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Nurses' clinical intuition and its application in clinical practice: a qualitative Meta-integration

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ADMINISTRATIVE INFORMATION

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Conflicts of interest - As the authors of this systematic review, we are acutely aware of the importance of the objectivity and impartiality of research for the development of academia. Hereby, we solemnly make the following declaration of conflicts of interest: I. Funding and Sponsorship Source of Research Funding: The research work for this systematic review is primarily funded by the Hubei Provincial Key Laboratory of Occupational Hazard Identification and Control, with the grant number OHIC2024Y04. The sponsor has provided only the necessary funds for the research and has not exerted any influence on the design, implementation, data analysis, or the writing and publication of the results. Other Financial Associations: Apart from the aforementioned funding, none of the authors have received any funds, equipment, or materials directly related to this research from any other organizations or individuals during the course of the study. II. Relationships and Collaborations All authors have only a collaborative relationship based on this systematic review study. There are no hierarchical, familial, or other special personal relationships that could potentially affect the judgment of the research. III. Intellectual Property and Potential Interests Intellectual property: Currently, none of the authors have any intellectual property disputes related to this systematic review, nor have.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 1 May 2025 and was last updated on 1 May 2025.

INTRODUCTION

Review question / Objective To systematically synthesize evidence from qualitative studies on "nurses' clinical intuition and its application in clinical practice," explore the essential attributes, formation mechanisms, influencing factors, and practical value of nurses' clinical intuition, and provide an evidence-based basis for clinical decision-making, nursing education, and management. **Condition being studied** This systematic review focuses on nurses' clinical intuition, a critical cognitive capability that enables nurses to make rapid, context-sensitive judgments in complex clinical scenarios. Clinical intuition in nursing refers to an experience-driven, subconscious cognitive process where nurses integrate explicit knowledge, implicit practice wisdom, and situational cues to form judgments that may precede or complement formal analytical reasoning. It operates as a bridge between theoretical knowledge and practical expertise, particularly pivotal in high-stakes environments such as emergency departments, intensive care units, and chronic care settings where timely, nuanced decisions significantly impact patient outcomes.

The health condition or phenomenon of interest is not a specific disease but the cognitive mechanism of clinical intuition itself and its application in nursing practice. Nurses frequently encounter ambiguous, dynamic, or high-risk situations where standard protocols alone may be insufficient. For example, in detecting early signs of patient deterioration, recognizing subtle nonverbal cues in critically ill patients, or tailoring care to culturally diverse populations, clinical intuition allows nurses to identify risks or needs that might otherwise go unrecognized by structured assessment tools. This is particularly relevant in scenarios requiring rapid decision-making, such as emergency triage, acute illness management, or end-of-life care, where delays in judgment can escalate risks.

Existing research has highlighted that clinical intuition emerges from prolonged experience, reflective practice, and the internalization of patterns observed in patient interactions. However, the evidence base remains fragmented across cultures, clinical settings, and stages of nursing expertise (e.g., novice to expert). Key gaps include understanding how intuition develops over time, how it interacts with rational decision-making, and how institutional, educational, and interdisciplinary factors facilitate or hinder its effective use. Misunderstandings about intuition-such as perceiving it as mere "gut feeling" rather than an evidence-informed cognitive process-can also limit its integration into clinical practice, despite its documented role in enhancing patient safety and care quality.

This review aims to synthesize qualitative research evidence to clarify the nature of nurses' clinical intuition, its formation mechanisms (e.g., experience accumulation, knowledge transformation thresholds), contextual influences (e.g., interdisciplinary collaboration, institutional constraints), and practical implications for education and management. By explicating how nurses use intuition to navigate uncertainty, researchers and clinicians can better appreciate its value in complementing standardized protocols, particularly in underspecified clinical scenarios where human judgment remains indispensable. Ultimately, this work seeks to advance understanding of clinical intuition as a core component of nursing expertise, fostering its

systematic integration into practice to improve decision-making and patient outcomes in complex healthcare environments.

METHODS

Participant or population The primary population of interest comprises nurses across diverse clinical settings, roles, and experience levels, including registered nurses, specialist nurses (e.g., emergency, critical care, oncology nurses), and nursing students/interns. The review also encompasses interactions involving nurses, patients, and family members in clinical practice, as many qualitative studies explore nurse-patient/ family dynamics as part of intuition-driven care.

Intervention This review focuses on nurses' clinical intuition as a core cognitive process in clinical decision-making, defined as an experiencedriven, subconscious judgment that integrates explicit knowledge (e.g., guidelines, pathology) and implicit expertise (e.g., nonverbal cue recognition, pattern matching). Specifically, it includes:

Practical Manifestations: Intuitive strategies in complex scenarios (e.g., emergency triage, early detection of patient deterioration, cross-cultural care), including "tinkerer" practices that adaptively reorganize fragmented clinical and contextual information.

Influencing Factors: Experience thresholds for the transformation of knowledge into intuition, dynamics of clinical settings (acute vs. chronic care, high-risk environments), tensions/trust in interdisciplinary collaboration, and institutional/ ethical constraints (e.g., nurse autonomy, policy support).

Promotion Strategies: Educational approaches (reflective practice, simulation training, curricula blending evidence-based and humanistic care) and managerial interventions (institutional empowerment, technology-aided intuition support).

Comparator Comparator: Comparators in this review reflect contextual, experiential, and procedural contrasts that illuminate nurses' clinical intuition:

Clinical Settings: Acute care (ED/ICU, prioritizing rapid risk assessment) vs. chronic/palliative care (relational, nuanced need recognition).

Nurse Expertise: Novice nurses (reliant on explicit guidelines) vs. experts (experience-driven intuitive schema, per Benner's framework).

Decision-Making Modes: Intuitive judgments (subconscious pattern matching) vs. rational analysis (structured guidelines, lab data), and individual vs. interdisciplinary decision-making (e.g., nurse autonomy vs. hierarchical constraints).

Cultural/Institutional Contexts: Resource-rich vs. resource-constrained environments, and Western vs. non-Western healthcare cultures (impacting nonverbal cue interpretation and intuition legitimacy).

Educational Strategies: Traditional didactic training vs. reflective/experiential learning (e.g., simulation, mentorship) that cultivates intuition.

These comparators are not interventions but dimensions of variation across studies, enabling synthesis of how intuition differs under diverse conditions, fostering a holistic understanding of its mechanisms, influences, and practice implications.

Study designs to be included This systematic review includes qualitative research designs that explore nurses' clinical intuition and its application in clinical practice, aligned with the SPIDER framework's "Design" component. Eligible study designs are those that generate descriptive, interpretive, or exploratory insights into the phenomenon of interest through inductive analysis of human experiences, behaviors, or contexts.

Eligibility criteria The eligibility criteria for this systematic review are defined using the SPIDER framework to ensure relevance to the research question: What is the nature, mechanisms, influences, and practical value of nurses' clinical intuition in clinical decision-making?

Inclusion Criteria

Study Type

Primary research explicitly classified as qualitative studies, including:

Phenomenology, grounded theory, ethnography, qualitative description, case studies, focus groups, semi-structured interviews, or narrative inquiry.

Mixed-methods studies where qualitative data dominate the analysis (e.g., qualitative findings drive interpretation or theory development).

Studies using qualitative data collection (interviews, observations) and analysis (thematic analysis, interpretive description) to explore nurses' clinical intuition.

Research Topic

Focus on nurses' clinical intuition in any aspect of clinical practice, including:

Formation mechanisms (e.g., experience accumulation, knowledge-to-intuition transformation thresholds).

Cognitive processes (e.g., pattern recognition, implicit knowledge, intuitive-rational decision-making interactions).

Contextual influences (e.g., clinical settings, interdisciplinary collaboration, institutional policies, cultural factors).

Practical applications (e.g., decision-making in acute/chronic care, patient-nurse-family interactions, educational strategies to cultivate intuition).

Population/Participants

Primary participants: Nurses (registered, specialist, student, or novice-to-expert) in any clinical setting (acute care, chronic care, community, primary health, etc.).

Studies involving nurse-patient or nurse-family interactions relevant to intuitive practice (e.g., cross-cultural communication, end-of-life care decisions).

Language & Publication Date

Studies published in English or Chinese (to capture both Western and Eastern research contexts).

Publication date: From April 6, 2005, to April 6, 2025 (aligning with the review's 20-year temporal scope).

Methodological Quality

Studies rated A or B quality using the JBI Critical Appraisal Tool for Qualitative Research (2017 version), indicating low to moderate risk of bias. Exclusion Criteria

Study Type

Purely quantitative studies (surveys, randomized controlled trials, correlational research).

Mixed-methods studies where quantitative data or methods take primacy (e.g., qualitative data used only for illustration).

Non-research materials (editorials, commentaries, theoretical papers without original empirical data). Research Topic

Studies unrelated to nursing practice (e.g., physician intuition, medical technology development, health policy).

Topics focusing exclusively on patients/families without nurse-centric analysis of intuitive decision-making.

Population/Participants

Research involving non-nurse healthcare providers (e.g., physicians, pharmacists) as the primary population, unless exploring nurse-interdisciplinary collaboration dynamics.

Language & Accessibility

Studies in languages other than English or Chinese.

Articles with incomplete data or inaccessible fulltext (after reasonable attempts to obtain them).

Methodological Quality

Studies rated C quality (high risk of bias) per the JBI tool.

Information sources International Databases

PubMed: A primary source for biomedical literature, covering nursing and healthcare research.

Web of Science (WoS): Encompasses multidisciplinary research, including articles on clinical decision-making and cognitive processes in nursing.

Cochrane Library: Focused on healthcare interventions and methodologies, with an emphasis here on qualitative studies related to clinical intuition.

EBSCO (CINAHL & MEDLINE): Specializes in nursing and allied health literature, which is critical for capturing nurse-centric perspectives.

Chinese Databases

CNKI (China National Knowledge Infrastructure): The largest Chinese academic database, indexing nursing research and healthcare policies from mainland China.

Wanfang Data: Contains peer-reviewed journals and conference proceedings relevant to nursing practices in China.

VIP Chinese Science and Technology Journal Database: Covers technical and clinical research within Chinese healthcare settings.

Search Parameters

Time Span: Studies published between April 6, 2005, and April 6, 2025, will be searched to capture the evolution of clinical intuition research over the past two decades, aligning with the review's focus on recent advancements and historical context.

Language: Both English and Chinese studies will be included to ensure cultural and geographic diversity in the evidence synthesis.

Literature Sources

Peer-Reviewed Journals Only: This study will only include articles published in peer-reviewed journals. Grey literature (e.g., unpublished dissertations, conference abstracts, reports) will not be considered.

Handsearching: Reference lists of included studies and key review articles will be manually searched to identify any missed publications, enhancing the comprehensiveness of the search.

Literature Management and Deduplication

EndNote 20.0: This software will be used to manage citations, remove duplicates, and streamline the screening process. Two reviewers will independently screen titles, abstracts, and full texts to ensure consistency.

Main outcome(s) Cognitive Mechanisms in Decision-Making: Elucidation of how clinical intuition emerges as an experience-driven cognitive schema, involving temporal embeddedness (longitudinal experience accumulation), multidimensionality (cognitive, embodied, relational dimensions), and a threshold effect for knowledge-to-experience transformation (e.g., pattern recognition in acute care). Contextual Dynamics: Identification of situational influences, such as "tinkerer" practices in resource-constrained environments, adaptability to dynamic clinical contexts (e.g., emergency triage, end-of-life care), and tensions/balances in interdisciplinary collaboration (e.g., nursephysician power dynamics affecting intuitive judgment acceptance).

Educational & Managerial Implications: Synthesis of strategies to cultivate intuition, including reflective practice, curricula blending evidencebased and humanistic care, and institutional empowerment (e.g., policy support for intuitive decision-making).

Ethical & Relational Complexities: Exploration of autonomy-institution conflicts (e.g., legal risks limiting intuitive actions) and patient-nurse-family interactions, where intuition shapes trust-building, cultural sensitivity, and end-of-life care decisions.

Quality assessment / Risk of bias analysis The quality of included primary studies will be evaluated using the JBI Critical Appraisal Tool for Qualitative Research (2017 version), a validated framework designed for systematic assessment of qualitative research rigor. This tool comprises 10 core criteria across three dimensions:

Methodological Coherence: Assesses alignment between the study's philosophical foundation (e.g., phenomenology, grounded theory) and research design, ensuring consistency in data collection (e.g., semi-structured interviews, observations) and analysis (e.g., thematic analysis, interpretive description).

Researcher Reflexivity: Evaluates transparency about the researcher's role (e.g., conflicts of interest, cultural/contextual biases) and how these influenced data interpretation (e.g., bracketing assumptions in phenomenology).

Interpretive Validity: Examines the credibility of findings, including whether data saturation was achieved, participant quotes are used to support conclusions, and transferability of results to other contexts.

Only studies rated Grade A or B will be included, ensuring the review synthesizes evidence with acceptable methodological quality. Grade C studies are excluded to minimize bias from poorly conducted research. This rigorous appraisal aligns with JBI guidelines for qualitative Meta-integration, ensuring the final synthesis is based on trustworthy, context-rich findings that accurately reflect nurses' experiences and mechanisms of clinical intuition.

Strategy of data synthesis Data synthesis will follow the JBI Meta-integration methodology for qualitative research, a systematic approach to

synthesizing diverse qualitative findings into coherent, aggregated interpretations. The process involves iterative stages of immersion, coding, categorization, and thematic integration, ensuring rigorous synthesis of rich, context-sensitive evidence.

1. Data Extraction & Immersion

Initial Extraction: Two reviewers will independently extract raw data from included studies, including:

Study characteristics (author, year, country, design, population, clinical setting).

Qualitative findings (explicit themes, participant quotes, conceptual frameworks, contextual descriptions of intuition).

Immersion: Reviewers will engage in deep reading of each study to grasp its philosophical stance (e.g., phenomenology, grounded theory) and interpretive nuances, ensuring contextual fidelity during synthesis.

2. Thematic Coding & Categorization

Open Coding: Raw data (themes, quotes, narratives) will be broken into discrete units of meaning (e.g., "intuition as pattern recognition," "institutional constraints on intuition").

Synthesis Coding: Similar codes will be grouped into descriptive categories based on shared semantic content (e.g., all codes related to intuition's temporal development form the category "time embeddedness of intuition").

Example: A quote from an emergency nurse—"You just sense something's wrong based on years of seeing similar cases"—might be coded as "experience-driven pattern recognition," later grouped into the category "implicit knowledge as a foundation for intuition."

3. Aggregative Integration into Synthesized Findings

Category Clustering: Descriptive categories will be further synthesized into analytical themes that transcend individual studies, identifying overarching patterns or theoretical constructs. For example:

Categories like "time embeddedness," "knowledge-experience threshold," and "multidimensional intuition" may cluster into the synthesized finding "Intuitive mechanisms and experiential integration in nursing decision-making" (as in the review's results).

Conceptual Elevation: Synthesized findings will be interpreted through relevant theories (e.g., Benner's expert practice theory, dual-process theory of cognition) to build a cumulative understanding of nurses' clinical intuition, such as its role as an "experience-driven cognitive schema" or its interaction with rational decisionmaking.

4. Rigor & Reflexivity

Inter-Rater Consistency: Discrepancies in coding or categorization will be resolved through discussion or third-party arbitration to ensure reliability.

Auditability: A clear audit trail will be maintained, tracing how raw data map to final synthesized findings (e.g., via tables linking participant quotes to categories to integrated results).

Contextual Sensitivity: Findings will explicitly acknowledge variations across settings (acute vs. chronic care) and populations (novice vs. expert nurses), avoiding overgeneralization.

5. Final Output: Integrated Findings

The synthesis will culminate in 4–6 overarching integrated findings, each encapsulating clusters of related categories. These findings will:

Describe the nature of clinical intuition (e.g., cognitive schemas, multidimensionality).

Elucidate its formation mechanisms (e.g., experience thresholds, reflective practice).

Identify contextual influences (e.g., interdisciplinary collaboration, institutional policies).

Highlight practical implications for education, practice, and policy (e.g., curricula redesign, institutional empowerment strategies).

Subgroup analysis No formal statistical subgroup analysis will be conducted, as this is a qualitative Meta-integration focusing on thematic synthesis rather than quantitative comparisons. However, contextual variations (e.g., clinical settings, nurse expertise levels, cultural contexts) will be systematically explored during data synthesis to identify how they shape nurses' clinical intuition. Findings will acknowledge differences in intuition's manifestation (e.g., acute vs. chronic care, novice vs. expert practices) within the integrated themes, ensuring sensitivity to diverse contexts without discrete subgroup testing.

Sensitivity analysis No statistical sensitivity analysis will be conducted, as this is a qualitative Meta-integration. Instead, sensitivity will be assessed by:

Examining whether excluding moderate-quality studies (Grade B) alters core themes.

Checking consistency of findings across qualitative traditions (phenomenology, grounded theory, etc.).

Documenting inter-rater reliability in data extraction and coding to ensure synthesis rigor.

Scrutinizing marginal cases (e.g., borderline mixedmethods studies) for conceptual coherence.

These steps ensure the review's findings are robust to methodological variations, aligning with qualitative Meta-integration standards for trustworthiness and interpretive validity.

Language restriction English, Chinese.

Country(ies) involved China.

Keywords Nurses; Clinical intuition; Qualitative research; Meta-integration; Clinical decision-making.

Contributions of each author

Author 1 - Liu Yang - Conceived the study concept and design, drafted the initial manuscript, and led all stages of the systematic review, including developing the search strategy, conducting literature searches across international (PubMed, Web of Science, Cochrane Library, EBSCO) and Chinese (CNKI, Wanfang, VIP) databases, and managing EndNote bibliographic records. Performed title/abstract screening, full-text.

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Author 2 - Wang Ying - Conducted the literature search across international and Chinese databases, managed EndNote bibliographic records, and performed initial screening of titles/ abstracts. Assisted in data extraction and contributed to the thematic coding of included studies.

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Author 3 - Li Yan - Specialized in qualitative methodology, advising on the application of the JBI Meta-integration framework and critical appraisal of study quality using the JBI tool. Reviewed and revised the sections on quality assessment and data synthesis for methodological rigor.

Author 4 - Wu Hui Hong - Contributed expertise in nursing education and clinical practice, interpreting findings for educational and managerial implications. Edited the discussion of intuition's role in curricula redesign and institutional empowerment strategies.