Journal of Pelvic, Obstetric and Gynaecological Physiotherapy, Spring 2019, **124,** 22–32

LITERATURE REVIEW

Does pelvic floor muscle training improve symptoms of pelvic organ prolapse for women? A review of the evidence and reflection on the physiotherapist's role

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Abstract
Pelvic organ prolapse (POP) affects more than 30% of the general female population. While physiotherapy treatment, especially pelvic floor muscle training (PFMT), is well established as a key part of the management strategy for this condition, there are inconsistencies with regard to its pathway across the UK. Furthermore, it is well established that management of POP is directed by the patient's symptoms; however, to the authors' knowledge, there has not been a review of the literature that specifically uses symptom-based outcomes. The aim of this paper is to: (1) critically review the available literature in order to determine if PFMT is effective in improving the symptoms of women with POP; and (2) consider the impact that this may have on managing patients with POP, and the role of physiotherapy within the management pathway. The review found a moderate body of good evidence supporting the role of PFMT in the management of the symptoms of POP. It also supported physiotherapy as a first-line management strategy for grade I–III POP.

Keywords: management, pelvic floor muscle training, pelvic organ prolapse, POP, symptoms.

Introduction

Pelvic organ prolapse (POP) is the descent of the anterior or posterior vaginal wall, the uterus, or the apex of the vagina (Haylen *et al.* 2016). Common symptoms reported by patients include vaginal bulging, pelvic pressure and low back pain, with or without bladder, bowel or sexual dysfunction. Pregnancy, childbirth, connective tissue abnormalities, pelvic floor weakness, age, the menopause and a chronic increase in abdominal pressure (e.g. straining to open the bowel) can all contribute to the aetiology of POP (Hagen & Stark 2011). The prevalence of this condition is significant, and has been reported to exceed 30% of the general female population (Bø *et al.* 2015), with some literature reporting frequencies of up to 50% in parous women (Hagen & Stark 2011).

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A diagnosis of POP is made by grading its severity using the Pelvic Organ Prolapse Quantification System (POP-Q), which correlates the stage of prolapse according to its most distal portion in relation to the hymen. The severity ranges from I to IV, by which stage complete eversion has occurred (Haylen *et al.* 2016). This anatomical definition is often used in research, but does not always help to determine patient management in clinical practice. When considering treatment, it is well documented that the anatomical positioning of a prolapse should be correlated with relevant POP symptoms. However, Mouritsen & Larsen (2003) concluded that the latter had little relation to prolapse compartment failure or POP-Q staging. Symptoms are the main reason for patients presenting to healthcare professionals, since these affect their quality of life. It is paramount that each individual's symptoms, not simply anatomical change, determine management.

The treatment options that are available to patients are: surgery; mechanical support, in the

form of a vaginal pessary; and conservative measures to improve the symptoms and the prolapse itself, such as pelvic floor muscle (PFM) training (PFMT). Up to 7% of women have prolapse surgery during their lifetime (Hagen *et al.* 2014). Prolapse reoccurs in up to 58% of these individuals, and up to one-third have further surgery (Whiteside *et al.* 2004). In recent years, there has been controversy with regard to complications following vaginal mesh repair surgery (de Tayrac & Sentilhes 2013). The English National Health Service (NHS) has recently announced a "high-vigilance restriction period", decreasing the number of surgical options for this patient group that are currently available (NHS England 2018). Therefore, it is imperative to use conservative measures, and a robust evidence base for the use of these approaches is essential.

Pelvic floor muscle training, accompanied by lifestyle advice, is commonly implemented on a one-to-one basis by physiotherapists for the management of POP. Women with POP have reduced PFM strength (DeLancey *et al.* 2007). The PFMs are integral to pelvic organ support. A randomized controlled trial (RCT) of 109 women by Brækken *et al.* (2010a) demonstrated that 6 months of PFMT altered the morphology of the these muscles by improving strength, thickness and length, and as a result, enhanced bladder neck position and levator hiatus area in women with stage I–III POP. In their Cochrane Review, Hagen & Stark (2011) concluded that the evidence to support PFMT for POP remained limited, and that standard outcome measures were required to pool data. A more recent meta-analysis by Li *et al.* (2016) was only able to pool data from high-quality RCTs of POP-Q outcomes. A variety of both objective and subjective primary outcomes have been reported in the literature, hampering comparisons across studies. This calls for a symptom-based review of the literature to ensure that best practice is based on evidence that supports symptom improvement and relief.

There are currently no national guidelines for the management of women with POP. However, the forthcoming publication of the updated National Institute for Health and Care Excellence (NICE) guidance on the management of urinary incontinence and POP in women (NICE 2019) is eagerly anticipated.

Conservative management has never been more essential in the management of POP. In many public and private settings, the pathways of care for individuals with this condition lack consistency. There is disparity between patients with POP who can self-refer to private or NHS physiotherapy, those who are seen in secondary care by urogynaecologists in the first instance, and those seen by physiotherapists in the first instance, following GP referral. With the current changes with regard to surgical interventions, it is proposed that conservative management may be best placed to be the first-line treatment for patients with stage I–III POP in both public and private practice. It is proposed that physiotherapists have the skills to manage these patients during first-line treatment. Streamlined pathways will also contribute to the cost-effectiveness of service use. However, robust evidence is needed to support this argument.

The aims of the present study were to:

(1) critically review the available literature in order to determine if PFMT is effective in improving the symptoms of women with POP (to the present authors' knowledge, this is the first review to focus purely on patients' experiences of symptoms); and
(2) consider the impact that this may have on managing patients with POP, and the role of physiotherapy within the management pathway.

Materials and methods

A comprehensive, systematic search of appropriate healthcare databases was completed using specifically designed population, intervention, control, outcome, study type and time (PICOST) criteria that served the aims of the present literature review. Table 1 shows the PICOST criteria, search terms and reasoning for these selections.

The inclusion criteria were as follows. Studies must involve women of any age with POP, as defined by the POP-Q, and one-to-one PFMT for at least one session with a trained therapist, or study personnel, as the primary intervention. Control should be through a waiting list, lifestyle advice or verbal instruction of PFMT. At least one of the primary outcomes must be symptom-related, and make use of a validated outcome measure or questionnaire. There should be adequate symptom outcome information for cross-comparison. Only RCTs of PFMT conducted between 2010 and 2018, inclusive, must be considered: the last comprehensive Cochrane Review (Hagen & Stark 2011) completed its literature search up until 2010, thus defining the time line for the present search.

The exclusion criteria were: studies that duplicated the same data as another study (in such cases, the study with the longest follow-up was

Table 1. Search criteria: (POP) pelvic organ prolapse; (POP-Q) Pelvic Organ Prolapse Quantification System; (PFM) pelvic floor muscle; (PFMT) pelvic floor muscle training; and (RCTs) randomized controlled trials

Criterion	Search	Search terms/keywords	Reasoning
Population	Women with POP of any adult age diagnosed with POP-Q staging	POP, prolapse, genital prolapse	Postnatal, pre- and post-menopausal women can present with POP at any age; the POP-Q is a standardized tool used in the literature to define POP
Intervention	PFMT with at least one, one-to-one session	PFMT, PFM exercises, Kegel exercises, physiotherapy, physical therapy	The first author's (C.P.) current practice is one-to-one PFMT with no formal PFMT group
Control	Waiting list, no treatment, or lifestyle or verbal advice	Waiting list, advice, leaflets, lifestyle advice	To ensure that the primary analysis was of PFMT and not alternative therapies in parallel arms
Outcome	At least one primary outcome measure of patient symptoms with a validated gauge or questionnaire	Symptoms, quality of life, questionnaires	To focus the review on symptom outcomes, since this is of most concern to patients and drives their care
Study type	RCTs in the English language	RCTs	To ensure that the highest-quality primary evidence is reviewed in the hierarchy of evidence
Time	2010–2018 (September 2018)	2010–2018	To ensure that more-recent evidence is reviewed, i.e. studies published after the previous Cochrane Review (Hagen & Stark 2011)

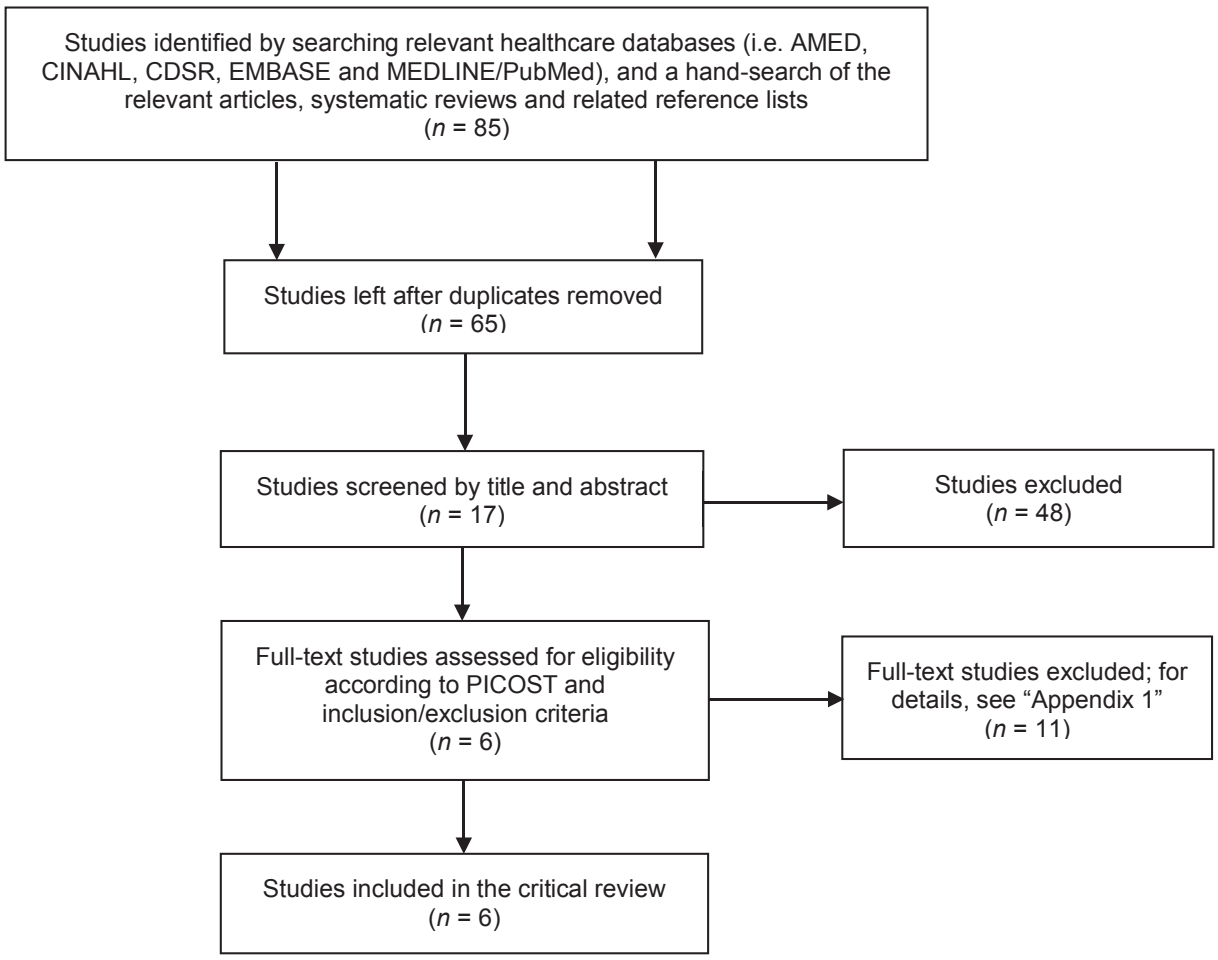

Figure 1. Literature search strategy: (AMED) Allied and Complementary Medicine Database; (CINAHL) Cumulative Index to Nursing and Allied Health Literature; (CDSR) Cochrane Database of Systematic Reviews; (EMBASE) Excerpta Medica Database; (MEDLINE) Medical Literature Analysis and Retrieval System Online; and (PICOST) population, intervention, control, outcome, study type and time.

utilized); pilot studies with small sample sizes; controls where another significant treatment arm was used for primary analysis; and outcomes for PFM strength, or bladder, bowel and sexual dysfunction, rather than POP-symptom-specific outcomes.

Figure 1 shows the search strategy and process utilized in order to decide on the final studies for inclusion in the present review. The search strategy was adapted from the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram (Moher *et al.* 2009).

Results

Six studies were identified and appraised using the Critical Appraisal Skills Programme (CASP 2018). Five of the six studies found statistically significant improvements in PFMT intervention groups compared with their controls. When pooled, the entire sample size of these studies is 1506 participants. Four studies were deemed to be of good validity according to the appraisal method employed by the present authors, while the remaining two were found to be of moderate and low validity, respectively. A Physiotherapy Evidence Database (PEDro) score (PEDro 1999) was calculated for each study to ensure that only high-quality studies were included in the present critical review. A score higher than 6 is deemed to indicate high quality. The PEDro scale is a valid measure of the methodological quality of clinical trials (de Morton 2009). Table 2 provides a summary of the appraisal of each study in accordance with these methods.

Discussion

Taken at face value, the evidence base in support of PFMT as an intervention appears to be promising. However, further considerations with regard to the content of these studies must be discussed.

Due *et al.* (2016a) differed from the other studies by concluding that there was no statistical difference between groups or from baseline

Table 2. Critical analysis of the studies included in the literature review: (POP-Q) Pelvic Organ Prolapse Quantification System; (PFMT) pelvic floor muscle training; (POP-SS) Pelvic Organ Prolapse Symptom Score; (PGI-I) Patient Global Impression of Improvement; (PFDI-20) Pelvic Floor Distress Inventory; (HRQoL) health-related quality of life; (PFIQ-7) Pelvic Floor Impact Questionnaire – Short Form 7; (95% CI) 95% confidence interval; (FU) follow-up; and (PEDro) Physiotherapy Evidence Database

	Study					
Variable	Brækken *et al.* (2010b)	Kashyap *et al.* (2013)	Hagen *et al.* (2014)	Due *et al.* (2016a)	Panman *et al.* (2017)	Hagen *et al.* (2017)
Population	POP-Q stage I–III ($n = 109$) Age: any	POP-Q stage I–III ($n = 140$) Age: 20–70 years	POP-Q stage I–III ($n = 447$) Age: any	POP-Q stage II–III ($n = 109$) Age: ≥ 18 years	POP-Q stage I–II ($n = 287$) Age: ≥ 55 years	POP-Q stage I–III ($n = 414$) Age: any but postnatal
Intervention	PFMT 1:1 × 17 in 6 months, home PFMT × 3 per day + lifestyle advice ($n = 59$)	PFMT 1:1 × 7 + home PFMT with self-instruction manual ($n = 70$)	PFMT 1:1 × 5 in 16 weeks + home PFMT × 3 daily + lifestyle leaflet ($n = 225$)	PFMT 1:1 × 1, home PFMT × 5 per week + structured lifestyle advice programme with group PFMT × 6 sessions in 12 weeks ($n = 56$)	PFMT 1:1, pragmatic and tailored to individual needs + lifestyle advice + home PFMT × 3–5 per week ($n = 145$)	PFMT 1:1 × 5 in 16 weeks + home PFMT × 3 daily + lifestyle advice leaflet + Pilates class ($n = 207$)
Control	Lifestyle advice + asked not to do PFMT ($n = 50$)	Self-instruction manual for home PFMT (unsure if leaflet) with × 3 visits ($n = 70$)	Lifestyle leaflet in post ($n = 222$)	Structured lifestyle advice programme × 6 sessions in 12 weeks ($n = 53$)	Watchful waiting with education leaflet on PFMs ($n = 142$)	Lifestyle advice leaflet ($n = 207$)
Primary outcomes	POP-Q and valid symptom questionnaire – limited information Baseline + 6 months	POP-SS Baseline + 6, 18 and 24 weeks	POP-SS Baseline + 6 and 12 months	PGI-I, PFDI-20, HRQoL and PFIQ-7 Baseline + 3, 6 and 12 months	PFDI-20 Baseline + 3, 12 and 24 months	POP-SS Baseline + 1 and 2 years
Primary result	$P = 0.035$, significant improvement (one POP-Q stage) compared to control 95% CI = 1.03–7.73, $P = 0.04$, significant improvement in POP bother	$P = 0.002$, significant improvement in POP-SS compared with control	95% CI = 0.46–2.59, $P = 0.0053$, significant improvement in POP symptoms compared to control	No significant difference between groups or from baseline in PGI-I, $P = 1.0$, or PFDI-20, $P = 0.17$	95% CI = 7.2–17.2, $P < 0.001$, significant improvement in PFDI-20 compared to control	95% CI = –1.70 to –0.33, $P = 0.004$, significant improvement in POP-SS compared to control
Statistical analysis	Over 80% power Pre-set calculations Between-group analysis by χ^2 95% CI for treatment effect	Over 80% power Pre-set power calculations Baseline to 24 weeks variables Between-groups Mann–Whitney *U*-test No CI	Underpowered, 253 needed per group for 80% power CI at 95% Between-groups *P*-value Baseline to 12 months with linear mixed-effects model	Missing data for PGI-I at 12 months Parametric test not clear No power analysis – initial study calculations mean the 12-month FU is underpowered CI at 95%	Pre-set participant numbers, for power, CI, statistical significance Over 80% power CI at 95% Appropriate tests	Over 80% power Pre-set power calculations CI at 95% POP-SS compared between groups with repeated measures mixed models
Follow-up	6 months	6 months	12 months	12 months	24 months	24 months
Randomization	Computer-generated	Block randomization, not concealed	Computer-generated	Computer-generated	Computer-generated	Computer-generated

Continued/

Table 2. (*Continued*)

	Study					
Variable	Brækken *et al.* (2010b)	Kashyap *et al.* (2013)	Hagen *et al.* (2014)	Due *et al.* (2016a)	Panman *et al.* (2017)	Hagen *et al.* (2017)
Dropout (%)	105 of 109 final outcomes 4% dropout at 6 months	120 of 140 at final visit, 140 in analysis 14% dropout at 24 weeks	295 of 447 final outcomes 34% at 12 months for questionnaire	83 of 109 final outcomes 24% dropout	265 of 287 final outcomes 10% dropout of questionnaire from PFMT	345 of 414 final outcomes 17% dropout at 24 months
Intention-to-treat analysis	Completed	Completed	Completed	Completed in initial study for 6-month FU, but not for 12-month FU	Completed for each equation	Completed
Blinding:						
assessor	Yes	No	Yes	Yes	Yes	Yes
participants	No	No	No	No	No	No
therapist	No	No	No	No	No	No
Baseline	Mostly similar Important difference in POP symptoms, $P = 0.024$	No statistically significant differences	No differences in descriptive data	No statistically significant differences	Mostly similar Previous POP treatment and surgery differences, with descriptive data	Similarity between groups in descriptive data Time collected differed at different sites for POP-Q
Bias	Performance	Performance Detection Selection	Performance	Reporting – no data for primary outcome Performance	Performance	Performance
Applicability	Moderate: method has very high patient contact, not applicable to clinical context	Poor: method was not pragmatic as per clinical practice for home exercises	Good: pragmatic method and patient population as per first author's (C.P.'s) practice	Moderate: long-term FU, but limited 1:1 PFMT	Good: primary care population as per first author's (C.P.'s) pathway	Good: pragmatic method and patient population as per first author's (C.P.'s) practice
Overall validity	Good	Low	Good	Moderate	Good	Good
PEDro score	8	6	8	7	8	8

at 12 months. However, they used a different methodology from that employed in the other five studies. One PFMT one-to-one session was completed, compared to either a pragmatic approach or a minimum of five. Thompson *et al.* (2005) suggested that 36–49% of women with prolapse can perform a correct PFM contraction. Skill training may take more than one session for some participants. Therefore, some participants in the intervention group may not have competently performed PFMT, and this may have resulted in a poorer outcome. Other methodological flaws across the studies include the use of only slow-twitch PFM contractions in Kashyap *et al.* (2013), which is not typical of PFMT, and the inclusion of adjuncts to PFMT in some pragmatic methods (Panman *et al.* 2017) compared to the exclusion of these additions in others (Hagen *et al.* 2014). The intervention by Hagen *et al.* (2017) included a Pilates class, and Brækken *et al.* (2010b) reported a longer patient contact time than is possible in some private and NHS practices. The variety in methods across the studies poses a challenge for comparison. The differences in methods mean that the results must be carefully considered.

The control in four of the six studies involved leaflet advice or watchful wait. However, Due *et al.* (2016a) and Kashyap *et al.* (2013) had patient contact, the former authors conducting group sessions. While equalizing contact time between groups provides comparability, it may also create a Hawthorne effect in the control group, possibly improving subjective outcomes. This may contribute to the non-statistical difference reported by Due *et al.* (2016a).

The POP-Q stages investigated differed across the six studies. It is possible that the inclusion of only lower-grade stages might benefit results: patients' symptoms may be less severe initially, resulting in a greater treatment effect, as in the case of Panman *et al.*'s (2017) results ($P < 0.001$). Including higher grades (Hagen *et al.* 2014) allows for a more-representative population, as seen in patients presenting to a healthcare practitioner for the first time.

Two points stand out with regard to the recruitment of participants. First, Hagen *et al.* (2017) recruited participants from a database. This is beneficial since it has been estimated that prolapse symptoms are underreported because of embarrassment. Conversely, compared to other studies utilizing the Pelvic Organ Prolapse Symptom Score (POP-SS) as a primary outcome measure, it resulted in less-severe baseline values, potentially influencing the good treatment effect, i.e. $P = 0.004$ (Hagen *et al.* 2014, 2017, baseline = 10.04 and baseline for intervention group = 4.4, respectively). Secondly, Hagen *et al.* (2014) and Brækken *et al.* (2010b) excluded patients who had undergone previous prolapse surgery. Since Peterson *et al.* (2010) suggested that the first operation is the most successful, it is particularly recommended that such patients should initially explore conservative measures. The populations involved in these studies should be interpreted with some caution since the consideration of patients who have had previous surgery in physiotherapy management is paramount.

All six studies utilized valid symptom outcome measures. The Pelvic Floor Distress Inventory (PFDI-20), which was used in two studies, has been found to be valid and reliable (Barber *et al.* 2005). The POP-SS, which was used in three studies, has good internal consistency and construct validity (Hagen *et al.* 2009). A strength of the POP-SS is that it specifically measures prolapse symptoms, whereas the PFDI-20 assesses pelvic floor dysfunction as a whole. Brækken *et al.* (2010b) referenced a valid symptom outcome measure, but it differed from those employed in the other studies, making a comparison of the results difficult. A standardized POP-related valid outcome (e.g. the POP-SS) should be used in future research to allow cross-comparison. This should be considered to be a valid, patient-focused symptom outcome measure in physiotherapy management.

The outcome data collected across the studies included relatively good follow-up, which is positive. With the exception of Brækken *et al.* (2010b), who conducted a short, 6-month follow-up period, the final outcome data was collected over 1–2 years. This is important because POP is a chronic condition in which risk factors (e.g. obstetric history and menopausal state) may not change. The supportive data collected across this timescale is significant when discussing conservative management and longevity. Compliance with ongoing PFMT at follow-up was reported in three studies, and ranged from 89% at 6 months to 77% at 2 years. This information supports a long-term approach to conservative management.

Another strength of long-term follow-up was that three studies collected secondary data on the uptake of further treatment. This ranged from 0% (Hagen *et al.* 2017) to 11% (Hagen *et al.* 2014) for surgery in the intervention group. It is postulated that, since the former study recruited patients from a database, they had no symptoms or

relatively less-bothersome ones, and therefore, they would not embark on invasive procedures. A negative aspect of longer-term follow-up is that it is often associated with a higher dropout rate. Dropout rates ranged from 4% (Brækken *et al.* 2010b) to 34% (Hagen *et al.* 2014), with the former showing a relationship with shorter follow-up. Two studies reported dropout rates that were higher than 20%, which means that these results should be treated with caution. On the other hand, all but one study (Due *et al.* 2016a) did complete an intention-to-treat analysis, which enhances validity. However, the results of the intention-to-treat analysis performed by Kashyap *et al.* (2013) must be interpreted with caution: four participants transferred from the control to the intervention group after randomization, but it is not made clear as to where they were finally analysed.

All six studies used adequate group randomization, resulting in similar baseline characteristics between groups. Most utilized allocation concealment, reducing selection bias risk. However, Kashyap *et al.* (2013) did not adequately conceal allocation. Furthermore, these authors did not blind the principle assessor, and thus, increased the risk of selection and detection bias. Therefore, the validity of this study is reduced, compromising confidence in its results. Assessor blinding was adhered to across the five other studies. It is accepted that, because of the nature of the intervention, study design prohibits blinding of the participants and therapists. Although performance bias is a possibility, it should not detract from the potential effect of the intervention. The study by Due *et al.* (2016a) may suffer from reporting bias because they reported no data for the primary outcome. Overall, four of the studies (Brækken *et al.* 2010b; Hagen *et al.* 2014, 2017; Panman *et al.* 2017) are at low risk of bias, which allows conclusions to be drawn.

The combined number of study participants ($n = 1506$) facilitates relative confidence in the effect size. However, two studies were under the acceptable power level of 80%. There was no power analysis for Due *et al.* (2016b), and the high dropout rate in Hagen *et al.* (2014) led to an underpowered study. This equates to questions about whether the study findings are the result of chance, and this should be taken into account alongside other flaws in each study when considering the overall validity.

With merit, five studies reported clinical relevance with confidence intervals at 95%. Although statistically significant, it should be noted that only Hagen *et al.* (2017) had a value that was less than clinically important. This may be attributed to the participation of possibly asymptomatic patients. Encouragingly, four studies provide clinically significant results.

Limitations

There are limitations to the present literature review. It was solely conducted by the first author (C.P.), and hence, the analysis of each RCT has an element of opinion since the validity has not been discussed with other professionals. Additionally, the review does not utilize a formal systematic approach, and does not include a meta-analysis.

Implications

The present literature review provides insight into a pertinent area of clinical practice. The validity of four of the studies is good (Brækken *et al.* 2010b; Hagen *et al.* 2014, 2017; Panman *et al.* 2017), and the findings support the use of PFMT in the management of POP. These results can be used with confidence. As discussed above, two studies have less validity as a result of a higher risk of bias and methodological flaws (Kashyap *et al.* 2013; Due *et al.* 2016b). However, all studies were deemed to be of high quality on PEDro scoring, and thus, were included in the present literature review.

The strengths of the well-powered studies are that these employed pragmatic methods, and reported valid outcomes, mostly comparable outcomes and insightful follow-ups. All studies included in the present literature review represent the highest level of available evidence, and consist only of RCTs, some of which were large multicentre trials. The weaknesses involve the variations in the methods, with some studies being at risk of bias or high dropout rates. It should be noted that the study that did not support PFMT over control treatment (Due *et al.* 2016a) had both methodological and statistical flaws. The value of patient-reported symptoms in comparison to objective POP-Q scoring has been highlighted.

The role of physiotherapy

It has been possible to draw a number of conclusions from this literature review. In order to improve symptoms, the present findings support referring patients with stage I–III POP to physiotherapy for PFMT in the first instance, possibly including patients who have previously had POP surgery. Pelvic floor muscle training appears to be effective, and there is some evidence that

patients are compliant over the longer term and maintain the benefits. In comparison to surgical interventions, this appears a sensible first-line approach. There is no evidence for implementing this pathway for patients with stage IV POP, and because of the risk of secondary complications such as ulceration, they should be referred for mechanical or surgical support in first instance.

Pelvic health physiotherapists have a variety of competences, including excellent clinical reasoning, high standards of conservative treatment delivery, excellent communication skills and a thorough approach to examination. Additionally, in many NHS and private services, extended scope practitioners in pelvic health are independent prescribers, and can assess and manage patients with POP for pessary fitting and follow-up. It is well known that the needs of the community and the direction of the NHS are driving a move towards a community-based care system, which will enable patients to access care in a safe and convenient setting.

Within musculoskeletal physiotherapy, the Chartered Society of Physiotherapy has produced guidelines for the implementation of first-contact practitioners, i.e. extended scope physiotherapists who review patients within general practice and utilize their expertise in musculoskeletal conditions. This is part of NHS England's First Contact Practitioner High Impact Intervention (CSP, RCGP & BMA 2018). With supporting evidence for the role of PFMT and lifestyle advice as first-line management for stage I–III POP and pelvic health physiotherapists with skills in prescribing and pessary management, it is proposed that, within pelvic health, we should be ambitious as first-contact practitioners for patients with POP in the general practice setting. In truth, with thorough subjective and objective examination skills, pelvic health physiotherapists sit in a privileged position, one in which their expertise across bladder, bowel, sexual dysfunction and pelvic pain conditions would be of significant benefit to patients at their first contact. They may not only benefit from triage to a relevant service, but would also receive expert advice, guidance and treatment at their initial presentation.

The present literature review has supported the role of PFMT as a first-line treatment for POP symptom management within the pathway of the multidisciplinary team (MDT). It has also highlighted an area for discussion relating to extended scope physiotherapists with first-contact practitioner roles managing patients with POP, and the wider implications for pelvic health.

Further research

Gaps in the knowledge base highlighted by this critical review should be considered as areas for future research. The significance of patient groups (e.g. those who have undergone previous surgery), menopausal status and the prevalence of pelvic floor defects (e.g. levator trauma) should be explored. These may potentially affect outcomes and require a different pathway. A review of studies comparing pessary use and surgery to PFMT with a longer follow-up would be beneficial. It should involve a review of comparable risks to patients.

The cost-effectiveness of one-to-one PFMT should be closely examined, and this information is available for analysis in some of the studies discussed in the present literature review. Preventative measures to improve cost-effectiveness are well established in other areas of healthcare. One of the first studies to consider this was Hagen *et al.* (2017). Further research into the prevention and management of risk factors such as constipation would be invaluable. It is anticipated that the publication of the NICE guidance this year will help to modify the pathway (NICE 2019). The implementation of an algorithm following future publications would enable clear patient management across the MDT.

Conclusion

The present literature review highlights a moderate volume of good-quality evidence that supports the use of PFMT for women with POP to improve their symptoms. This should be utilized to implement consistent patient pathways. Considerations of the future role of pelvic health physiotherapists in general practice and primary care should be explored in order to provide the best patient care at the earliest possible presentation.

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Appendix 1

Table 3 lists full studies that were excluded from the literature search following an assessment for eligibility.

Table 3. Full studies excluded from the search following assessment for eligibility, and the reasons for doing so: (PFM) pelvic floor muscle; (PFMT) pelvic floor muscle training; and (POP) pelvic organ prolapse

Reference	Reason
Alves F. K., Riccetto C., Adami D. B. V., *et al.* (2015) A pelvic floor muscle training program in postmenopausal women: a randomized controlled trial. *Maturitas* **81** (2), 300–305.	Urinary symptoms were the primary outcome; PFMT taught only in a class
Bernardes B. T., Resende A. P. M., Stüpp L., *et al.* (2012) Efficacy of pelvic floor muscle training and hypopressive exercises for treating pelvic organ proapse in women: a randomized controlled trial. *Sao Paulo Medical Journal* **130** (1), 5–9.	POP was not the main outcome
Bø K., Hilde G., Stær-Jensen J., *et al.* (2015) Postpartum pelvic floor muscle training and pelvic organ prolapse – a randomized trial of primiparous women. *American Journal of Obstetrics and Gynecology* **212** (1), 38.e1–38.e7.	Symptoms were a secondary outcome; very limited data
Brækken I. H., Majida M., Engh M. E. & Bø K. (2010) Morphological changes after pelvic floor muscle training measured by 3-dimensional ultrasonography: a randomized controlled trial. *Obstetrics and Gynecology* **115** (2), 317–324.	Primary outcomes were changes in morphology, not symptoms
Cheung R. Y. K., Lee J. H. S., Lee L. L., Chung T. K. H. & Chan S. S. C. (2016) Vaginal pessary in women with symptomatic pelvic organ prolapse: a randomized controlled trial. *Obstetrics and Gynecology* **128** (1), 73–80.	Intervention involved pessary treatment, not PFMT
Due U., Brostrøm S. & Lose G. (2016) Lifestyle advice with or without pelvic floor muscle training for pelvic organ prolapse: a randomized controlled trial. *International Urogynecology Journal* **27** (4), 555–563.	Data published in another study with a longer-term follow-up
Özengin N., Ün Yıldırım N. & Bülent D. (2015) A comparison between stabilization exercises and pelvic floor muscle training in women with pelvic organ prolapse. *Turkish Journal of Obstetrics and Gynecology* **12** (1), 11–17.	Control was stabilization
Resende A. P. M., Stüpp L., Bernardes B. T., *et al.* (2012) Can hypopressive exercises provide additional benefits to pelvic floor muscle training in women with pelvic organ prolapse? *Neurourology and Urodynamics* **31** (1), 121–125.	PFM strength was the main outcome, not POP symptoms
Stüpp L., Resende A. P. M., Oliveira E., *et al.* (2011) Pelvic floor muscle training for treatment of pelvic organ prolapse: an assessor-blinded randomized controlled trial. *International Urogynecology Journal* **22** (10), 1233–1239.	Pilot study with a small sample size
Wiegersma M., Panman C. M. C. R., Kollen B. J., *et al.* (2014) Effect of pelvic floor muscle training compared with watchful waiting in older women with symptomatic mild pelvic organ prolapse: randomised controlled trial in primary care. *The BMJ* **349:** g7378. DOI: 10.1136/bmj.g7378.	Data published in another study with a longer-term follow-up
Wiegersma M., Panman C. M. C. R., Kollen B. J., *et al.* (2014) Pelvic floor muscle training versus watchful waiting or pessary treatment for pelvic organ prolapse (POPPS): design and participant baseline characteristics of two parallel pragmatic randomized controlled trials in primary care. *Maturitas* **77** (2), 168–173.	Pessary treatment was the main intervention