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ORIGINAL

Application of Virginia Henderson's Theory of the 14 Needs in the Clinical Training of Nursing Students

Aplicación de la Teoría de las 14 Necesidades de Virginia Henderson en la Formación Clínica de Estudiantes de Enfermería

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ABSTRACT

Introduction: Virginia Henderson's Theory of 14 Needs is a humanistic framework that guides clinical nursing practice by promoting patient independence through the satisfaction of fundamental needs.
Objective: to evaluate the impact of an educational intervention on the application of Henderson's Theory in nursing students, using the ENCH-56 as a measurement tool.
Method: a quasi-experimental, quantitative, longitudinal study was conducted with sixth-semester nursing students at a public university in Ecuador. The ENCH-56 scale was applied before and after a five-session educational intervention.
Results: a total of 226 clinical evaluations were performed after the intervention. The overall mean per item ranged from 3,26 to 3,43 (scale 1-4), reflecting high performance with minimal supervision. The needs with the greatest variability were "values and beliefs" and "health education," while "mobility," "dressing," and "ethics" showed greater consistency. Cluster analysis identified three groups of needs according to performance and dispersion. Fifty-seven point fifty-two percent of students perceived an improvement in their competencies after the intervention.
Conclusions: the implementation of the Henderson model using the ENCH-56 was effective in strengthening comprehensive clinical assessment. Its systematic inclusion in clinical training is recommended.

Keywords: Virginia Henderson; Human Needs; Nursing Care; Nursing Education; Competency Assessment.

RESUMEN

Introducción: la Teoría de las 14 Necesidades de Virginia Henderson constituye un marco humanista que guía la práctica clínica de enfermería al promover la independencia del paciente mediante la satisfacción de necesidades fundamentales.
Objetivo: evaluar el impacto de una intervención educativa sobre la aplicación de la Teoría de Henderson en estudiantes de enfermería, utilizando la ENCH-56 como herramienta de medición.
Método: estudio cuasi-experimental, cuantitativo y longitudinal, realizado con estudiantes de sexto semestre de Enfermería de una universidad pública en Ecuador. Se aplicó la escala ENCH-56 antes y después de una intervención educativa de cinco sesiones.
Resultados: se realizaron 226 evaluaciones clínicas tras la intervención. La media general por ítem varió entre 3,26 y 3,43 (escala 1-4), reflejando un desempeño elevado con mínima supervisión. Las necesidades con mayor variabilidad fueron "valores y creencias" y "educación para la salud", mientras que "movilidad", "vestido" y "ética" mostraron mayor consistencia. El análisis de clúster identificó tres grupos de necesidades

según desempeño y dispersión. El 57,52 % de los estudiantes percibió una mejora en sus competencias tras la intervención.
Conclusiones: la implementación del modelo de Henderson mediante la ENCH-56 resultó efectiva para fortalecer la valoración clínica integral. Se recomienda su inclusión sistemática en la formación clínica.

Palabras clave: Virginia Henderson; Necesidades Humanas; Cuidados de Enfermería; Educación en Enfermería; Evaluación de Competencias.

INTRODUCTION

Virginia Henderson's 14 basic needs theory is recognized for offering a comprehensive and humanized framework that guides clinical nursing practice, emphasizing patient independence and autonomy. Henderson defined nursing as the art of assisting people in performing activities that contribute to their health, recovery, or a peaceful death, which they would perform without assistance if they had the necessary strength, will, or knowledge.[1,2] This approach places the person at the center of the care process, incorporating not only physical, but also social, emotional, and spiritual dimensions.

Its relevance in clinical education lies in its ability to structure critical thinking, decision making, and systematic planning of nursing care (P). However, recent research has highlighted gaps in its practical application, particularly in areas such as communication, recreation, and patient education, which tend to receive less attention during actual care, underscoring the need to strengthen teacher training and the use of structured assessment tools.[3,4]

Among these tools, the Scale for Assessing Care Needs in Dependent Persons (ENCH-56) stands out, which has demonstrated high reliability (α = 0,97) and usefulness for objectively assessing students' clinical competencies.[5,6]

This scale, structured based on Virginia Henderson's 14 needs, allows not only a quantitative analysis of nursing intervention, but also a qualitative interpretation of clinical judgment, planning, execution, and evaluation of care. Its application in real-world scenarios facilitates the identification of critical areas, such as assessing the family environment, managing clinical records, and facilitating therapeutic communication. Additionally, it promotes individualized feedback designed to encourage continuous improvement in clinical performance.

The ENCH-56 thus becomes a dual-purpose pedagogical and clinical tool, guiding the student in the decision-making process and providing the teacher with an objective reference to evaluate and provide feedback on their progress. Its implementation in practical training reinforces the effective integration between theory and practice, promotes ethical and clinical reasoning, and strengthens the progressive autonomy of the student in caring for people with different levels of dependency.[5,6]

The incorporation of theoretical models, such as Henderson's, into the clinical curriculum also contributes to the standardization of care,[7] the improvement of clinical judgment and evidence-based decision-making, thus strengthening a reflective and ethical professional practice.[8,9] Research, such as that of Guilherme et al.[10] and Albuquerque et al.[11], supports the use of validated instruments as key elements to improve the quality of care, patient safety, and clinical reasoning among future professionals.

Likewise, education in cultural competencies has gained increasing importance in nursing education by being integrated into curricula through solid theoretical frameworks, as evidenced by the work of Alexander et al.[12] These approaches promote patient-centered care, considering cultural, linguistic, and social diversity, and strengthen the therapeutic relationship and health equity.

The validation of content in instruments applied to the nursing process, such as those described by Albuquerque et al.[13], and the use of conceptual models, such as those proposed by Wanda Horta, have proven to be effective pedagogical strategies to reinforce learning in real clinical contexts.[14,15] In addition, recent reviews emphasize the need to apply integrative models in assessing competencies to foster informed clinical practices that prioritize human needs.[15]

In this sense, the strengthening of the curriculum through theoretical models and the design of instruments such as the quality of nursing care questionnaire (QNC)[16] or the validation of tools for scenarios such as sexual and reproductive health care, demonstrate the need to integrate theory with clinical reality[16] continuously. These strategies not only enable the evaluation of competence levels but also promote continuous improvement in the training process.[17,18]

In the specific case of Virginia Henderson's theory, its application through standardized instruments enables the precise observation of how students internalize and operationalize the fundamental needs in a clinical

setting. This direct relationship between theory and practice is essential to ensure that nursing care responds not only to technical criteria but also to humanistic and ethical principles. Likewise, the use of validated tools in various clinical contexts, such as maternal-child, geriatric, or community settings, strengthens the student's ability to adapt to diverse scenarios, developing comprehensive competencies that reflect professional training consistent with the contemporary needs of health systems.

Therefore, this study systematically evaluated the application of Virginia Henderson's 14 needs theory by nursing students during their clinical practice to identify key areas for educational and clinical improvement, thereby promoting more comprehensive and practical training.

METHOD

A quasi-experimental study[19] was developed, employing a quantitative approach[20,21] and a longitudinal design, to evaluate the impact of systematically applying Virginia Henderson's Theory of 14 Needs on the development of clinical competencies in nursing students during their hospital internships. The research was conducted during the academic period from March to July 2025 at the pre-professional practice sites of nursing students, including clinical units and medical-surgical hospital services within Ecuador's public health system.

The population consisted of 72 students in the sixth semester of the nursing program at a technical university in Ambato. A non-probabilistic sampling method by convenience was used, including only students who gave their consent to participate in the research, as well as adult hospitalized patients with stable clinical conditions. Additionally, participants must have complied with at least 80 % of attendance in practices. Each student applied the intervention to three assigned patients, before and after a structured training on Henderson's Theory.[2]

The Scale for Assessing the Care Needs of Dependent Persons based on Virginia Henderson's Theory (ENCH-56) is an instrument designed to assess the clinical competence of nursing students in applying the model of the 14 fundamental human needs. This scale enables the structured measurement of a student's ability to identify, assess, and intervene adequately in each of the needs posed by Henderson's theory, particularly in patients with some degree of dependency.

The ENCH-56 is composed of 56 items, organized into 14 dimensions that correspond to each of the fundamental needs. Each dimension comprises four items that address essential aspects of the care process, including the clinical assessment of need, identification of relevant signs or symptoms, application of dependency scales, and adequate recording of findings in the clinical history. The items are answered using a five-point Likert-type scale, ranging from 0 (I do not feel capable of applying this part of the instrument) to 4 (I feel fully capable of using it autonomously and safely). This format enables the estimation of the level of perceived competence and facilitates the identification of areas of strength and those requiring pedagogical reinforcement.

The intervention consisted of five theoretical and practical training sessions led by clinical teachers, focusing on the systematic application of Henderson's model in real-world settings. Subsequently, the students were guided in the development of their clinical activities through direct supervision, which was closely monitored by the teachers responsible for the hospital practice.[22]

The data were analyzed using SPSS v.25 statistical software. Descriptive statistics (frequencies, percentages, means, and standard deviation) and mean comparison tests for related samples (Student's t-test) were applied to identify significant differences between pre- and post-intervention moments. Cronbach's alpha was also calculated to confirm the instrument's reliability in the sample.

Three types of variables were used in this study. The sociodemographic variables described the profile of the students (age, sex, academic level, hours of practice, among others). The perception variables evaluated prior knowledge, confidence, satisfaction, and perceived improvement after applying the ENCH-56 instrument. Finally, the main variables corresponded to clinical performance in assessing the 14 needs of Virginia Henderson, measured using a 4-point Likert scale, which allowed for the analysis of both the level of execution and the consistency of performance.

In addition to analyzing the performance means, the variability in the clinical performance of the students was evaluated through the standard deviation corresponding to each of the 14 basic needs outlined in the Virginia Henderson model. This measure made it possible to identify differences in the consistency of performance among students in each category evaluated.[23]

The study was conducted by the international ethical principles established in the Declaration of Helsinki, which guarantees respect for the dignity, rights, and well-being of participants.[18] The anonymity of the information, the confidentiality of the data collected, and the voluntariness of participation were assured. All students and patients involved had previously signed an informed consent form, in which the study's objectives, procedures, potential risks, and benefits were explained, as well as their right to withdraw from the study at any time without repercussions. The research was approved by the Ethics Committee of the Faculty of Health Sciences, which reviewed and endorsed both the methodological protocol and the instruments used.[24] This

clarification belongs to the methods section.

RESULTS

The sociodemographic description of the study participants allowed us to contextualize the academic and clinical profile of the group, as well as their level of previous exposure to Virginia Henderson's model and the use of assessment instruments.

Table 1. Sociodemographic characteristics of the participants applied ENCH-56 (n=226)

Variable	Category	Frequency (n)	Percentage (%)
Age	20-25 years old	176	77,88 %
	26-30 years old	45	19,91 %
	More than 30 years old	5	2,21 %
Sex	Female	181	80,09 %
	Male	45	19,91 %
Academic level	Basic nursing	149	65,93 %
	Professional nursing	77	34,07 %
Approved semesters	6 to 8 semesters	201	88,94 %
	More than 8 semesters	25	11,06 %
Clinical internships performed	Yes	226	100 %
Accumulated clinical practice hours	301-500 hours	152	67,26 %
	More than 500 hours	74	32,74 %
Theoretical training in Henderson model	Yes	204	90,27 %
	No	22	9,73 %
Frequency of use of clinical scales during training	Rarely	124	54,87 %
	Frequently	58	25,66 %
	Never	44	19,47 %

Regarding the self-reporting of competencies, 56,19 % indicated having a "medium" level of knowledge of the theory before the training. In contrast, after the intervention, 57,52 % stated they felt prepared to apply the instrument in their professional practice, although many noted that they needed more supervised practice.[25,26]

The descriptive analysis of the ENCH-56 scale showed a high overall performance of the students in the clinical application of the 14 needs. The overall mean per item ranged from 3,26 to 3,43, on a scale of 1 to 4, indicating that most performed the activities correctly with minimal supervision.

Analysis of variability in clinical performance.

The analysis revealed that the needs with the most significant variability were Need 11 (Values and beliefs) and Need 14 (Education and learning), with standard deviations of 0,50 and 0,49, respectively. This suggests a significant dispersion in the level of competence achieved by students in these dimensions. In contrast, the needs with the least variability were Need 3 (Urinary and fecal elimination) with a standard deviation of 0,46, and Needs 1 (Breathing) and 2 (Feeding) with standard deviations of 0,47.

The observed results suggest that clinical competencies related to psychosocial and educational needs might present a higher variability among students. However, due to the non-probabilistic sampling and the specific design of the study, these trends should be interpreted with caution and do not allow generalizable inferences.

Although the findings possess an acceptable degree of internal validity, they are not entirely generalizable to other populations. Even so, the observed differences may inform the design of more differentiated pedagogical strategies and the enhancement of clinical supervision, particularly in areas where greater formative challenges were identified. As these are specific data, and not only totals of general variables, I suggest providing a frequency table for them.

The radar shows that students achieved a uniformly high performance in the assessment of the 14 Henderson needs, with means between 3,29 and 3,37. Standard deviations were low and homogeneous (~0,49), indicating consistency among students. The highest rated needs were communication, recreation and body temperature. The figure evidences a solid and balanced clinical performance after application of the ENCH-56 instrument.

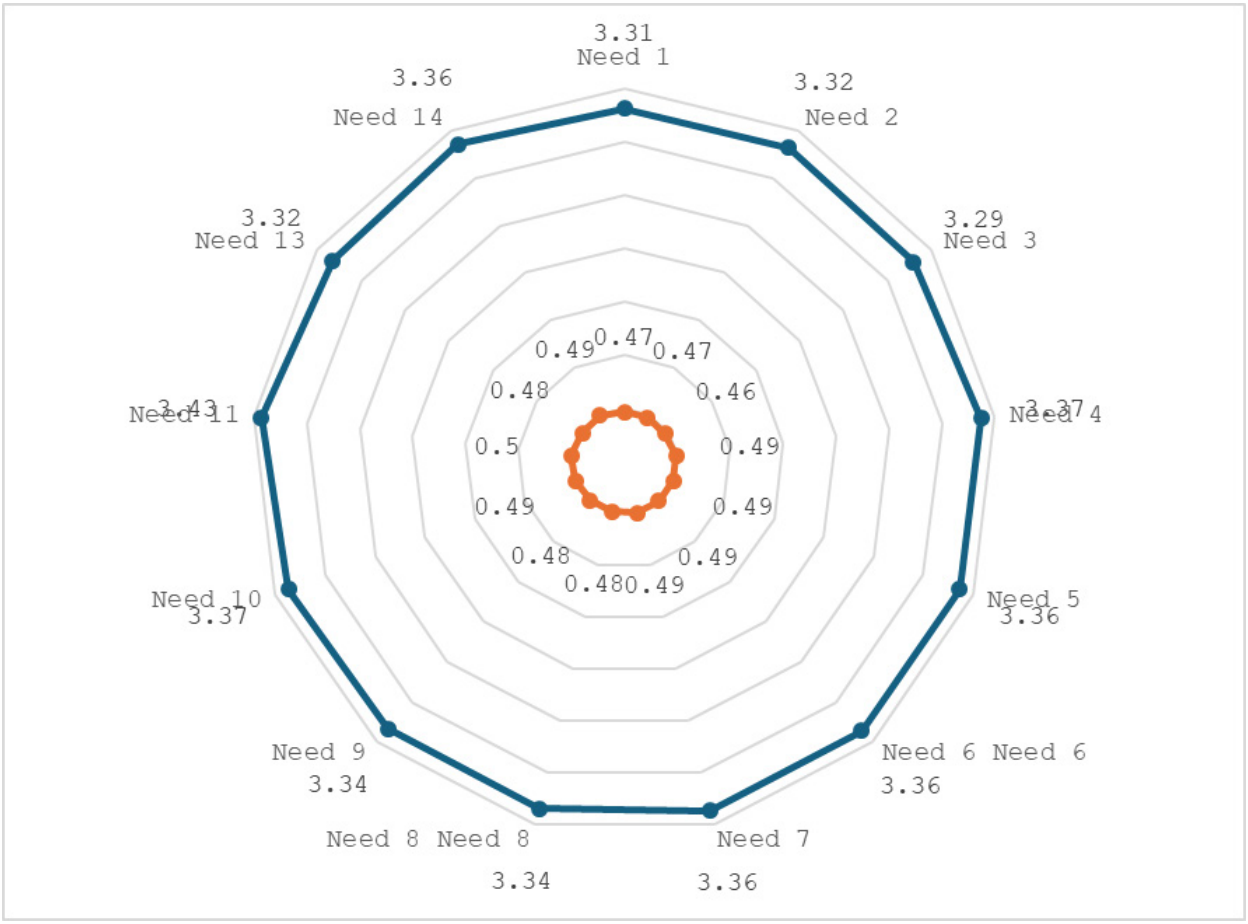

Figure 1. Radar diagram

Clustering Analysis by Need

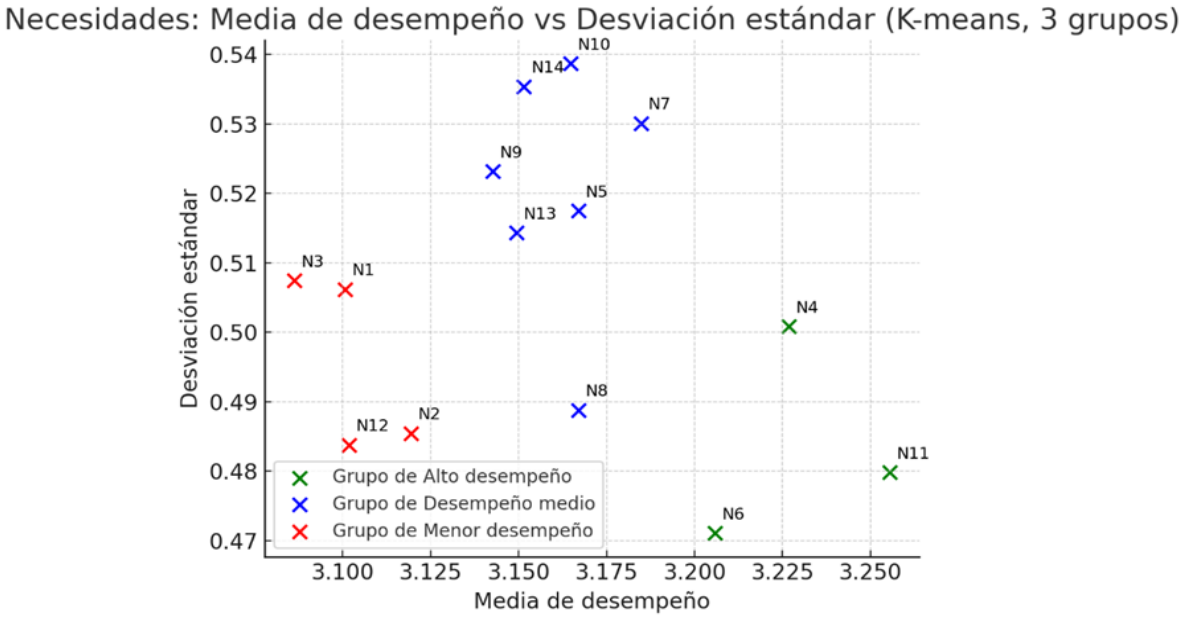

Figure 2. Scatter plot of Henderson's 14 basic needs

Scatter plot of Henderson's 14 basic needs, using as coordinates the mean performance (X) and standard deviation (Y) obtained from the student assessments. Each point Ni reflects need number i. The colors indicate the 3 clusters identified by K-means: green for the high average performance group, blue for average performance, and red for lower average performance. All needs are observed to have means around 3,1 to 3,25 (on a scale of 1 to 4), but the cluster analysis distinguishes subtle patterns in combination with variability.

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Although average performance on all needs was relatively high (above three on a scale of 4, suggesting that, in general, students managed to perform the assessments with minimal supervision), cluster analysis revealed three groups of needs with somewhat different profiles:[28]

- High-performing cluster (green in the figure):[29] corresponding to the need to *move and maintain appropriate postures*, *dressing/undressing*, and *living by one's values and beliefs*, respectively. These needs presented the highest means (3,20-3,25) along with the smallest deviations. This indicates that students, fairly uniformly, obtained very high performances in valuing patient mobility, dressing ability, and consideration of values/beliefs.
- Medium performance cluster with higher variability (blue in the figure): groups quite diverse needs: *sleeping and resting (N5)*, *maintaining body temperature (N7)*, *maintaining hygiene and skin integrity (N8)*, *avoiding environmental hazards and protecting others (N9)*, *communicating with others (N10)*, *participating in recreational activities (N13)*, and *learning, discovering or satisfying curiosity for health (N14)*. This group was characterized by means of around 3,15, and notably, the highest standard deviations (around 0,52).

Some assessments of these needs were performed very skillfully by some students, while others encountered more difficulties, resulting in greater dispersion in the scores. Cluster with the lowest average performance (red in the figure): corresponding to the basic needs of *breathing normally (oxygenation)*, *eating and drinking adequately*, *eliminating bodily waste*, and a need for personal fulfillment: *occupying oneself with something (meaningful work/occupation)*. This group obtained the lowest means (around 3,10), although we insist, it is still a positive value close to "performed properly with minimal supervision"-along with average standard deviations (0,49).

Need N12 (meaningful occupational activity) joins this cluster because assessing and encouraging personally meaningful activities in the patient may not have been a high priority or practical in the assessments, resulting in fewer opportunities to demonstrate complete competence in this area.

Taken together, this cluster points to areas for improvement where additional training or more supervised practice could elevate trainees' confidence and skill, given that patient independence in breathing, feeding and elimination is critical in care (and precisely Henderson highlights that when any of these basic needs are not met, the person loses independence and the role of nursing is to supplement or assist in that function).

DISCUSSION

The results obtained in this study indicate that the application of the ENCH-56 instrument, structured according to Virginia Henderson's theory, facilitated the strengthening of clinical competencies in nursing students. The overall performance achieved was high, with averages above 3 in most of the needs assessed, suggesting that the students were able to perform the assessments with partial autonomy or minimal supervision. These findings are consistent with previous research highlighting the usefulness of Henderson's model as a structured and humanized guide in the caregiving process.[5,6]

However, detailed analysis revealed significant differences between needs. Psychosocial and educational dimensions, such as "values and beliefs" (N11) and "health education" (N14), presented higher levels of dispersion, which could be due to the complexity involved in integrating subjective components of care, such as therapeutic communication, respect for cultural diversity and fostering learning.[12,13]

In contrast, basic physiological needs, such as breathing, nutrition, and elimination, were presented more homogeneously, probably because they are routine technical activities that students master more easily.[27] The finding indicates that, although some students were able to perform these activities with autonomy, others presented difficulties, possibly related to the integration of subjective aspects of care, such as therapeutic communication, respect for cultural diversity, or identifying the patient's educational needs.[30]

The cluster analysis performed allowed the identification of three differentiated performance clusters. The high-performance cluster included needs such as mobility, clothing, and personal values, suggesting a good fit of the model in these areas. In contrast, the lowest performing cluster grouped fundamental physiological functions, which is striking considering their clinical relevance. This may be explained by the technical complexity and the need for practical experience to assess them correctly, which aligns with the findings reported by Alkhaqani[21] and Mengistu et al.[31] These authors highlight that the lack of integration between theory and practice remains a challenge in nursing education.

Students' clinical competence was found to be stronger and more consistent. One possible reason is that several of these activities (e.g., assessing mobility or dressing ability) are a routine part of basic care,[30] which may have facilitated their mastery. The need related to values and beliefs also showed high compliance, perhaps due to training in ethics and humanism that emphasizes respect for the patient's individuality.[30]

From the pedagogical approach, the present study supports the usefulness of the ENCH-56 not only as a clinical assessment tool but also as a training resource that promotes ethical, clinical, and reflective reasoning.

As stated by González-Víllora et al.[15] and Ferreira et al.[16], the use of integrative pedagogical models and validated instruments enhances evidence-based decision-making and fosters person-centered care. In addition, the application of the instrument allowed students to concretely visualize the structure of Henderson's theory and its impact on care planning.[15,33]

In terms of student perception, more than 57 % of the participants indicated that their ability to apply the instrument improved after the training. However, they also expressed the need for more teacher supervision to consolidate mastery of the tool, which aligns with the findings reported by Mann and Sullivan[30], who emphasize the importance of guided clinical learning environments. Likewise, Zamanzadeh et al.[25] emphasize that teaching support is crucial to reducing the theory-practice gap in nursing education.[30,34]

Finally, the results of this study support the curricular incorporation of conceptual models, such as Virginia Henderson's model, together with instruments like the ENCH-56, as an effective pedagogical strategy for developing comprehensive competencies in real clinical scenarios. This integration favors the alignment between theoretical knowledge and professional action, promoting ethical, safe, and human needs-centered nursing care.[11,14]

Satisfaction of students with the application of the ENCH-56 instrument

As part of the evaluation process, items were included to assess the students' perception and satisfaction with the use of the Scale to Assess the Care Needs of Dependent Persons (ENCH-56) instrument during their clinical practice. This analysis provides key information on the formative usefulness of the instrument and its impact on participants' self-confidence and perceived competence.[25,26]

All the students reported having completed clinical internships in hospitals or health centers, with most accumulating between 301 and 500 hours of healthcare experience, which provides a solid basis for assessing the instrument in authentic contexts. However, a significant percentage indicated that they had rarely used structured rating scales during their training and had not previously applied any instrument based on Virginia Henderson's theory, which positions the ENCH-56 as a novel and formative tool within their academic trajectory.[25,31]

About perceived confidence before the assessment, most students rated their level as "medium", which reflects uncertainty in the initial handling of the instrument. After the formative intervention and the systematic application of the scale, 57,52 % reported that their ability to apply the instrument had improved to some extent. In contrast, a smaller group reported a significant improvement. This result indicates a positive impact on self-perceived competence. However, it also suggests that some students still require additional practice and supervised feedback to achieve autonomous application of the instrument.[31]

On the other hand, although overall favorable performance was observed in the execution of the clinical assessments, the response to the question "Did you suggest resources to promote patient education?" revealed that a considerable proportion of students performed it with difficulty or minimal supervision, suggesting that the integration of educational and communicational components still represents an area for improvement within the care process.

Taken together, these findings support the usefulness of the ENCH-56 as a tool not only for clinical assessment but also for strengthening the ethical, pedagogical, and professional reasoning of nursing students. The perception of improvement, together with the identification of critical areas, justifies its incorporation as part of the clinical curriculum, especially in pre-professional stages.[32]

CONCLUSIONS

The findings of this research suggest that the structured application of the Scale to Assess Care Needs in Dependent Persons (ENCH-56), based on Virginia Henderson's theory, constitutes a valuable tool for guiding and strengthening nursing students' clinical assessment processes in real care scenarios. A high level of overall performance was observed in the identification, analysis, and intervention regarding the fundamental human needs of the patient, which reflects a favorable application of the theoretical model by the participants.

The study acknowledges certain methodological limitations that restrict the possibility of making conclusive inferences. The quasi-experimental design, the use of non-probabilistic convenience sampling, and the application in a single institutional context limit the extrapolation of the results to other populations. Despite this, the data obtained provides a valid and guiding view of the competencies developed by the students, particularly in terms of integrating theory into clinical practice.

The detailed analysis revealed that the competencies associated with psychosocial and educational dimensions exhibited greater variability in performance, suggesting the need to reinforce these aspects through differentiated pedagogical strategies, increased supervised practice, and structured teaching support.

Overall, the progressive and systematic incorporation of Virginia Henderson's model and instruments, such as the ENCH-56, in clinical training is recommended as a strategy to promote clinical reasoning, informed, decision-making, and care focused on the real needs of the patient, respecting the methodological limits that condition the generalization of these findings.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest related to the conduct of this study, nor in the collection of data, analysis of results or writing of the manuscript. The research was developed independently,

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