ISSN: 2707-8965 (Online) & 2708-3772 (Print)

Volume: 8, Issue: 3
Page: 1 -12
2026

Euro Afro Studies International Journal®
(EASIJ.COM)

Exploring the Communication Cues of Preterm Neonates in Neonatal Intensive Care Unit: An Integrative Review

Author(s), OGUNDEKO, Cecilia Adeneye, OKAFOR Ngozi Anthonia, ORE, Omolara Theresa,

Abstract:

Preterm neonates in neonatal intensive care units (NICUs) rely on subtle behavioural and physiological cues to communicate comfort, distress, and self-regulatory needs. Understanding and responding to these cues is fundamental to developmentally supportive care and optimal neurodevelopmental outcomes. This integrative review explored the communication cues of preterm neonates in the NICU, assessed paediatric nurses' knowledge of the Synactive Theory of Development, and examined environmental stimulants that induce stress in preterm infants. Guided by Russell's framework and the PRISMA protocol, a systematic search of EBSCO, PubMed, ScienceDirect, and Google Scholar identified twelve eligible studies published between 2010 and 2023. The findings demonstrate that preterm infants consistently express hunger, stress, stability, and self-regulation through identifiable behavioural patterns, particularly during feeding and caregiving interactions. Recognition of these cues enables a shift from task-driven routines to co-regulated, infant-led care, resulting in earlier achievement of oral feeding, reduced length of hospital stay, enhanced parental involvement, and improved developmental trajectories. However, the evidence reveals persistent gaps in nurses' knowledge and inconsistent application of cue-based care, especially in developing settings. Environmental stressors, including excessive noise, bright lighting, and invasive procedures, further destabilise fragile autonomic systems. The review underscores the need for structured

EASIJ
Accepted 10 March 2026
Published 17 March 2026
DOI: 10.5281/zenodo.19065887

education on cue interpretation and the integration of developmental care principles into routine NICU practice to improve outcomes and promote the long-term neurodevelopmental well-being of preterm neonates.

Keywords: Preterm neonates, Communication cues, Neonatal intensive care unit, Synactive Theory of Development, Developmental care, Cue-based feeding,

About Author

Author(s):

OGUNDEKO, Cecilia Adeneye
Faculty of Nursing Science
Trinity University, Sabo Lagos State

OKAFOR Ngozi Anthonia
School of Nursing Science
BABCOCK University. Ilishan-Remo, Ogun State

ORE, Omolara Theresa
Faculty of Nursing Science
Trinity University, Sabo Lagos State

Introduction

The organisms are constantly interacting with the environments around them which communicate through both observable and unobservable processes, which show their internal processes. This is because all living organisms have basic functions in life which include respiration, nutrition, growth and reproduction, and through these mechanisms, living things are able to react to environmental stimuli (Larossa, 2023). Communication in human development process starts much earlier when language has not developed and is manifested through behavioural, physiological and motor patterns that express needs, comfort or discomfort. In the context of neonatal practice, the knowledge of such primordial types of communication is important especially when dealing with preterm infants due to hypotrophic conditions which prevent them to manifest their needs in an overt fashion. To describe and formalise these initial patterns of communicative behaviour, in 1982 an American neuropsychologist, Heidilise Als, put forward the Synactive Theory of Development. The given theory offers an observational theory in a full environment, which is concerned with how preterm infants react to internal and external stimuli especially under the technologically enriched environment of the neonatal intensive care unit (NICU).

The conceptualisation of the Synactive Theory presupposes the preterm development as the process of interaction between several subsystems, which constantly affect the organisation of behaviour of the infant. Als showed that preterm infants use non-verbal signals to express their instability or well-being via detailed behavioural observation and indicated that these signals are the result of the autonomic, motor, behavioural state, attention -interaction and self-regulatory systems functioning, thus relating their information to them (Als, 1982; Als, 2011; Als, 2013; Maltese et al., 2017). Such cues are particularly intense during stress, as may be the case in the NICU. The behaviours are frequently described as disorganised, unstable and sensitive to environmental overload due to the fact that organs and systems of preterm neonates are still developing and thus fail to attain maturity. Comprising of preterm infants, unlike term babies, they are extremely vulnerable to light, sound, touching and to medical practices as they require a lot of support around them to ensure a proper physiological balance.

Out of this theoretical basis emerges the philosophy of the developmental supportive care which revitalises the handling of the surroundings and individualisation of the care founded on close observation of behaviour. Developmental supportive care aims at enhancing the stability, organisation, and competence of the preterm infant in accordance with the cues and capacity of the infant (Als, 2013). Instead of treating the neonate as an inert receiver of care, the approach identifies the infant as an active communicator whose behaviours give vital data regarding readiness, stress, and recovery. By doing so, the process of caregiving can be seen as a form of responsive interaction, wherein the nurses and clinicians have to respond to the signals of the infant to ensure that the level of stress is reduced as much as possible in order to facilitate neurodevelopment.

The significance of utilizing this framework is supported by the worldwide prevalence of preterm births. It is observed that preterm birth is one of the most serious problems of maternal and child health as about 15 million babies are born prematurely each year and over one out of every ten is born before the due date (WHO, 2023). In 2022, about 2.7 million children under five years age died during the first 28 days of life and an average of 6,500 children died on the neonatal level per day. Worryingly, three-quarters of these deaths were amassed in the first week of life, and close to one million in the initial 24 hours. Despite the global decrease in the rates of neonatal mortality, the process in Africa is lagging behind other areas, and at least 64 nations face the risk of failing to achieve the neonatal mortality target

set by the Sustainable Development Goal by 2030 (WHO, 2024). Sub Saharan Africa and southern and central Asia still continue to face the brunt of newborn deaths.

Nigeria is a significant cause of this international crisis. It documents the second highest number of neonatal deaths in Africa with about 270,000 neonatal deaths per years and a neonatal mortality rate of 37 per 1000 live births. The mortality rates of children on the 1st 28 days of life are at 39% nationally, and even lower (but still alarming) in the South-West part of Nigeria (36%) and Lagos State (35%) (Fajolu et al., 2022; WHO, 2020; NDHS, 2019). These figures indicate overall issues with the system of perinatal and neonatal care and emphasize the susceptibility of preterm babies in the Nigerian healthcare system. Since the number of deaths among children under five years of age due to complications of preterm birth is the leading cause of mortality, not to mention the number of such deaths was about 900,000 in 2019 (WHO, 2020), the necessity to improve preterm care should not be exaggerated. It is worth mentioning that out of the three-quarters of these deaths, the majority can be avoided by applying existing cost-effective measures.

There are indications that the fate and survival of preterm infants during their initial postnatal years is directly related to the quality of care offered to them. There is a severe place of the birth disparity in preterm survival in the world. Infants born in poor countries with extremely low birth weight survive less than 90 percent during the first several days of existence, as compared to less than 10 percent in rich environments (WHO, 2023). Such variations cannot be attributed to technological ability alone but also to the differences in their care giving methods, training of staff and sensitivity to infant needs. Based on the Synactive Theory, developmentally supportive care is a low-cost, high-impact form of care that can be applied in resource-limited settings, in terms of improving observational competence and responsive caregiving.

The significance of the knowledge and understanding of the preterm behavioural cues among nurses has been proven to be empirical. In a quasi-experimental study in Egyptian NICUs, Mohamed-Idrees and Elasayed-Hassan (2018) concluded that nurses had poor knowledge of behavioural cues and performed unsatisfactorily in terms of intervention practices. After a systematic educational intervention, there were major gains in the knowledge as well as in the care giving responses as compared to the results before the intervention with lasting effects at the follow up. These results support the assumption according to which the possibility to read and react to the cues of preterm infants is not instinctive or accidental, but the system needs to be trained and grounded in some concept.

Premature babies express their messages using strong and weak behaviours. Cues are more likely to be subtle in the NICU though since preterm and severely ill infants do not have the strength to display explicit cues like crying hysterically. Their immature body causes disorganisation of behaviour and reaction to stress and makes them more dependent on environmental modulation to stabilize themselves. Developmental supportive care is thus based on the identification of these cues and the customization of interventions that promote regulation and recovery. Infant cues are in general talks about either preparedness to, or signs of distress and anxiety. The latter are commonly referred to as stress cues and can be observed in the clinical setting in various forms such as alteration in alertness, facial expression, movement pattern, and vital signs. Every baby has their own set of cues, which are dependent on gestational age, medical state, and personal temperament, which reveals the necessity to observe the babies individually.

In the Synactive model, the subsystem of autonomic nervous system is placed in the core considering the first level of physiological stability in the infant. Color variations, tremors, startles, breathing problems, and visceral reactions represent the first warning signs that the

infant is comfortable with the stimulation (Tabaczyński et al., 2021). Another essential dimension is muscle tone that is closely connected to feeding competence and developmental progression, and early hypotonia is related to feeding problems (Pires et al., 2020). These physiological manifestations are not single occurrences but rather combined messages where the infant expresses the ability, stress and rest. Observation and understanding of these signs enable the caregiver to change the way they handle, position, and the environment to the manner in which they preserve infant energy and promote the process of homeostasis.

In this respect, the NICU turns out not only to be a special location of medical intervention but also a multifaceted communicative space where the survival and development of the infants require the quality of interrelation between vulnerable biological systems and human care. Knowledge of preterm communication indicators is hence at the heart of bettering the neonatal outcomes especially in the context of a country like Nigeria where resource constraint increases the significance of non-technological and knowledge-oriented interventions. This paper has been set in the context of this imperative and the researcher is looking to understand the communication cues among preterm infants in the NICU using integrative review concerning the need to reinforce caregiving practice and improve the developmental performance of a highly vulnerable population. The specific objectives of this study were to:

1. assess the current level of knowledge of paediatric nurses regarding the Synactive Theory of Development;
2. identify and describe the behavioural cues exhibited by preterm neonates in the neonatal intensive care unit; and
3. examine the undesirable environmental stimulants within the neonatal intensive care unit that induce stress in preterm neonates.

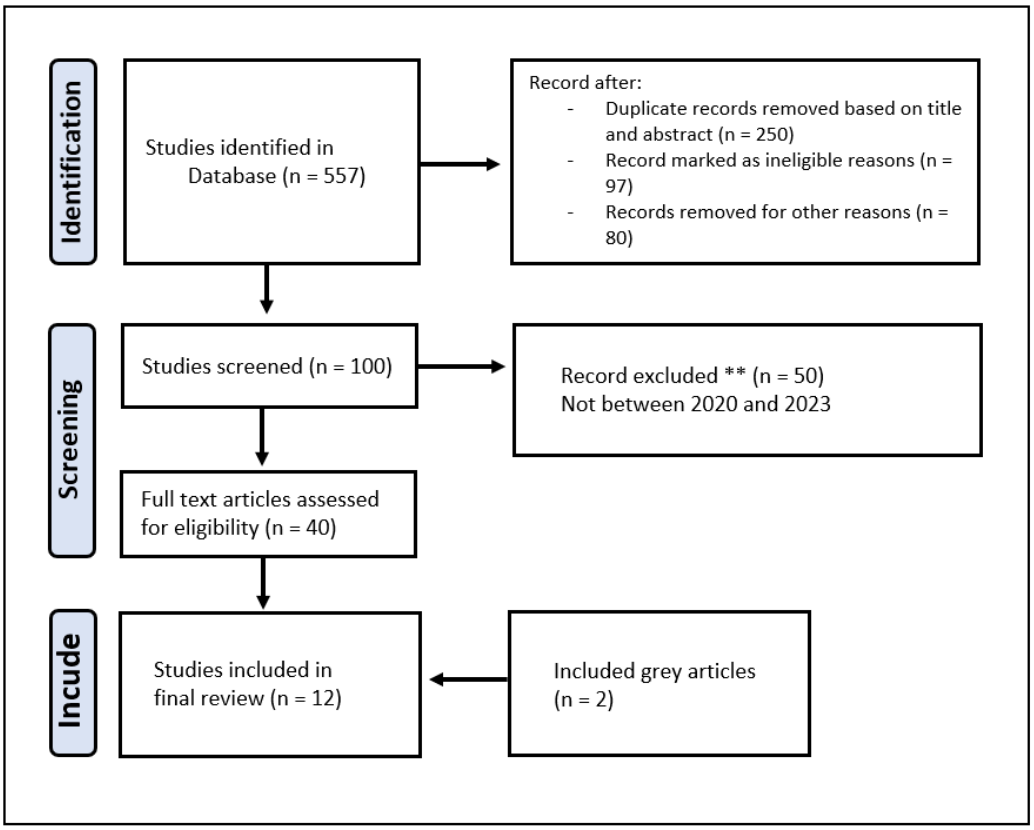
Methodology

This study employed an integrative literature review design guided by Russell's (2005) framework, which allows for the systematic synthesis of empirical and theoretical evidence to generate comprehensive understanding of a phenomenon. The integrative approach was considered appropriate because it accommodates diverse research methodologies and enables the inclusion of both empirical studies and grey literature, thereby providing a holistic perspective on the communication cues of preterm neonates in the neonatal intensive care unit (NICU). The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol was adopted to ensure methodological rigour, transparency, and reproducibility in the identification, screening, eligibility assessment, and selection of relevant studies, as illustrated in Figure 1. A comprehensive literature search was conducted across four major electronic databases: EBSCO, PubMed, ScienceDirect, and Google Scholar. These databases were selected because of their extensive coverage of nursing, medical, and allied health literature.

Search terms were used in various combinations and included "preterm neonates," "communication cues," "behavioral cues," "NICU nurses and preterm neonates," "preterm language," and "NICU environment," as well as phrases relating to factors influencing the NICU experience of preterm infants. Boolean operators such as "AND" and "OR" were applied to refine and broaden the search strategy as appropriate. In addition to peer-reviewed articles, grey literature, including policy documents, reports, and dissertations, was incorporated to capture emerging evidence and contextual insights that may not yet be published in academic journals.

Inclusion criteria were defined a priori to ensure relevance and consistency. Studies were eligible if they were published between 2010 and 2023, available in the English language, and

focused on communication or behavioural cues of preterm infants in the NICU setting. Both primary research studies and relevant grey literature were included. Only studies that examined preterm infants aged 0 to 28 days and that involved observation of behavioural cues during hospital admission were considered. Articles that did not explicitly address interactions between NICU nurses and preterm infants or that focused on post-discharge contexts were excluded. Titles and abstracts were initially screened for relevance, followed by full-text review of eligible articles. Data extraction involved identifying key themes, methodological characteristics, and findings related to preterm communication cues and environmental stressors. The synthesised evidence was then analysed thematically to generate an integrated understanding of how preterm neonates communicate distress and stability within the NICU environment.



Result

The reviewer identified 12 articles that met the inclusion criteria. Table 1 provides a summary of the literature reviewed.

Table 1: *Summary of Literature Reviewed*

S/N	Title/Author/Year	Methodology	Summary of findings
1	Understanding Your NICU Baby's Behavior & Cues.Lurie children blog,Ann & Roberts Chilldrens hospital Chicago. Susan Horner(2022)	Parental education and training	Mothers learned baby typical cues and learn to help them stay more comfortable and relaxed.
2	Awareness of preterm infants'	Quantitative	Staff do recognise infant cue signs ■ Staff

	behavioural cues: a survey of neonatal nurses in three Scottish neonatal units. Linda A Hannah 2010	approach.	possess knowledge of a wide range of different cue signs ■ This knowledge does influence staff in providing behaviourally supportive care but only some of the time. ■ Parents are taught and supported in providing cue-based care for their infants, some of the time
3	Preterm infant cues during breastfeeding and its measurement: A scoping review Haryatiningsih Purwandari2023. Taiwan	A Scoping review	These feeding cues are identifiable before, during, and after breastfeeding and include cues for hunger, self-regulation, stress, satiation, approach, avoidance, and sucking quality.
4	Cue-Based Feeding in the NICU: Using the Infant's Communication as a Guide. Catherine S. Shaker,2013	Quantitative approach	When the infant is perceived as having meaningful behavior (i.e., communicative intent), the focus changes from a volume driven to a co-regulated approach, through which the infant guides the caregiver.
5	Implementation of Cue-Based Feeding to Improve Preterm Infant Feeding Outcomes and Promote Parents' Involvement Tesi Thomas 2019	A retrospective review involving pre–post evidence-based practice	Cue-based feeding decreased time to achieve full oral feedings, decreased length of stay, increased parents' involvement in the feeding process, and resulted in cost savings for the institution.
6	Cue-based feeding and short-term health outcomes of premature infants in newborn intensive care units: a non-randomized trial. Sefatbaqa Samane 2022, Iran	Quasi-experimental study utilized	The findings indicate that cue-based feeding is beneficial for preterm infants.
7	Cue-Based feeding in the NICU Cynthia Wheten 2016 DOI: https://doi.org/10.1016/j.nwh.2016.08.006Volume 20.issue5, pp507-510. USA.	Cross-sectional study	Evidence from the literature suggests that preterm infants fed via cue-based feeding reach full oral feeding status faster than their volume-feeding counterparts and have
8	Effects of Early Communication Intervention on Speech and Communication Skills of Preterm Infants in the Neonatal Intensive Care Unit (NICU): A Systematic Review Harding, C., Levin, A., et al. (2019)..Australia	Systematic review	Results indicated early communication and interaction interventions (e.g., video recording, explicit parent counseling and education) demonstrated moderate (0.5) and large (over 0.8) effects on preterm infants in a neonatal intensive care unit.
9	Assessing pain in preterm infants in the neonatal intensive care unit: moving to a 'brain-oriented' approach. Holsti, Grunau,&	Quantitative research.	More accurate pain assessment tools will help in devising strategies to reduce pain in premature infants.

	Shany,(2011). Doi:10.2217;pain mang.2011 1(12). Sweden.		
10	Practice-Based Guidance for Nurses About The Behavioral Cues Exhibited From Preterm Infants Idrees & Hassan (2018)	A quasi-experimental design (pre / post-test)	The result revealed poor nurses' knowledge regarding behavioral cues exhibited by preterm infants and unsatisfactory intervention toward avoidance of behavioral cues pre-program implementation which improved after program implementation and at follow-up
11	Preterm infant cues during breastfeeding and its measurement: Purwandari,et al., 2023	A scoping review	The initial review stage found 183 potential articles, but only four satisfied the criteria. The notion of preterm infant cues during breastfeeding is centered on the actions of preterm infants while positioned on their mother's chest. These feeding cues are identifiable before, during, and after breastfeeding and include cues for hunger, self-regulation, stress, satiation, approach, avoidance, and sucking quality.
12	The effect of loud NICU Environments on premature infants and interventions to help minimize noise. Gramajo, 2023	Quasi-experimental design	Repeated exposure to loud noise in the NICU can cause negative physiological effects in preterm infants such as elevated heart rate, increased respiratory rate, and changes in oxygen saturation levels. From machines beeping, parents talking, nurses giving hand-off reports, and telephone ringing these noises can cause premature infants to be overstimulated, leading to the negative physiological risks stated above, and in severe cases, can lead to hearing loss and sleep changes in premature neonates (Negative effect on autonomic state necessary for survival).

The reviewed literature has always shown that preterm infants are able to use recognisable behavioural expressions to indicate both their physiological and emotional conditions and that these expressions ought to be used to apply more responsive and efficient care in the NICU. In parental education materials, surveys, scoping reviews, and interventional studies, the infant cues are revealed to indicate hunger, stress, self-regulation, satiation, and readiness to be engaged especially on the occasion of feeding and care giving (Horner, 2022; Hannah, 2010; Purwandari et al., 2023; Shaker, 2013). When the caregivers begin to appreciate the preterm infants as purposeful communicators, the responsibility of care becomes less based on mechanical routines and more co-regulated using an infant-led mode of care. The analysis of cue-based feeding always cites positive short-term effects, such as sooner achievement of full oral feeding, less hospital stay, more parental care, and cost savings in institutions (Thomas, 2019; Samane, 2022; Wheten, 2016). Moreover, communication and interaction intervention at the early stages show moderate to huge impacts on the development of speech and communication, supporting the importance of prior relational and behavioural responsiveness in the formation of the trajectory of neurodevelopment (Harding et al., 2019). Simultaneously, the evidence demonstrates the consistent lack of professional knowledge and environmental management in NICU environments. According to surveys and quasi-

experiment research, nurses might identify certain behavioural cues but this knowledge is not consistently applied in practice, and systematic education about cue interpretation is still not available, especially in developing settings (Hannah, 2010; Idrees and Hassan, 2018). Stress factors in the environment, which involve too much noise and intrusive interventions, are continually demonstrated to affect autonomic stability and increase the activity of the heart and respiratory rate and oxygen saturation, thereby worsening the neonatal susceptibility (Gramajo, 2023). The developments in pain measurements also indicate the greater importance of more sensitive and brain-sensitive methods of perceiving infant distress (Holsti et al., 2011). Taken together, these results indicate that the NICU care cannot be effectively provided by simply having the technological capacity and the skill of the caregivers to correctly interpret the behavioural cues, reducing the environmental stress, and involving the infants and their parents in developmentally supportive, cue-based relationships.

Theme One: NICU Comforting Cues.

Normal preterm babies in the NICU will have a hangar-on vital signs, a classified pink and well-perfused skin colour, loose flexed posture, coherent and synchronised movements, silent alertness, and a closedness towards the caregiver. Such cues are indicators of physiological stability and behavioural organisation which show that the infant is adapting successfully to the environment and open to communication. These kinds of signals are of primary focus to the Synactive Theory of Development that focuses on the fact that preterm infants constantly provide information of their internal condition to the outside world through recognizably behavioural patterns (Als, 1982).

An important sub-theming under this category is the necessity to have systematic education to the NICU nurses on the elements of the Synactive Theory of Development. Proper knowledge of this framework can help the nurses to correctly interpret the preterm behavioural signs and react in a manner that enhances stability and development. There is some evidence indicating that the attitude of neonatal nurses to developmental care practice, and their awareness about the theoretical aspects of developmental care practice has not been adequately investigated in the developing nations. Based on the study, Kassab and Hamadneh (2021) found that the lack of implementing developmental care and an insufficient grasp of variables that affect the work of NICU nurses create a gap between theory, research, and practice. This loophole highlights the need to undergo specific training to enhance the ability of the nurses to recognise and support organised infant behaviours.

Theme Two: Indications of Stress within NICU

In the case of preterm babies, when they get discomforted, overwhelmed or stressed, the different behavioural and physiological changes indicate these conditions. The stress cues are the changes in vital signs namely increased or slow or irregular breathing rate, deoxygenation, colour change including pallor, flushing, mottling or cyanosis. Other signs are yawning, sighing, hiccupping, sneezing, gagging, vomiting, grimacing, frowning, dropped or sunken facial expression, spreading of fingers, saluting, hyperextension of the body parts, flailing, staring facial expression, aversion to the gaze, dull or withdrawn facial expression and state changes like shutting down into sleep or increasing irritability and uncontrollableness. Crying, brow bulging, jittery or jerky movements, clenched fists, or toes and frequently continued with tachypnoea or tachycardia can also serve as manifestations of stress in infants.

The sub- theme that is related to this category goes on to point out the presence of the environmental stimulants in the NICU. Preterm babies are sensitive to noise, excessive sound, bright lighting, and invasive procedures among the others. Kassab and Hamadneh (2021)

stressed that the concept of developmental care is quite expansive and is centred around different intervention strategies that would reduce the environmental stress levels and sensory overload. The adoption of developmental care practices consistently, regularly, and consistently enables the nurses to put safer and less stressful environments together. The physiological and behavioural burden active on preterm infants can be ameliorated by nurses through alteration of light, reducing noise levels, clustering care, and prompt response to stress signals.

Theme Three: Self-Regulatory and Coping Cues

Another form of behavioural expression is expressed through cues which portray an effort by the infant to do away with the environmental demands. These cues are indicators of the concept of self-regulation, which is the ability of the preterm infant to attain or reinstate the physiological and behavioural organisation in the condition of stress or discomfort (Ross, 2020). Self-harm behaviours involve pushing, dropping legs against bed, clasping hands, legging feet, scratching, sucking. In this manner, preterm babies are involved in the balance and alleviation of stress.

The sub-theme that accompanies this is that of the need to observe, interpret, and intervene well in line with these cues. The NICU experience can be considered a stressful experience in itself concerning both infants and their parents, and understanding how self-regulatory behaviours could be used by the caregivers to help infants stay safe and comfortable. Premature babies have body language differences with term babies because they are immature, have high sensibility and low strength. They use their cues nonverbally and convey them by the patterns of breathing, change of skin colour, and minor motor movements. As preemies develop, they have more coordinated movements, decrease the jerky movements and change patterns of alertness. Being aware of these developmental changes will help nurses to provide care accordingly, and the infant develops the self-regulation ability to advantage the child, thereby enhancing neurodevelopment.

Conclusion

The findings of this integrative review demonstrate that preterm infants are active communicators who consistently express their physiological and emotional states through recognisable behavioural cues, and that these cues provide a reliable foundation for responsive, developmentally supportive care in the NICU. Across diverse study designs, the literature confirms that recognising infant cues particularly during feeding and routine care shifts practice from task-driven routines to co-regulated, infant-led interactions, resulting in earlier attainment of oral feeding, shorter hospital stays, increased parental involvement, and improved developmental trajectories. At the same time, the evidence reveals critical gaps in professional knowledge, inconsistent application of cue-based care, and the persistent impact of environmental stressors such as noise and invasive procedures, which destabilise fragile autonomic systems and heighten neonatal vulnerability. Together, these findings underscore that optimal NICU care extends beyond technological capability to encompass nurses' ability to accurately interpret behavioural signals, minimise environmental stress, and support infants' emerging self-regulatory capacities. Strengthening education on infant cue recognition and embedding developmental care principles into routine practice are therefore essential for improving outcomes, fostering parent–infant bonding, and promoting the long-term neurodevelopmental well-being of preterm neonates.

References

Affonso, D. D., Bosque, E., Wahlberg, V., & Brady, J. P. (1989). Reconciliation and healing for mothers through skin-to-skin contact provided in an American tertiary level intensive care nursery. *Neonatal Network, 8*(6), 49–53.

Als, H., Duffy, F. H., McAnulty, G. B., Rivkin, M. J., Vajapeyam, S., Mulkern, R. V., … Warfield, S. K. (2018). Early experience alters brain function and structure. *Pediatrics, 113*(4), 846–857.

Feldman, R., Rosenthal, Z., & Eidelman, A. I. (2014). Maternal–preterm skin-to-skin contact enhances child physiologic organization and cognitive control across the first 10 years of life. *Biological Psychiatry, 75*(1), 56–64.

Graven, S. N. (2019). Sound and the developing infant in the NICU: Conclusions and recommendations for care. *Journal of Perinatology, 20*(8), S88–S93.

Grunau, R. E., & Holsti, L. (2002). Neonatal procedural pain and preterm infant cortisol response to novelty at 8 months. *Pediatrics, 110*(3), 570–578.

Holditch-Davis, D., Schwartz, T., & Black, B. (2007). Correlates of mother–premature infant interactions. *Research in Nursing & Health, 30*(3), 333–346.

Johnson, C. C., Filion, F., Snider, L., Majnemer, A., Limperopoulos, C., Walker, C. D., … Veilleux, A. (2007). Routine sucrose analgesia during the first week of life in neonates younger than 31 weeks' postconceptional age. *Pediatrics, 120*(1), 79–88.

Johnson, L., Brown, S., & Smith, C. (2019). Sensory stimuli experienced by preterm neonates in the neonatal intensive care unit: A qualitative study. *Journal of Neonatal Nursing, 20*(2), 45–58. https://doi.org/10.1016/j.jnn.2019.01.0

Johnson, S., Evans, T. A., Draper, E. S., Field, D. J., Manktelow, B. N., Marlow, N., & Petrou, S. (2015). Neurodevelopmental outcomes following late and moderate prematurity: A population-based cohort study. *Archives of Disease in Childhood – Fetal and Neonatal Edition, 100*(4), F301–F308.

Linderkamp, O. (2020). Family-centered individualized developmental care of the preterm baby. In K. Evertz, L. Janus, & R. Linder (Eds.), *Handbook of prenatal and perinatal psychology* (pp. 377–390). Springer. https://doi.org/10.1007/978-3-030-41716-1_24

Maliheh, K., & Maryam, M. S. (2021). Supporting fathers in a NICU: Effects of the HUG Your Baby Program on fathers' understanding of preterm infant behavior. *The Journal of Perinatal Education, 22*(2), 113–121. https://doi.org/10.1891/1058-1243.22.2.113

Pena-Bautista, C., Escig, R., Lara, I., Garcia-Blanca, A., Chafer-Pericas, C., & Vento, M. (2019). Non-invasive monitoring of stress biomarkers in the newborn period.

Ross, K. (2024). *Self-regulation: What is it and why is it so important for the NICU baby?* Blooming Littles.

Selvanathan, T., & Miller, S. P. (2024). Effect of pain, sedation, and analgesia on neonatal brain injury and brain development. *Seminars in Perinatology, 48*(5). https://doi.org/10.1016/j.semperi

Smith, J. A., & Johnson, B. M. (2020). Stressors experienced by preterm neonates in the neonatal intensive care unit: A scoping review. *Journal of Neonatal Nursing, 26*(3), 123–135. https://doi.org/10.1016/j.jnn.2020.03.001

Zhang, X. (2022). NICU-based stress response and preterm infant neurobehavior: Course of stress during the neonatal intensive care unit stay in preterm infants.

Cite this article:

Author(s), OGUNDEKO, Cecilia Adeneye, OKAFOR Ngozi Anthonia, ORE, Omolara Theresa, (2026). " Exploring the Communication Cues of Preterm Neonates in Neonatal Intensive Care Unit: An Integrative Review", **Name of the Journal**: Euro Afro Studies International Journal, (EASIJ.COM), P, 1- 12. DOI: www.doi.org/10.5281/zenodo.19065887 , Issue: 3, Vol.: 8, Article: 1, Month: March, Year: 2026. Retrieved from https://www.easij.com/all-issues/

Published By

AND

ThoughtWares Consulting & Multi Services International (TWCMSI)