

Neonatal Intensive Care Unit Nurses' perspectives, staffing workload, and burnout in the transition toward family-integrated care models: A structured literature review

Harsari Irzha Rahmadiani¹ and Mahendra Tri Arif Sampurna^{2,*}

¹ Medical Study Program, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia.

² Department of Pediatric, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia.

World Journal of Advanced Research and Reviews, 2026, 31(01), 923–935

Publication history: Received on 31 May 2026; revised on 14 July 2026; accepted on 16 July 2026

Article DOI: <https://doi.org/10.30574/wjarr.2026.31.1.1913>

Abstract

Background: The transition toward Family-Integrated Care (FICare) and Family-Centered Care (FCC) models in the Neonatal Intensive Care Unit (NICU) is highly advocated to optimize infant developmental outcomes. However, executing this paradigm shift at the bedside creates deep institutional friction, profoundly reshaping the operational realities and psychological burdens placed on the neonatal nursing workforce.

Objective: This structured literature review aims to evaluate the comprehensive impact of the FCC/FICare transition on NICU nurses' occupational, psychological, and operational dimensions, specifically focusing on staff readiness, workload changes, and systemic triggers of burnout or missed care.

Methods: A systematic search was performed across PubMed, ScienceDirect, and Google Scholar for peer-reviewed primary studies, health economic evaluations, clinical audits, and rapid reviews published between 2021 and 2026. Applying strict eligibility criteria, 15 studies were selected for final analysis. Due to methodological heterogeneity, a narrative thematic synthesis was executed across three core domains: nurse perspectives, objective vs. subjective workloads, and predictors of professional burnout.

Results: The synthesis revealed a statistically significant gap between ideal FCC philosophies and real bedside capacities, imposing an unmeasured cognitive load on nurses. Objective physical workloads escalated rapidly when infant-to-nurse staffing ratios exceeded the critical threshold of 2:1, particularly in resource-limited countries. Crucially, subjective workload (mental and emotional stress) served as a much more consistent driver of workforce failure than objective metrics, showing a direct correlation with missed nursing care across all 17 clinical neonatal performance indicators. Severe nurse burnout was strongly driven by systemic failures, with mandatory extra duties increasing burnout risk 5.28-fold ($p = 0.001$) and a lack of specialized transition training increasing it 4.28-fold ($p = 0.003$). Conversely, when properly managed, family integration yielded clear clinical dividends, reducing high-dependency care duration from 13 to 10 days, invasive ventilation by 12%, and CPAP support by 26%.

Conclusion: Successful family-integrated neonatology cannot survive on romanticized textbook assumptions; it functions as a delicate ecosystem where staff well-being directly dictates patient safety. Hospital administrations must move beyond simplistic task delegation checklists toward an integrated, risk-stratified framework. Protecting workforce sustainability requires immediate structural interventions, including maintaining strict staffing controls ($\leq 2:1$), implementing experience-stratified training for complex family dynamics, and allocating dedicated nurse educators.

Keywords: Neonatal Intensive Care Unit (NICU); Family-Integrated Care (FICare); Nursing Workload; Burnout Syndrome; Missed Nursing Care

* Corresponding author: Mahendra Tri Arif Sampurna

1. Introduction

The Neonatal Intensive Care Unit (NICU) remains one of the most high-stakes, time-sensitive environments in modern clinical practice. Although the transition toward Family-Integrated Care (FICare) and Family-Centered Care (FCC) models may appear seamlessly collaborative and universally beneficial in academic textbooks, this paradigm shift is often profoundly complex and disruptive at the bedside. Advanced neonatal care requires constant, high-alert medical surveillance, and rapid shifts in clinical caregiving frameworks can quickly compromise workforce stability if executed without structural adaptations. Despite corporate advances in hospital policies, parental engagement protocols, and developmental care spaces, the neonatal nursing workforce continues to carry an intense burden of operational and systemic stress. Recent global reports still describe that a critical portion of intensive care nurses suffer from debilitating occupational burnout, while unmanaged workforce pressures continuously trigger an alarming rate of missed clinical care across essential neonatal indicators.¹ Subjective cognitive overload is generally associated with poorly defined professional boundaries during these institutional transitions, yet it is by no means a benign variable, as overextended bedside clinicians experience persistent emotional exhaustion and professional resistance long after initial implementation.² Therefore, this structured literature review aims to evaluate the real operational, psychological, and safety impacts of family-integrated models on the NICU nursing workforce to build a sustainable framework for future neonatology practices.

2. Materials and Methods

2.1. Study Design

A structured literature review is employed to review the impact of the transition towards a family-integrated and family-centered care model in the NICU on nurses' occupational, psychological, and operational aspects. Mainly, three themes of literature were reviewed, such as the NICU nurse's perspectives and readiness for Family-Integrated Care model, the effect of transition on objective and subjective nursing workload, and the systemic correlation behind nurse's burnout and missed clinical care. A comprehensive approach with methodological steps, alongside a transparent, multi-stage screening process, is used to minimize bias as little as possible and bring together varied methodological data into one coherent narrative framework.

2.2. Literature Search Strategy

Literature bodies were gathered by online platforms and electronic datasets in search of them. Journals and articles were drawn from, but not limited to PubMed, ScienceDirect, and Google Scholar. Literature of peer-reviewed articles from 2021 to 2026 was specifically used to capture the recent clinical evidence in the post-COVID-19 pandemic era, the current nursing workforce statistic data and the latest innovations used. The search strings combined revealed relevant MeSH terms and keywords with Boolean operators, namely, "Neonatal Intensive Care Unit" OR "NICU" AND "Family-Integrated Care" OR "FICare" OR "Family-Centered Care", "neonatal nurse" OR "nursing staff" AND "workload" OR "burnout" OR "emotional exhaustion", "missed nursing care" OR "patient safety" AND "subjective workload" OR "staffing ratio".

2.3. Eligibility Criteria

To warrant relevance to the review objective, inclusion and exclusion criteria were employed. The inclusion criteria were primary original research (such as prospective cohort, longitudinal replication, cross-sectional quantitative surveys, and qualitative descriptive or grounded theory designs), health economic evaluations, clinical audits, and rapid reviews published in peer-reviewed journals that had been gathered. Literature bodies must embody NICU nursing staff, multidisciplinary neonatal teams, and operational deployment of FCC/FICare models in their content. Excluded studies are literature centralized only on pediatric or adult ICUs, secondary literature outside of the 2021–2026 timeframe, lack of full-text access publications, or studies on neonatal clinical outcomes without addressing nursing workload, perspectives, or burnout data in its content.

2.4. Study Selection and Data Extraction

The study selection process employed a process of multi-stage screening, which included the removal of duplicate literature records from initial database extractions. Titles and abstracts were separately screened through the eligibility criteria. Potentially relevant papers then underwent thorough full-text review after screening. Articles clarifying the boundaries of nursing responsibility, objective nurse staffing to patient ratio, subjective mental stress, and institutional resource limitation were specifically prioritized. Finally, a total of 15 peer-reviewed studies met all the criteria and were included in the final analysis. Data extractions were conducted systematically using a standardized matrix capturing

primary author, publication year, study design, geographic location/country, specific study focus, and precise findings relevant to nursing workload, burnout, and family-care model transition impact and its effect on nurses.

2.5. Data Synthesis

The variety of literature included is heterogenous, including quantitative surveys, qualitative grounded theories and health economic audits, thus a narrative thematic synthesis was undertaken rather than a statistical meta-analysis. The extracted evidence was categorized into three main themes group consistent with the study objectives, which includes:

Nurses' perspectives, cultural mindsets, and readiness for change, to examine the role of conflict, task-oriented barriers and institutional gaps.

Changes in objective and subjective workload changes during FICare transition, to evaluate staffing ratios, family educational demands, physical unit designs, and the occurrence of missed nursing care.

Predictors and mechanism or nurse burnout, to analyze the risk factors such as extra duties, lack of specialized training, emotional stress and systemic mitigation methods.

3. Result and Discussion

3.1. Overview of the Included Literature

The reviewed studies demonstrate that the transition to a family-integrated and family-centered care model in the Neonatal Intensive Care Unit (NICU) significantly alters the work realities of the nursing workforce. Across the selected literature, three key domains emerge repeatedly: highly diverse perspectives and professional preparedness of nurses regarding family engagement, varying objective and subjective increases in nursing workload during operational transitions, and critical institutional and psychological triggers leading to nurse burnout and missed patient care.

Most of the studies included in this review utilized a variety of methodological approaches, including cross-sectional quantitative surveys, prospective observational cohort designs, qualitative grounded theory methods, and health economic evaluations across diverse global health systems. This methodological diversity enabled the synthesis to effectively move from individual nurses' perceptions and cultural mindsets to a structural, systemic analysis and clear clinical safety outcomes. Rather than viewing family integration as a simple programmatic checklist, the synthesized literature demonstrates that it should be understood as a complex organizational shift that fundamentally reshapes the cognitive, emotional, and physical demands placed on nurses at the bedside. To provide a concise yet comprehensive summary of this evidence base, the methodological and clinical profiles of the 15 selected primary studies are systematically detailed in Table 1.

Table 1 Characteristics of the Included Studies

No	Author (Year)	Study Design	Country	Study Focus	Findings Relevant to the Review
1	Ulfa, M., et al. (2026)	Cross-sectional quantitative study	Indonesia and Taiwan	The prevalence of burnout syndrome among nurses in Indonesia and Taiwan	Moderate burnout syndrome in both countries, which may impact patient service, especially in the nurse-focused bridge between healthcare providers and family in FICare or FCC concept
2	Lim, A. M., et al. (2026)	Multinational survey	Japan, Indonesia, Malaysia, the Philippines, Singapore, South Korea, Taiwan,	Exploring the variations in care practices due to the challenges of family involvement in NICU, between high-income and low- and middle-income countries	Better facilities in high-income countries, better developmental care practices but were more restrictive in KMC duration. Low- and middle-income countries have longer KMC durations and better breastfeeding support, meaning that low- and middle- income countries

			and Thailand		relied more on nurse involvement and having greater workload
3	Mariani I., Vuillard, C. L. J., Bua, J., et al. (2024)	Scoping review of randomized controlled trials	Global	Reviewing the characteristics of FCC interventions, related outcomes and measurement methods in randomized controlled trials (RCTs) in NICU	The most common interventions done is educational, meaning that workload will most likely be the point of concern for NICU nurses, furthermore, having inconsistent method for family centered care interventions and evaluations after its implementations will deepen this burden further
4	Shokane, M. A., Mogale, R. S., Maree, C. (2023)	Action research with mixed method approach	South Africa	Evaluating daily analysis of the neonatal ward and developing strategies to implement FICare model in developing region	The common themes of resource shortages, such as staff or equipment will result in a heavier workload for nurses, which contributes to higher vulnerability to stress and burnout, along with the changes of nurse's role in the neonatal unit which had no clear boundaries will further complicate their workload.
5	Ansari, N. S., et al. (2023)	Prospective cohort, pilot study	Canada	Evaluating the safety and feasibility of augmented FICare method in critically ill infants in their first weeks	The care model is highly acceptable and adopted by the daycare nursing staff, driven by the development of dedicated resources to assist nurses in fostering early parental engagement. A significant decrease in parental anxiety scores prior to infant discharge ($p = 0.02$) is found, which will reduce the psychological workload and the intensity of repeated education required of NICU nurses, thus having greater workload management efficiency.
6	Waddington, C., van Veenendaal, N. R., O'Brien, K., Patel, N. (2021)	Expert review, discussion paper	Global	Discussing the essence of FICare collaborative model, its systemic requirement, managing the culture change, and eradicating communication barrier between parents-HCPs and the use of digital innovation post-pandemic	The successful implementation of FICare model requires a readiness for change from HCPs, which is requiring multidisciplinary commitment, staff motivation and adequate preparation time. To reduce nurse's psychological stress during the transitioning phase, a relational communication and regular meetings between staff and parents are needed, to clarify the nurse's boundaries of responsibility in the NICU, thereby reducing their cognitive workload.
7	Mushtaq, O., et al. (2022)	Conceptual or descriptive overview	Global/ India	Specifying between Neonatal Intensive Care Unit (NICU) and its specific function as a high-level, critical care surveillance system, with Intermediate Nursery Care	The high demand of constant nursing is the use of life support system which requires the nurses of NICU to be readily available at all times will heighten their vulnerability to burnout, which is in dire need of supplementary intervention, while an intermediate nursery care, which can serve as a "step-down unit", can be an

					ideal location to teach parents and involve parents in neonatal care in the FICare model.
8	Kumar, A., et al. (2021)	Cross-sectional survey	India	Prevalence of burnout syndrome in nurses who work in the ICU, identifying the correlative factors or main trigger which had significant relationship with the high burnout rate, by demography, job characteristic or psychosomatic symptoms in working staffs.	About 7.6% nurses of ICU experience high levels of burnout. Workload factors, such as extra duty, increased the risk of staff burnout by 5.28-fold ($p = 0.001$). The lack of specialized training in ICU also increased the risk of burnout by 4.28-fold ($p = 0.003$). In FICare model, the addition of time-consuming educational roles has the potential to force nurses to perform extra duties. If these new time demands are exercised without overtime restrictions and thorough transition training, burnout rates among intensive care nurses will increase.
9	Wepener, C., Oliver, E. & Gerber, B. (2026)	Rapid review	Global/ South Africa	Evaluating the perspective of NICU nurses with the implementation of Family-Centered Care (FCC) in lower- and middle-income countries (LMICs) and identifying the contextual factors and unique hinderances that affect the success of FCC implementation	NICU nurses in LMICs have highly varied views regarding family involvement due to the strong influence of cultural and contextual factors. The six crucial, interrelated domains influencing staff readiness, including policies and resources, the role of nurses, and nurse-family dynamics are identified. To minimize role conflict and increased adaptive workload for nurses, developing clear clinical guidelines; adequate unit resources; and appropriate training support are in need to be actualized. Without these, staff resistance due to unclear operational responsibility boundaries will arise.
10	Carew, M., Redley, B., Bloomer, M. (2024)	Qualitative descriptive study	Australia	Exploring the neonatal nurse's perspective towards the implementation of Family-Centered Care (FCC), their understanding of it and how they integrated the parent's cultural needs in neonatal caregiving, identifying tension between clinical priority and FCC approach	The emergency clinical priorities will always shift the FCC approach, as most nurses are still stuck in a task-oriented perspective to support parent-infant bonding, rather than fully internalizing the collaborative philosophy. Furthermore, their understanding of the specific cultural needs of the patient's parents is poorly understood. This mindset combined with the uncertainty of acute situations in the NICU, contributes significantly in nurses' cognitive and emotional workload, increasing the vulnerability of daily staff burnout.
11	Tubbs-Cooley, H. L., et al (2025)	Prospective observational, longitudinal	USA	Objectively and subjectively evaluating the impact of nurse workload with missed nursing	The employment ratios above two babies per nurse ($> 2:1$) significantly increase the odds of missed nursing care across most essential care types. Subjective

		replication study		care in NICU, identifying which has more impact towards missed nursing care between objective and subjective workload	workload (staff mental stress) had more consistent negative impact, leading to missed care across all (17/17) neonatal care indicators. The service transitioning to family-based, FICare, the addition of family education roles without a balanced control of staff mental stress will increase nurses' subjective workload, which compromise safety (high levels of missed care).
12	Al Bizri, A., et al. (2025)	Cross-sectional survey	Canada	Understanding the general needs and specific needs, along with mapping the readiness for FICare implementation in the neonatal care unit	The lack of environmental support for prolonged parental presence in FICare model, such as limited physical space, forces nurses to work in crowded environments, which psychologically increases staff's adaptive workload. Limited financial resources and skepticism about the cost-efficiency of new programs have direct implications for workforce policies; as hospitals tend to be reluctant to increase the allocation of specialized nurse educator staff, forcing the new responsibility of family's integration in already existing daily nursing capacity, which will likely increasing the risk of burnout.
13	Hounscome, N., Rabe, H., Turk, E., Saha, P., Ebrahimjee, F., Fernandez, R., Pellicer, A. (2026)	Health economics evaluation and clinical audit	England	Evaluating the cost-efficiency and economic impact of FICare model implementation the neonatal care unit	In FICare model implementation, the duration of infants in the high-dependency care phase is reduced from an average of 13 days to 10 days, reduce the duration of invasive ventilation by 12% and CPAP by 26% with parental integration. These directly reduced the intensity of daily critical monitoring that triggers extreme physical and cognitive workloads on NICU nurses. Financially, this model is resource- and cost-saving, supporting hospital management to adopt this system for budget efficiency and reducing nurse's workload.
14	Dall'Olgio, I. et al. (2022)	Cross-sectional multicenter observational study	Italy	Quantitative evaluation of multidisciplinary NICU staff's perspective of current FCC implementation, compared to what necessarily should be done	A statistically significant gap exists between the current FCC implementation and the ideal conditions deemed necessary by staff. This indicates a hidden cognitive load, where nurses understand the importance of family integration but are constrained by the unit's daily operational systems that don't yet support it. Educational level, profession type, and operational work experience positively influence staff's

					perceived maturity regarding the demands of FCC practice. Hospital management should have tailored training program based on staff experience levels, junior nurses or those lower will require more intensive clinical supervision to build confidence in managing parent dynamics within the unit and reduce staff's stress and resistance.
15	Kutahyalioğlu, N., Mallinson, R., Scafide, K., D'Agata, A. (2023)	Qualitative grounded theory study approach	Global/ USA	In-depth exploration of neonatal nurses supportive or hindering factors in field implementation of Family-Centered Care in NICU	The implementation of FCC is a collective process analogous to the principle of "it takes a village" through the active participation of all stakeholders. This adaptation process is closely influenced by six interrelationship domains, such as the formation of equitable relationships and bonds of trust between staff and families. The uncertainty in building this trust, along with the high demands of flexibility of multidisciplinary team to overcome the limitations of the unit's physical design (despite its design), all increases the emotional and cognitive workload of nurses. Therefore, if this system is imposed as unilateral task for nurses without collaborative responsibility sharing and continuing education, staff resistance and work burnout will arise.

3.2. Nurse Readiness and Perspectives in FICare Models

In the neonatology world, the concept of Family-Integrated Care (FICare) and Family-Centered Care (FCC) models has long been associated as the ideal model for clinical caregiving, but also labelled as a clinical paradigm. In standardized institutional guidelines, this framework is associated as a model of collaborative trust between parents and healthcare providers, a seamless parental empowerment, and a fluid multidisciplinary cooperative effort. Nevertheless, reviewed literature suggests that assuming immediate and total nurse readiness along with uniform perspectives is a significant oversight that has misled hospital administrators and stakeholders.

In reality, only a handful of NICUs had successfully integrated and achieved standardized family integration care without notable staff resistance. Among the studied literature, a discrepancy between theoretical acceptance of FCC and its execution in the field was found. In a comprehensive and multicenter study, a statistically significant gap was found between the ideal FCC model or philosophy and the actual operational capabilities allowed in the daily NICU system.¹⁴ This then created a hidden, unaccounted-for cognitive load for NICU nurses, who understood the psychological importance of parent-infant bonding but were structurally restrained by restrictive architectures by their institutions and fixed shift schedules. Nurses reported feeling caught between the rigidity of medical protocols and, on the other end, the demands of parental management in the implementation of the current FICare model.¹ This ambiguity in the professional field resulted in a conflict of roles and operational bottlenecks, as the usual triage of nursing responsibilities becomes confusing, herein, the proper institutional support needed to be established first.

Similar pattern is observed in the cultural resistance and cognitive inertia across highly varied socioeconomic regions. The practice of family-integrated models are mostly varied and rarely homogenous, as it is skewed by regional resource distribution and historical healthcare mindset. In a multinational surveys evaluating neonatal settings, high-income countries presented superior physical infrastructures but implemented very rigid, clinician-oriented restrictions on

developmental care indicators such as Kangaroo Mother Care (KMC) duration.² Contrariwise, in the lower- and middle-income countries (LMICs), a severe shortages of specialized monitoring equipment forced an enormous reliance on direct nurse involvement, resulting in longer KMC execution times and substantially heavier objective nursing workloads.² Family integration shan't be introduced as a generic checklist, as its acceptance is led by convoluted sociocultural dynamics and unit-level realities, where clinical emergencies consistently nullify family integrated care philosophies due to deeply rooted, task-oriented nursing mindset.¹⁰

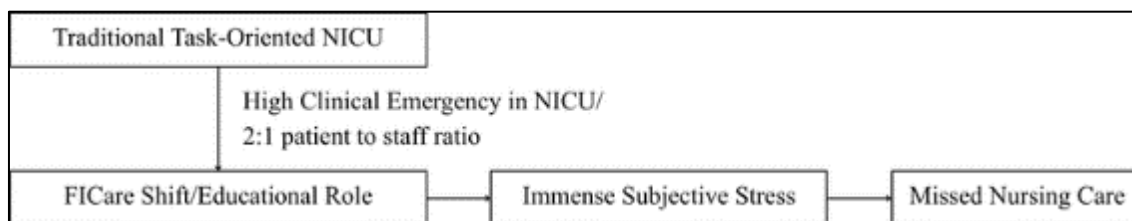


Figure 1 Factors Affecting the Shift to FICare Model in NICU

The dramatic reduction of nurse adaptability during the transition phase can be elucidated by specific demographic and systemic variables. Staff readiness to absorb new collaborative care frameworks is essentially shaped by the nurse's baseline education, specific intensive care training, and total years of operational experience.¹⁴ Junior nursing staff and individuals lacking advanced pediatric certifications frequently display lower confidence and higher stress when managing complex parental dynamics at the bedside. When these groups are forced to manage anxious families without continuous clinical supervision, substantial resistance arises, driven by fear of clinical errors and poorly defined operational boundaries.⁹

3.3. Operational Workload: Objective and Subjective Pressure Differentiation

Differentiating between objective physical work and subjective psychological stress is an important regulation when evaluating nursing workload in the changing neonatal care models. The disparity in the operational of NICU brings real and direct consequences in patient's safety and institutional quality assurance. In a traditional neonatal care, it is especially emphasized on high-intensity objective surveillance because of the complex life support that is needed by critically ill neonate.⁷ The transition towards FICare model embedded a large, non-traditional subjective demands that is rarely accounted for in staffing metrics in a standard hospital setting. The objective workload in NICU is traditionally measured with the ratio of infant to nurse and the timely clinical intervention. A comprehensive longitudinal data replication stated that the ratio of baseline staffing more than 2 neonate per nurse ($> 2:1$) act as the threshold of critical line, which mathematically heightened the failure of healthcare giving.¹¹ When a nurse is tasked with more than two neonate with high dependency, the physical capacity to complete the instructed medical task will go beyond the threshold. In developing regions, this objective demand is continuously worsened by chronic lack of equipment and health personnel, which forced nurses to keep expanding their physical availability without institutional help.⁴

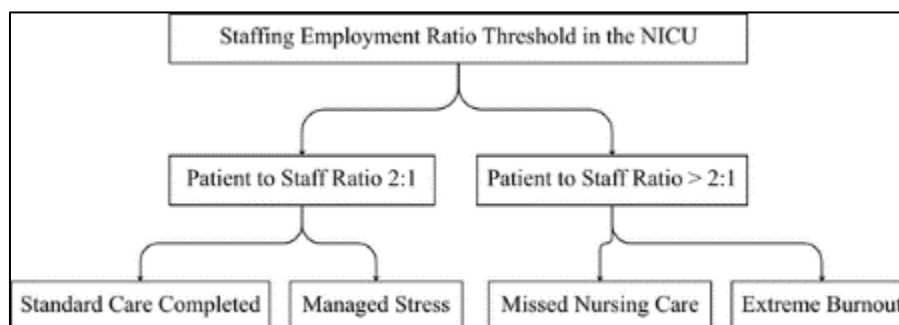


Figure 2 Staffing Employment Ratio and its Impact

However, the introduction of family-based interventions changed the workload paradigm by multiplying subjective mental stress. FCC implementation at its core is educational and relational, transforming nurses from direct clinicians to a family educator and continuous emotional counselor.³ While structured pilot programs show that providing dedicated educational resources can lower parental anxiety, therein reducing the long-term cognitive burden of repetitive discharge teaching⁵. The reality in most units is that these new roles are imposed unilaterally onto existing staff without additional personnel allocation.¹² Nurses are forced to execute high-stakes medical interventions, such as

adjusting invasive mechanical ventilation parameters or monitoring continuous positive airway pressure (CPAP) systems, while simultaneously navigating crowded spaces and managing the intense emotional anxieties of co-bedding parents.^{10,12} This clinical overlap between intense medical surveillance and family education makes symptoms of professional overload inevitable. Objective physical strain and subjective emotional fatigue do not exist in isolation; they feed into each other. When a crisis occurs in the unit, the immediate demands of acute clinical priorities instantly collide with the collaborative philosophy of family presence.¹⁰ Because the physical layouts of many older NICU structures were never architecturally configured for prolonged parental occupancy, nurses are forced to work in tightly confined, high-density environments.¹² This structural limitation turns basic medical movements into sources of spatial and psychological friction, driving rapid cognitive exhaustion and professional resistance across all levels of the nursing hierarchy.¹⁵

3.4. Safety Concern: Subjective Burden as Stimulus to Missed Nursing Care

The synthesized evidence demonstrates that modern neonatal intensive care must look past basic physical metrics to understand workforce failures. Evaluating performance purely through numerical nurse-to-patient ratios provides an incomplete picture of clinical integrity. Instead, institutional safety and the prevention of missed nursing care are directly governed by the unmanaged accumulation of subjective mental stress within the workforce. A clinical approach centered entirely on objective task logging systematically fails during major care transitions. While maintaining proper physical staffing ratios is essential, prospective observational data indicates that subjective workload, defined as the internal mental stress and cognitive overload experienced by the individual nurse, serves as a much more consistent and dangerous predictor of care omissions.¹¹ In extensive clinical safety audits, elevated levels of subjective nurse stress showed a direct, negative correlation with care completion, resulting in documented missed nursing care across all 17 critical neonatal performance indicators.¹¹ This finding proves that even if a hospital maintains an ideal physical staffing grid, the cognitive and emotional noise generated by unguided family integration can paralyze a nurse's operational focus, directly compromising the clinical safety of the vulnerable infant. Furthermore, etiological patterns of care failure differ according to the structural maturity of the unit. In units where family care is treated as a collaborative, multi-stakeholder process, functioning like an integrated "village" supported by clear boundaries and mutual trust, the cognitive strain on the workforce is mitigated.¹⁵ Conversely, in institutions marked by rigid administrative demands, poor communication channels, and a lack of dedicated nurse educators, the incidence of missed care spikes sharply.¹² The systemic failure to provide tailored training programs for complex family interactions directly impairs clinical performance, showing that safety is an organizational product rather than an individual nursing responsibility.¹⁴

3.5. Systemic and Psychological Triggers of Nurse Burnout

The development of severe burnout syndrome among intensive care nurses is driven by a predictable matrix of occupational, demographic, and systemic risk factors. The literature demonstrates that professional exhaustion is not an individual vulnerability; rather, it is an expected systemic consequence when high-demand care transitions are executed without robust institutional safety nets.

Table 2 Predictors of Severe Nurse Burnout Risk Factor and its Risk Increase

Predictors of Severe Nurse Burnout	
Risk Factor	Risk Increase
Mandatory Extra Duty	5.28-fold ($p = 0.001$)
Lack of Specialized Training	4.28-fold ($p = 0.003$).

Mandatory extra duties stand out as one of the most powerful predictors of severe burnout syndrome. Cross-sectional quantitative data reveals that when nursing staff are subjected to unmanaged overtime and extra shifts to meet the intensive demands of continuous care, the risk of developing high-level burnout escalates 5.28-fold ($p = 0.001$).⁸ The transition to FICare inherently expands the time required for a single patient encounter by adding prolonged parent training, milk expression guidance, and relational updates to the shift agenda. If these extra time requirements are forced upon an already strained workforce without strict overtime management or compensatory relief, widespread emotional exhaustion quickly occurs. A lack of specialized transition training serves as another critical driver of workforce attrition. Introducing complex family-centered models without providing structured, experience-stratified training programs increases the risk of high-level staff burnout 4.28-fold ($p = 0.003$).⁸ Bedside nurses who are highly competent in technical, device-driven critical care frequently feel unequipped to handle the psychological distress, diverse cultural needs, and boundary negotiations that come with continuous parental presence.¹⁰ This lack of professional preparation turns every parent-nurse interaction into a potential source of role conflict and emotional

friction, driving up staff resistance and accelerating the onset of burnout syndrome.⁹ Furthermore, the physical and functional architecture of the critical care unit shapes long-term burnout rates. High-level NICU environments that act as primary surveillance centers place nurses under constant stress due to the continuous threat of acute clinical deterioration.⁷ When these high-stakes environments suffer from poor physical designs, limited space, and crowded patient bays, the baseline emotional stress of the staff increases.^{12,15} Hospital administrations frequently show skepticism regarding the cost-efficiency of restructuring these environments or hiring specialized nurse educators, choosing instead to compress these new duties into existing operational frameworks.¹² This resource containment directly triggers severe physical and mental exhaustion, proving that unmanaged workloads inevitably break workforce stability.

3.6. FICare Implementation: Balancing Clinical Dividends with Workforce Sustainability

The reviewed literature reveals a fascinating paradox: the clinical and financial success of family-integrated models is highly dependent on the very workforce that the transition threatens to exhaust. Robust health economics evaluations and clinical audits demonstrate that successful parent integration yields clear institutional dividends, cutting the duration of the infant high-dependency care phase from an average of 13 days down to 10 days.¹³ Furthermore, active parental involvement achieves a 12% reduction in invasive mechanical ventilation time and a 26% reduction in CPAP support requirements.¹³

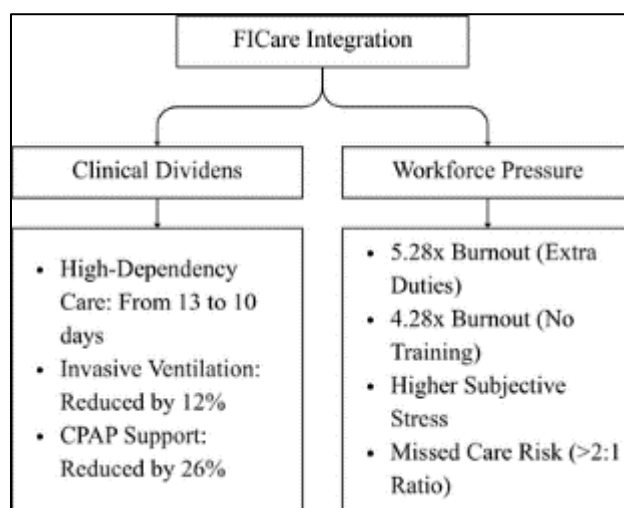


Figure 3 Clinical Dividends and Workforce Pressure in FICare Integration

From a medical and administrative standpoint, these represent a major success. The reduction in respiratory support and high-dependency hospital days directly lowers the daily intensity of advanced clinical monitoring that triggers severe physical and cognitive stress on the nursing staff.¹³ Financially, this model is highly resource-saving, providing hospital networks with the budget efficiency needed to justify its adoption. However, these clinical gains are entirely built upon the nurse's daily labor as an educator. If the nurse is too burned out to build trust or effectively train parents, the parents cannot take over basic developmental care, the length of stay does not decrease, and the entire model collapses. Therefore, family integration cannot be viewed merely as a tool, as it is a balanced ecosystem where staff health is protected as a core requirement for patient safety.

3.7. Clinical Synthesis and Framework Transition

Taken together, the reviewed literature demands a major shift in how family-integrated care models are implemented in intensive neonatal environments. The idealistic rhetoric surrounding FCC/FICare models remains highly valuable, but it is not robust enough to guarantee success by itself. Bedside reality is shaped by heavy workloads, psychological stress, and systemic friction, making successful family care impossible to sustain without structural changes.

Table 3 Administrative and Safety Controls Framework for Sustainable FICare

Integrated Framework for Sustainable FICare	
Administrative Prerequisites	Clinical Safety Controls
Experience-stratified training	Strict 2:1 or less staffing ratios
Clear operational boundaries	Mitigation of subjective stress
Dedicated educator allocations	Architectural space expansion

This synthesis provides clear practical directives for modern hospital management, such as removing unilateral task delegation, in which hospital administrators must stop treating family integration as a generic task to be added to an already full nursing schedule. It requires explicit systemic guidelines and clear operational boundaries to protect nurses from role confusion. Then, objective staffing control, which to maintain strict staffing ratios at $< 2:1$ as an absolute safety requirement, as adding educational duties to ratios above this threshold directly causes missed care and compromises infant safety. Afterwards, experience-stratified training, as training programs must be made and tailored to the staff's experience levels. Junior nurses require structured, continuous clinical supervision to build the communication skills and confidence needed to navigate parent dynamics without experiencing acute stress. Lastly, having dedicated resources, which explicitly allocating funds for specialized nurse educators and improved physical space.

A successful family integration requires risk-managed, systematic planning. A care model cannot be truly effective if it breaks the well-being of the clinicians executing it. Moving toward an organizationally supported, risk-stratified framework is the only way to minimize nurse burnout, prevent missed care, and unlock the full clinical potential of family-integrated neonatology.

4. Conclusion

Family-Integrated Care (FICare) and Family-Centered Care (FCC) implementation remains a critical operational and psychological challenge due to highly variable nurse readiness and deeply entrenched systemic barriers. The idealistic philosophy of collaborative trust, seamless parental empowerment, and fluid multidisciplinary cooperation is still useful as a conceptual framework, but it should not be assumed as an immediate baseline reality in intensive care environments. Because a significant proportion of neonatal units, especially those relying on junior staff, unsupportive physical architectures, or task-oriented mindsets present without genuine cultural readiness, the theoretical appeal of family integration should never be used to minimize hidden operational friction or delay administrative intervention. Furthermore, traditional staffing metrics alone are insufficient to differentiate between objective physical labor and subjective mental stress due to significant operational overlap. Objective physical workload, specifically when staffing employment ratios exceed the critical threshold of two infants per nurse ($> 2:1$), is generally associated with immediate care omissions, missed nursing indicators, and compromised infant safety, while subjective psychological stress carries a less obvious but equally damaging risk, leading to widespread cognitive exhaustion, emotional fatigue, and persistent staff resistance. Furthermore, structured clinical guidelines, adjusted unit environments, and dedicated nurse educators are invaluable for workload mitigation during this transitioning time. Long-term sustainability of the neonatal workforce and the avoidance of severe burnout syndrome are dependent on a complex mix of systemic and occupational risk factors rather than individual vulnerability. Mandatory extra duties, a lack of experience-stratified transition training, junior professional status, crowded or restrictive unit designs, and the constant demands of high-stakes medical surveillance are strong independent predictors of an unfavorable professional outcome. Most crucially, the largest modifiable factor to minimize workforce attrition and safeguard infant safety is to reduce institutional delay in deploying tailored resource support. This organized literature evaluation ends with the conclusion that modern clinical management of neonatal intensive care units must move on from an overreliance on textbook family-centered care checklists. An integrated approach is needed to avoid operational friction and enhance both workforce stability and patient outcomes. Hospital administrators need to maintain a proactive structural awareness, combined with rapid resource allocation and early risk stratification of the nursing workforce.

Compliance with ethical standards

Acknowledgments

The authors would like to express their sincere gratitude to the Department of Pediatric, Faculty of Medicine, Universitas Airlangga, for the guidance and support throughout this study. The authors also sincerely thank the supervisors for their invaluable guidance, constructive feedback, and continuous encouragement during the completion of this research.

Disclosure of conflict of interest

All authors have no conflict of interest.

Statement of ethical approval

Ethical approval was not required for this study because it was based solely on published literature.

References

- [1] Aalia Mushtaq, O., Ahmad Mir, J., Mushtaq, B., 2022. Organization and management of nursing services in NICU, levels of transport. *IP J. Paediatr. Nurs. Sci.* 4, 149–151. <https://doi.org/10.18231/j.ijpns.2021.031>
- [2] Ansari, N.S., Franck, L.S., Tomlinson, C., Colucci, A., Brien, K.O., 2023. A Pilot Study of Family-Integrated Care (FICare) in Critically Ill Preterm and Term Infants in the NICU: FICare Plus. *Child.* 2023 10, 1–14. <https://doi.org/https://doi.org/10.3390/children10081337>
- [3] Bizri, A. Al, Bueno, M., Shah, V., Bacchini, F., Campbell, D.M., Benzies, K.M., Brien, K.O., 2025. Facilitators and Barriers to the Implementation of Family Integrated Care in Ontario Level II Neonatal Intensive Care Units. *Child.* 2025 12, 1–12. <https://doi.org/10.3390/children12111548>
- [4] Carew, Maddison, Redley, Bernice, Bloomer, M., 2024. Competing Tensions: Nurse Perceptions of Family-Centered Care and Parents ' Needs in Neonatal Care Author. *Adv. Neonatal Care.* <https://doi.org/10.1097/ANC.0000000000001136>
- [5] Dall'Oglio, I., Gesù, B., 2022. Staff perceptions of Family-Centered Care in Italian Neonatal Intensive Care Units : A multicenter cross-sectional study. *Children* 9, 1–10. <https://doi.org/10.3390/children9091401>
- [6] Hounscome, N., Rabe, H., Turk, E., Saha, P., Ebrahimjee, F., Fernandez, R., Pellicer, A., Consortium, R., Union, E., 2026. Implementation of Family Integrated Care in the Neonatal Intensive Care Unit , University Hospitals Sussex , UK. *Child.* 2026 13, 1–17. <https://doi.org/doi.org/10.3390/children13020195>
- [7] Kumar, A., Sinha, A., Varma, J.R., Prabhakaran, A.M., Phatak, A.G., Nimbalkar, S.M., 2021. Burnout and its correlates among nursing staff of intensive care units at a tertiary care center. *J Fam. Med Prim Care* 10, 443–448. <https://doi.org/10.4103/jfmpc.jfmpc>
- [8] Kutahyalioğlu, N.S., Mallinson, R.K., Scafide, K.N., D'Agata, A.L., 2023. "It Takes a Village" to Implement Family-Centered Care in the Neonatal Intensive Care Unit. *Adv. Neonatal Care* 23, 457–466. <https://doi.org/10.1097/ANC.0000000000001091>
- [9] Lim, A.M., Quek, B.H., Amin, Z., Poon, W.B., Cho, S.J., Youn, Y., Chee, S.C., 2026. Practices and challenges of family involvement in neonatal intensive care units (NICUs) across Asia : a multinational survey of the Asian neonatal network. *Front. Pediatr.* 1–8. <https://doi.org/10.3389/fped.2026.1753007>
- [10] Mariani, I., Vuillard, C.L.J., Bua, J., Girardelli, M., Lazzerini, M., 2024. Family-centred care interventions in neonatal intensive care units: a scoping review of randomised controlled trials providing a menu of interventions, outcomes and measurement methods. *BMJ Paediatr. open* 8, e002537. <https://doi.org/10.1136/bmjpo-2024-002537>
- [11] Shokane, M.A., Mogale, R.S., Maree, C., 2023. Preparing for implementation of family-integrated neonatal care by healthcare providers in a district hospital of Limpopo Province. *Int. J. Africa Nurs. Sci.* 19, 100575. <https://doi.org/10.1016/J.IJANS.2023.100575>

- [12] Tubbs-cooley, H.L., Carle, A.C., Mark, B.A., Gurses, A.P., Pickler, R.H., Hall, P.D., Bartman, T., 2026. Nurse Workload and Missed Nursing Care in Neonatal Intensive Care Units. *JAMA Pediatr.* 179, 1335–1342. <https://doi.org/10.1001/jamapediatrics.2025.3647>.Nurse
- [13] Ulfa, M., 2025. BURNOUT IN NURSING : A CROSS-SECTIONAL STUDY IN INDONESIA AND TAIWAN. *Ankara Med J.* 25, 122–136. <https://doi.org/10.5505/amj.2025.94580>
- [14] Waddington, C., van Veenendaal, N.R., O'Brien, K., Patel, N., 2021. Family integrated care: Supporting parents as primary caregivers in the neonatal intensive care unit. *Pediatr. Investig.* 5, 148–154. <https://doi.org/10.1002/ped4.12277>
- [15] Wepener, C., Olivier, E., Gerber, B., Sciences, R., Speech-language, D., Therapy, H., Town, C., Wepener, C., 2024. Nurses' perceptions of family-centred care in neonatal intensive care units : Rapid qualitative evidence synthesis of studies in low- and middle-income countries. *Heal. SA Gesondheid* 31, 1–9. <https://doi.org/10.4102/hsag.v31i0.3236>