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Review article

Gaps between current practice in perinatal depression screening and guideline recommendations: a systematic review

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ABSTRACT

Objective: Screening for perinatal depression is recommended by many guidelines to reduce the disease burden, but current implementation practices require clarification.
Method: Fifteen databases were searched for observational studies using a pre-tested search strategy. In addition, the websites of academic organizations were searched for guidelines, recommendations, and reports. Literature published between January 1, 2010, and December 19, 2021, in either English or Chinese, was included. The standard form of the Joanna Briggs Institute (JBI) was used to assess risk of bias of the included studies.
Results: The data analysis covered 103 studies, 21 guidelines, 11 recommendations, five position statements, three reports, two committee opinions, three consensuses, one consultation, and one policy statement. All but one guideline recommended that mothers be routinely screened for perinatal depression at least once during the perinatal period. In addition, 39 documents recommended that perinatal mothers at risk of perinatal depression be provided with or referred to counseling services. In original studies, however, only 8.7% of the original studies conducted routine screenings, and only one-third offered referral services after the screening process. The EPDS emerged as the most frequently used screening tool to measure perinatal depression. 32% ($n = 33$) of studies reported the technology used for screening. The most commonly used method was face-to-face interviews ($n = 22$). Screening personnel the agents conducting the screening comprised researchers ($n = 26$), nurses ($n = 15$), doctors ($n = 11$).
Conclusions: A significant disparity was observed between the recommendations and implementation of perinatal depression screening, highlighting the need to integrate routine screening and referral processes into maternal care services.

1. Introduction

Perinatal depression, which encompasses major and minor depressive episodes that occur during pregnancy or within the first 12 months after delivery, is one of the most prevalent medical complications of the perinatal period [1]. Symptoms include loss of interest and depressed mood [2]. The global prevalence ranges from 13% to 30% [3], with antenatal depression at 26.3% and postnatal depression at 23.1% [4]. Adverse implications arise for both mothers [5–7]and their babies [8–12] as a result of perinatal depression. This condition imposes a substantial disease burden worldwide. It is estimated that untreated perinatal depression costs $14.2 billion in total societal expenses related to productivity loss and the utilization of public services for all births in the United States alone [13].

Despite the significant burden it poses, perinatal depression in low- and middle-income countries remains under-recognized and under-treated [14]. To reduce the disease burden, health departments and organizations have developed guidelines and recommendations for perinatal depression screening. The American Congress of Obstetricians and Gynecologists (ACOG) [15,16] recommend screening at least once during the perinatal period using a standardized and validated tool. However, according to American Family Physicians, screening is recommended either at the 4- to 6-week postpartum visit or the 2-month well-child visit. Detailed recommendations regarding screening also vary significantly across different guidelines.

Although several original studies [17–19] have addressed routine depression screening, there is considerable variation in the timing of screening (e.g., at 24–28 weeks of pregnancy and at 6 weeks postpartum, at 10 days and 4 weeks postpartum, and at 2–4 days postpartum). These variations highlight the gaps between implementation studies and

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guideline recommendations for perinatal depression screening. Furthermore, disparities may exist in terms of screening tools, technology, personnel involved in screening, and referrals for perinatal depression. To the best of our knowledge, no systematic review has comprehensively described the gaps between the recommendations and the current research on perinatal depression screening. Therefore, the aim of this study is to 1) Review and summarize current screening recommendations and guidelines, 2) Review and summarize research on the implementation of guidelines, 3) Examine discrepancies or gaps between recommendations and existing research practice.

2. Methods

This study was conducted according to the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) guidelines. The protocol for this systematic review was registered with the International Prospective Register of Systematic Reviews (PROSPERO) on January 10, 2022 (CRD42022296087).

2.1. Information sources and search strategy

The following databases were systematically searched for observational studies that focused on screening for perinatal depression: Cumulative Index to Nursing and Allied Health Literature, Web of Science, PubMed, Health and Medical Collection, Springer, Taylor & Francis Online, Ovid-Embase, Wiley Inter Science, ScienceDirect Online (SDOL), National Knowledge Infrastructure (China), Wanfang Data Knowledge Service Platform (China), Science and Technology Journal Database (China), the full-text database of Chinese Medical Journals, Superstar journals (China), and SinoMed (China). In addition, relevant academic organizations' websites were explored to identify guidelines, recommendations, and other resources related to perinatal depression screening: the Scottish Intercollegiate Guidelines Network, Registered Nurses' Association of Ontario, National Institute for Health and Care Excellence, New Zealand Guidelines Group, Guidelines International Network, Medlive, Agency for Healthcare Research and Quality, Canadian Medical Association, National Health and Medical Research Council, MedSci, and World Health Organization. The search terms were as follows: “perinatal* OR maternal OR mother* OR pregnan* OR intrapartum OR postpartum OR prenatal OR postnatal OR antenatal OR trimest* OR gestation* OR antepartum OR ante-partum OR prepartum OR post-partum OR intra-partum OR peripartum OR peri-partum OR antenatal* OR post-natal OR prenatal* OR pre-natal* OR peri-natal* OR Gravidit*” AND “depression OR depressive OR depress* OR mental” AND “screen*.” Language restrictions were applied to English and Chinese publications from January 1, 2010, to December 19, 2021 (inclusive). Only the guideline search for January 2022–December 2023 has been added.

The detailed search strategy employed for each electronic database is provided in Appendix A and Tables 1–16.

2.2. Eligibility criteria

The inclusion criteria were as follows: Studies with a focus on perinatal depression in which the participants were pregnant women or women within 12 months after delivery; studies intended to screen for perinatal depression or investigate its prevalence using validated scales; observational studies, guidelines, recommendations, reports, position statements, policy statements, committee opinions, consensus, and consultations.

The exclusion criteria were studies focusing on specific populations, such as high-risk mothers with various types of obstetric complications, mothers diagnosed with severe mental illness, and single mothers; studies on screening for perinatal depression using methods other than validated questionnaires, such as biochemical methods and face-to-face interviews with psychiatrists; abstracts, comments, and other materials for which full-text access was unavailable.

2.3. Screening procedure

All records identified from the databases were imported into Endnote 20, and duplicates were removed. Following a three-stage procedure (described in Appendix B), four reviewers conducted screening for qualified studies. The reviewers were divided into two groups, each consisting of two independent reviewers responsible for literature screening. Disagreements were resolved through discussions with a senior researcher.

2.4. Data extraction procedure

For original studies, the reviewers extracted the following information using a standardized data extraction table: (1) general information, such as study design, country, setting, participants, and sample size; and (2) details of screening, including screening tools, frequency and timing of screening, and modality of screening.

For the guidelines and other recommendations, three independent reviewers extracted the required information using a standardized data extraction table.

2.5. Data analysis

The review focused on summarizing the key recommendations for perinatal depression screening, reviewing original studies on perinatal depression screening and summarizing key features, and comparing and analyzing research gaps.

2.6. Risk of bias assessment

Quality assessment of the included studies was conducted using the Joanna Briggs Institute (JBI) framework [20], which specifically addresses four study designs: prevalence studies, analytical cross-sectional studies, cohort studies, and case-control studies. Before conducting the assessment, the reviewers underwent training and engaged in thorough discussions to ensure a complete understanding of the items in the JBI form. Because data extraction was performed by three experienced reviewers with extensive knowledge in this field, each reviewer independently evaluated the quality of the literature within their assigned group. Supporting information for each item (yes, no, unclear, or not applicable) was recorded, along with the justifications provided by each reviewer. In cases where disagreements arose between the two reviewers, a third reviewer arbitrated. The kappa coefficient was calculated to assess the inter-rater agreement.

3. Results

3.1. Study selection

In total, 22,946 records were identified, and 8504 duplicates were removed. After title screening, 3591 records underwent abstract screening, while full-text screening was conducted on 337 records. Ultimately, 103 original studies qualified for the data analysis. The study selection process is illustrated in the PRISMA flowchart in Fig. 1. In addition, 47 documents were identified by searching the websites of academic organizations. (See Tables 1 and 2.)

3.2. Guidelines, recommendations, and reports ($n = 47$)

3.2.1. Details of screening

Following a thorough search of websites, the data analysis included 21 guidelines, 11 recommendations, five position statements, three reports, two committee opinions, three consensuses, one consultation, and one policy statement. All but one [21] recommended screening for

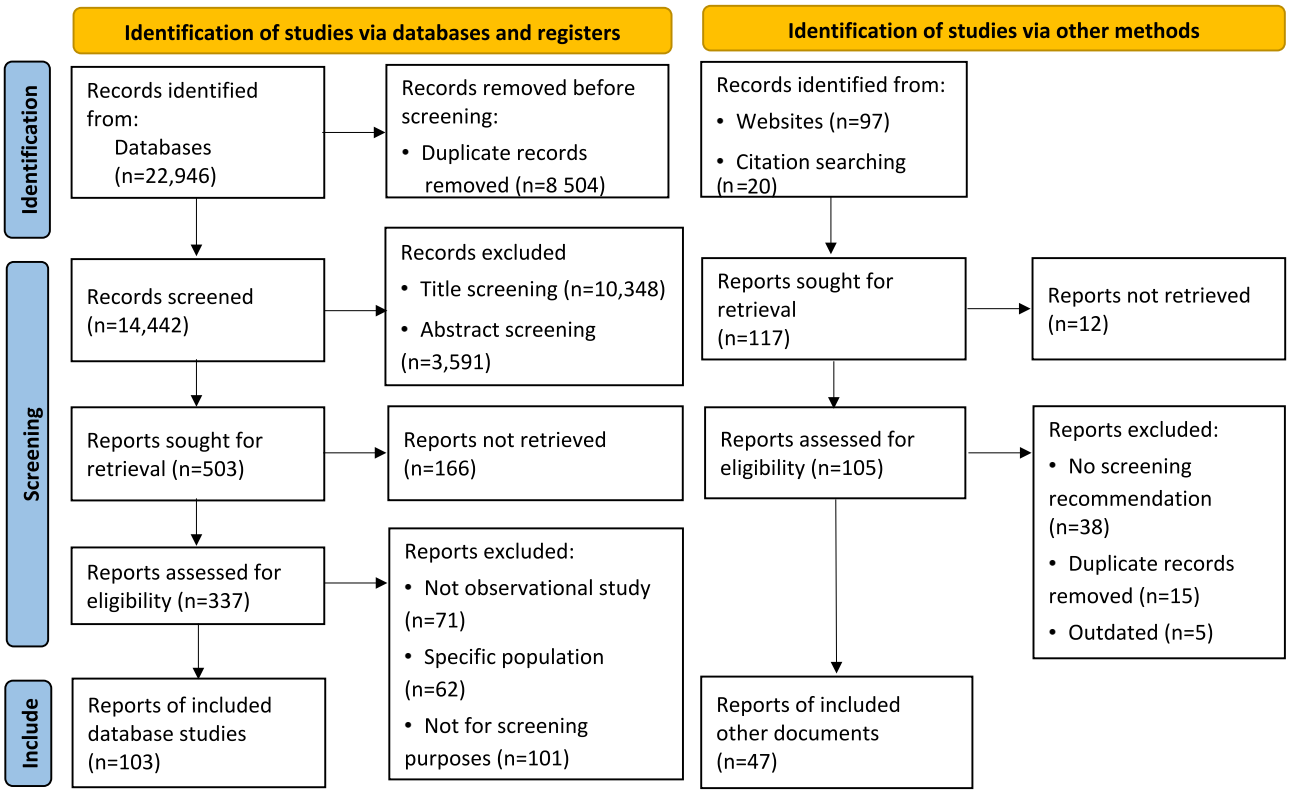

Fig. 1. Study selection process.

Table 1
A high-level summary table of guidelines and recommendations (n = 47).

Recommendation		Reference
Country	High income (Australia, New Zealand, America, The United Kingdom, Canada, Switzerland, Scotland)	[48] [49] [22] [53] [39] [23] [24] [21] [47] [25] [26] [27] [28] [29] [50] [51] [30] [31] [45] [40] [41] [46] [42] [1] [59] [57] [54] [2] [55] [43] [56] [52] [32] [44] [15,16,34–37,60–62,64]
	Upper-middle income (China)	[33,38]
Times of screening	One	[48] [49] [23] [24] [28] [29] [50] [31] [41] [1] [2] [33]
	Two	[25] [27] [51] [30] [43] [36–38,52]
	≥Three	[22] [26] [41] [32] [44] [53] [39] [40] [42] [54] [55] [56] [34] [15,45]
Timing of screening	First trimester	[53] [23] [39] [26] [41] [42] [32] [15,33,36–38]
	Second trimester/ Third trimester	[53] [39] [45] [41] [2] [27] [15,38,45]
	At the four- to six-week postpartum	[48] [22] [26] [41] [54] [55] [56] [32]
	6–12 weeks postpartum	[49] [22] [24] [25] [26] [27] [51] [45] [40] [41] [42] [54] [55] [56] [52] [32] [34,36,37]
	6 month/9 month/12 month postpartum	[51] [45] [41] [54] [55] [56] [52]
setting of screening	In primary care setting	[21] [47] [45] [46] [41]
	In pediatric clinic	[53] [45] [46] [57]
	In obstetrical clinic	[46] [1] [41]

perinatal depression at least once during the perinatal period. Only one guideline [21] suggested non-routine screening for depression. Further details on these recommendations are provided in in Appendix C and Table 9

3.2.2. *Frequency, timing, and setting of screening*

For antenatal depression, most studies (n = 21) [1,2,15,16,22–38] recommended screening at least once. Nine studies [36–44] recommended screening at least twice, and two [15,45] recommended screening three times. The timing of screening varied across guidelines. For screening at least once, nine studies [15,22,23,26,32,33,36–38] recommended screening in the first trimester, one study [2] suggested screening in the second trimester, five studies [27,34,36–38] proposed screening in the third trimester, and nine studies [1,16,24,25,28–31,35] recommended screening during pregnancy without clear indication about when. For screening at least twice, two studies [39,41] recommended screening in the first and second trimesters, two studies [40,42] suggested screening in the second and third trimesters, and five studies [15,37,38,43,44] recommended screening at least twice during pregnancy. One study [45] recommended screening in the first, second, and third trimesters. Obstetric [1,41,45,46] and primary care settings [21,46,47] were recommended.

With regard to postpartum depression, screening was recommended at least once in most studies (n = 18) [1,16,24,25,27–31,36,37,39,41,44,45,48–50], with some suggesting twice (n = 9) [22,26,32,34,40,42,45,51,52], three times (n = 1) [45], or four times (n = 4) [53–56]. The screening time points varied between guidelines. For single screening, 8 weeks postpartum was suggested in three sources [29,48,50], 3 months postpartum was recommended in the other three sources [24,25,49], 6 weeks postpartum in one source [45], between 3 and 8 weeks postpartum in one source [41], 6–16 weeks postpartum in one source [27,36,37] and at any point during the first year postpartum according to six sources [1,28–31,44]. For double screening, four sources [34,40,42,43] recommended screening at 6–12 weeks and 12 months postpartum, three sources [22,26,32] recommended 4–6 weeks and 3–4 months postpartum, another [51] suggested screening at both 6–12 weeks and 26 weeks postpartum, and one recommended screening at both 6 and 12 months postpartum [45], although the same study also recommended three screenings, at 3, 9,

Table 2
A high-level summary table of guidelines and recommendations ($n = 47$).

Recommendation		Reference
Screening tools	PHQ-9	[26] [27] [28] [29] [50] [31] [40] [46] [54] [43] [56] [32] [15,33,38,61,62]
	EPDS	[53] [48] [49] [39] [22] [23] [24] [25] [26] [27] [28] [29] [50] [51] [30] [45] [40] [46] [42] [1] [54] [55] [43] [56] [52] [32] [33] [15,34,36–38,61,62]
	Others (PHQ-2, BDI, GAD-2, CES—D, Zung SDS, PDSS, the Whooley Questions, K-10, HRSD, HADS, QIDS)	[39] [23] [26] [27] [28] [31] [40] [59] [43] [32,61]
Modality of screening	Interview/ Telephone	[53] [49] [23] [27] [41] [43]
	Paper questionnaire	[53] [23] [55] [15,52]
	Electronic questionnaire	[39] [53] [23] [15,40]
Screening personnel	Clinician (Pediatrician, Obstetrician, Psychiatrist)	[53] [24] [21] [29] [51] [31] [45] [40] [42] [1] [57] [54] [55] [34,38]
	Nurse or midwives	[49] [24] [47] [50] [30] [45] [40] [41] [2] [52] [37,44]
	Others (Primary/health care provider, Researcher, Health visitor)	[53] [39] [48] [22] [23] [26] [27] [45] [43] [32,35]
Referral of screening	A positive history warrant	[48] [39] [26]
	Screen positive	[49] [24] [50] [41] [57] [55] [43] [52] [33,36–38,61,62]
	referral to a psychiatrist, primary care provider, behavioral health providers, mental health providers)	[48] [27] [45] [56] [44]
	Referral to emergency mental health services/ a secondary mental health service.	[53] [26] [32]

and 12 months postpartum. Four studies [53–56] recommended quadruple screenings at 1, 2, 4, and 6 months postpartum.

The recommended settings for depression screening included obstetric [41,51], pediatric clinic [45,51,53,57] and primary care settings [21,41,46,47]. There were 29 studies that did not report a specific setting for screening and this is deliberated as below.

3.2.3. Screening tools

Screening using validated tools was recommended by 40 sources [1,15,16,22–40,42,43,45,46,48–56,58–62], whereas the remaining sources did not specify any particular screening tool. The Edinburgh Postnatal Depression Scale (EPDS) was the most frequently recommended screening tool, either alone or in combination with other measures. The suggested cut-off values for the EPDS were 13 ($n = 6$), 10 ($n = 3$), and 12 ($n = 1$). Fifteen studies recommended the use of the Patient Health Questionnaire-9 (PHQ-9), with cut-off values ranging from 9 to 10 Other recommended assessment tools included the Beck Depression Inventory (BDI) ($n = 7$), Patient Health Questionnaire-2 (PHQ-2) ($n = 5$), Center for Epidemiologic Studies Depression Scale (CES—D) ($n = 4$), Postpartum Depression Screening Scale (PDSS) ($n = 2$), SDS (n = 2), Generalized Anxiety Disorder 2-item (GAD-2) (n = 2), Whooley questions (n = 2), Kessler Psychological Distress Scale ($K-10$) (n = 2), Hamilton Rating Scale for Depression (HRSD) ($n = 1$), and Hospital Anxiety Depression Scale (HADS) (n = 1).

3.2.4. Modality of screening

Eighteen sources [15,21,23,27,32,36–41,43,49,50,52–55] specified the recommended modality of screening. The analysis revealed no clear preference for a specific screening method (paper questionnaires, $n = 7$; electronic questionnaires, $n = 6$; face-to-face, $n = 5$; telephone, $n = 4$; email, $n = 2$; interview, n = 2; and clinical clues, $n = 1$).

3.2.5. Screening personnel

The recommended screening personnel were specified in 37 sources [1,2,21–24,26,27,29–32,34,35,37–58,61], with ten unavailable. These personnel included nurses and midwives ($n = 12$), obstetricians ($n = 9$), primary healthcare providers (n = 9), clinicians ($n = 5$), pediatricians (n = 5), psychiatrists ($n = 2$), researchers (n = 1), and professional managers (n = 1).

3.2.6. Referrals

Among the 47 sources reviewed, referral was recommended by healthcare workers in 39 studies [1,2,15,16,22,24,26–41,43–49,51–58,61,62]. The most commonly suggested criterion for referral eligibility was positive screening results ($n = 21$), while several documents ($n = 5$) also emphasized the need for referral in cases where patients had previous psychiatric illnesses or a history of serious psychiatric disorders. For recommended means of referral, there were significant variations among the guidelines. Ten sources suggested that patients should be referred to healthcare settings, including mental health services, primary healthcare providers, and perinatal and infant/child services. Seven sources suggested referring patients to specialists, including psychiatrists and behavioral health providers. For the referral personnel, Clinical staff, obstetric providers, and pediatricians should decide whether to make referrals. Psychiatric follow-ups and diagnoses were also recommended.

3.2.7. Other recommendations

Some guidelines recommended that screening scales should not be relied on alone and emphasized the importance of conducting a thorough clinical assessment to confirm diagnoses [23,27,39,48,52,63]. Furthermore, one guideline [40] highlighted the potential for future development in terms of the effectiveness and cost-effectiveness evaluation of screening programs (including e-screening) to support the sustainable implementation of best practices.

3.3. Original studies

3.3.1. Characteristics

Information on the included studies is presented in Appendix C and Tables 1–4. In total, 103 original studies with a combined participant count of 498,688 were included. Of these studies, 86 were analytical cross-sectional studies, 12 were prevalence studies, three were cohort studies and two were case-control studies. Most were conducted in upper-middle-income countries ($n = 74$), with 28 originating from low- and middle-income countries. One study did not specify the country of origin. In terms of perinatal depression, 33 focused on antenatal depression, 48 focused on postpartum depression, and 22 examined perinatal depression.

3.3.2. Details of screening

The comprehensive screening information is summarized in Appendix C and Tables 5–8.

3.3.2.1. Screening tools. The EPDS emerged as the most frequently used screening tool to measure perinatal depression, either alone or in conjunction with other screening tools, followed by the PHQ-9 ($n = 14$), HADS ($n = 3$), SDS (n = 3), PDSS ($n = 2$), and CES-D (n = 2).

3.3.2.2. Cut-off values. Of the 82 studies using the EPDS, 27 studies opted for a cut-off value of 10 and 27 opted for 13. 23 studies reported cut-off values in the studies were 9, 9.5, and 12. In studies using the PHQ-9, the cut-off values varied greatly, from 5 to 15. The most

frequently used score was 10.

3.3.2.3. Frequency and timing. Sixty-eight studies conducted a single one-time screening, whereas 33 studies performed two or more screenings.

For antenatal depression, most studies ($n = 39$) conducted screening only once, while seven studies performed screening twice. Two studies implemented screening three times, and two other studies carried out screening five times. With regard to single-time screening, eight studies conducted screening during the first trimester, eight during the second trimester, eight during the third trimester, and 15 during pregnancy. Two studies performed dual screening in both the second and third trimesters; one study covered both the first and second trimesters; one study encompassed the first and third trimesters; and three studies conducted screening during pregnancy. Two studies performed triple screening in all three trimesters.

For postpartum depression, the majority of studies ($n = 58$) conducted screening only once. Seven studies conducted screening twice, five studies conducted screening three times, one study conducted screening four times, and one study conducted screening five times. With regard to single-time screenings, 30 studies conducted screening at 6–16 weeks postpartum, seven studies were carried out at 1 day to 1 week postpartum, seven studies were at 1 week to 6 months postpartum, four studies were at 10 days to 4 weeks postpartum, three studies were carried out at 12 months postpartum, one study was at 14 months postpartum, and six studies remained unclear. For screening two times, five studies conducted screening at 3 to 7 days postpartum and 6 weeks postpartum; one study was at 12 weeks postpartum and 8 months postpartum; and one study was at 3–8 weeks or 3 months postpartum.

For screening three times, two studies conducted screening at 1, 2, and 3 months postpartum; one study screened at 0–2, 2–8, and 8–12 weeks postpartum; one study screened at 6 weeks, 6 months, and 12 months postpartum; and one study screened at 7 days, 3 months, and 6 months postpartum. For screening four times, one study conducted screening at 1 week, 4 weeks, 8 weeks, and 12 weeks postpartum. For screening five times, one study conducted screening at 2, 4, 6, 12, and 18 months postpartum.

3.3.2.4. Modality of screening. 32% ($n = 33$) of studies reported the modality of screening. The most commonly used method was face-to-face interviews ($n = 22$), followed by electronic questionnaires ($n = 6$), and telephone surveys (n = 2).

3.3.2.5. Screening personnel. Screening personnel conducting the screening comprised researchers ($n = 26$), nurses ($n = 15$), doctors ($n = 11$), and other personnel (n = 22). The remaining 34 studies did not identify the personnel.

3.3.2.6. Setting of screening. The screening settings comprised medical organizations ($n = 83$), communities ($n = 4$), and homes (n = 3). Of the 55 studies that screened during pregnancy, 40% (n = 22) screened in obstetrics and/or gynecology departments. Other settings were hospitals (n = 6), mother and child healthcare (MCH) centers (n = 6), homes ($n = 5$), clinics (n = 3), and communities (n = 3).

Of the 70 studies that conducted screening during the postpartum period, 34.29% ($n = 24$) did so in obstetrics and/or gynecology. Other settings were MCH centers (n = 11), clinics (n = 8), homes (n = 6), child/infant immunization clinics (n = 5), hospitals (n = 5), and pediatrics (n = 1).

3.3.2.7. Routine screening. nine studies conducted routine screening, with the majority originating from high-income countries (except for one from Sri Lanka, a lower-middle-income country). Seven studies performed routine screening at antenatal and another seven studies at postpartum. Other details of routine screening have been poorly reported, with only two studies reporting the screening and completion rates (see Appendix: Table 5, No. 74, and Table 7, No. 2).

3.3.2.8. Referrals. 27.2% of the studies provided referrals for those with positive results (scores above the cut-off value). Of the studies that conducted routine screening, five studies made referrals to mothers with positive screening results. Means of referral included healthcare settings ($n = 14$), specialists ($n = 10$), and other interventions ($n = 6$). The most common referral setting was a mental health center ($n = 9$). One study reported referring mothers who had suicidal thoughts to emergency departments. Ten studies mentioned mothers being referred to specialists, including psychiatrists (n = 6), physicians ($n = 3$), and medical/nursing professionals (n = 1). Other interventions after referral were mental interventions, psychiatric treatment, and outpatient crisis interventions.

3.3.3. Risk of bias

The risk of bias assessment was summarized using a radar map (Fig. 2). In Fig. 2, the numbers on the axes represent the item numbers on the JBI form. The numbers on the web's outer layer represent each original study listed in the reference (Appendix C). Green represents "yes" responses to the JBI questions, pink represents "no," yellow represents "unclear," and blue represents "not applicable." The cross-sectional studies exhibited good quality and were characterized by a greater extent of green areas. The risk of bias in the prevalence studies was relatively high. There were insufficient samples to justify the quality of the cohort (n = 3) and case-control studies ($n = 2$). The Cohen's k of each group showed high consistency in the assessment (k1 = 0.981, k2 = 0.960, and k3 = 0.946).

4. Discussion

To the best of our knowledge, only one review has summarized the recommendations for perinatal depression screening [65]. However, this study focused only on recommendations from five member countries of the Organization for Economic Co-operation and Development (OECD). Although several reviews on screening for perinatal depression exist [66–69], they primarily address one specific aspect of screening, such as settings or providers. Our review aimed to compare the research gaps between current practices and the guideline recommendations, providing insights into future implementation screening research for perinatal depression.

Our review found that a consensus has been reached regarding routine perinatal depression screening by majority of existing guidelines. And our finding was similar to that of a previous review [65]. Evidence from guidelines suggested that screening may confer benefits above usual care [1,51,70,71].

Although routine screening is recommended, there are significant variations in the timing and frequency of screening recommendations. For screening during pregnancy, five recommendations suggested conducting screening at the first prenatal visit [22,23,26]. The BC Reproductive Mental Health Program recommended late pregnancy [27], while others did not specify timing for screening [31,59]. According to the summary of the American Academy of Pediatrics, prenatal depression peaks in the first trimester and then declines [55]. In addition, routine depression screening during early pregnancy will increase the accuracy of identifying both maternal depression and other mental disorders that may emerge later in pregnancy or postpartum [72]. Thus, early screening can identify patients requiring further assessment and provide a mechanism for early detection. However, early screening may also result in the exclusion of individuals who develop depression during later stages of pregnancy. Additional screening may be a solution, as recommended in some documents [39,41,44]. However, the timeframe remained unclear. In the postpartum period, both timing and frequency varied significantly. Crucial factors to consider when determining an

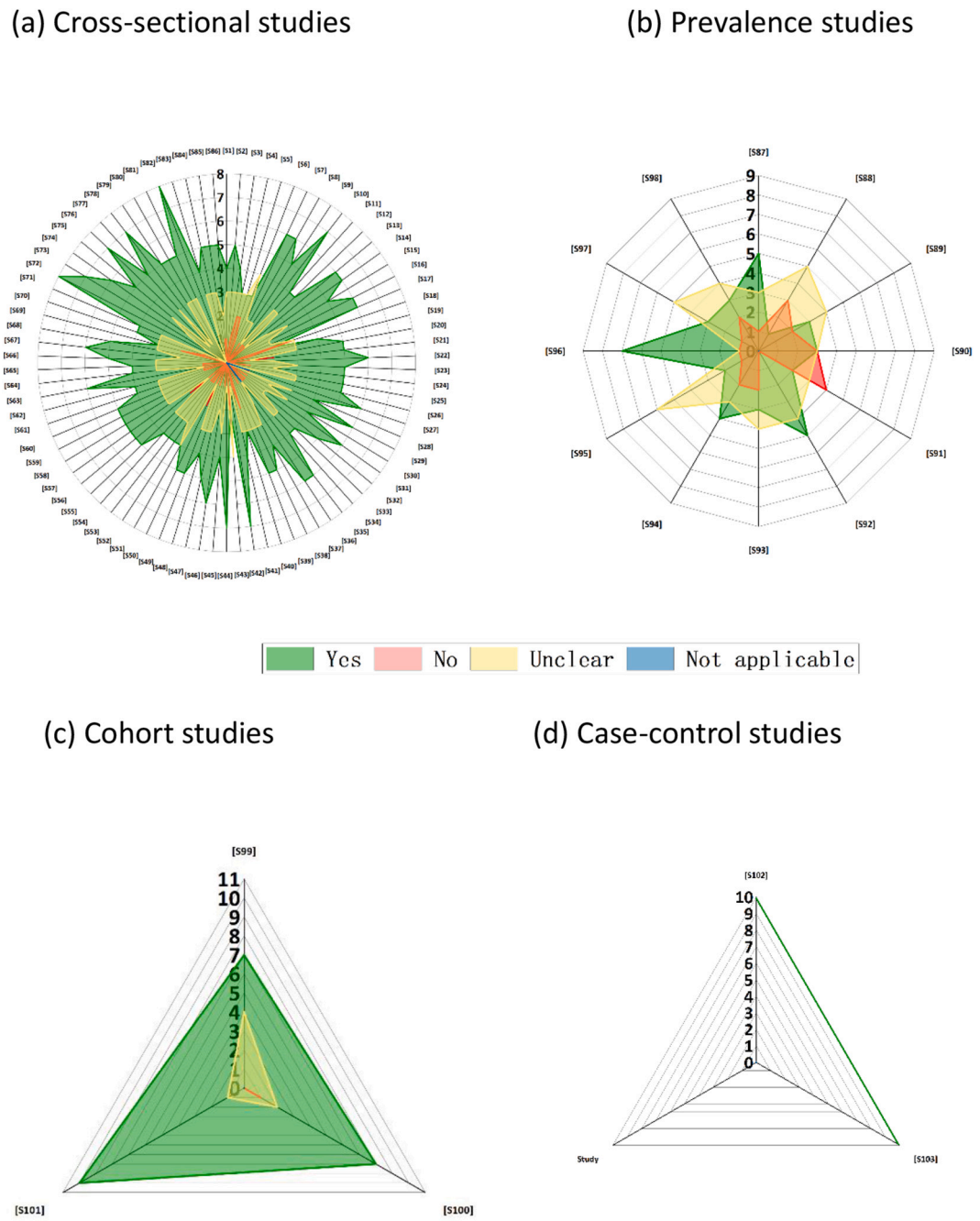

Fig. 2. Risk of bias for included original studies (n = 103).

appropriate timeframe are the prevalence and incidence of postpartum depression. Evidence shows that the peak prevalence of postpartum depression occurs at 3 months after delivery [24,25,41,73]. Another consideration is feasibility. As mothers in most countries are bound to undergo medical checks at 6 weeks postpartum, screening at this time point is convenient for mothers. Hence, many organizations recommend screening at this point [22,26,32].

Our systematic review revealed heterogeneity in recommendations pertaining to healthcare providers responsible for screening. Owing to variations in healthcare systems across countries, suitable screening personnel may differ. However, nurses were the most recommended, as they may identify mothers who are struggling emotionally very early in the perinatal period and play an important role in ensuring that mothers are connected with appropriate support [30].

For referrals, most guidelines recommended that women with a history of severe mental illness or those suspected of having such a history should be routinely referred as part of primary healthcare. It is vital to prevent or ameliorate adverse outcomes in perinatal women who have or are suspected of having, severe mental illness [74].

Although many guidelines exist regarding screening for perinatal depression, significant gaps were found between implementation studies and the guideline recommendations.

First, clinical guidelines recommended routine screening for perinatal depression. However, the implementation of this practice remained limited in original settings, with only 8.7% of the studies conducting routine screening, predominantly in high-income countries. Furthermore, most studies focused on one-time screening, indicating a lack of extensive adoption of routine screening for perinatal depression in clinical practice. Therefore, it is crucial to prioritize the integration of routine screening and referral for perinatal depression into existing

medical care systems.

Second, a significant disparity was observed between implementation studies and guideline recommendations regarding the timing and frequency of perinatal depression screening. Guidelines suggest that mothers should be screened for perinatal depression at least once during pregnancy, preferably as early as their first prenatal visit. However, in practice, only 22.22% of studies screened for perinatal depression during the first trimester. Delayed screening may exacerbate depressive symptoms.

Third, the guidelines recommend routine referral to secondary mental health services for mothers with a history of severe mental illness or those suspected of having one (scores above the cut-off value). However, only 27.2% of the original studies provided referrals for patients with positive results. Few studies reported referring mothers with a history of severe mental illness. The expert panel maintains that comprehensive and coordinated mental health services and supports, encompassing screening, assessment, prevention, intervention, and evaluation, are essential for maximizing access, timely follow-up, and referral pathways and avoiding sporadic or inconsistent care approaches [41,75]. In addition, it is of great importance that women be provided with access to timely and appropriate services post-assessment, ongoing psychosocial support, and appropriate treatment [40].

A number of limitations should be noted with regard to the study. First, this review included only observational studies. In addition, studies with purposes other than screening were excluded. Consequently, the studies included in this review may not have comprehensively reflected the implementation of perinatal depression screening. Therefore, caution should be exercised when interpreting the findings of this review.

5. Conclusion

Great gaps exist between guideline recommendations and implementation studies for screening and referring perinatal depression. Routine screening and referral for perinatal depression are not extensively performed in current clinical practice. Future research should focus on embedding routine screening and referring perinatal depression into medical care systems, following the guideline recommendations. This study provides valuable insights for future research aimed at reducing the disease burden associated with perinatal depression.

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CRediT authorship contribution statement

Yating Yang: Writing – original draft, Formal analysis, Data curation. **Ting Wang:** Data curation. **Di Wang:** Formal analysis. **Miaomiao Liu:** Data curation. **Shi Lun:** Data curation. **Shuang Ma:** Data curation. **Juan Yin:** Writing – review & editing, Methodology.

Declaration of competing interest

None.

Data availability

The data supporting the findings of this study are available from the corresponding author [author initials] upon reasonable request.

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Appendix A. Supplementary data

Search strategy. The search strategies used in each electronic database were carefully developed, and the detailed information is listed in Tables 1–16. Appendix B: Screening procedure. Screening for qualified studies followed a three-stage procedure. Appendix C: Details of the original studies and guidelines and recommendations. Basic information on the included studies is listed in Tables 1 to 4; detailed information on screening is summarized in Tables 5 to 9. Supplementary data to this article can be found online at [https://doi.org/10.1016/j.genhosppsych.2024.04.011].

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