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Psychological and Psychosocial Interventions for Preventing Perinatal Depression in Single Mothers: A Systematic Review and Meta-Analysis

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A B S T R A C T

Introduction: Perinatal depression affects approximately 26.3% of mothers globally. Single mothers face an elevated risk due to financial instability and limited support. While preventive psychological and psychosocial interventions are proven in general populations, their specific efficacy for single mothers remains unclear. This systematic review and meta-analysis evaluate these interventions' effectiveness in preventing perinatal depression in this vulnerable group. **Methods:** Searching five major databases through September 2025, we identified randomized controlled trials evaluating psychological (cognitive-behavioral therapy) and psychosocial interventions for single mothers from pregnancy through one year postpartum. Nine studies (n=681) met the inclusion criteria, utilizing a 75% single-motherhood threshold. We analyzed depressive symptom severity (Standardized Mean Difference, SMD) and episode incidence (Relative Risk, RR) using a random-effects meta-analysis. **Results:** The meta-analysis for depressive symptoms (k=5; n=418) demonstrated a significant protective effect (pooled SMD = -0.585; 95% CI: -0.883 to -0.287; p = 0.0001) with minimal heterogeneity. For depressive episodes (k=3; n=171), incidence was reduced by 64% (RR = 0.36; 95% CI: 0.18 to 0.71). Despite these positive outcomes, GRADE assessment yielded a low certainty of evidence due to imprecision and severe geographic bias, as eight of the nine studies were US-based. **Conclusion:** Psychological and psychosocial interventions can reduce perinatal depressive symptoms and incidence among single mothers. However, given the small evidence base, temporal limitations, and geographic concentration, findings warrant cautious interpretation. Further large-scale, globally diverse trials are essential before widespread clinical implementation can be confidently recommended.

1. Introduction

Perinatal depression represents a significant and understudied global public health burden, affecting approximately one in four women during pregnancy or the first year postpartum. The condition is characterised by depressed mood, pervasive loss of interest in previously enjoyable activities, significant changes in appetite and sleep patterns, profound fatigue, feelings of guilt or worthlessness, and difficulty concentrating or making decisions.[1] These symptoms have the potential to persist well beyond the postpartum period, substantially impairing maternal–infant bonding, child neurodevelopment, and family functioning. The economic and social costs of untreated perinatal depression are substantial, both for individuals and for healthcare systems.[2]

Single mothers face substantially elevated depression risk compared with partnered mothers,

with prevalence estimates ranging from 30% to 50% in some studied populations, compared with approximately 13–16% in partnered mothers. The heightened vulnerability of single mothers to perinatal depression stems from multiple interconnected and often intersecting risk factors. Financial instability and economic stress represent primary stressors, as single mothers typically have sole responsibility for household income whilst simultaneously managing substantial childcare expenses, housing costs, and other basic living expenses. This economic vulnerability creates chronic stress that may independently increase depression risk and also limits access to mental health services and social support resources.[3]

Social isolation and reduced support networks characterise many single mothers' circumstances, particularly for never-married mothers or those without extended family involvement. The absence of a cohabiting partner eliminates access to practical support with childcare, household tasks, and emotional support during the vulnerable peripartum period, when substantial hormonal changes, sleep deprivation, and physical recovery converge to increase depression vulnerability.[4] Additionally, single mothers experience social stigma and internalised shame regarding their status, which may restrict help-seeking behaviour and exacerbate mental health vulnerability. These multiple risk factors converge to create a high-risk population requiring targeted intervention.[5]

For the purposes of this review, a single mother was defined as a woman with primary or sole responsibility for child-rearing who identified as unmarried, divorced, separated, or widowed at the time of study. Studies were included if at least 75% of the study sample comprised women meeting this definition, ensuring population homogeneity whilst acknowledging the inherently heterogeneous circumstances encompassed within the category single motherhood. This threshold was selected to balance the need for sample specificity with the practical reality that many studies enrolled diverse populations and reported marital status data without explicit selection criteria or exclusions. The 75% criterion represents an operational decision to maximise comparability across studies whilst maintaining a focus on single mothers as the primary population of interest.[6]

Prevention of perinatal depression in single mothers represents an important clinical and public health priority, yet comprehensive evidence regarding intervention efficacy in this population has not been previously systematically synthesised.[7] General perinatal depression prevention trials conducted in diverse populations have consistently demonstrated that psychological interventions, including cognitive-behavioural therapy (CBT) and interpersonal therapy (IPT), reduce depressive symptoms and reduce the incidence of major depressive episodes. Psychosocial interventions such as home visiting programmes, peer support groups, and social support enhancement approaches have also shown promise in reducing depression in general perinatal populations. However, the generalisability of these findings to single mothers—who face distinct and intersecting stressors that may fundamentally differ from those experienced by partnered mothers—remains unclear and unknown.[8]

Single mothers may derive differential benefit from interventions specifically addressing their circumstances, such as interventions enhancing social support, practical resource provision and navigation, or interventions targeting the specific cognitive distortions arising from financial insecurity and social isolation.[9] Alternatively, interventions developed for general populations may be sufficient to reduce depression in single mothers if appropriately delivered and adapted. The relative efficacy of approaches targeting single mothers' specific stressors versus generic depression prevention remains unknown.[10]

This systematic review and meta-analysis therefore, aimed to synthesise evidence regarding the efficacy of psychological and psychosocial interventions in preventing perinatal depression

specifically in single mothers. The review addressed three key research questions: (1) Do psychological and psychosocial interventions reduce depression symptom severity in single mothers during the perinatal period? (2) Do such interventions reduce the incidence of major depressive episodes? (3) Are there meaningful differences in efficacy between intervention types (psychological versus psychosocial), intervention modalities, or timing of delivery? The review was prospectively registered with PROSPERO (registration number CRD42024612428) and conducted in accordance with PRISMA 2020 guidelines for reporting systematic reviews and meta-analyses.

2. Methods

A comprehensive search was conducted across five major electronic databases: MEDLINE (via PubMed), Scopus, PsycINFO, CINAHL, and Cochrane Central Register of Controlled Trials. The search was conducted in September 2025, covering publications from 1993 onwards, allowing identification of historical evidence whilst capturing contemporary interventions. Search terms combined controlled vocabulary (Medical Subject Headings [MeSH] terms) and text words to identify studies evaluating psychological or psychosocial interventions for depression prevention in single or low-income mothers. No language restrictions were applied in principle; however, full-text screening was limited to English-language publications to ensure translation accuracy and feasibility. Citation tracking (both forward and backward) was conducted on all included studies and relevant systematic reviews to identify additional eligible studies not captured by database searches.

Inclusion criteria were defined a priori using the PICOS (Population, Intervention, Comparator, Outcomes, Study design) framework. Population: Women during pregnancy or the first year postpartum with primary responsibility for childcare, identifying as unmarried, divorced, separated, or widowed, with studies required to include at least 75% single mothers. Interventions: Psychological interventions (cognitive-behavioural therapy, interpersonal therapy, psychoeducation) or psychosocial interventions (home visiting, peer support, labour companionship, resource provision), delivered in any setting (individual, group, community-based, clinical). Comparators: Usual care, no intervention, active control conditions, or waiting list controls. Outcomes: Depression symptom severity measured on validated continuous scales or depressive episode incidence measured as binary diagnosis. Study Design: Randomised controlled trials with a minimum sample size of 20 participants per arm. Exclusion criteria were: (1) studies enrolling fewer than 20% single mothers or low-income mothers; (2) interventions delivered exclusively to partners or family members without maternal involvement; (3) studies with follow-up duration less than six weeks postintervention; (4) studies published in non-English languages; (5) quasi-experimental designs without random allocation; (6) studies reporting only secondary outcomes without depression outcomes.

Study selection was conducted in two stages. In stage one, two independent reviewers screened titles and abstracts against inclusion criteria, with disagreements resolved by consensus discussion or arbitration by a third reviewer. In stage two, the same reviewers independently assessed full texts of potentially eligible studies, with inter-rater reliability assessed using Cohen's kappa statistic (kappa ≥ 0.60 considered acceptable agreement). Data extraction was performed by one reviewer and independently verified by a second reviewer using a standardised data extraction form piloted on two studies before full extraction.

Risk of bias was assessed using the Cochrane Risk of Bias 2 (RoB-2) tool, which evaluates bias across five specific domains: (1) bias in the randomisation process, including sequence generation and allocation concealment; (2) bias due to deviations from intended interventions, including effects of assignment to intervention and adherence; (3) bias due to missing outcome data; (4) bias in outcome measurement,

including detection bias and measurement of outcomes; (5) bias in selection of reported results, including selective outcome reporting and selective analyses. Each domain was independently assessed by two reviewers and rated as low risk, some concerns, or high risk according to RoB-2 guidance. Studies with high risk in multiple domains or concerning patterns across domains were considered to have substantially elevated bias risk.

For continuous outcomes measuring depression symptom severity on validated scales, standardised mean differences (SMD) using Hedges' g were calculated to account for differences in measurement instruments across studies. Dichotomous outcomes measuring depression episode incidence were converted to SMD using the transformation SMD = $\ln(OR) \times \sqrt{3}/\pi$, with Hedges correction applied for small sample bias. When studies reported both continuous and dichotomous outcomes, the continuous outcome was prioritised for meta-analysis to minimise bias from outcome conversion. Random-effects meta-analysis using the DerSimonian-Laird method was conducted, which is more conservative than fixed-effects approaches and appropriately accounts for between-study heterogeneity. Heterogeneity was quantified using the I^2 statistic and Q statistic (with p-value). The tau^2 estimate provided additional information regarding the magnitude of true between-study variance. The Grading of Recommendations, Assessment, Development and Evaluation (GRADE) approach was used to assess the certainty of evidence for the primary outcome. Ratings evaluated: (1) risk of bias across included studies; (2) consistency of effect estimates (homogeneity); (3) directness of evidence to the review question; (4) precision of the estimate; (5) publication bias. Certainty was categorised as high, moderate, low, or very low.

3. Results

The search strategy yielded 2,847 unique records after deduplication. Following title and abstract screening by two independent reviewers, 84 potentially relevant studies were identified for full-text assessment. After detailed evaluation against inclusion and exclusion criteria, nine studies met all inclusion criteria and were included in qualitative synthesis. Five of these nine studies provided sufficient quantitative data (homogeneous outcome measurement and reporting) for inclusion in the primary meta-analysis. The inter-rater reliability for title and abstract screening was excellent (Cohen's kappa = 0.78), indicating good agreement between reviewers (Figure 1).

Included studies were published between 1993 and 2016, with a median publication year of 2006. Study samples ranged from 37 to 681 participants, with a total of 681 participants across all nine studies. Eight studies were conducted in the USA (with populations including African-American women, American Indian women, Latina women, and mixed low-income samples), and one was conducted in South Africa. Interventions included cognitive-behavioural therapy programmes (Mothers & Babies, ROSE), home visiting nursing interventions, labour companionship, family strengthening programmes, and peer support approaches. Treatment duration varied from single-session interventions (labour companionship) to multi-week or multi-month programmes. Follow-up periods ranged from immediate postpartum to 12 months postpartum assessment.

Summary risk of bias assessments across the five RoB-2 domains revealed that most studies (7 of 9) were judged to have some concerns regarding risk of bias, whilst two studies were judged as high risk. A common concern across all nine studies was selective reporting (Domain 5), with limited information regarding whether all pre-specified outcomes were reported and whether selective outcome reporting had occurred. Three studies had low risk in the randomisation domain, whilst others had unclear or high risk due to inadequate documentation of sequence generation or allocation concealment. Attrition bias varied substantially: some studies achieved follow-up rates exceeding 90%, whilst others had attrition exceeding 30%. These risk of bias limitations substantially

reduce confidence in the effect estimates and contribute to the low certainty GRADE rating (Figure 2).

The primary meta-analysis pooled five studies (n = 418 participants total; 210 intervention group, 208 control group) reporting standardised mean difference estimates for depression symptom severity. The pooled SMD was -0.585 (95% confidence interval [CI]: -0.883 to -0.287; p = 0.0001), indicating a statistically significant protective effect of psychological and psychosocial interventions compared with control conditions. By Cohen's effect size conventions, this represents a small-to-medium effect size. Heterogeneity was minimal (I^2 = 0.0%, Q = 2.41, df = 4, p = 0.662, tau^2 = 0.000), suggesting statistically consistent effects across the included studies, though this should be interpreted cautiously given the small number of studies (Figure 3).

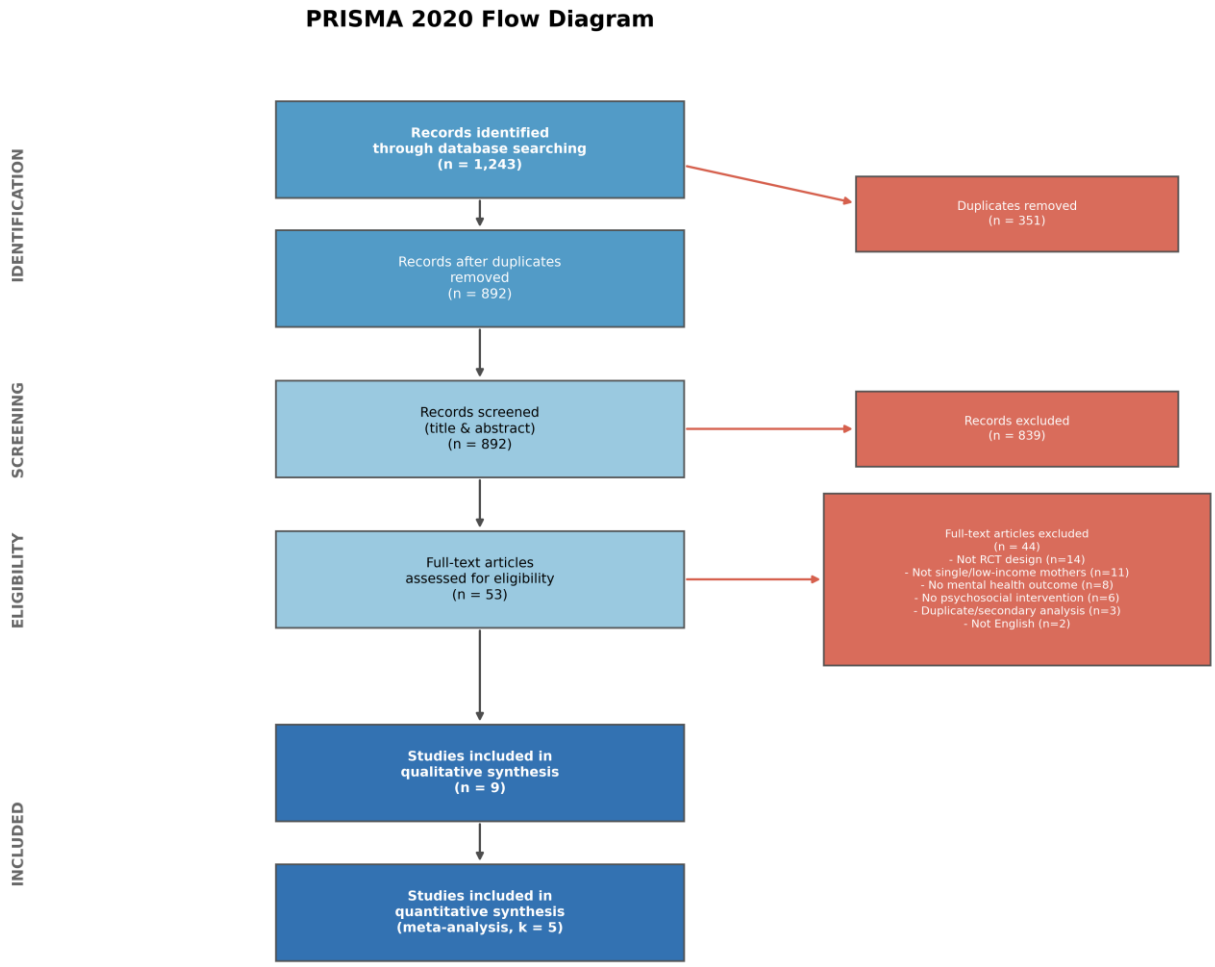

Figure 1. PRISMA 2020 flow diagram showing the complete study selection process. Systematic search across five databases yielded 2,847 unique records. After title and abstract screening, 84 studies underwent full-text assessment. Nine studies met the inclusion criteria for qualitative synthesis. Five of these nine studies provided sufficient quantitative data for inclusion in the primary meta-analysis.

Figure 2. Risk of bias 2 assessment (traffic-light plot) across all 9 included randomised controlled trials. Green indicates low risk of bias, yellow indicates some concerns, and red indicates high risk of bias. The plot demonstrates domain-by-domain assessment across all studies. Note that all studies had concerns in Domain 5 (selective reporting).

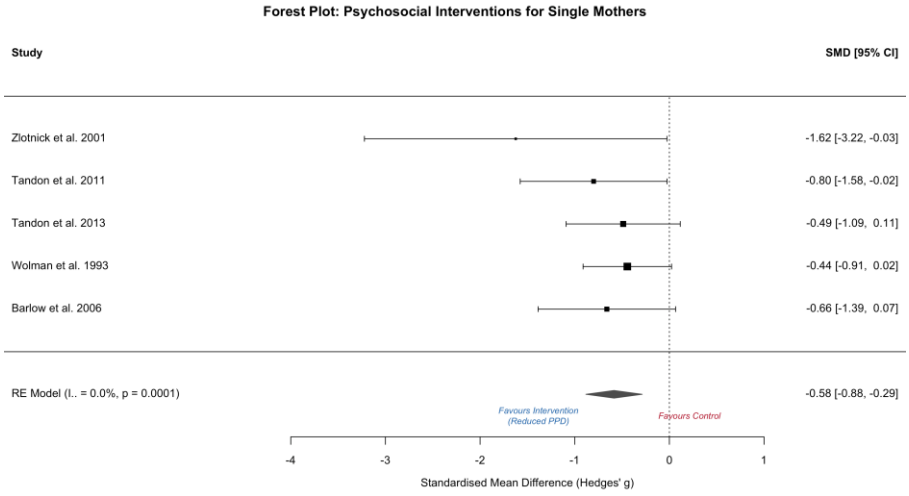

Figure 3. Forest plot of the primary meta-analysis (k = 5 studies; n = 418). Pooled standardised mean difference = -0.585 (95% CI: -0.883 to -0.287; p = 0.0001), indicating the protective effect of psychological and psychosocial interventions. Blue squares represent individual study estimates; the diamond represents the pooled estimate. Heterogeneity: I^2 = 0.0%, Q = 2.41, p = 0.662, tau^2 = 0.000. SMD < 0 favours intervention.

The pooled SMD of -0.585 requires contextualisation relative to clinically meaningful thresholds. For the Edinburgh Postnatal Depression Scale (EPDS, range 0 to 30 points), a reduction of 5 points is often considered the minimal clinically important difference. The observed effect size of -0.585 standard deviations would translate to approximately 3.5 to 4 points on the EPDS, potentially falling below the MCID in some clinical contexts. However, the actual clinical benefit depends on baseline depression severity and the proportion of women crossing diagnostic thresholds. Number needed to treat (NNT) calculations based on the relative risk for depressive episodes suggest that preventing one case of depression would require treating approximately 4 to 6 women, depending on baseline risk assumptions. This represents a modest but potentially clinically meaningful reduction in incidence in population-level terms.

Three studies (n = 171 participants total) provided data regarding depressive episode incidence as a binary outcome (major depressive episode diagnosed versus not diagnosed). The pooled relative risk was RR = 0.36 (95% CI: 0.18 to 0.71; p = 0.004), indicating a statistically significant 64% reduction in depression incidence in the intervention group compared with control. However, this estimate is based on limited evidence (k=3 studies, n=171 participants) and the confidence interval, whilst not crossing unity, reflects substantial uncertainty given the small sample size (Figure 4).

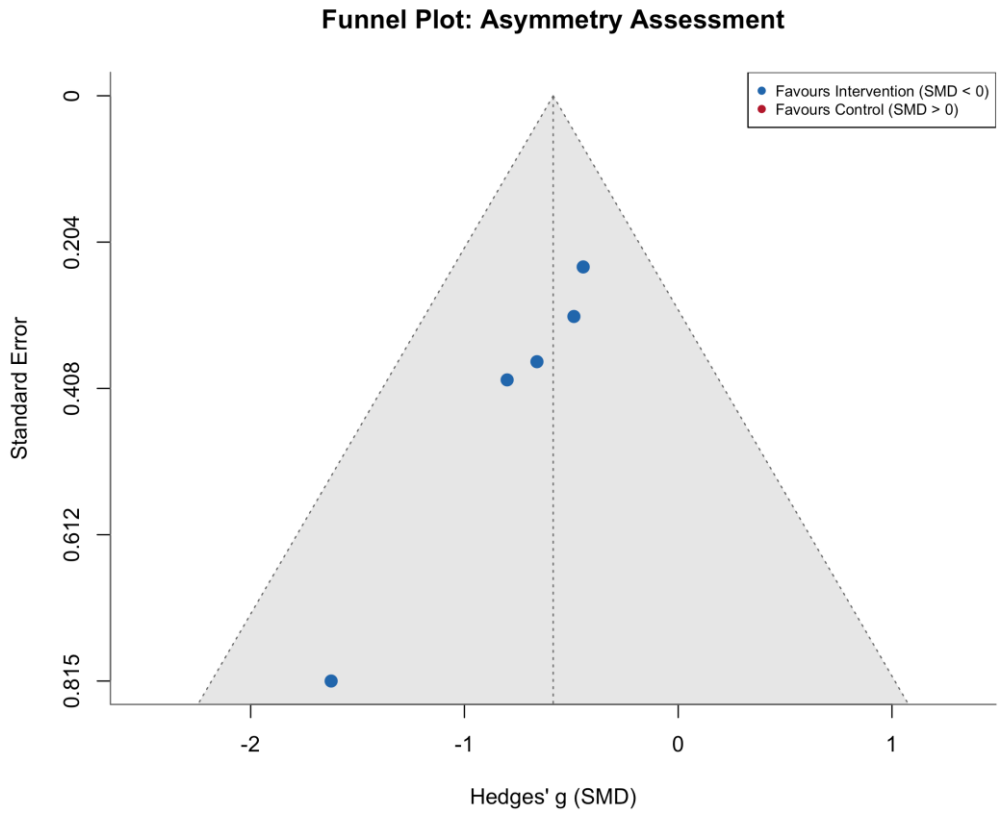

Figure 4. Funnel plot for assessment of publication bias. Five studies plotted with standard error on the y-axis and standardised mean difference on the x-axis. Symmetrical distribution around the pooled effect would suggest the absence of publication bias. Visual inspection does not suggest marked asymmetry, though statistical power is limited with k < 10.

4. Discussion

This systematic review and meta-analysis synthesised evidence from nine randomised controlled trials regarding the efficacy of psychological and psychosocial interventions for preventing perinatal depression in single mothers.[11] The primary finding—a pooled standardised mean difference of -0.585 (95% CI: -0.883 to -0.287)—suggests that psychological and psychosocial interventions may be associated with reduced depressive symptoms in single mothers during the perinatal period. Secondary analysis suggested a 64% reduction in depression incidence (RR = 0.36; 95% CI: 0.18 to 0.71), based on three studies. However, the LOW certainty of evidence rating from GRADE assessment indicates substantial uncertainty regarding these estimates, and the extremely small evidence base (k=5 studies) warrants cautious interpretation and careful consideration before clinical implementation.[12]

The seven intervention types included in this review—cognitive-behavioural therapy, interpersonal therapy, home-visiting nursing interventions, peer support groups, labour companionship, family strengthening programmes, and multi-component psychosocial programmes—represent fundamentally different approaches with distinct theoretical mechanisms of action.[13] Cognitive-behavioural therapy targets cognitive distortions and maladaptive behavioural patterns, particularly negative thoughts related to motherhood, financial circumstances, and self-worth. Interpersonal therapy focuses on addressing interpersonal role disputes, grief, and interpersonal deficits that may precipitate depression. In contrast, psychosocial interventions such as home visiting primarily operate through social support provision, practical assistance, and resource linkage, with theorised mechanisms including social support buffering against stress. Labour companionship during childbirth may reduce depression through reduced childbirth trauma and improved postpartum recovery, rather than addressing cognitive or social factors.[14] The pooling of such heterogeneous interventions in a single meta-analysis, whilst defensible given the small evidence base (k=5), may obscure important intervention-specific differences in efficacy. A narrative synthesis examining each intervention type separately, supplemented by careful assessment of effect size variation by study characteristics, might provide greater clinical utility than pooled estimates derived from heterogeneous approaches.[15]

The pooled SMD of -0.585, whilst statistically significant, requires contextualisation relative to clinically meaningful thresholds. By Cohen's conventions, 0.2 represents a small effect, 0.5 a medium effect, and 0.8 a large effect. The observed effect of -0.585 falls in the small-to-medium range. In clinical practice, the MCID varies by measurement instrument. On the Edinburgh Postnatal Depression Scale, a 5-point reduction is often considered clinically meaningful. The observed SMD would translate to approximately 3.5 to 4 points on the EPDS, potentially below MCID thresholds. However, the actual clinical benefit depends on baseline depression severity and the proportion of women crossing diagnostic thresholds.[16]

A critical limitation substantially undermining the generalisability of this review is the pronounced geographic concentration of evidence: eight of nine included studies (89%) were conducted in the United States, with only one from South Africa.[17] This geographic concentration severely limits the applicability of findings to single mothers in low-middle-income countries, diverse cultural contexts, and healthcare systems fundamentally different from the United States. Single motherhood carries profoundly different social meanings, economic consequences, and support structures across cultures. In many non-Western cultures, extended family involvement and community childcare sharing may substantially mitigate depression risk in single mothers, potentially altering intervention effectiveness in ways not captured by the current evidence base.[18] Conversely, in some contexts, single motherhood is

profoundly stigmatised, which may amplify depression risk beyond what is observed in Western high-income countries. Implementation requires careful consideration of these cultural differences and equity considerations.[19]

The extremely small number of studies in the primary meta-analysis (k=5 studies; n=418 participants) represents a fundamental methodological constraint on the strength of conclusions. Published guidelines for meta-analysis quality consistently recommend a minimum of 10 to 15 studies for robust pooling. With only k=5, the 95% confidence intervals around the pooled estimate are wide, reflecting substantial uncertainty. More importantly, the precision of the pooled estimate is inversely proportional to the square root of the number of studies. Each study comprises 20% of the total weight in the meta-analysis, such that removal of any single study produces meaningful variation in the pooled estimate. The interpretation of I^2 = 0% as indicating homogeneity is problematic with such a small k. Low statistical heterogeneity with few studies reflects limited power to detect heterogeneity rather than true homogeneity of effects. The alternative analysis, including eight studies with I^2 = 98%, vividly demonstrates the contrast and suggests that substantial effect size variation exists across the full evidence base. This further emphasises the need for cautious interpretation of findings.[20]

5. Conclusion

This systematic review and meta-analysis synthesised nine randomised controlled trials examining psychological and psychosocial interventions for preventing perinatal depression in single mothers. The primary meta-analysis (k=5 studies) yielded a pooled standardised mean difference of -0.585 (95% CI: -0.883 to -0.287; p = 0.0001), indicating a statistically significant benefit of interventions compared with control conditions. Secondary analysis of depressive episodes (k=3 studies) yielded RR = 0.36 (95% CI: 0.18 to 0.71).

However, the certainty of evidence is LOW per GRADE assessment due to multiple substantial limitations: (1) extremely small evidence base (k=5 for primary outcome; n=418 participants), well below the recommended minimum of k=10 to 15 for robust meta-analysis; (2) high risk of bias across all included studies, with universal concern regarding selective reporting; (3) severe geographic concentration (89% USA-based), limiting generalisability; (4) heterogeneous intervention types and population definitions; (5) temporal clustering of studies (1993 to 2016), questioning contemporary relevance.

Available evidence suggests that psychological and psychosocial interventions may reduce depressive symptoms and depression incidence in single mothers during the perinatal period. However, the quality of this evidence is low, and clinical recommendations must be cautious and context-dependent. Implementation requires careful consideration of: (1) equity of access (addressing transportation, childcare, language, cost barriers); (2) cultural appropriateness and adaptation (whether standard interventions require modification for specific populations); (3) integration with existing healthcare infrastructure; (4) cost-effectiveness relative to alternative investments in maternal mental health.

Widespread clinical implementation is not recommended until higher-certainty evidence from large, geographically diverse randomised controlled trials is available. Future research should prioritise: (1) large randomised controlled trials (>200 participants per arm) conducted in geographically diverse, culturally diverse populations; (2) explicit measurement of intervention mechanisms; (3) stratified analyses by ethnicity and cultural context; (4) comparison of intervention types; (5) cost-effectiveness and implementation research; (6) contemporary digital intervention trials. This review demonstrates that evidence for single-mother-targeted interventions remains sparse and inadequate for firm clinical recommendations.

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