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A Systematic Review and Meta-Analysis of Recent Randomized Controlled Trials Evaluating Effects of Psychosocial Interventions on Perinatal Depression

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A SYSTEMATIC REVIEW AND META-ANALYSIS OF RECENT RANDOMIZED CONTROLLED TRIALS EVALUATING EFFECTS OF PSYCHOSOCIAL INTERVENTIONS ON PERINATAL DEPRESSION

by

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Abstract

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Depression is among the most common and burdensome health problems affecting pregnancy and the first-year postpartum (collectively, the perinatal period). Prior quantitative reviews have established both the overall efficacy of psychosocial interventions for perinatal depression and benefits of specific approaches. However, there are important knowledge gaps. We conducted a systematic review and meta-analysis of peer-reviewed articles published from 2021 and 2022 describing randomized controlled trials evaluating psychosocial interventions for perinatal depression. We aimed to evaluate the durability of intervention benefits, whether effects differ when interventions are embedded within medical settings, and whether effects differ across trials using mental health professionals vs. non-mental health professionals. Data from 2021-2022 articles yielded 63 studies representing 13,188 participants, and a total of 151 effect estimates. There was considerable uncertainty about durability of effects due to important methodological differences across trials and sparse long-term follow-up data. There was clear evidence of intervention benefits in studies utilizing non-mental-health providers, in both medical and non-medical settings. However, clear evidence of intervention benefits was not seen in trials utilizing mental health professionals as intervention providers. Findings highlighted the need to not only focus on overall estimates of benefits, but rather more thoroughly evaluate the data to understand the heterogeneity present.

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Chapter 1

Introduction

Public Health Burden of Perinatal Depression

Perinatal depression is among the most common health complications of pregnancy and the postpartum period. Previous literature has shown that the prevalence of a depression diagnosis is approximately 20.7% (95% CI [19.4, 21.9%]) during pregnancy and 17.7% (95% CI [16.6, 18.8%]) in the postpartum period (Hahn-Holbrook et al., 2018; Mateus et al., 2022; Yin et al., 2021). In addition, prevalence rates for perinatal depression and co-morbid disorders increased globally during the COVID-19 pandemic (English, 2020; Mateus et al., 2022).

Not only is perinatal depression highly prevalent, but it has also been linked to a host of chronic and burdensome parental and child health complications. Depressed pregnant and postpartum individuals are at elevated risk for poor obstetric outcomes and long-term mental health problems (Hu et al., 2015; Liu et al., 2016; US Preventive Services Task Force, 2019). Pregnant individuals with perinatal depression exhibit elevated suicidal ideation and completed suicide, self-harm behaviors, and a higher frequency of delivery complications, such as preterm birth, small gestational size, and low birth weight (Howard & Khalifeh, 2020; Meaney, 2018; US Preventive Services Task Force, 2019). Offspring exposed to perinatal depression are more likely to develop adverse neurological, behavioral, emotional, and physical health outcomes (Kingston et al., 2018; Lee et al., 2014; Meaney, 2018). For example, untreated and persistently high depressive symptoms across the perinatal and first-year postpartum have been associated with hyperactivity/impulsivity, inattention, physical aggression, emotional/anxiety

symptoms, and separation anxiety in children (Kingston et al., 2018). Perinatal depression also appears to disrupt parenting, breastfeeding, and parent-child bonding (Howard & Khalifeh, 2020; Slomian et al., 2019). Although the link between perinatal depression and offspring sequelae is partly explained by shared genetic underpinnings, the link does not appear to be fully attributable to genetic confounding (Rice et al., 2010).

Vulnerable and disadvantaged populations appear to be at greater risk for perinatal depression, and the effects of perinatal depression may exacerbate existing inequities. Research has shown that perinatal mental health disorders exacerbate negative outcomes for pregnant individuals with a personal or family history of behavioral health concerns, physical or sexual abuse, unexpected pregnancy, stressful life events, and medical disorders (Santos et al., 2017; US Preventive Services Task Force, 2019). In fact, for many individuals with perinatal depression, mood symptoms predate and extend well beyond the perinatal period. The stressors accompanying gestation, delivery, and postnatal parenting may worsen preexisting mental health symptoms. Furthermore, numerous socioeconomic factors, such as low social and financial support, and age at the time of pregnancy may modulate the risk of de novo mental health concerns (Santos et al., 2017; US Preventive Services Task Force, 2019). Research has shown that pregnant individuals of color, including self-identifying Black/African American and Hispanic, have worse maternal and child health outcomes when compared to White pregnant individuals in the United States (Bryant et al., 2010; Thomas et al., 2017). In sum, vulnerable populations may be more prone to perinatal depression, and perinatal depression may contribute to or exacerbate existing health disparities. Consequently, it is

critical for psychosocial interventions to be tailored to, or be developed in collaboration with, these populations (Heck et al., 2023).

Beyond complications in birthing individuals and their families, perinatal depression introduces societal public health burden by substantially increasing health care costs (Bauer et al., 2016). Untreated perinatal depression has been estimated to incur a five-year population-level cost of approximately $14 billion in the United States (Luca et al., 2020). A 2016 U.K. study estimated the average lifetime cost per case of perinatal depression to be £75,728 (2012-2013 £) which converts to approximately £95,054 in 2022 ($120,795 in 2022 U.S. dollars). Approximately 70% of these costs were attributed to offspring health complications (Bauer et al., 2016).

In sum, perinatal depression exacts an enormous burden on affected families and society at large via its high prevalence and link to chronic, costly, and intergenerational health complications. This has prompted the U.S. Preventive Services Task Force to call for improved systems for identifying high-risk pregnancies and systems for broad intervention delivery (US Preventive Services Task Force, 2019).

Psychosocial Interventions for Perinatal Depression

Effective and scalable interventions targeting perinatal depression are needed to curb its tremendous societal burden; however, there are unique challenges. Some pharmacotherapies have been linked to rare but serious adverse health outcomes in exposed offspring (Kolding et al., 2021). Consequently, many pregnant and breastfeeding individuals – and their providers – avoid pharmacological interventions (Eakley & Lyndon, 2022), substantially reducing treatment access (Hayes et al., 2012). Thus,

effective and accessible psychosocial interventions are particularly critical during the perinatal period.

Fortunately, there is strengthening evidence for the efficacy of psychosocial interventions for perinatal depression. Multiple systematic reviews have shown reductions in both depression severity and disorders for both face-to-face interventions and internet-based interventions. A systematic review of 20 trials (14,727 patients) reported that those who received a psychosocial intervention were less likely to develop a postpartum depression diagnosis (variably defined) compared to those receiving usual care (RR 0.78, 95% CI: [0.66, 0.93]). Specific interventions studied in this review were individualized postpartum home visits delivered by nurses or midwives (RR = 0.56, 95% CI [0.43, 0.73]), peer-based telephone support (RR = 0.54, 95% CI [0.38, 0.77]), and Interpersonal Therapy (IPT) (standardized mean difference = -0.27, 95% CI: [-0.52, -0.01]) (Dennis & Dowswell, 2013). A systematic review of 29 trials (2,779 patients) also reported a moderate treatment effect of Cognitive Behavioral Therapy (CBT) (Hedges' *g* = -0.61, 95% CI [-0.73, -0.49]), particularly for individuals with Major Depressive Disorder (MDD) during pregnancy (Branquinho et al., 2021; Howard & Khalifeh, 2020; van Ravesteyn et al., 2017). CBT and IPT when using both a prevention and treatment approach, have been frequently associated with notable reductions in depressive symptoms, including among minority populations (Branquinho et al., 2021; O'Connor et al., 2019; US Preventive Services Task Force, 2019). Given the likely adverse effects of perinatal depression on both birthing individuals and the developing fetus/infant, prevention is critical. Preventive interventions may reduce the incidence of perinatal

depression by up to 50% (Muñoz et al., 2021), potentially sparing the infant/fetus exposure to a toxic prenatal and postnatal environment (Rice et al., 2010).

There are, however, important limitations of the existing literature evaluating psychosocial interventions for perinatal depression. First, there is a paucity of research evaluating the durability of intervention benefits (Loughnan et al., 2019). Few trials have assessed whether benefits persist for more than a few months beyond receiving the intervention (Lee et al., 2014; Simas et al., 2018). Previous meta-analyses have evaluated intervention effects at multiple follow-up points (aggregating over weeks or months) (Cuijpers et al., 2023), but they have not formally tested whether the effects diminish over time. This can be better accomplished by including all relevant effect estimates from each study across multiple time points and treating time as a predictor in meta-regression models. Research quantifying effect durability would improve our ability to gauge the overall value of perinatal depression interventions and inform both levels of public health investment and future research priorities.

Intervention Accessibility & Sustainability

A second limitation of the existing literature is that, despite significant investment in improved identification and systems for triaging patients to empirically supported interventions, significant barriers remain for perinatal when mental health care (Byatt, Biebel, et al., 2012; Iturralde et al., 2021; O'Mahen & Flynn, 2008). At the patient level, socio-economic disparities appear to contribute to poor access. Parents facing socioeconomic challenges (e.g., single parenthood, transportation difficulties, inadequate insurance, and lack of childcare) are less likely to access adequate perinatal mental health services (Byatt, Biebel, et al., 2012; Smith et al., 2019). Additionally, there are cultural

differences in levels of stigma associated with engaging in mental health services (Byatt, Biebel, et al., 2012; Iturralde et al., 2021; O'Mahen & Flynn, 2008). Expectations tied to parental identity or fear of losing parental rights with disclosure of mental health concerns may place additional burdens for pregnant individuals and dissuade them from seeking needed services. Negative perceptions of obstetricians (i.e., unresponsive and unsupportive medical providers, excessive symptom normalization, lack of knowledge about safety psychiatric medications during pregnancy) may hinder pregnant individuals from taking steps to better their behavioral health (Byatt, Simas, et al., 2012; Eakley & Lyndon, 2022). Pregnant individuals may also prefer non-professional sources of care, such as their friends and family (O'Mahen & Flynn, 2008). Furthermore, perinatal depression often co-occurs with other mental health problems, which may complicate care and affect treatment outcomes. The prevalence of comorbid depression and anxiety disorders is estimated to be 9.3% (95% CI [4.0, 14.7%] during pregnancy and 8.0% (95% CI [0.6, 15.5%]) up to 24 weeks postpartum (Falah-Hassani et al., 2017; Mateus et al., 2022).

Managing perinatal mental health concerns typically falls to prenatal care providers who lack requisite training and support. Although universal screening is now common in healthcare settings (Griffen et al., 2021), providers often lack reliable referral pathways (Byatt, Biebel, et al., 2012; Byatt, Simas, et al., 2012), leading some to question the utility of screening when those conducting screening do not have requisite resources to offer (Buist et al., 2002). System-level barriers, include lack of contact and access to mental health providers primarily due to long wait times to schedule appointments, as

well as poorly coordinated care and inadequate communication between health professionals (Byatt, Biebel, et al., 2012; Griffen et al., 2021).

Developing and implementing integrated perinatal mental health programs may help overcome these barriers and lead to more equitable service delivery (Thomas et al., 2017). The American Psychological Association (APA) defines "integrative care" broadly as "any attempt to fully or partially blend behavioral health services with general and/or specialty medical services" (*Integrated Health Care*, 2013). In practice, there has been considerable variability in what is termed "integrated care." In the perinatal depression literature, the term has typically been applied to systemic efforts to embed mental health services within prenatal or pediatric clinics (Jarvis et al., 2021; Simas et al., 2018). Existing models emphasize building strong collaborations across health providers and ensuring that medical providers have requisite knowledge to identify mental health problems, provide basic interventions, and connect patients to helpful community services (Jarvis et al., 2021).

Integrated care programs require system-level changes designed to make perinatal mental health care part of standard obstetric and postnatal care rather than something separate (Byatt, Biebel, et al., 2012). Integrating care has the potential to improve all phases of mental health services: identification of those in need of care, connection to qualified providers, coordination among mental health providers and physicians, and follow-up. Existing scholarship provides evidence that integrated care programs increase accessibility, lower stigma, and facilitate cross-disciplinary collaboration (Simas et al., 2018). Patients in the Obstetrics and Gynecology department are approximately four times more likely to follow-up with mental health treatment when it is offered in the

same clinic as their other services compared to engaging in outside care (Lomonaco-Haycraft et al., 2019).

Implementing behavioral health care in the form of screening, assessment, and treatment in healthcare settings may reduce social isolation and mental health stigma, and enhance service access by removing or lessening barriers to perinatal interventions (i.e., eliminating the need for additional transportation to seek behavioral health services, fewer childcare costs, and reduction in costs of appointments), particularly for high-risk populations (Byatt, Simas, et al., 2012; Lomonaco-Haycraft et al., 2019; Smith et al., 2019; Thomas et al., 2017). Finally, because pregnant individuals have unusually frequent contact with the health system due to the numerous standard and acute appointments (i.e., roughly 10-15 prenatal appointments), the impact of collaboration among interdisciplinary providers may be particularly strong for this population (American Academy of Pediatrics & American College of Obstetricians and Gynecologists, 2017; Lomonaco-Haycraft et al., 2019; Thomas et al., 2017).

Although the potential benefits of integrated perinatal mental health are abundant, there are formidable implementation challenges. These programs require sustainable financial systems, motivated providers, and robust resources (Miller et al., 2020). Myors et al (2013) identified eight key elements to integrated care: funding and resources for collaboration, a shared vision of aims and goals, pathways and guidelines, continuity of care, building relationships and trust, role clarity, training and education of staff, and support to work in new ways (Myors et al., 2013). Although these programs require substantial investment, the potential cost offsets could make them a prudent use of resources as the cost of a perinatal depression is roughly $31,778 per maternal-child dyad

over 0-5 years postpartum (Luca et al., 2020). Data remains limited on the overall effectiveness of integrated care programs for perinatal depression in medical settings. In addition, there is a great degree of heterogeneity and variability in the implementation and evaluation of integrated care, despite studies showing benefits (Myors et al., 2013; Simas et al., 2018; Singla et al., 2021). An overall assessment of integrated care programs is also complicated by the fact that the term "integrated care" has been ascribed to a highly heterogeneous group of intervention programs.

Integrated care models inherently involve delivering interventions in real-world settings. There are likely challenges to delivering mental health services within busy medical clinics (e.g., time and space constraints) that could affect quality of service delivery and prove burdensome. The costs of developing and sustaining these models over time are substantial and changing established care systems and workflows requires commitment at many levels (e.g., providers, patients, and healthcare administrators) (Myors et al., 2013). However, they also allow for opportunities for engagement and sharing the message that mental health care is a critical element of perinatal health care (Simas et al., 2018).

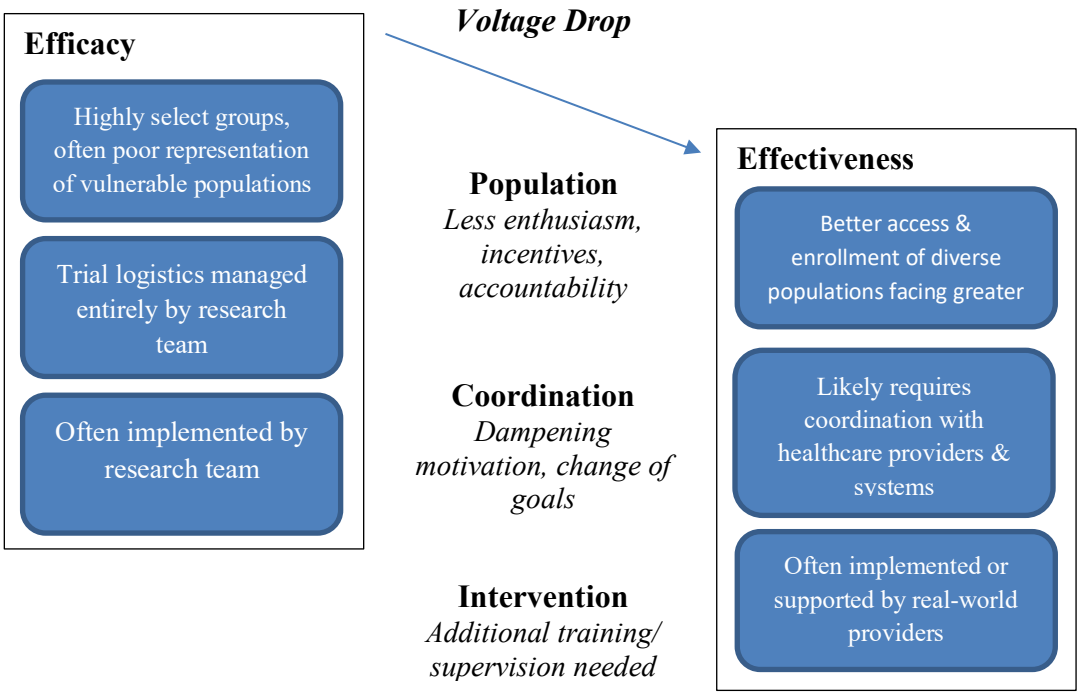
Intervention Scalability

Prior evidence has shown that the effects of psychosocial interventions tend to diminish over time (Bockting et al., 2015; Hollon et al., 2005). Skill acquisition, knowledge, and accountability are likely to fade over time after intervention delivery, making one vulnerable to relapses and recurrences (DeRubeis & Strunk, 2017; Hollon et al., 2005; Natsuaki, 2015). In addition, financial resources may decrease as the novelty and impact of the intervention fades (Gottfredson et al., 2015).

In addition, there is substantial evidence that the potency of mental health interventions diminishes when interventions initially tested in tightly controlled efficacy trials move toward more pragmatic implementation in effectiveness trials, a phenomenon often referred to as “voltage drop” (Simas et al., 2018). In efficacy trials, the research team is typically highly involved in all phases of trial implementation, including recruitment, intervention delivery, evaluation, and follow-up. As healthcare interventions are delivered in contexts that better approximate real-world conditions, the lack of research team scaffolding, and resources may negatively impact intervention outcomes. For example, research team members may play a critical role in keeping participants engaged in interventions by checking in regularly or reimbursing travel costs. But these resources may not be present in real-world settings. Additionally, in tightly controlled efficacy trials, the research team often provides interventions in locations where they have control over the logistics of intervention delivery. This is often impossible in pragmatic trials conducted in realistic settings. For example, trials evaluating integrated care programs must work to deliver the interventions without disrupting hectic clinical workflows (Jarvis et al., 2021) (Figure 1).

Figure 1

Moving from Efficacy to Effectiveness



Integrated care approaches, unlike individual long-term psychotherapy, often involve brief and problem-focused interventions, particularly when implemented in medical settings (Hunter et al., 2022). This may result in smaller intervention effects relative to those seen in efficacy studies evaluating lengthy intervention programs. Typically, trials implementing integrated perinatal mental health interventions are more pragmatic than efficacy trials in which there is little or no collaboration with healthcare providers. It is plausible, therefore, that the added challenges of implementing psychosocial interventions in healthcare settings, or in direct collaboration with healthcare personnel, might also contribute to weaker intervention effects (Nilsen, 2015).

Certain Dissemination and Implementation Frameworks, such as the RE-AIM Framework, focus specifically on evaluating interventions when scaling up to clinical practice, taking into account both health equity and sustainability issues that may arise over time with changing contextual environments (Shelton et al., 2020). The RE-AIM Framework provides a guide for evaluating the reach, effectiveness, adoption, implementation, and maintenance of interventions at an individual and setting level to assess and maximize public health impact.

Integrated care approaches highlight potential opportunities and challenges when conceptualized under the RE-AIM Framework. Integrated care under the "Reach" Dimension improves access to interventions, may target a heterogenous population, and potentially reduce stigma. In terms of "Effectiveness," validated outcomes are already being measured in healthcare settings (i.e., screenings in prenatal and pediatric care), indicating presence of quantitative measures, which could facilitate pragmatic evaluation of interventions. The "Adoption" Dimension of the RE-AIM Framework emphasizes multilevel application (i.e., settings where interventions are delivered, utilization of multiple delivery agents and contexts) to expand reach, impact, and sustainability. In contrast, integrated care approaches introduce considerable implementation and maintenance challenges at the setting level, specifically in terms of intervention delivery, fidelity, costly healthcare system workflows, and ongoing support and community collaborations (Holtrop et al., 2021).

In addition to the benefits of collaboration between medical providers and mental health professionals, there has been limited evidence that utilizing non-specialist providers to deliver psychosocial interventions as well may alleviate the treatment burden

of perinatal depression on providers and patients (Singla et al., 2021). Paraprofessionals may be helpful in certain settings to provide adequate access, particularly for prevention. More research is needed on utilizing interventionists without mental health expertise, as there are important implications for scalability.

Current Study

We aimed to evaluate the extent to which there is compelling quantitative evidence for psychosocial interventions (treatment and prevention) targeting depression in the perinatal population among peer-reviewed articles published in 2021-2022. We extended the existing literature by evaluating (1) the extent to which intervention effects persist over time; and (2) whether intervention setting (medical setting versus non-medical setting) and provider mental health expertise modify intervention effects. Although this review will ultimately include all relevant randomized controlled trials evaluating perinatal depression interventions, for this thesis we focused only on studies described in articles published in 2021 and 2022. Described within are interim analyses and preliminary results focused on this recent literature.

Although prior meta-analyses have provided strong evidence for the efficacy of psychosocial perinatal interventions for perinatal depression, there are important remaining questions. Previous reviews have not adequately addressed whether there is overall evidence of effectiveness of integrated care programs targeting perinatal depression and how these effects compare to intervention delivery without integration into medical settings. There is, to our knowledge, no universally accepted definition of integrated mental health care. Some scholars define integrated care as care provided by mental health professionals working within medical settings (i.e., providers integrated

within medical settings) (Hunter et al., 2022). Others may consider any mental health care provided within medical settings, regardless of whether the providers were mental health professionals or not, to be integrated care (e.g., an intervention delivered within medical clinics by medical staff) (Jarvis et al., 2021). For this study, we will use a broad definition including any interventions delivered within non-mental-health medical settings as integrated care programs. However, we will also consider *who* delivers the interventions. In sum, when evaluating the effectiveness of integrated care, we will focus on two critical study features:

- *Setting:* Was the intervention delivered within non-mental-health-focused medical settings (e.g., OB/GYN or pediatrics) in conjunction with standard medical care?
- *Providers:* Were the intervention providers mental health professionals?

Assuming an adequate number of relevant studies and effect estimates, this would allow us to evaluate effectiveness in a more nuanced way across levels of setting and provider (e.g., Is there evidence of benefits when interventions are delivered within medical settings by mental health professionals?). Importantly, integrated care interventions will likely differ in important ways from non-integrated interventions, for example, in dosage or intensity. Therefore, when comparing integrated vs. non-integrated care interventions we will also adjust for potentially confounding study features: e.g., intervention delivery characteristics (e.g., in person vs. remote and individual vs. group sessions).

Hypotheses

We proposed the following hypotheses:

1. Mean intervention effects will diminish over time.

2. Mean intervention effects will be smaller on average among studies delivering interventions in medical settings due to the challenges of implementing programs in real-world medical settings (i.e., integrated care trials).
3. Mean effects will be smaller on average among studies utilizing interventionists without mental health expertise.
4. The mean effect of intervention setting (medical vs. non-medical) will be modified by the type of intervention providers, with effects among trials in medical settings stronger when delivered by mental health professionals vs non-mental health professionals.

Chapter 2

Methods

Systematic Review Protocol

This systematic review was conducted in accordance with the Preferred Reporting for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021). The Population Intervention Comparison Outcome (PICOS) framework was applied to aid in developing the review parameters prior to beginning a database search. The study was registered with PROSPERO, CRD42023408373. The finalized PROSPERO submission can be seen in Appendix A.

Eligibility Criteria

Table 1 provides the full inclusion criteria for this systematic review and meta-analysis. Studies were included if they met all the following criteria: (1) enrolled participants who were either pregnant or in the first year postpartum (perinatal period); (2) evaluated the effects of a psychosocial mental health intervention targeting depression on individuals during the perinatal period; (3) compared intervention groups to control groups (e.g., care-as-usual group or waitlist control group) in which participants received no more than minimal intervention not exceeding what is commonly provided in standard care (e.g., self-help flyers or community referrals); (4) measured depression outcomes using validated instruments that provided either a quantitative score purportedly measuring symptom severity or a threshold purportedly differentiating between individuals with and without clinically relevant symptoms; (5) assigned participants to conditions using a random or pseudorandom (e.g., a random number generator) process.

Table 1

Summary of Inclusion Criteria and PICOS Framework

Perinatal Depression Studies	
Population characteristics	Human participants who are pregnant or in the first-year postpartum
Intervention	Psychosocial (non-pharmacological) treatment or prevention intervention targeting perinatal depression
Comparator	No more than minimal intervention, including care as usual, waitlist, placebo, or brief consultation that does not exceed standard practice (e.g., provision of referrals, or handout)
Outcome	Measurement of perinatal depression symptoms or disorders as defined by symptoms listed in the Diagnostic and Statistical Manual of Mental Disorders or the International Classification of Diseases measured with validated instruments after the intervention
Study Design	Randomized controlled trial (RCT): Allocated participants to study arms using a random or pseudo-random process (e.g., coin flip, random number generator, etc.)

Studies were not eligible if they were written in a language other than English. This could induce bias if there were systematic differences in the intervention effects reported in trials written in English and those written in other languages. However, our research team lacked the resources required to conduct rigorous translations of non-English studies. Studies evaluating a psychosocial intervention were not included if intervention delivery began prior to, or extended beyond, the perinatal period (pregnancy to one-year post childbirth). Studies evaluating combined psychosocial and pharmacological intervention conditions were only included if the study allowed for the isolation of the effect of a psychosocial component of the intervention (e.g., a sequenced

trial in which the psychosocial intervention was given prior to the addition of pharmacological intervention, and outcomes compared to a control condition were measured prior to administration of pharmacotherapy).

Search Strategy

In collaboration with a library and information specialist, an initial search strategy was developed. The search did not have restrictions related to date of publication, but results were limited to English language publications. The primary search utilized the following electronic databases: Medline (ProQuest), PsycArticles, PsycInfo, PubMed. Modified search strategies were developed for each database utilizing consistent keywords. Full search strategies for each database are provided in Appendix B.

Selection Process and Data Extraction

Review of abstracts to determine study eligibility was completed in two stages. Stage 1 was a rapid review of abstracts only. Two members of the research team (including a clinical psychology doctoral student, undergraduate research assistants, and a senior investigator with a Ph.D. in psychology) independently reviewed each abstract to determine whether it should be excluded from the review. Abstract reviewers did not have access to the other coders' decisions. In the rapid review stage, coders were instructed to only eliminate articles that were clearly did not meet inclusion criteria (e.g., non-intervention studies, review and commentary papers, study protocols, and studies that clearly did not include the perinatal population). Any article that was deemed pertinent by either reviewer was retained for stage 2. In stage 2, two members of our research team (a clinical psychology Ph.D. student and a Ph.D. level psychologist) reviewed the surviving full text articles independently to determine whether the full

inclusion criteria had been met. The two full-text reviewers discussed disagreements until reaching a consensus about whether the article should be included.

Synthesis Methods

A study codebook was developed and utilized for data abstraction. All data was extracted and inputted into a REDCap database (*Using REDCap for Systematic Reviews*, n.d.). Information about study design, methodology, participant demographics and effect sizes were recorded. The full codebook is provided in Appendix C. For studies that reported continuous outcomes, we coded means, standard deviations, and sample sizes to calculate between-group standardized mean difference estimates comparing intervention and control group scores at a given post-intervention assessment.

Effect estimates were calculated using Hedges' *g*, which applies a correction to traditional standardized mean difference statistic to reduce upward bias in estimates from small sample sizes (Hedges, 1981)

$$g = \frac{(Mint\ -Mcon)}{SDpooled} \cdot \frac{(N-3)}{(N-2.25)} \cdot sqrt\left(\frac{(N-2)}{N}\right)$$

Where *Mint and Mcon* are the means of the intervention and control groups, respectively; *SDpooled* is the pooled standard deviation (*SD*) across groups; and *N* is to total sample size contributing to the estimate. Effect estimates and variances (v_{gij}) were calculated in the `metafor` R package (version 4.2-0) (Viechtbauer, 2010). For estimates evaluating effects on binary outcomes (e.g., MDD criteria met versus not met), we coded the number of positive outcomes (e.g., exceeds threshold) and negative outcomes (e.g., does not exceed threshold) in both intervention conditions to calculate an odds ratio. Only 27 estimates from 13 studies were based on binary outcomes. To allow all effect estimates (including the 27 quantified on the odds ratio scale) to be included in our models, odds

ratio estimates were converted to standardized mean differences using the `effectsize` R package (version 0.8.3) (Ben-Shachar et al., 2020).

Whenever possible, we calculated effect estimates using descriptive statistics (e.g., means, *SD*s, and sample sizes). If descriptive statistics were not provided but there was an effect estimate provided (e.g., Cohen's *d* or an odds ratio), we used the estimate provided. In some cases, neither descriptive statistics nor effect size estimates were provided, but there was sufficient information to estimate the effect size (e.g., based on regression coefficients and standard errors).

Our primary analyses were conducted using robust variance estimation (RVE) meta-analysis (Hedges et al., 2010). Standard meta-analytic procedures assume that each effect estimate is independent, such that each study provides only a single estimate per analysis. RCTs often provide several relevant effect estimates, including estimates from multiple time points, multiple outcome measures, and multiple comparisons (Tanner-Smith et al., 2016). Typically, to avoid violating the assumption of independence, meta-analysts exclude or aggregate over effect estimates (Cooper et al., 2019). These approaches are inefficient, resulting in information loss and potentially bias if there is systematic selection of estimates to include. Multilevel meta-analyses resolve this problem by explicitly modeling both within- and between-cluster correlations (Van den Noortgate & Onghena, 2003). However, multilevel meta-analyses require knowledge of the correlation among the within-cluster correlations (Tanner-Smith et al., 2016) not reported consistently in research articles (Hedges et al., 2010). Thus, multilevel meta-analyses often require approximating the missing within-cluster correlations based on prior literature and subject-area expertise.

The major benefit of RVE meta-analysis is that it allows for the inclusion of all relevant effect estimates from each cluster (study) but will provide robust standard errors and confidence intervals without knowledge of the within-cluster correlations among effect estimates (Hedges et al., 2010; Tanner-Smith et al., 2016). The *robumeta* package (Fisher & Tipton, 2015) in R was used to conduct the analyses. As recommended by Tipton & Pustejovsky (2015), we applied small-sample-size corrections in all analyses (Tipton & Pustejovsky, 2015). The RVE method accommodates multiple sources of dependence, including having multiple estimates from the same study, and having multiple estimates from studies conducted by the same research team. The primary source of dependence in this review was due to having multiple outcome measurements (and corresponding effect estimates) over time from the same study. Consequently, as recommended by developers of the RVE approach, we used the "correlated effects" formula to calculate inverse variance weights (w_{ij}) for individual effect estimates (i) within studies (j) (Hedges et al., 2010):

$$w_{ij} = \frac{1}{k_j(v_{.j} + \tau^2)}$$

where $v_{.j}$ is the average of the within-study sampling variances, k_j represents the number of effect estimates within each study, and τ^2 is an estimate of the between-study variance. As in traditional meta-analysis, effect estimates were weighted by the inverse variance weight (which captures the fact that estimates vary in their precision) prior to calculating a mean effect estimate.

Our *a priori* meta-analytic model was as follows:

$$y^{ij} = \gamma_{00} + \gamma_{10}x_1^{ij} + \gamma_{20}x_2^{ij} + \gamma_{01}w_1^j + \gamma_{02}w_2^j + \gamma_{03}w_3^j + \gamma_{04}w_4^j + \gamma_{05}w_5^j + \gamma_{06}\left(w_1^j \times w_2^j\right) + u^j + \varepsilon^{ij}$$

where y^{ij} = for effect estimate *i* within study *j*; γ_{00} = conditional mean of the distribution of population effect sizes; γ_{10} & γ_{20} = regression weights for covariates (x^{ij}) whose values vary within studies; $\gamma_{01} - \gamma_{05}$ = regression weights for covariates (w^j) whose values are constant within studies; γ_{06}= regression weight for the interaction among study-level characteristics; e^{ij} = within-study sampling error; u^j = between-study deviations from the population average effect size. The model covariates are defined as follows:

- x_1^{ij} = *linear time effect*: coded in approximate months from the intervention
- x_2^{ij} = *non-linear time effect*: nonlinear effect using restricted cubic spline
- w_1^j = *study setting*: 0 = study took place outside of medical setting; 1 = study took place within a medical setting (e.g., prenatal, pediatric, or primary care clinic)
- w_2^j = *provider*: 0 = non-mental-health professional; 1 = mental-health professional
- w_3^j = *intervention type*: 0 = prevention; 1 = treatment
- w_4^j = *intervention delivery*: 0 =delivered to groups; 1 = delivered to individuals
- w_5^j = *intervention format*: 0 = in-person; 1 = not in-person
- $w_1^j \times w_2^j$= *setting*provider interaction*

The model estimated the effect of hypothesized effect modifiers (i.e., moderators of effect magnitude). The primary effect modifiers in the model were *time* (continuous measure indicating the number of months of follow-up relative to intervention receipt),

intervention setting (binary variable indicating whether the intervention was delivered within a medical setting, like a hospital or outpatient clinic), and *intervention provider* (binary variable indicating whether study intervention providers were predominantly or entirely non-mental health specialists). Additionally, we included an interaction term (*setting x provider*) quantifying the extent to which intervention effects in medical settings differ depending on whether interventions were delivered by mental health professionals vs. other providers (e.g., medical personnel or community members). It was plausible that the effects of *setting* and *provider* would be confounded by other intervention characteristics. For example, we anticipated that mental health providers would be better represented in treatment than prevention trials and that treatment trials would yield larger effects. Similarly, we anticipated that prevention trials would be more likely to use non-in-person interventions (e.g., online interventions and bibliotherapy) and that in-person interventions might yield stronger effects because of the benefits of in-person interaction. Thus, when estimating effects of *setting* and *provider* we adjusted for the following intervention delivery characteristics: *intervention format* (delivery to groups of individuals vs non-group-based interventions), *intervention delivery mode* (in-person vs. not in person), and intervention strategy *(prevention vs. treatment)*.

As recommended by developers of the RVE approach, degrees of freedom for each model predictor (i.e., effect modifier) were calculated using the Satterthwaite method. Estimates with fewer than df=4 were considered unreliable (Tipton & Pustejovsky, 2015).

Several sensitivity analyses were conducted to identify potential sources of bias. First, the calculation of estimate weights (inverse variances) for individual effect

estimates in RVE requires users to specify an assumed common mean correlation for all estimates provided by the same study (ρ). Importantly, although the presumed value of ρ is unlikely to be accurate, the value of ρ appears to have negligible impact on model estimates (Hedges et al., 2010). We assumed ρ = 0.80 in all analyses. To ensure that the selected value of rho was inconsequential, we reran our final models 6 times iteratively changing the value of rho from the minimum possible value (0.0 = no within-study correlation among estimates) to the largest possible value (1.0 = perfect correlation of within-study estimates) at an interval of 0.2. Second, to evaluate the extent to which estimates from a single study exerted strong influence on model parameter estimates, we reran our final model iteratively removing one study at a time (and all its effect estimates) from the analysis. We then evaluated the extent to which the primary parameters of interest changed as consequence of each individual study's removal. Finally, recognizing that small trials providing imprecise estimates are less likely to publish non-statistically significant findings than large trials (Rosenthal, 1979), we evaluated whether there was an association between effect precision and magnitude. We conducted a mixed-effects regression model with individual effect estimates (g_{ij}) regressed on their inverse variance weights, adjusting for intervention strategy (treatment vs. prevention) and delivery mode (in person vs. not in person). The effect of inverse variance weights was permitted to be nonlinear using a restricted cubic spline with 4 knots.

Chapter 3

Results

Study Inclusion and Exclusion

Figure 2

Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Flow Diagram of Included Studies

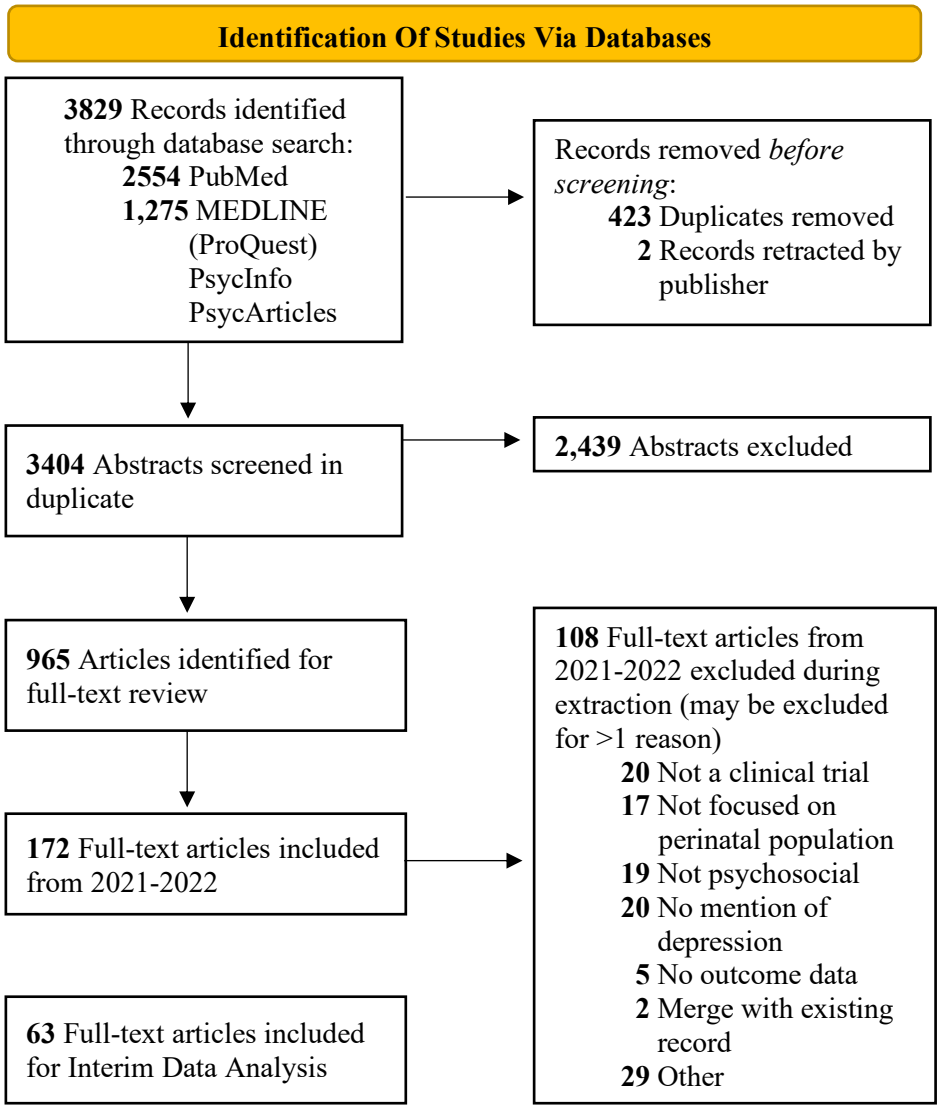


Figure 2 shows the flowchart of eligible articles. In the stage 1 rapid abstract review, 3,404 abstracts independently coded by two members of the research team. The independent coders reached the same determination regarding whether the article should be excluded for 2,974 (87.4%) of the abstracts (Cohen's kappa = 0.63). The coders excluded 2,439 articles in stage 1 (71.7%). For the interim analyses described in this thesis, only articles published in 2021 and 2022 were considered. The full text of 172 articles from 2021 and 2022 were coded in stage 2 of the literature review, with 108 (62.8%) excluded. Coder agreement for full-text reviews was kappa = 0.52, with nearly all disagreements (94.4%) the result of the faculty coder eliminating studies that the Ph.D. student marked for retention.

Study Characteristics & Preliminary Analyses

Overall, 63 studies met the inclusion criteria representing 13,188 participants or families that were randomized to either a psychosocial/behavioral intervention or a control condition. The studies provided 151 effect estimates (mean per study = 2.4, median = 2, min = 1, max = 10). Most studies had fewer than 200 participants with a median of 118 (IQR: [64, 194], min = 20, max = 1,940). Nearly all trials (k =57, 90.4%) determined condition assignment using parallel randomization of individual pregnant or postpartum individuals, and the rest (k = 6; 9.5%) randomized clusters of individuals (cluster-randomized trials).

Table 2 describes a summary of study characteristics by publication year of the included trials. Studies were conducted in 25 unique countries, with 12 (19.0%) from low or lower-middle income nations according to the World Bank classification (*World Bank Country and Lending Groups*, 2023). The country in which the most studies were

conducted was the United States (k = 12) followed by China (k = 8), and then Australia, Canada, and Iran (all k = 7*).* A small majority of studies (k = 38, 60.3%) used a prevention approach (i.e., participants were not required to exceed a symptom threshold indicative of clinically meaningful depression at baseline) rather than a treatment approach (k = 25; 39.7%). The Edinburgh Postnatal Depression Scale (Cox et al., 1987) was by far the most used instrument to measure depression outcomes, with 105 (64.8%) estimates based on this measure. Approximately half of studies (k = 31; 49.2%) implemented interventions in medical settings (e.g., hospital or outpatient clinics). Mental health professionals delivered intervention skills in 34.9% (k = 22) of studies, and medical providers delivered interventions in 44.4% of studies (k = 28).

Table 3 highlights pertinent information about the included individual studies, including year of publication, country of publication, mean/median age, digital-intervention component, in-person intervention component, intervention delivery by medical providers, intervention delivery by mental health professionals, and trial type. Table 4 further describes characteristics of interventions by trial type for the included trials. Studies published in 2021 and 2022 consisted of 91 unique intervention types. 22 studies described interventions not categorized precisely into pre-determined intervention options (e.g., music therapy, unique combination of therapeutic approaches, intervention based in self-efficacy theory and social exchange theory, etc.). The most reported intervention strategies had a parenting component (k = 16) and cognitive behavior therapy skills (k = 13). Of prevention trials, parenting interventions (k = 14) were the most utilized (with the exclusion of the other category). Many studies also included interventions describing multiple treatment approaches.

Table 2

Summary Characteristics of Included Studies

Trial Characteristics by Publication Year	2021 (N=36)	2022 (N=27)	Overall (N=63)
Depression Risk Factor Required for Inclusion?			
Not Risk Based	18 (50.0%)	10 (37.0%)	28 (44.4%)
Risk Based	18 (50.0%)	17 (63.0%)	35 (55.6%)
Intervention Delivery Setting			
Non-Medical	19 (52.8%)	13 (48.1%)	32 (50.8%)
Medical	17 (47.2%)	14 (51.9%)	31 (49.2%)
Providers—Mental Health Professionals			
Non-Mental Health Provider	23 (63.9%)	18 (66.7%)	41 (65.1%)
Mental Health Provider	13 (36.1%)	9 (33.3%)	22 (34.9%)
Providers—Medical Professionals			
Non-Medical Provider	20 (55.6%)	15 (55.6%)	35 (55.6%)
Medical Provider	16 (44.4%)	12 (44.4%)	28 (44.4%)
Country Income Level			
Upper or Upper Middle	28 (77.8%)	23 (85.2%)	51 (81.0%)
Lower or Lower Middle	8 (22.2%)	4 (14.8%)	12 (19.0%)
Intervention Delivery Location			
In person	27 (75.0%)	20 (74.1%)	47 (74.6%)
Not in person (e.g., online or bibliotherapy)	9 (25.0%)	7 (25.9%)	16 (25.4%)
Intervention Delivery Format			
Individual session	19 (52.8%)	18 (66.7%)	37 (58.7%)
Group or family session	17 (47.2%)	9 (33.3%)	26 (41.3%)
Intervention Strategy			
Prevention	22 (61.1%)	16 (59.3%)	38 (60.3%)
Treatment	14 (38.9%)	11 (40.7%)	25 (39.7%)

Table 3

Individual Study Characteristics

Study Characteristics				Intervention Characteristics			Intervention Providers	
Study Name	**Country**	**Country Income[a]**	**Mean/ Median Age**	**Type[b]**	**Digital**	**In-Person**	**Medical Profess-ional**	**Mental Health Profes-sional**
Kuo 2022	Taiwan	High	33.9	Prev-Sel	No	Yes	Yes	Yes
Sun 2021	China	Low	30	Tx	Yes	No	Yes	Yes

Study Characteristics				Intervention Characteristics			Intervention Providers	
Sinha 2021	India	Lower-Middle	23	Tx	No	Yes	No	No
Huang 2021	China	Low	27.25	Tx	Yes	No	No	No
Bliznashka 2021	Tanzania	Lower-Middle	26.87	Prev-Univ	No	Yes	No	No
Golshani 2021	Iran	High	31.45	Tx	No	Yes	Yes	No
Smith 2021	United States	High	36.2	Prev-Univ	Yes	No	No	No
Wulff 2021	Germa-ny	High	33.73	Prev-Univ	No	Yes	No	Yes
Amani 2021	Canada	High	31.55	Tx	No	Yes	No	No
Lewis 2021	United States	High	30.74	Prev-Univ	Yes	No	No	Yes
Milgrom 2021	Australia	High	32.1	Tx	Yes	Yes	No	Yes
Franco-Antonio et al. 2022	Spain	High	32.82	Prev-Univ	No	Yes	Yes	No
Landry 2022	Canada	High	33	Tx	No	Yes	No	No
Mannocci et al 2022	Italy	High	34.3	Prev-Univ	No	Yes	Yes	No
Keys 2022	Canada	High	--	Prev-Sel	No	Yes	Yes	No
Felder et al 2022	United States	High	33.5	Prev-Sel	Yes	No	No	No
O'Mahen 2022	United Kingd-om	High	31.5	Tx	No	Yes	Yes	Yes
Comrie-Thomson 2022	Zimba-bwe	High	25.45	Tx	No	Yes	No	No
Obadia Yator 2022	Kenya	High	23	Tx	No	Yes	No	No
Cooijmans et al. 2022	Netherl-ands	High	32.42	Prev-Univ	No	Yes	No	No
Kim 2022	South Korea	Low	38.93	Prev-Sel	Yes	No	No	No
Gureje 2022	Nigeria	Lower-Middle	18	Tx	No	No	Yes	No
Treyvaud 2022	Australia	High	32.3	Prev-Sel	Yes	No	Yes	No
Liu 2022	China	Low	31.81	Prev-Univ	Yes	No	No	No
Yu 2022	China	Upper-Middle	31.11	Prev-Sel	No	Yes	No	Yes

Study Characteristics				Intervention Characteristics			Intervention Providers	
Van Lieshout 2022	Canada	High	30.91	Tx	No	Yes	Yes	No
Asnani 2021	Jamaica	Upper-Middle	28.8	Prev-Sel	No	Yes	Yes	No
Zheng et al. 2022	China	Upper-Middle	26.7	Prev-Sel	No	Yes	Yes	No
Wulff 2021	Germa-ny	High	34.03	Tx	No	Yes	No	Yes
Broberg 2021	Denma-rk	High	31.8	Prev-Sel	No	Yes	No	No
Teychenne 2021	Australia	High	33.3	Prev-Ind	Yes	No	No	No
Alhusen 2021	United States	High	24.5	Tx	No	Yes	Yes	Yes
Goldfeld 2021	Australia	High	27.48	Prev-Sel	No	Yes	Yes	Yes
Nejad 2021	Iran	Lower-Middle	29.12	Tx	No	Yes	Yes	No
Hamilton 2021	United Kingd-om	High	30.45	Tx	No	Yes	No	Yes
Zhao 2021	China	Upper-Middle	--	Tx	No	Yes	Yes	No
Ural 2021	Turkey	Upper-Middle	32.71	Prev-Sel	No	Yes	Yes	No
Çankaya 2021	Turkey	Upper-Middle	25.8	Prev-Univ	No	Yes	Yes	No
Beydokhti 2021	Iran	Lower-Middle	27.9	Prev-Univ	No	Yes	Yes	No
Oxford 2021	United States	High	28.1	Prev-Univ	Yes	Yes	No	Yes
Tandon 2021	United States	High	26.3	Prev-Sel	No	Yes	No	Yes
Jussila 2021	Finland	High	24	Prev-Sel	No	Yes	Yes	Yes
Vigod 2021	Canada	High	32.96	Tx	Yes	No	No	Yes
Rong 2021	China	Upper-Middle	28.58	Prev-Univ	No	Yes	No	No
Koçak 2021	Turkey	Upper-Middle	26.85	Prev-Univ	Yes	No	Yes	No
Ochoa 2021	United States	High	23.1	Prev-Sel	No	No	No	No
Trillingsg-aard 2021	Denma-rk	High	29.4	Prev-Univ	No	Yes	Yes	No
Rouzafzo-on 2021	Iran	Lower-Middle	29.6	Prev-Univ	No	Yes	Yes	No

Study Characteristics				Intervention Characteristics			Intervention Providers	
Van Lieshout 2021	Canada	High	31.8	Tx	Yes	No	No	Yes
Zhao 2021	China	High	30.49	Tx	No	Yes	Yes	No
Perković 2021	Bosnia & Herzeg-ovina	Upper-Middle	31.14	Prev-Univ	No	Yes	Yes	No
South 2021	United States	High	28.28	Prev-Sel	Yes	Yes	No	No
Sanaeinasab 2021	Iran	Lower-Middle	26.4	Prev-Univ	No	Yes	No	No
Gaden 2022	Norway	Lower-Middle, Upper-Middle, & High	32.94	Tx	No	Yes	No	Yes
Ammerm-an 2022	United States	High	23.2	Prev-Sel	No	Yes	No	No
Sangsawa-ng et al 2022	Thailand	Upper-Middle	17.15	Prev-Sel	No	Yes	Yes	No
Sapkota 2023	Nepal	High	25.51	Prev-Ind	No	Yes	Yes	Yes
Bahari 2022	Iran	High	27.59	Tx	Yes	Yes	No	Yes
Nicolson 2022	Australia	Low	31	Prev-Sel	No	Yes	Yes	No
Doty 2022	United States	High	--	Tx	Yes	Yes	No	Yes
Blunden 2022	Australia	High	--	Prev-Univ	No	No	No	No
Puertas-Gonzalez 2022	Spain	High	35	Tx	Yes	No	No	Yes
Van Horne 2022	United States	High	30.02	Tx	No	Yes	No	Yes

Note. Some studies either did not report mean/median age or it was unable to be determined (e.g., participants were separated based on age strata). In addition, some studies utilized multiple trial types, intervention components, and intervention providers. This information is not reflected in this table.

[a]Based on World Bank Classification; [b]Tx = Treatment; Prev-Ind = Indicated Prevention; Prev-Sel = Selective Prevention; Prev-Univ = Universal Prevention

Table 4

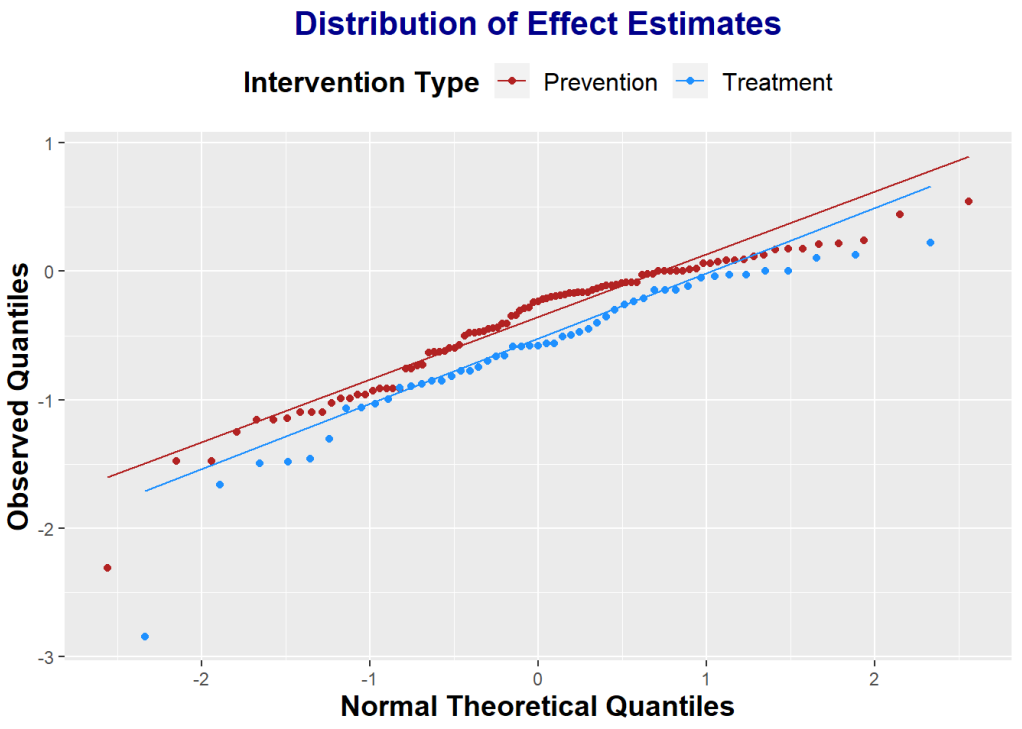
Summary of Interventions Used by Trial Type

Intervention Characteristics by Trial Type					
	Treatment ***N=25***	**Universal Prevention** ***N=18***	**Selective Prevention** ***N=18***	**Indicated Prevention** ***N=2***	**All Studies** ***N=63***
Acceptance and Commitment Therapy	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Behavioral Activation	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Behavior Change (Health-Related)	0.08 (2)	0.06 (1)	0.17 (3)	0.50 (1)	0.11 (7)
Bibliotherapy	0.00 (0)	0.00 (0)	0.06 (1)	0.00 (0)	0.02 (1)
Cognitive Analytic Therapy	0.04 (1)	0.00 (0)	0.00 (0)	0.00 (0)	0.02 (1)
Cognitive Behavior Therapy	0.36 (9)	0.06 (1)	0.17 (3)	0.00 (0)	0.21 (13)
Dialectical Behavior Therapy	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Family Therapy	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Interpersonal Therapy	0.08 (2)	0.00 (0)	0.00 (0)	0.00 (0)	0.03 (2)
Journaling	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Mentalization-Based Therapy	0.00 (0)	0.00 (0)	0.06 (1)	0.00 (0)	0.02 (1)
Mindfulness	0.20 (5)	0.17 (3)	0.06 (1)	0.00 (0)	0.14 (9)
Motivational Interviewing	0.00 (0)	0.06 (1)	0.06 (1)	0.00 (0)	0.03 (2)
Parenting Intervention	0.08 (2)	0.44 (8)	0.33 (6)	0.00 (0)	0.25 (16)
Physical Contact (Breastfeeding Skills, Touch Intervention)	0.12 (3)	0.06 (1)	0.06 (1)	0.00 (0)	0.08 (5)
Psychodynamic Therapy	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Sleep Hygiene	0.04 (1)	0.11 (2)	0.11 (2)	0.00 (0)	0.08 (5)
Spiritual	0.00 (0)	0.06 (1)	0.00 (0)	0.00 (0)	0.02 (1)
Supportive Therapy	0.08 (2)	0.00 (0)	0.17 (3)	0.50 (1)	0.10 (6)
Other	0.16 (4)	0.44 (8)	0.50 (9)	0.50 (1)	0.35 (22)

Note. Numbers after proportions are frequencies. Some studies used multiple types of interventions, so proportions will not necessarily sum down columns to 1.0.

Figure 3

Quantile-Quantile Plot of the Distribution of Effect Estimates



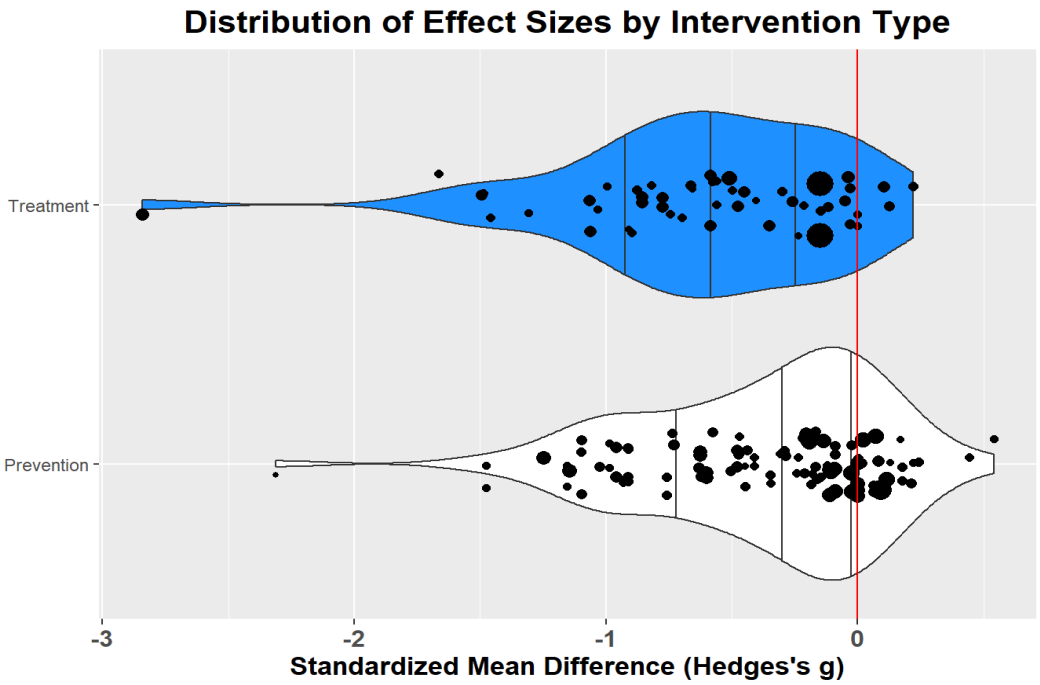
Note. Q-Q plot showing the distribution of observed effect estimates (Hedges's *g*) for both prevention and treatment trials. There is evidence of deviation from normality with estimates in the tails indicating larger intervention benefits (negative values of *g*) than would be expected had the estimates been drawn from normal distributions.

A quantile-quantile plot showed evidence that the observed distribution of effect estimates deviated from the assumed normal distribution (Figure 3) for both prevention and treatment trials. In both tails of the distributions, observed effect estimates tended to fall below expected values (indicated by diagonal lines) had the estimates been drawn from normal distributions. This indicates that estimates tended to systematically deviate

from normality in a manner favoring intervention groups (larger-than-expected intervention benefits). Figure 4 shows distributions of observed effect estimates for both prevention and treatment trials using violin plots. Most effect estimates (Hedges's *g*) were negative, indicating lower depressive symptoms in the intervention vs. control groups. However, many of the most precise estimates (larger dots) appear to cluster closer to 0 (null effect).

Figure 4

Violin Plot of the Distribution of Effect Estimates by Intervention Type



Note. Violin plots showing the distributions of effect estimates for prevention (white violin) and treatment (blue violin) trials. Black vertical lines within the violin bodies correspond to the 0.25, 0.50, and 0.75 quartiles of the observed effect distributions. The vertical red line (at $g = 0$) corresponds to no difference between the intervention and control conditions.

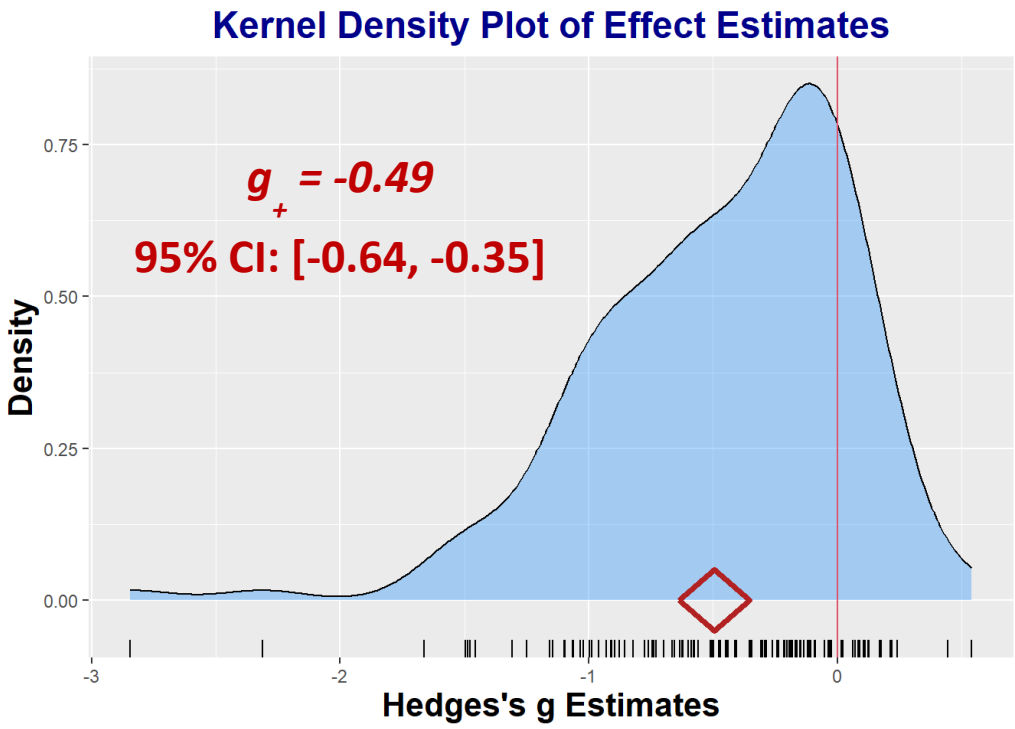
Primary Analyses

Our initial RVE model included only an intercept and no covariates, providing an estimate of the unconditional weighted average effect (i.e., average intervention effect across all observed estimates). On average, intervention conditions reported depressive

symptoms that were 0.48 *SD*s lower than control conditions (95% CI: [-0.34, -0.62]). Figure 5 shows the weighted average effect and confidence interval as a red diamond superimposed on a kernel density plot based on the observed effect estimates. The center of the diamond represents the point estimate (weighted average standardized mean difference) with the left and right corners representing the lower and upper 95% confidence limits, respectively.

Figure 5

Kernel Density Plot of Effect Estimates



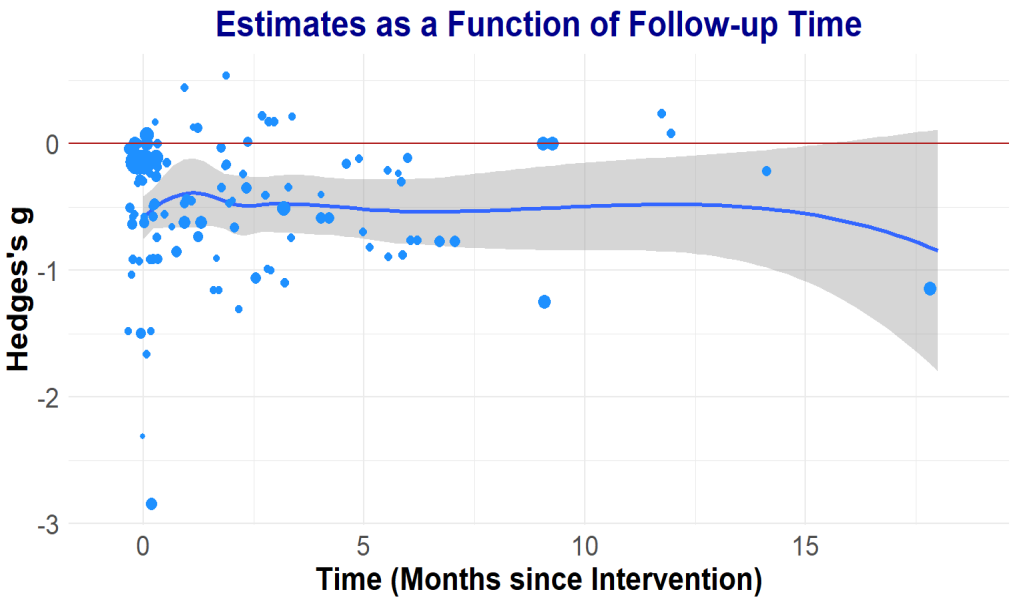
Note. The unconditional weighted mean effect estimate (average difference between intervention and control conditions in standard deviation units) corresponds to the center of the red diamond and the lower- and upper-bounds of the 95% CIs correspond to the left and right corners of the diamond, respectively. The kernel density plot shows the distribution of the observed effect estimates without accounting for the estimates weight (inverse variance).

We next added time variables capturing the number of months from the intervention and allowed for a nonlinear effect using a 3-knot restricted cubic spline with knots placed at the 0.10, 0.50, and 0.90 quantiles (Harrell, 2001). There was little

evidence that effect estimates varied by the number of months that passed since the intervention. Figure 6 shows observed effect estimates by time since intervention. As not all studies anchored assessment schedules to the amount of time passed since the intervention, there was considerable missing data (k = 13 studies and n = 43 estimates) in models with follow-up time (time-since-intervention) as a predictor. As there was little evidence of effects, time was dropped from subsequent analyses to avoid having estimates drop from the analyses.

Figure 6

Estimates as a Function of Follow-Up Time



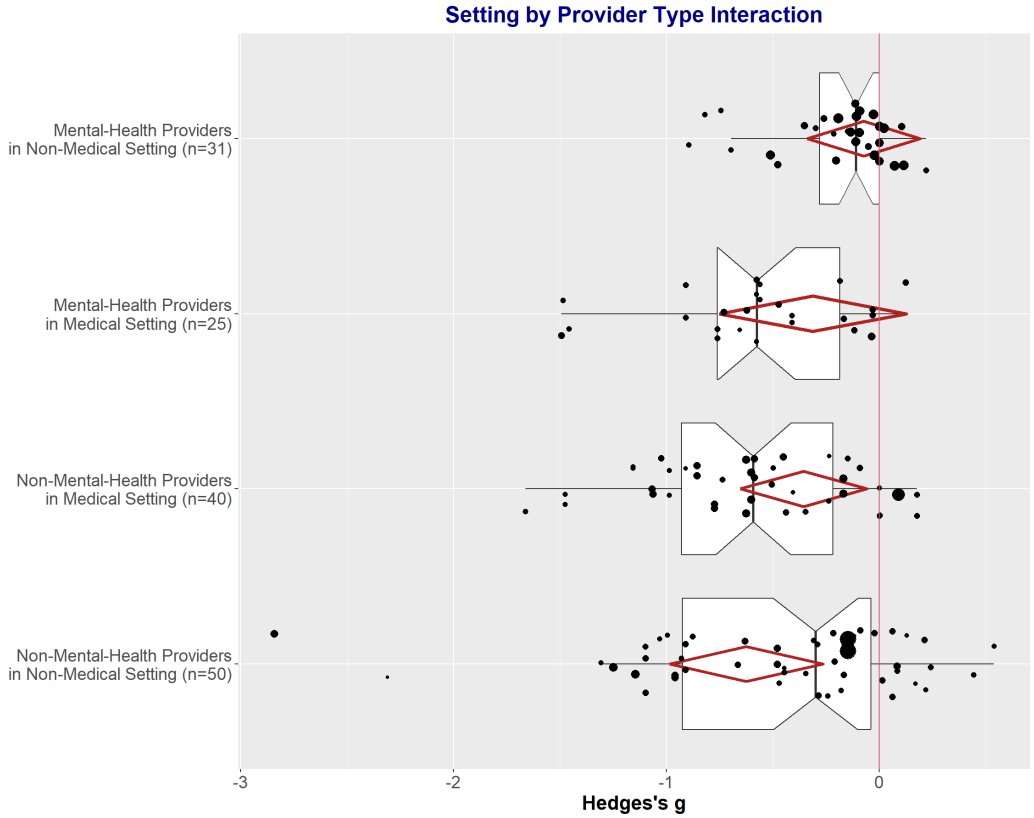
Note. Time effect plotted showing the distribution of effect estimates during follow-up measures. Point sizes reflect inverse variances with larger points indicative of greater precision. Estimates that equal zero indicate no difference between intervention condition and control condition. Negative values indicate benefit of the intervention condition relative to control condition.

Our final model included all covariates of interest except time: intervention type (prevention vs. treatment), intervention setting (medical vs. non-medical), intervention provider (mental health professional vs. all others), provision of skills (in groups vs. individuals), and intervention delivery format (in person vs. all other formats [e.g., online and bibliotherapy]). There was some evidence of an interaction between study setting and provider type (Estimate = -0.51, 95% CI: [-0.99, -0.02]).

Figure 7 shows conditional weighted mean estimates for all combinations of setting type and provider type (red diamonds) superimposed upon boxplots showing observed distributions of effect estimates (dots with size indicative of precision). The least amount of evidence for intervention effects was found among studies utilizing mental health professionals within non-medical settings (-0.07, 95% CI: [-0.34, 0.19]). Among studies using mental health providers in medical settings, a wide range of conditional effect estimates (including the null) were compatible with our data: g_+ = -0.32, 95% CI: [-0.75, 0.13]. There was clearer evidence of intervention benefits in studies using non-mental-health providers. The conditional mean effect estimate among studies with non-mental-health providers in medical settings indicates a mean reduction in symptoms of 0.35 *SD*s (95% CI: [-0.65, -0.05]). Finally, studies using non-mental-health professionals in non-medical settings had the clearest evidence of benefits for intervention conditions, with a mean reduction of 0.62 *SDs* (95% CI: [-0.99, -0.26]) on depressive symptoms relative to controls.

Figure 7

Setting by Provider Type Interaction



Note. A visualization of the setting by provider type interaction. Points correspond to observed effect estimates with larger points indicating greater precision. The center of the red diamonds are conditional weighted mean effect estimates. The left and right corners of the red diamonds reflect the lower and upper 95% confidence intervals. The vertical red line at 0 indicates a null effect (no difference between intervention and control conditions).

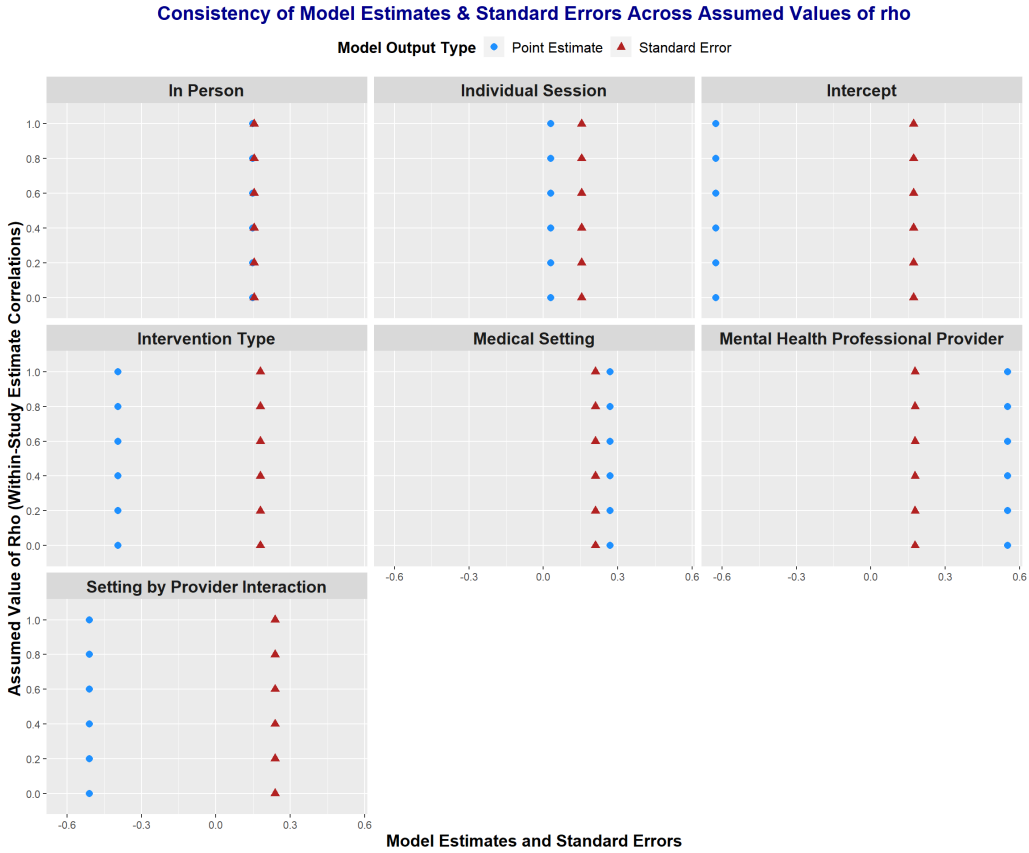
Sensitivity Analyses

RVE models require users to input an assumed value of the average correlation among estimates from the same study (ρ) to allow for calculation of effect weights

(Tanner-Smith & Tipton, 2014). To ensure that the value of rho selected was not consequential in the analyses, we re-ran our final model six times varying the value of rho from 0 (no correlation) to 1 (perfect correlation) by 0.2 increments. As is common (Tanner-Smith & Tipton, 2014), the value of ρ had practically no impact on our model estimates or standard errors (Figure 8).

Figure 8

Consistency of Model Estimates and Standard Errors Across Rho Values

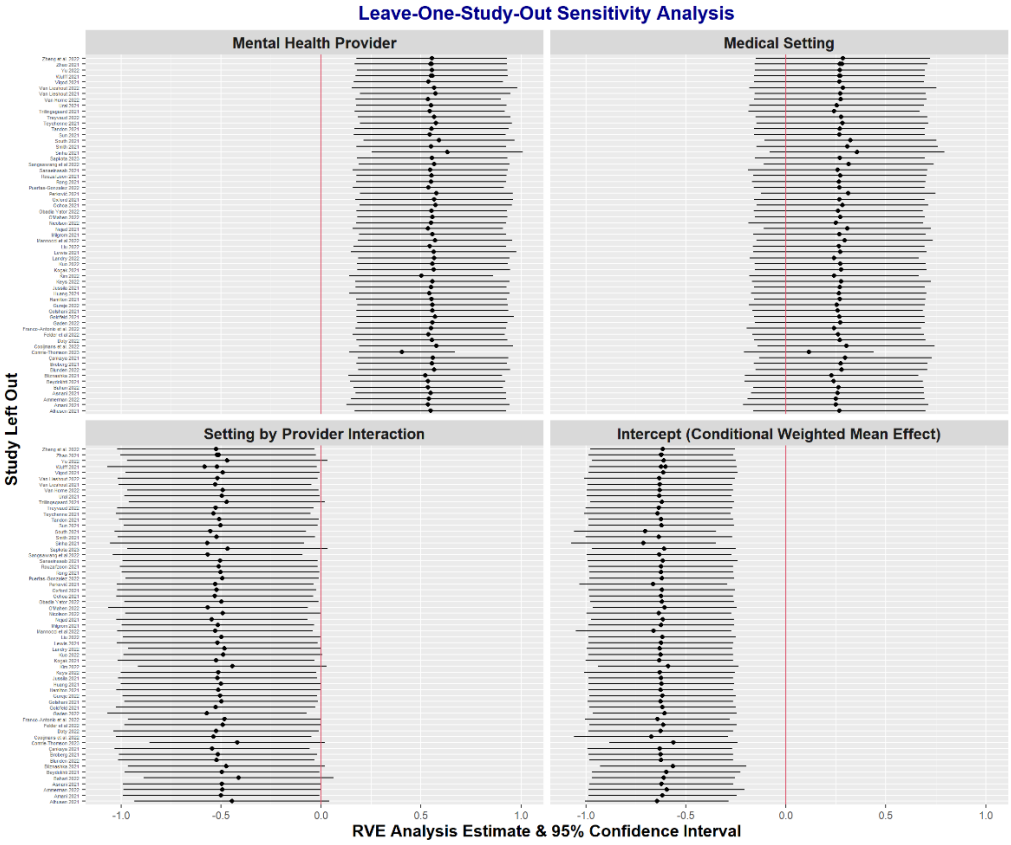


Note. Sensitivity analysis evaluating impact of the assumed value of rho on model point estimates and standard errors. Each panel shows a single parameter from our final RVE model (i.e., covariates). The x-axis shows the value of the point estimate (Hedges's *g*) and its accompanying standard error. The y-axis shows different values of rho used in the sensitivity analyses. Blue dots are point estimates and red triangles are standard errors. The values of the point estimates and standard errors were practically unchanged for differing values of rho (points line up in a nearly straight vertical line).

To evaluate whether any single study had strong influence on model estimates (covariate coefficients), we reran our final model 63 times, removing one study at a time (and all its effect estimates) from the model (leave-one-study-out analysis). Figure 9 shows the regression coefficients and confidence intervals for the intercept (conditional weighted mean effect estimate) and primary predictors (setting, provider, and their interaction) when each individual study was removed. One study stood out as having stronger influence than other studies. The intervention components described in this study consisted of psychoeducation regarding local mental health services and parenting/pregnancy resources, problem-solving skills, and reflection on the experience participating in the provided intervention, The intervention was delivered in a community setting by non-health care professionals to postpartum individuals and their partners. Exclusion of this study resulted in the main effect of intervention setting changing in magnitude from 0.27 (95% CI: [-0.16, 0.70]) to 0.11 (95% CI [-0.21, 0.44]), and the main effect of intervention provider changing from 0.55 (95% CI [0.18, 0.93]) to 0.40 (95% CI [0.14, 0.67]). A closer review of the study data showed that the standard deviations for the depressive symptom means were unusually small, resulting in large inverse variance weights and relatively strong influence in analyses. When leaving one study out at a time, 7 of the 63 95% confidence intervals for the effect of the interaction between setting and provider contained the null value (14%). Thus, we would not have ruled out a null effect of the interaction between setting and provider had we removed these studies.

Figure 9

Leave-One-Study-Out Sensitivity Analysis



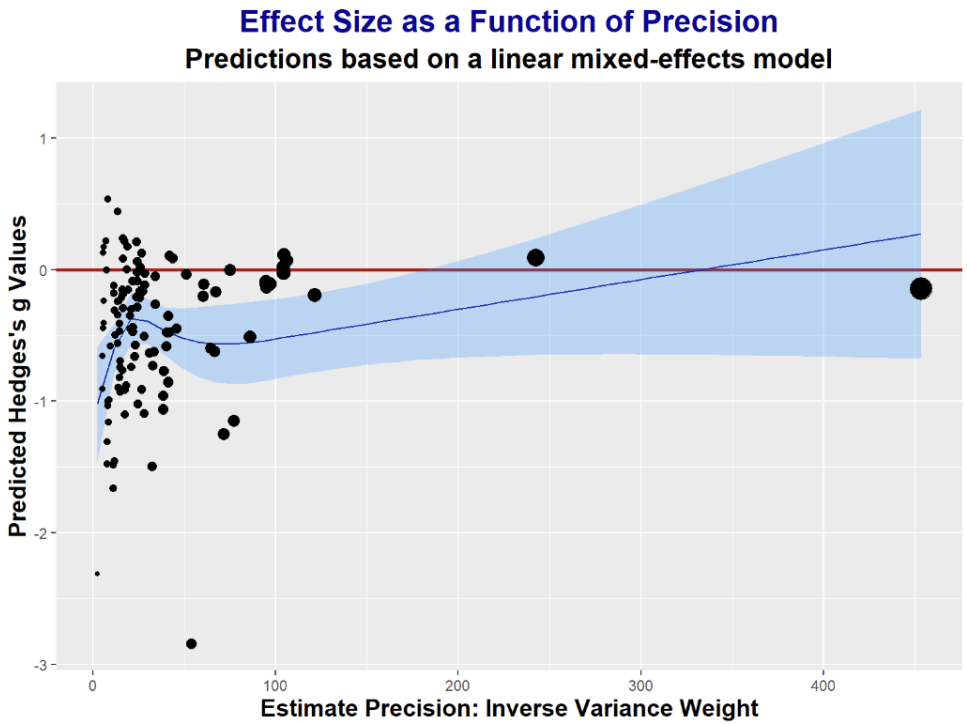
Note. A visualization of the Leave-One-Study-Out Sensitivity Analysis. Points correspond to the observed effect estimates with their 95% confidence intervals when that individual study was removed from the analysis. The red vertical line represents a null effect. The degree of influence can be gauged by the distance between the point of interest and the other points.

Finally, because visualizations of the effect estimate distributions seemed to show that estimates with higher precision were clustered near the null, we conducted a mixed-effects regression evaluating whether there was an association between inverse variance

weights (estimate precision) and effect magnitude. There was a nonlinear effect of estimate precision on effect magnitude. Larger studies with greater precision tended to report smaller intervention effects: chi-squared (*df*=2) = 8.07, *p* = .04 (Figure 10).

Figure 10

Relation Between Observed Estimate Magnitude and Precision



Note. A mixed-effects regression model showed a nonlinear association between the precision of estimates (inverse variance weight) and the size of the effect estimates, indicating that intervention benefits tended to be smaller in larger studies providing more precise estimates. This plot shows the magnitude of the model-predicted effect estimates (predicted size of the intervention effect: *g*) against the precision of the estimates (inverse variance).

Chapter 4

Discussion

Summary

The present study examined the effectiveness and durability of psychosocial interventions for perinatal depression in trials published in 2021 and 2022. It is evident that intervention research in this field has been highly active and continues to expand, with 63 studies meeting our inclusion criteria for 2021 and 2022 alone. Studies included in this meta-analysis emanated from twenty-five unique countries, with 19% (12/63) originating from low and low-middle income regions. These findings demonstrate a global recognition of the public health impact of perinatal depression. Included studies evaluated both prevention and treatment approaches, which aligns with recommendations from public health organizations (McNab et al., 2022; US Preventive Services Task Force, 2019). Despite the availability of many depression instruments that have been evaluated in perinatal samples, the Edinburgh Postnatal Depression Scale (EPDS) remains the most widely used instrument in perinatal depression intervention trials. This is likely due to the fact that the instrument was developed specifically for the perinatal population, has been evaluated in many studies, and is freely available (Cox et al., 1987). This underscores the importance of ongoing research aimed at understanding the contexts in which the EPDS total scores and clinical cut points provide the most (and least) valid measurement of perinatal depression (Matthey & Agostini, 2017).

Coder agreement for Phase 1 (rapid abstract review) was $\kappa = 0.63$, and for Phase 2 (full-text review) was $\kappa = 0.52$, indicating only a moderate level of agreement. In the vast majority of cases where there were coder disagreements, the study was ultimately

excluded when reviewed by the senior researcher. We believe that this reflects the fact that coders were explicitly instructed to be highly conservative, only eliminating studies when there was a high degree of certainty that the study was irrelevant. Having less experience and training in the field, undergraduate and graduate trainees were less confident than the senior researcher in eliminating studies with features that clearly indicated irrelevance. As all studies with coder disagreements were included in the stage 2 review, and nearly all records with a disagreements in the stage 1 review were ultimately eliminated in the more thorough stage 2 review, we think it is unlikely that the moderate level of coder agreement resulted in relevant studies being eliminated. All exclusions during Phase 2 of the coding process were discussed by two members of the research team, a clinical psychology Ph.D. student and Ph.D. level psychologist. Again, nearly all disagreements in stage 2 were due to the senior investigator eliminating a study that the Ph.D. student marked as relevant.

Contrary to expectations, we did not find clear evidence that intervention effects diminish at longer follow-up intervals. However, there remains great uncertainty about the durability of effects for several reasons. In many studies, outcome measurements were anchored to the child's postpartum age rather than time since intervention receipt. This complicates our ability to assess effect durability. If, for example, pregnant participants with a wide range of gestational ages (e.g., 8-32 weeks) complete an intervention and the outcome measurement is anchored to time since birth (e.g., 1 month postpartum), then there could be great between-participant variability in the amount of time that has passed between intervention receipt and outcome assessment. A pregnant individual who completes the intervention at 10-weeks gestation and delivers at 40-weeks

gestation would have a 34-week gap between the intervention and the one-month postpartum outcome measurement. In contrast, a pregnant individual who completes the intervention at 30-weeks gestation and delivers at 38-weeks gestation would have only a 12-week gap. As it is common for intervention effects to wane over time (Manolova et al., 2023; Natsuaki, 2015), the intervention effect at one-month postpartum might be substantially smaller for pregnant individuals who completed the intervention early in pregnancy. But the observed difference might be due simply to the passage of time rather than a true differential intervention effect. It will be important for future studies to consider timing of outcomes both in relation to gestational/child age and intervention receipt. Finally, long-term follow up data were relatively sparse in this review, making it difficult to support a regression model evaluating deterioration in effects.

A key goal of this review was to gauge strength of evidence for interventions delivered within medical settings, consistent with integrated care approaches. We expected that the strength of evidence for interventions embedded within medical settings would be stronger for trials that used mental health professional providers (effect modification). As hypothesized, the effect of intervention setting was modified by intervention provider type. However, the pattern of effects was not as anticipated. Surprisingly, the strength of evidence for intervention benefits was weak for trials utilizing mental health professionals as providers. This was particularly true among studies in non-medical settings. There were relatively few trials evaluating intervention led by mental health providers within medical settings (k = 12, n = 25 estimates), and they tended to be small studies with imprecise effect estimates. Consequently, our data

are consistent with a wide range of plausible weighted mean effects for this subgroup of trials, including null and relatively large (reductions of ¾ of a *SD*) intervention effects.

The evidence for intervention benefits was clearer for studies utilizing non-mental health professionals, particularly in non-medical settings. It is possible that mental health providers were less successful in delivering interventions. However, we think it is more likely that there are confounding factors at play. It could be that studies utilizing mental health providers enrolled participants with more severe psychopathology or adversity who were less likely to respond regardless of provider type. Another possibility is that studies using mental health providers used less comprehensive care models. For example, it could be that mental health providers used brief and highly focused intervention protocols, whereas studies with non-mental-health providers could have evaluated more intensive and comprehensive approaches (e.g., home visiting throughout pregnancy and the first year postpartum). Some of the interventions using non-mental health providers (e.g., home visits) did not require participants to travel, which could have removed barriers to engagement.

Studies that used non-mental health providers showed favorable post-intervention depression mean scores in intervention conditions relative to control both inside and outside of medical settings. This is promising as the use of non-mental-health providers may be key in achieving intervention scalability, particularly for prevention efforts (Singla et al., 2021). The fact that our results provide some evidence of efficacy across trials using non-mental health providers in medical settings is encouraging given the recent push to embed mental health services in medical settings. If the evidence remains supportive, this could encourage greater investment in providing mental health care in the

same places where birthing individuals are receiving other forms of health care. This could reduce stigma and the time burden on birthing parents requiring both standard prenatal care and mental health care. Additionally, it could lead to better collaboration across health providers. However, average intervention benefits as small as 0.06 *SD*s are consistent with our data (with alpha = .05), and it is unclear whether differences this small would warrant investment. On the other hand, average benefits as large as 0.65 *SD*s are also consistent with our data. In sum, we need to evaluate more studies to obtain a more precise estimate of the average intervention benefit of interventions led by non-mental-health professionals within medical settings.

The clearest evidence for perinatal depression interventions comes from trials using non-mental-health providers in non-medical settings, with mean intervention benefits of 0.26 to 0.99 standard deviations compatible with our data. Although these interventions are not compatible with integrated care approaches, several intervention strategies included in this subgroup have great potential for scalability, including online interventions and home visiting programs. As more studies are included in the review, and as new published trials continue to accumulate, it will be important to evaluate effects among more homogenous subgroups of trials using similar intervention approaches. Ultimately, having a variety of effective intervention strategies would be optimal and could better meet the diverse needs of the perinatal population.

Our review also highlighted that there is a substantial risk of bias when estimating average effects based on the recent perinatal depression intervention literature. Several studies included had a small sample size and beneficial effects. Small studies with negligible effects appear to be underrepresented if we assume that the magnitude of effect

estimates should follow a normal distribution. Generally, more precise estimates (from larger studies) tended to be less favorable to intervention conditions relative to control than less precise estimates. This could be indicative of a file-drawer problem where publication of smaller studies requires "significant" effects whereas larger studies can get published with small or null intervention effects. This issue may extend to follow-up data, as studies may be less likely to publish long-term follow-up results if they do not provide compelling evidence of enduring effects. In our analysis, one study had strong leverage. The exclusion of this study led to notable changes in model estimates, as unusually small standard deviations for means were reported, leading to this study being more heavily weighted. Alternatively, it could be that effects truly dissipate in larger trials. This could happen if the administrative challenges inherent in conducting large trials adversely affect intervention delivery or collection of follow-up data (e.g., training and adequately support large numbers of providers).

When re-visiting the RE-AIM Framework, evidence suggests that challenges remain for effectiveness, implementation, and maintenance of psychosocial interventions for the perinatal population. The RE-AIM Framework highlights strategies to measure key factors for evidence-based interventions to maximize public health impact and broaden accessibility with health inequities at the forefront. Although all studies were randomized controlled trials focused on pregnant individuals, there was substantial heterogeneity in intervention aspects being reported or completed, which potentially limits the ability to evaluate intervention studies in a nuanced way. It was found that fidelity, quality, and supervision of intervention delivery were not typically reported. Often, descriptions of intervention content were not sufficiently detailed, leading to

difficulties in determining with high confidence whether a study should be included. By nature, it is often difficult to blind participants and researchers about intervention condition with psychosocial/behavioral interventions. However, many studies did report blinding outcome assessors.

Implications

Perinatal depression is an immense public health problem, making it a critical area for future research efforts. The current study at its completion may help identify priorities for researchers in this field. Psychosocial interventions that show to be effective across pregnancy and post-partum can have broad implications by improving maternal-child health and behavior outcomes (Thomas et al., 2017).

As this is an interim analysis, more data and abstraction from all years of publication may help reduce uncertainty in our estimates of average intervention effects. At present, studies with non-mental health professionals appear to show effective delivery of perinatal depression interventions, potentially supporting a call to allocate additional resources and training to these providers to address accessibility of evidence-based interventions for pregnant and postpartum individuals. However, our analysis shows that we cannot focus on overall estimates of benefits but rather more thoroughly evaluate the data to understand heterogeneity and avoid making broad claims about strength of evidence for effectiveness.

Limitations and Strengths

This study has several notable limitations that must be considered when interpreting results. First, some studies did not provide optimal quantitative data for calculating effect estimates, requiring estimation based on other data available in the

manuscript (e.g., regression coefficients or mean trajectory plots). However, there was nearly always enough data reported to allow for a reasonable approximation of effect estimates. Third, there was considerable heterogeneity in the resources available to participants in control conditions. In all cases, interventions were compared to usual care control groups; but "usual care" for the perinatal population differs immensely across settings. For example, in some control groups, participants received parenting classes, home visits, and basic mental health support as part of standard care, whereas others received far fewer resources. It may be easier to have an intervention effect in trials where standard perinatal care is limited. Future reviews should attempt to account for these differences, though many studies do not report what services are provided through usual care. Fourth, this interim analysis is only based on recent data, and we have not yet rated risk of bias using a standard system (i.e., Cochrane Risk of Bias Tool). Therefore, only preliminary conclusions can be made. Ultimately, we plan to evaluate whether effects differ across studies depending on levels of bias risk. Carefully coding risk of bias is critical because if there are certain biases are normative across trials (e.g., lack of blinding), meta-analytic analyses could amplify these biases.

There are also additional limitations inherent in study-level meta-analyses. Meta-analyses do not allow for conclusions to be drawn about individual participants or groups; rather, inferences can only be drawn at the level at which the data are collected. For example, although we evaluated in the United States whether the percentage of BIPOC individuals enrolled in an intervention is predictive of effect magnitude, we cannot draw conclusions about the relative benefits of perinatal interventions for BIPOC and non-BIPOC individuals from this analysis. We can only draw inferences about

whether studies that enroll a higher percentage of BIPOC participants yield, on average, stronger effects.

The proposed study also has several notable strengths including the inclusion of all relevant effect estimates available, allowing for a more precise data synthesis. Sensitivity analysis showed that regardless of the ρ value selected, coefficients for the predictors were unchanged and model estimates and standard errors remained consistent. This study was registered through PROSPERO before data collection began (CRD42023408373). All final analyses and R code will be publicly accessible to ensure research transparency and reproducibility. Additionally, the focus on addressing potential sources of heterogeneity, specifically medical setting, provider type, and time may provide insight into how best to reduce the multitude of behavioral health concerns which may arise during the perinatal period, as well as further the evidence regarding the use of integrated care in perinatal settings.

Future Directions

Data extraction will continue for all publication years. Our future search will also include conference abstracts; however, effects from abstracts and non-peer-reviewed resources will not be included in our primary analyses. We will curate a list of registered trials for which we could not locate peer-reviewed outcome papers (e.g., trials with outcomes only reported in conference abstracts and trials registered on clinicaltrials.gov that have no corresponding peer-reviewed outcome papers). This will help assess the threat of publication bias and inform the interpretation of sensitivity analyses (described above), and gauge how robust our overall estimates are to systematic bias against peer-reviewed publishing of trials with null results.

The Cochrane Risk-of-Bias Tool for Randomized Trials (RoB 2) will be used as a framework to assess the risk of bias in each individual study. This tool will include assessment of biases that may result from five domains: the randomization process, deviations from intended interventions utilizing an intention-to-treat analysis, missing outcome data, measurement of the outcome, and selection of the reported results (Higgins et al., 2022). Studies will be allocated a judgment of high concern, some concern, or low concern for each domain using pre-established signaling questions and tool algorithms, with an end overall risk of bias judgement which will be used during data synthesis. A sensitivity analysis will be done to assess the effects of limiting data analysis to studies that show low risk of bias, assuming there are any (*Risk of Bias 2 (RoB 2) Tool | Cochrane Methods*, n.d.). In addition to providing an assessment of bias risk in individual trials, we will use the G.R.A.D.E. framework to provide an overall evaluation of the strength of evidence in the literature as a whole for perinatal depression interventions (Meader et al., 2014).

Conclusion

In sum, this interim study highlights that the conditions under which perinatal depression interventions are effective is more complex than is typically stated in broad summaries. The current study describes mixed findings for integrated care approaches when setting and provider are explicitly considered. Psychosocial intervention delivery has shown some indication to be effective within medical settings, however evidence for intervention delivery within medical settings specifically by mental health professionals is not as compelling. The potential for pinpointing this uncertainty may be crucial in

developing interventions that target the behavioral health needs accurately for the perinatal population.

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Appendix A

PROSPERO Protocol

PROSPERO
International prospective register of systematic reviews

NHS National Institute for Health Research

UNIVERSITY of York
Centre for Reviews and Dissemination

Systematic review

This record cannot be edited because it has been marked as out of scope

1. * Review title.

Give the title of the review in English

A Systematic Review and Meta-Analysis of Perinatal Depression Interventions: Evaluating Effect Durability and Relative Effectiveness of Integrated Care Models

2. Original language title.

For reviews in languages other than English, give the title in the original language. This will be displayed with the English language title.

3. * Anticipated or actual start date.

Give the date the systematic review started or is expected to start.

02/04/2022

4. * Anticipated completion date.

Give the date by which the review is expected to be completed.

02/09/2023

5. * Stage of review at time of this submission.

This field uses answers to initial screening questions. It cannot be edited until after registration.

Tick the boxes to show which review tasks have been started and which have been completed.

Update this field each time any amendments are made to a published record.

The review has not yet started: No

Review stage	Started	Completed
Preliminary searches	Yes	Yes
Piloting of the study selection process	Yes	Yes
Formal screening of search results against eligibility criteria	Yes	No
Data extraction	No	No
Risk of bias (quality) assessment	No	No
Data analysis	No	No

Provide any other relevant information about the stage of the review here.

6. * Named contact.

The named contact is the guarantor for the accuracy of the information in the register record. This may be any member of the review team.

Anisha Satish

Email salutation (e.g. "Dr Smith" or "Joanne") for correspondence:

Anisha

7. * Named contact email.

Give the electronic email address of the named contact.

satish27@rowan.edu

8. Named contact address

Give the full institutional/organisational postal address for the named contact.

Rowan University, Glassboro, NJ, 08028, USA

9. Named contact phone number.

Give the telephone number for the named contact, including international dialling code.

1-856-256-4500, ext. 5-3525

10. * Organisational affiliation of the review.

Full title of the organisational affiliations for this review and website address if available. This field may be

completed as 'None' if the review is not affiliated to any organisation.

Rowan University

Organisation web address:

https://csm.rowan.edu/departments/psychology/

11. * Review team members and their organisational affiliations.

Give the personal details and the organisational affiliations of each member of the review team. Affiliation refers to groups or organisations to which review team members belong. **NOTE: email and country now MUST be entered for each person, unless you are amending a published record.**

Anisha Satish. Rowan University
Dr Steven Brunwasser. Rowan University
Brook Matthews. Rowan University
Desiree Browser. Rowan University
Samantha Mindlin. Rowan University
Soorya Baliga. Rowan University
Ashleigh D'Cruz. Rowan University
Shriya Patel. Rowan University
Kathryn Brennan. Rowan University

12. * Funding sources/sponsors.

Details of the individuals, organizations, groups, companies or other legal entities who have funded or sponsored the review.

Rowan University Internal Funding

Grant number(s)

State the funder, grant or award number and the date of award

13. * Conflicts of interest.

List actual or perceived conflicts of interest (financial or academic).

None

14. Collaborators.

Give the name and affiliation of any individuals or organisations who are working on the review but who are not listed as review team members. **NOTE: email and country must be completed for each person, unless you are amending a published record.**

15. * Review question.

State the review question(s) clearly and precisely. It may be appropriate to break very broad questions down into a series of related more specific questions. Questions may be framed or refined using PI(E)COS or similar where relevant.

1. How strong is the existing published evidence for the effects of perinatal depression interventions on depressive symptoms?

2. To what extent are the effects of perinatal depression interventions durable?

3. If beneficial effects are observed across studies, to what degree is there risk of bias in these studies, and to what degree does this reduce our confidence in the public health benefits of perinatal depression interventions?

4. Are the effects of perinatal depression interventions modified by whether care is provided in medical settings versus outside of medical settings?

5. Are the effects of perinatal depression interventions modified by whether mental-health specialists versus non-mental health specialists deliver them?

6. If there is enough data, is there evidence of an interaction between intervention provider type (mental-health professional versus non-mental-health professional) and setting (medical setting versus non-medical setting)?

16. * Searches.

State the sources that will be searched (e.g. Medline). Give the search dates, and any restrictions (e.g. language or publication date). Do NOT enter the full search strategy (it may be provided as a link or attachment below.)

PubMed, MEDLINE (ProQuest), PsycArticles, and PsycINFO. An initial search strategy was developed in collaboration with a library and information specialist.

Search dates (from and to): To 10/27/2022

Restrictions on the search including language and publication period: None

Whether searches will be re-run prior to the final analysis: Yes

Whether unpublished studies will be sought: No

17. URL to search strategy.

Upload a file with your search strategy, or an example of a search strategy for a specific database, (including the keywords) in pdf or word format. In doing so you are consenting to the file being made publicly accessible. Or provide a URL or link to the strategy. Do NOT provide links to your search **results**.

https://www.crd.york.ac.uk/PROSPEROFILES/408373_STRATEGY_20230315.pdf

Alternatively, upload your search strategy to CRD in pdf format. Please note that by doing so you are consenting to the file being made publicly accessible.

Do not make this file publicly available until the review is complete

18. * Condition or domain being studied.

Give a short description of the disease, condition or healthcare domain being studied in your systematic review.

Depressive symptoms and disorders as measured by instruments whose psychometric properties have been established in prior studies.

19. * Participants/population.

Specify the participants or populations being studied in the review. The preferred format includes details of both inclusion and exclusion criteria.

Perinatal population (individuals receiving depression interventions during pregnancy to 1-year postpartum).

20. * Intervention(s), exposure(s).

Give full and clear descriptions or definitions of the interventions or the exposures to be reviewed. The preferred format includes details of both inclusion and exclusion criteria.

Skill-based psychosocial/behavioral treatment or prevention interventions targeting depression delivered during the perinatal period. Combined psychosocial and pharmacological treatment conditions will be excluded unless we can isolate the effect of the psychosocial intervention. Interventions that involve only psychoeducation (only providing information about mental health or related concepts), screening, referral, or any other interventions that are not predicated on imparting psychological or behavioral coping skills will not be included. Interventions that require medical devices to achieve their intervention effects (e.g., acupuncture, deep brain stimulation, etc.) will be excluded unless accompanied by psychological/behavioral coping skills training and the effect of the psychosocial/behavioral component can be isolated from the effects of the medical device.

Inclusion Criteria: Quantitative measurement of perinatal depression measured after the intervention, control condition, random allocation to study arms (including using pseudo-random number generators), English language, human participants, intervention takes place during pregnancy or in the 1-year postpartum following a live birth.

Exclusion Criteria: No quantitative measurement of depression following the intervention and before 12 months postpartum using an instrument with established psychometric properties, Non-English language, not original research (review article, meta-analysis, opinion, case report, etc.), not a randomized clinical trial,

evaluates intervention that is not a skill-based psychosocial/behavioral intervention.

21. * Comparator(s)/control.

Where relevant, give details of the alternatives against which the intervention/exposure will be compared (e.g. another intervention or a non-exposed control group). The preferred format includes details of both inclusion and exclusion criteria.

Care as usual, waitlist, placebo, or a minimal intervention (brief consultation that does not exceed standard practice, provision of referrals, or psychoeducation about perinatal depression without skills training).

22. * Types of study to be included.

Give details of the study designs (e.g. RCT) that are eligible for inclusion in the review. The preferred format includes both inclusion and exclusion criteria. If there are no restrictions on the types of study, this should be stated.

Randomized Control Trials, including parallel-arm and cluster randomized trials.

23. Context.

Give summary details of the setting or other relevant characteristics, which help define the inclusion or exclusion criteria.

Studies in any healthcare or community setting (including online).

24. * Main outcome(s).

Give the pre-specified main (most important) outcomes of the review, including details of how the outcome is defined and measured and when these measurement are made, if these are part of the review inclusion criteria.

Depression symptoms or disorders as defined by DSM-III, DSM-IV, DSM-IV-TR, DSM-5, or DSM-5-TR criteria and measured using instruments with established evidence of validity.

Measures of effect

Please specify the effect measure(s) for you main outcome(s) e.g. relative risks, odds ratios, risk difference, and/or 'number needed to treat.

25. * Additional outcome(s).

List the pre-specified additional outcomes of the review, with a similar level of detail to that required for main outcomes. Where there are no additional outcomes please state ‘None’ or ‘Not applicable’ as appropriate to the review

Wellbeing: quality of life, life satisfaction, and adaptive functioning using instruments with established validity.

Offspring mental and physical health outcomes.

Measures of effect

Please specify the effect measure(s) for you additional outcome(s) e.g. relative risks, odds ratios, risk

difference, and/or 'number needed to treat.

26. * Data extraction (selection and coding).

Describe how studies will be selected for inclusion. State what data will be extracted or obtained. State how this will be done and recorded.

Primary Search Strategy: Stage 1 will consist of a rapid abstract review coded in duplicate independently to eliminate clearly irrelevant studies (e.g., case reports, non-perinatal samples, non-RCTs). All records in which either reviewer coded “don’t exclude” will be retained for the 2nd stage. Stage 2 will consist of a full-text review of any surviving records. A quality check will be done by a second reviewer for each surviving record after abstraction. Disagreements that cannot be resolved by consensus among coders will be resolved by the project PI/senior investigator who has a Ph.D. in Clinical Psychology, subject-area expertise in perinatal depression, and experience with clinical trials, meta-analyses, and systematic reviews.

Secondary Search Strategy: We will search clinical trial registries, including the National Library of Science’s ClinicalTrials.gov and the World Health Organization’s International Clinical Trials Registry Platform (for trials evaluating psychosocial treatment or prevention interventions in perinatal health settings). All searches will be documented in detail, including individuals and dates the searches were conducted, and will be provided with the final report.

Review Criteria: A study codebook has been developed and will be used for data abstraction. Information about the study design, methodology, participant demographics, and effect sizes will be recorded. Queries will be written to identify discrepancies across coders. Disagreements that cannot be resolved by consensus among coders will be resolved by the project PI/senior investigator.

Missing Data: When relevant data are not provided in published articles, we will contact the article’s corresponding author using the email address provided in the article and with any additional email addresses found online, in case the investigator changed institutions. If we do not hear back from the corresponding author within two weeks, we will attempt to contact co-authors whose contact information can be located online.

27. * Risk of bias (quality) assessment.

State which characteristics of the studies will be assessed and/or any formal risk of bias/quality assessment tools that will be used.

We will use the Cochrane Criteria Risk of Bias Tool Version 2 to assess risk of bias. A table providing all risk

of bias ratings will be provided with scholarly manuscripts. Assuming there is a sufficient range of risk-of-bias ratings, we will evaluate whether weighted mean effect estimates vary across levels of risk of bias (i.e., Does the strength of evidence for intervention effects differ depending on the level of risk of bias?).

28. * Strategy for data synthesis.

Describe the methods you plan to use to synthesise data. This **must not be generic text** but should be **specific to your review** and describe how the proposed approach will be applied to your data. If meta-analysis is planned, describe the models to be used, methods to explore statistical heterogeneity, and software package to be used.

We anticipate that most studies will provide multiple relevant effect estimates (e.g., effect estimates at multiple time points or using multiple instruments). We will include all relevant effect estimates in our analyses and relax the traditional meta-analytic assumption that all estimates are independent. To accomplish this, we will use robust variance estimation (RVE) to estimate weighted mean effects and potential effect modification using the robumeta package in R. This approach accounts for the fact that effect estimates from the same study are correlated and adjusts standard errors and confidence intervals accordingly. We will use small-sample-size adjustments in all analyses. The correlated effects model, which assumes that dependency is mostly attributable to having multiple dependent effect estimates nested within studies, will be used. To allow for the calculation of inverse variance weights, we will assume a within-study correlation of ? = 0.80. As recommended by Tipton, regression coefficient estimates with Satterthwaite df 4 will be considered unreliable. In these situations, we will seek to identify potential causes that were not captured in preliminary data screening (including high-leverage data points, unbalanced covariates, and sparse data cells) and, when indicated, rerun the model after applying corrective procedures (e.g., aggregating cells of a categorical covariate or dropping covariates with sparse cells). We will conduct several forms of sensitivity analyses. First, we will evaluate whether results are sensitive to the value of our within-study common correlation value (? = 0.80) used to approximate inverse variance weights. We will rerun each model five times, substituting ? with values ranging from 0.00 to 1.00 at intervals of 0.20, evaluating whether parameter and standard error estimates change meaningfully. Second, to evaluate the influence of individual studies on the overall results, we will rerun each model while iteratively removing one study (and all its effect sizes) at a time. Finally, we will rerun models removing studies with the highest risk of bias to gauge the extent of their influence on the results.

29. * Analysis of subgroups or subsets.

State any planned investigation of 'subgroups'. Be clear and specific about which type of study or participant will be included in each group or covariate investigated. State the planned analytic approach.

Our planned primary model will include covariates representing potential effect modifiers:

where $\gamma_{0j} = \gamma_{00} + \gamma_{01} w_j + u_{0j}$ and $\beta_{1j} = \gamma_{10} + \gamma_{11} w_j + u_{1j}$, γ_{00} is the overall mean of the distribution of population effect

sizes; ?10 & ?20 = regression weights for covariates (xij) whose values vary within studies; ?01,?02 = regression weights for covariates (wj) whose values are constant within studies; ?02 = regression weight for the interaction among study-level characteristics; eij = within-study sampling error; uj = between-study deviations from the population average effect size. The model covariates are defined as follows:

x1ij = linear time effect: coded in approximate months from the intervention

x2ij = non-linear time effect: nonlinear effect using restricted cubic spline

w1j = study setting: 0 = study took place outside of medical setting; 1 = study took place within a medical setting (e.g., prenatal, pediatric, or primary care clinic)

w2j = provider: 0 = non-mental-health professional; 1 = mental-health professional

w3j = setting*provider interaction

Our primary model may need to be reduced if the number of studies and effect estimates is fewer than anticipated. We will conduct separate models for treatment and prevention studies. Additionally, we will run the models using in the subset of studies with the lowest risk of bias to gauge the plausibility that high-risk-of-bias studies strongly affected coefficient estimates.

30. * Type and method of review.

Select the type of review, review method and health area from the lists below.

Type of review

Cost effectiveness
No

Diagnostic
No

Epidemiologic
No

Individual patient data (IPD) meta-analysis
No

Intervention
No

Living systematic review
No

Meta-analysis
Yes

Methodology
No

Narrative synthesis
No

Network meta-analysis
No

Pre-clinical
No

Prevention
No

Prognostic
No

Prospective meta-analysis (PMA)
No

Review of reviews
No

Service delivery
No

Synthesis of qualitative studies
No

Systematic review
Yes

Other
No

Health area of the review

Alcohol/substance misuse/abuse
No

Blood and immune system
No

Cancer
No

Cardiovascular
No

Care of the elderly
No

Child health
No

Complementary therapies
No

COVID-19
No

Crime and justice
No

Dental
No

Digestive system
No

Ear, nose and throat
No

Education
No

Endocrine and metabolic disorders
No

Eye disorders
No

General interest
No

Genetics
No

Health inequalities/health equity
No

Infections and infestations
No

International development
No

Mental health and behavioural conditions
Yes

Musculoskeletal

No

Neurological
No

Nursing
No

Obstetrics and gynaecology
Yes

Oral health
No

Palliative care
No

Perioperative care
No

Physiotherapy
No

Pregnancy and childbirth
Yes

Public health (including social determinants of health)
No

Rehabilitation
No

Respiratory disorders
No

Service delivery
No

Skin disorders
No

Social care
No

Surgery
No

Tropical Medicine
No

Urological
No

Wounds, injuries and accidents

No

Violence and abuse

No

31. Language.

Select each language individually to add it to the list below, use the bin icon to remove any added in error.

English

There is not an English language summary

32. * Country.

Select the country in which the review is being carried out. For multi-national collaborations select all the countries involved.

United States of America

33. Other registration details.

Name any other organisation where the systematic review title or protocol is registered (e.g. Campbell, or The Joanna Briggs Institute) together with any unique identification number assigned by them. If extracted data will be stored and made available through a repository such as the Systematic Review Data Repository (SRDR), details and a link should be included here. If none, leave blank.

34. Reference and/or URL for published protocol.

If the protocol for this review is published provide details (authors, title and journal details, preferably in Vancouver format)

Add web link to the published protocol.

Or, upload your published protocol here in pdf format. Note that the upload will be publicly accessible.

No I do not make this file publicly available until the review is complete

Please note that the information required in the PROSPERO registration form must be completed in full even if access to a protocol is given.

35. Dissemination plans.

Do you intend to publish the review on completion?

Yes

Give brief details of plans for communicating review findings.?

A manuscript will be written and submitted to a relevant journal in this field.

36. Keywords.

Give words or phrases that best describe the review. Separate keywords with a semicolon or new line. Keywords help PROSPERO users find your review (keywords do not appear in the public record but are included in searches). Be as specific and precise as possible. Avoid acronyms and abbreviations unless these are in wide use.

Systematic review; meta-analysis, mental health; behavioral health; perinatal; pregnancy; integrated care

37. Details of any existing review of the same topic by the same authors.

If you are registering an update of an existing review give details of the earlier versions and include a full bibliographic reference, if available.

38. * Current review status.

Update review status when the review is completed and when it is published.New registrations must be ongoing so this field is not editable for initial submission.

Please provide anticipated publication date

Review_Ongoing

39. Any additional information.

Provide any other information relevant to the registration of this review.

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40. Details of final report/publication(s) or preprints if available.

Leave empty until publication details are available OR you have a link to a preprint (NOTE: this field is not editable for initial submission). List authors, title and journal details preferably in Vancouver format.

Give the link to the published review or preprint.

Appendix B

Database Search Strings

Base Search String:

((("Intervention") OR ("Trial") OR (RCT) OR ("Treatment") OR ("Approach") OR ("Prevention")) AND ((“perinatal”) OR (“maternal”) OR (“pregnancy”) OR (“antenatal”) OR (“prenatal”) OR (“postnatal”) OR (“prepartum”) OR (“postpartum”) OR (“peripartum”) OR (“antepartum”)) AND ((depress) OR (“mood”) OR ("mental health") OR (“wellness”) OR ("well-being")))*

Medline (ProQuest), PsycArticles, PsycInfo: ((("Intervention") OR ("Trial") OR (RCT) OR ("Treatment") OR ("Approach") OR ("Prevention")) AND (("perinatal") OR ("maternal") OR ("pregnancy") OR ("antenatal") OR ("prenatal") OR ("postnatal") OR ("prepartum") OR ("postpartum") OR ("peripartum") OR ("antepartum")) AND ((depress*) OR ("mood") OR ("mental health") OR ("wellness") OR ("well-being"))) AND (la.exact("ENG") AND me.exact(("Clinical Trial" OR "Treatment Outcome") NOT ("Interview" OR "Qualitative Study" OR "Literature Review" OR "Systematic Review" OR "Clinical Case Study" OR "Meta Analysis" OR "Focus Group" OR "Mathematical Model" OR "Nonclinical Case Study" OR "Metasynthesis" OR "Scientific Simulation")) AND po.exact("Human"))

PubMed with Base Search String – Filter Modification with Randomized Controlled Trial (Article Type)

Appendix C

Study Codebook

Data Dictionary Codebook

07/18/2023 8:47pm

	#	Variable / Field Name	Field Label *Field Note*	Field Attributes (Field Type, Validation, Choices, Calculations, etc.)
Instrument: **Study** (study)				
	1	[record_id]	Record ID	text
	2	[abstractid]	Abstract ID number	text, Required
	3	[reviewer]	Reviewer Name	dropdown 1, Anisha 2, Brook 3, Desi 4, Sami 5, Steve 6, Sierra 7, Kathryn 8, Soorya Field Annotation: 1
	4	[article_name]	Study Name *Last name of the first author of the first chronological article describing the study and the year of the first article (e.g., Satish 2020)*	text
	5	[article1_title]	Title of the First Article	text
	6	[citation]	Full Citation Article 1 (APA Format)	notes
	7	[multiplearticles]	Are there multiple articles providing data for the same study?	yesno 1, Yes 0, No
	8	[article2_title] Show the field ONLY if: [multiplearticles] = '1'	Title of the Second Article	text
	9	[citation_2] Show the field ONLY if: [multiplearticles] = '1'	Full Citation Article 2 (APA Format)	notes
	10	[article3_title] Show the field ONLY if: [multiplearticles] = '1'	Title of the Third Article	text
	11	[citation_3] Show the field ONLY if: [multiplearticles] = '1'	Full Citation Article 3 (APA Format)	notes
	12	[article4_title] Show the field ONLY if: [multiplearticles] = '1'	Title of the Fourth Article	text
	13	[citation_4] Show the field ONLY if: [multiplearticles] = '1'	Full Citation Article 4 (APA Format)	notes
	14	[yesno_exclude_abstract]	Should this study be excluded?	dropdown 1, Yes

				2 No 3 Unsure Field Annotation: @DEFAULT = '2'
	15	[why_exclude_abstract] Show the field ONLY if: [yesno_exclude_abstract] = '1'	Why did you exclude this study?	checkbox 1 why_exclude_abstract___1 Not a clinical trial (e.g., observational study, case report, review paper, etc.) 2 why_exclude_abstract___2 Not focused on perinatal population 3 why_exclude_abstract___3 Not evaluating a psychosocial intervention 4 why_exclude_abstract___4 No mention of depression or related outcomes 5 why_exclude_abstract___5 Study protocol or description for a clinical trial (no outcome data) 6 why_exclude_abstract___6 Not human population 7 why_exclude_abstract___7 Language other than English 8 why_exclude_abstract___8 Article from study already entered (merge with existing record) 9 why_exclude_abstract___9 Other (explain)
	16	[linked_study] Show the field ONLY if: [why_exclude_abstract(8)] = '1'	What existing abstract ID should this study be linked to?	text (number)
	17	[other_why_exclude_abstract] Show the field ONLY if: [why_exclude_abstract(9)] = '1'	Other: Why did you exclude this study? (Be specific)	notes
	18	[notes_exclude_abstract] Show the field ONLY if: [yesno_exclude_abstract] = '1'	Any other notes about the excluded study	notes
	19	[unsure_exclude_abstract] Show the field ONLY if: [yesno_exclude_abstract] = '3'	What makes you unsure? Be specific (include page numbers to relevant information)	notes
	20	[final_decision] Show the field ONLY if:	The final decision was made by which coder?	dropdown 1 Anisha

		[yesno_exclude_abstract] = '1'		2 Brook 3 Desi 4 Sami 5 Steve
	21	[final_decision_date] Show the field ONLY if: [yesno_exclude_abstract] = '1'	What was the date of the final decision?	text (date_mdy)
	22	[linked_article]	Is this one of the multiple articles from a single study/cohort?	radio 1 Yes 2 No 3 Unclear
	23	[linked_article_which] Show the field ONLY if: [linked_article] = '1'	What other articles are from the same study/cohort?	notes
	24	[year]	Year of Publication	text
	25	[country]	In what country was the study conducted?	dropdown (autocomplete) 1 Afghanistan 2 Albania 3 Algeria 4 Andorra 5 Angola 6 Antigua & Deps 7 Argentina 8 Armenia 9 Australia 10 Austria 11 Azerbaijan 12 Bahamas 13 Bahrain 14 Bangladesh 15 Barbados 16 Belarus 17 Belgium 18 Belize 19 Benin 20 Bhutan 21 Bolivia 22 Bosnia Herzegovina 23 Botswana 24 Brazil 25 Brunei 26 Bulgaria 27 Burkina 28 Burundi 29 Cambodia

30	Cameroon
31	Canada
32	Cape Verde
33	Central African Rep
34	Chad
35	Chile
36	China
37	Colombia
38	Comoros
39	Congo
40	Congo (Democratic Rep)
41	Costa Rica
42	Croatia
43	Cuba
44	Cyprus
45	Czech Republic
46	Denmark
47	Djibouti
48	Dominica
49	Dominican Republic
50	East Timor
51	Ecuador
52	Egypt
53	El Salvador
54	Equatorial Guinea
55	Eritrea
56	Estonia
57	Ethiopia
58	Fiji
59	Finland
60	France
61	Gabon
62	Gambia
63	Georgia
64	Germany
65	Ghana
66	Greece
67	Grenada
68	Guatemala
69	Guinea
70	Guinea-Bissau
71	Guyana
72	Haiti
73	Honduras
74	Hungary

75	Iceland
76	India
77	Indonesia
78	Iran
79	Iraq
80	Ireland (Republic)
81	Israel
82	Italy
83	Ivory Coast
84	Jamaica
85	Japan
86	Jordan
87	Kazakhstan
88	Kenya
89	Kiribati
90	Korea North
91	Korea South
92	Kosovo
93	Kuwait
94	Kyrgyzstan
95	Laos
96	Latvia
97	Lebanon
98	Lesotho
99	Liberia
100	Libya
101	Liechtenstein
102	Lithuania
103	Luxembourg
104	Macedonia
105	Madagascar
106	Malawi
107	Malaysia
108	Maldives
109	Mali
110	Malta
111	Marshall Islands
112	Mauritania
113	Mauritius
114	Mexico
115	Micronesia
116	Moldova
117	Monaco
118	Mongolia
119	Montenegro

120	Morocco
121	Mozambique
Myanmar	(Burma)
122	Namibia
123	Nauru
124	Nepal
125	Netherlands
126	New Zealand
127	Nicaragua
128	Niger
129	Nigeria
130	Norway
131	Oman
132	Pakistan
133	Palau
134	Panama
135	Papua New Guinea
136	Paraguay
137	Peru
138	Philippines
139	Poland
140	Portugal
141	Qatar
142	Romania
143	Russian Federation
144	Rwanda
145	St Kitts & Nevis
146	St Lucia
147	Saint Vincent & the Grenadines
148	Samoa
149	San Marino
150	Sao Tome & Principe
151	Saudi Arabia
152	Senegal
153	Serbia
154	Seychelles
155	Sierra Leone
156	Singapore
157	Slovakia
158	Slovenia
159	Solomon Islands
160	Somalia
161	South Africa
162	South Sudan
163	Spain

				164 Sri Lanka 165 Sudan 166 Suriname 167 Swaziland 168 Sweden 169 Switzerland 170 Syria 171 Taiwan 172 Tajikistan 173 Tanzania 174 Thailand 175 Togo 176 Tonga 177 Trinidad & Tobago 178 Tunisia 179 Turkey 180 Turkmenistan 181 Tuvalu 182 Uganda 183 Ukraine 184 United Arab Emirates 185 United Kingdom 186 United States 187 Uruguay 188 Uzbekistan 189 Vanuatu 190 Vatican City 191 Venezuela 192 Vietnam 193 Yemen 194 Zambia 195 Zimbabwe
	26	[country_income]	Based on the World Bank classifications, select all that apply for the countries included in the study. *Note: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups*	checkbox 1 country_income___1 Low-income 2 country_income___2 Lower-middle income 3 country_income___3 Upper-middle income 4 country_income___4 High income 5 country_income___5 Unclear
	27	[participants_age]	Section Header: *Eligibility & Selection* What was the mean or median age of participants?	text
	28	[participants_number]	What was the total number of participants at the time of randomization?	text
	29	[participants_bipoc]	What was the percentage of BIPOC participants (Black, Indigenous, People of Color)?	radio 1 Less than 5% 2 5-15%

				3 16-25% 4 26-50% 5 51-75% 6 76-85% 7 86% or higher 8 Not indicated
	30	[sx_cut_point]	Did participants have to have certain levels of symptoms to be eligible for the study (check all that apply)?	checkbox 1 sx_cut_point___1 Yes, they had to meet a cut point for diagnosis 2 sx_cut_point___2 Yes, they had to be above a cut point for high-risk symptoms, but below a cutpoint for diagnosis 3 sx_cut_point___3 No 4 sx_cut_point___4 Not indicated
	31	[participants_risk]	Did participants have to have a known risk factor for depression in order to be eligible to participate in the study? (e.g., past depression diagnosis, trauma history, substance use). Or is any pregnant participant allowed to participate regardless of risk-level? *Note: Pregnancy should not be considered a risk factor. Only code "risk-based" if the participants had a risk factor unrelated to the usual symptoms pregnancy.*	radio 1 Risk-based 2 Not risk-based
	32	[participants_risk_type] Show the field ONLY if: [participants_risk] = '1'	What was/were the risk factors influencing selection for the study? *Note: Select all that apply*	checkbox 1 participants_risk_type___1 Past depression diagnosis 2 participants_risk_type___2 Other past mental health history 3 participants_risk_type___3 Trauma 4 participants_risk_type___4 Substance use 5 participants_risk_type___5 Poverty/low income 6 participants_risk_type___6 Domestic violence 7 participants_risk_type___7 Single parent 8 participants_risk_type___8 Medical history 9 participants_risk_type___9 Racial/ethnicity or high-risk identity group 10 participants_risk_type___10 Existing sleep problems 11 participants_risk_type___11 Past pregnancy complications 12 participants_risk_type___12 Age-related 13 participants_risk_type___13 Other
	33	[participant_risk_type_other] Show the field ONLY if: [participants_risk_type(13)] = '1'	Other: What was the risk factor?	notes

	34	[parity]	Were participants required to be of a certain parity? If so, which? Select "No restrictions" if parity was not part of the inclusion/exclusion criteria.	checkbox 1 parity___1 Nulliparous 2 parity___2 Primiparous 3 parity___3 Multiparous 4 parity___4 No restrictions 5 parity___5 Not indicated
	35	[criteria_include]	What was the study inclusion criteria?	notes
	36	[criteria_exclude]	What was the study exclusion criteria?	notes
	37	[healthcare_setting]	Were patients recruited in a healthcare setting?	checkbox 1 healthcare_setting___1 Fully 2 healthcare_setting___2 Partly 3 healthcare_setting___3 Not at all 4 healthcare_setting___4 Not indicated
	38	[healthcare_setting_yes] Show the field ONLY if: [healthcare_setting(1)] = '1' or [healthcare_setting(2)] = '1'	Where was the healthcare setting? *Note: You can copy and paste directly from article*	notes
	39	[intervention_setting]	Section Header: *Psychosocial Intervention* Where was the intervention delivered? i.e., Where did the participants receive training in the intervention skills? *They may receive training in one setting (e.g., medical clinic) but implement the skills in another (e.g., home). We want the place(s) where they received the training.*	checkbox 1 intervention_setting___1 Hospital/Medical Center 2 intervention_setting___2 Outpatient Healthcare Facility 3 intervention_setting___3 University/Research Center 4 intervention_setting___4 Community 5 intervention_setting___5 Online 6 intervention_setting___6 Phone 7 intervention_setting___7 Mail/Written 8 intervention_setting___8 Home 9 intervention_setting___9 Other
	40	[other_intervention_setting] Show the field ONLY if: [intervention_setting(9)] = '1'	Other: Where was the intervention delivered?	notes
	41	[team_role]	What was the role of the research team?	checkbox 1 team_role___1 Recruitment 2 team_role___2 Intervention Administration 3 team_role___3 Intervention Delivery 4 team_role___4 Data Collection 5 team_role___5 Payment 6 team_role___6 Not indicated
	42	[intervention_recruitment] Show the field ONLY if: [team_role(1)] = '1'	Was the research team responsible for recruitment?	radio 1 Fully 2 Partly 3 Not at all

				4 Not indicated
	43	[providers_team] Show the field ONLY if: [team_role(2)] = '1' or [team_role(3)] = '1'	To what degree did the research team participate in delivering the intervention?	radio 1 Fully 2 Partly 3 Not at all 4 Not indicated
	44	[providers]	Who were the intervention providers?	checkbox 1 providers___1 Online 2 providers___2 Mental Health Professionals 3 providers___3 Medical (non-mental health) professionals (OB/GYN, midwife, doula, etc.) 4 providers___4 Peers/community advocates (non-healthcare professionals) 5 providers___5 Other
	45	[providers_other] Show the field ONLY if: [providers(5)] = '1'	Other: Who were the intervention providers?	notes
	46	[intervention_providers_desc]	Describe the intervention providers *Note: You can copy and paste directly from article*	notes
	47	[providers_training]	Was there training for the intervention providers?	radio 1 Yes 2 No 3 Not indicated
	48	[providers_training_who] Show the field ONLY if: [providers_training] = '1'	Who provided the training for the intervention providers?	checkbox 1 providers_training_who___1 Mental Health Professionals 2 providers_training_who___2 Non Mental Health Professionals 3 providers_training_who___3 Not indicated
	49	[providers_training_time] Show the field ONLY if: [providers_training] = '1'	How many hours of training were given to the intervention providers?	text
	50	[providers_training_team] Show the field ONLY if: [providers_training] = '1'	Were the trainers part of the research team?	radio 1 Yes 2 No 3 Not indicated
	51	[population]	What population(s) is the intervention studying? (i.e., who was the intervention delivered to?) *Note: Study should not be included if pregnant individuals are not one of the targets*	checkbox 1 population___1 Pregnant Individuals 2 population___2 Postpartum Individuals 3 population___3 Partners of Pregnant Individuals 4 population___4 Other Family Members 5 population___5 Other
	52	[population_other] Show the field ONLY if:	Other: What population(s) was the intervention delivered to?	notes

		[population(4)] = '1' or [population(5)] = '1'		
	53	[intervention_target]	Who was the intervention ultimately for? (i.e., who is the target?; who is being measured?) *Note: Study should not be included if pregnant individuals are not one of the targets*	checkbox 1 intervention_target___1 Pregnant Individuals 2 intervention_target___2 Postpartum Individuals 3 intervention_target___3 Partners of Pregnant Individuals 4 intervention_target___4 Other Family Members 5 intervention_target___5 Other
	54	[intervention_target_other] Show the field ONLY if: [intervention_target(4)] = '1' or [intervention_target(5)] = '1'	Other: Who was the intervention ultimately for?	notes
	55	[intervention_type]	What was the intervention type? *Note: Select all that apply; Click other too to copy and paste text describing intervention*	checkbox 1 intervention_type___1 Acceptance and commitment therapy 2 intervention_type___2 Behavioral activation 3 intervention_type___3 Behavior change (health-related) 4 intervention_type___4 Bibliotherapy 5 intervention_type___5 Cognitive analytic therapy 6 intervention_type___6 Cognitive behaviour therapy 7 intervention_type___7 Dialectical behaviour therapy 8 intervention_type___8 Family therapy 9 intervention_type___9 Interpersonal therapy 10 intervention_type___10 Journaling 11 intervention_type___11 Mentalisation-based therapy 12 intervention_type___12 Mindfulness 13 intervention_type___13 Motivational interviewing 14 intervention_type___14 Parenting Intervention 15 intervention_type___15 Physical contact (Breastfeeding Skills, Touch Intervention) 16 intervention_type___16 Psychodynamic psychotherapy 17 intervention_type___17 Sleep hygiene 18 intervention_type___18 Spiritual

				19 | intervention_type___19 | Supportive psychotherapy 20 | intervention_type___20 | Other
	56	[intervention_type_other] Show the field ONLY if: [intervention_type(3)] = '1' or [intervention_type(20)] = '1'	Other: What was the intervention type?	notes
	57	[intervention_format]	What was the intervention format? *This refers to the format when participants were learning the skills, not when they were implementing the skills.*	checkbox 1 | intervention_format___1 | Individual Session 2 | intervention_format___2 | Group Session (Multiple pregnant individuals) 3 | intervention_format___3 | Family Session 4 | intervention_format___4 | Other
	58	[treatment_format_other] Show the field ONLY if: [intervention_format(4)] = '1'	Other: What was the intervention format?	notes
	59	[intervention_delivery]	How was the intervention delivered? *Note: Select all that apply*	checkbox 1 | intervention_delivery___1 | In-person 2 | intervention_delivery___2 | Online 3 | intervention_delivery___3 | Telehealth 4 | intervention_delivery___4 | Mobile app 5 | intervention_delivery___5 | Bibliotherapy 6 | intervention_delivery___6 | Other
	60	[treatment_delivery_other] Show the field ONLY if: [intervention_delivery(6)] = '1'	Other: How was the intervention delivered?	notes
	61	[medical_intervention]	Was the treatment combined with a medical intervention?	yesno 1 | Yes 0 | No
	62	[medical_intervention_desc] Show the field ONLY if: [medical_intervention] = '1'	Describe the medical intervention	notes
	63	[intervention_faciliator]	Was there an intervention facilitator?	radio 1 | Yes 2 | No 3 | Not indicated
	64	[faciliator_role] Show the field ONLY if: [intervention_faciliator] = '1'	What was the role of the facilitator? *Note: Select all that apply*	checkbox 1 | faciliator_role___1 | Teach intervention skills 2 | faciliator_role___2 | Send reminders/texts 3 | faciliator_role___3 | Monitor the intervention 4 | faciliator_role___4 | Not indicated

				5 facilliator_role___5 Other
	65	[faciliator_role_other] Show the field ONLY if: [facilliator_role(5)] = '1'	Other: What was the role of the facilitator?	notes
	66	[intervention_fidelity]	Did they check whether the intended intervention skills were delivered or not?	radio 1 Yes 2 No 3 Not indicated
	67	[intervention_pace]	Was the intervention self-paced?	radio 1 Yes 2 No 3 Not indicated
	68	[intervention_supervision]	Was there ongoing supervision for the delivery of the intervention?	radio 1 Yes 2 No 3 Not indicated
	69	[intervention_quality]	Did they rate the quality of delivery?	radio 1 Yes 2 No 3 Not indicated
	70	[intervention_dose]	Did they report the dose of the intervention the person completed? (e.g., How many sessions/modules did they complete? What was the length of the intervention? How much time was spent in an app? How many in-person sessions did they attend?) *Copy and paste/Be specific*	notes
	71	[intervention_outside]	Was there any homework or completing assignments/skill-based activities outside of the intervention groups? If online, did you have to complete exercises outside of the main sessions to practice the skills that were taught?	radio 1 Yes 2 No 3 Not indicated
	72	[controltype]	Section Header: *Control Group* What type of control group was used?	checkbox 1 controltype___1 Usual care 2 controltype___2 Waitlist 3 controltype___3 Minimal intervention beyond usual care (e.g., psychoed) 4 controltype___4 Active control 5 controltype___5 No info 6 controltype___6 Other (describe in next field)
	73	[controldesc]	Describe the control group	notes
	74	[depprimary]	Section Header: *Study Design* Was depression (disorder or symptoms) the primary outcome of the study? *(if available and not clearly stated in the article, check clinicaltrials.gov which lists the primary outcomes (endpoint).*	dropdown 1 Yes 2 No 3 Not indicated/Unclear
	75	[study_design]	What was the study design for the RCT?	radio 1 Parallel-group 2 Cluster

				3 Crossover 4 Factorial 5 Other
	76	[study_design_other] Show the field ONLY if: [study_design] = '5'	Other: What was the study design?	notes
	77	[type_trial]	What type of trial?	checkbox 1 type_trial___1 Treatment Trial 2 type_trial___2 Prevention Trial
	78	[type_trial_prevention] Show the field ONLY if: [type_trial(2)] = '1'	What kind of prevention trial? *Note: Select all that apply*	checkbox 1 type_trial_prevention___1 Universal 2 type_trial_prevention___2 Selected 3 type_trial_prevention___3 Indicated
	79	[study_design_notes]	Additional notes about study design	notes
	80	[coch1desc]	Section Header: *Cochrane Risk of Bias Assessment* Describe the method used for random sequence generation. Was the allocation sequence concealed until participants were enrolled and assigned to the intervention? Do you have any concerns about the randomization process? *Copy and paste; Address all questions*	notes
	81	[coch2desc]	Describe the method used to conceal the allocation sequence in sufficient detail to determine whether intervention allocations could have been foreseen in advance of, or during enrollment.	notes
	82	[coch2desc2]	Were there failures in implementing the intervention that could have affected the outcome? Was there non-adherence to the assigned intervention that could have affected participants' outcomes?	notes
	83	[coch3desc]	Describe all measures used, if any, to blind study participants and personnel from knowledge of which intervention a participant received. Provide any information relating to whether the intended blinding was effective.	notes
	84	[coch4desc]	Describe all measures used, if any, to blind outcome assessors from knowledge of which intervention a participant received. Provide any information relating to whether the intended blinding was effective.	notes
	85	[coch5desc]	Describe the completeness of outcome data for each main outcome, including attrition and exclusions from the analysis. State whether attrition and exclusions were reported, the numbers in each intervention group (compared with total randomized participants), reasons for attrition/exclusions where reported, and any re-inclusions in analyses performed by the review authors.	notes
	86	[coch6desc]	State how the possibility of selective outcome reporting was examined by the review authors, and what was found.	notes
	87	[coch7desc]	State any important concerns about bias not addressed in the other domains in the tool.	notes
	88	[coding_problems]	Important notes related to coding the study. Were there any challenges that could not be resolved?	notes
	89	[quality_check]	Reviewer for Quality Check *Remember to change from unverified to completed*	dropdown 1 Anisha

				2 Ashleigh 3 Brook 4 Desi 5 Katie 6 Sami 7 Shriya 8 Soorya 9 Steve
	90	[study_complete]	Section Header: *Form Status* Complete?	dropdown 0 Incomplete 1 Unverified 2 Complete
Instrument: **Effect Sizes** (effect_sizes)				
	91	[table_image]	Upload Images of Data Tables	file
	92	[time]	How many months from birth? *Note: "At birth" would be 0; 5 weeks post-natal would be 1.25*	text
	93	[monthsint]	Months from the intervention *This is the number of months from the intervention. Put -1 for the baseline (pre-intervention assessment), 0 for the post assessment, and the number of months for all follow-up assessments*	text Field Annotation: This is the number of months from the intervention. Put -1 for the baseline (pre-intervention assessment), 0 for the post assessment, and the number of months for all follow-up assessments
	94	[intervention_group]	What was the intervention group?	text Field Annotation: @DEFAULT = '[intervention_group][first-instance]'
	95	[control_group]	What was the control group?	text Field Annotation: @DEFAULT = '[control_group][first-instance]'
	96	[outcome_type]	Are the outcomes at this time point categorical or continuous?	radio 1 Categorical only 2 Continuous only 3 Both
	97	[raw_odds] Show the field ONLY if: [outcome_type] = '1' or [outcome_type] = '3'	Did they report enough information to calculate a raw odds ratio?	yesno 1 Yes 0 No
	98	[measure_comp1_cat_out1] Show the field ONLY if: [raw_odds] = '1'	What measure was used? *Categorical Outcome 1; Note: Stay consistent with naming*	text
	99	[intpresent_comp1_cat_out1] Show the field ONLY if: [raw_odds] = '1'	How many individuals in the intervention group developed depression? *Categorical Outcome 1*	text
	100	[intabsent_comp1_cat_out1] Show the field ONLY if: [raw_odds] = '1'	How many individuals in the intervention group did not develop depression? *Categorical Outcome 1*	text
	101	[conpresent_comp1_cat_out1] Show the field ONLY if:	How many individuals in the control group developed depression? *Categorical Outcome 1*	text

		[raw_odds] = '1'		
	102	[conabsent_comp1_cat_out1] Show the field ONLY if: [raw_odds] = '1'	How many individuals in the control group did not develop depression? *Categorical Outcome 1*	text
	103	[notes_comp1_cat_out1] Show the field ONLY if: [raw_odds] = '1'	Any notes for this outcome? *Categorical Outcome 1*	notes
	104	[yesno_comp1_cat_out2] Show the field ONLY if: [raw_odds] = '1'	Is there another categorical outcome at this time point? *Categorical Outcome 1*	yesno 1, Yes 0, No
	105	[measure_comp1_cat_out2] Show the field ONLY if: [yesno_comp1_cat_out2] = '1'	What measure was used? *Categorical Outcome 2; Note: Stay consistent with naming*	text
	106	[intpresent_comp1_cat_out2] Show the field ONLY if: [yesno_comp1_cat_out2] = '1'	How many individuals in the intervention group developed depression? *Categorical Outcome 2*	text
	107	[intabsent_comp1_cat_out2] Show the field ONLY if: [yesno_comp1_cat_out2] = '1'	How many individuals in the intervention group did not develop depression? *Categorical Outcome 2*	text
	108	[conpresent_comp1_cat_out2] Show the field ONLY if: [yesno_comp1_cat_out2] = '1'	How many individuals in the control group developed depression? *Categorical Outcome 2*	text
	109	[conabsent_comp1_cat_out2] Show the field ONLY if: [yesno_comp1_cat_out2] = '1'	How many individuals in the control group did not develop depression? *Categorical Outcome 2*	text
	110	[notes_comp1_cat_out2] Show the field ONLY if: [yesno_comp1_cat_out2] = '1'	Any notes for this outcome? *Categorical Outcome 2*	notes
	111	[yesno_comp1_cat_out3] Show the field ONLY if: [yesno_comp1_cat_out2] = '1'	Is there another categorical outcome at this time point? *Categorical Outcome 2*	yesno 1, Yes 0, No
	112	[measure_comp1_cat_out3] Show the field ONLY if: [yesno_comp1_cat_out3] = '1'	What measure was used? *Categorical Outcome 3; Note: Stay consistent with naming*	text
	113	[intpresent_comp1_cat_out3] Show the field ONLY if: [yesno_comp1_cat_out3] = '1'	How many individuals in the intervention group developed depression? *Categorical Outcome 3*	text

	114	[intabsent_comp1_cat_out3] Show the field ONLY if: [yesno_comp1_cat_out3] = '1'	How many individuals in the intervention group did not develop depression? *Categorical Outcome 3*	text
	115	[conpresent_comp1_cat_out3] Show the field ONLY if: [yesno_comp1_cat_out3] = '1'	How many individuals in the control group developed depression? *Categorical Outcome 3*	text
	116	[conabsent_comp1_cat_out3] Show the field ONLY if: [yesno_comp1_cat_out3] = '1'	How many individuals in the control group did not develop depression? *Categorical Outcome 3*	text
	117	[notes_comp1_cat_out3] Show the field ONLY if: [yesno_comp1_cat_out3] = '1'	Any notes for this outcome? *Categorical Outcome 3*	notes
	118	[yesno_comp1_cat_out4] Show the field ONLY if: [yesno_comp1_cat_out3] = '1'	Is there another categorical outcome at this time point? *Categorical Outcome 3*	yesno 1, Yes 0, No
	119	[measure_comp1_cat_out4] Show the field ONLY if: [yesno_comp1_cat_out4] = '1'	What measure was used? *Categorical Outcome 4; Note: Stay consistent with naming*	text
	120	[intpresent_comp1_cat_out4] Show the field ONLY if: [yesno_comp1_cat_out4] = '1'	How many individuals in the intervention group developed depression? *Categorical Outcome 4*	text
	121	[intabsent_comp1_cat_out4] Show the field ONLY if: [yesno_comp1_cat_out4] = '1'	How many individuals in the intervention group did not develop depression? *Categorical Outcome 4*	text
	122	[conpresent_comp1_cat_out4] Show the field ONLY if: [yesno_comp1_cat_out4] = '1'	How many individuals in the control group developed depression? *Categorical Outcome 4*	text
	123	[conabsent_comp1_cat_out4] Show the field ONLY if: [yesno_comp1_cat_out4] = '1'	How many individuals in the control group did not develop depression? *Categorical Outcome 4*	text
	124	[notes_comp1_cat_out4] Show the field ONLY if: [yesno_comp1_cat_out4] = '1'	Any notes for this outcome? *Categorical Outcome 4*	notes
	125	[adjusted_odds] Show the field ONLY if: [raw_odds] = '0'	Did they report an adjusted odds ratio or odds ratio based on statistical modeling?	yesno 1, Yes 0, No

	126	[adjusted_odds_value] Show the field ONLY if: [adjusted_odds] = '1'	What was the odds ratio estimate?	text
	127	[adjusted_odds_se] Show the field ONLY if: [adjusted_odds] = '1'	What was the standard error of the effect size estimate?	text
	128	[measure_comp1_cont_out1] Show the field ONLY if: [outcome_type] = '2' or [outcome_type] = '3'	What measure was used? *Continuous Outcome 1; Note: Stay consistent with naming*	text
	129	[raw_smd_out1]	Did the article report sufficient information to calculate a standardized mean difference effect size estimate (i.e., Ns, means, and standard deviations for the intervention and control groups) for outcome 1? *If no to this item, skip the next several fields prompting you to enter means, SDs, and Ns. Enter the reported effect size estimate and N below.*	yesno 1 Yes 0 No
	130	[intn_comp1_cont_out1] Show the field ONLY if: [outcome_type] = '2' or [outcome_type] = '3'	How many intervention group participants completed the assessment? *Continuous Outcome 1*	text
	131	[intmean_comp1_cont_out1] Show the field ONLY if: [outcome_type] = '2' or [outcome_type] = '3'	What was the mean of the intervention group? *Continuous Outcome 1*	text
	132	[intsd_comp1_cont_out1] Show the field ONLY if: [outcome_type] = '2' or [outcome_type] = '3'	What was the standard deviation of the intervention group? *Continuous Outcome 1*	text
	133	[contn_comp1_cont_out1] Show the field ONLY if: [outcome_type] = '2' or [outcome_type] = '3'	How many control group participants completed the assessment? *Continous Outcome 1*	text
	134	[contmean_comp1_cont_out1] Show the field ONLY if: [outcome_type] = '2' or [outcome_type] = '3'	What was the mean of the control group? *Continous Outcome 1*	text
	135	[contsd_comp1_cont_out1] Show the field ONLY if: [outcome_type] = '2' or [outcome_type] = '3'	What was the standard deviation of the control group? *Continous Outcome 1*	text
	136	[out1_smd_reported] Show the field ONLY if: [raw_smd_out1] = '0'	If the article provided an estimate of the standardized mean difference (e.g., Cohen's d, Hedges's g, Glass's delta) for outcome 1, comparison 1, enter it here.	text (number)
	137	[out1_smd_se]	If the article provided a standard error for the standardized mean difference (e.g., Cohen's d, Hedges's g, Glass's delta) for outcome 1, comparison 1, enter it here.	text
	138	[notes_comp1_cont_out1] Show the field ONLY if: [outcome_type] = '2' or [outcome_type] = '3'	Any notes for this outcome? *Continuous Outcome 1*	notes

	139	[yesno_comp1_cont_out2] Show the field ONLY if: [outcome_type] = '3' or [outcome_type] = '2'	Is there another continuous outcome at this time point?	yesno 1, Yes 0, No
	140	[measure_comp1_cont_out2] Show the field ONLY if: [yesno_comp1_cont_out2] = '1'	What measure was used? *Continuous Outcome 2; Note: Stay consistent with naming*	text
	141	[intn_comp1_cont_out2] Show the field ONLY if: [yesno_comp1_cont_out2] = '1'	How many intervention group participants completed the assessment? *Continuous Outcome 2*	text
	142	[intmean_comp1_cont_out2] Show the field ONLY if: [yesno_comp1_cont_out2] = '1'	What was the mean of the intervention group? *Continuous Outcome 2*	text
	143	[intsd_comp1_cont_out2] Show the field ONLY if: [yesno_comp1_cont_out2] = '1'	What was the standard deviation of the intervention group? *Continuous Outcome 2*	text
	144	[contn_comp1_cont_out2] Show the field ONLY if: [yesno_comp1_cont_out2] = '1'	How many control group participants completed the assessment? *Continous Outcome 2*	text
	145	[contmean_comp1_cont_out2] Show the field ONLY if: [yesno_comp1_cont_out2] = '1'	What was the mean of the control group? *Continous Outcome 2*	text
	146	[contsd_comp1_cont_out2] Show the field ONLY if: [yesno_comp1_cont_out2] = '1'	What was the standard deviation of the control group? *Continous Outcome 2*	text
	147	[out2_smd_reported] Show the field ONLY if: [yesno_comp1_cont_out2] = '1'	If the article provided an estimate of the standardized mean difference (e.g., Cohen's d, Hedges's g, Glass's delta) for outcome 2, comparison 1, enter it here.	text (number)
	148	[out2_smd_se] Show the field ONLY if: [yesno_comp1_cont_out2] = '1'	If the article provided a standard error for the standardized mean difference (e.g., Cohen's d, Hedges's g, Glass's delta) for outcome 2, comparison 1, enter it here.	text
	149	[yesno_comp1_cont_out3] Show the field ONLY if: [yesno_comp1_cont_out2] = '1'	Is there another continuous outcome at this time point?	yesno 1, Yes 0, No
	150	[notes_comp1_cont_out2] Show the field ONLY if: [yesno_comp1_cont_out2] = '1'	Any notes for this outcome? *Continuous Outcome 2*	notes
	151	[measure_comp1_cont_out3]	What measure was used? *Continuous Outcome 3; Note: Stay consistent with naming*	text

		Show the field ONLY if: [yesno_comp1_cont_out3] = '1'		
	152	[intn_comp1_cont_out3] Show the field ONLY if: [yesno_comp1_cont_out3] = '1'	How many intervention group participants completed the assessment? *Continuous Outcome 3*	text
	153	[intmean_comp1_cont_out3] Show the field ONLY if: [yesno_comp1_cont_out3] = '1'	What was the mean of the intervention group? *Continuous Outcome 3*	text
	154	[intsd_comp1_cont_out3] Show the field ONLY if: [yesno_comp1_cont_out3] = '1'	What was the standard deviation of the intervention group? *Continuous Outcome 3*	text
	155	[contn_comp1_cont_out3] Show the field ONLY if: [yesno_comp1_cont_out3] = '1'	How many control group participants completed the assessment? *Continous Outcome 3*	text
	156	[contmean_comp1_cont_out3] Show the field ONLY if: [yesno_comp1_cont_out3] = '1'	What was the mean of the control group? *Continous Outcome 3*	text
	157	[contsd_comp1_cont_out3] Show the field ONLY if: [yesno_comp1_cont_out3] = '1'	What was the standard deviation of the control group? *Continous Outcome 3*	text
	158	[yesno_comp1_cont_out4] Show the field ONLY if: [yesno_comp1_cont_out3] = '1'	Is there another continuous outcome at this time point?	yesno 1 Yes 0 No
	159	[notes_comp1_cont_out3] Show the field ONLY if: [yesno_comp1_cont_out3] = '1'	Any notes for this outcome? *Continuous Outcome 3*	notes
	160	[measure_comp1_cont_out4] Show the field ONLY if: [yesno_comp1_cont_out4] = '1'	What measure was used? *Continuous Outcome 4; Note: Stay consistent with naming*	text
	161	[intn_comp1_cont_out4] Show the field ONLY if: [yesno_comp1_cont_out4] = '1'	How intervention participants completed the assessment? *Continuous Outcome 4*	text
	162	[intmean_comp1_cont_out4] Show the field ONLY if: [yesno_comp1_cont_out4] = '1'	What was the mean of the intervention group? *Continuous Outcome 4*	text
	163	[intsd_comp1_cont_out4] Show the field ONLY if:	What was the standard deviation of the intervention group? *Continuous Outcome 4*	text

		[yesno_comp1_cont_out4] = '1'		
	164	[contn_comp1_cont_out4] Show the field ONLY if: [yesno_comp1_cont_out4] = '1'	What was the sample size of the control group? *Continous Outcome 4*	text
	165	[contmean_comp1_cont_out4] Show the field ONLY if: [yesno_comp1_cont_out4] = '1'	What was the mean of the control group? *Continous Outcome 4*	text
	166	[contsd_comp1_cont_out4] Show the field ONLY if: [yesno_comp1_cont_out4] = '1'	What was the standard deviation of the control group? *Continous Outcome 4*	text
	167	[notes_comp1_cont_out4] Show the field ONLY if: [yesno_comp1_cont_out4] = '1'	Any notes for this outcome? *Continuous Outcome 4*	notes
	168	[effect_sizes_complete]	Section Header: *Form Status* Complete?	dropdown 0, Incomplete 1, Unverified 2, Complete

Appendix D

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