

Mental health care in the perinatal period: Australian clinical practice guideline

2023 Update

Technical Report Part F:

Perinatal mental health assessment of fathers and non-birthing partners

Prepared by Natasha Prakash, Sue Campbell & Agnes Wilson

ISBN: 978-0-6485095-8-5



13 February 2023

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ABBREVIATIONS

| | |
|--------|---|
| ALPHA | Antenatal Psychosocial Health Assessment tool |
| ANRQ | Antenatal Risk Questionnaire |
| ARPA | Antenatal Routine Psychosocial Assessment |
| AUC | area under the curve |
| AUROC | area under the receiver-operating characteristics curve |
| BDI | Beck Depression Inventory |
| BRO | Brief Risk Overview |
| CALD | culturally and linguistically diverse |
| CBR | consensus-based recommendation |
| CI | confidence interval |
| CIDI | Composite International Diagnostic Interview |
| COPE | Centre of Perinatal Excellence |
| DASS | Depression Anxiety Stress Scales |
| DSM | Diagnostic and Statistical Manual |
| EAC | Expert Advisory Committee |
| EBR | evidence-based recommendation |
| EDS | Edinburgh Depression Scale |
| EPDS | Edinburgh Postnatal Depression Scale |
| FN | false negative |
| FP | false positive |
| GAD | Generalised Anxiety Disorder |
| GHQ | General Health Questionnaire |
| GMDS | Gotland Male Depression Scale |
| GRADE | Grading of Recommendations, Assessment, Development and Evaluation |
| HADS | Hospital Anxiety and Depression Scale |
| ICD-10 | International Statistical Classification of Diseases and related health problems, 10 th revision |
| K10 | Kessler 10 item questionnaire |
| LGBTIQ | Lesbian, gay, bisexual, gender diverse, intersex and queer and questioning people |
| LR | likelihood ratio |
| LR- | negative likelihood ratio |
| LR+ | positive likelihood ratio |
| MGMQ | Matthey Generic Mood Question |
| MIDIRS | The Midwives Information & Resource Service (including the Maternity and Infant Care Database) |
| MINI | Mini-International Neuropsychiatric Interview |
| NICU | neonatal intensive care units |
| NPV | negative predictive value |
| NR | not reported |
| OR | odds ratio |
| PAS | Posttraumatic Adjustment Screen |
| PDSS | Postpartum Depression Screen Scale |
| PHQ | Patient Health Questionnaire |
| PICO | patient/population, intervention, comparison and outcomes. |
| PICU | paediatric intensive care units |
| PNRQ | Postnatal Risk Questionnaire |
| PPV | positive predictive value |
| PRQ | Pregnancy Risk Questionnaire |

| | |
|--------|---|
| PTSD | post-traumatic stress disorder |
| QUADAS | Quality Assessment of Diagnostic Accuracy Studies |
| RCT | randomised controlled trial |
| ROC | receiver operating characteristics |
| SAS | Self-rating Anxiety Scale |
| SCID | Structural Clinical Interview for DSM Disorders |
| SOF | summary of findings |
| SR | systematic review |
| STAI | State-Trait Anxiety Inventory |
| TN | true negative |
| TP | true positive |
| UK | United Kingdom |
| VLBW | very low birth weight |
| WQ | Whooley questions |

1 Executive summary

The transition to parenthood is a period of change and adjustment for both mothers and fathers. There has been acknowledgement and extensive investigation of mental health problems in women for some years (O’Hara and Wisner, 2014), with established screening and treatment programs in place to identify and support new mothers that may be experiencing mental health problems. Prevalence rates for major and minor depression in mothers vary but can be up to 20% during pregnancy and the first 3 months postpartum (O’Hara and Wisner, 2014). In men, perinatal depression and anxiety are relatively common mental health conditions experienced during the transition to fatherhood, yet both are under-recognised in fathers. Studies have indicated that depression, anxiety and stress are more prevalent among fathers than among men in the general population (Cameron et al., 2016; Leach et al., 2016; Philpott et al., 2017). Between 5–10% of fathers experience perinatal depression and 5–15% experience perinatal anxiety (Paulson, 2010; Cameron 2016; Leach, 2016) and it is acknowledged that fathers may also experience post-traumatic stress symptoms following the birth (Leach, 2016; Daniels 2020). Mental health problems among men are often not detected, as men are less likely than women to seek healthcare services for such difficulties (Smith et al., 2006). Fathers’ mental health will impact on, and be affected by, the mental health of their partner. As reported in the 2017 guideline, several qualitative studies of fathers in the perinatal period conducted in Australia and internationally have identified that fathers want to be included in perinatal health care and engaged by health professionals about their health and wellbeing. (Rowe et al 2013; Darwin et al 2017; Rominov et al 2017) It is well recognised that early detection and effective management of perinatal mental health problems is critical for the well-being, safety and outcomes of all families.

Objectives and scope of the current review

The current evidence review aims to identify and synthesise the evidence around psychosocial assessment and screening for mental health problems in fathers in the perinatal period. In recognition of the diverse family structures across society, the current evidence review also encompasses screening of all non-birthing partners regardless of gender, relationship status or connectedness to the child. This evidence review will be considered by the Expert Advisory Committee to help develop recommendations regarding appropriate psychosocial assessment and screening tools to use to screen fathers and non-birthing partners for mental health problems in the perinatal period. The focus of the review is on the performance, acceptability and implementability of the tools in the Australian setting.

Methods used to identify the evidence review

A mixed methods approach was used for the assessment of psychosocial assessment and screening tools for the detection of mental health problems in fathers and non-birthing partners. The approach included the use of systematic reviews of quantitative evidence (e.g., screening test performance), descriptions of non-technical characteristics of the tests (e.g., time to administer, complexity of scoring), and narrative reviews of acceptability, effectiveness and implementation issues associated with perinatal mental health assessment in fathers and non-birthing partners. The process to identify, interpret and synthesise relevant information followed a proposed strategy presented in the Research Protocol that was approved by the Fathers and Partners Expert Advisory Committee.

Findings of the evidence review

An initial main search was undertaken to identify published systematic reviews and primary studies that address psychosocial assessment and mental health screening for fathers and non-birthing partners in the perinatal period. The systematic reviews were initially screened for eligibility based on pre-specified criteria. One systematic review was identified that met the inclusion criteria (Darwin et al. 2021) and this

was selected as the foundation review. Critical appraisal and data extraction was performed for Darwin et al. 2021. An updated literature search was carried out (from the date of last literature search in Darwin 2021) and this identified one additional primary study to supplement the Darwin review (Shaheen, 2019). Critical appraisal, data extraction and citation chaining were also performed on these studies to ensure no important studies were excluded.

The foundation review used a mixed-methods approach with narrative synthesis. The approach used to document information in the current review has been tailored according to the information available in the foundation review.

Results

The literature search identified one systematic review that met the inclusion criteria, Darwin et al. (2021). Darwin 2021 was selected as the foundation review for the two main clinical questions (psychosocial assessment and mental health screening), even though the review does not explicitly differentiate psychosocial assessment from mental health screening. In addition to the foundation review by Darwin, one primary study published in 2019 was also included in this evidence review (Shaheen, 2019). The study by Shaheen and colleagues was a study that aimed to identify the optimal EPDS cut-off for Saudi Arabian fathers. No studies were found for either psychosocial screening or mental health screening of Aboriginal and Torres Strait Islander, refugee/asylum seeker or CALD people (which were pre-specified subgroups of interest). In all studies reported in the Darwin review, the participants were described as “fathers” or “partners”; all were male and there was only one mention of a non-resident father.

Psychosocial screening tools

The literature search identified no studies that reported technical performance, acceptability or implementability of the psychosocial assessment tools of interest to the EAC in fathers or non-birthing partners. This report does however summarise the non-technical characteristics of all the psychosocial tools of interest (see Table 9). The ANRQ psychosocial screening tool is currently used in Australia for screening women in an antenatal and postnatal context and is currently integrated into the iCOPE digital screening platform.

Mental health screening tools

The literature search identified one systematic review that met the inclusion criteria, published in 2021 by Darwin and colleagues. This was selected as the foundation review for the two main clinical questions (psychosocial assessment and mental health screening), although the review does not explicitly differentiate psychosocial assessment from mental health screening. The literature search identified evidence in fathers for technical performance and acceptability of several mental health screening tools of interest. No evidence was identified on effectiveness or implementability of the specified mental health screening tools in fathers or non-birthing partners in the perinatal period; however, the Darwin review discusses general issues associated with implementation of mental health assessment in this population. Darwin identified seven studies that reported diagnostic test accuracy of mental health screening tools compared with a diagnostic/clinical interview. The Darwin review states that several “good quality” diagnostic test accuracy studies have been conducted with fathers; however, the results are highly varied. The overall quality of the studies ranged from low to very low. Across all seven studies, the EPDS was investigated for screening fathers. This reflects the wide use of this tool in perinatal research and clinical settings for mothers, and its practical extension to fathers, and not necessarily that it is a superior tool. The Darwin review reported that the EPDS is the only English language version tool to have been validated and is the only measure to have been validated for use in the perinatal period in Westernised countries. The authors all concluded that the EPDS performed similarly to, or better than, the other measures assessed.

Across the included studies, the EPDS was used to assess depression, anxiety and categories inclusive of both. Various translations of the tool were used across the studies and there was no consensus on the optimal cut-offs for use in fathers, with cut-offs ranging from ≥ 5 to ≥ 13 . Lower thresholds were observed in lower income countries in comparison to higher-income countries and this may reflect cultural differences concerning emotional expression and/or insensitivity of the tool to people facing poverty and adversity, due to the way that questions are framed (symptoms different to their usual state).

The Australian study by Matthey et al. (2009) proposed lower optimal cut-off for the EPDS when compared with the thresholds for mothers. Matthey reported that there are gendered differences in endorsement of items, finding no differences for self-blame, sleep difficulties, and thoughts of self-harm, but that endorsement of crying was significantly lower in fathers. Fathers may express their low mood in behaviours, such as anger and irritation, that may differ from those for women, with alternative scales introduced to some settings to better identify distress (Fletcher et al 2015).

It is important to acknowledge that the EPDS is only a screening tool so it is more likely to be used in screening settings whereas the K-6 and K-10 can be used for both screening and diagnosis tools.

Conclusions

There is a paucity of published evidence on how best to assess the mental health of fathers and non-birthing partners in the perinatal period. There is a need to be responsive to mental health needs, however further research is needed in a range of practice settings and with a range of stakeholders, including minority groups (minority ethnic parents, non-resident parents, step-parents, LGBTIQ+ parents) to inform the implementation of evidence-based assessment tools. The literature to date is largely focused on postnatal depression but anxiety and distress may also be important to address in the perinatal period. Further research should focus on both the effectiveness and acceptability of psychosocial and mental health screening tools. Digital collection of data on screening tools will facilitate further research. It is recommended that screening take place within a context that offers opportunities to respond to identified risk factors or needs.

2 Background

In October 2017, the Centre of Perinatal Excellence (COPE) released the *Mental Health Care in the Perinatal Period: Australian Clinical Practice Guideline*. This Guideline provides a reliable and standard reference for health professionals providing care to women in the perinatal period, and aimed to improve a woman's experience of pregnancy and early parenthood, her emotional wellbeing, her safety and outcomes for all families (Austin et al., 2017). The 2017 version of the Guideline is due to be updated by 2023.

In the 2017 version of the perinatal mental health guideline, there was a dedicated narrative chapter focused on perinatal mental health in men. There are currently no national evidence-based clinical practice guidelines for mental health care of fathers or non-birthing partners in the perinatal period. The current project seeks to review the evidence and make recommendations around psychosocial assessment and screening for mental health problems in fathers or non-birthing partners (of any gender) in the perinatal period.

On 12 May 2019, the Prime Minister of Australia, the Hon Scott Morrison MP announced the time-limited investment of \$36 million over three years to establish the world-first digital Perinatal Mental Health Check Program. Of this investment, funding was provided to COPE to roll out iCOPE, a [digital mental health screening tool](#), in every public maternity hospital and maternal and child health centre in Australia. The Perinatal Mental Health Check Program is designed to support public hospitals and maternal and child health centres in the provision of routine mental health screening of mothers in line with best practice. As part of this investment, the Prime Minister advised that fathers should also be offered mental health screening via iCOPE. The purpose of this review is to explore the available evidence on existing tools for psychosocial assessment, and depression and/or anxiety screening in fathers and partners in the perinatal period, for selection of optimal screening tools to integrate into iCOPE. The target population includes fathers and non-birthing partners of gestational parents, regardless of relationship status, gender, or relationship to the child. The focus of the review is on the performance, acceptability and implementability of the tools in the Australian setting.

3 Aims

The current review sought to identify and assess published evidence on the tools available to detect mental health problems or risk factors for mental health problems in fathers or non-birthing partners. The evidence review sought to describe the following aspects of the identified tools:

1. Validity, in terms of comprehensiveness of domains and description of the methods used to develop the instrument. This captures face, construct and content validity (criterion validity is captured under technical performance (predictive accuracy)).
2. Technical performance, in terms of their ability to reliably detect mental health problems or risk factors for mental health problems.
3. Reliability, based on internal consistency, inter-rater and test-retest data.
4. Non-technical characteristics, for example, number of items, time to administer, perinatal/postnatal timing, mode of delivery, validation, complexity of scoring, training requirements, and available languages.
5. Acceptability to the target populations, namely men and non-birthing partners (including Aboriginal and Torres Strait Islander peoples and people from culturally and linguistically diverse (CALD) backgrounds), health professionals, and the general public.

6. Effectiveness, in terms of whether use of the tools has been demonstrated to impact on help-seeking behaviour, initiation of appropriate preventive or treatment interventions, or mental health outcomes.
7. Implementability, for example, any training requirements to administer them, availability of an appropriate workforce to administer them, or the existence of appropriate, accessible referral pathways.

This evidence review is intended to inform the development of recommendations on psychosocial assessment and screening for mental health problems in fathers and non-birthing partners.

4 Methods

The evidence review focuses on two distinct, but closely related topics:

1. Psychosocial assessment of fathers or non-birthing partners (of any gender) at risk of mental health problems in the perinatal period.

The review is restricted to validated tools that have been developed to identify a range of factors in a person's current situation or past that might place them at increased risk of distress during the perinatal period or developing mental health issues. Instruments that examine only current mental health are not included here (although they may apply to the screening topic below).

2. Screening of fathers or non-birthing partners (of any gender) for mental health problems (including, but not limited to depression and anxiety) in the perinatal period.

The review is restricted to validated tools that have been developed to examine current mental health. These tools are generally intended to screen for depression, anxiety, or psychological distress.

The specific tools included within scope of this review, as agreed by the Expert Advisory Committee (EAC), are listed in Table 1.

Table 1 Psychosocial assessment tools and mental health screening tools evaluated in the evidence review

| Psychosocial assessment tools | Mental health screening tools |
|--|---|
| Antenatal Psychosocial Health Assessment (ALPHA) | Beck Depression Inventory (BDI) |
| Antenatal Risk Questionnaire (ANRQ) | Depression Anxiety Stress Scales (DASS-21) |
| Brief Risk Overview (BRO) | Edinburgh Postnatal Depression Scale (EPDS) |
| Psychosocial Assessment Tool (PAT/PAT-2) | General Anxiety Disorder-7 (GAD-7) |
| Pregnancy Risk Questionnaire (PRQ) | Gotland Male Depression Scale (GMDS) |
| | Kessler Psychological Distress Scale (K-6) |
| | Kessler Psychological Distress Scale (K-10) |
| | Matthey Generic Mood Question (MGMQ) |
| | Patient Health Questionnaire-2 (PHQ-2, Whooley questions) |
| | Patient Health Questionnaire-9 (PHQ-9) |
| | State-Trait Anxiety Inventory (STAI) |

The research questions and the process to identify, interpret and synthesise relevant information followed the proposed strategy presented in the pre-specified Research Protocol, which was approved by the EAC in September 2021.

4.1 Clinical questions

The evidence review was designed to address two main clinical questions:

1. What are the most appropriate methods for psychosocial assessment of (a) fathers or (b) non-birthing partners at risk of mental health problems in the perinatal period?
2. What are the most appropriate methods for screening (a) fathers or (b) non-birthing partners for mental health problems in the perinatal period?

A series of sub-questions were developed for each main question, addressing tool performance, non-technical characteristics, acceptability, effectiveness and implementation implications. The EAC anticipated that a systematic literature review would identify limited evidence to address these questions and agreed on a pragmatic methodological approach, as described in Section 4.3.

Table 2 Summary of research questions for the evidence review

| Question | Research question | Methodological approach |
|----------|---|---|
| Q1 | What are the most appropriate methods for psychosocial assessment of fathers or non-birthing partners at risk of mental health problems in the perinatal period? | |
| Q1a | What is the performance (defined as reliability, validity and accuracy) of multidimensional tools for perinatal psychosocial assessment? | Systematic review of primary studies |
| Q1b | What are the non-technical characteristics (defined as number of items, time to administer, perinatal/postnatal timing, mode of delivery, validation, complexity of scoring, training requirements, and available languages) of multidimensional tools for perinatal psychosocial assessment? | Descriptive review of tools identified in Q1a |
| Q1c | What is the acceptability to fathers/non-birthing partners, health professionals, and the general public of multidimensional tools for perinatal psychosocial assessment? | Narrative review of primary studies |
| Q1d | What are the implications (for resourcing, workforce, and models of care) of implementing perinatal psychosocial assessment (via different modes of delivery) with a multidimensional tool? | Narrative review of primary studies |
| Q2 | What are the most appropriate methods for screening fathers or non-birthing partners for mental health problems in the perinatal period? | |
| Q2a | What is the performance (defined as reliability, sensitivity, specificity, positive likelihood ratio, and negative likelihood ratio) of tools for perinatal mental health screening? | Systematic review of primary studies |
| Q2b | What are the non-technical characteristics (defined as number of items, time to administer, perinatal/postnatal timing, mode of delivery, validation, complexity of scoring, training requirements, and available languages) of tools for perinatal mental health screening? | Descriptive review of tools identified in Q2a |
| Q2c | What is the acceptability to fathers/non-birthing partners, health professionals, and the general public of screening for perinatal mental health screening? | Narrative review of primary studies |
| Q2d | What is the effectiveness (defined as impact on detection, care sought or received, and mental health outcomes) of screening for perinatal mental health screening? | Narrative review of primary studies |
| Q2e | What are the implications (for resourcing, workforce, and models of care) of implementing perinatal mental health screening (via different modes of delivery) with a tool? | Narrative review of primary studies |

4.2 Evidence selection criteria (PICO)

For the two main clinical questions, a PICO framework was used to define the target population, the intervention being considered (psychosocial assessment tool or mental health screening tool), the appropriate comparator (including the reference standard for diagnostic performance outcomes), and the outcomes of interest. The population subgroups of particular interest were fathers and non-birthing partners of (i) Aboriginal and Torres Strait Islander background, (ii) refugee and asylum seeker background, and (iii) migrant or culturally and linguistically diverse (CALD) background as they may be at increased risk.

Table 3 Detailed PICO criteria for Q1: Psychosocial assessment

| Question 1 | | What is the most appropriate method for psychosocial assessment of fathers or non-birthing partners at risk of mental health problems in the perinatal period? | |
|---|---|---|---|
| Population | <ul style="list-style-type: none"> Expectant or new non-birthing partners, regardless of relationship status, gender, and relationship to the child. Includes: <ul style="list-style-type: none"> fathers co-parents step-parents or other non-birthing partners of gestational parents | Subgroups of interest: | <ul style="list-style-type: none"> Previous mental health problems and/or a history of trauma Aboriginal and Torres Strait Islanders Refugee and asylum seekers Migrant or CALD backgrounds |
| Intervention | <ul style="list-style-type: none"> Relevant multidimensional psychosocial assessment tools to identify people at risk of mental health problems in the perinatal period <ul style="list-style-type: none"> Limited to ALPHA, ANRQ, BRO, PAT, PAT-2, PRQ | | |
| Comparator | <ul style="list-style-type: none"> Any type of standardised diagnostic interview, defined as a structured interview (such as the SCID, CIDI or MINI) delivered by trained staff, or an ICD mental health diagnosis by a psychiatrist or clinical psychologist A different psychosocial assessment or symptom-based tool (from the list above) | | |
| Outcomes | <p>Tool performance</p> <p><u>Critical outcomes</u></p> <ul style="list-style-type: none"> Predictive accuracy (OR of identifying a factor of concern) Positive Predictive Value (PPV) Negative Predictive Value (NPV) Positive Likelihood Ratio (LR+) Negative Likelihood Ratio (LR-) <p>Clinical usefulness</p> <p><u>Critical outcomes</u></p> <ul style="list-style-type: none"> Acceptability to fathers & non-birthing partners, to healthcare providers, to the general public | | <p><u>Important outcomes</u></p> <ul style="list-style-type: none"> Sensitivity Specificity AUROC |
| Additional information & data extraction | <ul style="list-style-type: none"> Evaluation of applicability (country, setting and availability of normative data) <p><u>Inclusion of non-technical characteristics</u></p> <ul style="list-style-type: none"> Number of items Time to administer Perinatal/postnatal timing Mode of delivery Validation Complexity of scoring Training requirements Available languages <p><u>Information on practice implications</u></p> <ul style="list-style-type: none"> Resourcing (e.g., who funds the delivery of psychosocial assessment) Workforce (e.g., who delivers the psychosocial assessment) Models of care (e.g., systems for referral/pathways to care) | | |

Abbreviations: ALPHA, Antenatal Psychosocial Health Assessment; ANRQ, Antenatal Risk Questionnaire; AUROC, Area Under the Receiver Operator Characteristic; BRO, Brief Risk Overview; CALD, culturally and linguistically diverse; CIDI, Composite International Diagnostic Interview; DSM, Diagnostic and Statistical Manual of Mental Disorders; ICD, International Classification of Diseases; MINI, Mini-International Neuropsychiatric Interview; OR, odds ratio; PAT/PAT-2, Psychosocial Assessment Tool; PRQ, Pregnancy Risk Questionnaire; SCID, Structured Clinical Interview for DSM.

Table 4 Detailed PICO criteria for Q2: Screening for mental health problems

| Question 2 | | What are the most appropriate methods for screening fathers or non-birthing partners for mental health problems in the perinatal period? | |
|---|---|--|---|
| Population | <ul style="list-style-type: none"> Expectant or new non-birthing partners, regardless of relationship status, gender, and relationship to the child. Includes: <ul style="list-style-type: none"> fathers co-parents step-parents or other non-birthing partners of gestational parents | Subgroups of interest: | <ul style="list-style-type: none"> Previous mental health problems and/or a history of trauma Aboriginal and Torres Strait Islanders Refugee and asylum seekers Migrant or CALD backgrounds |
| Intervention | <ul style="list-style-type: none"> Relevant screening tools to identify people with current mental health problems in the perinatal period <ul style="list-style-type: none"> Limited to BDI, DASS-21, EPDS, GAD-7, GMDS, K-6, K-10, MGMQ, PHQ-2 (Whooley questions), PHQ-9, STAI | | |
| Comparator | <ul style="list-style-type: none"> Any type of standardised diagnostic interview, defined as a structured interview (such as the SCID, CIDI or MINI) delivered by trained staff, or an ICD mental health diagnosis by a psychiatrist or clinical psychologist A different screening tool (from the list above) | | |
| Outcomes | <p>Tool performance</p> <p><u>Critical outcomes</u></p> <ul style="list-style-type: none"> Sensitivity Specificity Positive likelihood ratio (LR+) Negative likelihood ratio (LR-) <p>Clinical usefulness</p> <p><u>Critical outcomes</u></p> <ul style="list-style-type: none"> Mental health outcomes Acceptability to fathers & non-birthing partners, to healthcare providers, to the general public | <p><u>Important outcomes</u></p> <ul style="list-style-type: none"> AUROC | <p><u>Important outcomes</u></p> <ul style="list-style-type: none"> Impact on help-seeking behaviour (services sought or utilised) Impact of detection (e.g., referral rates if screen positive) |
| Additional information & data extraction | <ul style="list-style-type: none"> Evaluation of applicability (country, setting and availability of normative data) <p><u>Inclusion of non-technical characteristics</u></p> <ul style="list-style-type: none"> Number of items Time to administer Perinatal/postnatal timing Mode of delivery Complexity of scoring Training requirements Available languages <p><u>Information on practice implications</u></p> <ul style="list-style-type: none"> Resourcing (e.g., who funds the delivery of screening) Workforce (e.g., who delivers the screening) Models of care (e.g., systems for referral/pathways to care) | | |

Abbreviations: AUROC, Area Under the Receiver Operating Characteristic; BDI, Beck Depression Inventory; CALD, culturally and linguistically diverse; CIDI, Composite International Diagnostic Interview; DASS-21, Depression Anxiety Stress Scales; DSM, Diagnostic and Statistical Manual of Mental Disorders; EPDS, Edinburgh Postnatal Depression Scale; GAD-7, General Anxiety Disorder-7; GMDS, Gotland Male Depression Scale; ICD, International Classification of Diseases; K-10/K-6, Kessler Psychological Distress Scale (10 item/6-item); MGMQ, Matthey Generic Mood Question; MINI, Mini-International Neuropsychiatric Interview; PHQ, Patient Health Questionnaire; STAI, State-Trait Anxiety Inventory; SCID, Structured Clinical Interview for DSM.

4.3 Overall approach to the evidence review

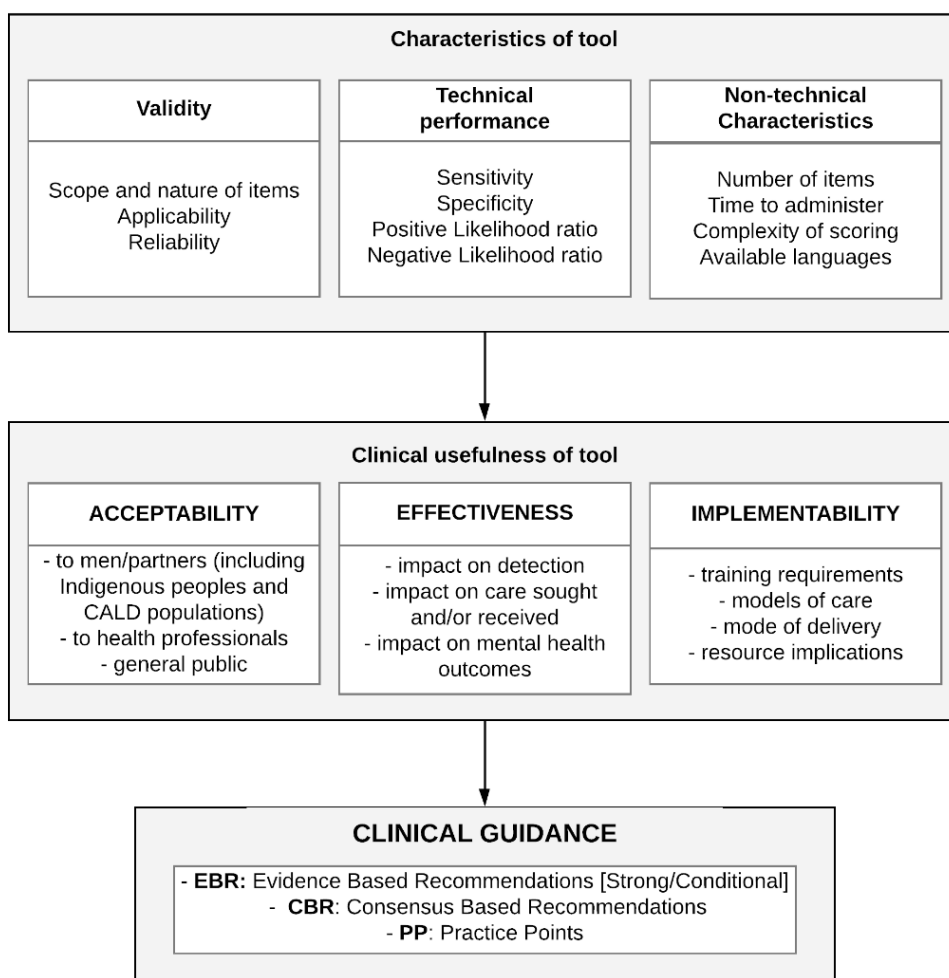
A mixed methods approach was employed for the assessment of tools related to psychosocial assessment and screening for mental health problems in fathers and non-birthing partners. The approach included the use of systematic reviews of quantitative evidence (e.g., screening test performance), descriptions of non-technical characteristics of the tests (e.g., time to administer, complexity of scoring), and narrative reviews

of acceptability, effectiveness and implementation issues associated with perinatal mental health assessment in fathers and non-birthing partners.

The agreed framework for organising and applying the different evidence review methods is shown in Figure 1. This is based on the framework used for psychosocial assessment and screening for depression and anxiety in mothers in the 2017 *Mental Health Care in the Perinatal Period: Australian Clinical Practice Guideline*.

The sections within this Technical Report follow the format of the framework, with evidence presented for psychosocial assessment and then mental health screening, under subheadings relating to (technical performance, non-technical characteristics, acceptability, effectiveness, implementability).

Figure 1 Framework for organising and applying the evidence



Abbreviations: CALD, culturally and linguistically diverse

Note: 'Models of care' refers to how services are delivered and accessed. It is acknowledged that models of care may not exist for perinatal mental health care of fathers and non-birthing partners.

Literature searches

Broad literature searches were undertaken to identify published systematic reviews and primary studies that focus on psychosocial assessment and mental health screening for fathers and non-birthing partners in the perinatal period. This approach was chosen because there is significant variation in the literature regarding the terminology used to describe psychosocial assessment and screening. It was also recognised that some systematic reviews might focus on one topic or the other, whereas others might include both

aspects of care. In addition, it was expected that some systematic reviews might focus on technical performance alone, while others might focus on acceptability, effectiveness, and/or implementation issues.

The bibliographic databases that were searched and the search limits that were applied are listed in Table 5. The literature searches were intended to capture contemporary evidence only (last 10 years), as approved by the EAC. The search strings for each bibliographic database are shown in Appendix 1.

In each search, a systematic review ‘filter’ was applied to obtain an enriched subset of records for initial screening. The enriched subset and the remaining records identified in the literature searches were downloaded separately into an EndNote database for de-duplication. Unique records were then uploaded into the systematic review software, DistillerSR, for screening and critical appraisal.

Table 5 Bibliographic databases and literature search limits

| Limit type | Limit |
|-------------------------|--|
| Bibliographic databases | EMBASE.com (concurrent searches of Medline and EMBASE) – search date 28/09/2021 Cochrane Library (Cochrane Database of Systematic Reviews and Central Register of Controlled Trials) – search date 30/09/2021 PsycINFO – search date 07/10/2021 CINAHL – search date 06/10/2021 |
| Study types | Peer-reviewed publications (quantitative and qualitative) of clinical studies Systematic reviews of the above <i>Exclusions: Conference abstracts, letters, editorials, narrative reviews</i> |
| Search span | January 2011 to search date (see above) |
| Language | English language articles only |

The reference lists of included studies were scanned for any additional relevant studies that might not have been identified in the formal literature searches. In addition, articles recommended by the EAC were considered for inclusion if they met the pre-specified eligibility criteria.

Screening

Records were assessed against pre-specified inclusion/exclusion criteria based on the components of the PICO criteria and the additional limits shown in Table 5 regarding study types, date span and language.

The set of records identified using systematic review filters were screened in the first instance to identify one or more systematic reviews that would serve as a ‘foundation review’ for technical performance and for clinical usefulness (acceptability, effectiveness and/or implementability) for each of psychosocial assessment and for mental health screening.

All records in DistillerSR that were published after the literature search date in the foundation review were screened to capture relevant new primary studies.

No relevant cost-effectiveness studies were identified during the screening process for consideration of potential resource implications (implementability) of mental health assessment in fathers and non-birthing partners.

Selection of foundation review

One systematic review was identified that met the inclusion criteria specified in Table 3 and Table 4. This systematic review by Darwin et al. (2021) was selected as the foundation review for the two main clinical questions (psychosocial assessment and mental health screening), even though the review does not explicitly differentiate psychosocial assessment from mental health screening.

The aim of the Darwin review was to identify and synthesise evidence on the performance of mental health screening tools and the acceptability of mental health assessment, specifically in relation to fathers, other

co-parents and partners in the perinatal period. The authors conducted a broad search in April 2019 of Medline, PsycINFO, Maternity and Infant Care Database (MIDIRS) and CINAHL, complemented by backward and forward citation chaining. The search used a combination of keywords and subject headings for all the following concepts: partners, perinatal period, mental health or psychosocial or relationship. A total of 29,179 unique records were identified and screened. Eligibility was restricted to primary research published in English-language peer-reviewed academic journals; no date restriction was applied. Eligibility was not restricted by study design, enabling the inclusion of qualitative, quantitative, and mixed methods studies. No restrictions were placed on the mental health assessment tools reported or whether validated tools were used at all. Quality appraisal was used to assess the strengths and weakness of the included studies rather than to determine eligibility for inclusion in the review.

Diagnostic test accuracy studies were eligible in the Darwin review if a mental health screening tool (for any type of mental health disorder) was compared with a standardised diagnostic interview based on international criteria (the reference standard). No restrictions were made regarding the mode of assessment.

Acceptability was assessed in relation to specific measures or examining the concept/proposal of partners' mental health assessment more broadly, provided it was a stated focus of the study (e.g., stated aim, objective, or data collection topic). The authors of the Darwin review were primarily interested in anticipated (prospective) and experienced (retrospective) cognitive and emotional responses of those (potentially) receiving or delivering assessment. This included parents' and health professionals' perspectives, gathered using quantitative methods (e.g., surveys) or qualitative methods (e.g., interviews or focus groups). Studies examining feasibility of assessment were also included, even if they did not report stakeholder's views.

A total of 27 studies were ultimately included in the Darwin review (7 studies of diagnostic test accuracy and 20 studies relating to acceptability). Narrative synthesis was applied to all elements of the review, with thematic analysis applied to the acceptability studies.

The authors commented that studies on acceptability were not straightforward to identify based on title and abstract, requiring a broader search strategy with further assessment at the level of full text. It remains a possibility that some studies may have been missed and this is an acknowledged limitation of the review.

The authors noted that their review found no studies evaluating the effectiveness of mental health assessment in fathers, co-parents and partners in the perinatal period.

Results of the screening process

The results of the screening process are shown in Table 6. In addition to the foundation review by Darwin, one primary study published in 2019 was included in this evidence review (Shaheen, 2019). Shaheen 2019 was a study that aimed to identify the EPDS cut-off for Saudi Arabian fathers.

The citations for the included studies are provided in Appendix B.1. The citations for the 47 records excluded at full text review are listed in Appendix B.2.

Table 6 Records included and excluded during the screening process

| | No. records excluded | No. records included |
|--|----------------------|----------------------|
| Identified via literature searches | | 4,276 |
| <i>EMBASE.com (Medline & EMBASE)</i> | | (1,903) |
| <i>Cochrane Library</i> | | (1,112) |
| <i>PsycINFO</i> | | (517) |
| <i>CINAHL</i> | | (744) |
| Identified manually | | 0 |
| Identified by EAC members | | 19 |

| | No. records excluded | No. records included |
|---|----------------------|----------------------|
| Total citations identified | | 4,295 |
| Total unique citations identified | | 3,290 |
| Total unique citations screened | | 1,444 |
| <i>Literature search subset using systematic review filters</i> | | <i>(380)</i> |
| <i>All records published 2019-2021^a</i> | | <i>(1,045)</i> |
| <i>Papers identified by EAC</i> | | <i>(19)</i> |
| Title/abstract excluded | 1395 | |
| Title/abstract included | | 49 |
| Full text publications excluded | 47 | |
| <i>Excluded – ineligible study design</i> | <i>(7)</i> | |
| <i>Excluded – ineligible population</i> | <i>(6)</i> | |
| <i>Excluded – ineligible intervention</i> | <i>(10)</i> | |
| <i>Excluded – ineligible comparator^b</i> | <i>(18)</i> | |
| <i>Excluded – ineligible outcomes</i> | <i>(5)</i> | |
| <i>Excluded – already included in foundation review</i> | <i>(1)</i> | |
| Full text publications included | | 2 |
| Systematic reviews | | 1^c |
| Primary studies | | 1^d |

^a Published after the literature search date in the foundation review.

^b The majority of studies excluded for ineligible comparator reported prevalence of mental health problems using the screening tool rather than diagnostic performance of the screening tool.

^c Foundation review (Darwin et al. 2021)

^d Primary studies (Shaheen, 2019)

Synthesis of the evidence

The Research Protocol specified that the critical appraisal and synthesis of the body of evidence would follow the 'GRADE-style' approach used in the 2017 *Mental Health Care in the Perinatal Period: Australian Clinical Practice Guideline*, which included specific consideration of study design and the content (face or construct) validity, reliability and applicability of each instrument, with appraisal using the Quality Assessment of Diagnostic Accuracy Studies (QUADAS-2) risk of bias tool for studies reporting the diagnostic performance of mental health screening tools.

However, due to the foundation review using a mixed-methods approach with narrative synthesis, the approach used in the current review has been tailored according to the information available in the foundation review. No attempt was made to extract additional information from the primary studies contained in the foundation review.

Where reporting permitted, the features of the included primary studies and quantitative data on diagnostic performance of mental health screening tools have been tabulated, accompanied by narrative descriptions. The findings of the acceptability studies have been discussed using an entirely narrative approach, based on the themes discussed in the foundation review relating to challenges associated with mental health assessment of fathers and non-birthing partners (see Table 7).

Table 7 Summary of themes discussed in Darwin et al. (2021)

| Individual-level influences | Practitioner-level influences | Service-level influences |
|--|---|--|
| Gendered perspectives | Knowledge, skills, confidence | Culture of the service |
| Fear of compromising support for women (birthing parents) if there is a focus on the father or partner | Fear of causing offense or distress Conflicting needs of parents | Remit of the service Workload and time pressures Opportunity for contact (including lack of privacy, building rapport) |
| Perceived purpose of assessment | | Need for training |
| Ability to recognise symptoms | | Need for clinical supervision Need for guidelines Need for appropriate tools Need for onward referral routes |

The narrative synthesis in this report is intended to support the selection of particular psychosocial assessment and mental health screening tools for integration into iCOPE as part of perinatal care provided to fathers and non-birthing partners. To further support the integration of these tools, the review also captured contextual information that has been recognised as important to the synthesis – applicability, non-technical characteristics, and information on practice implications (training, etc.).

5 Findings

5.1 Psychosocial assessment

Summary of evidence identified in the literature search

The literature search identified no studies that reported technical performance, acceptability or implementability of the psychosocial assessment tools of interest to the EAC in the target population (see Table 8).

The foundation review included one Australian survey of fathers that attended antenatal classes using psychosocial questions (Fletcher et al. 2008); however, this study did not meet the eligibility criteria for the current review.

Table 8 Studies included for perinatal psychosocial assessment in fathers or non-birthing partners

| Tool | Study ID | Nature of evidence reported | | |
|-------|------------------------------|-----------------------------|---------------|------------------|
| | | Technical performance | Acceptability | Implementability |
| ALPHA | <i>No studies identified</i> | | | |
| ANRQ | <i>No studies identified</i> | | | |
| BRO | <i>No studies identified</i> | | | |
| PAT | <i>No studies identified</i> | | | |
| PAT-2 | <i>No studies identified</i> | | | |
| PRQ | <i>No studies identified</i> | | | |

Abbreviations: ALPHA, Antenatal Psychosocial Health Assessment; ANRQ, Antenatal Risk Questionnaire; BRO, Brief Risk Overview; PAT/PAT-2, Psychosocial Assessment Tool; PRQ, Pregnancy Risk Questionnaire.

Characteristics of relevant tools

Validity

No studies reporting on the content validity or reliability of psychosocial assessment tools in fathers and non-birthing partners in the perinatal period were identified in the literature search.

Technical performance

No studies reporting on technical performance of psychosocial assessment tools in fathers or non-birthing partners in the perinatal period were identified in the literature search.

Non-technical characteristics of relevant tools

The table below summaries the non-technical characteristics of all the psychosocial tools of interest. Characteristics of ALPHA, ANRQ and PRQ, are provided below as reported in the 2017 *Mental Health Care in the Perinatal Period: Australian Clinical Practice Guideline*. These three psychosocial assessment tools had high to moderate quality evidence of technical performance in maternal perinatal population. The complexity of scoring for each tool has been assessed as Simple, Moderate or High on the basis of information in the published literature and the experience of the EAC. BRO and the PAT, PAT 2.0 tools have been added to this table, with unpublished information about the tools.

Table 9 Non-technical characteristics of psychosocial assessment tools

| Tool | Number of items | Time to administer | Complexity of scoring | Available languages |
|-------------|--|--------------------------|---|--|
| ALPHA | 35 | >10 minutes ^a | Simple <i>Three-point scoring for each question</i> | English |
| ANRQ | 9 standard items, 13 if yes answered to certain questions (PNRQ 3 extra items for post-natal setting) | 5-10 minutes | Moderate <i>Combination of categorical and continuous data (requires skip logic)</i> | English, Arabic, Vietnamese, Mandarin, Cantonese, Punjabi, Tamil, Chin Hakka, Dinka, Dari, Persian/Farsi, Pashto, Turkish ; cultural sensitivity unknown |
| BRO | 16 | >10 minutes ^a | Simple <i>Three-point scoring for each question</i> | English Spanish |
| PAT/PAT 2.0 | 68 | >10 minutes ^a | High <i>Total score and seven sub-scores; three tiers of risk— Universal, Targeted, and Clinical</i> | English Spanish |
| PRQ | 21 ^b | 10-20 minutes | Moderate <i>Five-point Likert scale for each question</i> | English |

Abbreviations: ALPHA, Antenatal Psychosocial Health Assessment; ANRQ, Antenatal Risk Questionnaire; BRO, Brief Risk Overview; PAT, Psychosocial Assessment Tool; PAT 2.0, Psychosocial Assessment Tool 2.0 ; PRQ, Pregnancy Risk Questionnaire.

^a Assumed based on number of items and comparison with PRQ. ^b originally 23 items. Latest version has 21 items comprised 18 antenatal items and three early postnatal items.

Clinical usefulness of relevant tools

Acceptability

No studies were identified in the literature search that specifically reported on acceptability of psychosocial assessment tools in fathers or non-birthing partners in the perinatal period. However, the foundation review (Darwin et al. 2021) explores the acceptability of mental health assessment, specifically in relation to fathers, other co-parents and partners in the perinatal period. Refer to Section 5.2 for a narrative synthesis of the themes that emerged from the identified literature on the topic.

Implementability

No studies were identified in the literature search that specifically reported on implementability of psychosocial assessment tools in fathers or non-birthing partners in the perinatal period. However, the foundation review (Darwin et al. 2021) touches on issues associated with implementation of mental health assessment in fathers and non-birthing partners, that extends beyond acceptability. Refer to Section 5.2 for a narrative synthesis of the themes that emerged from the identified literature relating to service-level influences.

Overall summary of findings

The table below shows the overall summary of findings regarding all relevant aspects of perinatal psychosocial assessment in fathers or non-birthing partners: technical characteristics/performance, non-technical characteristics and clinical usefulness.

Table 10 Overall summary of findings relating to the use of psychosocial assessment tools in fathers and non-birthing partners in the perinatal period

| Tool | Technical characteristics | | Non-technical characteristics | | Clinical usefulness | | |
|--------------|---------------------------|------------------------|-------------------------------------|--|----------------------------|----------------------------|-------------------------------|
| | Performance ^a | Certainty ^b | Ease of administration ^c | Language availability ^d & cultural sensitivity ^e | Acceptability ^f | Effectiveness ^g | Implementability ^h |
| ALPHA | Unknown | N/A | Moderate | English only; cultural sensitivity unknown | Unknown | Unknown | Limited |
| ANRQ | Unknown | N/A | High | English, Arabic, Vietnamese, Mandarin, Cantonese, Punjabi, Tamil, Chin Hakka, Dinka, Dari, Persian/Farsi, Pashto, Turkish ; cultural sensitivity unknown | Unknown | Unknown | High |
| BRO | Unknown | N/A | Moderate | English and Spanish; cultural sensitivity unknown | Unknown | Unknown | Unknown |
| PAT, PAT 2.0 | Unknown | N/A | Low | English and Spanish; cultural sensitivity unknown | Unknown | Unknown | Unknown |
| PRQ | Unknown | N/A | Moderate | English only; cultural sensitivity unknown | Unknown | Unknown | Limited |

Footnotes

a Performance defined as predictive accuracy, positive predictive value, negative predictive value, positive likelihood ratio and/or negative likelihood ratio (defined as Acceptable, Limited, or Unknown).

b Certainty assessed on the basis of study design and evidence of validity, reliability and applicability (defined as High, Moderate, Low or Very Low).

c Ease of administration was based on judgement regarding the number of items, and the time and complexity of administering and scoring the tool (rated as High, Moderate, or Low).

d Language availability based on information from the included literature and the awareness of the EAC.

e Cultural sensitivity was based on information from the included literature of any use in culturally and linguistically diverse populations.

f Acceptability was based on the overall judgement of the EAC of the acceptability of each tool to fathers and non-birthing partners, health care professionals and/or the general public (rated as High, Moderate, Low or Unknown).

g Effectiveness was defined as positive impact on the number of psychosocial risk factors identified, services referred to or utilised, and impact on mental health (rated as High, Good, Limited, or Unknown).

h Implementability was based on the overall judgement of the EAC based on available information regarding the training requirements for use of the tool and implications for current models of care and staff and service availability.

Abbreviations: ALPHA, Antenatal Psychosocial Health Assessment; ANRQ, Antenatal Risk Questionnaire; BRO, Brief Risk Overview; PAT, Psychosocial Assessment Tool; PAT 2.0, Psychosocial Assessment Tool 2.0. N/A, not applicable; PRQ, Pregnancy Risk Questionnaire.

5.2 Mental health screening

Summary of evidence identified in the literature search

The literature search identified evidence in the target population for technical performance and acceptability of several mental health screening tools of interest to the EAC (see Table 11). No evidence was identified on effectiveness or implementability of the specified mental health screening tools in fathers or non-birthing partners in the perinatal period; however, the foundation review (Darwin et al. 2021) discusses general issues associated with implementation of mental health assessment in this population. In all studies reported in the Darwin review, the participants were described as “fathers” or “partners”; all were male and there was only one mention of a non-resident father.

Table 11 Studies included for perinatal mental health screening in fathers or non-birthing partners

| Tool | Study ID | Nature of evidence reported | | | |
|---------------------------|--------------------------------|-----------------------------|------------------|---------------|------------------|
| | | Technical performance | Acceptability | Effectiveness | Implementability |
| BDI | Darwin 2021 SR | ✓ | ✓ ^a | | |
| DASS-21 | Darwin 2021 SR | | ✓ ^{a,b} | | |
| EPDS | Darwin 2021 SR Shaheen 2019 | ✓ ✓ | ✓ | | |
| GAD-7 | Darwin 2021 SR | | ✓ | | |
| GMDS | Darwin 2021 SR | | ✓ ^a | | |
| K-6 | <i>No studies identified</i> | | | | |
| K-10 | Darwin 2021 SR | | ✓ ^a | | |
| MGMQ | <i>No studies identified</i> | | | | |
| PHQ-2 (Whooley questions) | Darwin 2021 SR | | ✓ | | |
| PHQ-9 | Darwin 2021 SR | ✓ | ✓ ^a | | |
| STAI | <i>No studies identified</i> | | | | |

Abbreviations: BDI, Beck Depression Inventory; DASS-21, Depression Anxiety Stress Scales; EPDS, Edinburgh Postnatal Depression Scale; GAD-7, General Anxiety Disorder-7; GMDS, Gotland Male Depression Scale; K-10/K-6, Kessler Psychological Distress Scale (10 item/6-item); MGMQ, Matthey Generic Mood Question; PHQ, Patient Health Questionnaire; SR, systematic review; STAI, State-Trait Anxiety Inventory.

^a The study did not specifically assess the acceptability of this tool but reported that it was among several being used within their service.

^b Not clear if this is the DASS-21.

Characteristics of relevant tools

Characteristics of studies of technical performance

Studies included in the foundation review

Darwin et al. 2021 identified seven studies that reported diagnostic test accuracy of mental health screening tools compared with a diagnostic/clinical interview. The studies were published between 1996 and 2013. Only two studies (Massoudi et al. 2013; Tran et al. 2012) would have been eligible for the current review based on date restriction. The only Australian study included in the Darwin review was published in 2001. No studies included the subgroups of interest specified in the PICO for the current review (e.g., Aboriginal and Torres Strait Islanders, refugee/asylum seekers).

A summary of the characteristics of the studies included in the Darwin review is provided in Table 12. All studies recruited participants through universal settings (e.g., maternity services or health visiting services) and without targeting assessment, for example on the basis of the mother’s mental health. All studies

included only male partners, with one study limited to first-time fathers. Only one study reported ethnicity and was limited to Chinese fathers in Hong Kong.

The Darwin review states that several “good quality” diagnostic test accuracy studies have been conducted with fathers; however, the results are highly varied. The authors undertook risk of bias assessment using the QUADAS-2 tool. Based on this assessment, the overall quality of the studies ranges from low to very low. All studies had at least two out of the four domains that were considered high or medium risk (see Appendix C).

Across all seven studies, the EPDS was investigated for screening fathers and reflects the wide use of this tool in perinatal research and clinical settings for mothers, and its practical extension to fathers. One Hong Kong study with Chinese fathers (Lai et al. 2010) also assessed the performance of the Beck Depression Inventory (BDI) and 9-item Patient Health Questionnaire (PHQ-9). The Darwin review reported that the EPDS is the only English language version tool to have been validated and is the only measure to have been validated for use in the perinatal period in Westernised countries. In studies that assessed multiple tools (including some that were not pre-specified by the EAC, such as the 12-item General Health Questionnaire [GHQ-12] and Hospital Anxiety and Depression Scale [HADS-A]), the authors all concluded that the EPDS performed similarly to, or better than, the other measures assessed.

Table 12 Characteristics of studies of technical performance of mental health screening tools in fathers or non-birthing partners

| Study ID | Country Recruitment | Timing Setting | Tool(s) (version) | Reference standard | Mental health disorder Cases, n/N (%) | Optimal cut-off |
|----------------|---|--|--|--|---|---|
| Areias 1996 | Portugal Antenatal maternity clinics | Pooled data: Antenatal (6 mo) Postnatal (3, 12 mo) Self-completed at health setting & home (12 mo) | EPDS (Portuguese) | Schedule for Affective Disorders (regular and lifetime versions) | Depression (type unspecified) 12/96 (12.5%) | No cut-off specified |
| Ballard 1996 | UK Postnatal maternity wards | Postnatal (6 mo) Self-completed at home | EPDS – early version, 13-items (English) | Psychiatric Assessment Scale | Depression (type unspecified) 6/48 (12.5%) | ≥13 EPDS |
| Edmondson 2010 | UK Postnatal maternity wards | Postnatal (7-14 wks) Self-completed at home | EPDS (English) | SCID (modules for depression and anxiety disorders) | Depression (major) 19/189 (10.0%) Depression (major)/GAD 26/189 (13.8%) | ≥11 EPDS ≥9 EPDS |
| Lai 2010 | Hong Kong Postnatal maternity wards | Postnatal (10 wks) Self-completed at home | EPDS; BDI; PHQ-9 (Chinese) | SCID-NP | Depression (minor/major) 17/551 (3.1%) | ≥9 EPDS ≥6 BDI ≥4 PHQ-9 |
| Massoudi 2013 | Sweden Postnatal home visit by child health nurse | Postnatal (3-4 mo) Self-completed at home | EPDS; HADS-A (Swedish) | Prime-MD (modules for depression and anxiety disorders) | Depression (major) 8/262 (3.1%) Depression (minor/major) 28/262 (10.7%) Anxiety (type unspecified) 29/262 (11.1%) | ≥12 EPDS ≥9 EPDS ≥8 EPDS ≥8 HADS-A |

| Study ID | Country Recruitment | Timing Setting | Tool(s) (version) | Reference standard | Mental health disorder Cases, n/N (%) | Optimal cut- off |
|-----------------|---|---|---|---|---|--------------------------------------|
| Matthey 2001 | Australia Antenatal classes (preparation for parenthood) | Postnatal (6-7 wks) Self-completed at home | EPDS (English) | Diagnostic Interview Schedule | Depression (minor/major) 7/200 (3.5%) "Distress" ^a 12/217 (5.5%) | ≥10 EPDS ≥6 EPDS |
| Tran 2012 | Vietnam Postnatal community health visits or home visits | Pooled data: Antenatal (~28 weeks) Postnatal (~6 weeks) Commune health station ^b | EPDS; Zung's SAS; GHQ-12 (Vietnamese) | SCID (modules for depression, GAD and panic disorder) | Perinatal non- psychotic common mental health disorders ^c 41/231 (17.7%) | ≥5 EPDS ≥36 Zung SAS ≥1 GHQ-12 |

Abbreviations: BDI, Beck Depression Inventory; EPDS, Edinburgh Postnatal Depression Scale; GAD, General Anxiety Disorder; GHQ, General Health Questionnaire; HADS-A, Hospital Anxiety and Depression Scale-Anxiety; mo, months; Prime-MD, Primary Care Evaluation of Mental Disorders; SAS, Self-rating Anxiety Scale; SCID, Structured Clinical Interview for DSM-IV; SCID-NP, Structured Clinical Interview for DSM-IV (non-patient version); wks, weeks.

Note: Tools in grey text are not included among the pre-specified tools of interest to the EAC.

^a Minor/major depression, adjustment disorder with anxiety (all criteria for GAD except duration of 6 months), panic disorder, specific phobia.

^b Administered as structured interview by health research worker.

^c Includes major depression, dysthymia, GAD, panic disorder.

Across the included studies, the EPDS was used to assess depression, anxiety and categories inclusive of both. Various versions of the tool were used across the studies and there was no consensus on the optimal cut-offs for use in fathers. The highest cut-off (≥13) is not comparable due to using the 13-item EPDS, which the authors claim is no longer used in clinical practice. The lowest cut-off (≥5) was recommended for perinatal non-psychotic common mental disorders, including major depression, dysthymia, GAD, and panic disorder in a Vietnamese study (Tran et al. 2012). The authors suggests that this low threshold in comparison to higher-income countries may reflect cultural differences concerning emotional expression and/or insensitivity of the tool to people facing poverty and adversity, due to the way that questions are framed (symptoms different to their usual state).

The one study that did not specify an optimal cut-off reported that the EPDS was less satisfactory when used in fathers due to poor sensitivity. This Portuguese study indicated that a cut-off of 8 provides a balance between sensitivity and specificity (Areias et al. 1996). The study demonstrated that while minor and major depression was successfully categorised by EPDS in mothers, it was unable to distinguish between the two in fathers.

The Australian study by Matthey et al. (2009) proposed lower optimal cut-off for the EPDS when compared with the thresholds for mothers. This study reported gendered differences in item endorsement, finding no differences for self-blame, sleep difficulties, and thoughts of self-harm, but that endorsement of crying was significantly lower in fathers.

Across the included studies, the author's recommendations concerning the EPDS were divergent, with some suggesting that it may be valuable and others advising against routine assessment due to poor sensitivity. The authors of the Australian study recommended a broader use for the EPDS to routinely screen for 'distress' (depression and anxiety).

Darwin and colleagues noted that the only mention of tool acceptability in the accuracy studies related to higher levels of dropout for fathers compared to mothers prior to or during diagnostic interview (Matthey et al. 2009; Areias et al. 1996) and a comment that the measures were "acceptable and comprehensible" to participants (Tran et al. 2012), although no data were reported to confirm this.

Other primary studies

The literature search identified one additional primary study that reported the technical performance of the EPDS in Arabic-speaking fathers of newborns in Saudi Arabia (Shaheen et al. 2019).

Table 13 Characteristics of additional studies of technical performance of mental health screening tools in fathers or non-birthing partners

| Study ID | Country Recruitment | Timing Setting | Tool(s) (version) | Reference standard | Mental health disorder Cases, n/N (%) | Optimal cut-off |
|----------|---|--|---|--|--|-----------------|
| Shaheen | Saudi Arabia Postnatal wards and birth registration office | Postnatal ≤6 months Self-completed at recruitment setting | EPDS plus set of questions (to identify risk factors for depression) (Arabic) | Structured interview with psychologist (DSM-5) | Major depressive disorders 98/290 (16.6% adjusted for prevalence) 9/57 (15.8%) using gold standard | 8/9 EPDS |

Abbreviations: DSM-5, Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition; EPDS, Edinburgh Postnatal Depression Scale.

Technical performance

EPDS

The table below presents technical performance outcomes (sensitivity and specificity) for the EPDS, extracted from the foundation review (Darwin et al. 2021) and the additional primary study (Shaheen et al. 2019). Results are reported by condition and EPDS cut-off. The timing of screening using the EPDS was postnatal in all studies, except for Areias et al. (1996) and Tran et al. (2012), which presented pooled data for antenatal and postnatal timepoints. Accuracy of screening fathers during pregnancy therefore remains unknown.

The study quality presented in the table is based on the overall ratings undertaken for the current review but based on the QUADAS-2 assessment reported in Darwin et al. (2021) for all studies except Shaheen et al. (2019).

Other critical PICO outcomes (positive and negative likelihood ratio) were not reported in Darwin et al. (2021). Positive and negative predictive value (PPV/NPV) were reported in the Darwin review (where available from primary studies), but these outcomes were not deemed to be critical or important by the EAC as they are dependent on prevalence.

Table 14 Evidence summary table for EPDS for detection of mental health problems in fathers, by condition and cut-off

| Condition EPDS cut-off | Study ID | Country | Sensitivity % | Specificity % | LR+ | LR- | Study quality |
|-------------------------|----------------|--------------|--|--|-----|-----|---------------|
| Major depression | | | | | | | |
| ≥7 | Edmondson 2010 | UK | 100.0 | 52.9 | NR | NR | Very Low |
| ≥8 | Edmondson 2010 | UK | 100.0 | 60.0 | NR | NR | Very Low |
| ≥9 | Edmondson 2010 | UK | 100.0 | 65.3 | NR | NR | Very Low |
| | Shaheen 2019 | Saudi Arabia | 77.8%* | 81.3%* | NR | NR | Low |
| ≥10 | Edmondson 2010 | UK | 94.7 | 68.2 | NR | NR | Very Low |
| | Massoudi 2013 | Sweden | 100.0 100.0 ^w | 72.7 89.4 ^w | NR | NR | Low |
| ≥11 | Edmondson 2010 | UK | 89.5* 77.3^{w*} | 78.2* 92.9^{w*} | NR | NR | Very Low |
| | Massoudi 2013 | Sweden | 100.0 100.0 ^w | 83.9 93.0 ^w | NR | NR | Low |

| Condition EPDS cut-off | Study ID | Country | Sensitivity % | Specificity % | LR+ | LR- | Study quality |
|-------------------------------------|----------------|-----------|--|--|-----|-----|---------------|
| ≥12 | Edmondson 2010 | UK | 78.9 | 84.7 | NR | NR | Very Low |
| | Massoudi 2013 | Sweden | 100.0* 100.0^{w*} | 87.4* 94.9^{w*} | NR | NR | Low |
| ≥13 | Edmondson 2010 | UK | 68.4 | 90.6 | NR | NR | Very Low |
| | Massoudi 2013 | Sweden | 100.0 51.7 ^w | 91.3 96.7 ^w | NR | NR | Low |
| ≥14 | Edmondson 2010 | UK | 63.2 | 94.1 | NR | NR | Very Low |
| ≥15 | Edmondson 2010 | UK | 52.6 | 96.5 | NR | NR | Very Low |
| Minor/major depression | | | | | | | |
| ≥3 | Matthey 2001 | Australia | 100.0 | 37.8 | NR | NR | Very Low |
| ≥4 | Matthey 2001 | Australia | 85.7 | 50.3 | NR | NR | Very Low |
| ≥5 | Matthey 2001 | Australia | 71.4 | 59.1 | NR | NR | Very Low |
| ≥6 | Matthey 2001 | Australia | 71.4 | 70.5 | NR | NR | Very Low |
| ≥7 | Matthey 2001 | Australia | 71.4 | 79.8 | NR | NR | Very Low |
| ≥8 | Lai 2010 | Hong Kong | 100 | 89 | NR | NR | Low |
| | Massoudi 2013 | Sweden | 85.7 65.3 ^w | 58.1 81.6 ^w | NR | NR | Low |
| | Matthey 2001 | Australia | 71.4 | 85.0 | NR | NR | Very Low |
| ≥9 | Lai 2010 | Hong Kong | 91 | 92 | NR | NR | Low |
| | Massoudi 2013 | Sweden | 85.7* 66.0^{w*} | 67.1* 86.3^{w*} | NR | NR | Low |
| | Matthey 2001 | Australia | 71.4 | 91.2 | NR | NR | Very Low |
| ≥10 | Lai 2010 | Hong Kong | 91 | 94 | NR | NR | Low |
| | Massoudi 2013 | Sweden | 75.0 49.0 ^w | 76.0 90.8 ^w | NR | NR | Low |
| | Matthey 2001 | Australia | 71.4* | 93.8* | NR | NR | Very Low |
| ≥11 | Lai 2010 | Hong Kong | 91* | 97* | NR | NR | Low |
| | Massoudi 2013 | Sweden | 57.1 34.3 ^w | 85.9 93.9 ^w | NR | NR | Low |
| | Matthey 2001 | Australia | 57.1 | 95.3 | NR | NR | Very Low |
| ≥12 | Lai 2010 | Hong Kong | 66 | 98 | NR | NR | Low |
| | Matthey 2001 | Australia | 42.9 | 95.9 | NR | NR | Very Low |
| ≥13 | Lai 2010 | Hong Kong | 41 | 98 | NR | NR | Low |
| | Matthey 2001 | Australia | 42.9 | 97.9 | NR | NR | Very Low |
| ≥14 | Lai 2010 | Hong Kong | 35 | 98 | NR | NR | Low |
| Depression, type unspecified | | | | | | | |
| ≥8 | Areias 1996 | Portugal | 40 | 93 | NR | NR | Very Low |
| ≥9 | Areias 1996 | Portugal | 40 | 81 | NR | NR | Very Low |
| ≥10 | Areias 1996 | Portugal | 40 | 81 | NR | NR | Very Low |
| ≥11 | Areias 1996 | Portugal | 20 | 86 | NR | NR | Very Low |
| ≥12 | Areias 1996 | Portugal | 20 | 92 | NR | NR | Very Low |
| ≥13 | Areias 1996 | Portugal | 10 | 94 | NR | NR | Very Low |
| | Ballard 1994 | UK | 85.7 | 75.0 | NR | NR | Low |
| Major depression/GAD | | | | | | | |
| ≥9 | Edmondson 2010 | UK | 92.0* | 66.5* | NR | NR | Very Low |

| Condition EPDS cut-off | Study ID | Country | Sensitivity % | Specificity % | LR+ | LR- | Study quality |
|---|---------------|-----------|--|--|-----|-----|---------------|
| Anxiety, type unspecified | | | | | | | |
| ≥7 | Massoudi 2013 | Sweden | 89.7 74.1 ^w | 49.4 74.7 ^w | NR | NR | Low |
| ≥8 | Massoudi 2013 | Sweden | 86.2* 66.2^{w*} | 58.4* 81.8^{w*} | NR | NR | Low |
| ≥9 | Massoudi 2013 | Sweden | 58.6 31.5 ^w | 63.9 84.6 ^w | NR | NR | Low |
| Distress^a | | | | | | | |
| ≥3 | Matthey 2001 | Australia | 100.0 | 37.6 | NR | NR | Very Low |
| ≥4 | Matthey 2001 | Australia | 83.3 | 49.8 | NR | NR | Very Low |
| ≥5 | Matthey 2001 | Australia | 75.0 | 58.5 | NR | NR | Very Low |
| ≥6 | Matthey 2001 | Australia | 75.0* | 69.8* | NR | NR | Very Low |
| ≥7 | Matthey 2001 | Australia | 66.7 | 80.5 | NR | NR | Very Low |
| ≥8 | Matthey 2001 | Australia | 66.7 | 85.9 | NR | NR | Very Low |
| ≥9 | Matthey 2001 | Australia | 66.7 | 91.7 | NR | NR | Very Low |
| ≥10 | Matthey 2001 | Australia | 66.7 | 94.1 | NR | NR | Very Low |
| ≥11 | Matthey 2001 | Australia | 41.7 | 94.6 | NR | NR | Very Low |
| ≥12 | Matthey 2001 | Australia | 33.3 | 95.6 | NR | NR | Very Low |
| ≥13 | Matthey 2001 | Australia | 33.3 | 97.6 | NR | NR | Very Low |
| Non-psychotic common mental health disorders^b | | | | | | | |
| ≥3 | Tran 2012 | Vietnam | 78.1 | 56.8 | NR | NR | Very Low |
| ≥4 | Tran 2012 | Vietnam | 73.2 | 67.9 | NR | NR | Very Low |
| ≥5 | Tran 2012 | Vietnam | 68.3* | 77.4* | NR | NR | Very Low |
| ≥6 | Tran 2012 | Vietnam | 58.5 | 84.2 | NR | NR | Very Low |

Abbreviations: AUC, area under the curve; EPDS, Edinburgh Postnatal Depression Scale; GAD, generalised anxiety disorder; LR+, positive likelihood ratio; LR-, negative likelihood ratio; NR, not reported; UK, United Kingdom.

Note: Sensitivity and specificity were reproduced from Darwin et al. (2021). 95% confidence intervals were not reported.

a Minor/ major depression, adjustment disorder with anxiety (all criteria for GAD except duration of 6 months), panic disorder, specific phobia)

b Including major depression, dysthymia, GAD, panic disorder

* Optimal cut-offs identified by authors of the primary study, shown in bold text and grey shading

^w weighted

Technical performance outcomes (sensitivity and specificity) are presented for the BDI (Table 15) and the PHQ-9 (Table 16), extracted from the foundation review. The only study that reported technical performance of these tools was Lai et al. (2010), which used the Chinese versions of the BDI and PHQ-9 to screen fathers postnatally (10 weeks) for minor/major depression.

Other critical PICO outcomes (positive and negative likelihood ratio) were not reported in the foundation review.

Table 15 Evidence summary table for BDI for detection of mental health problems in fathers, by condition and cut-off

| Condition BDI cut-off | Study ID | Country | Sensitivity % | Specificity % | LR+ | LR- | Study quality |
|-------------------------------|----------|-----------|---------------|---------------|-----|-----|---------------|
| Minor/major depression | | | | | | | |
| ≥4 | Lai 2010 | Hong Kong | 100 | 71 | NR | NR | Low |
| ≥5 | Lai 2010 | Hong Kong | 100 | 76 | NR | NR | Low |
| ≥6 | Lai 2010 | Hong Kong | 100* | 81* | NR | NR | Low |

| Condition BDI cut-off | Study ID | Country | Sensitivity % | Specificity % | LR+ | LR- | Study quality |
|--------------------------|----------|-----------|---------------|---------------|-----|-----|---------------|
| ≥7 | Lai 2010 | Hong Kong | 90 | 84 | NR | NR | Low |
| ≥8 | Lai 2010 | Hong Kong | 82 | 85 | NR | NR | Low |
| ≥9 | Lai 2010 | Hong Kong | 67 | 89 | NR | NR | Low |
| ≥10 | Lai 2010 | Hong Kong | 64 | 93 | NR | NR | Low |

Abbreviations: BDI, Beck Depression Inventory; LR+, positive likelihood ratio; LR-, negative likelihood ratio; NR, not reported.

Note: Sensitivity and specificity were reproduced from Darwin et al. (2021). 95% confidence intervals were not reported.

* Optimal cut-off identified by authors of the primary study, shown in bold text and grey shading

Table 16 Evidence summary table for PHQ-9 for detection of mental health problems in fathers, by condition and cut-off

| Condition PHQ-9 cut-off | Study ID | Country | Sensitivity % | Specificity % | LR+ | LR- | Study quality |
|-------------------------------|----------|-----------|---------------|---------------|-----|-----|---------------|
| Minor/major depression | | | | | | | |
| ≥2 | Lai 2010 | Hong Kong | 100 | 62 | NR | NR | Low |
| ≥3 | Lai 2010 | Hong Kong | 93 | 69 | NR | NR | Low |
| ≥4 | Lai 2010 | Hong Kong | 85* | 81* | NR | NR | Low |
| ≥5 | Lai 2010 | Hong Kong | 77 | 87 | NR | NR | Low |
| ≥6 | Lai 2010 | Hong Kong | 71 | 91 | NR | NR | Low |
| ≥7 | Lai 2010 | Hong Kong | 70 | 94 | NR | NR | Low |
| ≥8 | Lai 2010 | Hong Kong | 56 | 96 | NR | NR | Low |

Abbreviations: LR+, positive likelihood ratio; LR-, negative likelihood ratio; NR, not reported; PHQ-9, Patient Health Questionnaire (9-item).

Note: Sensitivity and specificity were reproduced from Darwin et al. (2021). 95% confidence intervals were not reported.

* Optimal cut-off identified by authors of the primary study, shown in bold text and grey shading

Summary of findings regarding technical performance

The Summary of Findings (SOF) tables present a summary of the important and critical outcomes, as defined in the PICO (determined by the EAC). Unpooled sensitivity and specificity results are presented for the optimal cut-offs determined by each study author (the Darwin review did not pool results). The LR+ and LR- values have been calculated by the authors of the current review, based on the corresponding sensitivity and specificity results. The 'goodness' of sensitivity and specificity was defined as follows: >0.90, high; 0.70 – 0.90, moderate; <0.70, low (keeping in mind that <0.5 is non-discriminating).

Table 17 Summary of Findings table for the EPDS for detection of mental health problems in fathers

| Tool; condition; cut-off | Study (no. participants) | Critical outcomes | | | | Important AUC (95% CI) | Overall certainty |
|-----------------------------------|-----------------------------|-----------------------------|----------------------------|------------------|------------------|---------------------------|-------------------------------|
| | | Sensitivity % ^a | Specificity % ^a | LR+ ^b | LR- ^b | | |
| EPDS; major depression; ≥9 | Sheehan 2019 (290) | 77.8% | 81.3% | 4.16 | 0.27 | 0.81 (NR) | ●○○○ Very low ^f |
| EPDS; major depression; ≥11 | Edmondson 2010 (189) | 89.5 77.3 ^w | 78.2 92.9 ^w | 4.11 10.89 | 0.13 0.24 | 0.916 (0.864, 0.967) | ●○○○ Very low ^f |
| EPDS; major depression; ≥12 | Massoudi 2013 (262) | 100.0 100.0 ^w | 87.4 94.9 ^w | 7.94 19.61 | 0 0 | NR | ●○○○ Very low ^f |
| EPDS; minor/major depression; ≥9 | Massoudi 2013 (262) | 85.7 66.0 ^w | 67.1 86.3 ^w | 2.60 4.82 | 0.21 0.39 | NR | ●○○○ Very low ^f |
| EPDS; minor/major depression; ≥10 | Matthey 2001 (200) | 71.4 | 93.8 | 11.52 | 0.30 | NR | ●○○○ Very low ^f |
| EPDS; minor/major depression; ≥11 | Lai 2010 (551) | 91 | 97 | 30.33 | 0.09 | 0.97 (0.95, 0.99) | ●○○○ Very low ^f |

| Tool; condition; cut-off | Study (no. participants) | Critical outcomes | | | | Important AUC (95% CI) | Overall certainty |
|--|-----------------------------|----------------------------|----------------------------|------------------------------|------------------------------|---------------------------|-------------------------------|
| | | Sensitivity % ^a | Specificity % ^a | LR ⁺ ^b | LR ⁻ ^b | | |
| EPDS; depression (type unspecified); ≥8 ^c | Areias 1996 (96) | 40 | 93 | 5.71 | 0.65 | NR | ●○○○ Very low ^f |
| EPDS; depression (type unspecified); ≥13 | Ballard 1994 (48) | 85.7 | 75.0 | 3.43 | 0.19 | NR | ●○○○ Very low ^f |
| EPDS; major depression/GAD; ≥9 | Edmondson 2020 (189) | 92.0 | 66.5 | 2.75 | 0.12 | NR | ●○○○ Very low ^f |
| EPDS; anxiety (type unspecified); ≥8 | Massoudi 2013 (262) | 86.2 66.2 ^w | 58.4 81.8 ^w | 2.07 3.64 | 0.24 0.41 | NR | ●○○○ Very low ^f |
| EPDS; distress ^d ; ≥6 | Matthey 2001 (217) | 75.0 | 69.8 | 2.48 | 0.36 | NR | ●○○○ Very low ^f |
| EPDS; non-psychotic common mental health disorders ^e ; ≥5 | Tran 2012 (231) | 68.3 | 77.4 | 3.02 | 0.41 | 0.767 (0.679, 0.855) | ●○○○ Very low ^f |

Abbreviations: AUC, area under the curve; CI, confidence interval; EPDS, Edinburgh Postnatal Depression Scale; GAD, generalised anxiety disorder; LR+, positive likelihood ratio; LR-, negative likelihood ratio; NR, not reported.

a Reproduced from Darwin et al. (2021). 95% confidence intervals were not reported.

b Calculated from sensitivity and specificity using the following formulas: LR+ = sensitivity/(1-specificity); LR- = (1-sensitivity)/specificity.

c Authors of the primary study did not nominate an optimal cut-off. The Darwin review noted that a cut-off of 8 provides the best balance of sensitivity and specificity based on the scores reported.

d Minor/ major depression, adjustment disorder with anxiety (all criteria for GAD except duration of 6 months), panic disorder, specific phobia)

e Including major depression, dysthymia, GAD, panic disorder

f Single study of low or very low quality.

^w weighted

Table 18 Summary of Findings table for the BDI for detection of mental health problems in fathers

| Tool; condition; cut-off | Study (no. participants) | Critical outcomes | | | | Important AUC (95% CI) | Overall certainty |
|---------------------------------|-----------------------------|----------------------------|----------------------------|------------------------------|------------------------------|---------------------------|-------------------------------|
| | | Sensitivity % ^a | Specificity % ^a | LR ⁺ ^b | LR ⁻ ^b | | |
| BDI; minor/major depression; ≥6 | Lai 2010 (551) | 100 | 81 | 5.26 | 0 | 0.93 (0.88, 0.97) | ●○○○ Very low ^c |

Abbreviations: AUC, area under the curve; BDI, Beck Depression Inventory; CI, confidence interval; LR+, positive likelihood ratio; LR-, negative likelihood ratio.

a Reproduced from Darwin et al. (2021). 95% confidence intervals were not reported.

b Calculated from sensitivity and specificity using the following formulas: LR+ = sensitivity/(1-specificity); LR- = (1-sensitivity)/specificity.

c Single study of low or very low quality.

Table 19 Summary of Findings table for the PHQ-9 for detection of mental health problems in fathers

| Tool; condition; cut-off | Study (no. participants) | Critical outcomes | | | | Important AUC (95% CI) | Overall certainty |
|-----------------------------------|-----------------------------|----------------------------|----------------------------|------------------------------|------------------------------|---------------------------|-------------------------------|
| | | Sensitivity % ^a | Specificity % ^a | LR ⁺ ^b | LR ⁻ ^b | | |
| PHQ-9; minor/major depression; ≥4 | Lai 2010 (551) | 85 | 81 | 4.47 | 0.19 | 0.92 (0.86, 0.98) | ●○○○ Very low ^c |

Abbreviations: AUC, area under the curve; CI, confidence interval; LR+, positive likelihood ratio; LR-, negative likelihood ratio; PHQ-9, Patient Health Questionnaire (9-item).

a Reproduced from Darwin et al. (2021). 95% confidence intervals were not reported.

b Calculated from sensitivity and specificity using the following formulas: LR+ = sensitivity/(1-specificity); LR- = (1-sensitivity)/specificity.

c Single study of low or very low quality.

Non-technical characteristics of relevant tools

The table below summarises the non-technical characteristics of the mental health screening tools that were summarised in the 2017 *Mental Health Care in the Perinatal Period: Australian Clinical Practice Guideline*. In addition, the K-6 has been included as this tool is of particular interest to the EAC for use in fathers or non-birthing partners. The complexity of scoring for each tool has been assessed as Simple, Moderate or High on the basis of information in the published literature and the experience of the EAC.

Table 20 Non-technical characteristics of mental health screening tools

| Tool | No. of items | Time to administer | Complexity of scoring | Available languages |
|---------------------------|--------------|--------------------|-----------------------|---|
| EPDS | 10 | 5-10 minutes | Simple | Developed in English and validated for depression screening in >20 languages Translated into >50 languages |
| GAD-7 | 7 | 5-10 minutes | Simple | Developed in English Translated into >20 languages |
| K-6 | 6 | <2 minutes | Simple | Developed in English Translated into >15 languages ¹ |
| K-10 | 10 | 5-10 minutes | Simple | Developed in English Translated into >15 languages ¹ |
| PHQ-2 (Whooley questions) | 2 | <2 minutes | Simple | Developed in English Translated into >40 languages |
| PHQ-9 | 9 | 5-10 minutes | Simple | Developed in English Translated into >40 languages |

Abbreviations: EPDS, Edinburgh Postnatal Depression Scale; GAD-7, General Anxiety Disorder-7; K-10/K-6, Kessler Psychological Distress Scale (10 item/6-item); PHQ, Patient Health Questionnaire.

Clinical usefulness of relevant tools

Acceptability

Studies included in the foundation review

Darwin et al. 2021 identified 20 studies that reported acceptability of mental health screening tools. All were from high-income Westernised countries where maternal mental health assessment is already part of current practice. Five studies were from Australia (Schuppan 2019; Fletcher et al. 2017; Rominov et al. 2017; Rowe et al. 2013; Fletcher et al. 2008). The publication range was 2005 to 2020. Three studies would not have been eligible for the current review based on the date restriction specified in the EAC-approved Research Protocol (Curro et al. 2009; Fletcher et al. 2008; Greening et al. 2006).

A summary of the characteristics of the studies included in the Darwin review is provided in Table 21. All studies referred to “fathers” or “partners” and one study referred to “non-birthing parents” (Stahl et al. 2020). However, all partners who participated were male and most were in a relationship with the mother. The majority of studies did not report ethnicity or indicated under-representation of ethnic minority groups. No studies included the subgroups of interest specified in the PICO for the current review (e.g., Aboriginal and Torres Strait Islanders, refugee/asylum seekers).

Eight studies reported parent perspectives and nine studies reported health professional perspectives. The remaining three studies were feasibility and implementation studies that reported behavioural indicators such as completion rates without collecting the perspectives of participants.

The mental health screening tools used in the practice-based studies included three tools of interest to the EAC: EPDS, Whooley questions (PHQ-2) and the Depression Anxiety Stress Scale (DASS). In two of these studies, the screening tools were completed as part of a more comprehensive psychosocial assessment (Stahl et al. 2020; Fletcher et al. 2017). Other studies mentioned that the GMDs, BDI, PHQ-9 and the 10-item Kessler Psychological Distress Scale (K-10) were being used within their service but did not specifically report on the acceptability of these tools.

All assessments completed in practice settings were postnatal (e.g., early parenting services, neonatal or paediatric intensive care units [NICU/PICU], public health child nursing), whereas studies in a research setting included completion during pregnancy.

¹ https://www.hcp.med.harvard.edu/ncs/k6_scales.php

Many studies did not reference specific tools but reported parents' views or health professionals' views. Some of these studies focused on partners' perinatal mental health whereas others reported on engaging fathers in services or on partners' broader support.

Table 21 Characteristics of studies of acceptability of mental health screening tools in fathers or non-birthing partners

| Study ID | Study design | Country Practice setting | Tool(s) (version) | Sample | Data collection | Analysis |
|-----------------------------------|--|-------------------------------|--|---|--|------------------------|
| EPDS | | | | | | |
| Clavenna 2017 | Pilot study (feasibility of routine screening) | Italy Paediatric primary care | EPDS (Italian) Self-completed in waiting room at clinic | 1,420 fathers attending well-child visit at 2-3 months postpartum | Feasibility data (completion rates) | Descriptive statistics |
| Curro 2009 | Feasibility study | Italy Paediatric primary care | EPDS (Italian, French, Spanish, English, Arabic, Punjabi, Singhalese) Completed "without any help" (setting not specified) | 499 fathers | Feasibility data (completion rates) | Descriptive statistics |
| Fletcher 2008 | Mixed methods | Australia No | EPDS and 14 "psychosocial questions" | 75 fathers who attended antenatal classes | Survey and telephone interviews | Descriptive statistics |
| Schuppan 2019 | Qualitative | Australia No | EPDS Completed online | 9 fathers from antenatal clinic/ classes | Interviews | Thematic analysis |
| Whitlock 2016 | Qualitative | UK Health visiting | EPDS | 12 health visitors | Focus groups | Thematic analysis |
| EPDS and Whooley questions | | | | | | |
| Stahl 2020 | Qualitative | Sweden Child health nursing | Whooley questions and EPDS Completed with a 'comprehensive parental interview' | 11 child health nurses | Focus groups and interviews | Content analysis |
| PHQ and GAD-7 | | | | | | |
| Darwin 2017 | Qualitative | UK No | PHQ-8, GAD-7, PHQ-15 Self-completed | 19 fathers of baby born at term | Interviews | Thematic analysis |
| Other tools | | | | | | |
| Bagge 2017 | Feasibility study | UK NICU | CES-D, IES-R Completed on NICU as part of questionnaire (unclear if self-completed) | 38 parents of VLBW infants + 36 parents of term infants | Acceptability questionnaire, feasibility data (consent, completion rates), field notes | Descriptive statistics |

| Study ID | Study design | Country Practice setting | Tool(s) (version) | Sample | Data collection | Analysis |
|---------------------------------------|---|------------------------------------|---|---|---|---|
| Cole 2018 | Implementation study | USA NICU | CES-D, IES-R, (English or Spanish) Completed independently by parents at the unit | 602 fathers of newborns with prenatally diagnosed fetal anomalies | Feasibility data (completion rates, processes) | Descriptive statistics |
| Greening 2006 | Pilot study for 'And how was it for you dad?' questionnaire | UK Health visiting | Structured questionnaire including experience of birth and fatherhood Self-completed then discussed with health visitor (setting unclear) | 20 fathers on the health visiting caseload | Acceptability questions and feasibility data (completion rates) | Descriptive statistics |
| Samuel 2015 | RCT ^a | UK PICU | PAS (with amended wording) Completed during stay | 209 parents of children admitted to PICU | Acceptability questionnaire | Descriptive statistics |
| No reference to specific tools | | | | | | |
| Baldwin 2019 | Qualitative | UK No | None | 21 first-time fathers with children <12 months | Interviews | Framework analysis |
| Fletcher 2017 | Qualitative | Australia Early parenting services | Various reported as being used with services (e.g., EPDS, DASS, K-10) | 18 professional staff | Interviews | Thematic survey analysis |
| Freitas 2016 | Mixed methods | USA (international experts) No | Various mentioned as possible tools (e.g., EPDS, BDI, PDSS, GMDS, PHQ-9) | 16 professionals (practitioners, academics) | Delphi study with online questionnaires | Thematic phenomenological analysis and consensus measurement |
| Hammarlund 2015 | Qualitative | Sweden Child health nursing | None | 10 child health nurses | Interviews | Thematic analysis |
| Massoudi 2011 | Survey | Sweden Child health nursing | None | 348 child health nurses | Survey | Content analysis, descriptive statistics, logistic regression |
| Oldfield 2017 | Qualitative | UK Health visiting | None | 3 students or newly qualified health visitors | Interviews | Interpretive Phenomenological Analysis |
| Rominov 2017 | Multi methods | Australia Maternity | None | 106 midwives surveyed, 13 midwives interviewed | Survey and interviews | Semantic thematic analysis and descriptive statistics |
| Rowe 2013 | Qualitative | Australia No | None | 16 fathers who attended childbirth education classes | Focus groups (single-sex) and interviews | Thematic analysis |

| Study ID | Study design | Country Practice setting | Tool(s) (version) | Sample | Data collection | Analysis |
|------------|--------------|----------------------------|-------------------|---|-----------------|---|
| Wells 2017 | Survey | UK Child health nursing | None | 363 child health nurses who attended a conference | Survey | Content analysis and various statistics |

Abbreviations: BDI, Beck Depression Inventory; CES-D, Center for Epidemiologic Studies-Depression scale; EPDS, Edinburgh Postnatal Depression Scale; DASS, Depression Anxiety Stress Scales; GAD-7, General Anxiety Disorder; GMDS, Gotland Male Depression Scale; IES-R, of Events Scale—Revised; K-10, 10-item Kessler Psychological Distress Scale; MGMQ, Matthey Generic Mood Question; NICU, neonatal intensive care unit; PAS, Post-traumatic Adjustment Screen; PDSS, Postpartum Depression Screen Scale; PHQ, Patient Health Questionnaire; PICU, Paediatric Intensive Care Unit; RCT, randomised controlled trial; UK, United Kingdom; USA, United State of America; VLBW, very low birth weight.

Note: Information is taken from the foundation review. No attempt was made to extract additional information from the primary studies.
 a Parents scoring high on the PAS were randomised to the intervention (follow-up clinical 2 months after discharge) or treatment as usual.

Only one study assessed the acceptability of a tool in detail. This Australian study (Schuppen et al. 2019) reported the views of nine expectant fathers with a current or past diagnosis of depression or anxiety, who completed the EPDS in a research context. Although most reported positive feedback on the tool, the Darwin review notes that participants welcomed the anonymity, which would not apply in a practice setting. Another Australian study (Fletcher et al. 2008) conducted telephone interviews on acceptability of the EPDS plus psychosocial questions (details on the questions were not provided) and reported that no fathers were “bothered” by the questions.

One UK study that conducted focus groups with health visitors commented that one participant reported that she would feel comfortable using the EPDS to screen fathers but suggested the need to change some of the words to be more “man-friendly” (Whitelock et al. 2016).

Two Italian studies examined feasibility of screening fathers using the EPDS at universal well child visits with paediatricians. One study reported 99.6% of the fathers completed the EPDS when conducted as standard practice at the first visit, reporting that it is feasible to screen fathers in this setting (Curro et al. 2009). The other study sought consent at the first visit to complete the EPDS at the second visit. The authors reported that 38% of fathers completed the EPDS at the second visit compared with 73% of mothers (Clavenna et al. 2017).

The authors of the Darwin review identified factors that influenced the views of parents and health professionals toward acceptability of mental health assessment in fathers and the potential challenges involved. These factors were grouped in the review as candidate themes (see Table 7) and were discussed narratively, categorised at the individual-level, practitioner-level and service-level (although some my span multiple levels). The themes from Darwin et al. (2021) are summarised in the table below.

Table 22 Themes discussed in the narrative synthesis in Darwin et al. (2021)

| Themes | Summary of findings |
|---|---|
| Individual-level influences | |
| Gendered perspectives | <ul style="list-style-type: none"> It was suggested that stigma may be overcome by framing information about screening in a way that appealed to men’s roles as fathers. Health professionals perceived that barriers relating to stigma and masculinity may vary across cultures and individual beliefs. One of the few ethnically diverse samples found that some fathers felt it was culturally and socially unacceptable to discuss difficulties with fatherhood. Some fathers noted concerns about completing a tool in their partner’s presence, reporting concerns about friends, family and colleagues learning of their mental health needs. |
| Compromising support for women (birthing parents) | <ul style="list-style-type: none"> Fathers expressed concerns that women’s needs were greater and should be prioritised. Assessment of fathers was seen as a potential burden to services that were perceived as already under-resourced. |

| Themes | Summary of findings |
|---|---|
| Perceived purpose of assessment | <ul style="list-style-type: none"> Some fathers indicated their willingness to be screened would depend on the perceived value of completion and transparency about the intention and outcomes. |
| Ability to recognise symptoms | <ul style="list-style-type: none"> Fathers noted that greater awareness of signs and triggers may reduce barriers to assessment. |
| Practitioner-level influences | |
| Knowledge, skills, confidence | <ul style="list-style-type: none"> Health professionals and parents identified knowledge, skills and confidence of the practitioner as influencing the acceptability of assessment. Some fathers questioned whether primary care providers were qualified to support mental health. Health visitors and child health nurses raised concerns about not having the skills to support fathers and partners. Midwives and health visitors reported lacking confidence, both in working with fathers more generally and in asking them about their mental health. |
| Fear of causing offense or distress | <ul style="list-style-type: none"> Health professionals noted the potential for causing offense or distress was dependent on the fathers' individual culture, religion or personal beliefs. |
| Conflicting needs of parents | <ul style="list-style-type: none"> Health professionals noted challenges when working closely with both parents, including potential 'conflict of interest', keeping viewpoints separate, feeling like a mediator and issues around confidentiality. |
| Service-level influences | |
| Culture of the service | <ul style="list-style-type: none"> The emphasis of services (health visiting, child health and early parenting) is often on the birthing mother, with the assumption that the mother would attend the appointments and communication would be with the mother. The prevalence of female staff was identified as a potential barrier to routinely screening fathers. |
| Remit of the service | <ul style="list-style-type: none"> Some professionals and parents questioned the inclusion of partners' mental health across a range of services. Maternity is perceived to be focused on the woman and pregnancy, and physical rather than emotional health. A preference was expressed to speak with a general practitioner rather than someone in maternity or health visiting. Men's emotional wellbeing is not perceived as a priority in current models of care. |
| Workload and time pressures | <ul style="list-style-type: none"> Health visitors expressed concerns about lack of time to screen fathers and for meaningful discussions. Fathers perceived health professionals in maternity and health visiting as not having enough time to meet their mental health needs. |
| Opportunity for contact (including lack of privacy, building rapport) | <ul style="list-style-type: none"> Services' limited hours and need for flexibility with appointments were raised repeatedly, to accommodate fathers' work commitments and travel time. It was noted that fathers do not always engage with services (e.g., they may be present at a home visit but choose not to stay in the room). Child health nurses reported struggling to establish continuity with fathers due to not seeing them regularly. Some fathers identified a lack of privacy as a barrier to assessment, feeling unable to talk to a health visitor independently, away from their partner. |
| Need for training | <ul style="list-style-type: none"> Professionals in universal services (maternity, health visiting and child health) identified a fundamental need for training in theory and practice for working with fathers and specifically in relation to paternal mental health and addressing potentially difficult situations when working with couples. |
| Need for clinical supervision | <ul style="list-style-type: none"> Professionals with experience of supporting fathers in relation to their mental health identified the importance of access to clinical supervision. |
| Need for guidelines | <ul style="list-style-type: none"> Across settings, professionals identified the need for guidelines as a barrier to assessing fathers' mental health. Child health nurses reported a range of approaches and lack of structured methods, commending the introduction of a planned approach. Similarly, within specialist services there was no uniform approach. |

| Themes | Summary of findings |
|---------------------------------|--|
| Need for appropriate tools | <ul style="list-style-type: none"> • Need for tools that are appropriate for use in men. |
| Need for onward referral routes | <ul style="list-style-type: none"> • Need mechanisms in place for referring fathers and other non-birthing parents to appropriate support, and staff having the confidence to make these referrals. |

Other primary studies

The literature search identified no additional primary studies that reported on the acceptability of mental health screening tools in fathers or non-birthing partners.

Effectiveness

Studies included in the foundation review

The Darwin et al. (2021) systematic review found no studies evaluating the effectiveness of mental health screening in fathers or non-birthing partners in the perinatal period. The authors commented that within the practice-based studies, there were occasional comments regarding uptake of support following screening indicating the need to also address barriers to onward service use. No evidence was identified regarding effectiveness of screening undertaken as part of a care pathway. Similarly, the Darwin review found no evidence that examined potential harm linked to screening in partners.

Other primary studies

The literature search identified no additional primary studies that reported effectiveness outcomes (defined as impact on detection, care sought or received, and mental health outcomes) for mental health screening tools in fathers or non-birthing partners.

Implementability

The narrative synthesis in the Darwin review raises a number of concerns relating to implementability (refer to practitioner-level influences and service-level influences in Table 22). Fathers and health professionals both share concerns about limited contact and its associated practical barriers, and resource implications, including the potential to compromise support offered to women. Additionally, health professionals expressed concerns regarding their knowledge, skills and confidence to deliver mental health screening to fathers and non-birthing partners, the lack of appropriate tools (particularly for fathers), lack of guidelines, and lack availability of onward referral routes.

Depression-focused tools may provide a marker for other mental health problems, necessitating a comprehensive approach to risk protocols and onward referrals.

Training and supervision is needed to help practitioners address gender bias and build confidence in working with partners.

The Darwin review identified no evidence on the acceptability of assessing couples' mental health together; however, some health professionals raised concerns about potential tensions in working closely with both parents, including knowledge or suspicion of inter-partner violence and domestic abuse.

The Darwin review notes that established barriers amongst health professionals regarding maternal mental health assessment also apply to mental health services for fathers and non-birthing partners. This includes challenges at the practitioner level (e.g., knowledge, skills, confidence, attitude and scope of practice, fear of causing offense) and at the service level (e.g., lack of onwards referral options, resources/workload issues, and tools being unavailable in different languages). The authors warn that consideration is needed of care pathways, shifting from an emphasis on assessment and focusing on resource implications for each step. This includes practitioners' and services' abilities to document and act on identified risk, which is a key ethical concern.

Other ethical considerations include safeguarding, confidentiality and data protection. Darwin and colleagues suggest that services introducing mental health screening for fathers and non-birthing partners will need to develop systems for recording information on partners' mental health, with consideration of their responsibilities regarding different family members.

Overall summary of findings

The table below shows the overall summary of findings regarding technical performance, non-technical characteristics and clinical usefulness of perinatal mental health screening in fathers or non-birthing partners.

Table 23 Overall summary of findings relating to the use of mental health screening tools in fathers and non-birthing partners in the perinatal period

| Tool | Technical characteristics | | Non-technical characteristics | | Clinical usefulness | | |
|------------------------------|---------------------------|------------------------|-------------------------------------|--|------------------------------------|----------------------------|-------------------------------|
| | Performance ^a | Certainty ^b | Ease of administration ^c | Language availability ^d & cultural sensitivity ^e | Acceptability ^f | Effectiveness ^g | Implementability ^h |
| EPDS | Antenatal: Unknown | N/A | High | Multiple languages Multiple populations | Moderate/Low | Unknown | High |
| | Postnatal: Uncertain | ●○○○ Very low | | | | | |
| GAD-7 | Antenatal: Unknown | N/A | High | Multiple languages Western populations | Unknown (but likely to be good) | Unknown | Moderate |
| | Postnatal: Uncertain | ●○○○ Very low | | | | | |
| K-10 | Antenatal: Unknown | N/A | High | Multiple languages Western populations | Unknown (but likely to be good) | Unknown | High |
| | Postnatal: Unknown | N/A | | | | | |
| PHQ-2 (Whooley questions) | Antenatal: Unknown | N/A | High | Multiple languages Western populations | Unknown (but likely to be good) | Unknown | High |
| | Postnatal: Unknown | N/A | | | | | |
| PHQ-9 | Antenatal: Unknown | N/A | High | Multiple languages Western populations | Unknown (but likely to be good) | Unknown | High |
| | Postnatal: Uncertain | ●○○○ Very low | | | | | |
| STAI | Antenatal: Unknown | N/A | Low | Multiple languages Western populations | Unknown (but likely to be good) | Unknown | Low |
| | Postnatal: Unknown | N/A | | | | | |

Footnotes

- a** Performance defined as sensitivity, specificity, positive likelihood ratio and/or negative likelihood ratio (defined as Acceptable, Limited, or Unknown).
- b** Certainty assessed according to GRADE and QUADAS-2 criteria (defined as High, Moderate, Low or Very Low).
- c** Ease of administration was based on judgement regarding the number of items, and the time and complexity of administering and scoring the tool (rated as High, Moderate, or Low).
- d** Language availability based on information from the included literature and the awareness of the EAC.
- e** Cultural sensitivity was based on information from the included literature of any use in culturally and linguistically diverse populations.
- f** Acceptability was based on the overall judgement of the EAC of the acceptability of each tool to fathers and non-birthing partners, health care professionals and/or the general public (rated as High, Moderate, Low or Unknown).
- g** Effectiveness was defined as positive impact on mental health symptoms, services referred to or utilised, and impact on mental health (rated as High, Good, Limited, or Unknown).
- h** Implementability was based on the overall judgement of the EAC based on available information regarding the training requirements for use of the tool and implications for current models of care and staff and service availability.

Abbreviations: BDI, Beck Depression Inventory; DASS-21, Depression Anxiety Stress Scales; EPDS, Edinburgh Postnatal Depression Scale; GAD-7, General Anxiety Disorder-7; GMDS, Gotland Male Depression Scale; K-10/K-6, Kessler Psychological Distress Scale (10 item/6-item); MGMT, Matthey Generic Mood Question; N/A, not applicable; PHQ, Patient Health Questionnaire; STAI, State-Trait Anxiety Inventory.

6 Discussion

What are the most appropriate methods for psychosocial assessment of (a) fathers or (b) non-birthing partners at risk of mental health problems in the perinatal period?

No evidence-based conclusions can be drawn on the most appropriate tools for perinatal psychosocial assessment of fathers and non-birthing partners. Although the ANRQ appears to be attractive in terms of ease of administration and implementability, the language and domains covered in the tool may not be appropriate for fathers.

The mode/setting of delivery may be an important consideration as mothers tend to be in contact with health services throughout the perinatal period, whereas fathers and partners have sporadic contact. Overall, the existing evidence regarding the most appropriate methods for psychosocial assessment of (a) fathers or (b) non-birthing partners at risk of mental health problems in the perinatal period is insufficient and more research is needed. Furthermore, it is unlikely that extending the evidence review to fathers/partners outside the perinatal period will yield more studies, and the wider evidence will not necessarily be generalisable to the perinatal period and may not be worthwhile.

What are the most appropriate methods for screening (a) fathers or (b) non-birthing partners for mental health problems in the perinatal period?

A limited body of evidence was identified on the use of the mental health screening tools of interest to the EAC in fathers and non-birthing partners. All studies reporting diagnostic test accuracy included male partners only; no evidence was identified on the performance or acceptability of mental health screening tools in co-mothers, step-parents or other partners.

Families from minority communities are priority populations as they face additional risks for perinatal anxiety and depression, and barriers to accessing safe, appropriate services. Populations considered to be more at risk include LGBTIQ+ parented families, along with Aboriginal and Torres Strait Islander families, and CALD families. Experiences of discrimination and isolation can discourage help-seeking at a time of particular risk for these vulnerable families.

Although a small number of studies were identified suggesting the accuracy and acceptability of mental health screening tools in fathers in the postnatal period, overall there is insufficient published evidence to support that using a specific tool (on a universal basis or targeted to high-risk groups) would be accurate, acceptable or effective at identifying mental health problems or improving outcomes.

All studies that assessed diagnostic performance of mental health screening tools in the target population reported on the EPDS, which is likely a reflection of the wide use of this tool in perinatal clinical and research settings rather than it being the most appropriate tool for use in fathers and non-birthing partners. The included studies (7 in total) were all of low or very low quality and only one study, published in 2001, was conducted in Australia. Across the studies there was no consensus on the appropriate EPDS cut-off for screening fathers for mental health problems.

The literature on mental health screening in fathers points toward the need for male-specific measures that are not limited to “traditional” symptoms of distress, but instead incorporate different signs and behaviours. For example, men may be more likely to acknowledge fatigue and irritability, to withdraw socially, use avoidant/escapist activities (e.g., sports, overworking, excessive time on internet/TV, gambling, alcohol use, reckless behaviour), and to display hostility and anger.

Similar to psychosocial assessment, the mode/setting of delivery of mental health screening may be an important consideration as fathers and non-birthing partners tend not to be in regular contact with the health system throughout the perinatal period.

Implementation of mental health assessment for fathers and non-birthing partners into clinical practice depends on acceptability to both health professionals and parents. The foundation review notes that evidence regarding the acceptability of specific measures is limited but resonated with literature on acceptability in women, with timing of administration, time required to complete the assessment and clarity of wording being important considerations. However, there are also fundamental challenges to overcome if effective mental health screening is to be implemented in fathers and non-birthing parents.

Further research is needed in a range of practice settings and with a range of stakeholders, including minority groups (minority ethnic parents, non-resident parents, step-parents, LGBTIQ+ parents). The literature to date is largely focused on postnatal depression but anxiety and distress may also be important to address in the perinatal period.

7 References

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Appendix A Literature search strings

Table App 1 EMBASE.com search string (literature search date 28/09/2021)

| Search set | Query no. | Search string | Records |
|---------------------------------|-----------|---|------------|
| Fathers & non-birthing partners | #1 | 'father'/de OR 'adolescent father'/de OR 'expectant father'/de OR 'male'/de OR 'father child relation'/de | 10,353,621 |
| | #2 | father*:ti,ab OR dad*:ti,ab OR paternal:ti,ab OR patriarch:ti,ab OR 'birth father*':ti,ab OR 'birth-father*':ti,ab OR men:ti,ab OR man:ti,ab OR male:ti,ab OR boyfriend*:ti,ab OR husband*:ti,ab | 2,594,123 |
| | #3 | parent'/de OR 'spouse'/exp OR 'adolescent parent'/de OR 'divorced parent'/de OR 'separated parent'/de OR 'adoptive parent'/de OR 'parenthood'/de | 119,866 |
| | #4 | parent*:ti,ab OR 'co parent*':ti,ab OR partner*:ti,ab OR couple*:ti,ab OR spous*:ti,ab OR 'co mother*':ti,ab OR 'co-mother*':ti,ab OR 'comother*':ti,ab OR wife:ti,ab OR girlfriend*:ti,ab OR 'co-parent*':ti,ab OR coparent*:ti,ab OR 'step parent*':ti,ab OR 'step-parent*':ti,ab OR 'step mother*':ti,ab OR 'step-mother*':ti,ab OR 'step father*':ti,ab OR 'step-father*':ti,ab | 1,234,622 |
| | #5 | lgbt*:ab,ti OR lesbian:ab,ti OR gay:ab,ti OR homosexual:ab,ti OR queer:ab,ti OR bisexual:ab,ti OR transgender:ab,ti OR 'same sex':ab,ti OR 'same-sex':ab,ti | 42,367 |
| | #6 | #1 OR #2 OR #3 OR #4 OR #5 | 11,641,230 |
| Perinatal period | #7 | 'adolescent pregnancy'/de OR 'first trimester pregnancy'/de OR 'second trimester pregnancy'/de OR 'third trimester pregnancy'/de OR 'unplanned pregnancy'/de OR 'unwanted pregnancy'/de OR 'perinatal period'/de OR 'prenatal period'/de OR 'postnatal care'/de OR 'puerperium'/de | 192,503 |
| | #8 | perinatal:ti,ab OR 'peri natal':ti,ab OR 'peri-natal':ti,ab OR prenatal:ti,ab OR 'pre natal':ti,ab OR 'pre-natal':ti,ab OR antenatal:ti,ab OR 'ante natal':ti,ab OR 'ante-natal':ti,ab OR postnatal:ti,ab OR 'post natal':ti,ab OR 'post-natal':ti,ab OR postpartum:ti,ab OR 'post partum':ti,ab OR 'post-partum':ti,ab OR antepartum:ti,ab OR 'ante partum':ti,ab OR 'ante-partum':ti,ab OR peripartum:ti,ab OR 'peri partum':ti,ab OR 'peri-partum':ti,ab OR parturition:ti,ab OR puerper*:ti,ab OR pregnan*:ti,ab | 1,018,479 |
| | #9 | #7 OR #8 | 1,047,619 |
| Tools | #10 | 'patient health questionnaire 9'/de OR 'patient health questionnaire 2'/de OR 'gotland male depression scale'/de OR 'generalized anxiety disorder-7'/de OR 'edinburgh postnatal depression scale'/de OR 'depression, anxiety and stress scale'/exp OR 'kessler psychological distress scale'/exp OR 'state trait anxiety inventory'/de OR 'beck depression inventory'/de OR 'psychosocial assessment tool'/de | 47,477 |
| | #11 | 'antenatal risk questionnaire':ti,ab,kw OR anrq:ti,ab,kw OR 'psychosocial assessment tool':ti,ab,kw OR pat:ti,ab,kw OR 'pat 2':ti,ab,kw OR 'pat-2':ti,ab,kw OR 'pregnancy risk questionnaire':ti,ab,kw OR prq:ti,ab,kw OR 'antenatal psychosocial health assessment':ti,ab,kw OR alpha:ti,ab,kw OR 'patient health questionnaire-9':ti,ab,kw OR 'phq 9':ti,ab,kw OR 'phq-9':ti,ab,kw OR 'patient health questionnaire-2':ti,ab,kw OR 'phq 2':ti,ab,kw OR 'phq-2':ti,ab,kw OR 'gotland male depression scale':ti,ab,kw OR gmds:ti,ab,kw OR 'general anxiety disorder-7':ti,ab,kw OR 'gad 7':ti,ab,kw OR 'gad-7':ti,ab,kw OR 'edinburgh postnatal depression scale':ti,ab,kw OR epds:ti,ab,kw OR 'depression anxiety stress scales':ti,ab,kw OR dass:ti,ab,kw OR 'matthey generic mood question*':ti,ab,kw OR mgmq:ti,ab,kw OR 'kessler psychological distress scale*':ti,ab,kw OR 'k 10':ti,ab,kw OR k10:ti,ab,kw OR 'k-10':ti,ab,kw OR 'k 6':ti,ab,kw OR 'k-6':ti,ab,kw OR k6:ti,ab,kw OR 'brief risk overview':ti,ab,kw OR bro:ti,ab,kw OR 'state trait anxiety inventory':ti,ab,kw OR 'state-trait anxiety inventory':ti,ab,kw OR stai:ti,ab,kw OR 'beck depression inventory':ti,ab,kw OR bdi:ti,ab,kw | 451055 |
| | #12 | #10 OR #11 | 465885 |
| Search terms combined | #13 | #6 AND #9 AND #12 | 5675 |
| Search limits | #14 | #13 NOT ([conference abstract]/lim OR [conference review]/lim OR [letter]/lim OR [editorial]/lim) | 4056 |
| | #15 | #14 NOT [animals]/lim | 3039 |
| | #16 | #15 AND [english]/lim | 2789 |

| Search set | Query no. | Search string | Records |
|--------------------------|-----------|--|---------|
| Main search set | #17 | #16 AND [2011-2021]/py | 1903 |
| Systematic review filter | #18 | 'systematic review'/exp OR 'systematic review':ab,ti OR 'systematic literature review':ab,ti OR 'systematic literature search':ab,ti OR 'systematic search':ab,ti OR 'meta analysis'/exp OR 'meta analysis':ab,ti OR metaanalysis:ab,ti OR 'pooled analysis':ab,ti OR 'evidence synthesis':ab,ti | 527460 |
| SR set | #19 | #17 AND #18 | 53 |
| Remainder of main search | #20 | #17 NOT #19 | 1850 |
| | #21 | #20 AND [2019-2021]/py | 754 |

Table App 2 Cochrane Library search string (literature search date 30/09/2021)

| Search set | Query no. | Search string | Records |
|---------------------------------|-----------|--|---------|
| Perinatal period | #1 | ((pregnancy OR pregnant) OR (perinatal OR "peri-natal" OR "peri natal") OR (prenatal OR "pre-natal" OR "pre natal") OR (postnatal OR "post-natal" OR "post-natal") OR (postpartum OR "post-partum" OR "post partum") OR (antenatal OR "ante-natal" OR "ante natal") OR puerper*):ti,ab,kw | 78187 |
| Fathers & non-birthing partners | #2 | (father* OR dad* OR paternal OR patriarch OR men OR man OR male OR boyfriend OR husband OR parent* OR ("co parent*" OR "co-parent*" OR coparent) OR partner* OR couple* OR spous* OR ("co mother*" OR "co-mother*" OR "comother*") OR wife OR girlfriend* OR ("step parent*" OR "step-parent*") OR ("step mother*" OR "step-mother*") OR ("step father*" OR "step-father*") OR lgbt* OR lesbian OR gay OR homosexual OR queer OR bisexual OR transgender OR ("same sex" OR "same-sex")):ti,ab,kw | 808122 |
| Tools | #3 | ((“antenatal risk questionnaire” OR anrq) OR (“psychosocial assessment tool” OR pat OR “pat 2” OR “pat-2”) OR (“pregnancy risk questionnaire” OR prq) OR (“antenatal psychosocial health assessment” OR alpha) OR (“patient health questionnaire-9” OR “phq 9” OR “phq-9”) OR (“patient health questionnaire-2” OR “phq 2” OR “phq-2”) OR (“gotland male depression scale” OR gmgs) OR (“general anxiety disorder-7” OR “gad 7” OR “gad-7”) OR (“edinburgh postnatal depression scale” OR epds) OR (“depression anxiety stress scales” OR dass) OR (“matthey generic mood question*” OR mgmq) OR (“kessler psychological distress scale*” OR “k 10” OR “k-10” OR “k 6” OR “k-6”) OR (“brief risk overview” OR bro) OR (“state trait anxiety inventory” OR “state-trait anxiety inventory” OR stai) OR (“beck depression inventory” OR bdi)):ti,ab,kw | 59178 |
| Main search set | #4 | #1 AND #2 AND #3 with Cochrane Library publication date Between Jan 2011 and Sep 2021 | 1112 |
| SR set | | Cochrane Database of Systematic Reviews set | 264 |
| Controlled trials set | | Cochrane Central Register of Controlled Trials set | 848 |

Table App 3 PsycINFO search string (literature search date 07/10/2021)

| Search set | Query no. | Search string | Records |
|---------------------------------|-----------|--|----------|
| Fathers & non-birthing partners | 1 | Expectant Fathers/ or Adolescent Fathers/ or Fathers/ or Father Child Relations/ | (14413) |
| | 2 | (father* or dad* or paternal or patriarch* or birth father* or birth-father* or Men or man or male or boyfriend* or husband*).ti,ab. | (547327) |
| | 3 | Parents/ or Spouses/ or Adoptive parents/ or Parenthood Status/ | (58770) |

| Search set | Query no. | Search string | Records |
|--------------------------|-----------|---|--------------|
| | 4 | (adolescent parent* or divorced parent* or separated parent or parent* or co parent* or partner* or couple* or spous* or co mother* or co-mother* or comother* or wife or girlfriend* or co-parent* or coparent* or step parent* or step-parent* or step mother* or step-mother* or step father* or step-father*).ti,ab. | (443178) |
| | 5 | (lgbt* or lesbian* or gay or homosexual* or queer or bisexual or transgender or same sex or same-sex).ti,ab. | (52880) |
| | 6 | or/1-5 | (926031) |
| Perinatal period | 7 | Adolescent Pregnancy/ or Perinatal Period/ or Postnatal Period/ | (11297) |
| | 8 | (first trimester pregnancy or second trimester pregnancy or third trimester pregnancy or unplanned pregnancy or unwanted pregnancy or prenatal period or postnatal care or puerperium or perinatal or peri natal or peri-natal or prenatal or pre natal or pre-natal or antenatal or ante natal or ante-natal or postnatal or post natal or post-natal or postpartum or post partum or post-partum or antepartum or ante partum or antepartum or peripartum or peri partum or peri-partum or parturition or puerper* or pregnan*).ti,ab. | (88043) |
| | 9 | or/7-8 | (88924) |
| Tools | 10 | State Trait Anxiety Inventory/ or Beck Depression Inventory/ | (1148) |
| | 11 | (patient health questionnaire 9 or patient health questionnaire 2 or gotland male depression scale or edinburgh postnatal depression scale or psychosocial assessment tool or antenatal risk questionnaire or anrq or psychosocial assessment tool or pregnancy risk questionnaire or prq or antenatal psychosocial health assessment or alpha or phq 9 or phq-9 or patient health questionnaire-2 or phq 2 or phq-2 or gotland male depression scale or gmds or general anxiety disorder-7 or gad 7 or gad-7 or edinburgh postnatal depression scale or epds or depression anxiety stress scales or dass or matthey generic mood question* or mgmq or kessler psychological distress scale* or k 10 or k10 or k-10 or k 6 or k-6 or k6 or brief risk overview or bro or state trait anxiety inventory or state-trait anxiety inventory or stai or beck depression inventory or bdi).ti,ab. | (85901) |
| | 12 | or/10-11 | (85969) |
| | 13 | and/6,9,12 | (1100) |
| Main search set | 14 | limit 13 to (human and english language and yr="2011 -Current") | (517) |
| | 15 | risk:tw. | (429378) |
| | 16 | search:tw. | (110513) |
| | 17 | exp treatment/ | (1110615) |
| | 18 | or/15-17 | (1494960) |
| SR set | 19 | and/14,18 | (301) |
| Remainder of main search | 20 | 14 not 19 | (216) |

Table App 4 CINAHL search string (literature search date 06/10/2021)

| Search set | Query no. | Search string | Records |
|---------------------------------|-----------|--|---------|
| Fathers & non-birthing partners | S1 | (MH "Father-Infant Relations") OR (MH "Expectant Fathers") OR (MH "Father-Child Relations") OR (MH "Adolescent Fathers") OR (MH "Fathers") | |
| | S2 | TI ((father* or dad* or paternal or patriarch* or birth father* or birth-father* or Men or man or male or boyfriend* or husband*)) OR AB ((father* or dad* or paternal or patriarch* or birth father* or birth-father* or Men or man or male or boyfriend* or husband*)) | |
| | S3 | (MH "Parents") OR (MH "Spouses") OR (MH "Adoptive Parents") | |

| Search set | Query no. | Search string | Records |
|------------------|-----------|--|---------|
| | S4 | TI ((adolescent parent* or divorced parent* or separated parent or parent* or co parent* or partner* or couple* or spous* or co mother* or co-mother* or comother* or wife or girlfriend* or co-parent* or coparent* or step parent* or step-parent* or step mother* or step-mother* or step father* or step-father*)) OR AB ((adolescent parent* or divorced parent* or separated parent or parent* or co parent* or partner* or couple* or spous* or co mother* or co-mother* or comother* or wife or girlfriend* or co-parent* or coparent* or step parent* or step-parent* or step mother* or step-mother* or step father* or step-father*)) | |
| | S5 | TI ((lgbt* or lesbian* or gay or homosexual* or queer or bisexual or transgender or same sex or same-sex)) OR AB ((lgbt* or lesbian* or gay or homosexual* or queer or bisexual or transgender or same sex or same-sex)) | |
| | S6 | S1 OR S2 OR S3 OR S4 OR S5 | |
| Perinatal period | S7 | (MH "Pregnancy in Adolescence") OR (MH "Postnatal Period") OR (MH "Pregnancy") OR (MH "Pregnancy, Multiple+") OR (MH "Pregnancy Trimesters+") | |
| | S8 | TI ((first trimester pregnancy or second trimester pregnancy or third trimester pregnancy or unplanned pregnancy or unwanted pregnancy or prenatal period or postnatal care or puerperium or perinatal or peri natal or peri-natal or prenatal or pre natal or pre-natal or antenatal or ante natal or ante-natal or postnatal or post natal or post-natal or postpartum or post partum or post-partum or antepartum or ante partum or ante-partum or peripartum or peri partum or peri-partum or parturition or puerper* or pregnan*)) OR AB ((first trimester pregnancy or second trimester pregnancy or third trimester pregnancy or unplanned pregnancy or unwanted pregnancy or prenatal period or postnatal care or puerperium or perinatal or peri natal or peri-natal or prenatal or pre natal or pre-natal or antenatal or ante natal or ante-natal or postnatal or post natal or post-natal or postpartum or post partum or post-partum or antepartum or ante partum or ante-partum or peripartum or peri partum or peri-partum or parturition or puerper* or pregnan*)) | |
| | S9 | S7 OR S8 | |
| Tools | S10 | (MH "State-Trait Anxiety Inventory") OR (MH "Beck Depression Inventory, Revised Edition") | |
| | S11 | TI ((patient health questionnaire 9 or patient health questionnaire 2 or gotland male depression scale or edinburgh postnatal depression scale or psychosocial assessment tool or antenatal risk questionnaire or anrq or psychosocial assessment tool or pregnancy risk questionnaire or prq or antenatal psychosocial health assessment or alpha or phq 9 or phq-9 or patient health questionnaire-2 or phq 2 or phq-2 or gotland male depression scale or gmds or general anxiety disorder-7 or gad 7 or gad-7 or edinburgh postnatal depression scale or epds or depression anxiety stress scales or dass or matthey generic mood question* or mgmq or kessler psychological distress scale* or k 10 or k10 or k-10 or k 6 or k-6 or k6 or brief risk overview or bro or state trait anxiety inventory or state-trait anxiety inventory or stai or beck depression inventory or bdi)) OR AB ((patient health questionnaire 9 or patient health questionnaire 2 or gotland male depression scale or edinburgh postnatal depression scale or psychosocial assessment tool or antenatal risk questionnaire or anrq or pregnancy risk questionnaire or prq or antenatal psychosocial health assessment or alpha or phq 9 or phq-9 or patient health questionnaire-2 or phq 2 or phq-2 or gotland male depression scale or gmds or general anxiety disorder-7 or gad 7 or gad-7 or edinburgh postnatal depression scale or epds or depression anxiety stress scales or dass or matthey generic mood question* or mgmq or kessler psychological distress scale* or k 10 or k10 or k-10 or k 6 or k-6 or k6 or brief risk overview or bro or state trait anxiety inventory or state-trait anxiety inventory or stai or beck depression inventory or bdi)) | |
| | S12 | S10 OR S11 | |
| | S13 | S6 AND S9 AND S12 | |
| Main search set | S14 | S13, Limiters - English Language; Published Date: 20110101-20211231 | 744 |

| Search set | Query no. | Search string | Records |
|--------------------------|-----------|---|------------|
| Systematic review filter | S15 | (TI (systematic* n3 review*)) or (AB (systematic* n3 bibliographic*)) or (TI (systematic* n3 bibliographic*)) or (AB (systematic* n3 bibliographic*)) or (TI (systematic* n3 literature)) or (AB (systematic* n3 literature)) or (TI (comprehensive* n3 literature)) or (AB (comprehensive* n3 literature)) or (TI (comprehensive* n3 bibliographic*)) or (AB (comprehensive* n3 bibliographic*)) or (TI (integrative n3 review)) or (AB (integrative n3 review)) or (JN "Cochrane Database of Systematic Reviews") or (TI (information n2 synthesis)) or (TI (data n2 synthesis)) or (AB (information n2 synthesis)) or (AB (data n2 synthesis)) or (TI (data n2 extract*)) or (AB (data n2 extract*)) or (TI (medline or pubmed or psyclit or cinahl or (psycinfo not "psycinfo database") or "web of science" or scopus or embase)) or (AB (medline or pubmed or psyclit or cinahl or (psycinfo not "psycinfo database") or "web of science" or scopus or embase)) or (MH "Systematic Review") or (MH "Meta Analysis") or (TI (meta-analy* or metaanaly*)) or (AB (meta-analy* or metaanaly*)) | |
| SR set | S16 | S14 AND S15 | 18 |
| Remainder of main search | S17 | S14 NOT S16 | 726 |

Appendix B List of included and excluded studies

B.1 Included studies

Table App 5 Citations of included studies, by study type

| Citation | Identification |
|---|-------------------|
| Systematic reviews | |
| Darwin, Z., Domoney, J., Iles, J., Bristow, F., Siew, J., Sethna, V. (2021). Assessing the mental health of fathers, other co-parents, and partners in the perinatal period: Mixed methods evidence synthesis. <i>Frontiers in Psychiatry</i> , 11:585479. | Literature search |
| Primary studies | |
| Shaheen, N. A., AlAtiq, Y., Thomas, A., Alanazi, H. A., AlZahrani, Z. E., Younis, S. A. R., Hussein, M. A. (2019). Paternal postnatal depression among fathers of newborn in Saudi Arabia. <i>American Journal of Men's Health</i> , 13(1):1557988319831219 | Literature search |

B.2 Excluded studies

Table App 6 Citations of excluded studies

| Citation | Reason for exclusion |
|---|-------------------------|
| Albicker, J., Hölzel, L. P., Bengel, J., Domschke, K., Kriston, L., Schiele, M. A., Frank, F. (2019). Prevalence, symptomatology, risk factors and healthcare services utilization regarding paternal depression in Germany: Study protocol of a controlled cross-sectional epidemiological study. <i>BMC Psychiatry</i> . 19(1):289. | Ineligible comparator |
| Baral, J. E. V., de Guzman, R. (2021). Anxieties and coping among Filipino new fathers with postnatal depression. <i>Journal of Family Issues</i> , 42(5):1077-1091. | Ineligible outcomes |
| Baldwin, S., Malone, M., Sandall, J., Bick, D. (2018). Mental health and wellbeing during the transition to fatherhood: a systematic review of first time fathers' experience. <i>JB I Database of Systematic Reviews and Implementation Reports</i> . 16(11):2118-2191. | Ineligible intervention |
| Beesley, Amy, Karwatzki, Emma, Sullivan, Keith. (2019) Anxiety and Depression Symptoms in Fathers During their Partner's Pregnancy: How does this Impact Paternal Fetal Attachment?. <i>Journal of Prenatal & Perinatal Psychology & Health</i> . 33:221-240. | Ineligible comparison |
| Bhandari, P. M., Levis, B., Neupane, D., Patten, S. B., Shrier, I., Thombs, B. D., et al. (2021) Data-driven methods distort optimal cutoffs and accuracy estimates of depression screening tools: a simulation study using individual participant data. <i>Journal of Clinical Epidemiology</i> . 137:137-147. | Ineligible population |
| Carlberg, M., Edhborg, M., Lindberg, L. (2018). Paternal perinatal depression assessed by the Edinburgh Postnatal Depression Scale and the Gotland Male Depression Scale: Prevalence and possible risk factors. <i>American Journal of Men's Health</i> , 12(4):720-729. | Ineligible outcomes |
| Çevik Ateş, Ayşe, Topatan, Serap. (2019) The relationship between support systems and anxiety in couples admitted to the emergency department with vaginal bleeding. <i>International Emergency Nursing</i> . 46: 100781 | Ineligible comparison |
| Condon, J.T., Boyce, P., Corkindale, C.J. (2004). The First-Time Fathers Study: a prospective study of the mental health and wellbeing of men during the transition to parenthood. <i>The Australian and New Zealand Journal of Psychiatry</i> . 38(1-2):56-64. | Ineligible comparison |
| Cook, F., Giallo, R., Petrovic, Z., Coe, A., Seymour, M., Cann, W., Hiscock, H. (2016) Depression and anger in fathers of unsettled infants: A community cohort study. <i>Journal of Paediatrics and Child Health</i> . 53(2):131-135. | Ineligible comparison |
| Cumbe, V. F. J., Muanido, A., Manaca, M. N., Fumo, H., Chiruca, P., Hicks, L., De Jesus Mari, J., Wagenaar, B. H. (2020). Validity and item response theory properties of the Patient Health Questionnaire-9 for primary care depression screening in Mozambique (PHQ-9-MZ). <i>BMC Psychiatry</i> , 20(1):382. | Ineligible population |
| Da Costa, D., Danieli, C., Abrahamowicz, M., Dasgupta, K., Sewitch, M., Lowensteyn, I., Zekowitz, P. (2019). A prospective study of postnatal depressive symptoms and associated risk factors in first-time fathers. <i>Journal of Affective Disorders</i> . 249:371-377. | Ineligible comparison |

| Citation | Reason for exclusion |
|--|---|
| Darwiche, J., Milek, A., Antonietti, J. P., Vial, Y. (2019). Partner support during the prenatal testing period after assisted conception. <i>Women and Birth</i> . 32:e264-e271. | Ineligible intervention |
| Domoney, J., Trevillion, K., Challacombe, F. (2020). Developing an intervention for paternal perinatal depression: An international Delphi study. <i>Journal of Affective Disorders Report</i> . 2: 100033. | Ineligible intervention |
| Edward, K. L., Giandinoto, J. A., Stephenson, J., Mills, C., McFarland, J., Castle, D. J. (2019). Self-screening using the Edinburgh post natal depression scale for mothers and fathers to initiate early help seeking behaviours. <i>Archives of Psychiatric Nursing</i> , 33(4):421-427. | Ineligible outcomes. Focus on dyads. |
| Farrer, L.M., Walker, J., Harrison, C., Banfield, M. (2018). Primary care access for mental illness in Australia: Patterns of access to general practice from 2006 to 2016. <i>PLoS One</i> . 13(6):e0198400 | Ineligible intervention |
| Fentz, Hanne Norr, Simonsen, Marianne, Trillingsgaard, Tea. (2019) General, interpersonal, and gender role specific risk factors of postpartum depressive symptoms in fathers. <i>Journal of Social and Clinical Psychology</i> . 38:545-567 | Ineligible comparator |
| Finnbogadóttir, Hafrún, Persson, Eva K. (2019). Lifestyle factors, self-reported health and sense of coherence among fathers/partners in relation to risk for depression and anxiety in early pregnancy. <i>Scandinavian Journal of Caring Sciences</i> . 33:436-445. | Ineligible intervention |
| Fisher, S.D., Cobo, J., Figueiredo, B., Fletcher, R., Garfield, C.F., Hanley, J., Ramchandani, P., Singley, D.B. (2021). Expanding the international conversation with fathers' mental health: toward an era of inclusion in perinatal research and practice. <i>Archives of Women's Mental Health</i> . 24(5):841-848. | Ineligible study type |
| Fletcher R, Dowse E, St George J, Payling T. (2017). Mental health screening of fathers attending early parenting services in Australia. <i>J Child Health Care</i> . 21:498-508. | Included in foundation review |
| Fletcher, R.J., O'Neil, N.M., Fletcher Watson, C.H., May, C., Skeates, N., Gruenert, S. (2012). Fathers with mental illness: implications for clinicians and health services. <i>Medical Journal of Australia</i> . 199(3 Suppl):S34-6 | Ineligible study type |
| Fletcher, R.J., Matthey, S., Marley, C.G. (2006). Addressing depression and anxiety among new fathers. <i>Medical Journal of Australia</i> . 185(8):461-3. | Ineligible study type |
| Fogarty, A.S., Proudfoot, J., Whittle, E.L., Clarke, J., Player, M.J., Christensen, H., Wilhelm, K. (2017). Preliminary evaluation of a brief web and mobile phone intervention for men with depression: Men's positive coping strategies and associated depression, resilience, and work and social functioning. <i>JMIR Mental Health</i> . 4(3):e33. | Ineligible comparison |
| Garfield, C. F., Lee, Y. S., Warner-Shifflett, L., Christie, R., Jackson, K. L., Miller, E. (2021). Maternal and paternal depression symptoms during NICU stay and transition home. <i>Pediatrics</i> . 148: | Ineligible comparison |
| Giallo, R., Cooklin, A., Zerman, N., Vittorino, R. (2012). Psychological distress of fathers attending an Australian early parenting service for early parenting difficulties. <i>Clinical Psychologist</i> . 17 (2). | Ineligible comparison |
| Husain, Muhammad I., Chaudhry, Imran B., Khoso, Ameer B., Wan, Ming W., Kiran, Tayyeba, Shiri, Tinevimbo, Chaudhry, Nasim, Mehmood, Nasir, Jafri, Syed F., Naeem, Farooq, Husain, Nusrat. (2021). A Group Parenting Intervention for Depressed Fathers (LTP + Dads): A Feasibility Study from Pakistan. <i>Children</i> . 8:1-8. | Ineligible intervention |
| Johansson, M., Nordström, T., Svensson, I. (2021). Depressive symptoms, parental stress, and attachment style in mothers and fathers two and a half years after childbirth: Are fathers as affected as mothers?. <i>Journal of Child Health Care</i> . 25:368-378. | Ineligible comparison |
| Johansson, Maude, Benderix, Ylva, Svensson, Idor. (2020). Mothers' and fathers' lived experiences of postpartum depression and parental stress after childbirth: a qualitative study. <i>International Journal of Qualitative Studies on Health & Well-Being</i> . 15:1-11. | Ineligible intervention |
| Kiepara, E., Kmita, G. (2020). Antenatal depression and anxiety in primiparous Polish mothers and fathers. <i>Ginekologia polska</i> . 91:24-28. | Ineligible comparison |
| Koch, S., De Pascalis, L., Vivian, F., Meurer Renner, A., Murray, L., Arteché, A. (2019). Effects of male postpartum depression on father–infant interaction: The mediating role of face processing. <i>Infant Mental Health Journal</i> . 40:263-276. | Ineligible intervention |
| Lyubenova, A., Neupane, D., Levis, B., Wu, Y., Sun, Y., He, C., et al. (2021). Depression prevalence based on the Edinburgh Postnatal Depression Scale compared to Structured Clinical Interview for DSM Disorders classification: Systematic review and individual participant data meta-analysis. <i>International Journal of Methods in Psychiatric Research</i> . 30:e1860 | Ineligible population |
| Mackie, F. L., Pattison, H., Jankovic, J., Morris, R. K., Kilby, M. D. (2019). Parental attachment and depressive symptoms in pregnancies complicated by twin-twin transfusion syndrome: A cohort study. <i>BMC Pregnancy and Childbirth</i> . 20(1):4 | Ineligible comparison |

| Citation | Reason for exclusion |
|---|-------------------------|
| Madsen, S-A., Juhl, T. (2007). Paternal depression in the postnatal period assessed with traditional and male depression scales. <i>Journal of Men's Health and Gender</i> . 4(1):26-31. | Ineligible outcomes |
| Matthey, S., Della Vedova, A. M. (2020). Screening for mood difficulties in men in Italy and Australia using the Edinburgh Postnatal Depression Scale and the Matthey Generic Mood Questionnaire. <i>Psychology of Men & Masculinities</i> , 21(2):278-287. | Ineligible comparator |
| Matthey, S. (2021). Errors and omissions in reporting research using the Edinburgh Postnatal Depression Scale for fathers. <i>Midwifery</i> . 102:103071 | Ineligible study design |
| Nakić Radoš, S. (2021). Parental Sensitivity and Responsiveness as Mediators Between Postpartum Mental Health and Bonding in Mothers and Fathers. <i>Frontiers in Psychiatry</i> . 12:723418. | Ineligible comparator |
| Neupane, D., Levis, B., Bhandari, P. M., Thombs, B. D., Benedetti, A. (2021). Selective cutoff reporting in studies of the accuracy of the Patient Health Questionnaire-9 and Edinburgh Postnatal Depression Scale: Comparison of results based on published cutoffs versus all cutoffs using individual participant data meta-analysis. <i>International Journal of Methods in Psychiatric Research</i> . 30(3):e1873. | Ineligible population |
| O'Brien et al. (2016). New fathers' perinatal depression and anxiety - Treatment options: An integrative review. <i>American Journal of Men's Health</i> . 11(4):863-876. | Ineligible study type |
| Paul, E., Pearson, R. M. (2020). Depressive symptoms measured using the Edinburgh Postnatal Depression Scale in mothers and partners in the ALSPAC Study: A data note. <i>Wellcome Open Research</i> , 5(108):1-20. | Ineligible outcomes |
| Reilly, N., Loxton, D., Black, E., Austin M-P. (2021) The antenatal risk questionnaire-revised: Development, use and test-retest reliability in a community sample of pregnant women in Australia. <i>Journal of Affective Disorders</i> . 293:43-50. | Ineligible population |
| Rigg, E., and Dahlen, H.G. (2021) Woman centered care: Has the definition been morphing of late? <i>Women and Birth: Journal of the Australian College of Midwives</i> . 34(1):1-3. | Ineligible study type |
| Rollans, M., Kohlhoff, J., Meade, T., Kemp, L., Schmied, V. (2016) Partner involvement: Negotiating the presence of partners in psychosocial assessment as conducted by midwives and child and family health nurses. <i>Infant Mental Health Journal</i> . 37(3):302-12. | Ineligible population |
| Rowe, H.J., Holton, S., Fisher, J.R.W. (2013) Postpartum emotional support: a qualitative study of women's and men's anticipated needs and preferred sources. <i>Australian Journal of Primary Health</i> . 19(1):46-52 | Ineligible intervention |
| Scarff, J. R. (2019). Postpartum depression in men. <i>Innovations in Clinical Neuroscience</i> . 16:11-14. | Ineligible study design |
| Schwartz, T. S., Christensen, K. D., Uveges, M. K., Waisbren, S. E., McGuire, A. L., Pereira, S., Robinson, J. O., Beggs, A. H., Green, R. C., Bachmann, G. A., Rabson, A. B., Holm, I. A. (2021). Effects of participation in a U.S. trial of newborn genomic sequencing on parents at risk for depression. <i>Journal of Genetic Counseling</i> . https://doi.org/10.1002/jgc4.1475 . | Ineligible comparison |
| Tandberg, B. S., Flacking, R., Markestad, T., Grundt, H., Moen, A. (2019). Parent psychological wellbeing in a single-family room versus an open bay neonatal intensive care unit. <i>PLoS ONE</i> . 14(11):e0224488. | Ineligible comparator |
| Wells, M. B., Kerstis, B., Andersson, E. (2021). Impacted family equality, self-confidence and loneliness: a cross-sectional study of first-time and multi-time fathers' satisfaction with prenatal and postnatal father groups in Sweden. <i>Scandinavian journal of caring sciences</i> . 35:844-852. | Ineligible intervention |
| Wynter, K., Wilson, N., Thean, P., Bei, B., Fisher, J. (2018) Psychological distress, alcohol use, fatigue, sleepiness, and sleep quality: an exploratory study among men whose partners are admitted to residential early parenting service. <i>Australian Psychologist</i> . 54(2):143-150. | Ineligible comparison |

Appendix C QUADAS-2 assessment of risk of bias

Table 24 Summary of risk of bias of included studies assessing diagnostic test accuracy for mental health screening in fathers and non-birthing partners in the perinatal period

| Study ID | Country Setting | Participant selection | | Index test | | Reference standard | Flow & timing | | | Study quality ^a |
|----------------|---|-----------------------|----------|------------|-------------------------|------------------------------|---------------|-------------------|----------|----------------------------|
| | | Sampling | Dropouts | Blinding | Order of administration | Likely to correctly classify | Time interval | Verification bias | Analysis | |
| Areias 1996 | Portugal Self-completed at health setting and home | Low | High | Unclear | Unclear | Low | Low | Unclear | High | Very Low |
| Ballard 1996 | United Kingdom Self-completed at home | Low | High | Low | Low | Low | Medium | High | Medium | Low |
| Edmondson 2010 | United Kingdom Self-completed at home | Unclear | High | Unclear | Low | Low | High | High | Low | Very Low |
| Lai 2010 | Hong Kong Self-completed at home | Low | High | Low | Low | Low | Medium | High | Medium | Low |
| Massoudi 2013 | Sweden Self-completed at home | Low | High | Low | Low | Low | Medium | High | Low | Low |
| Matthey 2001 | Australia Self-completed at home | Unclear | High | Unclear | Unclear | Low | Low | Low | Medium | Very Low |
| Shaheen 2019 | Saudi Arabia Self-completed at health setting | Unclear | High | Low | Low | Low | Low | Unclear | Medium | Low |
| Tran 2012 | Vietnam Completed at commune health station ^b | Low | High | Low | Unclear | Low | Low | Low | Medium | Very Low |

Note: QUADAS-2 assessment taken from Darwin et al. (2021), Supplementary Material Table 2, for all studies except Shaheen et al. (2019). Applicability was not reported in the Darwin review.

^a The overall quality of each study has been determined for the purposes of the current report using the following framework:

- **High quality** when all four sub-domains are assessed as low risk according to the QUADAS-2 checklist.
- **Moderate quality** when one or two sub-domains of the QUADAS-2 checklist are assessed as unclear but no domains are assessed as high risk, or when only one domain is assessed as high risk and all other domains are low risk.
- **Low quality** when two QUADAS-2 sub-domains are assessed as high or medium risk, and all other sub-domains are assessed as low risk.
- **Very Low quality** when one or no sub-domains of the QUADAS-2 checklist are rated as low risk, regardless of the whether the remaining sub-domains are assessed as high risk or unclear.

^b Administered as structured interview by health research worker.