National Institute for Health and Care Excellence

Final

Postnatal care

[J] Perineal pain

NICE guideline NG194

Evidence review underpinning recommendations 1.2.15 to 1.2.22

April 2021

Final

This evidence review was developed by the National Guideline Alliance, part of the Royal College of Obstetricians and Gynaecologists

Disclaimer

The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or service users. The recommendations in this guideline are not mandatory and the guideline does not override the responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or their carer or guardian.

Local commissioners and/or providers have a responsibility to enable the guideline to be applied when individual health professionals and their patients or service users wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with compliance with those duties.

NICE guidelines cover health and care in England. Decisions on how they apply in other UK countries are made by ministers in the Welsh Government, Scottish Government, and Northern Ireland Executive. All NICE guidance is subject to regular review and may be updated or withdrawn.

ISBN: 978-1-4731-4078-3

Contents

Perineal pain

Review question

What characteristics of perineal pain suggest the need for further evaluation?

Introduction

The process of giving birth vaginally nearly always results in some degree of perineal trauma. The committee's experience is that the associated symptoms are often normalised by health professionals, and this may result in the pain or the complications of perineal wounds not being assessed or addressed appropriately. The aim of this evidence review is to explore what characteristics of perineal pain suggest a need for further evaluation.

Summary of the protocol

Please see Table 1 for a summary of the Population, Prognostic factors, Confounding factors and Outcome characteristics of this review.

Table 1: Summary of the protocol

Population	Women who have given vaginal birth and are experiencing perineal pain, after the initial postpartum assessment up to 8 weeks after birth.
Prognostic factors	• Pain duration • Severity of pain on a validated pain score • Pain not decreasing or increasing over time or increased requirement for analgesia • Swelling and duration of swelling • Wound breakdown or infection • Offensive vaginal discharge • Fever • Urinary and faecal incontinence • Difficulty urinating or defecating • Physical discomfort • Sexual distress score
Confounding factors	• Age • BMI • Parity • Cultural and linguistic differences
Outcomes	**Critical** • psychosexual problems • chronic perineal pain • physical and emotional functional impairment. **Important** • unplanned attendance to health services including admissions.

For further details see the review protocol in appendix A.

Methods and process

This evidence review was developed using the methods and process described in Developing NICE guidelines: the manual 2014. Methods specific to this review question are described in the review protocol in appendix A.

Declarations of interest were recorded according to NICE's 2014 conflicts of interest policy until March 2018. From April 2018 until June 2019, declarations of interest were recorded according to NICE's 2018 conflicts of interest policy. From July 2019 onwards, the declarations of interest were recorded according to NICE's 2019 conflicts of interest policy. Those interests declared before July 2019 were reclassified according to NICE's 2019 conflicts of interest policy (see Register of Interests).

Clinical evidence

Included studies

One prospective cohort study, which also reports cross-sectional data (Chang 2016) was included in this review. It describes the association between perineal pain and postpartum depressive symptoms.

Relevant evidence was identified for pain duration as a prognostic factor for postpartum depressive symptoms during the 6-month postpartum period.

The included study is summarised in Table 2.

See the literature search strategy in appendix B and study selection flow chart in appendix C.

Excluded studies

Studies not included in this review with reasons for their exclusions are provided in appendix K.

Summary of studies included in the evidence review

A summary of the study included in this review is presented in Table 2.

Table 2: Summary of included study

Study	Population	Prognostic factors	Outcomes
Chang 2016 Prospective cohort study Taiwan	N=432 women who have given birth Only 65.5% of women had pain 3-5 days postnatally	• Pain duration and severity assessed using both the pain rating index (PRI) and visual analogue scale (VAS) of the short-form McGill Pain Questionnaire (SF-MPQ), respectively	• Depressive symptoms assessed using the Center for Epidemiologic Studies Depression Scale (CES-D) at 3-5 days, 4-6 weeks, 3 months, and 6 months

See the full evidence tables in appendix D. No meta-analysis was conducted (and so there are no forest plots in appendix E).

Quality assessment of studies included in the evidence review

See the clinical evidence profile in appendix F.

Economic evidence

Included studies

A single economic search was undertaken for all topics included in the scope of this guideline but no economic studies were identified which were applicable to this review question. See the literature search strategy in appendix B and economic study selection flow chart in appendix G.

Excluded studies

No economic studies were reviewed at full text and excluded from this review.

Economic model

No economic modelling was conducted for this review question because the committee agreed that other topics were higher priorities for economic evaluation.

Evidence statements

Clinical evidence statements

Critical outcomes

Psychosexual problems

No evidence was identified for this outcome.

Chronic perineal pain

No evidence was identified for this outcome.

Physical and emotional functional impairment

Depressive symptoms at 3-5 days postpartum

- Low quality evidence from 1 prospective cohort study, which also reported cross-sectional data (N=432) showed no important difference in the risk of developing depressive symptoms (CES-D >16) at 3-5 days postpartum in women with perineal pain (PRI scores) or with higher levels of perineal pain (VAS scores) measured at 3-5 days postpartum.

Depressive symptoms at 4-6 weeks postpartum

- Low and moderate quality evidence from 1 prospective cohort study, which also reported cross-sectional data (N=432) showed no important difference in the risk of developing depressive symptoms (CES-D >16) at 4-6 weeks postpartum in women with perineal pain (PRI scores) measured at 3-5 days or with higher levels of perineal pain (VAS scores) measured at 3-5 days and 4-6 weeks postpartum. However, presence of perineal pain (PRI scores) measured at 4-6 weeks postpartum was associated with an important increase in the risk of developing depressive symptoms (CES-D >16) at 4-6 weeks postpartum.

Depressive symptoms at 3 months postpartum

- Low quality evidence from 1 prospective cohort study, which also reported cross-sectional data (N=432) showed no important difference in the risk of developing depressive symptoms (CES-D >16) at 3 months postpartum in women with perineal pain (PRI scores) or with higher levels of perineal pain (VAS scores) measured at 3-5 days, 4-6 weeks, and 3 months postpartum.

Depressive symptoms at 6 months postpartum

- Low to moderate quality evidence from 1 prospective cohort study, which also reported cross-sectional data (N=432) showed no important difference in the risk of developing depressive symptoms (CES-D >16) at 6 months postpartum in women with perineal pain (PRI scores) or with higher levels of perineal pain (VAS scores) measured at 3-5 days, 3 months, and 6 months postpartum. However, when these were measured at 4-6 weeks postpartum, there was an important increase in the risk of developing depressive symptoms (CES-D >16) at 6 months postpartum.

Economic evidence statements

No economic evidence was identified which was applicable to this review question.

The committee's discussion of the evidence

Interpreting the evidence

The outcomes that matter most

The committee agreed that the prognostic factors listed in the protocol alongside perineal pain are most likely to be the most significant predictors of the long-term sequelae of perineal pain. The committee arrived at the listed predictors by using their clinical expertise because the data available was uninformative.

The committee rated chronic perineal pain and physical and emotional functional impairment as critical outcomes as unresolved perineal pain has significant long term implications that can impact on the woman's functioning on a daily basis. Furthermore, psychosexual problems were rated as a critical outcome as perineal pain is commonly associated with sexual dysfunction, which can have a significant impact on emotional wellbeing and relationships.

The committee were interested in unplanned health service attendance including admissions as an important outcome.

The quality of the evidence

The quality of evidence ranged from moderate to low with limited data on depressive symptoms from only 1 study. The quality of the evidence was downgraded for indirectness as a proportion of the population in the study did not have perineal pain. Furthermore, outcomes were downgraded due to imprecision as the 95% confidence intervals crossed 1 the line of null effect.

A limitation of the evidence was that no sub-group analysis was conducted on the mode of vaginal delivery (non-operative or operative vaginal delivery). Women that have undergone an operative vaginal delivery are at a higher risk of perineal pain,

thus it would have been informative to have this sub-group analysis to see if the association with depressive symptoms was significant in both sub-groups.

The committee highlighted that the CES-D self-report depression scale used in the study is not used in clinical practice in UK. Thus, the generalisability with other common self-report depression scales used in the UK is uncertain.

Majority of the studies excluded from this review were excluded because it was not reported whether the population were experiencing perineal pain.

Benefits and harms

Although, evidence was only identified on the association between pain duration and severity with depressive symptoms, based on their expertise the committee agreed that it was important to highlight the other consequences of perineal pain, namely, long-term perineal pain, problems with daily functioning and psychosexual difficulties. The committee agreed that in practice it is often deemed acceptable to normalise perineal pain in contrast to the pain experienced following other clinical events. Healthcare professionals often describe perineal pain as a normal result of giving birth. The committee agreed this is inappropriate and that this recommendation would benefit women by emphasising the long-term consequences of perineal pain, therefore prompting healthcare professionals or women themselves to recognise the seriousness of perineal pain and seek early assessment for appropriate management.

The committee discussed the importance of highlighting factors that make some women at higher risk of perineal pain, so that appropriate assessment and management is conducted. Even though the included study did not conduct sub-group analyses for these specific populations, the committee agreed that it is well established in clinical practice that women who have had an episiotomy or vaginal tear, an operative vaginal birth, or wound infection or breakdown are at higher risk of persistent perineal pain. Furthermore, the committee agreed that every woman's experience of giving birth is different and that although healthcare professionals may not perceive the birth as traumatic because they have an intact perineum, the woman may still report the birth as traumatic for different reasons and be experiencing perineal pain and the associated long-term consequences. The committee agreed that this recommendation would benefit women by identifying those with a higher risk of perineal pain, therefore prompting healthcare professionals to assess and manage these women sooner to prevent long-term consequences of perineal pain.

The committee agreed that healthcare professionals should actively ask during postnatal checks whether women have any concerns with their perineum, for example, pain not resolving, pain worsening, increasing use of analgesics, discharge with a strong or unpleasant smell, swelling, or wound breakdown. They agreed that this recommendation would benefit women who, in current practice, are told that perineal pain is part and parcel of giving birth and therefore fail to report it at postnatal checks and continue to suffer perineal pain months or years after the birth.

On the basis of the evidence presented, the committee discussed the importance of good perineal hygiene, for example, daily showering of the perineum, frequent changing of sanitary pads and hand washing before and after doing this. The committee agreed that this would benefit women by promoting good perineal hygiene, thus reducing the risk of perineal infection that can lead to long term complications for the woman.

The committee agreed that self-reporting of perineal pain or perineal concerns were sufficient for further assessment. Nonetheless they also agreed that healthcare

professionals should consider using a validated self-assessment pain score as a way of enabling women to determine the change in perineal pain over time and therefore aid in the management of pain.

The committee recognised that not every healthcare professional with whom the woman has contact will be qualified to conduct an assessment of the perineum, for example health visitor or maternity support worker. If the woman raises perineal concerns or seeks reassurance, an assessment should be offered and if the healthcare professional is not qualified to do this themselves then arrangements for an examination should be made with an appropriate healthcare professional (a midwife, a GP or an obstetrician). The committee agreed that this recommendation would benefit women, who in current practice, may feel that they are not taken seriously by acknowledging their concerns and prompting further assessment and management.

The committee acknowledged that specific pain management options are beyond the scope of this question. Nevertheless, the committee emphasised that options around pain relief should be discussed with the woman, in particular safe analgesics to use whilst breastfeeding. The committee recognised that women are often discharged from hospital with different medications and may not know their indications, and may have concerns regarding side effects and their safety in breastfeeding. The committee agreed that this recommendation would be of particular benefit to breastfeeding women, who tend to minimise the use of analgesics and only take them when they are in pain rather than regularly in the initial postpartum period because of concerns for the safety of their baby.

The committee discussed the seriousness of perineal wound breakdown and agreed that an urgent referral to specialist maternity services should be made for further management, for example antibiotic therapy for infected wounds prior to active management. The committee agreed that this recommendation would benefit women with perineal wound breakdown by preventing further complications or a delay in the appropriate management of the perineum.

The committee agreed the harms that could potentially result from these recommendations are small and will be outweighed by the improvement in women's short and long term postnatal experiences. Harms considered included additional visits to appropriate health professionals, anxiety of possible short term separation from baby and impact on breastfeeding.

Given the limited evidence identified in this review, the committee prioritised this area for a research recommendation. They recommended research on the characteristics of perineal pain that may suggest the need for further investigation in acknowledgment that poor perineal pain management can lead to long term physical, psychological, and psychosexual difficulties. See appendix L for further details.

Cost effectiveness and resource use

No economic evidence is available for this review question. The committee agreed that spending time to ask women whether they have any concerns about their perineum at each postnatal contact and potentially using a validated self-assessment pain scale to measure change in perineal pain over time has low-to-modest resource implications (health professionals' time). However, it may lead to important benefits for the women and cost-savings to the health system as ongoing perineal pain may be associated with symptoms of depression, chronic perineal pain, general functional impairment and psychosexual difficulties, early identification and management of which is expected to lead to better outcomes for the women and requires less

intensive (and thus less costly) intervention. The committee also agreed that an examination of the perineum if the woman has perineal concerns or needs reassurance may identify conditions that need immediate management by appropriate maternity services, so that early identification has significant benefits for the women. It may also provide reassurance to women and prevent unnecessary concerns and unplanned visits to health services for further evaluation and investigations. Finally, referring the woman urgently to specialist maternity services if the perineal wound breaks down or there are ongoing healing concerns allows immediate intervention where needed, with significant benefits for the woman. Therefore, the committee agreed that the recommendations likely enable the efficient use of healthcare resources.

Other factors the committee took into account

The committee noted during protocol development that certain subgroups of women may require special consideration due to their potential vulnerability:

- young women (19 years or under)
- women with physical or cognitive disabilities
- women with severe mental health illness
- women who have difficulty accessing postnatal care services.

A stratified analysis was therefore predefined in the protocol based on these subgroups. However, considering the lack of evidence for these sub-groups, the committee agreed not to make separate recommendations and that the recommendations they did make should apply universally.

References

Chang 2016

Chang SR, Chen KH, Lee CH, et al. Relationships between perineal pain and postpartum depressive symptoms: A prospective cohort study. International Journal of Nursing Studies 2016; 59: 68-79

Appendices

Appendix A – Review protocol

Review protocol for review question: What characteristics of perineal pain suggest the need for further evaluation?

Table 3: Review protocol

Field (based on PRISMA-P)	Content
Review question	What characteristics of perineal pain suggest the need for further evaluation?
Type of review question	Prognostic
Objective of the review	This review aims to determine what characteristics of perineal pain suggest the need for further evaluation.
Eligibility criteria – population/disease/condition/issue/domain	Women who have given birth and are experiencing perineal pain, after the initial postpartum assessment up to 8 weeks after birth. The following populations will be excluded: Women admitted to intensive care after labour and birth and women returning to theatre following a caesarean section Women experiencing these complications intrapartum: massive obstetric haemorrhage; fourth degree tear; caesarean hysterectomy; uterine artery embolisation due to haemorrhage; bladder, ureteric, blood vessel, or bowel injury at Caesarean section; sepsis; venous thromboembolism Women with these complications in pregnancy: gestational diabetes; pre-eclampsia; pregnancy induced hypertension; acute fatty liver of pregnancy Women with pre-existing conditions (for example, type 1 diabetes, type 2 diabetes, essential hypertension; solid organ transplant recipients; renal disease (usually related to hypertension or autoimmune causes); any form of malignancy; sickle cell disease; thalassaemia; cardiac disease; poorly controlled epilepsy; stroke; cerebral venous thrombosis; sub-arachnoid haemorrhage

Field (based on PRISMA-P)	Content
Eligibility criteria – prognostic factors	Data on the following risk factors – or predictors – will be searched for and where located, used in the analysis: • pain duration • severity of pain on a validated pain score • pain not decreasing or increasing over time or increased requirement for analgesia • swelling and duration of swelling • offensive vaginal discharge • fever • urinary and faecal incontinence • difficulty urinating or defecating • physical discomfort • wound breakdown or infection • sexual distress score.
Confounding factors	• Age • BMI • Parity • Cultural and linguistic differences
Outcomes	**Critical** • psychosexual problems • chronic perineal pain • physical and emotional functional impairment. **Important** • unplanned attendance to health services including admissions. MIDs will not be used to rate imprecision in this review. Instead, data will be downgraded for imprecision on the basis of statistical significance and sample size.

Field (based on PRISMA-P)	Content
Eligibility criteria – study design	Include published full text papers: • Systematic reviews • Prospective or retrospective comparative cohort studies • Only if cohort studies unavailable or there is limited data to inform decision making: case-control studies • Prospective study designs will be prioritised over retrospective study designs • Population-based studies and multicentre studies will be prioritised Exclude: • Conference abstracts • Studies with a sample size <100 • Studies where multivariate regression analysis was not conducted or important confounders not adjusted for in the multivariate analysis.
Other inclusion exclusion criteria	Studies from low- and middle-income countries will be excluded Date: published from 2000. Practice has changed since 2000 and anything published before this is unlikely to be relevant.
Proposed sensitivity/sub-group analysis, or meta-regression	Groups that will be reviewed and analysed separately: • young women (19 years or under) • women with physical or cognitive disabilities • women with severe mental illness • women who have difficulty accessing postnatal care services. In the presence of heterogeneity, the following subgroups will be considered for sensitivity analysis: • instrumental vs non-instrumental vaginal birth vs caesarean section.
Selection process – duplicate screening/selection /analysis	Review questions selected as high priorities for health economic analysis (and those selected as medium priorities and where health economic analysis could influence recommendations) will be subject to dual weeding and study selection; any discrepancies above 10% of the dual weeded resources will be resolved through discussion between the first and second reviewers or by reference to a third person. This review question was not prioritised for health economic analysis and so no formal dual weeding, study selection (inclusion/exclusion) or data extraction into evidence tables will be undertaken. (However, internal (NGA) quality assurance

Field (based on PRISMA-P)	Content
	processes will include consideration of the outcomes of weeding, study selection and data extraction and the committee will review the results of study selection and data extraction).
Data management (software)	NGA STAR software will be used for study sifting, data extraction, recording quality assessment using checklists and generating bibliographies/citations. A modified version of 'GRADE' will be used to assess the quality of evidence for each outcome. In the absence of MIDs, imprecision will be rated by: Downgrading once if the data is not statistically significant Downgrading once if the study is below a given sample size threshold.
Information sources – databases and dates	The following databases will be searched: • CDSR • DARE • Embase • EMCare • HTA Database • MEDLINE and MEDLINE IN-PROCESS Searches will be restricted by: • Date limitations: 2000 to 16th September 2019 • English language Other searches: • Inclusion lists of systematic reviews
Identify if an update	This is an update. However the review and drafting of recommendations are being completed afresh. The 2006 version of the postnatal care guideline included these recommendations: 1.2.27 At each postnatal contact, women should be asked whether they have any concerns about the healing process of any perineal wound; this might include experience of perineal pain, discomfort or stinging, offensive odour or dyspareunia.[2006] 1.2.28 The healthcare professional should offer to assess the perineum if the woman has pain or discomfort. [2006]

Field (based on PRISMA-P)	Content
	1.2.32 Signs and symptoms of infection, inadequate repair, wound breakdown or non-healing should be evaluated (urgent action). [2006]
Author contacts	National Guideline Alliance https://www.nice.org.uk/guidance/indevelopment/gid-ng10070
Highlight if amendment to previous protocol	For details please see section 4.5 of Developing NICE guidelines: the manual
Search strategy – for one database	For details please see appendix F.
Data collection process – forms/duplicate	A standardised evidence table format will be used, and published as appendix D (clinical evidence tables) or H (economic evidence tables).
Data items – define all variables to be collected	For details please see evidence tables in appendix D (clinical evidence tables) or H (economic evidence tables).
Methods for assessing bias at outcome/study level	Standard study checklists were used to critically appraise individual studies. For details please see section 6.2 of Developing NICE guidelines: the manual Appraisal of methodological quality: The methodological quality of each study will be assessed using an appropriate checklist: ROBIS for systematic reviews Quality in prognostic studies (QUIPS) tool
Criteria for quantitative synthesis (where suitable)	For details please see section 6.4 of Developing NICE guidelines: the manual
Methods for analysis – combining studies	For a full description of methods see Supplement 1.

Field (based on PRISMA-P)	Content
and exploring (in)consistency	
Meta-bias assessment – publication bias, selective reporting bias	For details please see section 6.2 of Developing NICE guidelines: the manual.
Assessment of confidence in cumulative evidence	For details please see sections 6.4 and 9.1 of Developing NICE guidelines: the manual
Rationale/context – Current management	For details please see the introduction to the evidence review.
Describe contributions of authors and guarantor	A multidisciplinary committee developed the guideline. The committee was convened by The National Guideline Alliance and chaired by Dr David Jewell in line with section 3 of Developing NICE guidelines: the manual. Staff from The National Guideline Alliance undertook systematic literature searches, appraised the evidence, conducted meta-analysis and cost-effectiveness analysis where appropriate, and drafted the guideline in collaboration with the committee. For a full description of methods see Supplement 1.
Sources of funding/support	The National Guideline Alliance is funded by NICE and hosted by The Royal College of Obstetricians and Gynaecologists
Name of sponsor	The National Guideline Alliance is funded by NICE and hosted by The Royal College of Obstetricians and Gynaecologists
Roles of sponsor	NICE funds The National Guideline Alliance to develop guidelines for those working in the NHS, public health, and social care in England
PROSPERO registration number	This protocol has not been registered in PROSPERO

GRADE: Grading of Recommendations Assessment, Development and Evaluation; MID: minimally important difference; NGA: National Guideline Alliance; NICE: National Institute for Health and Care Excellence; PRISMA-P: Preferred Reporting Items for Systematic and Meta-analysis Protocols; QUIPS: quality in prognosis studies; RCT: randomised controlled trial; ROBIS: risk of bias in non-randomised studies of interventions

Appendix B – Literature search strategies

Literature search strategies for review question: What characteristics of perineal pain suggest the need for further evaluation?

Clinical search

The search for this topic was last run on 16th September 2019.

Database: Emcare, Embase, Medline, Medline Ahead of Print and In-Process & Other Non-Indexed Citations – OVID [Multifile]

#	Search
1	perinatal period/ or exp postnatal care/
2	1 use emczd, emcr
3	postpartum period/ or peripartum period/ or postnatal care/
4	3 use ppez
5	(((first time or new) adj mother*) or nullipara* or peri natal* or perinatal* or postbirth or post birth or post childbirth or postdelivery or post delivery or postnatal* or post natal* or postpartum* or post partum* or primipara* or puerpera* or puerperium* or ((after or following or post) adj (birth* or delivery or labour or labour))).ti,ab.
6	or/2,4-5
7	perineum/
8	7 use emczd, emcr
9	perineum/
10	9 use ppez
11	(perineum or perineal or pelvic floor).ti,ab.
12	or/8,10-11
13	(bruise* or cut*1 or cutting or discomfort or dysfunction* or episiotom* or impair* or incision* or injur* or lacerat* or pain* or repair* or scar* or sore* or stitch* or swollen or tear* or trauma* or wound*).ti,ab,hw.
14	12 and 13
15	episiotomy/ use emczd, emcrm, ppez or episiotom*.ti,ab.
16	perineal pain/ or perineum injury/
17	16 use emczd, emcr
18	pelvic pain/ use emczd, emcrm, ppez
19	or/14,15,17-18
20	6 and 19
21	limit 20 to english language
22	limit 21 to yr="2000 -current"

Database: CDSR [Wiley]

#	Search
#1	mesh descriptor: [postpartum period] explode all trees
#2	mesh descriptor: [peripartum period] this term only
#3	mesh descriptor: [postnatal care] this term only
#4	((((“first time” or new) near/1 mother*) or nullipara* or "peri natal*" or perinatal* or postbirth or "post birth" or postdelivery or "post delivery" or postnatal* or "post natal*" or postpartum* or "post partum*" or primipara* or puerpera* or puerperium* or ((after or follow*) near/2 birth*))):ti,ab,kw
#5	#1 or #2 or #3 or #4
#6	mesh descriptor: [length of stay] this term only
#7	mesh descriptor: [patient discharge] this term only
#8	mesh descriptor: [duration of therapy] this term only
#9	(((hours or length or long* or rapid or short*) near/3 stay*)):ti,ab,kw
#10	((hospital* near/3 stay*)):ti,ab,kw
#11	((patient* near/3 discharg*)):ti,ab,kw
#12	(((hospital* or postnatal* or "post natal*" or postpartum* or "post partum*") near/3 discharg*)):ti,ab,kw
#13	((("6 hour*" or "12 hour*" or "24 hour*" or early or late or rapid or short*) near/3 discharg*)):ti,ab,kw
#14	#6 or #7 or #8 or #9 or #10 or #11 or #12 or #13
#15	#5 and #14 with cochrane library publication date between jan 2000 and sept 2019

Database: DARE, HTA (global) [CRD Web]

#	Search
1	mesh descriptor postpartum period in dare,hta
2	mesh descriptor peripartum period in dare,hta
3	mesh descriptor postnatal care in dare,hta
4	(nullipara* or peri natal* or perinatal* or postbirth or post birth or postdelivery or post delivery or postnatal* or post natal* or postpartum* or post partum* or primipara* or puerpera* or puerperium* or ((after or follow*) near2 birth*)) in dare, hta
5	#1 or #2 or #3 or #4
6	mesh descriptor breast feeding explode all trees in dare,hta
7	mesh descriptor lactation in dare,hta
8	(breastfeed* or breast feed* or breastfed* or breastfeed* or breast fed or breastmilk or breast milk or expressed milk* or lactat* or (nursing next (baby or infant* or mother* or neonate* or newborn*))) in dare, hta
9	#6 or #7 or #8
10	mesh descriptor bottle feeding in dare,hta
11	mesh descriptor infant formula in dare,hta
12	(((bottle or formula or synthetic) near2 (artificial or fed or feed* or infant* or milk*)) or (artificial next (formula or milk)) or bottlefed or bottlefeed or cup feeding or (milk near2 (substitut* or supplement*)) or ((infant or milk or water or glucose or dextrose or formula) next supplement) or formula supplement* or supplement feed or milk feed or ((baby or babies or infant* or neonate* or newborn*) next (formula* or milk)) or formulafeed or formulated or (milk near2 powder*) or hydrolyzed formula* or (((feeding or baby or infant) next bottle*) or infant feeding or bottle nipple* or milk pump*)) in dare, hta
13	#10 or #11 or #12

#	Search
14	#5 or #9 or #13

Health economic search

The search for this topic was last run on 5th December 2019.

Database: Emcare, Embase, Medline, Medline Ahead of Print and In-Process & Other Non-Indexed Citations (global) – OVID [Multifile]

#	Search
1	puerperium/ or perinatal period/ or postnatal care/
2	1 use emczd, emcr
3	postpartum period/ or peripartum period/ or postnatal care/
4	3 use ppez
5	(nullipara* or peri natal* or perinatal* or postbirth or post birth or postdelivery or post delivery or postnatal* or post natal* or postpartum* or post partum* or primipara* or puerpera* or puerperium* or ((after or follow*) adj2 birth*)).ti,ab.
6	or/2,4-5
7	breast feeding/ or breast feeding education/ or lactation/
8	7 use emczd, emcr
9	exp breast feeding/ or lactation/
10	9 use ppez
11	(breastfeed* or breast feed* or breastfed* or breastfeed* or breast fed or breastmilk or breast milk or expressed milk* or lactat* or (nursing adj (baby or infant* or mother* or neonate* or newborn*))).ti,ab.
12	or/8,10-11
13	artificial food/ or bottle feeding/ or infant feeding/
14	13 use emczd, emcr
15	bottle feeding/ or infant formula/
16	15 use ppez
17	(((bottle or formula or synthetic) adj2 (artificial or fed or feed* or infant* or milk*)) or (artificial adj (formula or milk)) or bottlefed or bottlefeed or cup feeding or (milk adj2 (substitut* or supplement*)) or ((infant or milk or water or glucose or dextrose or formula) adj supplement) or formula supplement* or supplement feed or milk feed or ((baby or babies or infant* or neonate* or newborn*) adj (formula* or milk)) or formulafeed or formulated or (milk adj2 powder*) or hydrolyzed formula* or (((feeding or baby or infant) adj bottle*) or infant feeding or bottle nipple* or milk pump*)).ti,ab.
18	or/14,16-17
19	or/6,12,18
20	budget/ or exp economic evaluation/ or exp fee/ or funding/ or exp health care cost/ or health economics/
21	20 use emczd, emcr
22	exp budgets/ or exp "costs and cost analysis"/ or economics/ or exp economics, hospital/ or exp economics, medical/ or economics, nursing/ or economics, pharmaceutical/ or exp "fees and charges"/ or value of life/
23	22 use ppez
24	budget*.ti,ab. or cost*.ti. or (economic* or pharmaco?economic*).ti. or (price* or pricing*).ti,ab. or (cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or

#	Search
	estimat* or variable*)).ab. or (financ* or fee or fees).ti,ab. or (value adj2 (money or monetary)).ti,ab.
25	or/21,23-24
26	economic model/ or quality adjusted life year/ or "quality of life index"/
27	(cost-benefit analysis.sh. and (cost-effectiveness ratio* and (perspective* or life expectanc*)).tw.)
28	((quality of life or qol).tw. and cost benefit analysis.sh.)
29	or/26-28 use emczd, emcr
30	models, economic/ or quality-adjusted life years/
31	(cost-benefit analysis.sh. and (cost-effectiveness ratio* and (perspective* or life expectanc*)).tw.)
32	((quality of life or qol).tw. and cost-benefit analysis.sh.)
33	or/30-32 use ppez
34	(eq-5d* or eq5d* or eq-5* or eq5* or euroqual* or euro qual* or euroqual 5d* or euro qual 5d* or euro qol* or euroqol*or euro quol* or euroquol* or euro quol5d* or euroquol5d* or eur qol* or eurqol* or eur qol5d* or eurqol5d* or eur?qul* or eur?qul5d* or euro* quality of life or european qol).tw.
35	(euro* adj3 (5 d* or 5d* or 5 dimension* or 5dimension* or 5 domain* or 5domain*)).tw.
36	(hui or hui2 or hui3).tw.
37	(illness state* or health state*).tw.
38	(multiattibute* or multi attribute*).tw.
39	(qaly* or qal or qald* or qale* or qtime* or qwb* or daly).tw.
40	(quality adjusted or quality adjusted life year*).tw.
41	(sf36 or sf 36 or sf thirty six or sf thirtysix).tw.
42	sickness impact profile.sh.
43	(time trade off*1 or time tradeoff*1 or tto or timetradeoff*1).tw.
44	(utilit* adj3 (score*1 or valu* or health* or cost* or measur* or disease* or mean or gain or gains or index*)).tw.
45	utilities.tw.
46	((qol or hrqol or quality of life).tw. or *quality of life/) and ((qol or hrqol* or quality of life) adj2 (change*1 or declin* or decreas* or deteriorat* or effect or effects or high* or impact*1 or impacted or improve* or increas* or low* or reduc* or score or scores or worse)).ab.
47	quality of life.sh. and ((health-related quality of life or (health adj3 status) or ((quality of life or qol) adj3 (chang* or improv*)) or ((quality of life or qol) adj (measure*1 or score*1))).tw. or (quality of life or qol).ti. or ec.fs.)
48	or/29,33-47
49	or/25,48
50	19 and 50
51	limit 50 to english language
52	(animals/ not humans/) or exp animals, laboratory/ or exp animal experimentation/ or exp models, animal/ or exp rodentia/
53	52 use ppez
54	(animal/ not human/) or nonhuman/ or exp animal experiment/ or exp experimental animal/ or animal model/ or exp rodent/
55	54 use emczd, emcr
56	(rat or rats or mouse or mice).ti.

#	Search
57	or/53,55-56
58	51 not 57

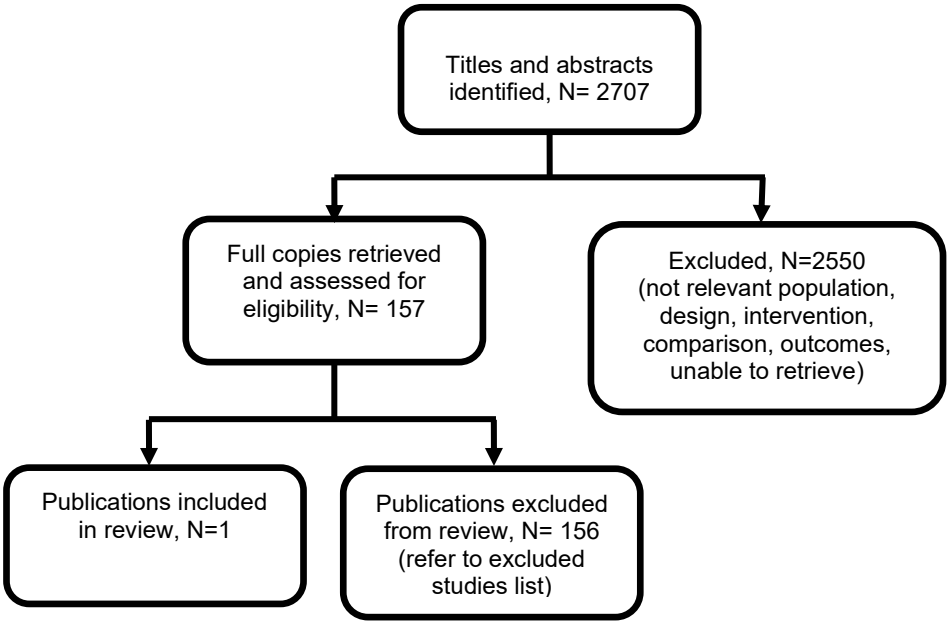
Database: HTA, NHS EED (global) [CRD Web]

#	Search
1	mesh descriptor postpartum period in hta, nhs eed
2	mesh descriptor peripartum period in hta, nhs eed
3	mesh descriptor postnatal care in hta, nhs eed
4	(nullipara* or peri natal* or perinatal* or postbirth or post birth or postdelivery or post delivery or postnatal* or post natal* or postpartum* or post partum* or primipara* or puerpera* or puerperium* or ((after or follow*) near2 birth*)) in hta, nhs eed
5	#1 or #2 or #3 or #4
6	mesh descriptor breast feeding explode all trees in hta, nhs eed
7	mesh descriptor lactation in hta, nhs eed
8	(breastfeed* or breast feed* or breastfed* or breastfeed* or breast fed or breastmilk or breast milk or expressed milk* or lactat* or (nursing next (baby or infant* or mother* or neonate* or newborn*))) in hta, nhs eed
9	#6 or #7 or #8
10	mesh descriptor bottle feeding in hta, nhs eed
11	mesh descriptor infant formula in hta, nhs eed
12	(((bottle or formula or synthetic) near2 (artificial or fed or feed* or infant* or milk*)) or (artificial next (formula or milk)) or bottlefed or bottlefeed or cup feeding or (milk near2 (substitut* or supplement*)) or ((infant or milk or water or glucose or dextrose or formula) next supplement) or formula supplement* or supplement feed or milk feed or ((baby or babies or infant* or neonate* or newborn*) next (formula* or milk)) or formula feed or formulated or (milk near2 powder*) or hydrolyzed formula* or (((feeding or baby or infant) next bottle*) or infant feeding or bottle nipple* or milk pump*)) in hta, nhs eed
13	#10 or #11 or #12
14	#5 or #9 or #13

Appendix C – Clinical evidence study selection

Clinical study selection for: What characteristics of perineal pain suggest the need for further evaluation?

Figure 1: Study selection flow chart for database



Appendix D – Clinical evidence tables

Clinical evidence tables for review question: What characteristics of perineal pain suggest the need for further evaluation?

Table 4: Clinical evidence table

Study details	Participants	Factors	Methods	Outcomes and Results	Comments
Full citation Chang, S. R., Chen, K. H., Lee, C. N., Shyu, M. K., Lin, M. I., Lin, W. A., Relationships between perineal pain and postpartum depressive symptoms: A prospective cohort study, International journal of nursing studies, 59, 68-78, 2016 Ref Id 923516 **Country/ies where the study was carried out** Taiwan **Study type** Prospective prognostic cohort study **Aim of the study** To investigate the association between pain	Sample size n=432 women given birth Characteristics Baseline Characteristics of Women Age (years): 32.72 BMI: 25.10 Gestational age (weeks): 38.31 Newborn birth weight (grams): 3062 Highest education level: High school and below: 9.95% University: 62.96%	Perineal pain and "Any pain" ("any pain" includes other pain and perineal pain) measured using both the pain rating index (PRI) and visual analogue scale (VAS) of the short-form McGill Pain Questionnaire (SF-MPQ)	<u>Pain Rating Index (PRI)</u> Pain presence or absence for both any pain and perineal pain were assessed using the Taiwanese version of PRI. The PRI consists of 15 representative words (i.e. throbbing, shooting, stabbing, sharp, cramping, gnawing, hot-burning, aching, heavy, tender, splitting, tiring-exhausting, sickening, fearful, punishing-cruel) including sensory and affective dimensions, and respondents rate pain on four-point scales ranging from 0 (none) to 3 (severe). In the study, total scores on the PRI are classified as pain absence or no pain (score of 0) and pain presence (score >0). The reliability coefficients of the PRI are high, and its validity has been established for postpartum women. <u>Visual Analog Scale (VAS)</u> Taiwanese version of VAS to measure overall pain intensity and pain severity for both any pain and perineal pain was used. The instrument uses a 10-cm visual	**Outcome: Depressive symptoms at 3-5 days postpartum** PRI scores for perineal pain - days 3-5: aRR (95% CI) 1.8 (0.98-3.2) VAS scores for perineal pain - days 3-5: adjusted estimate 0.2 (-0.2 to 0.5) p-value >0.05 **Outcome: Depressive symptoms at 4-6 weeks postpartum** PRI scores for perineal pain - days 3-5: aRR (95% CI) 1.0 (0.5-1.7) PRI scores for perineal pain - weeks 4-6: aRR (95% CI) 1.9 (1.2-3.2)	**Methodological limitations** (assessed using QUIPS risk of bias tool) Study participation: Low risk Study attrition: Low risk Prognostic factor measurement: Low risk Outcome measurement: Low risk Study confounding: Low risk

Study details	Participants	Factors	Methods	Outcomes and Results	Comments
and previous postnatal pain with depression during the 6-month postpartum period. **Study dates** 2010-2011 **Source of funding** Study was supported by a grant from the Ministry of Science and Technology, Taiwan (NSC 100-2314-B-002-032).	Graduate and above: 27.08% Ethnic group: HoLou: 72.69% Non-HoLou: 27.31 Marital status: Single: 1.16% Married: 98.84% Feeding type: Completely or mostly breastfeeding: 85.53% Other feeding types: 16.47% Parity: 1: 55.32% 2: 37.27% 3: 6.48% 4: 0.93% Gravidity: 1: 35.19% 2: 39.35% 3: 15.51% ≥4: 9.95% Pregnancy intention:		scale to measure pain intensity on a scale ranging from 0 (no pain) to 10 (unbearable pain), with scores then recalculation on a scale ranging from 0 to 100 (0.1 cm = score of 1). Meanwhile, VAS was used to measure the pain severity of both any pain and perineal pain. Based on a modification of Eisenach's pain classification method for postpartum women, total scores on the VAS were classified as no pain (score 0), mild pain (score <40), moderate pain (≥40 and <70), and severe pain (70-100) <u>Center for Epidemiologic Studies Depression Scale (CES-D)</u> Depressive symptoms measured using the Taiwanese version of CES-D, which was translated from the original version of CES-D. CES-D including 20 items (e.g. I was bothered by things that usually don't bother me, I felt sad etc) rated on 4-point likert scales has high sensitivity and specificity with alpha coefficients >0.85. CES-D range scores ranfe from 0-60. In this study, the prevalence of depressive symptoms was evaluated. Participants were categorised according to their CES-D score into low-scoring (scores <16) and high scoring (scores (≥16) groups. Women with high scores were identified as possibly suffering from	VAS scores for perineal pain - days 3-5: adjusted estimate -0.12 (-0.5 to 0.2) p-value >0.05 VAS scores for perineal pain - weeks 4-6: adjusted estimate 0.33 (-0.1 to 0.8) p-value >0.05 **Outcome: Depressive symptoms at 3 months postpartum** PRI scores for perineal pain - days 3-5: aRR (95% CI) 0.7 (0.4-1.3) PRI scores for perineal pain - weeks 4-6: aRR (95% CI) 0.8 (0.5-1.5) PRI scores for perineal pain - 3 months: aRR (95% CI) 1.3 (0.6-2.8) VAS scores for perineal pain - days 3-5: adjusted estimate -0.4 (-0.8	Statistical analysis and reporting: low risk Comments: Multivariate analysis (PRI scores) adjusted for employment, types of feeding, delivery method, and whether pregnancy was planned. Multivariate analysis (VAS scores) adjusted for covariates but didn't specify which ones

Study details	Participants	Factors	Methods	Outcomes and Results	Comments
	Unintended: 7.42% Intended: 92.58% Newborn number: Single: 96.53% Twin: 3.47% Newborn sex: Female: 48.84% Male and both: 51.16% Newborn care unit: Baby room or room in: 88.89% Neonatal observation room: 8.56% Neonatal intensive care unit: 2.55% Prenatal depression history: No: 98.84% Yes: 1.16% Delivery method: Vaginal delivery: 59.26% Caesarean delivery: 40.74%		depression. The Taiwanese version of the CES-D was translated and developed by 2 psychiatrists and was found to be valid for use in the Taiwanese community populations. <u>Statistical analysis</u> Descriptive analyses were used to identify the characteristics of the participants and the prevalence of depressive symptoms, perineal pain, and any pain. These characteristics included time-dependent and fixed cariables. Time-dependent variables included age, body mass index (BMI), marital status, employment, current medical condition/history, and types of baby feeding. Fixed variables included ethnicity, gravidity, parity, educational level, gestational age, body weight of newborn, personal income, whether the pregnancy was intended, number of newborn, sex of newborn, prenatal depression history, neonatal care unit, and delivery method. The relationship between personal characteristics and depressive symptoms was examined by a generalised estimating equation to identify potentially significant factors or covariates. Outcome variables included depressive symptoms (high and low CES-D groups) at 3-5 days, 4-6 weeks, and 3 and 6 months after delivery. The	to 0.03) p-value >0.05 VAS scores for perineal pain - weeks 4-6: adjusted estimate 0.2 (-0.4 to 0.7) p-value >0.05 VAS scores for perineal pain - 3 months: adjusted estimate -0.1 (-0.8 to 0.5) p-value >0.05 **Outcome: Depressive symptoms at 6 months postpartum** PRI scores for perineal pain - days 3-5: aRR (95% CI) 0.8 (0.4-1.7) PRI scores for perineal pain - weeks 4-6: aRR (95% CI) 1.9 (1.1-3.3) PRI scores for perineal pain - 3 months: aRR (95% CI) 1.5 (0.7-3.3) PRI scores for perineal pain - 6 months: aRR (95% CI) 0.7 (0.3-1.9)	

Study details	Participants	Factors	Methods	Outcomes and Results	Comments
	Distribution of Pain Characteristics of Women in Study PRI perineal pain: Day 1: PRI = 0: 31.9%; PRI >0: 68.1% 3-5 days: PRI = 0: 39.1%; PRI >0: 60.9% 4-6 weeks: PRI = 0: 73.6%; PRI >0: 73.6% 3 months: PRI = 0: 84.7%; PRI >0: 15.3% 6 months: PRI = 0: 90.7; PRI >0: 9.3% VAS for perineal pain: Day 1: no pain: 28.2%; slight: 40.7%; moderate: 18.5%; severe: 12.5% 3-5 days: no pain: 34.5%; slight: 49.1%; moderate: 11.1%; severe: 5.3%		independent variables included the concurrent postnatal perineal pain, concurrent postnatal any pain, previous postnatal perineal pain, previous postnatal any pain, previous postnatal depressive symptoms, and time; covariates were entered into the generalised estimating equation to test the study hypotheses. Three models of the generalised estimating equation were evaluated using each of the three pain estimates as an independent variable; prevalence of pain according to the PRI (binary variable); pain level according to the VAS (ordinal variable); and pain scores on the VAS (continuous variable). The alpha level was set at 0.05 for all statistical sets.	VAS scores for perineal pain - days 3-5: adjusted estimate -0.2 (-0.6 to 0.2) p-value >0.05 VAS scores for perineal pain - weeks 4-6: adjusted estimate 0.6 (0.1 to 1.2) p-value <0.05 VAS scores for perineal pain - 3 months: adjusted estimate -0.2 (-0.9 to 0.5) p-value >0.05 VAS scores for perineal pain - 6 months: adjusted estimate 0.0 (-0.6 to 0.6) p-value >0.05	

Study details	Participants	Factors	Methods	Outcomes and Results	Comments
	4-6 weeks: no pain: 74.3% slight: 24.5%; moderate: 0.7%; severe: 0.5% 3 months: no pain: 81.5%; slight: 17.8%; moderate: 0.7%; severe: 0% 6 months: no pain: 90.3%; slight: 9.0%; moderate: 0.2%; severe: 0.5% Inclusion criteria 18 years old and ability to read traditional Chinese Exclusion criteria Not reported				

aRR: adjusted risk ratio; BMI: Body Mass Index; CES-D: Center for Epidemiologic Studies Depression Scale; PRI: Pain rating index; SF-MPQ: Short-form McGill Pain Questionnaire; VAS: Visual Analog Scale

Appendix E – Forest plots

Forest plots for review question: What characteristics of perineal pain suggest the need for further evaluation?

No meta-analysis was conducted for this review question and so there are no forest plots.

Appendix F – GRADE tables

GRADE tables for review question: What characteristics of perineal pain suggest the need for further evaluation?

Table 5: Clinical evidence profile for association between perineal pain and depressive symptoms at 3-5 days postpartum

Quality assessment							No of patients		Effect			
No of studies	**Design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**CES-D ≥16**	**CES-D <16**	**Relative (95% CI)**	**Absolute**	**Quality**	**Importance**
PRI scores for perineal pain (measured at 3-5 days postpartum)												
1	observational studies	no serious risk of bias	no serious inconsistency	serious[1]	serious[2]	None	240/432	192/432	aRR 1.8 (0.98 to 3.2)	355 more per 1000 (from 9 fewer to 977 more)	LOW	CRITICAL
VAS scores for perineal pain (measured at 3-5 days postpartum)												
1	observational studies	no serious risk of bias	no serious inconsistency	serious[1]	serious[3]	None	240/432	192/432	Adjusted estimate 0.2 (-0.2 to 0.5) p-value ≥0.05 (not significant)	-	LOW	CRITICAL

aRR: adjusted risk ratio; CES-D: center for epidemiologic studies depression scale; CI: confidence interval; PRI: pain rating index; VAS: visual analogue scale
1 Evidence downgraded by 1 level for indirectness as not all of the population had perineal pain at 3-5 days postnatally
2 Evidence downgraded by 1 level for imprecision as confidence interval crosses line of no effect
3 Evidence downgraded by 1 level for imprecision as p-value is not statistically significant

Table 6: Clinical evidence profile for association between perineal pain (various time points) and depressive symptoms at 4-6 weeks postpartum

Quality assessment							No of patients		Effect			
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	CES-D ≥16	CES-D <16	Relative (95% CI)	Absolute	Quality	Importance
PRI scores for perineal pain (measured at 3-5 days postpartum)												
1	observational studies	no serious risk of bias	no serious inconsistency	serious[1]	serious[2]	None	201/432	231/432	aRR 1.0 (0.5 to 1.7)	0 more per 1000 (from 297 fewer to 374 more)	LOW	CRITICAL
VAS scores for perineal pain (measured at 3-5 days postpartum)												
1	observational studies	no serious risk of bias	no serious inconsistency	serious[1]	serious[3]	None	201/432	231/432	Adjusted estimate – 0.12 (-0.5 to 0.2) p-value ≥0.05 (not significant)	-	LOW	CRITICAL
PRI scores for perineal pain (measured at 4-6 weeks postpartum)												
1	observational studies	no serious risk of bias	no serious inconsistency	serious[1]	No serious imprecision	none	201/432	231/432	aRR 1.9 (1.2 to 3.2)	481 more per 1000 (from 107 more to 1175 more)	MODERATE	CRITICAL
VAS scores for perineal pain (measured at 4-6 weeks postpartum)												
1	observational studies	no serious risk of bias	no serious inconsistency	serious[1]	serious[3]	none	201/432	231/432	Adjusted estimate 0.33 (-0.1 to 0.8) p-value ≥0.05 (not significant)	-	LOW	CRITICAL

aRR: adjusted risk ratio;; CES-D: center for epidemiologic studies depression scale; CI: confidence interval; PRI: pain rating index; VAS: visual analogue scale
1 Evidence downgraded by 1 level for indirectness as not all of the population had perineal pain at 3-5 days postnatally
2 Evidence downgraded by 1 level for imprecision as confidence interval crosses line of no effect

3 Evidence downgraded by 1 level for imprecision as p-value is not statistically significant

Table 7: Clinical evidence profile for association between perineal pain (various time points) and depressive symptoms at 3 months postpartum

Quality assessment							No of patients		Effect			
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	CES-D ≥16	CES D <16	Relative (95% CI)	Absolute	Quality	Importance
PRI scores for perineal pain (measured at 3-5 days postpartum)												
1	observational studies	no serious risk of bias	no serious inconsistency	serious[1]	serious[2]	none	240/432	192/432	aRR 0.7 (0.4 to 1.3)	133 fewer per 1000 (from 266 fewer to 133 more)	LOW	CRITICAL
VAS scores for perineal pain (measured at 3-5 days postpartum)												
1	observational studies	no serious risk of bias	no serious inconsistency	serious[1]	serious[3]	none	240/432	192/432	Adjusted estimate -0.4 (-0.8 to 0.03) p-value ≥0.05 (not significant)	-	LOW	CRITICAL
PRI scores for perineal pain (measured at 4-6 weeks postpartum)												
1	observational studies	no serious risk of bias	no serious inconsistency	serious[1]	serious[2]	none	240/432	192/432	aRR 0.8 (0.5 to 1.5)	88 fewer per 1000 (from 220 fewer to 220 more)	LOW	CRITICAL
VAS scores for perineal pain (measured at 4-6 weeks postpartum)												
1	observational studies	no serious risk of bias	no serious inconsistency	serious[1]	serious[3]	none	240/432	192/432	Adjusted estimate 0.2 (-0.4 to 0.7) p-value ≥0.05 (not significant)	-	LOW	CRITICAL
PRI scores for perineal pain (measured at 3 months postpartum)												

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	CES-D ≥16	CES D <16	Relative (95% CI)	Absolute		
1	observational studies	no serious risk of bias	no serious inconsistency	serious[1]	serious[2]	none	240/432	192/432	aRR 1.3 (0.6 to 2.8)	133 more per 1000 (from 178 fewer to 799 more)	LOW	CRITICAL
VAS scores for perineal pain (measured at 3 months postpartum)												
1	observational studies	no serious risk of bias	no serious inconsistency	serious[1]	serious[3]	none	240/432	192/432	Adjusted estimate -0.1 (-0.8 to 0.5) p-value ≥0.05 (not significant)	-	LOW	CRITICAL

aRR: adjusted risk ratio; CES-D: center for epidemiologic studies depression scale; CI: confidence interval; PRI: pain rating index; VAS: visual analogue scale
1 Evidence downgraded by 1 level for indirectness as not all of the population had perineal pain at 3-5 days postnatally
2 Evidence downgraded by 1 level for imprecision as confidence interval crosses line of no effect
3 Evidence downgraded by 1 level for imprecision as p-value is not statistically significant

Table 8: Clinical evidence profile for association between perineal pain (various time points) and depressive symptoms at 6 months postpartum

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	CES-D ≥16	CES-D <16	Relative (95% CI)	Absolute		
PRI scores for perineal pain (measured at 3-5 days postpartum)												
1	observational studies	no serious risk of bias	no serious inconsistency	serious[1]	serious[2]	none	264/432	168/432	aRR 0.8 (0.4 to 1.7)	78 fewer per 1000 (from 233 fewer to 272 more)	LOW	CRITICAL
VAS scores for perineal pain (measured at 3-5 days postpartum)												
1	observational studies	no serious	no serious inconsistency	serious[1]	serious[3]	none	264/432	168/432	Adjusted estimate	-	LOW	CRITICAL

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	CES-D ≥16	CES-D <16	Relative (95% CI)	Absolute		
		s risk of bias							-0.2 (-0.6 to 0.2) p-value ≥0.05 (not significant)			
PRI scores for perineal pain (measured at 4-6 weeks postpartum)												
1	observational studies	no serious risk of bias	no serious inconsistency	serious[1]	no serious imprecision	none	264/432	168/432	aRR 1.9 (1.1 to 3.3)	349 more per 1000 (from 39 more to 892 more)	MODERATE	CRITICAL
VAS scores for perineal pain (measured at 4-6 weeks postpartum)												
1	observational studies	no serious risk of bias	no serious inconsistency	serious[1]	no serious imprecision	none	264/432	168/432	Adjusted estimate 0.6 (0.1 to 1.2) p-value <0.05	-	MODERATE	CRITICAL
PRI scores for perineal pain (measured at 3 months postpartum)												
1	observational studies	no serious risk of bias	no serious inconsistency	serious[1]	serious[2]	none	264/432	168/432	aRR 1.5 (0.7 to 3.3)	194 more per 1000 (from 116 fewer to 892 more)	LOW	CRITICAL
VAS scores for perineal pain (measured at 3 months postpartum)												
1	observational studies	no serious risk of bias	no serious inconsistency	serious[1]	serious[3]	none	264/432	168/432	Adjusted estimate -0.2 (-0.9 to 0.5) p-value >0.05 (not significant)	-	LOW	CRITICAL
PRI scores for perineal pain (measured at 6 months postpartum)												
1	observational studies	no serious risk of bias	no serious inconsistency	serious[1]	serious[2]	none	264/432	168/432	aRR 0.7 (0.3 to 1.9)	116 fewer per 1000 (from 272	LOW	CRITICAL

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	CES-D ≥16	CES-D <16	Relative (95% CI)	Absolute		
										fewer to 349 more)		
VAS scores for perineal pain (measured at 6 months postpartum)												
1	observational studies	no serious risk of bias	no serious inconsistency	serious[1]	serious[3]	none	264/432	168/432	Adjusted estimate 0.0 (-0.6 to 0.6) p-value ≥0.05 (not significant)	-	LOW	CRITICAL

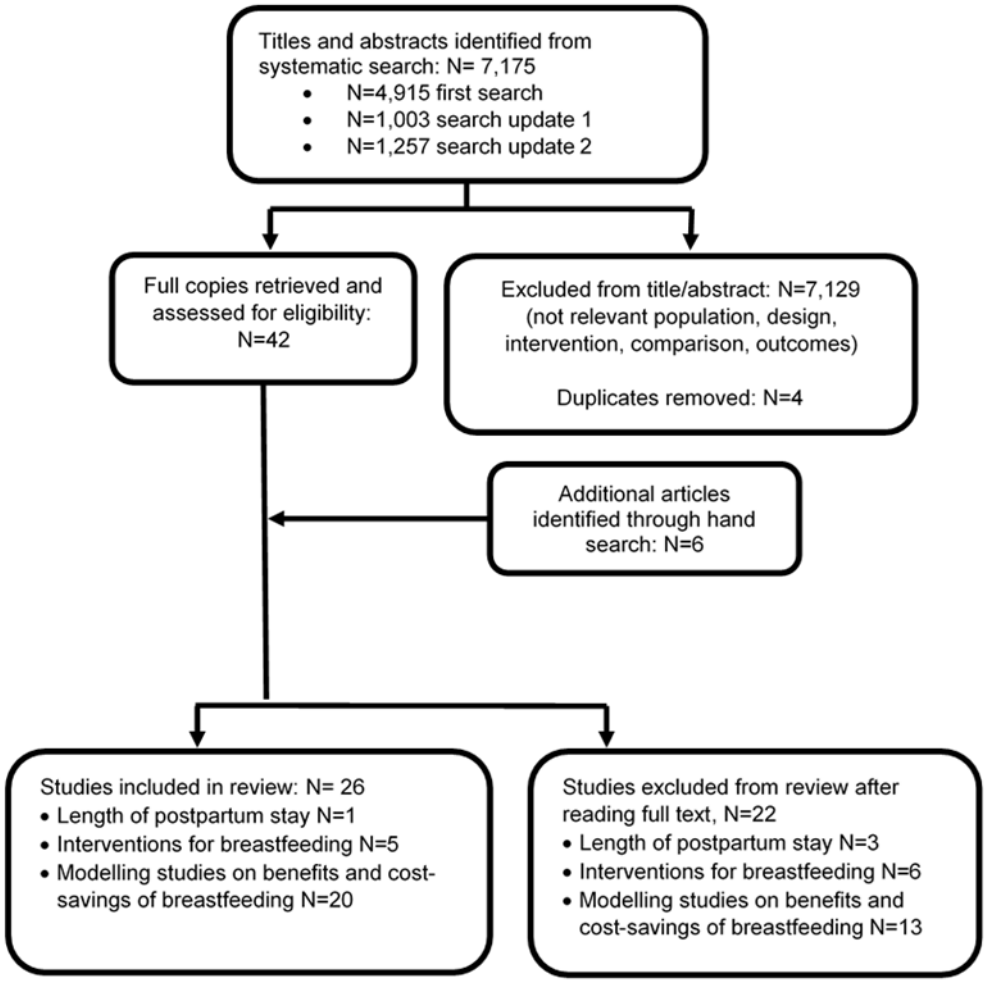
aRR: adjusted risk ratio; CES-D: center for epidemiologic studies depression scale; CI: confidence interval; PRI: pain rating index; VAS: visual analogue scale
1 Evidence downgraded by 1 level for indirectness as not all of the population had perineal pain at 3-5 days postnatally
2 Evidence downgraded by 1 level for imprecision as confidence interval crosses line of no effect
3 Evidence downgraded by 1 level for imprecision as p-value is not statistically significant

Appendix G – Economic evidence study selection

Economic evidence study selection for review question: What characteristics of perineal pain suggest the need for further evaluation

A global health economics search was undertaken for all areas covered in the guideline. Figure 2 shows the flow diagram of the selection process for economic evaluations of postnatal care interventions, including modelling studies on the benefits and cost-savings of breastfeeding.

Figure 2. Flow diagram of selection process for economic evaluations of postnatal care interventions and modelling studies on the benefits and cost-savings of breastfeeding



Appendix H – Economic evidence tables

Economic evidence tables for review question: What characteristics of perineal pain suggest the need for further evaluation?

No economic evidence was identified which was applicable to this review question.

Appendix I – Economic evidence profiles

Economic evidence profiles for review question: What characteristics of perineal pain suggest the need for further evaluation?

No economic evidence was identified which was applicable to this review question.

Appendix J – Economic analysis

Economic analysis for review question: What characteristics of perineal pain suggest the need for further evaluation?

No economic analysis was conducted for this review question.

Appendix K – Excluded studies

Excluded studies for review question: What characteristics of perineal pain suggest the need for further evaluation?

Clinical studies

Table 6: Excluded studies and reasons for their exclusion

Study	Reason for exclusion
Abdool, Z., Thakar, R., Sultan, A. H., Postpartum female sexual function, European Journal of Obstetrics Gynecology and Reproductive Biology, 145, 133-137, 2009	Study design not of interest for review: not a prognostic study.
Abramowitz, L., Sobhani, I., Ganansia, R., Vuagnat, A., Benifla, J. L., Darai, E., Madelenat, P., Mignon, M., Are sphincter defects the cause of anal incontinence after vaginal delivery? Results of a prospective study, Diseases of the Colon and Rectum, 43, 590-598, 2000	Population not of interest for review: pregnant women.
Albert, H. B., Godskesen, M., Korsholm, L., Westergaard, J. G., Risk factors in developing pregnancy-related pelvic girdle pain, Acta Obstetricia et Gynecologica Scandinavica, 85, 539-44, 2006	Population not of interest for review: pregnant women with pelvic girdle pain.
Ali, A., Glennon, K., Kirkham, C., Yousif, S., Eogan, M., Delivery outcomes and events in subsequent pregnancies after previous anal sphincter injury, European Journal of Obstetrics, Gynecology, & Reproductive Biology, 174, 51-3, 2014	Population not of interest for review: women with a history of anal sphincter injury who were pregnant again.
Alligood-Percoco, N. R., Kjerulff, K. H., Repke, J. T., Risk Factors for Dyspareunia after First Childbirth, Obstetrics and Gynecology, 128, 512-518, 2016	Risk factor not of interest for review: only presence of perineal pain, no details of severity or if other risk factors co-existed.
Alon, R., Shimonovitz, T., Brecher, S., Shick-Nave, L., Lev-Sagie, A., Delivery in patients with dyspareunia-A prospective study, European Journal of Obstetrics and Gynecology and Reproductive Biology, 237, 131-136, 2019	Multivariate regression analysis not performed.
Andersen, L. B., Melvaer, L. B., Videbech, P., Lamont, R. F., Joergensen, J. S., Risk factors for developing post-traumatic stress disorder following childbirth: a systematic review, Acta Obstetricia et Gynecologica Scandinavica, 91, 1261-72, 2012	Risk factor not of interest for review: pain during labour.
Andreucci, C. B., Bussadori, J. C., Pacagnella, R. C., Chou, D., Filippi, V., Say, L., Cecatti, J. G., Parpinelli, M. A., Costa, M. L., Silveira, C., Angelini, C. R., Ferreira, E. C., Zanardi, D. M., Santos, J. P., Souza, R. T., Cecchini, G. N., Firoz, T., von Dadelszen, P., Magee, L. A., Agrawal, P., Vanderkruik, R., Tuncalp, O., Gulmezoglu, A. M., van Den Broek, N., Hirose, A., Donnay, F., Ferguson, R., Fawole, O., Gherissi, A., Gyte, G., Jayathilaka, A., Kone, Y., Foundation, A. K., Lange, M. I., McCaw-Binns, A., Morgan, M., Munjanja, S., Oztopcu, C.,	No data of interest for review: descriptive review.

Study	Reason for exclusion
Sullivan, E., Sexual life and dysfunction after maternal morbidity: A systematic review, BMC Pregnancy and Childbirth, 15 (1) (no pagination), 2015	
Andrews, V., Shelmeridine, S., Sultan, A. H., Thakar, R., Anal and urinary incontinence 4 years after a vaginal delivery, International Urogynecology Journal and Pelvic Floor Dysfunction, 24, 55-60, 2013	Risk factor not of interest for review: women sustaining OASIS (no mention of pain).
Andrews, V., Thakar, R., Sultan, A. H., Jones, P. W., Evaluation of postpartum perineal pain and dyspareunia-A prospective study, European Journal of Obstetrics Gynecology and Reproductive Biology, 137, 152-156, 2008	No outcomes of interest for review: association between perineal trauma and pain up to 7 weeks postpartum.
Anglim, B., Kelly, L., Fitzpatrick, M., Risk factors and outcome of repair of obstetric anal sphincter injuries as followed up in a dedicated perineal clinic, International Urogynecology Journal., 2019	Risk factor not of interest for review: women sustaining OASIS (no mention of pain).
Ansara, D., Cohen, M. M., Gallop, R., Kung, R., Schei, B., Predictors of women's physical health problems after childbirth, Journal of Psychosomatic Obstetrics & GynecologyJ Psychosom Obstet Gynaecol, 26, 115-25, 2005	Outcome not of interest for review: perineal pain at 8-10 weeks postpartum.
Arrue, M., Ibanez, L., Paredes, J., Murgiondo, A., Belar, M., Sarasqueta, C., Diez-Itza, I., Stress urinary incontinence six months after first vaginal delivery, European Journal of Obstetrics Gynecology and Reproductive Biology, 150, 210-214, 2010	No risk factors of interest for review: maternal and delivery characteristics.
Athanasakos, E., Raeburn, A., Vashisht, A., Zarate, N., Emmanuel, A., "have your second baby first, and have 'em young": Risks of obstetric trauma and anorectal dysfunction after obstetric injury, Gut, 65 (Supplement 1), A117, 2016	Conference abstract.
Axelsson, D., Brynhildsen, J., Blomberg, M., Postpartum infection in relation to maternal characteristics, obstetric interventions and complications, Journal of Perinatal Medicine, 46, 271-278, 2018	No risk factors of interest for review: maternal and delivery characteristics.
Baksu,B., Davas,I., Agar,E., Akyol,A., Varolan,A., The effect of mode of delivery on postpartum sexual functioning in primiparous women, International Urogynecology Journal, 18, 401-406, 2007	Risk factor not of interest for review: mode of delivery (no mention of pain).
Barbara, G., Pifarotti, P., Facchin, F., Cortinovis, I., Dridi, D., Ronchetti, C., Calzolari, L., Vercellini, P., Impact of Mode of Delivery on Female Postpartum Sexual Functioning: Spontaneous Vaginal Delivery and Operative Vaginal Delivery vs Cesarean Section, Journal of Sexual Medicine, 13, 393-401, 2016	Risk factor not of interest for review: mode of delivery (no mention of pain).
Baud, D., Vial, Y., Hohlfeld, P., Achtari, C., Meyer, S., Pelvic floor dysfunction after an anal sphincter tear during childbirth, American Journal of Obstetrics and Gynecology, 204 (1 SUPPL.), S328, 2011	Conference abstract.

Study	Reason for exclusion
Baydock, S. A., Flood, C., Schulz, J. A., MacDonald, D., Esau, D., Jones, S., Hiltz, C. B., Prevalence and Risk Factors for Urinary and Fecal Incontinence Four Months After Vaginal Delivery, Journal of Obstetrics and Gynaecology Canada, 31, 36-41, 2009	Risk factor not of interest for review: maternal characteristics and mode of delivery (no mention of pain).
Benassi, L., Bocchialini, E., Bertelli, M., Kaihura, C. T., Ricci, L., Siliprandi, V., Risk of genital prolapse and urinary incontinence due to pregnancy and delivery. A prospective study, Minerva Ginecologica, 54, 317-324, 2002	Sample size not of interest for review: <100 participants.
Bergstrom, C., Persson, M., Mogren, I., Pregnancy-related low back pain and pelvic girdle pain approximately 14 months after pregnancy - pain status, self-rated health and family situation, BMC Pregnancy and Childbirth, 14 (1) (no pagination), 2014	Population not of interest for review: pregnant women with low back and pelvic girdle pain.
Bertozzi, S., Londero, A. P., Fruscalzo, A., Driul, L., Delneri, C., Calcagno, A., Di Benedetto, P., Marchesoni, D., Impact of episiotomy on pelvic floor disorders and their influence on women's wellness after the sixth month postpartum: A retrospective study, BMC women's health, 11 (no pagination), 2011	Population not of interest for review: women who delivered vaginally (no mention of perineal pain).
Bjelland, E. K., Owe, K. M., Pingel, R., Kristiansson, P., Vangen, S., Eberhard-Gran, M., Pelvic pain after childbirth: A longitudinal population study, Pain, 157, 710-716, 2016	Risk factor not of interest for review: maternal characteristics and mode of delivery (no mention of pain). Outcome not well defined: pelvic pain that was self-reported that could or could not include perineal pain.
Bo, K., Hilde, G., Tennfjord, M. K., Engh, M. E., Does episiotomy influence vaginal resting pressure, pelvic floor muscle strength and endurance, and prevalence of urinary incontinence 6 weeks postpartum?, Neurourology and Urodynamics, 36, 683-686, 2017	Risk factor not of interest for review: mode of delivery (no mention of pain).
Borello-France, D., Burgio, K. L., Richter, H. E., Zyczynski, H., FitzGerald, M. P., Whitehead, W., Fine, P., Nygaard, I., Handa, V. L., Visco, A. G., Weber, A. M., Brown, M. B., Fecal and urinary incontinence in primiparous women, Obstetrics and Gynecology, 108, 863-872, 2006	Risk factor not of interest for review: perineal tear (no mention of pain).
Bourgon, N., Mottet, N., Bourtembourg, A., Pugin, A., Ramanah, R., Riethmuller, D., Obstetrical anal sphincter injuries and vacuum-assisted delivery at term in primiparas, Gynecologie Obstetrique Fertilite et Senologie, 46, 686-691, 2018	Full text not in English.
Bradley, C. S., Richter, H. E., Gutman, R. E., Brown, M. B., Whitehead, W. E., Fine, P. M., Hakim, C., Harford, F., Weber, A. M., Risk factors for sonographic internal anal sphincter gaps 6-12 months after delivery complicated by anal sphincter tear, American Journal of Obstetrics and Gynecology, 197, 310.e1-310.e5, 2007	Risk factor not of interest for review: maternal characteristics and delivery complications (no mention of pain).
Buchanan, J., Beckmann, M., Postpartum voiding dysfunction: Identifying the risk factors,	Outcome not of interest for review: 4h postpartum bladder residual volume of >150ml.

Study	Reason for exclusion
Australian and New Zealand Journal of Obstetrics and Gynaecology, 54, 41-45, 2014	
Burgio, K. L., Borello-France, D., Richter, H. E., Fitzgerald, M. P., Whitehead, W., Handa, V. L., Nygaard, I., Fine, P., Zyczynski, H., Visco, A. G., Brown, M. B., Weber, A. M., Pelvic Floor Disorders, Network, Risk factors for fecal and urinary incontinence after childbirth: the childbirth and pelvic symptoms study, American Journal of Gastroenterology, 102, 1998-2004, 2007	Risk factor not of interest for review: maternal characteristics and delivery complications (no mention of pain).
Burrell, M., Dilgir, S., Patton, V., Parkin, K., Karantanis, E., Risk factors for obstetric anal sphincter injuries and postpartum anal and urinary incontinence: a case-control trial, International Urogynecology Journal and Pelvic Floor Dysfunction, 26, 383-389, 2014	Risk factor not of interest for review: maternal characteristics and mode of delivery (no mention of pain).
Cappell, J., Pukall, C. F., Clinical profile of persistent genito-pelvic postpartum pain, Midwifery, 50, 125-132, 2017	Multivariate regression analysis not performed.
Chang, S. R., Chen, K. H., Ho, H. N., Lai, Y. H., Lin, M. I., Lee, C. N., Lin, W. A., Depressive symptoms, pain, and sexual dysfunction over the first year following vaginal or cesarean delivery: A prospective longitudinal study, International Journal of Nursing StudiesInt J Nurs Stud, 52, 1433-44, 2015	Risk factor not of interest for review: mode of delivery (no mention of pain).
Chang, S. R., Chen, K. H., Lin, H. H., Chao, Y. M. Y., Lai, Y. H., Comparison of the effects of episiotomy and no episiotomy on pain, urinary incontinence, and sexual function 3 months postpartum: A prospective follow-up study, International journal of nursing studies, 48, 409-418, 2011	Risk factor not of interest for review: complications of delivery (no mention of pain).
Chang, S. R., Lin, W. A., Lin, H. H., Shyu, M. K., Lin, M. I., Sexual dysfunction predicts depressive symptoms during the first 2 years postpartum, Women and Birth., 2018	Risk factor not of interest for review: any pain after childbirth (may or may not be perineal).
Chivers, M. L., Pittini, R., Grigoriadis, S., Villegas, L., Ross, L. E., The relationship between sexual functioning and depressive symptomatology in postpartum women: A pilot study, Journal of Sexual Medicine, 8, 792-799, 2011	Sample size not of interest for review: <100 participants.
Connolly,A.M., Thorp,J., Pahel,L., Effects of pregnancy and childbirth on postpartum sexual function: A longitudinal prospective study, International Urogynecology Journal and Pelvic Floor Dysfunction, 16, 263-267, 2005	Multivariate regression analysis not performed.
Constable, L. G., Monga, D. A., Mylonas, G., O'Connor, E., The impact of maternal body mass index on the rate of severe perineal trauma in primiparous women; A Victorian retrospective cohort study, Journal of Paediatrics and Child Health, 55 (Supplement 1), 118-119, 2019	Conference abstract.
Cooklin, A. R., Amir, L. H., Jarman, J., Cullinane, M., Donath, S. M., Maternal Physical	Multivariate regression analysis not performed.

Study	Reason for exclusion
Health Symptoms in the First 8 Weeks Postpartum Among Primiparous Australian Women, Birth (Berkeley, Calif.), 42, 254-260, 2015	
Cooklin, A. R., Amir, L. H., Nguyen, C. D., Buck, M. L., Cullinane, M., Fisher, J. R. W., Donath, S. M., Physical health, breastfeeding problems and maternal mood in the early postpartum: a prospective cohort study, Archives of Women's Mental Health, 21, 365-374, 2018	No risk factors of interest for review: physical health and breastfeeding problems (no mention of perineal pain).
Crane, A. K., Geller, E. J., Bane, H., Ju, R., Myers, E., Matthews, C. A., Evaluation of pelvic floor symptoms and sexual function in primiparous women who underwent operative vaginal delivery versus cesarean delivery for second-stage arrest, Female pelvic medicine & reconstructive surgery, 19, 13-16, 2013	Risk factors not of interest for review: mode of delivery.
Dave, B. A., Leader-Cramer, A., Mueller, M., Johnson, L. L., Kenton, K., Lewicky-Gaupp, C., Anal Sphincter Injuries After Operative Vaginal Versus Spontaneous Delivery-Is There a Difference in Postpartum Symptoms?, Female Pelvic Medicine & Reconstructive SurgeryFemale pelvic med, 22, 194-8, 2016	Risk factors not of interest for review: mode of delivery.
de Groot, N., Birnie, E., Vermolen, J. H., Dorscheidt, J. J. A., Bonsel, G. J., The prevalence of adverse postnatal outcomes for mother and infant in the Netherlands, PLoS ONE, 13 (9) (no pagination), 2018	No risk factors of interest for review: pain not reported in postnatal characteristics.
Declercq, E., Cunningham, D. K., Johnson, C., Sakala, C., Mothers' reports of postpartum pain associated with vaginal and cesarean deliveries: Results of a national survey, Birth, 35, 16-24, 2008	Multivariate regression analysis not performed.
Dogan, B., Gun, I., Ozdamar, O., Yilmaz, A., Muhcu, M., Long-term impacts of vaginal birth with mediolateral episiotomy on sexual and pelvic dysfunction and perineal pain, Journal of Maternal-Fetal and Neonatal Medicine, 30, 457-460, 2017	Multivariate regression analysis not performed.
Dooley, N., Hoesni, S., Tan, T., Carey, M., A survey of the prevalence of persistent pain after vaginal delivery: A pilot study, Irish Journal of Medical Science, 182, 69-71, 2013	Multivariate regression analysis not performed.
Driul, L., Bertozzi, S., Londero, A. P., Fruscalzo, A., Rusalen, A., Marchesoni, D., Di Benedetto, P., Risk factors for chronic pelvic pain in a cohort of primipara and secondipara at one year after delivery: Association of chronic pelvic pain with autoimmune pathologies, Minerva Ginecologica, 63, 181-187, 2011	Outcome not of interest for review: chronic pelvic pain.
Dunn, A. B., Paul, S., Ware, L. Z., Corwin, E. J., Perineal Injury During Childbirth Increases Risk of Postpartum Depressive Symptoms and Inflammatory Markers, Journal of Midwifery and Women's Health, 60, 428-436, 2015	Risk factors not of interest for review: 2nd degree or more perineal laceration (pain not specifically mentioned).
Durnea, C. M., Khashan, A. S., Kenny, L. C., Durnea, U. A., Smyth, M. M., O'Reilly, B. A.,	Risk factors not of interest for review: no mention of perineal pain.

Study	Reason for exclusion
Prevalence, etiology and risk factors of pelvic organ prolapse in premenopausal primiparous women, International Urogynecology Journal and Pelvic Floor Dysfunction, 25, 1463-1470, 2014	
Durnea, C., Carlson, V., Khashan, A., Kenny, L. C., O'Reilly B, A., Prevalence of pelvic floor dysfunction in primiparous women at 1 year after delivery, International Urogynecology Journal and Pelvic Floor Dysfunction, 22, S74-S75, 2011	Conference abstract.
Eason,E., Labrecque,M., Marcoux,S., Mondor,M., Effects of carrying a pregnancy and of method of delivery on urinary incontinence: A prospective cohort study, BMC Pregnancy and Childbirth, 4,;#2004. Date of Publication, -, 2004	Risk factors not of interest for review: maternal and delivery characteristics (no mention of pain).
East, C. E., Sherburn, M., Nagle, C., Said, J., Forster, D., Perineal pain following childbirth: prevalence, effects on postnatal recovery and analgesia usage, Midwifery, 28, 93-7, 2012	Multivariate regression analysis not performed.
Ewings, P., Spencer, S., Marsh, H., O'Sullivan, M., Obstetric risk factors for urinary incontinence and preventative pelvic floor exercises: Cohort study and nested randomized controlled trial, Journal of Obstetrics and Gynaecology, 25, 558-564, 2005	No risk factors of interest for review: maternal and delivery characteristics (no perineal pain mentioned).
Fabris, L. K., Persistent post-partum pain after vaginal birth and cesarean section, Periodicum Biologorum, 113, 239-241, 2011	Study design not of interest for review: literature review.
Fauconnier,A., Goltzene,A., Issartel,F., Janse-Marec,J., Blondel,B., Fritel,X., Late post-partum dyspareunia: does delivery play a role?, Progres en Urologie, 22, 225-232, 2012	Multivariate regression analysis does not include pain as a risk factor.
Firouzkouhi Moghaddam, M., Shamsi, A., Ghazihosseini, P., The prevalence of post-traumatic stress disorder among women with normal vaginal delivery in Zahedan City in 2013, European Psychiatry, 30, 1111, 2015	Conference abstract.
Fodstad, K., Staff, A. C., Laine, K., Sexual activity and dyspareunia the first year postpartum in relation to degree of perineal trauma, International Urogynecology Journal and Pelvic Floor Dysfunction, 27, 1513-1523, 2016	Multivariate regression analysis does not include pain as a risk factor.
Gartland,D., Donath,S., MacArthur,C., Brown,S.J., The onset, recurrence and associated obstetric risk factors for urinary incontinence in the first 18 months after a first birth: An Australian nulliparous cohort study, BJOG: An International Journal of Obstetrics and Gynaecology, 119, 1361-1369, 2012	No risk factors of interest for review: maternal and delivery characteristics (no perineal pain mentioned).
Glowacka, M., Rosen, N., Chorney, J., Snelgrove-Clarke, E., George, R. B., Prevalence and predictors of genito-pelvic pain in pregnancy and postpartum: The prospective impact of fear avoidance, Journal of Sexual Medicine, 11, 3021-3034, 2014	No risk factors of interest for review: biopsychosical predictors of genito-pelvic pain.

Study	Reason for exclusion
Gommesen, D., Nohr, E. A., Drue, H. C., Qvist, N., Rasch, V., Obstetric perineal tears: risk factors, wound infection and dehiscence: a prospective cohort study, Archives of Gynecology and Obstetrics, 300, 67-77, 2019	No risk factors of interest for review: maternal and delivery characteristics (no perineal pain mentioned).
Gommesen, D., Nohr, E. A., Qvist, N., Rasch, V., Obstetric perineal ruptures -risk of anal incontinence among primiparous women 12 months postpartum: a prospective cohort study, American Journal of Obstetrics and Gynecology., 23, 2019	No risk factors of interest for review: maternal and delivery characteristics (no perineal pain mentioned).
Gutke, A., Lundberg, M., Ostgaard, H. C., Oberg, B., Impact of postpartum lumbopelvic pain on disability, pain intensity, health-related quality of life, activity level, kinesiophobia, and depressive symptoms, European Spine Journal, 20, 440-8, 2011	Population not of interest for review: women with lumbopelvic pain (no mention of perineal pain in definition).
Gyhagen, M., Bullarbo, M., Nielsen, T. F., Milsom, I., Prevalence and risk factors for pelvic organ prolapse 20 years after childbirth: a national cohort study in singleton primiparae after vaginal or caesarean delivery, BJOG: An International Journal of Obstetrics & Gynaecology, 120, 152-60, 2013	No risk factors of interest for review: maternal and delivery characteristics (no perineal pain mentioned).
Halle, T. K. T., Staer-Jensen, J., Bo, K., Engh, M. E., Siafarikas, F., Prevalences of major levator ani muscle defects 6 weeks and 1 year postpartum and factors associated with persisting major levator ani muscle defects 1 year postpartum, Neurourology and Urodynamics, 36, S121-S122, 2017	Conference abstract.
Handa, V. L., Blomquist, J. L., McDermott, K. C., Friedman, S., Munoz, A., Pelvic floor disorders after vaginal birth: Effect of episiotomy, perineal laceration, and operative birth, Obstetrics and Gynecology, 119, 233-239, 2012	Risk factors not of interest for review: mode of delivery.
Hatem, M., Pasquier, J. C., Fraser, W., Lepire, E., Factors Associated With Postpartum Urinary/Anal Incontinence in Primiparous Women in Quebec, Journal of Obstetrics and Gynaecology Canada, 29, 232-239, 2007	No risk factors of interest for review: maternal and delivery characteristics (no perineal pain mentioned).
Howell,E.A., Mora,P.A., Chassin,M.R., Leventhal,H., Lack of preparation, physical health after childbirth, and early postpartum depressive symptoms, Journal of Women's Health, 19, 703-708, 2010	No risk factors of interest for review: maternal and delivery characteristics (no perineal pain mentioned).
Huser, M., Janku, P., Hudecek, R., Zbozinkova, Z., Bursa, M., Unzeitig, V., Ventruba, P., Pelvic floor dysfunction after vaginal and cesarean delivery among singleton primiparas, International Journal of Gynecology and Obstetrics, 137, 170-173, 2017	Risk factors not of interest for review: mode of delivery.
Iles, D., Khan, R., Naidoo, K., Kearney, R., Myers, J., Reid, F., The impact of anal sphincter injury on perceived body image, European Journal of Obstetrics Gynecology and Reproductive Biology, 212, 140-143, 2017	Population not of interest for review: women referred to clinic with a sphincter tear (no specific mention of pain, plus don't know proportion of grade 3 or 4 tears).

Study	Reason for exclusion
Jelovsek, J. E., Rogers, R. G., Yu, C., Leeman, L., Barber, M. D., Validation of nomograms that predict a woman's individual probability of developing urinary and fecal incontinence after her first delivery, Female Pelvic Medicine and Reconstructive Surgery, 19, S137, 2013	Conference abstract.
Johannessen, H. H., Stafne, S. N., Falk, R. S., Stordahl, A., Wibe, A., Morkved, S., Prevalence and predictors of double incontinence 1 year after first delivery, International Urogynecology Journal, 29, 1529-1535, 2018	No risk factors of interest for review: maternal and delivery characteristics (no perineal pain mentioned).
Jones, K., Webb, S., Manresa, M., Hodgetts Morton, V., Morris, K., Systematic review of the incidence of wound infection and dehiscence following childbirthrelated perineal trauma, BJOG: An International Journal of Obstetrics and Gynaecology, 126, 111, 2019	Conference abstract.
Jundt,K., Scheer,I., Schiessl,B., Karl,K., Friese,K., Peschers,U.M., Incontinence, bladder neck mobility, and sphincter ruptures in primiparous women, European Journal of Medical Research, 15, 246-252, 2010	Risk factors not of interest for review: mode of delivery.
Kainu, J. P., Halmesmaki, E., Korttila, K. T., Sarvela, P. J., Persistent Pain After Cesarean Delivery and Vaginal Delivery: A Prospective Cohort Study, Anesthesia & AnalgesiaAnesth Analg, 123, 1535-1545, 2016	Population not of interest for review: women who had given birth in a tertiary maternity hospital (no mention of perineal pain).
Kingsbury, B., Rathore, S., Chelliah, H., Londhe, V., Benjamin, S. J., Mathews, J., Risk factors for peripartum wound dehiscence, Journal of Clinical and Diagnostic Research, 12, 2018	No risk factors of interest for review: maternal and delivery characteristics (no perineal pain mentioned).
Klein,M.C., Kaczorowski,J., Firoz,T., Hubinette,M., Jorgensen,S., Gauthier,R., A comparison of urinary and sexual outcomes in women experiencing vaginal and Caesarean births, Journal of Obstetrics and Gynaecology Canada: JOGC, 27, 332-339, 2005	Risk factors not of interest for review: mode of delivery.
Lagaert, L., Weyers, S., Van Kerrebroeck, H., Elaut, E., Postpartum dyspareunia and sexual functioning: a prospective cohort study, European Journal of Contraception and Reproductive Health Care, 22, 200-206, 2017	Multivariate regression analysis not performed.
Lagana, A. S., Burgio, M. A., Ciancimino, L., Sicilia, A., Pizzo, A., Magno, C., Buttice, S., Triolo, O., Evaluation of recovery and quality of sexual activity in women during postpartum in relation to the different mode of delivery: A retrospective analysis, Minerva Ginecologica, 67, 315-320, 2015	Risk factor not of interest for review: mode of delivery (no mention of pain).
Laine,K., Skjeldestad,F.E., Sanda,B., Horne,H., Spydslaug,A., Staff,A.C., Prevalence and risk factors for anal incontinence after obstetric anal sphincter rupture, Acta Obstetricia et Gynecologica Scandinavica, 90, 319-324, 2011	No risk factors of interest for review: maternal and delivery characteristics (no perineal pain mentioned).
Lal, M., Pattison, H. M., Allan, T. F., Callender, R., Does post-caesarean dyspareunia reflect sexual malfunction, pelvic floor and perineal	Population not of interest for review: women who had given birth (no mention of perineal pain).

Study	Reason for exclusion
dysfunction?, Journal of Obstetrics & Gynaecology, 31, 617-30, 2011	
Landau,R., Bollag,L., Ortner,C., Chronic pain after childbirth, International Journal of Obstetric Anesthesia, 22, 133-145, 2013	Multivariate regression analysis not performed.
Larsson, C., Hedberg, C. L., Lundgren, E., Soderstrom, L., TunOn, K., Nordin, P., Anal incontinence after caesarean and vaginal delivery in Sweden: a national population-based study, Lancet (London, England), 393, 1233-1239, 2019	No risk factors of interest for review: maternal and delivery characteristics (no perineal pain mentioned).
Lavand'Homme, P., Postpartum chronic pain, Minerva Anestesiologica, 85, 320-324, 2019	Multivariate regression analysis not performed.
Leader-Cramer, A., Kenton, K., Dave, B., Gossett, D. R., Mueller, M., Lewicky-Gaupp, C., Factors Associated With Timing of Return to Intercourse After Obstetric Anal Sphincter Injuries, Journal of Sexual Medicine, 13, 1523-9, 2016	Multivariate regression analysis not performed.
Leader-Cramer, A., Kenton, K., Johnson, L., Gossett, D., Lewicky-Gaupp, C., Risk factors for wound complication in women with obstetric anal sphincter injuries, Neurourology and Urodynamics, 34, S35, 2015	Conference abstract.
Leeman, L. M., Fullilove, A. M., Borders, N., Manocchio, R., Albers, L. L., Rogers, R. G., Postpartum perineal pain: Association with genital trauma, labor care and birth variables, Journal of Pelvic Medicine and Surgery, 14 (4), 306-307, 2008	Conference abstract.
Leeman, L., Rogers, R., Borders, N., Teaf, D., Qualls, C., The Effect of Perineal Lacerations on Pelvic Floor Function and Anatomy at 6 Months Postpartum in a Prospective Cohort of Nulliparous Women, Birth (Berkeley, Calif.), 43, 293-302, 2016	Risk factors not of interest for review: degree of perineal trauma.
Leeman,L., Fullilove,A.M., Borders,N., Manocchio,R., Albers,L.L., Rogers,R.G., Postpartum perineal pain in a low episiotomy setting: association with severity of genital trauma, labor care, and birth variables, Birth, 36, 283-288, 2009	Risk factors not of interest for review: degree of perineal trauma.
Leeman,L.M., Rogers,R.G., Greulich,B., Albers,L.L., Do unsutured second-degree perineal lacerations affect postpartum functional outcomes?, Journal of the American Board of Family Medicine: JABFM, 20, 451-457, 2007	Risk factors not of interest for review: degree of perineal trauma.
Lincova, M., Neumannova, H., Mikyskova, I., Zikan, M., Obstetric anal sphincter injuries - review of our date between 2015-2017, Ceska gynekologie, 84, 18-22, 2019	Full text not in English.
Lipschuetz, M., Cohen, S. M., Liebergall-Wischnitzer, M., Zbedat, K., Hochner-Celnikier, D., Lavy, Y., Yagel, S., Degree of bother from pelvic floor dysfunction in women one year after first delivery, European Journal of Obstetrics Gynecology and Reproductive Biology, 191, 90-94, 2015	Multivariate regression analysis not performed.

Study	Reason for exclusion
Londero, A. P., Bertozzi, S., Petrovec, M. M., Del Neri, C., Driul, L., Marchesoni, D., Di Benedetto, P., Risk factors for chronic pelvic pain in a cohort of primipara and secondipara at one year after delivery: Association of chronic pelvic pain with autoimmune patologies, International Urogynecology Journal and Pelvic Floor Dysfunction, 20, S339-S340, 2009	Conference abstract.
Macarthur,A.J., Macarthur,C., Incidence, severity, and determinants of perineal pain after vaginal delivery: a prospective cohort study, American Journal of Obstetrics and Gynecology, 191, 1199-1204, 2004	Risk factors not of interest for review: degree of perineal trauma.
Mallah, F., Tasbihi, P., Navali, N., Azadi, A., Urinary incontinence during pregnancy and postpartum incidence, Severity and risk factors in alzahra and taleqani hospitals in Tabriz, Iran, 2011-2012, International Journal of Women's Health and Reproduction Sciences, 2, 178-185, 2014	No risk factors of interest for review: maternal and delivery characteristics.
Manresa, M., Pereda, A., Bataller, E., Terre-Rull, C., Ismail, K. M., Webb, S. S., Incidence of perineal pain and dyspareunia following spontaneous vaginal birth: a systematic review and meta-analysis, International Urogynecology Journal, 30, 853-868, 2019	No risk factors of interest for review: mode of delivery and intact/different degrees of tear/episiotomy. References checked for additional studies.
Manresa, M., Pereda-Nunez, A., Bataller-Sanchez, E., Terre-Rull, C., Ismail, K. M., Webb, S. S., Incidence of dyspareunia following spontaneous vaginal childbirth: A systematic review and meta-analysis, International Urogynecology Journal, 29 (Supplement 1), S55, 2018	Conference abstract.
Martinez-Galiano, J. M., Hernandez-Martinez, A., Rodriguez-Almagro, J., Delgado-Rodriguez, M., Quality of life of women after giving birth: Associated factors related with the birth process, Journal of Clinical Medicine, 8, 324, 2019	Multivariate regression analysis not performed.
McDonald, E. A., Brown, S. J., Does method of birth make a difference to when women resume sex after childbirth?, BJOG: An International Journal of Obstetrics and Gynaecology, 120, 823-830, 2013	No risk factors of interest for review: maternal and delivery characteristics.
McDonald, E. A., Gartland, D., Small, R., Brown, S. J., Dyspareunia and childbirth: a prospective cohort study, BJOG: An International Journal of Obstetrics & Gynaecology, 122, 672-9, 2015	No risk factors of interest for review: maternal and delivery characteristics.
McDonald, E., Gartland, D., Small, R., Brown, S., Prevalence of postnatal dyspareunia and association of short-term and persisting dyspareunia with mode of delivery, International Journal of Gynecology and Obstetrics, 5), E113, 2015	Conference abstract.
Meyer, S., Hohlfeld, P., Achtari, C., Russolo, A., De Grandi, P., Birth trauma: Short and long term effects of forceps delivery compared with spontaneous delivery on various pelvic floor	No risk factors of interest for review: delivery characteristics.

Study	Reason for exclusion
parameters, British Journal of Obstetrics and Gynaecology, 107, 1360-1365, 2000	
Mogren,I.M., BMI, pain and hyper-mobility are determinants of long-term outcome for women with low back pain and pelvic pain during pregnancy, European Spine Journal, 15, 1093-1102, 2006	Population not of interest for review: women who have given birth and suffered from low back pain and pelvic pain during pregnancy.
Mukkannavar, P., Desai, B. R., Mohanty, U., Parvatikar, V., Karwa, D., Daiwajna, S., Pelvic girdle pain after childbirth: The impact of mode of delivery, Journal of Back and Musculoskeletal Rehabilitation, 26, 281-290, 2013	Country not of interest for review: India.
Neels, H., De Wachter, S., Wyndaele, J. J., Wyndaele, M., Vermandel, A., Does pelvic floor muscle contraction early after delivery cause perineal pain in postpartum women?, European Journal of Obstetrics Gynecology and Reproductive Biology, 208, 1-5, 2017	Multivariate regression analysis not performed.
Ng, K., Cheung, R. Y. K., Lee, L. L., Chung, T. K. H., Chan, S. S. C., An observational follow-up study on pelvic floor disorders to 3-5 years after delivery, International Urogynecology Journal, 28, 1393-1399, 2017	Population not of interest for review: women who have given birth (no mention of pain).
Nielsen, L. L., Clinical findings, pain descriptions and physical complaints reported by women with post-natal pregnancy-related pelvic girdle pain, Acta Obstetricia et Gynecologica Scandinavica, 89, 1187-1191, 2010	Population not of interest for review: post-natal pregnancy related pelvic girdle pain.
Nikpour, M., Delavar, M. A., Abedian, Z., Type of delivery and self-reported postpartum symptoms among Iranian women, Clinical & Experimental Obstetrics & Gynecology, 40, 144-7, 2013	Risk factor not of interest for review: mode of delivery (no mention of pain).
Noren, L., Ostgaard, S., Johansson, G., Ostgaard, H. C., Lumbar back and posterior pelvic pain during pregnancy: A 3-year follow-up, European Spine Journal, 11, 267-271, 2002	Population not of interest for review: pregnancy related lumbar /or pelvic pain.
O'Herlihy, C., Obstetric perineal injury: Risk factors and strategies for prevention, Seminars in Perinatology, 27, 13-19, 2003	Study design not of interest for review: literature review.
O'Leary, B. D., Ciprike, V., Anal sphincter injury associated with shoulder dystocia, Journal of Maternal Fetal and Neonatal Medicine., 2019	Population not of interest for review: women who have given birth complicated by shoulder dystocia (no mention of perineal pain).
Oliveira, L. S., Brito, L. G. O., Quintana, S. M., Duarte, G., Marcolin, A. C., Perineal trauma after vaginal delivery in healthy pregnant women, Sao Paulo Medical Journal, 132, 231-238, 2014	Country not of interest for review: Brazil.
O'Malley, D., Higgins, A., Begley, C., Daly, D., Smith, V., Prevalence of and risk factors associated with sexual health issues in primiparous women at 6 and 12months postpartum; A longitudinal prospective cohort study (the MAMMI study), BMC Pregnancy and Childbirth, 18 (1) (no pagination), 2018	Population not of interest for review: Pregnant women >18 years old (no mention of perineal pain).
Paterson, L. Q. P., Davis, S. N. P., Khalife, S., Amsel, R., Binik, Y. M., Persistent genital and pelvic pain after childbirth, Journal of Sexual Medicine, 6, 215-221, 2009	Multivariate regression analysis not performed.

Study	Reason for exclusion
Patton, V., Kumar, S., Parkin, K., Karantanis, E., Dinning, P., The relationship between residual sphincter damage after primary repair, faecal incontinence, and anal sphincter function in primiparous women with an obstetric anal sphincter injury, Neurourology and Urodynamics, 38, 193-199, 2019	Population not of interest for review: women who sustained OASI (no mention of perineal pain).
Perales, A., Sanroma, A., Nohales, F., Alfonso, M. J., Mendez, G., Nunez, G., Pau, M. J., Postpartum dyspareunia : Case-control study, International Urogynecology Journal and Pelvic Floor Dysfunction, 3), S1893-S1894, 2011	Conference abstract.
Pereira, G. M., Monteiro, M., Reis, Z. S., Figueiredo, E. M., Cruz, M. C., Meinberg, M., Prevalence of pelvic floor dysfunctions in primiparous 12 to 24 months after vaginal delivery, International Urogynecology Journal, 28, S182-S183, 2017	Conference abstract.
Pereira, T. R. C., Souza, F. G., Beleza, A. C. S., Implications of pain in functional activities in immediate postpartum period according to the mode of delivery and parity: an observational study, Brazilian journal of physical therapy, 21, 37-43, 2017	Country of study not of interest for review: Brazil.
Persico, G., Vergani, P., Cestaro, C., Grandolfo, M., Nespoli, A., Assessment of postpartum perineal pain after vaginal delivery: Prevalence, severity and determinants. A prospective observational study, Minerva Ginecologica, 65, 669-678, 2013	Risk factor not of interest for review: perineal trauma (no mention of pain).
Pregazzi, R., Sartore, A., Troiano, L., Grimaldi, E., Bortoli, P., Siracusano, S., Guaschino, S., Postpartum urinary symptoms: Prevalence and risk factors, European Journal of Obstetrics Gynecology and Reproductive Biology, 103, 179-182, 2002	No risk factors of interest for review: maternal and delivery characteristics.
Pregazzi,R., Sartore,A., Bortoli,P., Grimaldi,E., Ricci,G., Guaschino,S., Immediate postpartum perineal examination as a predictor of puerperal pelvic floor dysfunction, Obstetrics and Gynecology, 99, 581-584, 2002	Risk factor not of interest for review: degree of perineal tear (no mention of pain).
Premkumar, G., Perineal trauma: reducing associated postnatal maternal morbidity, RCM Midwives, 8, 30-2, 2005	Study design not of interest for review: editorial.
Prick, B. W., Bijlenga, D., Jansen, A. J. G., Boers, K. E., Scherjon, S. A., Koopmans, C. M., Van Pampus, M. G., Essink-Bot, M. L., Van Rhenen, D. J., Mol, B. W., Duvekot, J. J., Determinants of health-related quality of life in the postpartum period after obstetric complications, European Journal of Obstetrics Gynecology and Reproductive Biology, 185, 88-95, 2015	Risk factors not of interest for review: maternal and delivery complications (no mention of perineal pain).
Quigley, E. M. M., Impact of pregnancy and parturition on the anal sphincters and pelvic floor, Best Practice and Research in Clinical Gastroenterology, 21, 879-891, 2007	Study design not of interest for review: literature review.

Study	Reason for exclusion
Radestad, I., Olsson, A., Nissen, E., Rubertsson, C., Tears in the vagina, perineum, sphincter ani, and rectum and first sexual intercourse after childbirth: a nationwide follow-up, Birth, 35, 98-106, 2008	Risk factor not of interest for review: degree of perineal tear (no mention of pain).
Ramage, L., Yen, C., Qiu, S., Simillis, C., Kontovounisios, C., Tekkis, P., Tan, E., Functional and quality of life outcomes following obstetric anal sphincter injury (OASI): does the grade of injury affect outcomes?, International Urogynecology Journal, 28, 1709-1717, 2017	No risk factors of interest for review: degree of OASI grade (no mention of pain).
Robinson, H. S., Mengshoel, A. M., Veierod, M. B., Vollestad, N., Pelvic girdle pain: potential risk factors in pregnancy in relation to disability and pain intensity three months postpartum, Manual Therapy, 15, 522-8, 2010	Population not of interest for review: women with pelvic girdle pain in pregnancy.
Rogers, R. G., Leeman, L. M., Kleyboecker, S., Pukite, M., Manocchio, R., Albers, L. H., Is anterior genital tract trauma associated with complaints of postpartum urinary incontinence?, International Urogynecology Journal, 18, 1417-1422, 2007	Multivariate regression analysis not performed.
Rogers,R.G., Borders,N., Leeman,L.M., Albers,L.L., Does spontaneous genital tract trauma impact postpartum sexual function?, Journal of Midwifery and Women's Health, 54, 98-103, 2009	Risk factor not of interest for review: degree of perineal trauma (no mention of pain).
Rogers,R.G., Leeman,L.M., Migliaccio,L., Albers,L.L., Does the severity of spontaneous genital tract trauma affect postpartum pelvic floor function?, International Urogynecology Journal, 19, 429-435, 2008	Risk factor not of interest for review: perineal trauma (no mention of pain).
Ros, C., Martinez-Franco, E. M., Elias, N., Lopez, M., Palacio, M., Espuna, M., Pelvic floor symptoms and strength of pelvic floor muscles in women with history of obstetric anal sphincter injuries. Analysis according to the mode of delivery, Neurourology and Urodynamics, 33, 890-892, 2014	Conference abstract.
Ros, C., Martinez-Franco, E. M., Elias, N., Palau, M. J., Lopez, M., Palacio, M., Espuna-Pons, M., Persistency of anal sphincter defects in women with obstetric anal sphincter injuries and the function of pelvic floor muscles after delivery. How they influence on anal incontinence symptoms?, Neurourology and Urodynamics, 34, S176-S177, 2015	Conference abstract.
Rosen, N. O., Pukall, C., Comparing the Prevalence, Risk Factors, and Repercussions of Postpartum Genito-Pelvic Pain and Dyspareunia, Sexual Medicine Reviews, 4, 126-135, 2016	Study design not of interest for review: literature review (references checked for relevance to review).
Safarinejad, M. R., Kolahi, A. A., Hosseini, L., The effect of the mode of delivery on the quality of life, sexual function, and sexual satisfaction in primiparous women and their husbands, Journal of Sexual Medicine, 6, 1645-67, 2009	Risk factor not of interest for review: mode of delivery.

Study	Reason for exclusion
Sayed Ahmed, W. A., Kishk, E. A., Farhan, R. I., Khamees, R. E., Female sexual function following different degrees of perineal tears, International Urogynecology Journal, 28, 917-921, 2017	Risk factors not of interest for review: degrees of perineal tear.
Schytt,E., Waldenstrom,U., Risk factors for poor self-rated health in women at 2 months and 1 year after childbirth, Journal of Women's Health, 16, 390-405, 2007	Risk factor not of interest for review: only presence of perineal pain, no details of severity or if other risk factors co-existed.
Serati,M., Salvatore,S., Khullar,V., Uccella,S., Bertelli,E., Ghezzi,F., Bolis,P., Prospective study to assess risk factors for pelvic floor dysfunction after delivery, Acta Obstetricia et Gynecologica Scandinavica, 87, 313-318, 2008	Multivariate regression analysis not performed.
Shek, K. L., Green, K., Hall, J., Guzman-Rojas, R., Dietz, H. P., Perineal and vaginal tears are clinical markers for occult levator ani trauma: a retrospective observational study, Ultrasound in obstetrics & gynecology : the official journal of the International Society of Ultrasound in Obstetrics and Gynecology, 47, 224-227, 2016	Risk factors not of interest for review: perineal and vaginal trauma (no pain mentioned).
Signorello, L. B., Harlow, B. L., Chekos, A. K., Repke, J. T., Postpartum sexual functioning and its relationship to perineal trauma: a retrospective cohort study of primiparous women, American Journal of Obstetrics & Gynecology, 184, 881-8; discussion 888-90, 2001	Risk factors not of interest for review: degrees of perineal tear.
Skinner, E. M., Dietz, H. P., Psychological and somatic sequelae of traumatic vaginal delivery: A literature review, Australian & New Zealand Journal of Obstetrics & GynaecologyAust N Z J Obstet Gynaecol, 55, 309-14, 2015	Study design not of interest for review: literature review.
Soares, A. D., Couceiro, T. C., Lima, L. C., Flores, F. L., Alcoforado, E. M., de Oliveira Couceiro Filho, R., Association of pain catastrophizing with the incidence and severity of acute and persistent perineal pain after natural childbirth: longitudinal cohort study, Brazilian Journal of Anesthesiology, 63, 317-21, 2013	Sample size not of interest for review: <100.
Song, M., Ishii, H., Toda, M., Tomimatsu, T., Katsuyama, H., Nakamura, T., Nakai, Y., Shimoya, K., Association between sexual health and delivery mode, Sexual Medicine, 2, 153-158, 2014	No risk factors of interest for review: delivery mode.
Sperstad, J. B., Tennfjord, M. K., Hilde, G., Ellstrom-Engh, M., Bo, K., Diastasis recti abdominis during pregnancy and 12 months after childbirth: prevalence, risk factors and report of lumbopelvic pain, British journal of sports medicine, 50, 1092-1096, 2016	Risk factor not of interest for review: diastasis recti abdominis.
Sundquist, J. C., Long-term outcome after obstetric injury: A retrospective study, Acta Obstetricia et Gynecologica Scandinavica, 91, 715-718, 2012	Risk factors not of interest for review: degrees of sphincter tear.
Svare,J.A., Hansen,B.B., Lose,G., Risk factors for urinary incontinence 1 year after the first	Risk factors not of interest for review: maternal and delivery characteristics (no mention of pain).

Study	Reason for exclusion
vaginal delivery in a cohort of primiparous Danish women, International Urogynecology Journal and Pelvic Floor Dysfunction, 25, 47-51, 2014	
Swenson, C. W., DePorre, J. A., Haefner, J. K., Berger, M. B., Fenner, D. E., Postpartum depression screening and pelvic floor symptoms among women referred to a specialty postpartum perineal clinic, American Journal of Obstetrics & GynecologyAm J Obstet Gynecol, 218, 335.e1-335.e6, 2018	Population not of interest for review: Only 21% of population referred for pain to clinic.
Taithongchai, A., Veiga, S. I., Sultan, A. H., Thakar, R., The consequences of undiagnosed obstetric anal sphincter injuries (OASIS) following vaginal delivery, International Urogynecology Journal., 2019	Risk factors not of interest for review: maternal and delivery characteristics (no mention of pain)
Tjandra, J. J., Chan, M. K., Kwok, S. Y., Yeh, C. H., Tan, J. J., Sloane, K., Carey, M. P., Predictive factors for faecal incontinence after third or fourth degree obstetric tears: a clinico-physiologic study, Colorectal Disease, 10, 681-8, 2008	Population not of interest for review: women with third or fourth degree tears (no mention of pain).
Torrisi, G., Minini, G., Bernasconi, F., Perrone, A., Trezza, G., Guardabasso, V., Ettore, G., A prospective study of pelvic floor dysfunctions related to delivery, European Journal of Obstetrics, Gynecology, & Reproductive BiologyEur J Obstet Gynecol Reprod Biol, 160, 110-5, 2012	Risk factors not of interest for review: maternal and delivery characteristics (no mention of pain).
Trevor, J. J., Stafne, S. N., Stordahl, A., Johannessen, H. H., Prevalence and risk factors of postpartum urinary incontinence six years after fist delivery - A prospective cohort study, Neurourology and Urodynamics, 37, S234-S235, 2018	Conference abstract.
Trivino-Juarez, J. M., Romero-Ayuso, D., Nieto-Pereda, B., Forjaz, M. J., Oliver-Barrecheguren, C., Mellizo-Diaz, S., Aviles-Gamez, B., Arruti-Sevilla, B., Criado-Alvarez, J. J., Soto-Lucia, C., Pla-Mestre, R., Resumption of intercourse, self-reported decline in sexual intercourse and dyspareunia in women by mode of birth: A prospective follow-up study, Journal of Advanced Nursing, 74, 637-650, 2018	Risk factors not of interest for review: maternal and mode of birth characteristics (no mention of pain).
Turmo, M., Echevarria, M., Rubio, P., Almeida, C., Development of chronic pain after episiotomy, Revista espanola de anestesiologia y reanimacion, 62, 436-442, 2015	Population not of interest for review: women undergoing episiotomy at the end of fetal expulsion stage (no mention of perineal pain).
Van Brummen, H. J., Bruinse, H. W., Van De Pol, G., Heintz, A. P. M., Van Der Vaart, C. H., Which factors determine the sexual function 1 year after childbirth?, BJOG: An International Journal of Obstetrics and Gynaecology, 113, 914-918, 2006	No risk factors of interest for review: maternal, delivery and relationship characteristics (no mention of pain).
Wilkie, G. L., Saadeh, M., Robinson, J. N., Little, S. E., Risk factors for poor perineal outcome after operative vaginal delivery, Journal of Perinatology, 38, 1625-1630, 2018	Outcomes not of interest for review: higher order laceration and perineal wound breakdown.

Study	Reason for exclusion
Williams,A., Herron-Marx,S., Carolyn,H., The prevalence of enduring postnatal perineal morbidity and its relationship to perineal trauma, Midwifery, 23, 392-403, 2007	Risk factors not of interest for review: degree of perineal trauma (no mention of pain).
Williams,A., Herron-Marx,S., Knibb,R., The prevalence of enduring postnatal perineal morbidity and its relationship to type of birth and birth risk factors, Journal of Clinical Nursing, 16, 549-561, 2007	Risk factors not of interest for review: birth and delivery characteristics (no mention of pain).
Williams,M.K., Chames,M.C., Risk factors for the breakdown of perineal laceration repair after vaginal delivery, American Journal of Obstetrics and Gynecology, 195, 755-759, 2006	No risk factors of interest for review: delivery characteristics (no mention of pain).
Woolhouse, H., Gartland, D., Perlen, S., Donath, S., Brown, S. J., Physical health after childbirth and maternal depression in the first 12 months post partum: results of an Australian nulliparous pregnancy cohort study, Midwifery, 30, 378-384, 2014	Population not of interest for review: Only 30% of cohort reported perineal pain.

OASI: obstetric anal sphincter injury

Economic studies

No economic evidence was identified for this review.

Appendix L – Research recommendations

Research recommendations for review question: What characteristics of perineal pain suggest the need for further evaluation?

Research question

What characteristics of perineal pain after childbirth can help identify a need for further evaluation?

Why this is important

It is increasingly being recognised that poor perineal pain management can lead to long term physical, psychological and psychosexual difficulties, in addition to a negative impact on mother and baby bonding and attachment. Persistent perineal pain can occur in up to 10% of women one year after vaginal childbirth. Identifying and optimising care of women at risk of persistent perineal pain will help address a largely neglected area of need.

Table 7: Research recommendation rationale

Research question	**What characteristics of perineal pain after childbirth can help identify a need for further evaluation?**
Why is this needed	
Importance to 'patients' or the population	Poor management of perineal pain delays recovery of women after childbirth, impairs quality of life and can lead to postnatal depression and chronic pain.
Relevance to NICE guidance	Persistent perineal pain slows down the recovery of the mother from childbirth and can negatively impact the mother and baby bonding and attachment. Characteristics of pain which require further evaluation will help optimise perineal pain management, reduce the incidence of persistent pain and minimise its consequences.
Relevance to the NHS	The physical, psychological and psychosexual consequences of poor perineal pain management have a direct bearing on the productivity of an individual, their contribution to the family and society. Poor management leads to higher healthcare cost.
National priorities	Maternity NHS five-year forward review, Better Births calls for better postnatal care to significantly impact the life chances and wellbeing of the woman, baby and family.
Current evidence base	There are limited studies that have studied the long-term consequences of poor management of perineal pain after childbirth.
Equality	Nil known
Feasibility	Yes, given the number of vaginal births per year
Other comments	-

Table 8: Research recommendation modified PPO table

Criterion	**Explanation**
Population	Women who have given vaginal birth and are experiencing perineal pain, after the initial postpartum assessment up to 8 weeks after birth

Criterion	Explanation
Prognostic factors	• Pain duration • Severity of pain on a validated pain score • Pain not decreasing or increasing over time or increased requirement for analgesia • Swelling and duration of swelling • Wound breakdown or infection • Offensive vaginal discharge • Fever • Urinary and faecal incontinence • Difficulty urinating or defecating • Physical discomfort • Sexual distress score.
Outcomes	• Chronic perineal pain • Physical and emotional functional impairment • Psychosexual problems • Unplanned attendance to health services including admissions • Bonding and attachment with the baby
Study design	Prospective cohort study with multivariate analysis
Timeframe	In time for the next update of the NICE guideline
Additional information	-