

RESEARCH ARTICLE (ORIGINAL)

Nurse Residents' Perceptions of Clinical Reasoning Development in Undergraduate Nursing Education

Percepção dos Enfermeiros Residentes Sobre o Desenvolvimento da Competência Raciocínio Clínico Durante a Licenciatura em Enfermagem
Percepción de los Residentes Sobre el Desarrollo de la Competencia en Razonamiento Clínico Durante la Carrera de Enfermería

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Abstract

Background: Clinical reasoning is an essential skill in nursing, requiring strategies that promote critical thinking, problem-solving, and self-directed learning. Innovative, collaborative, and active methods are effective in improving technical and non-technical skills and facilitating the translation of theory into practice.

Objective: To understand how clinical reasoning is developed in undergraduate nursing education.

Methodology: Descriptive, qualitative study conducted with two focus groups and nine participants. Data were analyzed according to Bardin's content analysis technique.

Results: Reports mentioned predominance of traditional teaching, little use of simulations, problem-based learning, and flipped classroom. Difficulty in translating theory into practice and the need for revising nursing curricula and reinforcing preceptorship were highlighted.

Conclusion: The development of clinical reasoning remains fragile, requiring pedagogical practices that stimulate autonomy, critical analysis, and informed decision-making.

Keywords: clinical reasoning; teaching-learning process; education, nursing; clinical competence; internship and residency; education, continuing

Resumo

Enquadramento: O raciocínio clínico é uma competência essencial na enfermagem, exigindo estratégias promotoras do pensamento crítico, resolução de problemas e aprendizagem autodirigida. Métodos inovadores, colaborativos e ativos evidenciam eficácia no aprimoramento de habilidades técnicas e não técnicas e facilitam a translação da teoria para a prática.

Objetivo: Compreender o desenvolvimento do raciocínio clínico na licenciatura em enfermagem.

Metodologia: Estudo descritivo, qualitativo, realizado com dois grupos focais e nove participantes. Os dados foram analisados segundo a técnica de análise de conteúdo de Bardin.

Resultados: Relatos indicaram predomínio do ensino tradicional, pouco uso de simulações, aprendizagem baseada em problemas e sala de aula invertida. Destacaram-se dificuldades na integração teoria-prática, necessidade de revisão curricular e fortalecimento da preceptoria.

Conclusão: O desenvolvimento do raciocínio clínico permanece frágil, demandando práticas pedagógicas que estimulem autonomia, análise crítica e tomada de decisões fundamentadas.

Palavras-chave: raciocínio clínico; processo ensino-aprendizagem; educação em enfermagem; competência clínica; internato e residência; educação permanente

Resumen

Marco contextual: El razonamiento clínico es una competencia esencial en enfermería, que requiere estrategias que fomenten el pensamiento crítico, la resolución de problemas y el aprendizaje autorregulado. Los métodos innovadores, colaborativos y activos han demostrado su eficacia a la hora de mejorar las habilidades técnicas y no técnicas, y facilitan la aplicación de la teoría a la práctica.

Objetivo: Comprender cómo se desarrolla la competencia en razonamiento clínico durante la carrera de enfermería.

Metodología: Estudio descriptivo y cualitativo, llevado a cabo con dos grupos focales y nueve participantes. Los datos se analizaron mediante la técnica de análisis de contenido de Bardin.

Resultados: Los informes señalaron el predominio de la enseñanza tradicional y un escaso uso de simulaciones, aprendizaje basado en problemas y clase invertida. Destacaron las dificultades para integrar la teoría y la práctica, así como la necesidad de revisar el plan de estudios y reforzar la tutoría.

Conclusión: El desarrollo del razonamiento clínico sigue siendo precario, lo que exige prácticas pedagógicas que fomenten la autonomía, el análisis crítico y la toma de decisiones fundamentadas.

Palabras clave: razonamiento clínico; proceso de enseñanza-aprendizaje; educación en enfermería; competencia clínica; internado y residencia; educación continua

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Introduction

Nursing education in Brazil should be generalist, critical, reflective, and humanistic, as outlined in the National Curriculum Guidelines, preparing nurses to competently navigate the complexities of health and disease processes (Conselho Nacional de Educação. Câmara de Educação Superior, 2001). However, the importance of clinical reasoning is recognized worldwide as the cornerstone of safe and autonomous nursing practice (Huesmann et al., 2023), extending beyond the national context.

COFEN Resolution No. 736/2024 reinforces this by establishing diagnosis and prescription as the exclusive responsibility of nurses. The nursing process is a methodological tool that helps nurses carry out this resolution. It is structured into interdependent and interrelated stages (Conselho Federal de Enfermagem, 2024) and is guided by taxonomies such as the North American Nursing Diagnosis Association (NANDA), which lend scientific rigor to clinical practice (Herdman et al., 2021). Nevertheless, challenges remain in the practical training of clinical reasoning, primarily due to the prevalence of traditional methods despite the effectiveness of active learning methods, such as simulation, problem-based learning (PBL), and the flipped classroom (Carvalho et al., 2024). According to the international literature, integrating innovative pedagogical strategies such as active learning is crucial for bridging the gap between theory and practice and helping students apply knowledge in clinical settings (Kalu et al., 2023).

Thus, this study aims to understand how clinical reasoning skills are developed in undergraduate nursing education.

Background

Developing clinical reasoning skills is complex and requires educational strategies that foster critical thinking, problem-solving, and self-directed learning (Carvalho et al., 2017). This is especially important given the need for nurses to make fast and safe decisions in increasingly complex healthcare settings (Neethling et al., 2025).

In nursing education, it is crucial to distinguish clinical reasoning from related concepts that are often used interchangeably but have specific theoretical boundaries. Critical thinking is a mode of thinking that underpins and guides the clinical reasoning process, whereas clinical judgment is the outcome of that process and emerges from the synthesis of analyzed information (Alfaro-LeFevre, 2020; Kuiper et al., 2017).

Studies show that the quality of nursing care is directly related to a nurse's ability to analyze clinical data and make informed decisions, making it essential to introduce this competency in the earliest years of academic training (Bitencourt et al., 2023). However, both international and national literature point to the persistence of traditional teaching models that inadequately promote clinical reasoning development (Mwale et al., 2025).

The difficulty of integrating theory into practice underscores the relevance of this study, which explores nurse

residents' perceptions—during their transition from academic training to advanced practice—of the development of this competency during their undergraduate education.

Research question

How do nurse residents perceive the development of their clinical reasoning skills in undergraduate nursing education, and what implications does this training have for clinical practice?

Methodology

This descriptive, exploratory study uses a qualitative approach based on the Consolidated Criteria for Reporting Qualitative Research (COREQ; Souza et al., 2021) guidelines to ensure transparency and methodological rigor. The study was approved by the Research Ethics Committee of the higher education institution to which the researcher was affiliated (CAAE No. 78961024.4.0000.5580, Opinion No. 6.817.054).

Nine nurse residents enrolled in the second year of two residency programs in a capital city in southern Brazil participated in the study. The inclusion criteria were limited to second-year nurse residents. Residents were chosen over final-year students or recent graduates because residency is a form of professional development that allows for intensive practice and consolidation of clinical reasoning skills. The experience accumulated in the second year allows for more mature reflection, which is less biased by the recent memory of the undergraduate degree, enabling a more critical evaluation of academic training and the applicability of skills.

Participants were selected using the snowball sampling technique (Oliveira et al., 2021). Initial contact was made via WhatsApp. Initial participants (seeds) were asked to identify two other residents who met the inclusion criteria and provide their names and contact information. This process was repeated until the desired number of participants was reached. Some participants refused or dropped out after initial acceptance due to scheduling conflicts. Each participant took part only once.

Data collection was conducted through two focus groups (FGs), which were led in person by the principal investigator. FGs are a qualitative research technique that gathers information through interactions among participants (Trad, 2009). The principal investigator is a specialist nurse and faculty member who was previously a resident, providing her with an in-depth understanding of the topic and the participants' context. However, she had no prior professional or personal ties to the residents. The FGs were conducted neutrally, with the researcher intervening only to present questions and ensure the discussion's flow, thereby minimizing potential researcher bias in data collection and interpretation.

Three questions were posed to guide the FG discussion: 1. "How were clinical reasoning skills taught and developed during the undergraduate program?"; 2. "How did the

teaching methodologies used during the undergraduate program contribute to the development of clinical reasoning?”; 3. “How does the development of clinical reasoning during the undergraduate program contribute to professional practice during residency?”

Due to scheduling difficulties, two FGs were held: one with five participants and another with four, for a total of nine nurse residents. The first FG lasted 30 minutes, and the second lasted 40 minutes. Both meetings were audio- and video-recorded in a private room with prior consent. The researcher took handwritten notes, recording speaking time and participant identification.

Before the start of the meeting, the informed consent form was presented via a QR code and/or a link to access Google Forms. To preserve anonymity, alphanumeric coding was used (e.g., A1, B2).

The analysis of the obtained information was conducted using Bardin's (2016) content analysis technique. During the pre-analysis stage, the researcher transcribed the discourses in full. Floating and repetitive reading facilitated familiarization with the material. During the data exploration phase, recording and meaning units were defined and grouped based on content similarities. The principal investigator carried out this process with the assistance of a collaborating professor who participated in selecting the discourses and coding and categorizing themes (double

coding). Any disagreements were resolved by consensus to ensure interpretive consistency. The process was manual and used a structured spreadsheet for recording and quantification, resulting in four main categories.

After the second FG, no new themes emerged, and the information showed similarities and overlaps with that collected in the first FG. Therefore, the researcher deemed theoretical saturation to have been reached, as the desired analytical depth had been achieved with the study sample. The results and/or transcripts were not returned to the participants.

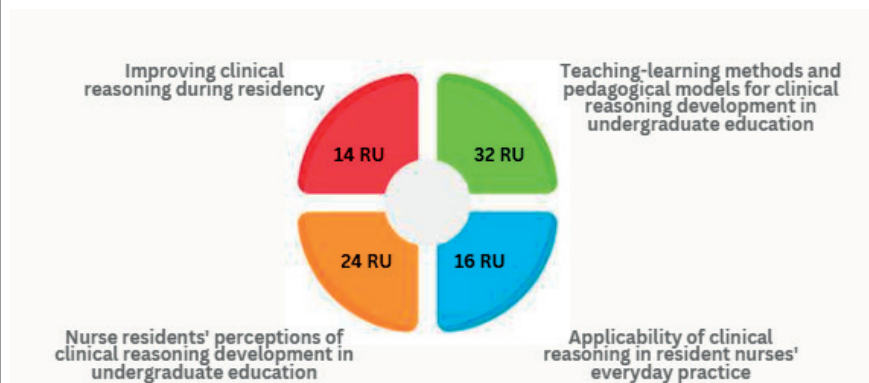
Results

All participants (100%) were female, and 5 of them (55.6%) were between 20 and 25 years old. All residents reported having 1–5 years of training and entering residency programs immediately after completing their undergraduate education. The participants were distributed as follows by area of specialization: six (66.6%) in Child and Adolescent Health Nursing, one (11.1%) in Women's Health Care, one (11.1%) in Obstetric Nursing, and one (11.1%) in Oncology and Hematology Care.

Analysis of the discourses obtained from the FGs yielded four main categories, as shown in Figure 1.

Figure 1

Representation of Categories, Recording and Meaning Units Derived from Focus Group Discussions



Note. RU: Recording Units. Direct quotes from participants have been retained in their original form (Brazilian Portuguese) to preserve the authenticity of their statements; RU - recording units. Source: Prepared by the authors (2024)

In the Nurse residents' perceptions of clinical reasoning development in undergraduate education category, opportunities and challenges in developing this competency were identified. One nurse resident highlighted the lack of structured strategies to foster clinical reasoning development:

“When we really needed to develop reasoning skills to assess patients, there weren't any methodologies to help us” (Participant A2).

During the FG discussions, positive perspectives emerged

regarding the teaching-learning process and the development of clinical reasoning in undergraduate education:

“The development of clinical reasoning during my undergraduate studies greatly contributed to my practice because, for example, I learned to use clinical reasoning in college, which they didn't teach me here” (Participant B3). However, other participants expressed dissatisfaction with the methodologies adopted in the undergraduate program, highlighting gaps in teaching clinical reasoning: “Now that I'm in residency, I realize that the process of

developing clinical reasoning has quite a few flaws” (Participant A1); “And I also think that many aspects of the undergraduate program were flawed because they didn’t empower us to take ownership of our learning process” (Participant A2).

In the second FG, participants emphasized that the NANDA taxonomic classifications—the Nursing Interventions Classification (NIC) and the Nursing Outcomes Classification (NOC)—are valuable tools that allow students to link theoretical knowledge to practice in a structured, evidence-based manner:

It wasn’t a typical ‘question-and-answer’ exam; instead, we had to respond to clinical cases based on the subject matter. For example, in respiratory care, a case would be presented, and we would diagnose using NANDA, NIC, and NOC. (Participant B1)

Despite the use of active methodologies throughout the undergraduate program, the impact of the COVID-19 pandemic was a recurring theme in the first FG discussions. Participants reported that the pandemic negatively affected the conduct of in-person practical activities, which directly impacted the development of clinical reasoning: “All the reasoning we had learned to develop had a flaw, a gap, because of the pandemic and because we could no longer go to the hospital” (Participant A2).

The Teaching-learning methods and pedagogical models for clinical reasoning development in undergraduate education category highlights the various methodologies participants experienced throughout their academic training.

When discussing these methods, the participants mentioned that the traditional teaching model, which was based primarily on passive listening, was predominant throughout their undergraduate program:

“During my undergraduate studies, most classes were traditional with lectures. We would sit, listen to the professor speak, take notes, and then study for the end-of-semester exams” (Participant A5).

This statement reveals how traditional teaching can limit active participation while emphasizing the importance of adopting pedagogical strategies that promote the development of practical and reflective skills.

Some participants shared their experiences with the blended learning model, which combines traditional practices with active methodologies. This format received positive evaluations:

“This mix was nice because it brought variety, and we didn’t get so tired of it” (Participant A5).

During the group discussions, simulation was identified as an effective strategy for developing clinical skills and competencies:

During my undergraduate studies, we did a lot of simulations. There was a simulation center—the one with the glass walls where you’re inside the room and can’t see anyone outside, but everyone outside can see you—and where we would simulate emergency situations, primary care visits, and consultations. (Participant A3)

In addition to this teaching and learning strategy, Participant A2 noted that the flipped classroom was also

adopted throughout the undergraduate.

“But when we had enough time to study and participate in class, it was much better; we could see that we absorbed the content much more than during a lecture alone” (Participant A2).

Despite its benefits, the use of the flipped classroom was considered a limitation, especially in relation to overload and exhaustion throughout the program:

During my undergraduate studies, we also used some active teaching methods, mainly the flipped classroom. There came a point in the program when we just didn’t want it anymore—we were tired of it (laughs)—and would say, ‘No, we want a traditional lecture, please.’ (Participant A2)

Finally, a lack of faculty preparation was mentioned as an obstacle to effectively and appropriately implementing active learning methodologies. According to the reports, effectively facilitating the learning process depends on well-trained, up-to-date faculty staff.

“This may be due to the fact that faculty members were not prepared to use these methodologies, or perhaps because the content was not suited to that particular methodology” (Participant A5).

The Enhancing clinical reasoning during residency category explores participants’ experiences with developing this competency in the multiprofessional residency context, highlighting the importance of implementing active teaching and learning methodologies.

The use of active methodologies, especially when combined with case studies, was frequently mentioned as a strategy that promotes clinical reasoning:

These days, in the program, we work a lot with case studies and things like that—things we had here and there in college, but they weren’t really integrated into the course material, which I think is really helpful. (Participant A1)

Although the benefits of active learning methods have been recognized, there has been a noted imbalance between these practices and the provision of structured theoretical content.

I sometimes feel like we could use a theoretical class on that topic because we form a group, do research, give a presentation, but we don’t delve deeply into many things—it all feels pretty vague. (Participant B2)

Another recurring theme in the FGs was the lack of systematic preceptorship in clinical settings. This absence is perceived as a significant gap in the training process that negatively impacts the support needed by nurse residents: “Because we don’t have real preceptorship in the hospital, so we have to make do with what we have. I keep thinking about residents who arrive here already having come from a flawed undergraduate program” (Participant B1). The Applicability of clinical reasoning in nurse residents’ everyday practice category examines participants’ experiences and perceptions of the challenges they face when transitioning from undergraduate studies to residency, especially with regard to using clinical reasoning in complex settings.

This transition is described as a time of profound change,

when the nurse resident assumes greater autonomy and must apply their knowledge effectively:

I think the main difference we feel in this transition from undergraduate education to residency is really the issue of responsibility . . . in residency, you take on the role of being in charge of the department; you have to get things done, you have to know everything, and the technical staff will turn to you. (Participant A3)

However, the challenges of this new reality can be exacerbated by a lack of adequate support, especially when nurse residents are expected to take on a supervisory role without the necessary training:

“You arrive thinking you’ll be supervised, but then they put you in charge of supervising others, so it’s a huge challenge” (Participant A4).

Discussion

This study’s central contribution lies in its critical perspective of nurse residents. Through their experience with advanced practice, these residents can look back and identify gaps in their academic training in clinical reasoning. The results reveal the complexity of developing this competency throughout nursing education and highlight its limitations and challenges in the undergraduate program and the residency.

The first category, Nurse residents’ perceptions of clinical reasoning development in undergraduate education, shows that active learning methods were perceived as facilitating clinical reasoning development. This finding corroborates the international literature demonstrating that active learning practices promote greater student engagement and the development of complex skills, such as clinical reasoning (Kalu et al., 2023). The literature also shows that students exposed to active learning methods demonstrate better knowledge retention and greater autonomy than those exposed to traditional methods (Freeman et al., 2014). However, a critical analysis of the data reveals that the perception of gaps in training, particularly the lack of structured strategies for developing clinical reasoning, is the main point of divergence between theory and practice. Benner et al. (2010) emphasize the importance of incorporating clinical experiences from the beginning of studies. Some participants in this study did not have this experience, primarily due to the pandemic. Participants reported that the impacts of the global health context were a significant obstacle to the consolidation of clinical reasoning because they limited essential in-person practices. These findings are in line with studies that point to disruptions in education (Oliveira et al., 2023) and highlight the need for pedagogical innovation to address the gaps created by this forced transition (Haslam, 2021). The second category, Teaching-learning methods and pedagogical models for clinical reasoning development in undergraduate education, reveals that the persistent use of traditional models is the main challenge. Although models such as integrated modular teaching and PBL have

been reported as conducive to clinical reasoning because they promote meaningful, contextualized learning (Pezzi & Neto, 2008), they appear to be applied sporadically. Simulation, identified as a powerful tool for developing clinical competencies (Machado et al., 2024), and the flipped classroom, which fosters engagement and theoretical depth, reveal a contradiction in the reports: their recognized effectiveness contrasts with their perceived scarcity. Furthermore, reports of exhaustion and overload suggest that overuse and poor planning may lead to cognitive fatigue (Abeysekera & Dawson, 2014), challenging the uncritical adoption of these methodologies.

Another relevant aspect concerns teaching practices. Nursing teachers must act as facilitators, encouraging student-centered learning (Oliveira et al., 2019). This requires a shift in attitude and investment in continuing professional development (Berbel & Sánchez Gamboa, 2011). The results of this study align with previous research (Medeiros et al., 2022; Rached et al., 2025), indicating that many faculty members are unprepared to implement these strategies. Therefore, this gap in faculty pedagogical training is a critical institutional factor that limits the transition to active methodologies, despite their recognized importance.

In the third category, Enhancing clinical reasoning during residency, participants agreed that residency promotes the development of clinical reasoning, especially through case studies and other active learning methods. However, they criticized the imbalance between practical activities and theoretical content, as well as the absence of structured preceptorship. These findings suggest that weaknesses in foundational training are not fully compensated for during specialization, where preceptors’ lack of preparation and excessive workload hinder their performance as educators and tutors (Ministério da Educação. Conselho Nacional de Educação, 2024; Rodrigues & Witt, 2022).

Finally, in the fourth category, Applicability of clinical reasoning in nurse residents’ everyday practice, participants discussed the challenges they encountered when transitioning from undergraduate studies to residency. They mentioned increased responsibility and autonomy and the demand for leadership as central aspects of this phase. This transition requires technical knowledge, interpersonal skills, and emotional competencies (Carneiro et al., 2021).

Pressure to perform well and the complexity of clinical situations can lead to insecurity and anxiety among residents, especially in the absence of adequate institutional support. This underscores the importance of rethinking training processes and bolstering emotional and pedagogical support for these professionals.

This study has limitations related to its qualitative and exploratory nature. The small sample size ($n = 9$) was restricted to two residency programs in a single capital city in southern Brazil, which limits the generalizability of the results. Additionally, no other validation techniques were used, such as member checking. Nevertheless, the results offer relevant exploratory insights that may guide future research in other training contexts.

Conclusion

The results of this study offer a retrospective and critical evaluation of academic training from the viewpoint of nurse residents—professionals at the forefront of advanced clinical practice. Their perceptions indicate that traditional pedagogical models hinder the development of autonomy and the ability to make informed decisions, both of which are essential to patient safety. These results highlight the urgent need to revise nursing curricula, emphasizing active learning methods such as high-fidelity simulation, faculty and preceptor pedagogical training to facilitate clinical reasoning development, and improved coordination between academic institutions and healthcare services to promote effective theory-practice integration. Longitudinal and intervention studies are needed to examine clinical reasoning development from the start of undergraduate education through residency and evaluate the effectiveness of faculty training programs focused on active methodologies.

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Data curation: Machado, L. D., Mendes, J. O.

Formal analysis: Machado, L. D., Mendes, J. O.

Investigation: Machado, L. D.

Methodology: Machado, L. D., Mendes, J. O., Esteves, R. Z.

Project administration: Machado, L. D., Esteves, R. Z.

Resources: Machado, L. D.

Supervision: Esteves, R. Z.

Validation: Esteves, R. Z.

Visualization: Mendes, J. O.

Writing – original draft: Machado, L. D., Mendes, J. O.

Writing – review & editing: Mendes, J. O., Esteves, R. Z.

Thesis/Dissertation

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