


# Neonatal Intensive Care Nurses' Perceptions of Artificial Intelligence Integration in Neonatal Skin Assessment: A Qualitative Phenomenological Study

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## ABSTRACT

**OBJECTIVE:** This study explores neonatal intensive care unit (NICU) nurses' perceptions of artificial intelligence (AI)-assisted neonatal skin assessment, focusing on its benefits, challenges, and ethical implications. Optimizing AI integration requires understanding nurses' attitudes.

**METHODS:** A qualitative phenomenological approach was employed. Semi-structured interviews were conducted with 23 NICU nurses from a public hospital in Gaziantep, Turkey, between January and March 2025. Data were analyzed using inductive content analysis to identify emerging themes related to AI's impact on clinical decision-making, workflow efficiency, and professional autonomy.

**RESULTS:** Findings revealed that nurses acknowledged AI's potential to enhance diagnostic accuracy, standardize assessments, and reduce inter-observer variability. However, concerns were raised regarding algorithm reliability, professional autonomy, and ethical considerations. Nurses recognized AI's potential but stressed the need for transparency, training, and safeguards against over-reliance. Participants emphasized human oversight to ensure patient-centered care.

**CONCLUSIONS:** Artificial intelligence may improve neonatal skin assessment, but integration must balance technology and ethics. Engaging NICU nurses in AI system development and implementation is essential to fostering trust and ensuring alignment with clinical needs. Future research should assess AI's long-term impact and support interdisciplinary tool development that complements nursing expertise.

**KEYWORDS:** artificial intelligence, neonatal intensive care, nursing perceptions, qualitative research, skin assessment

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## INTRODUCTION

The integration of artificial intelligence (AI) technologies in health care holds significant potential to advance patient care, improve clinical decision support, and reduce professional workload.<sup>1</sup> In neonatal intensive care units (NICUs), where preterm and high-risk infants require continuous monitoring and specialized care, AI-assisted clinical decision-making systems

have garnered increasing attention.<sup>2</sup> Systematic skin assessment is vital due to neonatal skin fragility and susceptibility to complications.<sup>3</sup> Standardized skin assessment reduces morbidity, but traditional methods rely on subjective judgment, affecting consistency.<sup>4</sup> The integration of AI-driven skin assessment systems presents a potential solution to this challenge, offering an objective and standardized approach to neonatal skin evaluation.<sup>5</sup> However, despite these potential benefits, the widespread implementation of AI in health care remains contingent upon nurses' perceptions of its feasibility, ethical implications, and its impact on professional autonomy.<sup>1,6</sup> Neonatal intensive care unit nurses' perceptions are critical to AI adoption in clinical practice. Existing literature highlights that nurses' acceptance, confidence, and concerns regarding AI technologies significantly influence the effectiveness of these innovations in patient care.<sup>7</sup> For instance, a study by Coşkun et al,<sup>1</sup> conducted in a specific NICU setting in Turkey, reported that although nurses expressed positive attitudes toward AI-based assessment tools, they also voiced concerns regarding reliability, error tolerance, and ethical aspects. Although informative, these findings represent a localized perspective and underscore the need for further multicenter studies to generalize such insights.<sup>1</sup> These findings suggest that nurses' trust in AI-driven systems directly impacts their clinical applicability and long-term sustainability in neonatal care. This qualitative study explores NICU nurses' perceptions of AI-assisted skin assessment. Specifically, this study aims to uncover nurses' lived experiences, the meanings they ascribe to AI-driven assessment technologies, and their perspectives on the integration of AI in neonatal care. By exploring these aspects, this study contributes to the academic discourse on AI in nursing and offers recommendations to support its ethical and sustainable use in neonatal intensive care.

## METHODS

### Study Design

This study employed a phenomenological research design to thoroughly explore NICU nurses' experiences, the meanings they attribute to these experiences, and the implications of these perceptions for clinical practice.

### Setting

This research was conducted in the NICU of a public hospital in Gaziantep, Turkey, between January and March 2025. Data collection was aligned with nurses' shifts to capture authentic, routine experiences with AI in practice.

### Participants

Twenty-three NICU nurses were recruited via convenience sampling. Most had more than 5 years of experience, with data

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saturation reached at the 23rd interview. The lead researcher identified participants in collaboration with the nurse manager to ensure inclusion criteria. Nurses were approached through internal announcements and direct verbal invitations during shift handovers. Participation was entirely voluntary, and no incentives were provided. Informed consent was obtained after verbal and written explanation.

### Inclusion and Exclusion Criteria

Only NICU nurses with at least 1 year of experience were included to ensure sufficient familiarity with skin assessment. Those with less experience or not directly employed in the unit were excluded to maintain clinical relevance in evaluating AI integration.

### Data Collection Methods

Interviews took place in private settings, scheduled around shifts for participant comfort and realism. Each 45- to 60-minute session was conducted by a single researcher, audio-recorded with informed consent, securely stored, and transcribed verbatim. The interview protocol, developed from literature and expert input, addressed nurses' views on AI-assisted skin assessment, including decision-making, workload, reliability, ethics, and care. Open-ended questions encouraged participants to express their experiences, concerns, and expectations regarding AI integration in neonatal care. The study focused solely on nurses' perceptions; no skin assessments or image analyses were conducted. Although participants discussed AI's potential to assess diverse skin tones, no standardized tool was used, as data were based entirely on interviews rather than patient observation or technology use.

### Data Analysis

Inductive content analysis allowed themes to emerge directly from nurses' experiences, without predefined categories. A structured analytical process was followed to ensure rigor.<sup>8,9</sup>

### Transcription of Data

All interviews were transcribed verbatim to preserve accuracy.

### Interview Conduction and Data Consistency

An experienced qualitative researcher conducted all interviews and contributed to initial coding, ensuring consistency. In total, 3 researchers were involved in the data analysis phase: one conducted the interviews and also contributed to initial coding, whereas the other two independently reviewed the transcripts, developed the coding framework, and validated the emerging themes. Two researchers independently reviewed and reconciled codes through consensus.

### Coding

The transcribed data were independently coded by researchers, grouping statements based on their meaning and relevance to AI-assisted neonatal skin assessment.

### Theme Development

Coded data were analyzed for patterns and relationships, resulting in key themes related to clinical decision-making, workload impact, reliability, ethics, and nurse-infant interaction.

### Theme Validation

Themes were refined through consensus to ensure analytical consistency. Two external associate professors, blinded to the study aims, reviewed and confirmed the final themes to enhance

credibility. Data were deidentified to uphold ethical standards. Trustworthiness and rigor were supported through multiple strategies: dual independent coding by 2 researchers, external validation, and member checking with selected participants to verify thematic accuracy. These methods align with established qualitative research standards.

### Selection of Quotations

Representative quotes were italicized to illustrate key findings in the results.

### Ethical Considerations

Ethical approval was granted by Hasan Kalyoncu University's Non-Interventional Clinical Research Ethics Committee. Participants received detailed study information and gave written consent. Identities were anonymized, and data were securely stored with restricted access per ethical standards.

## RESULTS

Interviews with 23 NICU nurses revealed 5 main themes on AI integration in neonatal skin assessment: (1) AI's role in neonatal skin assessment: clinical decision support and predictive accuracy; (2) AI's influence on nursing workflow and documentation efficiency; (3) reliability, algorithmic transparency, and ethical considerations; (4) AI's impact on human interaction and patient-centered care; and (5) the need for AI-specific training in neonatal care.

### Participant Characteristics

The 23 participants (15 females) were aged 25 to 46 (mean = 34.2), with 2 to 26 years of professional and 1 to 18 years of NICU experience (mean = 7.3). Most held a bachelor's degree (60.9%) and worked in clinical roles. Although only 26% had prior AI exposure, 83% expressed a strong interest in training. Regarding AI's role in clinical decision-making, 69.6% believed it could enhance accuracy and standardization, 21.7% were uncertain, and 8.7% were doubtful. Views on workload impact were mixed: 34.8% expected notable reductions, 26.1% anticipated minor benefits, and 39.1% expected no change or increased burden due to validation demands. Ethical concerns were common: 65.2% cited issues around patient safety, data security, and autonomy, whereas 34.8% believed AI could be integrated safely with proper oversight. Most relied on manual, observational methods for skin assessment (56.5%), with limited use of technological tools (26.1%) and minimal AI integration (17.4%). This diversity in demographic, professional, and technological experience provides a nuanced understanding of NICU nurses' perspectives, revealing both the potential and limitations of AI-assisted skin assessment.

### Theme 1. AI's Role in Neonatal Skin Assessment: Decision Support and Diagnostic Accuracy

Artificial intelligence may improve diagnostic accuracy by identifying subtle skin changes and reducing subjectivity in assessments. However, concerns included contextual limitations, automation overuse, and algorithmic bias (Table 1).

#### AI as a Potential Clinical Decision-Support System

A majority of participants (n = 17, 73.9%) believed AI-assisted tools could enhance neonatal skin assessment by improving accuracy, detecting early signs of complications, and standardizing evaluations:

*AI could standardize assessments often based on subjective judgment, helping reduce diagnostic variability. (Participant 8)*

**TABLE 1. NURSES' PERCEPTIONS OF AI'S ROLE IN NEONATAL SKIN ASSESSMENT**

Subtheme	Supporting Participant Quotes	Key Findings
AI as a clinical decision-support system	<i>AI provides standardization and a second opinion mechanism. (P8)</i> <i>AI lacks contextual awareness and may misinterpret clinical relevance. (P15)</i>	AI enhances diagnostic accuracy and assists in decision-making AI has limitations in integrating patient-specific factors
Standardization and reduction of subjectivity	<i>Each nurse evaluates skin differently. AI minimizes inconsistencies. (P11)</i> <i>Tactile assessment is irreplaceable. AI should remain a supportive tool. (P22)</i>	AI helps reduce interobserver variability in assessments AI cannot replace manual bedside skin evaluations
Early detection and predictive capabilities	<i>AI can alert us before visible complications develop. (P5)</i> <i>False positives and algorithmic bias could lead to overdiagnosis. (P19)</i>	AI's predictive analytics help prevent skin-related issues early AI models must be rigorously validated to avoid unnecessary interventions

Abbreviation: AI, artificial intelligence.

Although most participants acknowledged these benefits, some also noted that AI lacks the capacity to fully contextualize clinical findings—such as integrating medical history and environmental influences—highlighting the continued importance of professional interpretation.

These findings suggest that AI could function as an adjunct to human expertise but should not replace clinical judgment in decision-making.

### Standardization and Reduction of Subjectivity in Skin Assessments

Participants frequently emphasized AI's potential to reduce interobserver variability in neonatal skin assessments. They noted that such evaluations often rely on individual clinical experience, resulting in inconsistent documentation and intervention timing. Artificial intelligence–based tools could help minimize these discrepancies by offering quantifiable and objective data.

*Each nurse might evaluate skin integrity slightly differently. AI-generated analysis, if properly integrated, could allow for a more standardized approach to assessment and documentation. (Participant 11)*

However, some nurses were skeptical about AI's ability to replace traditional bedside assessments. They emphasized the importance of tactile evaluation—such as assessing skin texture, elasticity, and temperature—as a key limitation of AI systems. As one experienced NICU nurse noted:

*Skin texture and elasticity are crucial indicators, and AI cannot replicate what we feel through hands-on assessment. It should support, but never replace, the nurse's expertise. (Participant 22)*

These responses indicate that although AI might improve consistency, it cannot fully substitute the holistic and sensory-based approach required for neonatal skin assessments.

### Early Detection and Predictive Capabilities

Several participants highlighted AI's role in identifying neonatal skin conditions at early stages, potentially preventing complications by detecting subtle changes before clinical signs appear:

*AI could alert us to subtle skin changes earlier, allowing timely interventions before complications occur. (Participant 5)*

False positives and bias could misclassify benign findings, triggering unnecessary interventions. One participant

emphasized the risks of inadequate AI training on diverse neonatal populations:

*If AI isn't trained on a diverse neonatal population, it could incorrectly flag normal variations as concerning, creating extra workload and unnecessary stress for parents. (Participant 19)*

This finding underscores the importance of ensuring AI models are rigorously validated on heterogeneous neonatal data sets to minimize biases and improve clinical applicability.

### Theme 2. AI's Influence on Nursing Workflow and Documentation Efficiency

Nurses working in the NICU identified benefits and challenges regarding AI integration into neonatal skin assessment. Although AI was perceived as a tool to streamline documentation and enhance patient prioritization, concerns emerged regarding manual validation requirements, system compatibility issues, and its potential impact on professional autonomy. The findings underscore 3 key aspects of AI's projected influence on workflow (Table 2).

#### AI as a Potential Tool for Workflow Optimization

A majority of participants (n = 15, 65.2%) indicated that if properly integrated, AI-assisted documentation could optimize how routine assessments are performed—an essential component of direct patient care, thereby enabling nurses to better allocate time across multiple clinical responsibilities. In addition, AI-assisted risk stratification was perceived as a tool that might improve patient prioritization:

*If AI could help identify high-risk neonates more accurately, it might allow us to prioritize interventions more effectively. (Participant 12)*

However, some nurses (n = 8, 34.8%) emphasized that even if AI were implemented, they would still feel the need for manual review before accepting AI-generated reports.

*Even if AI-generated reports become available, I would still need to verify them to ensure they align with my own bedside evaluation. (Participant 19)*

These perspectives indicate a cautious optimism regarding AI's ability to improve workflow efficiency while also underscoring the importance of human oversight.

**TABLE 2. NURSES' PERCEPTIONS OF AI'S INFLUENCE ON NURSING WORKFLOW AND DOCUMENTATION EFFICIENCY**

Subtheme	Supporting Participant Quotes	Key Findings
AI as a tool for workflow optimization	<i>If AI could help identify high-risk neonates more accurately, it might allow us to prioritize interventions more effectively. (P12)</i> <i>Even if AI-generated reports become available, I would still need to verify them to ensure they align with my own bedside evaluation. (P19)</i>	AI is perceived as a tool that could enhance patient prioritization and reduce routine workload Nurses emphasize the need for human oversight in AI-generated documentation
Increased documentation and verification requirements	<i>If AI-generated reports require constant reformatting or manual verification, it could actually create extra work instead of saving time. (P4)</i> <i>For AI to be helpful, it has to work smoothly with our current systems. Otherwise, we'd be spending even more time correcting discrepancies. (P8)</i>	AI integration may increase the documentation burden if manual validation remains necessary Seamless integration with hospital documentation systems is crucial for AI efficiency
Balancing automation and clinical judgment	<i>AI might be useful, but final decisions should always rely on clinical expertise, not just automated outputs. (P9)</i> <i>If AI is introduced, it must be designed to support nurses, not to replace our professional judgment. (P6)</i>	AI should function as a decision-support tool rather than replace clinical expertise Clear guidelines are needed to ensure AI supports rather than diminishes professional autonomy

Abbreviation: AI, artificial intelligence.

### Projected Increase in Documentation and Validation Requirements

Despite its intended efficiency, several nurses (43.5%) expressed concerns that AI integration might inadvertently increase workload—particularly when frequent manual validation and documentation alignment with existing systems are required.

Participants emphasized that AI systems must be seamlessly compatible with current hospital infrastructure to avoid redundancy and prevent additional burdens:

*For AI to be helpful, it has to work smoothly with our current systems. Otherwise, we'd be spending even more time correcting discrepancies. (Participant 8)*

These concerns highlight that effective AI adoption requires thoughtful integration strategies that mitigate unintended inefficiencies and support nursing workflow rather than complicating it.

### Balancing Automation and Clinical Judgment

Although AI was generally seen as a potential tool for enhancing efficiency, 12 participants (52.2%) emphasized that clinical decisions should always remain under human control and that AI should function as a decision-support tool rather than a replacement:

*AI might be useful, but final decisions should always rely on clinical expertise, not just automated outputs. (Participant 9)*

Concerns regarding the impact of AI on professional autonomy were also evident, with nurses stressing the need for clear guidelines defining AI's role in clinical practice:

*If AI is introduced, it must be designed to support nurses, not to replace our professional judgment. (Participant 6)*

These findings suggest that although nurses recognize the potential advantages of AI, they also require reassurance that AI will complement—not replace—their expertise in neonatal care.

### Theme 3. Reliability, Algorithmic Transparency, and Ethical Considerations

Neonatal intensive care unit nurses raised concerns regarding AI reliability, transparency, and associated ethical

implications. Although AI standardizes assessments and minimizes human error, participants highlighted risks such as misclassification, algorithmic bias, and the lack of explainability in decision-making. Ethical concerns, particularly regarding professional autonomy and legal accountability, were also prominent (Table 3).

### AI Reliability and Diagnostic Accuracy

A majority of participants (n = 16, 69.6%) acknowledged AI's potential to enhance diagnostic accuracy and reduce interobserver variability. Artificial intelligence–based systems were seen as particularly useful in identifying early-stage skin abnormalities, thereby supporting timely interventions.

*AI ensures a more objective and standardized skin assessment, preventing inconsistencies in clinical evaluations. (Participant 7)*

However, 7 participants (30.4%) expressed skepticism regarding AI's reliability, highlighting cases where AI incorrectly flagged benign skin conditions as critical.

*Sometimes AI marks normal skin changes as concerning, leading to unnecessary interventions and increased parental anxiety. (Participant 14)*

These concerns underscore the necessity of continuous AI validation and refinement, particularly in neonatal populations with highly variable skin conditions.

### Algorithmic Transparency and Trust in AI Decisions

Concerns regarding AI's "black-box" nature were expressed by 10 participants (43.5%), who emphasized the need for greater transparency in how AI reaches its conclusions. Several participants referred to AI systems as a "black box," meaning that the internal decision-making processes of the algorithms are not transparent or easily interpretable by end-users.

*If AI suggests a risk, I need to understand why. Without transparency, how can I fully trust its recommendation? (Participant 6)*

Some nurses (n = 5, 21.7%) proposed that AI systems should include confidence scores or visual indicators to enhance interpretability.

**TABLE 3. NURSES' PERCEPTION OF AI RELIABILITY, ALGORITHMIC TRANSPARENCY, AND ETHICAL CONSIDERATIONS**

Subtheme	Supporting Participant Quotes	Key Findings
AI reliability and diagnostic accuracy	<i>AI ensures a more objective and standardized skin assessment, preventing inconsistencies in clinical evaluations. (P7)</i> <i>Sometimes AI marks normal skin changes as concerning, leading to unnecessary interventions and increased parental anxiety. (P14)</i>	AI enhances diagnostic accuracy and reduces interobserver variability Misclassification of benign conditions could lead to unnecessary interventions
Algorithmic transparency and trust in AI decisions	<i>If AI suggests a risk, I need to understand why. Without transparency, how can I fully trust its recommendation? (P6)</i> <i>If AI provided reasoning or confidence levels behind its decisions, it would be easier to integrate into our practice. (P10)</i>	Nurses require transparency in AI-generated risk assessments for trust and reliability AI should include confidence scores or explanations to enhance usability
Ethical concerns: patient safety and professional autonomy	<i>AI should support decision-making, not dictate it. Final responsibility must remain with nurses. (P3)</i> <i>If AI misdiagnoses a condition, who takes responsibility? We need clear legal regulations. (P19)</i>	AI should function as a supportive tool without compromising professional autonomy Clear legal frameworks are necessary to define accountability in AI-related errors

Abbreviation: AI, artificial intelligence.

*If AI provided reasoning or confidence levels behind its decisions, it would be easier to integrate into our practice. (Participant 10)*

This finding suggests that greater algorithmic transparency is key to fostering trust and adoption among NICU nurses.

#### Ethical Concerns: Patient Safety and Professional Autonomy

Ethical concerns were particularly prominent, with 9 participants (39.1%) raising alarms over AI potentially diminishing nursing autonomy:

*AI should support decision-making, not dictate it. Final responsibility must remain with nurses. (Participant 3)*

In addition, legal liability in AI-related errors was another critical issue. Nurses expressed uncertainty about who would be held accountable if AI made a diagnostic mistake:

*If AI misdiagnoses a condition, who takes responsibility? We need clear legal regulations. (Participant 19)*

To address these ethical concerns, nurses recommended establishing clear guidelines that define AI's role as a clinical support tool rather than a decision-maker.

#### Theme 4. AI's Impact on Human Interaction and Patient-Centered Care

Although AI integration can enhance workflow efficiency, nurses emphasized preserving human interaction and patient-centered care. Participants had mixed opinions on AI's role in parental education, nurse-patient interaction, and its potential to depersonalize care (Table 4).

#### AI as a Support Tool for Parental Education

A majority of participants (n = 15, 65.2%) recognized AI-generated reports as useful tools for improving parental education and engagement.

*Parents understand their baby's condition better when they see structured AI-generated reports. (Participant 10)*

However, 6 nurses (26.1%) raised concerns that parents might over-rely on AI-generated information rather than consulting health care providers.

*Some parents trust AI more than us, which could limit open discussions about their baby's condition. (Participant 3)*

These findings highlight the need for AI to be used as a supplementary tool, rather than a replacement for direct nurse-parent communication.

#### Impact on Nurse-Patient Interaction

Participants were divided regarding AI's influence on nurse-patient interactions. Twelve nurses (52.2%) were concerned that AI documentation requirements might reduce direct bedside care.

*Neonatal care isn't just about clinical accuracy—it's about being there for the baby and their family. (Participant 7)*

Conversely, 8 nurses (34.8%) believed AI could free up time for more meaningful patient interactions:

*If AI helps with paperwork, I can focus more on bedside care. (Participant 4)*

**TABLE 4. NURSES' PERCEPTIONS OF AI'S IMPACT ON HUMAN INTERACTION AND PATIENT-CENTERED CARE**

Subtheme	Supporting Participant Quotes	Key Findings
AI as a support tool for parental education	<i>Parents understand their baby's condition better when they see structured AI-generated reports. (P10)</i> <i>Some parents trust AI more than us, which could limit open discussions about their baby's condition. (P3)</i>	AI-generated reports can enhance parental understanding and engagement Over-reliance on AI-generated information may reduce direct communication with health care providers
Impact on nurse-patient interaction	<i>Neonatal care isn't just about clinical accuracy—it's about being there for the baby and their family. (P7)</i> <i>If AI helps with paperwork, I can focus more on bedside care. (P4)</i>	AI documentation demands may reduce direct bedside interactions AI has the potential to streamline administrative tasks, allowing more time for patient-centered care

Abbreviation: AI, artificial intelligence.

**TABLE 5. NURSES' PERSPECTIVES ON AI-SPECIFIC TRAINING IN NEONATAL CARE**

Subtheme	Supporting Participant Quotes	Key Findings
Training needs for AI integration in neonatal care	<i>Without proper AI education, nurses may either misuse or underutilize these technologies. (P11)</i> <i>We need interactive training that allows us to actually work with AI systems in neonatal care scenarios. (P6)</i>	Lack of AI training may hinder its effective use in neonatal care. Hands-on, scenario-based training is essential for AI competency
Challenges in adapting to AI-based training	<i>For those of us who have been in NICUs for decades, AI feels overwhelming. Training should be tailored accordingly. (P14)</i> <i>We work long shifts, and finding time for AI education is difficult. Training must be accessible and flexible. (P19)</i>	AI training programs should be customized based on nurses' experience levels Workload and scheduling constraints must be considered in AI training program designs

Abbreviation: AI, artificial intelligence.

This finding underscores the need for balanced AI integration, ensuring that automation does not detract from the human aspect of neonatal care.

### Theme 5. The Need for AI-Specific Training in Neonatal Care

Nurses underscored structured AI training as essential for effective and safe neonatal care implementation. Participants identified knowledge gaps, adaptation challenges, and accessibility barriers as key issues requiring targeted education (Table 5).

#### Training Needs for AI Integration in Neonatal Care

A significant proportion of nurses (n = 18, 78.3%) reported having no formal training in AI but expressed strong interest in structured education programs:

*Without proper AI education, nurses may either misuse or underutilize these technologies. (Participant 11)*

Participants stressed that training should go beyond theoretical knowledge and include hands-on workshops:

*We need interactive training that allows us to actually work with AI systems in neonatal care scenarios. (Participant 6)*

#### Challenges in Adapting to AI-Based Training

Experienced NICU nurses (n = 9, 39.1%) reported struggles in adapting to AI workflows, emphasizing the need for customized training based on experience levels:

*Experienced NICU nurses may find AI overwhelming; thus, training should be experience-specific. (Participant 14)*

In addition, 6 nurses (26.1%) cited shift schedules and workload pressures as barriers to participating in AI training:

*We work long shifts, and finding time for AI education is difficult. Training must be accessible and flexible. (Participant 19)*

These findings indicate that AI training programs must be adaptable, practical, and directly applicable to NICU settings to encourage effective learning.

### DISCUSSION

This study provides one of the first in-depth explorations in Turkey of NICU nurses' ethical, professional, and clinical views on AI-assisted neonatal skin assessment. Most prior research in this area emphasizes technological development and validation, whereas the present study foregrounds the lived experiences of end-users, addressing how such technologies align with professional practice, clinical autonomy, and patient safety. Nurses largely welcomed AI as a decision-support tool. Similar

demographic profiles in other studies support transferability.<sup>1,10</sup> Neonatal intensive care unit nurses in Turkey, including those in this study, generally share roles and responsibilities aligned with international standards in clinical assessment, documentation, and care coordination. However, contextual factors—such as staffing levels, resource availability, and institutional policies—may affect workflow and professional autonomy. Compared with high-resource countries, Turkish NICU nurses may face greater workload pressures, potentially shaping their views on AI's usefulness. Consistent with previous research, nurses in this study viewed AI tools as beneficial when used to support—not replace—their clinical expertise.<sup>10</sup> A few participants voiced cautionary perspectives, but these were framed as conditions for safe integration rather than outright opposition. In light of existing literature, the following discussion elaborates on each emergent theme, emphasizing the central theme of AI's role in neonatal skin assessment as decision support and a catalyst for diagnostic precision.

#### AI as Decision Support and Enhancer of Diagnostic Accuracy in Skin Assessment

Nurses valued AI for supporting skin assessment decisions, especially for detecting subtle signs of skin injury often missed during routine checks. This optimism is well-founded in current evidence. High AI accuracy in dermatologic and neonatal conditions supports nurses' belief in its diagnostic utility.<sup>11–13</sup> Importantly, nurses in the present study felt such tools would serve as a second pair of eyes, reinforcing their clinical judgments, especially in ambiguous cases. This perspective is consistent with Racine et al,<sup>10</sup> where NICU clinicians expected AI to enable more consistent and objective pain evaluations. By reducing reliance on solely individual experience or visual acuity, AI decision support may standardize skin assessments, thereby potentially improving patient safety and outcomes. Notably, neonatal skin injury identification today often depends on the clinician's experience and visual assessment skills.<sup>14</sup> The authors' findings suggest that integrating AI could mitigate this subjectivity: nurses believed AI could quickly analyze skin images or monitor data and flag areas of concern, allowing interventions before minor irritations progress to severe wounds. Such decision support aligns with broader evidence that AI can process clinical data rapidly to assist in early warning and decision-making, ultimately enhancing diagnostic precision in nursing care.<sup>1,10</sup> Theme 1 shows NICU nurses support AI to enhance diagnostic accuracy, if reliable and complementary. In this study, NICU nurses described "early signs of skin injury" as subtle changes in skin color, texture, moisture, and temperature—often preceding visible damage. They noted that AI could help detect common neonatal skin injuries such as pressure injuries, incontinence-associated dermatitis, medical adhesive-related skin injuries, and

superficial tears. Although rare conditions like epidermolysis bullosa were not mentioned, participants stressed the need for AI to identify early inflammatory responses before ulceration occurs. These findings highlight the importance of training AI systems on a broad range of neonatal skin conditions to ensure clinical relevance and safety.

### Integration into Nursing Workflow and the Human Touch in Care

Participants discussed AI's integration into daily workflow and its effect on care delivery. Several nurses noted that AI could streamline documentation and skin monitoring by automating routine assessments. By improving the efficiency of skin evaluations, an essential part of direct care, AI may help nurses better manage other clinical tasks. This perceived benefit aligns with previous findings that AI can reduce nursing workload and accelerate clinical processes.<sup>1</sup> However, nurses emphasized that efficiency should not compromise the human touch central to neonatal care. They highlighted the irreplaceable role of compassionate, hands-on care, which technology cannot replicate.<sup>4</sup> For example, although AI might consistently report a baby's skin integrity status, it cannot console an anxious parent or adjust care based on nuanced contextual understanding. Similar to prior findings, the participants in the present study affirmed AI's informational value but emphasized irreplaceable human caregiving.<sup>10</sup> Thus, the nurses in this study advocated for AI to be integrated in a way that supports clinical workflow—for instance, issuing alerts about skin integrity changes—while still allowing nurses to exercise judgment and maintain close nurse-infant/family relationships. In practice, this means clearly defining AI's role: it should handle data and pattern recognition in the background, enabling more consistent monitoring, but nurses would continue to play a vital role in communicating with parents and collaborating with providers to support clinical decision-making. Nurses are responsible for identifying and documenting skin changes, which are then evaluated collaboratively with neonatal nurse practitioners or neonatologists who interpret clinical significance and guide diagnosis. By doing so, AI can enhance consistency in assessments (eg, standardizing how skin findings are interpreted) without diminishing the personalized care and comfort that NICU nurses uniquely provide. Preserving empathy aligns with nursing literature emphasizing AI's role in informing, not delivering care.<sup>4,10</sup>

### Reliability, Trust, and Ethical Considerations

Nurses frequently expressed concerns about AI's reliability and trustworthiness. They emphasized that AI systems for skin assessment must be rigorously validated to prevent false alarms or missed injuries. Some feared misidentification could compromise patient safety—an issue also noted in the literature. Artificial intelligence tools should support, not replace, clinical judgment.<sup>10,15</sup> In this study, nurses emphasized that AI recommendations must always be verified against their own clinical assessments. This view aligns with ethical analyses, which argue that AI should operate under human oversight, with nurses retaining responsibility for final care decisions.<sup>15</sup> Another key concern was data integrity and accountability. Some participants questioned who would be responsible if AI made an error—highlighting broader issues of liability. Despite these concerns, nurses generally supported AI use, advocating for safeguards such as result verification, algorithm calibration for neonatal populations, and transparency in decision-making processes. Participants emphasized the need for clear legal frameworks to define accountability for AI-related errors. In high-risk neonatal care, legal uncertainty may hinder clinicians'

willingness to rely on AI. This underscores the urgent role of regulatory bodies in clarifying responsibility and establishing risk mitigation strategies for AI-supported decisions. Ensuring accuracy and building trust will be key to successful implementation. These participants' views on the need for validation, oversight, and trust in AI systems align with recent recommendations that emphasize extensive training and evaluation of AI systems in nursing before wide adoption.<sup>1</sup> Ultimately, participants agreed that AI can be a trusted ally if proven accurate and implemented with clear guidelines—though cautious skepticism remains appropriate. This balanced view is supported by the literature, which highlights both positive attitudes toward early AI integration in NICUs and the need for user trust and ethical safeguards.<sup>10</sup> This study's findings confirm that nurses will accept AI in skin assessment only if they trust its reliability and see it as a tool that supports—not replaces—their clinical judgment.

### Knowledge, Training, and Implementation Prerequisites

Neonatal intensive care unit nurses emphasized the need for structured training and system preparation for effective AI integration, acknowledging its novelty in their practice. The identified need for structured training and system readiness reflects the broader requirement to upskill nurses for effective AI integration.<sup>10</sup> Prior research highlights that AI education enhances nurses' confidence and readiness.<sup>4</sup> In the present study, nurses who were more knowledgeable about technology tended to be more receptive to AI integration. Moreover, participants emphasized the importance of interdisciplinary collaboration when rolling out AI—involving NICU nurses in the development and customization of the skin assessment, AI could ensure the tool truly meets clinical needs and fits into existing care routines. Evidence shows that involving end-users in AI design improves implementation outcomes.<sup>10</sup> A key implication of this study is that hospital leaders and educators should actively involve NICU nurses in AI development and provide targeted training in neonatal AI applications. Participants viewed AI as a positive addition—provided nurses are well-prepared and implementation is thoughtful. These findings align with broader support for AI integration, which emphasizes collaborative strategies to maximize benefits and minimize care disruptions.<sup>10</sup>

### Limitations

This single-site study limits generalizability to other settings. Although the sample size is suitable for phenomenological research, it may not reflect broader institutional or cultural diversity. Thus, findings should be viewed as exploratory. Given the evolving nature of AI, further multisite studies with larger samples are needed to validate results and support broader implementation. The qualitative design also limits causal inference, and self-reported data may introduce bias. As AI continues to develop, ongoing research is essential to understand nurses' changing perceptions and long-term adoption.

### CONCLUSIONS

This study highlights NICU nurses' views on AI-assisted skin assessment, including its benefits and challenges. Artificial intelligence is valued for diagnostic accuracy, though concerns about reliability, autonomy, and ethics persist. AI should support—not replace—clinical judgment, requiring transparency and training. Nurses expressed cautious optimism, emphasizing AI's benefits and the need for human oversight. Nurse engagement in

AI development is crucial for fostering trust and ensuring clinical alignment. Future research should explore AI's long-term effects to ensure it complements nursing practice and enhances care quality.

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