

Principles, Practices and Outcomes of Trauma-Informed Care in NICU: A Systematic Review

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ABSTRACT

Aim: This review compiles and evaluates existing research on the integration of trauma-informed care (TIC) within Neonatal Intensive Care Units (NICUs). It aims to understand how TIC practices influence infants, families, and healthcare staff, and to assess which interventions demonstrate measurable benefits in neonatal settings.

Method: Searches were conducted in PubMed, Google Scholar, and related scholarly databases for literature published between 2015 and 2025. Studies were included if they addressed TIC principles, implementation strategies, or outcomes in NICU contexts. Findings were synthesized following PRISMA guidelines.

Results: Fourteen eligible studies were analysed. The collective evidence shows that TIC enhances staff knowledge and communication, strengthens parental involvement, and decreases stress responses in both caregivers and infants. However, implementation was limited by variable training quality, resource restrictions, and differences in staff understanding of TIC concepts.

Conclusion: TIC shows strong potential to enhance developmental, emotional, and relational outcomes within NICUs. Consistent staff education, practical toolkits, and environmental strategies are essential for successful adoption. Tailored, culturally responsive approaches are particularly important in diverse or resource-limited healthcare settings.

Keywords: Trauma-informed care, NICU, infant stress, family-centered care, neonatal trauma

INTRODUCTION

The neonatal intensive care unit (NICU) is a specialized environment where critically ill or premature newborns receive lifesaving care. (1,8) However, this setting can also be a source of significant stress and trauma for infants and their families.(1.6.8)The exposure to painful procedures, separation from parents, and an unfamiliar environment can negatively affect infants' neurodevelopment and emotional

wellbeing.(1,8) Parents experience anxiety, helplessness, and other forms of psychological distress while navigating this complex care setting.(5,6,14)In addition, NICU healthcare providers are at risk of secondary traumatic stress due to the emotionally demanding nature of their work.(9,12)A comprehensive synthesis of the evidence is needed to clarify effective interventions, reveal gaps in knowledge, and guide clinical practice.(1,3,10)

Aim- To examine and summarize evidence on trauma-informed care practices and outcomes within NICU settings

Objectives

1. To identify and summarize existing research on trauma-informed care interventions and practices in NICU settings.
2. To analyze outcomes related to infants, families, and healthcare staff arising from the application of TIC principles.
3. To explore barriers and facilitators to implementing trauma-informed care within NICUs.

MATERIALS & METHODS

This review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline to ensure clarity, rigor, and transparency.

Search Strategy

A systematic search of PubMed, Google Scholar, and related databases was performed. Keywords included *trauma-informed care*, *NICU*, *trauma-informed neonatal care*, and *occupational therapy in NICU*. Boolean operators (“AND,” “OR”) were used to refine the search.

STUDY SELECTION AND DATA EXTRACTION-

Studies were considered eligible if they met the following criteria:

Inclusion criteria: -

1. Published between 2015 and 2025.
2. Written in English.
3. Included key words Trauma informed care, Trauma informed care in NICU, NICU
4. Focused on infants, parents and multidisciplinary members
5. Peer-reviewed articles, theses/dissertations, professional guidance, and empirical studies (qualitative, quantitative, mixed methods) that discuss trauma-informed principles, interventions, or parent/infant outcomes in the NICU.

Exclusion criteria:

1. Articles not specific to neonatal settings,
2. commentaries without NICU focus, or pieces that do not address trauma-informed principles.
3. Articles which are not full text.

PICO Framework

- **Population:** Infants, caregivers, NICU staff
- **Intervention:** Trauma-informed care principles and practices
- **Comparison:** Standard neonatal care
- **Outcome:** Psychological and developmental outcomes for infants and families; staff well-being; implementation barriers

RESULT

A total 14 studies met inclusion criteria.

Key Themes Identified

- **Conceptual and Framework Studies:** Sanders & Hall (2017) outlined core TIC principles such as safety, predictability, and caregiver connectedness in NICU environments. (1)
Falke (2024) emphasized recognizing trauma, promoting trust, and empowering families. (2)
- **Ethics and Decision-Making:** Hubbard et al. (2021) demonstrated that TIC helps reduce distress during complex ethical decisions involving neonatal care. (3)
- **Staff Knowledge and Attitudes:** Salameh & Polivka (2020) found that NICU nurses caring for infants with neonatal abstinence syndrome (NAS) showed limited TIC knowledge and required structured training. (4)
- **Parental Needs and Mental Health:** Rodrigues et al. (2023) identified that parents consistently requested support aligned with TIC control, trust, and clear communication. (5)
Williams et al. (2022) documented high trauma exposure among low-income NICU mothers, reinforcing the need for sensitive, trauma-aware practices. (6)

- **Training and Toolkits:** Alli-Casella (2021, 2022) highlighted significant improvements in staff communication and confidence following TIC training programs and described the development of a comprehensive TIC toolkit. (10,11)
- **Pediatric and Interdisciplinary Perspectives:** Goddard et al. (2021) underscored TIC as essential to pediatric nursing, (12) while the American Occupational Therapy Association

(2022) emphasized the critical role of occupational therapy in facilitating bonding, feeding, and sensory regulation. (13)

- **Environmental and Sensory Interventions:**

Flynn (2022) reported that although some developmental care practices were improving, essential TIC elements (e.g., noise control, maternal milk oral care, sensory modifications) required further attention. (15)

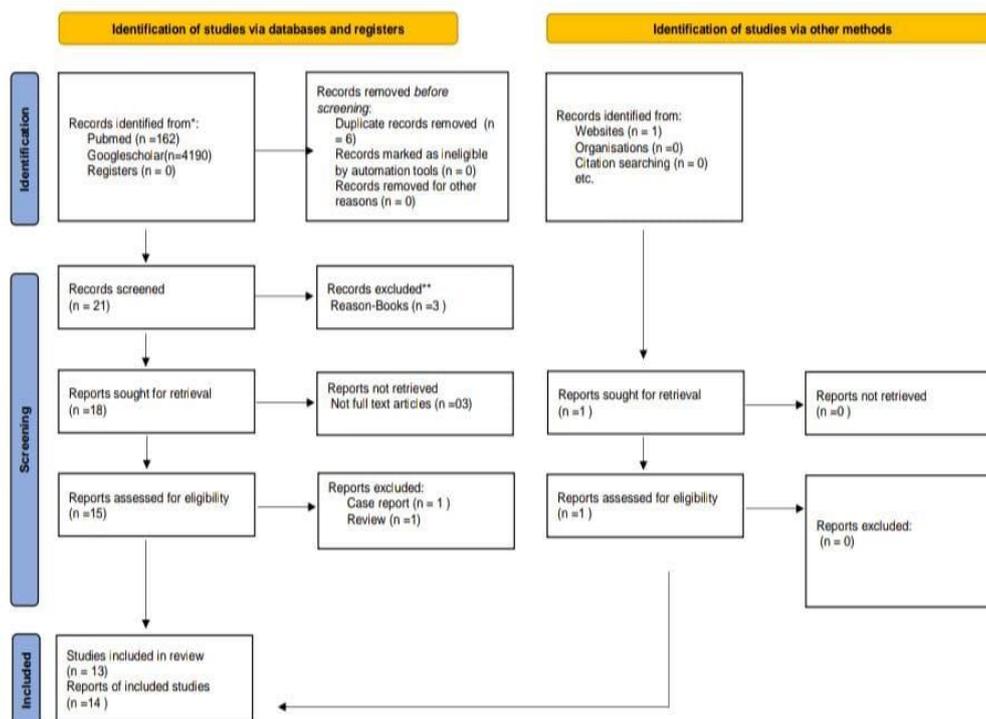


Figure 1. PRISMA flow diagram

DISCUSSION

1. Staff Training and Awareness

Across studies, staff education emerged as a central component of successful TIC implementation. (9,11) Structured programs improved recognition of trauma responses, enhanced communication with families, and supported cohesive caregiving. (10,11) However, many institutions lacked standardized curricula, leading to inconsistent understanding and application of TIC. (9)

2. Family-Centered Care and Parental Involvement

TIC reinforces the importance of parental presence, voice, and control within the NICU. (1,5) Practices such as skin-to-skin contact, shared decision-making, and emotional support help strengthen family resilience. (7) Families from vulnerable or low-income backgrounds benefit significantly from tailored, trauma-sensitive approaches. (6)

3. Infant Development and Stress Reduction

By reducing overstimulation, supporting caregiver bonding, and aligning practice with developmental neuroscience, TIC contributes to improved regulatory and developmental outcomes. (1,8) Decreases in physiological stress indicators were reported in several studies. (7,8)

4. Staff Well-Being

Given the emotional burden of neonatal care, staff are vulnerable to compassion fatigue and secondary trauma. (9,12) TIC frameworks provide strategies such as reflective practice and supportive communication that help sustain staff mental health and interpersonal resilience. (9)

5. Toolkit Use and Practical Strategies

Toolkits, checklists, and environmental modifications (e.g., noise management, individualized developmental care) support standardized TIC application. (11,15)

6. Ethical Considerations

TIC aligns closely with ethical principles by promoting transparency, shared decision-making, and respect for family values. (3) It provides a structure that reduces distress during ethically complex situations. (3)

CONCLUSION

This review highlights trauma-informed care as an essential approach within NICUs, offering benefits for infants, families, and healthcare personnel. Evidence demonstrates improvements in bonding, emotional well-being, and developmental outcomes when TIC principles are embedded into daily care. Despite its promise, challenges such as inconsistent training, limited resources, and the absence of standardized evaluation tools hinder widespread implementation. To advance TIC in neonatal care, ongoing institutional commitment, multidisciplinary collaboration, and culturally responsive frameworks are needed. In resource-limited settings such as India, practical toolkits and targeted staff training may serve as effective, low-cost strategies to promote TIC integration and improve neonatal outcomes.

Declaration by Authors

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Conflict of Interest: The authors declare no conflict of interest.

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