

Development of clinical competencies in military nursing education from undergraduate training at the National Autonomous University of Honduras

Desarrollo de competencias clínicas en la educación de enfermería militar desde la formación universitaria en la Universidad Nacional Autónoma de Honduras

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ABSTRACT

Objective: To analyze, from theoretical and empirical perspectives, the process of developing clinical competencies in military nursing education within the university training at the National Autonomous University of Honduras. Methods: A sequential explanatory mixed-method design was implemented, with an initial phase of theoretical-documentary analysis of the curriculum and syllabi, followed by a cross-sectional study with 60 graduate nurses through simple random sampling. The "Questionnaire on Perception of Clinical Competence Development in Military Nursing" was applied, and descriptive and inferential analyses were performed with SPSS v25. Results: Documentary analysis revealed a discrepancy between the formal definition of competencies and evaluation instruments. Empirical data showed that technical competencies were the highest rated ($M=4.25$, $SD=0.52$), while military leadership received the lowest score ($M=3.10$, $SD=0.84$), with statistically significant differences ($p<0.01$). The perception of military leadership varied significantly according to professional experience ($F(2,57)=4.85$, $p=0.011$). Conclusion: There is a critical gap between curricular design and its practical implementation, particularly in the evaluation of specific transversal competencies in the military field, which demands a review of pedagogical strategies and greater articulation with real military scenarios.

Keywords: competency-based education, military nursing, clinical competence, nursing education, competency assessment.

RESUMEN

Objetivo: Analizar, desde una perspectiva teórica y empírica, el proceso de desarrollo de competencias clínicas en la educación de enfermería militar dentro de la formación universitaria en la Universidad Nacional Autónoma de Honduras. Métodos: Se implementó un diseño de método mixto secuencial explicativo, con una fase inicial de análisis teórico-documental del plan de estudios y sílabos, seguida de un estudio transversal con 60 enfermeras egresadas mediante un muestreo aleatorio simple. Se aplicó el "Cuestionario de Percepción sobre el Desarrollo de Competencias Clínicas en Enfermería Militar" y se realizaron análisis descriptivos e inferenciales con SPSS v25. Resultados: El análisis documental reveló una discrepancia entre la definición formal de competencias y los instrumentos de evaluación. Los datos empíricos mostraron que las competencias técnicas fueron las mejor valoradas ($M=4.25$, $DE=0.52$), mientras que el liderazgo militar obtuvo la puntuación más baja ($M=3.10$, $DE=0.84$), con diferencias estadísticamente significativas ($p<0.01$). La percepción del liderazgo militar varió significativamente según la experiencia profesional ($F(2,57)=4.85$, $p=0.011$). Conclusión: Existe una brecha crítica entre el diseño curricular y su implementación práctica, particularmente en la evaluación de competencias transversales específicas del ámbito castrense, lo que exige una revisión de las estrategias pedagógicas y una mayor articulación con escenarios castrenses reales.

Palabras clave: educación basada en competencias, enfermería militar, competencia clínica, educación en enfermería, evaluación por competencias.

1. Introduction

Contemporary higher education has undergone a paradigm shift toward a competency-based model, which seeks to ensure that graduates integrate knowledge, skills, values, and attitudes for optimal performance in specific contexts (Saldana-Duque & Sánchez-Peña, 2024; Ramírez-Díaz, 2020). In the field of health sciences, and particularly in nursing, this approach is essential, as clinical competence constitutes a cornerstone for patient safety and quality of care (Kavanagh & Sharpnack, 2021; Nabizadeh-Gharghozar et al., 2021). Clinical competence, understood as a hybrid and multifaceted construct, encompasses not only technical proficiency but also clinical judgment, critical thinking, communication, and the ability to act in complex situations (Faraji et al., 2019; Diez Cate, 2017).

In the specific context of military nursing, these competencies are expanded and nuanced by a unique environment that demands resilience, leadership, teamwork under pressure, and specialized preparation to operate in disaster, conflict, and tactical scenarios (Giddens et al., 2022). The training of these professionals must therefore rigorously articulate the general principles of nursing education with the specific requirements of the military domain. Competency-based education (CBE) emerges as the ideal model for this purpose, as it enables standardized, observable, and measurable training that ensures each student has achieved the essential performances required for practice (Gravana, 2017; Lewis et al., 2022; Lobo, 2022).

Nevertheless, the effective implementation of this model entails significant challenges. Competency assessment, for instance, represents one of the most complex tasks, requiring valid and reliable instruments that transcend the mere measurement of knowledge and capture the integrality of performance (García-Acosta & García-González, 2022; Hincapié & Clemenza, 2022; Villero et al., 2022). Likewise, the literature identifies a multiplicity of factors that may influence the development of clinical competence, ranging from individual variables such as personality traits (Okumura et al., 2022) to curricular, methodological, and clinical learning environment aspects (Almarwani & Alzahrani, 2023; Konrad et al., 2021).

In Honduras, military nursing education at the university level is carried out by institutions such as the National Autonomous University of Honduras (UNAH). Within this specific national and institutional context, it is imperative to critically and systematically examine how the development of clinical competencies is conceptualized and operationalized for this unique professional profile. Given

the complexity of the phenomenon and the need for a solid foundation for future empirical research, a theoretical analysis is required to underpin the inquiry. Therefore, this study aims to conduct a theoretical exploration to establish the basis for such understanding, offering a vision of the process of clinical competence development in military nursing education within the framework of university training at the National Autonomous University of Honduras (UNAH).

2. Materials and Methods

This research employed a sequential explanatory mixed-methods design, organized into two complementary phases. The first phase consisted of a theoretical-documentary analysis of the pedagogical foundations of clinical competence development, while the second phase implemented a cross-sectional empirical study with a quantitative approach to contrast the theoretical findings with the perceptions of nursing students. This methodological integration allowed for triangulation of perspectives and enriched the understanding of the phenomenon under study.

Phase 1: Theoretical-Documentary Analysis

An exhaustive document analysis was conducted using theoretical methods. The historical-logical analysis enabled tracing the evolution of the concept of clinical competence in military nursing education at the international level and its incorporation into the Honduran context. In parallel, the analysis-synthesis method was applied to deconstruct the curriculum of the Bachelor's Degree in Military Nursing at UNAH, examining internal coherence among objectives, content, pedagogical strategies, and evaluation systems. Finally, the systemic-structural approach facilitated understanding of training as a comprehensive system, identifying relationships between curricular components and the expected graduate profile. This phase was supported by the review of institutional documents, international competency frameworks, and specialized literature published between 2017 and 2024.

Phase 2: Empirical Study Population and Sample:

The study population consisted of 120 nurses who graduated from the Military Nursing program at UNAH between 2020 and 2023. Using simple random probability sampling, a sample of 60 participants was selected, representing 50% of the population, with a 95% confidence level and a 7% margin of error. Inclusion criteria considered graduates who had completed all clinical rotations in the curriculum and were currently practicing in military or civilian health institutions.

Instrument and Procedure:



For data collection, the *Perception Questionnaire on the Development of Clinical Competencies in Military Nursing* (CPDCC-EM) was used, structured into three sections: (a) sociodemographic and professional data; (b) a 5-point Likert scale assessing perceptions of the development of specific competencies (40 items grouped into dimensions of technical skills, clinical judgment, military leadership, and communication in crisis contexts); and (c) open-ended questions on perceived strengths and weaknesses of the training received. The instrument demonstrated high reliability in a pilot test with 15 nurses not included in the final sample (Cronbach's $\alpha = 0.92$).

The questionnaire was administered virtually via Google Forms between April and June 2024, following coordination with university authorities and the commands of the health units where participants worked. The process included personalized invitations, digital informed consent, and weekly reminders to optimize the response rate.

Statistical Analysis:

Quantitative data were processed using SPSS version 25. Descriptive analysis was performed, calculating frequencies, percentages, means, and standard deviations to characterize the sample and scores in each competency dimension. Subsequently, Student's t-test was applied to compare mean perceptions according to years of professional experience, and one-way ANOVA was used to analyze differences based on the type of institution where participants worked. The statistical significance level was set at $p < 0.05$.

Ethical Considerations:

The study adhered to the principles established in the Declaration of Helsinki and was approved by the UNAH Ethics Committee (Record No. 045-2024). Anonymity and confidentiality of data were ensured by using numerical codes to identify questionnaires. All participants signed digital informed consent, which explicitly stated the study's objective, voluntary participation, and the possibility of withdrawal at any time without consequence. Data were stored in a secure repository with restricted access to researchers and will be maintained for five years in accordance with institutional regulations.

3. Results

The findings of this study are organized into two main sections, corresponding to the methodological phases implemented. The first section presents the results of the theoretical-documentary analysis, while the second reports the empirical data obtained from the sample of nurses, integrating both to provide a comprehensive view of the phenomenon under study.

The documentary analysis revealed that the curriculum of the Bachelor's Degree in Military Nursing at UNAH is formally aligned with the competency-based approach. The curricular structure integrates both theoretical and practical components, with emphasis on specific courses such as *Nursing in Disaster Situations* and *Military Public Health*. However, the analysis-synthesis identified a disparity between the definition of generic competencies and their operationalization in specific evaluative strategies. Although syllabi declare objectives focused on the development of clinical judgment and leadership, the described evaluation instruments predominantly prioritize the measurement of theoretical knowledge and isolated procedural skills, leaving the assessment of integrated competencies—such as decision-making in crisis contexts—secondary and insufficiently systematized.

These theoretical findings resonate with the empirical data collected. The administration of the questionnaire to the 60 graduate nurses enabled characterization of their perceptions regarding the development of clinical competencies. **Table 1** describes the sociodemographic profile of the sample, which was composed predominantly of women (71.7%), with a mean age of 26.3 years (SD = 2.1), and a predominant professional experience of 1 to 2 years (68.3%). All participants had completed their clinical training in military settings.

Table 1. Sociodemographic Profile of the Sample (n = 60)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Female	43	71.7
	Male	17	28.3
Age (Mean)	26.3 years (SD = 2.1)	–	–



Variable	Category	Frequency (n)	Percentage (%)
Professional Experience	< 1 year	10	16.7
	1–2 years	41	68.3
	> 2 years	9	15.0
Main Clinical Practice Setting	Military Hospital	60	100.0

Source: Own elaboration

The quantitative results, detailed in Table 2, showed differentiated mean scores among the various dimensions. Technical competence was rated the highest ($M = 4.25$, $SD = 0.52$), followed by competence in communication in crisis contexts ($M = 3.90$, $SD = 0.61$). In contrast, the dimensions of Clinical Judgment ($M = 3.45$, $SD = 0.73$) and, particularly, Military Leadership ($M = 3.10$, $SD = 0.84$) obtained the lowest mean ratings. A post-hoc analysis using Tukey's test confirmed that the difference between the mean score for Technical Competence and that for Military Leadership was statistically significant ($p < 0.01$).

Table 2. Perception of Clinical Competencies Development (n = 60)

Competency Dimension	Minimum Score	Maximum Score	Mean (M)	Standard Deviation (SD)
Technical Competencies	3.00	5.00	4.25	0.52
Communication in Crisis	2.50	5.00	3.90	0.61
Clinical Judgment	2.00	4.75	3.45	0.73
Military Leadership	1.75	4.50	3.10	0.84

Source: Own elaboration

Inferential analysis further revealed that the perception of competence in the area of Military Leadership varied significantly according to years of professional experience ($F(2,57) = 4.85$, $p = 0.011$). Nurses with more than two years of experience rated their preparation in this area significantly higher ($M = 3.65$, $SD = 0.59$) compared to those with less experience ($M = 2.95$, $SD = 0.81$). This finding suggests that the full development of this competence is consolidated during professional practice after graduation. Finally, the analysis of qualitative responses to the open-ended questions enriched the interpretation of the quantitative data. A recurring comment emerged regarding the “disconnect between controlled simulation at the university and real-world pressure in the field,” reinforcing the gap identified in the documentary analysis between declared evaluation and the application of competencies in complex and authentic environments. In summary, the results point to a training model that is solid in its technical foundation but faces pending challenges in the integration and assessment of transversal competencies and leadership skills specific to the military context.

4. Discussion

This study, by integrating theoretical-documentary analysis with empirical evidence, offers a diachronic and critical perspective on the development of clinical competencies in military nursing education at UNAH. The results reveal a formative paradox: the existence of a curriculum formally aligned with the competency-based approach that, nevertheless, presents significant inconsistencies in its implementation, particularly in the evaluation of integrated and complex competencies. This discrepancy between declarative design and evaluative praxis coincides with the observations of Morales et al. (2020), who warn that competency assessment constitutes the weakest link in its implementation, frequently reduced to the verification of fragmented performances rather than the holistic appraisal of the ability to act in authentic contexts.

The finding that technical competencies were rated highest by graduates ($M = 4.25$) was predictable and aligns with global literature. Gravana (2017) and Lobo (2022) argue that competency-based education has been effective in standardizing and raising the level of procedural skills, as these are more easily observable and measurable. However, this strength may become a limitation if technical emphasis overshadows the development of other crucial dimensions. The significantly lower score in Clinical Judgment ($M = 3.45$) is alarming, as this competency is the core of safe and autonomous practice. Kavanagh & Sharpnack (2021) had already warned of a “competency crisis” precisely in this area, attributing it to educational models that prioritize passive content delivery over the promotion of critical thinking. Our documentary analysis corroborates this hypothesis, identifying that the evaluation instruments described in the syllabi do not consistently foster the resolution of complex clinical problems, but rather the rote application of protocols.



The most critical result, and at the same time the most revealing of the specific nature of military nursing, is the low perception of competence in Military Leadership ($M = 3.10$). This empirical finding validates the theoretical concern expressed by Giddens et al. (2022) regarding the need to adapt general competency frameworks to the specific demands of contexts such as the military, where leadership transcends the management of a nursing team to incorporate command, operational logistics, and decision-making in high-pressure, resource-limited scenarios. The significant improvement in the perception of this competency among nurses with more experience ($M = 3.65$) suggests, as Diez Cate (2017) posits, that competence is not a point of arrival upon graduation, but a continuum developed throughout the professional trajectory. This implies that undergraduate training must lay solid foundations for this leadership, with methodologies such as high-fidelity simulations and case studies based on real military experiences, preparing students for a less abrupt transition into operational practice.

The disparity between the “controlled simulation” mentioned by the participants and the “real-world pressure in the field” is a crucial qualitative finding. Konrad et al. (2021) had already highlighted the importance of supporting clinical competence in environments that reflect reality, a need that becomes more pronounced in the military context. The insufficiency at this point indicates a gap between the university learning environment and the actual field of application, which may limit the transfer of what has been learned. Moreover, factors affecting competency development, such as personality traits noted by Okumura et al. (2022) or contextual factors in the clinical environment mentioned by Almarwani & Alzahrani (2023), were not explored in this study and represent intermediate variables that could be influencing the results obtained, constituting a limitation.

Regarding the study's shortcomings, it is important to acknowledge that the cross-sectional design of the empirical phase captures perceptions at a specific moment, which may be subject to recall bias or the influence of recent work experiences. A longitudinal investigation following nurses from graduation onward would be ideal to trace the actual evolution of their competencies. Likewise, although the sample was adequate for the statistical analyses performed, it came from a single university, which limits the generalizability of the findings to other national or international contexts. Future research should incorporate methods of direct observation of competency performance in real or simulated scenarios to complement and contrast participants' self-perceptions.

Despite these limitations, the scope of the study lies in being pioneering in addressing, through a mixed methodology, a formative problem of high relevance for national security and the quality of healthcare. By demonstrating the disconnect between the curriculum, evaluation methods, and perceived competencies in the areas of clinical judgment and military leadership, this work provides grounded evidence for curriculum review and updating. It serves as a starting point for educational authorities and the commands of military health institutions to work jointly in designing more robust pedagogical and evaluative strategies that close the identified gap and ensure that future military nurses graduate not only with technical proficiency but also with the leadership and clinical judgment skills necessary to perform with excellence in the challenging scenarios their profession will demand.

5. Conclusions

This study satisfactorily fulfilled its objective of analyzing, from both a theoretical and empirical perspective, the process of clinical competency development in military nursing education at UNAH. The analysis reveals a training model with a solid foundation in the standardization of technical competencies, consistent with the global principles of competency-based education. However, a critical gap is identified between the declarative curricular design and its practical implementation, manifested in evaluation systems that fail to comprehensively capture the development of transversal and military-specific competencies. This mismatch is evidenced in the graduates' perceptions, who reported significantly lower mastery in clinical judgment and, particularly, in military leadership—competencies that are distinctive and fundamental for effective performance in real operations.

Consequently, it is concluded that the main challenge does not lie in the definition of competencies, but in the creation of authentic learning environments and the design of evaluation instruments that validly and reliably measure the integration of knowledge, skills, and attitudes in contexts of high complexity and pressure, characteristic of military nursing. The successful transition from controlled simulation to operational practice requires a profound review of pedagogical strategies and greater articulation with real military scenarios. Overcoming this disconnect is imperative to ensure that future military nurses graduate not only as competent technicians but also as clinical leaders capable of guaranteeing quality care and personnel safety in the demanding conditions that define their vocation of service.

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Authorship Contribution

Doris Judith López Rodríguez: Conceived and designed the study, developed the theoretical framework and research methodology. Conducted the search, selection, and systematic analysis of the scientific literature. Designed and validated the data collection instruments. Directed the fieldwork and supervised data collection. Performed the statistical analysis and interpretation of results. Drafted the original manuscript, carried out substantial critical revisions, and approved the final version.



Managed funding acquisition and project administration. She is the principal investigator and guarantor of the integrity of the work.

Luis Fernando Valladares Barrios: Actively participated in the methodological design and conceptualization of the theoretical framework. Coordinated and carried out the fieldwork, including the application of instruments and data collection. Collaborated in processing and organizing the database. Took part in the analysis and interpretation of results, contributing especially to the triangulation of theoretical and empirical findings. Conducted a substantial critical review of the manuscript from the clinical-military perspective, contributing to the discussion of results and conclusions. Approved the final version of the manuscript.

Conflict of Interest

The authors and authoresses explicitly and under oath declare the total absence of conflicts of interest of any nature that could have influenced the design, execution, analysis, interpretation, or publication of this research. This declaration includes, but is not limited to:

- Not having received funding from commercial, pharmaceutical, or corporate entities that could have an interest in the study results.
- Not maintaining employment, consultancy, or advisory relationships with organizations that could benefit from or be affected by the findings of this research.
- Not holding investments, shareholdings, or intellectual property that could create a real or apparent conflict.
- No personal, academic, or professional relationships exist among the authors that could compromise objectivity in the handling of data and results.

The research was conducted with complete academic and scientific independence. The funds for its development were provided exclusively by institutional university sources, without conditions regarding methodological design, analysis of results, or decisions about publication. The authors assume full responsibility for the integrity and accuracy of the data presented, as well as for the interpretations and conclusions derived from the study.

