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Systematic Review and Meta-Analysis of Psychological Interventions Treating Posttraumatic Stress Symptomatology among Caregivers of Hospitalized Infants Receiving Neonatal Intensive Care

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ADMINISTRATIVE INFORMATION

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Review Stage at time of this submission - Formal screening of search results against eligibility criteria.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 6 March 2026 and was last updated on 6 March 2026.

INTRODUCTION

Review question / Objective Objective: 1. To synthesize the efficacy literature on interventions treating posttraumatic stress symptomatology (PTSS) among caregivers of infants who have received neonatal intensive care across various study and sample characteristics.

Research Question 1: Does the efficacy of interventions treating posttraumatic stress symptomatology (PTSS) among caregivers of infants receiving intensive care differ as a function of both intervention onset timing (during hospitalization vs. post-discharge) and outcome assessment timing (during hospitalization/at discharge vs. within 4 months post-discharge vs. more than 4 months post-discharge)?

Secondary Research Question 1a: Beyond timing of both intervention onset and outcome assessment, are the following intervention, study, and sample characteristics associated with larger treatment effects:

Intervention characteristics:
• Intensity
• Modality (i.e., digital/virtual, vs. hybrid vs. in real life)
• Focus (i.e., trauma-focused vs. not trauma focused)
• Facilitator (i.e., psychologist/therapist with training in psychology vs. other)
• Structure (i.e., individual vs. group)
• Setting (i.e., hospital vs. hospital & home vs. other)

Study characteristics:

• Geographical location (i.e., Western vs. non-Western country)

Sample characteristics:
• Duration of infant hospitalization
• Gestational age of infant
• Parent age

Research Question 2: Are caregivers with lived experiences of marginalization represented within the literature on interventions treating PTSS of parents of infants receiving neonatal intensive care?

Rationale As a result of the numerous stressors that constitute the experience of parenting a high-risk infant within an intensive care context, a significant number of caregivers of hospitalized infants exhibit PTSS which, if left untreated, may lead to meeting criteria for acute stress disorder (ASD) and/or posttraumatic stress disorder (PTSD). A 2023 systematic review by McKeown and colleagues reported that up to one-third of caregivers of infants receiving intensive care experience symptoms of PTSD (McKeown et al., 2023). Moreover, the duration of these symptoms can be longstanding with studies reporting approximately one-fifth of parents reporting PTSD symptoms more than one-year post-discharge (Schecter et al., 2020). PTSS that persists after birth can negatively impact parent-infant attachment and, as a consequence, infant development. For example, parental PTSD symptomatology has been linked to poorer infant cognitive and behavioural outcomes and higher levels of insensitive parent-infant interactions. Therefore, psychological interventions aimed at treating PTSS of parents of infant receiving intensive care may be a valuable and accessible health tool that has potential to support this particularly vulnerable population of caregivers and their families. Given the significant and far-reaching implications of untreated PTSS across parent, infant, and dyadic outcomes, it is clearly imperative to examine interventions that can support caregivers during and after their infant's intensive care.

Laccetta and colleagues (2023) conducted a review of interventions treating PTSS in caregivers of preterm infants. They identified 15 interventions available including parent-infant interaction programs, cognitive behavioural therapy, mindfulness-based stress reduction, auditory-tactile-visual-vestibular stimulation, kangaroo care, expressive writing, non-verbal music, NICU and preterm infant education, and trauma-based psychoeducation (Laccetta et al., 2023). However, they did not conduct a full systematic search of relevant databases (e.g., did not search include CINHAL, Ovid (Embase), PsycINFO, Cochrane Library), which may have greatly limited their ability to capture the full diversity of available interventions in their review. Secondly, they restricted their search to parents of preterm infants, disregarding how interventions may treat PTSS of caregivers of hospitalized, non-preterm infants. While many infants admitted for intensive care are preterm, a significant number of infants receiving intensive care are near-term or full-term (e.g., infants with congenital heart disease). Thirdly, due to the small number (n = 15) and heterogeneity of the included articles, the researchers were unable to conduct a meta-analysis on the efficacy of interventions reviewed (Laccetta et al., 2023). On the other hand, Sabnis and colleagues (2019) conducted a meta-analysis of interventions treating parental NICU trauma, however, they solely included hospital-based interventions in their search. Further, they used 'parental distress' as their outcome through aggregating various measures (i.e., trauma, stress, anxiety) and thus, could not disentangle interventional effects on parental PTSS specifically (Sabnis et al., 2019). To date, there has been no quantitative examination on the differential treatment effects of early vs. late intervention onset on proximal, intermediate, and distal PTSS of caregivers of infants receiving intensive care. Similarly, little is currently known about the key study, sample, and intervention characteristics that may moderate treatment effects, after accounting for differences in intervention onset and PTSS assessment timing.

To that effect, a preliminary scoping analysis suggested there was no research that focused on identities related to marginalization (e.g., Indigenous, newcomers, racialized, lived experiences with poverty). As such, subgroup analyses relating to indicators of marginalization will not be possible. Given this dearth of research, the second research question is descriptive in nature and seeks to understand the participation of diverse populations within existing studies.

Condition being studied PTSS of caregivers of infants receiving intensive care.

METHODS

Search strategy Working with an academic librarian with advanced experience with systematic meta-analysis, a systematic search was iterated using Cochrane Central Register of Controlled Trials, MEDLINE, Ovid (Embase), CINAHL, Web of Science, and APA PsycINFO for references. The

search was not limited by publication year or language. Search terms encompassed mental health terms (e.g., posttraumatic stress disorder, acute stress disorder, trauma, posttraumatic growth), parent terms (e.g., parent, mother, father, caregiver), intensive care terms (e.g., intensive care unit, preterm, low birthweight, infant) study design terms (e.g., randomized controlled trial, before-after, longitudinal) and intervention terms (e.g., cognitive behavioural, emotional support, expressive writing, mindfulness, family-integrated care, kangaroo care).

Participant or population This review will include studies involving parents or caregivers of infants who are receiving or have received neonatal intensive care. Eligible study parents will include mothers, fathers, birthing parents, or other primary caregivers who have a central caregiving role post-discharge.

Intervention Psychological interventions treating parental PTSS within two years of their infants' hospitalization.

Comparator Comparator, control, standard care.

Study designs to be included This review will include empirical studies that evaluate intervention efficacy, such as randomized controlled trials (i.e., parallel RCTs, cluster RCTs, pilot RCTs) and non-randomized designs (i.e., quasi-experimental, simple before-and-after, etc.). Case reports, protocols, dissertations, books, or any other non-peer-reviewed publications will be excluded.

Eligibility criteria This review will focus on interventions involving parents or primary caregivers of infants who required neonatal intensive care. To be eligible, studies must also:
• Include a validated or clearly described measure of posttraumatic stress (i.e., Davidson Trauma Scale, Impact of Events Scale, Perinatal PTSD Questionnaire, Stanford Acute Stress Reaction Questionnaire) assessed during the hospitalization period or within the first two years of the child's life (corrected age).
• Include a quantitative analysis on differences in parental PTSS pre-post intervention.
• Involve parents or primary caregivers of infants who are receiving or have received neonatal intensive care within the first year of life.
Exclusion criteria include studies that:
• Describe non-human participants
• Focus on parents whose infants have not received neonatal intensive care
• Do not have a parental intervention with an outcome of PTSS that is linked to the intensive care stay of their infant.

Information sources Electronic database searches were conducted in Cochrane Central Register of Controlled Trials, MEDLINE, Ovid (Embase), CINAHL, Web of Science , and APA PsycINFO from database inception to the date of search execution. Search strategies combined controlled vocabulary (e.g., MeSH, Thesaurus terms) and keywords related to neonatal intensive care, parental trauma, and interventional outcomes.

Only peer-reviewed empirical studies were included. Dissertations, conference abstracts, and other forms of grey literature were not included, as the review focuses on fully published data with sufficient methodological detail for extraction.

Main outcome(s) The outcome of interest is the change in PTSS pre-post intervention. Caregiver PTSS will be measured using validated instruments assessing PTSS (e.g., Davidson Trauma Scale, Impact of Events Scale, Perinatal PTSD Questionnaire, Stanford Acute Stress Reaction Questionnaire).

Outcomes may be reported as mean differences, regression estimates, or other effect measures reflecting differences between groups/outcomes from pre-post intervention.

Quality assessment / Risk of bias analysis The methodological quality and risk of bias of included studies will be independently evaluated using a customized risk of bias tool adapted from the NIH National Heart, Lung, and Blood Institute Quality Assessment Tool for Interventions, the Cochrane Risk of Bias 2.0 tool for randomized controlled trials, and the ROBINS-I-V2 for non-randomized designs . Each study will be rated as having low, high, some concern of risk of bias.

Up to four reviewers will complete assessments independently, resolving disagreements by discussion or third-party consultation. Risk of bias ratings will not be used to exclude studies but will inform the interpretation of evidence.

Confidence in our findings will operationalized using the GRADE (Grading of Recommendations Assessment, Development and Evaluation) system, classified into four levels (high, moderate, low, or very low).

Strategy of data synthesis A meta-analysis will be performed to examine whether intervention efficacy differs based on intervention onset and PTSS outcome assessment timing. A meta-regression analysis will be conducted to examine whether intervention, study, and sample characteristics (e.g., intervention intensity, modality, theoretical orientation, facilitator, structure, setting, geographical location, duration of infant hospitalization, gestational age of infant, parent age) are associated with greater efficacy, after adjusting for onset and outcoming timing. When quantitative analysis is not possible, a narrative strategy will be taken.

Subgroup analysis N/A.

Sensitivity analysis Sensitivity analysis will be performed to assess the robustness of the pooled estimates. Specifically, the primary meta-analysis will be repeated after excluding studies judged to be of low quality and different sample sizes. Based on the analyses, other post-hoc analyses may be performed.

Country(ies) involved Canada.

Keywords neonatal intensive care, infant, posttraumatic stress, parental trauma, parental mental health, intervention, systematic review, meta-analysis.

Dissemination plans We plan to publish in an open-access, peer-reviewed journal.

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