFDI-20, PFIQ-7, and ICIQ-VS and are recommended by ICI. In addition, the review identified a specific questionnaire, recently developed, to assess PFD during pregnancy and postpartum.

**Conclusion:** The questionnaires used to evaluate PFD during postpartum period are developed for general population or urology/gynecology patients with incontinence and reinforce the paucity of highly recommended questionnaires designed for postpartum, in order to improve early and specific approach for this period of life.

**Keywords:** pelvic floor disorders, puerperium, women's health, primary health care, surveys and questionnaires, patient reported outcome measure

## Background

Pelvic floor dysfunctions (PFDs) comprise a wide variety of interrelated clinical conditions, such as urinary incontinence (UI), fecal incontinence (FI), pelvic organ prolapse (POP), sexual dysfunction, and other urogenital symptoms. They affect 23%–49% of women in general,<sup>1,2</sup> with an increasing incidence estimate to 43.8 million cases in 2050 in developed and developing countries,<sup>3,4</sup> resulting in negative repercussions (emotional and physical) on women's quality of life (QoL).

The development of PFDs is a complex process secondary to multifactorial etiology. The pregnancy–puerperal cycle is one of the periods correlated with

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the onset or aggravation of the disorders.<sup>5</sup> The postpartum period provides a window of opportunity for early identification of symptoms to provide health promotion actions, thus reducing the development of PFDs and their consequences.

The precocious perception of these symptoms in puerperium depends on factors such as access and quality of care from the health team, as urogenital symptoms are accepted by women as a natural consequence of childbirth and/or aging, which may delay the diagnosis and treatment of PFDs.<sup>6</sup>

The questionnaires are health instruments that aid in fleshing out the proper analysis of the patient.<sup>7</sup> They are used to assess PFDs that identify urogenital symptoms, quantify the intensity and severity of symptoms, assess the impact on women's QoL, and are used as a clinical parameter in the treatment and evolution of PFDs. Moreover, in medical research, they are not invasive features and are low in cost, facilitating the reproducibility of the method.<sup>8,9</sup>

Thus, the objective of this systematic review is to evaluate questionnaires used to assess PFD in the postpartum period.

## Methods

A systematic review of articles was conducted according to the Preferred Reporting Items for the Systematic Reviews and Meta-Analyses (PRISMA) Statement.<sup>10</sup>

### Search strategy

Articles published until May 2018 were included, and the search was limited to articles published in peer-reviewed journals, using questionnaires for the evaluation of PFDs in postpartum women.

A systematic literature search of studies without limits on the publication date was conducted in the PubMed databases (<https://www.ncbi.nlm.nih.gov/pubmed>), Virtual Health Library (<http://bvsalud.org>), Web of Science (<https://isiknowledge.com>), and Scopus (<https://www.scopus.com>). The terms used for the search were pelvic floor dysfunction OR pelvic floor disorders; AND postpartum OR puerperium; AND questionnaire. These keywords were selected according to the Medical Subject Headings (MeSH) in the National Library of Medicine and also by their synonyms.

Selection of the keywords for searching the databases followed the PICOS model. The Population (P) was defined as women in the postpartum period with no time limit; the Intervention (I) must be the use of questionnaire to

evaluate PFD; the Outcome (O) was the results of PFD's questionnaires; the Comparison group (C) was not applicable; the Study (S) design excluded were data-based articles (eg, review articles, guidelines, books).

### Selection strategy

Initially, the duplicated articles were excluded, and then we undertook a screening of titles and abstracts according to the following exclusion criteria: 1) were not published in English, Portuguese, or Spanish languages; 2) were not related to the issue; 3) were not available for free access.

After this step, the remaining articles were read in full text and evaluated according to the following inclusion criteria: 1) in the method section the use of a validated questionnaire, in any female population, to evaluate the PFD must be described. 2) There was no restriction on sample size or study design (eg, cohort study, case-control, randomized clinical trial, cross-sectional studies), except to data-based articles (eg, reviews, guidelines, books).

The articles were excluded if they 1) used only specific questionnaires for urinary incontinence, FI, sexual dysfunctions, QoL in general or pain; 2) used adaptations or modifications of validated questionnaires (Figure 1).

To improve confidence in the selection of articles, the abstracts and full-text evaluation was conducted by two researchers in an independent and blinded way, strictly following the inclusion and exclusion criteria. In cases where there was disagreement over the selection of studies among the investigators, a third reviewer was consulted.

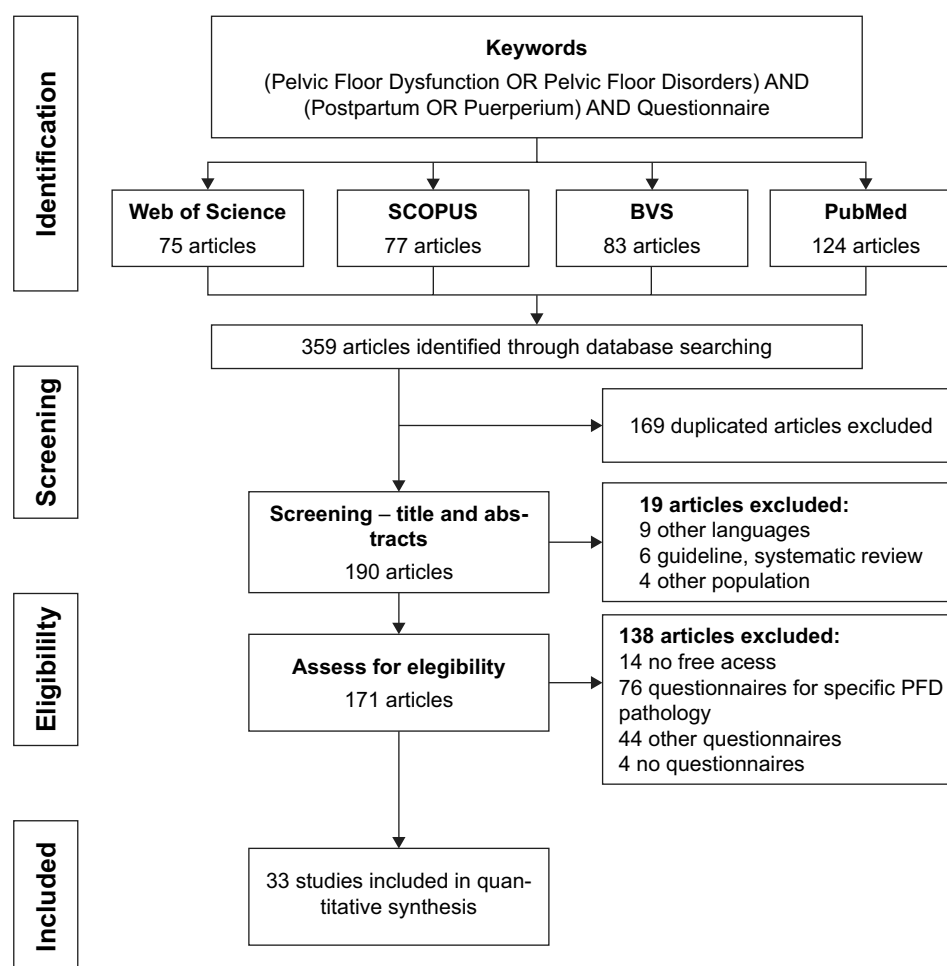
### Strategy for analyzing selected articles

By the criteria described above, the articles were selected to compose this systematic review. The articles included in the review were evaluated according to a checklist to identify the following information: the PFD questionnaires used in each article, subjects, postpartum period of the assessment, other evaluation techniques used in data collection, article goal, and conclusion.

The validation studies of the questionnaires were found in the references, and the translated versions were searched in all databases of the research (PubMed databases, Virtual Health Library, Web of Science, and Scopus) without limitation of languages or date.

## Results

The search of the databases resulted in 359 papers. Screening by title and abstract, 169 were excluded as duplicated titles and 19 as irrelevant to study purposes. The remaining articles



**Figure 1** Systematic presentation of methodology use and selection criteria.

were read in their entirety, and 138 articles did not meet the inclusion criteria; thus, 33 articles were selected to compose this systematic review (Figure 1).

The 33 articles were published between 2007 and 2018, and the following information were included in Table 1: authors and year of publication, study design, population studied (n), questionnaires used, other techniques used in data collection, objective, and conclusion of the studies.

The instruments were applied in different periods of pregnancy and postpartum. One study initiated the follow-up before the pregnancy,<sup>12</sup> and the postpartum period varied from 3 days<sup>30,33</sup> up to 5 years.<sup>19,38</sup>

The questionnaires were used in different types of studies, including cohort,<sup>12,14,17–21,23,25,27,31–33,35–40,43</sup> cross-sectional,<sup>11,13,16,24,26,29,34,41,42</sup> pilot study,<sup>15</sup> case-control,<sup>30</sup> and randomized clinical trials.<sup>22,28</sup>

In total, we identified nine questionnaires used to assess PFDs in the postpartum period. The description of these questionnaires, frequency of use in the articles, and translated

and validated versions for different languages are shown in Table 2.

The Pelvic Floor Distress Inventory-20 (PFDI-20) and the Pelvic Floor Impact Questionnaire-7 (PFIQ-7)<sup>44</sup> are the two most frequent questionnaires in the articles included in this review, being used in 30.3% and 27.3% of studies, respectively. They assess urinary symptoms, POP, and colorectal symptoms and have versions translated into 17 and 16 different languages, respectively.<sup>44–60</sup>

The International Consultation on Incontinence Questionnaire – Vaginal Symptoms (ICIQ-VS)<sup>61</sup> is the third most frequent questionnaire in this review, being used in 24.2% of the studies. It assesses vaginal symptoms, including POPs and sexual matters, and has versions translated into seven different languages.<sup>61–66</sup> The Female Pelvic Floor Questionnaire (FPFQ)<sup>67,68</sup> or Australian Questionnaire is the fourth most frequent in this review, being used in 12.1% of the studies. It assesses bladder, bowel, POP, and sexual domains, and has versions translated in three different languages.<sup>67–71</sup>

**Table 1** Summary of articles selected by systematic review questionnaires used to evaluate PFDs in the postpartum period

Author, year/ study design	Population studied (n)	Questionnaire used	Other assessment methods	Article goal	Article conclusion
Araujo et al, 2018 <sup>11/</sup> cross-sectional study	Primiparous women 12 and 24 months postpartum	ICIQ-VS	ICIQ-SF PFMS POP-Q US transperineal tomographic US imaging	To evaluate PFM after different delivery modes	VD was associated with PFM avulsion. There was no difference among VD and nonelective or elective cesarean in symptomatology or other anatomic alterations evaluated through 3D/4D transperineal US
Lockhart et al, 2018 <sup>12/</sup> cohort study	Nulligravida women before pregnancy and 6 months postpartum (n=10)	PFDI-20 PFIQ-7	POP-Q dp3T MRI PFMS	To prospectively characterize dp3T MRI findings in nulligravida women and characterize changes 6 months after delivery in the same woman	Dynamic pelvic 3 T MRI detected levator tears and increased pelvic organ descent, which can be directly attributed to pregnancy and delivery
Keshwani et al, 2018 <sup>13/</sup> cross- sectional study	Primiparas with DrA (n=32)	PFDI-20, PFIQ-7	Measure of IRD US transabdominal MBSR questionnaire – multidimensional body self- relations questionnaire VAS Oswestry Disability Index	To investigate the relationship between IRD and symptom severity in women with DrA in the early postpartum period	This preliminary work suggests that, in the early postpartum period, IRD as a measure of DrA severity is meaningful for body image
Halperin et al, 2017 <sup>14/</sup> cohort study	Women sustained an OASIS 6 and 12 months postpartum (n=80)	PFBQ	Numerical scoring system to evaluate striae	To examine the association between the severities of SG and OASIS and to measure the symptoms regarding UI, fecal/flatulence incontinence, and dyspareunia, at 6 and 12 months postpartum	The innovation of this research is the association between SG severity and OASIS severity (3A, 3B), added information regarding OASIS risk factors
Kruger et al, 2017 <sup>15/</sup> pilot study	Nulliparous women at third trimester of pregnancy and 5 months postpartum (n=167)	ICIQ-VS	ICIQ-SF ICIQ-BS Digital palpation by Dietz PFMS by Oxford US transperineal elastometry	To quantify levator ani muscle stiffness during the third trimester of pregnancy and postpartum in European and Polynesian women. Associations between stiffness, obstetric variables, and the risk of intrapartum levator ani injury (avulsion) were investigated	Quantification of levator ani muscle stiffness is feasible. Muscle stiffness is significantly different before and after birth
Metz et al, 2017 <sup>16/</sup> cross-sectional study	Nulliparous women at third trimester of pregnancy, 6 months, and 1 year postpartum (n=233)	PFD questionnaire specific for pregnancy and postpartum	None	The aim of this study was to develop and validate a questionnaire for the assessment of pelvic floor disorders, their symptoms, and risk factors in pregnancy and after birth including symptom course, severity, and impact on QoL	This pelvic floor questionnaire proved to be valid, reliable, and reactive for the assessment of pelvic floor disorders, their risk factors, incidence, and impact on QoL during pregnancy and postpartum. The questionnaire can be utilized to assess the course of symptoms and treatment effects using a scoring system

Abdool et al, 2017 <sup>17/</sup> cohort study	Black South African primiparae women at third trimester, 3, and 6 months postpartum (n=84)	ICIQ-VS	POP-Q US transperineal	To study delivery-related changes in pelvic floor morphology in Black South African primiparae. We also intended to determine the impact of anatomical changes on symptoms in the postpartum period	There is significant alteration in pelvic organ support and levator hiatal distensibility postpartum, with more marked effects in women after VD of black primiparous women, 15% sustained levator trauma after their first VD
Durnea et al, 2017 <sup>19/</sup> cohort study	Nulliparous at first trimester and 1 year postpartum (n=872)	PFQ	None	To investigate the impact of the mode of delivery on postnatal PFD in primiparas, when PFD existing before the first pregnancy is taken into consideration	Prepregnancy PFD was common and was mainly associated with modifiable risk factors such as smoking and exercising. The main risk factor for postpartum PFD was the presence of similar symptoms prior to pregnancy, followed by anthropometric and intrapartum factors. Hip circumference seems to be a better predictor of PFD compared to BMI
Ng et al, 2017 <sup>19/</sup> cohort study	Women 3–5 years after delivery (n=506)	PFDI-46 PFIQ-31	POP-Q	To determine the prevalence of UI, FI, and POP 3–5 years after delivery	VD increases the risk for UI. Higher body weight and weight gain from first trimester are risk factors for SUI and UI, respectively. More women reported symptoms of POP following an instrumental delivery than those who had a normal VD
Desseauve et al, 2016 <sup>20/</sup> cohort study	Women sustained an OASIS (n=159)	PFBQ	EuroQoL Pecatori grading system VAS	To assess long-term pelvic floor symptoms after an OASI	Pelvic floor symptoms 4 years after OASI were highly prevalent
Yohay et al, 2016 <sup>21/</sup> cohort study	Israeli women at third trimester and 3 months postpartum (n=117)	PFDI-20	None	To investigate the prevalence of PFD in women at late pregnancy and 3 months postpartum, to define changes in PFD rates, and to evaluate various obstetrical factors that may correlate with these changes	PFD is prevalent in both late pregnancy and the postpartum period. A significant association between perineal tears and SUI 3 months after delivery was noted
Kolberg Tennfjord et al, 2016 <sup>22/</sup> randomized clinical trial	Women 6 weeks after delivery (control) and 6 months after delivery (postintervention) (n=175)	ICIQ-VS	ICIQ FLUTSsex PFMS US transperineal (to evaluate LAM injury)	Evaluate effect of PFMT on vaginal symptoms and sexual matters, dyspareunia, and coital incontinence in primiparous women stratified by major or no defects of the LAM	Women with a major defect of the LAM had the symptom “vagina feels loose or lax” compared to the control group. No difference was found between groups for symptoms related to sexual dysfunction

(Continued)

Table 1 (Continued)

Author, year/ study design	Population studied (n)	Questionnaire used	Other assessment methods	Article goal	Article conclusion
Gagnon et al, 2016 <sup>23</sup> / cohort study	Women 3 and 6 months postpartum (n=54)	PFDI-20 PFIQ-7	PFMS PISQ-12	Evaluate and measure changes in pelvic floor function in women who self-selected to attend a standardized one-on-one PFMT program with a physiotherapist following a group workshop	Results suggest that a two-tiered, self-selection approach to administering PFMT in the postpartum period contributes to significant improvements in pelvic floor function, QoL, and PFMS, and to high satisfaction rates
Cyr et al, 2016 <sup>24</sup> / cross-sectional study	Women 3 months postpartum (n=58)	ICIQ-VS PFIQ-7	PF clinical examination US transperineal (PF morphometry) PFMS ICIQ-SF ICIQ-B	Compare PFM morphometry and function in primiparous women with and without puborectalis avulsion in the early postpartum period and then compare the two groups for pelvic floor disorders and impact on QoL	PFM morphometry and function are impaired in primiparous women with puborectalis avulsion in the early postpartum period. Moreover, it highlights specific muscle parameters that are altered, such as passive properties, strength, speed of contraction, and endurance
Leeman et al, 2016 <sup>25</sup> / cohort study	Nulliparous in the beginning of pregnancy and 6 months postpartum (n=448)	PFIQ-7	POP-Q PFMS Paper towel test Visual inspection of the perineum Assessment of the rectal sphincter strength	To determine the effect of perineal laceration on pelvic floor outcomes, including UI, FI, perineal pain, and sexual function in a nulliparous cohort of women with a low incidence of episiotomy	Women having second-degree lacerations are not at increased risk for PFD other than increased pain, and slightly lower sexual function scores at 6 months postpartum
Tennfjord et al, 2015 <sup>26</sup> /cross- sectional study	Women 12 months after delivery (n=177)	ICIQ-VS	ICIQ FLUTSsex PFMS	Investigate primiparous women 12 months postpartum and study (i) prevalence and bother of coital incontinence, vaginal symptoms, and sexual matters and (ii) whether coital incontinence and vaginal symptoms were associated with VRP, PFM strength, and endurance	Twelve-month postpartum coital incontinence was rare, whereas the prevalence of vaginal symptoms interfering with sexual life was more common. The large majority of primiparous women in the study had sexual intercourse at 12 months postpartum, and the reported overall bother on sexual life was low. Women reporting "vagina feels loose or lax" had lower VRP, PFM strength, and endurance when compared to women without the symptom
van Delft et al, 2015 <sup>27</sup> /cohort study	Primiparae women at 36 weeks gestation, 3 months, and 1 year postpartum (n=269)	ICIQ-VS	PFMS assessed by Oxford modified scale POP-Q US (to evaluate LAM injury)	To explore the natural history of levator avulsion in primipara 1 year postpartum and correlate this to PFD	Sixty-two percent of levator avulsions were no longer evident 1 year postpartum. Partial avulsion has a tendency to improve over time, which seems to be less common for complet



Fritel et al, 2015 <sup>28</sup> / randomized clinical trial	Nulliparous women at late pregnancy, 2 months, and 1 year postpartum (n=282)	FPFQ	POP-Q PAD-test 24 hours PFMS assessed by Laycock scale ICIQ-SF EuroQoL-5D	To compare, in an unselected population of nulliparous pregnant women, the postnatal effect of prenatal supervised PFM training with written instructions on postpartum UI	Prenatal supervised pelvic floor training was not superior to written instructions in reducing postnatal UI	e levator avulsions. Women with no longer evident and persistent levator avulsion had PFD, with worse patterns in the presence of persistent avulsion
Lipschuetz et al, 2015 <sup>29</sup> /cross- sectional study	Women 12 months after delivery (n=198)	PFBQ	None	To investigate rates and range of PFD complaints, including anterior and posterior compartments and sexual function, in an unselected population of primiparous women 1 year from delivery, and to examine the degree of bother they cause	Two-thirds of women had symptoms of PFD 1 year after childbirth that caused some degree of discomfort. Women are willing to talk about PFD. Health professionals should take the initiative	
Laterza et al, 2015 <sup>30</sup> / case-control study	Women immediately postpartum (up to 3 days) and 1 year after delivery (n=40)	FPFQ	US transperineal (to evaluate LAM injury) PFMS assessed by Oxford scale POP-Q	Evaluate PFD and anatomical signs of POP in patients with levator LAM trauma compared with patients with an intact LAM 1 year postpartum	Except for urinary symptoms, LAM trauma was asymptomatic in nearly all patients 1 year postpartum. However, POP stage I involving multiple compartments occurred more frequently in LAM trauma patients than in controls	
Rikard-Bell et al, 2014 <sup>31</sup> /cohort study	Women 6 months postpartum (n=766)	PFDI-20	PISQ-12	To investigate the relationship between perineal outcomes and postpartum PFD	This study shows a relationship between perineal outcome and PFD and suggests that an episiotomy is associated with the least morbidity because of symptoms of UI	
van Delft et al, 2014 <sup>32</sup> /cohort study	Women at 36 weeks gestation and 3 months postpartum (n=269)	ICIQ-VS	PFMS POP-Q US (to evaluate LAM injury) ICIQ-SF St Mark's Incontinence Score	To establish the relationship between postpartum LAM avulsion and signs and/or symptoms of PFD	Twenty-one percent of women sustain LAM avulsion during their first VD, with significant impact on signs and symptoms of PFD	
Rogers et al, 2014 <sup>33</sup> / cohort study	Women before 37 weeks gestation, immediately, and 6 months postpartum (n=782)	PFIQ-7	POP-Q Paper towel test ISI QUID Wexner Fecal Incontinence Scale Present Pain Intensity Scale FSFI	To compare pelvic floor function and anatomy between women who delivered vaginally vs those with cesarean delivery prior to the second stage of labor	VD resulted in prolapse changes and objective UI but not in increased self- report PFD at 6 months postpartum compared to women who delivered by cesarean delivery prior to the second stage of labor. The second stage of labor had a modest effect on postpartum pelvic floor function	(Continued)

Table 1 (Continued)

Author, year/ study design	Population studied (n)	Questionnaire used	Other assessment methods	Article goal	Article conclusion
Adaji et al, 2014 <sup>34</sup> / cross-sectional study	Women 9 weeks postpartum (n=90)	PFDI-20	None	To investigate the occurrence and severity of pelvic floor symptoms during the postnatal period among Nigerian women	Pelvic floor symptoms are prevalent in the study population and could be a pointer to the quality of obstetric care available. Efforts need to be intensified to create awareness and build capacity to prevent and manage these symptoms, which could impact the QoL of affected women
Chan et al, 2014 <sup>35</sup> / cohort study	Primiparous women 8 weeks and 1 year postpartum (n=442)	PFDI-46 PFIQ-31	POP-Q US transperineal (to evaluate LAM injury)	To evaluate the effect of LAM injury on pelvic floor disorders and health- related QoL in Chinese primiparous women during the first year after delivery	Seventy-nine percent of women who had LAM injury at 8 weeks after VD had persistent LAM injury at 12 months. LAM injury was associated with prolapse symptoms at 8 weeks after delivery and a higher POPDI general and Urogenital Distress Inventory obstructive subscale scoring. However, we are not able to confirm the association between LAM injury and SUI, UII, mixed UI, and FI at 8 weeks or 12 months after delivery, or prolapse symptoms and PFDI or PFIQ scores at 12 months after delivery
Geller et al, 2014 <sup>36</sup> / cohort study	Women at 35–37 weeks gestation and 6 weeks postpartum (n=73)	PFDI-20 PFIQ-7	POP-Q US endoanal	To determine if shortened perineal body length (<3 cm) is a risk factor for ultrasound-detected anal sphincter tear at first delivery	A shortened perineal body length in primiparous women is associated with an increased risk of anal sphincter tear at the time of first delivery
Durnea et al, 2014 <sup>37</sup> / cohort study	Women at 15 weeks gestation and 1 year postpartum (n=872)	FPFQ	None	To investigate the association between pregnancy and postnatal PFD in premenopausal primiparous women and the associated effect of mode of delivery	The main damage to the pelvic floor seems to occur in the majority of patients before first pregnancy, where first childbearing does not worsen pregnancy PFD in the majority of cases. Pregnancy appears to affect more preexisting symptoms of urgency and urge incontinence comparing to stress incontinence. Cesarean section seems to be more protective against postnatal worsening of pre-pregnancy PFD compared to de novo onset pathology



Elenskaia et al, 2013 <sup>38</sup> /cohort study	Women at second quarter pregnancy, 14 weeks, 1 year, and 5 years postpartum (n=182)	ePAQ PF	POP-Q	To evaluate the changes of pelvic organ support, symptoms, and QoL after childbirth	Five years after childbirth the stage of prolapse worsened after VD but not after cesarean. However, there was no impact on prolapse symptoms or QoL. After VD, women were more likely to experience a worsening in general sex score, but no other difference in QoL measures
Crane et al, 2013 <sup>39</sup> /cohort study	Women 1 year after delivery (n=109)	PFDI-20	FSFI questionnaire	To compare the prevalence and severity of pelvic floor symptoms and sexual function at 1 year postpartum in women who underwent either operative VD or cesarean delivery for second-stage arrest	In this sample of primiparous women with second-stage arrest, mode of delivery did not significantly impact pelvic floor function 1 year after delivery, except for bulge symptoms in the operative VD group and sexual satisfaction in the planned cesarean delivery group
Chan et al, 2012 <sup>40</sup> /cohort study	Primiparous women from first to third trimester of pregnancy, 8 weeks, 6 months, and 1 year postpartum (n=328)	PFDI-46	None	To evaluate factors and their prevalence associated with UI and FI incontinence during and after a woman's first pregnancy	The prevalence of SUI, UUI, and FI was 25.9%, 8.2%, and 4.0%, respectively, 12 months after delivery. VD, antenatal SUI, and UUI were associated with SUI; antenatal UUI and increasing maternal body mass index at the first trimester were associated with UUI. Antenatal FI was associated with FI pregnancy, regardless of route of delivery and obstetric practice, had an effect on UI and FI
Tin et al, 2010 <sup>41</sup> /cross-sectional study	It does not specify the postpartum period (n=325)	PFDI-20 PFIQ-7	None	To determine the prevalence of anal incontinence in postpartum women following obstetrical anal sphincter injury and to assess QoL and prevalence of other pelvic floor symptoms	The prevalence of anal incontinence was 7.7% (formed stool), 19.7% (loose stool), and 38.2% (flatus). Average PFDI and PFIQ scores were significantly higher in the fourth-degree tear group
Geller et al, 2007 <sup>42</sup> /cross-sectional study	Women 6 and 8 weeks postpartum (n=44)	PFDI-20 PFIQ-7	MRI (to evaluate LAM injury) POP-Q	To validate telephone-administered versions of two condition-specific QoL questionnaires: PFDI and PFIQ	Telephone application of these instruments is a reliable and accurate measurement of the impact of PFD and can facilitate clinical and epidemiologic research, reducing cost and improving access to research participants

(Continued)

Table 1 (Continued)

Author, year/ study design	Population studied (n)	Questionnaire used	Other assessment methods	Article goal	Article conclusion
Branham et al, 2007 <sup>83</sup> /cohort study	Women 6 weeks and 6 months postpartum (n=89)	PFIQ-31	MRI (to evaluate LAM injury) POP-Q	To assess postpartum changes in the LAM using MRI and relate these changes to obstetrical events and risk factors associated with PFD	Nulliparity did not guarantee a normal assessment of levator ani anatomy by our blinded reader, and frequency of injury in this series is somewhat greater than that previously reported for primiparas. Younger Caucasian primiparas had a better recovery at 6 months than older Caucasians. Subjects experiencing more global injury, in particular to the ileococcygeous, tended not to recover muscle bulk

**Abbreviations:** 3D, three-dimensional; dp3T MRI, dynamic pelvic 3 T magnetic resonance imaging; DrA, diastasis recti abdominis; ePAQ-PF, electronic Personal Assessment Questionnaire – Pelvic Floor; FSFI, Female Sexual Function Index; FI, fecal incontinence; FPFQ, Female Pelvic Floor Questionnaire; ICIQ-B, International Consultation on Incontinence Questionnaire – Bowel; ICIQ-FLUTSsex, International Consultation on Incontinence Questionnaire – Female Sexual Matters Associated with Lower Urinary Tract Symptoms; ICIQ-SF, International Consultation on Incontinence Questionnaire – Short Form; Tract Symptoms; ICIQ-VS, International Consultation on Incontinence Questionnaire – Vaginal Symptoms; IRD, interrectus distance; ISI, Incontinence Symptom Index; LAM, levator ani muscle; OASIS, obstetric anal sphincter injuries; PFBQ, Pelvic Floor Bother Questionnaire; PFD, Pelvic floor dysfunction; PFDI, Pelvic Floor Distress Inventory; PFIQ, Pelvic Floor Impact Questionnaire; PFDs, pelvic floor dysfunctions; PFM, pelvic floor muscle; PFMt, pelvic floor muscle training; PMS, pelvic floor muscle strength; PISQ-12, Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire; POP, pelvic organ prolapse; POPDI, Pelvic Organ Prolapse Distress Inventory; POP-Q, Pelvic Organ Prolapse – Quantification; QoL, quality of life; QUIJ, Questionnaire for Urinary Incontinence Diagnosis; SG, striae gravidarum; SUL, stress urinary incontinence; UI, urinary incontinence; US, ultrasound; UUI, urgency urinary incontinence; VD, vaginal delivery; VRP, vaginal resting pressure; MRI, magnetic resonance imaging.

The other questionnaires (PFDI-46, PFIQ-31,<sup>72</sup> Pelvic Floor Bother Questionnaire [PFBQ],<sup>75</sup> electronic Personal Assessment Questionnaire – Pelvic Floor [ePAQ-PF],<sup>79</sup> and PFD in pregnancy and postpartum<sup>16</sup>) were used in less than 10% of the studies.

## Discussion

Systematic review of the literature found 33 published articles using nine validated questionnaires for assessing PFDs in the postpartum period: PFDI-20, PFIQ-7, PFDI-46, PFIQ-31, ICIQ-VS, FPFQ (or Australian PFQ), PFBQ, ePAQ-PF, and PFD questionnaire specific for pregnancy and postpartum.

The most frequent questionnaires in our revision were PFDI-20, PFIQ-7, and ICIQ-VS, and probably this is due to ICIQ-VS being part of modular questionnaires of the International Consultation on Incontinence (ICI),<sup>80</sup> and PFDI-20 and PFIQ-7 were highly recommended (grade A) for the evaluation of symptoms and health-related QoL impact of POP by ICI. There is no questionnaire that is highly recommended to assess the PFD in a complete and integrated way by ICI.

The ICI is one of the consultations that are held under the auspices of the International Consultation on Urological Diseases and has a long-standing relationship with International Continence Society. The ICI aims to create an international consensus for evaluation of pelvic symptoms, recommending high-quality instruments, standardizing the evaluation of PFD and the impact on QoL, to guide professionals and researchers in the choice of instruments with universal application.<sup>80</sup> The use of the same instrument for data collection by several researchers favors comparison between studies, allowing meta-analysis of the published results.<sup>9,80</sup>

Regarding the PFDI and PFIQ questionnaires, they were first created in longer versions with 46 and 31 questions, respectively, but because they were too long they became burdensome and time consuming, so the simplified version showed good correlation with the expanded versions, discouraging the use of PFDI-46 and PFIQ-31 versions.<sup>81</sup>

The PFDs include various symptoms, such as UI, FI, POP, sexual dysfunction, and vaginal symptoms, and could be investigated in an integrated model, because often the cause is the same.<sup>82</sup>

Voorham-van der Zalm et al<sup>83</sup> said that PFDI-20, PFIQ-7, and ICIQ-VS are useful tools in research, but each one only assesses certain aspects of PFD and/or QoL. PFDI-20 and PFIQ-7 have some questions that address vaginal symptoms, but without emphasis on sexual factors, and ICIQ-VS is not able to assess bladder and bowel functions. The literature

**Table 2** Characterization, frequency, and translated and validated versions of questionnaires identified for evaluation of PFD in the postpartum period

Questionnaire/validation article/country	Domains – questions	Identified categories	Translation	Freq (%)	Articles in which the questionnaire was used
PFDI-20/Barber et al, 2004 <sup>44</sup> USA	Urinary – 6 POP – 6 Colorectal-anal – 8	Symptom Bother	English, <sup>44,a</sup> Spanish, <sup>45</sup> Greek, <sup>46</sup> Swedish, <sup>47</sup> Turkish, <sup>48</sup> Brazilian Portuguese, <sup>49</sup> Korean, <sup>50</sup> French, <sup>51</sup> Danish, <sup>52</sup> Norwegian, <sup>53</sup> Japanese, <sup>54</sup> Afrikaans, <sup>55</sup> Sesotho, <sup>55</sup> Dutch, <sup>56</sup> Tigrigna, <sup>57</sup> Hebrew, <sup>58</sup> Finnish <sup>59</sup>	10 (30.3%)	Lockhart et al, 2018 <sup>12</sup> Keshwani et al, 2018 <sup>13</sup> Yohay et al, 2016 <sup>21</sup> Gagnon et al, 2016 <sup>23</sup> Rikard-Bell et al, 2014 <sup>31</sup> Adaji and Olajide, 2014 <sup>34</sup> Geller et al, 2014 <sup>36</sup> Crane et al, 2013 <sup>39</sup> Tin et al, 2010 <sup>41</sup> Geller et al, 2007 <sup>42</sup>
PFIQ-7/Barber et al, 2004 <sup>44</sup> USA	Urinary – 7 POP – 7 Colorectal-anal – 7	QoL	English, <sup>44,a</sup> Spanish, <sup>45</sup> Greek, <sup>46</sup> Swedish, <sup>47</sup> Turkish, <sup>48</sup> Brazilian Portuguese, <sup>49</sup> Korean, <sup>50</sup> French, <sup>51</sup> Danish, <sup>52</sup> Norwegian, <sup>53</sup> Afrikaans, <sup>55</sup> Sesotho, <sup>55</sup> Dutch, <sup>56</sup> Tigrigna, <sup>57</sup> Hebrew, <sup>58</sup> Finnish, <sup>59</sup> Chinese <sup>60</sup>	9 (27.3%)	Gagnon et al, 2016 <sup>23</sup> Cyr et al, 2016 <sup>24</sup> Leeman et al, 2016 <sup>25</sup> Rogers et al, 2014 <sup>33</sup> Geller et al, 2014 <sup>36</sup> Tin et al, 2010 <sup>41</sup> Geller et al, 2007 <sup>42</sup> Lockhart et al, 2018 <sup>12</sup> Keshwani et al, 2018 <sup>13</sup>
ICIQ-VS/Price et al, 2006 <sup>61</sup> UK	Vaginal – 9 Sexual – 5	Symptom QoL Bother	English, <sup>61,a</sup> German, <sup>62</sup> Portuguese, <sup>63</sup> Greek, <sup>64</sup> Danish, <sup>65</sup> Sinhala and Tamil (Sri Lanka) <sup>66</sup>	8 (24.2%)	Araujo et al, 2018 <sup>11</sup> Kruger et al, 2017 <sup>15</sup> Abdool et al, 2017 <sup>17</sup> Kolberg Tennfjord et al, 2016 <sup>22</sup> Cyr et al, 2016 <sup>24</sup> Tennfjord et al, 2015 <sup>26</sup> van Delft et al, 2015 <sup>27</sup> van Delft et al, 2014 <sup>32</sup>
FPFQ/Baessler et al, 2010 <sup>67</sup> Baessler et al, 2009 <sup>68</sup> Australia	Bladder – 15 Bowel – 12 POP – 5 Sexual – 10	Symptom QoL Bother	English, <sup>67,68,a</sup> German, <sup>69</sup> French, <sup>70</sup> Serbian <sup>71</sup>	4 (12.1%)	Durnea et al, 2017 <sup>18</sup> Fritel et al, 2015 <sup>28</sup> Laterza et al, 2015 <sup>30</sup> Durnea et al, 2014 <sup>37</sup>
PFDI-46/Barber et al, 2001 <sup>72</sup> USA	Urinary – 28 POP – 16 Colorectal-anal – 17 <sup>b</sup>	Symptom Bother	English, <sup>72,a</sup> Chinese, <sup>73</sup> Spanish <sup>74</sup>	3 (9.1%)	Ng et al, 2017 <sup>19</sup> Chan et al, 2014 <sup>35</sup> Chan et al, 2012 <sup>40</sup>
PFIQ-31/Barber et al, 2001 <sup>72</sup> USA	Urinary – 31 POP – 31 Colorectal-anal – 31	QoL	English, <sup>72,a</sup> Chinese, <sup>73</sup> Spanish <sup>74</sup>	3 (9.1%)	Ng et al, 2017 <sup>19</sup> Chan et al, 2014 <sup>35</sup> Branham et al, 2007 <sup>43</sup>
PFBQ/Peterson et al, 2010 <sup>75</sup> USA	Urinary – 5 POP – 1 Bowel – 2 Sexual – 1	Bother	English, <sup>75,a</sup> Turkish, <sup>76</sup> Arabic, <sup>77</sup> Portuguese <sup>78</sup>	3 (9.1%)	Halperin et al, 2017 <sup>14</sup> Desseauve et al, 2017 <sup>20</sup> Lipschuetz et al, 2015 <sup>29</sup>
ePAQ-PF/Radley et al, 2005 <sup>79</sup> UK	Urinary – 35 Bowel – 33 Vaginal – 22 Sexual – 28	Symptom QoL Bother	English <sup>79,a</sup>	1 (3%)	Elenskaia et al, 2013 <sup>38</sup>
PFD in pregnancy and postpartum Metz et al, 2017 <sup>16</sup> Germany	Bladder – 16 Bowel – 11 POP – 5 Sexual – 9 Postpartum – 9	Symptom QoL Bother	German <sup>16,a</sup>	1 (3%)	Metz et al, 2017 <sup>16</sup>

**Notes:** <sup>a</sup>Original version of the questionnaire. <sup>b</sup>In the PFDI-46 questionnaire, some questions are used in more than one domain.

**Abbreviations:** ePAQ-PF, electronic Personal Assessment Questionnaire – Pelvic Floor; FPFQ, Female Pelvic Floor Questionnaire; ICIQ-VS, International Consultation on Incontinence Questionnaire – Vaginal Symptoms; PFBQ, Pelvic Floor Bother Questionnaire; PFDI, Pelvic Floor Distress Inventory; PFIQ, Pelvic Floor Impact Questionnaire; POP, pelvic organ prolapse; QoL, quality of life.

provides several standardized questionnaires, but each one assesses certain domains of PFD, and they are specific to evaluate symptoms, QoL, and/or bothersome.<sup>80,82,83</sup>

Among the questionnaires included in this review, ePAQ-PF, FPFQ, and PFBQ can evaluate all these domains, but there are some limiting factors for wide use in literature.

The ePAQ-PF<sup>79</sup> is an interactive, self-administered, computer-based questionnaire, developed for clinical practice and validated in primary and secondary care assessing four dimensions (urinary, intestinal, vaginal, and sexual) with symptoms identification, as well as quantifying degree of bother and impact on QoL. Indeed, the ePAQ-PF is not used extensively for reasons that include cost implications involved in purchasing an ePAQ license, and has no translated versions, limiting widespread use in researches.<sup>84</sup>

The PFBQ<sup>75</sup> questionnaire was validated in 2010 with the proposal to create a concise questionnaire that could verify the presence and degree of discomfort of the PFD, allowing its use in both clinical practice and research. But the questions were not well distributed among the domains, because it contains only nine questions, with an emphasis on urinary symptoms (five questions) and only one question for POPs and one question for sexual functions. Another limiting factor is the existence of translated versions in only four languages (English, Turkish, Arabic, and Portuguese), with the Portuguese version just being published.

The FPFQ is a complete questionnaire that can assess all domains, besides addressing the perception of symptoms, the impact on QoL, and the degree of bother, validated in community-dwelling women for application by interview<sup>67</sup> and for self-application.<sup>68</sup> Both versions are composed of 42 questions distributed in four domains: bladder function (15 questions), bowel function (12 questions), POP symptoms (five questions), and sexual function (10 questions).

However, its use is still scarce, as it was introduced only recently in the scientific literature, originally developed and validated in the English language, with versions translated and adapted for application in German,<sup>69</sup> French,<sup>70</sup> and Serbian.<sup>71</sup>

The ICI recommendation also encourages researchers to the translation and validation of these instruments in different languages. The existence of translated and validated versions in several languages also corroborates the widespread use of these evaluation tools in research conducted around the world.<sup>80,85</sup> This method makes it possible to compare results across studies, despite different languages and cultures because the data come from the same instrument. It also

allows the study to be carried out on a larger scale with international participation.

None of these questionnaires described till now were developed to be specifically applied to postpartum women, and most questionnaires have been developed for use with general population or urology/gynecology patients with incontinence.

The PFD has been described during late reproductive period and the occurrence of worsening of symptoms among nonreproductive life. Risk factors such as overweight, obesity, life habits (smoking, sedentarism), age, parity, and mode of delivery have been shown as a health-related multifactorial risk that can be modified and interfered by the health care professionals.<sup>82,86</sup> Indeed, the postpartum period is favorable and has been studied as an important period to early detection and early intervention.

Despite the generally high prevalence of postpartum PFD, the pelvic floor function is not routinely evaluated in health system.<sup>1,2,87</sup> Therefore, the evaluation of an instrument capable of identifying the presence of these symptoms is useful for health promotion and prevention of comorbidities. Health instruments, such as PFD questionnaires, are developed to quantify the often-qualitative symptoms that are underreported and normally coexist and affect the QoL and productivity of many women.<sup>88</sup> The questionnaires are used to identify and amplify early diagnosis and to assist the professionals in monitoring these symptoms, even when they are poorly perceived or not explained by the patients.<sup>89</sup>

Uniformity in obtaining symptoms and clinical complaints by professionals directs and enables evidence-based decision, allowing specialized societies to conduct behaviors and guide the management for PFD. It should be stressed that the health instruments established and recommended by societies, as well as the guidelines are fundamental in developing countries and in countries that adopt primary health care as the main access of patients.<sup>89</sup>

Furthermore, postpartum evaluation requires validated and preferred questionnaires that were designed for women during this period of life. Luthander et al<sup>90</sup> believe that the greatest symptoms of PFD are related to the need of reviewing obstetric care. Thus, it serves as a tool for evaluating obstetric practices, allowing the identification of possible failures and the improvement in obstetric care.

Recently, Metz et al<sup>16</sup> (2017) developed a questionnaire to assess PFDs in pregnancy and postpartum, and it is based on the German version of the FPFQ, with some modifications to access younger women. However, because this questionnaire is a recent addition to the field and only in German version,

its usefulness has not yet been thoroughly analyzed in clinical practice and further research is necessary to evaluate its feasibility and accessibility.

Still, the ICI advises that researchers should use existing highly recommended or recommended questionnaires if possible as this aids comparison, and to reduce the increasing proliferation of questionnaires.<sup>80,85</sup>

This review assists health care professionals and researchers in choosing an assessment tool for postpartum PFDs and proposes standardization in the method of research and scientific work. For the choice of questionnaire, it is suggested to use those validated and recommended by the academic society for population surveys and clinical practice of primary health care.<sup>80,85</sup>

The assessment of postpartum PFD is necessary to identify these symptoms, avoiding the evolution of these disorders. The international literature reveals that PFD tools developed specifically for women in postpartum period still need to be better explored and developed, allowing early treatment and comprehensive approach by the gynecologist and health care providers.<sup>16,90</sup> There is still no questionnaire that is highly recommended for this purpose by ICI.<sup>80,85</sup> They encourage researchers to raise the standard of outcome assessment and trial methodology in these fields in the forthcoming years.

## Limitations

One of the limitations of this systematic review was the choice of appropriate keywords for the evaluation of PFDs. The term used in the literature is Pelvic Floor Dysfunction, but it is registered in the MeSH as Pelvic Floor Disorders. The two descriptors were used according to the citations in the literature. In addition, different types of reporting biases may hinder the interpretation of systematic reviews. Other limitation was the exclusion of articles published in journals with restricted access being 14 titles excluded. Besides that, the research was focused on articles published in peer-reviewed journals, excluding reports and books.

## Conclusion

The most frequently reported questionnaires in this review included PFDI-20, PFIQ-7, and ICIQ-VS and are recommended by ICI. In addition, the review identified a specific questionnaire, recently developed, to assess PFD during pregnancy and postpartum.<sup>16</sup>

This review reveals that the questionnaires used to evaluate PFD during postpartum period are developed for the general population or urology/gynecology patients with

incontinence and reinforce the paucity of highly recommended questionnaires designed for postpartum, in order to improve early and specific approach for this period of life.

## Disclosure

The authors report no conflicts of interest in this work.

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