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NURSING EDUCATION

IN THE DIGITAL AGE: SMARTNURSE AS A BRIDGE TO INNOVATION

EDUCACIÓN EN ENFERMERÍA EN LA ERA DIGITAL: SMARTNURSE COMO PUENTE HACIA LA INNOVACIÓN

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ABSTRACT

In the context of the digital transformation in nursing education, the SmartNurse project emerges as an innovative methodology designed to improve the teaching and learning of students in this area. Its main objective is to strengthen nursing education through a digital approach, focused on health promotion, prevention, and basic management of chronic diseases in primary health care in Latin American countries. To achieve this purpose, the project has been structured into three fundamental goals: Curricular update with the SmartNurse methodology; strengthening the digital and pedagogical skills of faculty; and implementing innovative pedagogical methods and tools in nursing education. Exploratory bibliographic reviews were conducted, which served as a theoretical basis for the experience of nursing students with active learning methodologies. The expected results include the publication and adoption of the SmartNurse methodology; updating the Nursing curriculum in the different participating HEIs; and, above all, the training of teachers with greater pedagogical and digital skills. In the long term, this project will contribute to curriculum development, strengthening the digital and pedagogical competencies of teaching staff, and optimizing chronic disease management in primary health care through the use of digital technologies.

Keywords:

Methodology, skills, digitalization, nursing, primary care.

RESUMEN

En el contexto de la transformación digital en la educación de enfermería, el proyecto SmartNurse surge como una innovadora metodología diseñada para mejorar la enseñanza y el aprendizaje de los estudiantes en esta área. Su objetivo principal es fortalecer la formación en enfermería mediante un enfoque digital, centrado en la promoción de la salud, la prevención y el manejo básico de enfermedades crónicas en la atención primaria de la salud en los países de América Latina. Para lograr este propósito, el proyecto se ha estructurado en tres metas fundamentales: La actualización curricular con la metodología SmartNurse, el fortalecimiento de las habilidades digitales y pedagógicas del cuerpo docente, y la implementación de métodos y herramientas pedagógicas innovadoras en la educación de enfermería.Se realizaron revisiones bibliográficas exploratorias que sirvieron de base teórica la experiencia de los estudiantes de enfermería con metodologías de aprendizaje activo. Los resultados esperados incluyen la publicación y adopción de la metodología SmartNurse, la actualización del currículo de Enfermería en las diferentes IES participantes y sobre todo la capacitación de docentes con mayores competencias pedagógicas y digitales. A largo plazo, este proyecto contribuirá al desarrollo curricular, al fortalecimiento de la competencia digital y pedagógica del personal docente, y a la optimización del manejo de enfermedades crónicas en la atención primaria de salud mediante el uso de tecnologías digitales.

Palabras clave:

Metodología, habilidades, digitalización, enfermería, atención primaria.

INTRODUCTION

Currently, nursing education faces significant challenges in adapting to technological advances and the changing demands of the healthcare sector. The digitalization of medical services and the increase in chronic diseases have generated an urgent need to modernize curricula in higher education institutions in Latin America (Proyecto SmartNurse, 2020). Aware of the current situation, educators have identified gaps in the training of nursing professionals, particularly in the development of digital competencies, active teaching methodologies, and user self-management strategies.

In response to this need, the SmartNurse project was developed with the support of the European Union over a period of three years, with the purpose of improving nursing education through innovative digital methodologies. The project was coordinated by the Tampere University of Applied Sciences (TAMK) in Finland, and involved seven higher education institutions (HEIs), including the University of Ljubljana (UL) in Slovenia and five Latin American universities, including the Specialized Institute of Health Professionals (IEPROES), the University of El Salvador (UES), the Gerardo Barrios University (UGB), the Autonomous University of Aguascalientes (UAA), and the Autonomous University of San Luis Potosí (UASLP) (Smolander et al., 2024).

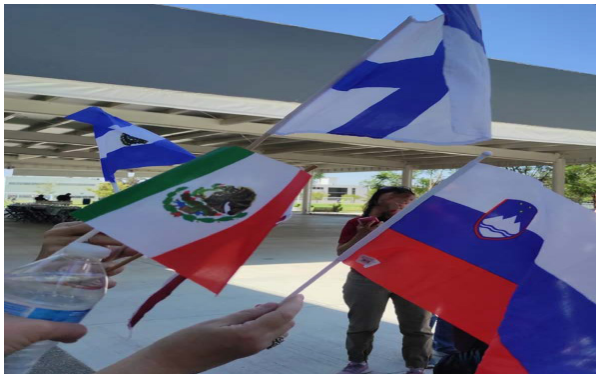

Figure 1. Flags of the consortium countries.

Since its inception in November 2020, SmartNurse was designed to strengthen nursing education in Latin America (Figure 1) through an updated curriculum, the development of digital competencies among educators, and the implementation of innovative pedagogical tools. Despite having begun before the COVID-19 pandemic, the project's implementation was impacted by the global health crisis, further highlighting the urgency of integrating digital methodologies into nursing education (Universidad de Aguascalientes TV, 2022).

The consortium's collaborative and interdisciplinary approach enabled the implementation of three pilot projects with faculty and students, validating the applicability of the SmartNurse methodology. The results included incorporating the methodology into nursing courses, training some faculty members in digital pedagogical strategies, and publishing recommendations for nursing education. The project culminated in the creation of a digital book documenting its development and presenting bibliographic reviews that allowed for exploring and detailing the lessons learned throughout the process (Smolander et al., 2024).

This article will present the impact and results of the SmartNurse project, highlighting its contribution to nursing education in Latin America and its potential to transform teaching and professional practice in the digital age.

METHODOLOGY

SmartNurse methodology was structured around three fundamental pillars: exploratory research, interdisciplinary collaboration, and validation through pilot studies. Each of these elements allowed for the development of an innovative methodology adapted to the current needs of nursing education in Latin America.

Exploratory research was conducted from 2020 to 2022. Before developing the methodology, research was conducted that included a comprehensive literature review and explanatory studies to support the pedagogical and technological structure of SmartNurse.

The literature review and theoretical framework were systematically conducted using scientific databases such as EBSCO Host, PubMed, and others. This review identified previous experiences using active learning methodologies in nursing, factors that influence student motivation with digital tools, effective strategies for training teachers and students in digital competencies, and applications of digitalization in self-care for chronic diseases in primary health care. These findings served as the basis for defining the pedagogical and technological principles that would be part of the SmartNurse model.

Needs analysis at partner institutions. Focus group surveys were conducted with students and faculty at participating universities in El Salvador and Mexico to identify deficits in nursing education related to the use of digital technologies; perceptions of active teaching methods and their applicability in virtual and in-person settings; and specific training needs for faculty in digital methodologies. The results of this analysis helped define the key components of the SmartNurse model, ensuring that it met the real needs of the educational context in Latin America.

Interdisciplinary Collaboration The implementation required the participation of a consortium of universities and experts from different disciplines. The project involved seven universities, coordinated by Tampere University of Applied Sciences (TAMK) in Finland. Other participants included: the University

of Ljubljana, Slovenia; the Specialized Institute of Health Professionals (IEPROES), the University of El Salvador (UES), the Gerardo Barrios University (UGB), the Autonomous University of Aguascalientes (UAA), Mexico; and the Autonomous University of San Luis Potosí (UASLP), Mexico. Each institution contributed its expertise in nursing education, digital technologies, and teacher training. The **pedagogical model** was designed through virtual and in-person meetings. The project partners designed an approach based on: Problem-based learning (PBL) and clinical simulations to develop skills; and the use of interactive digital platforms to facilitate autonomous and collaborative learning; and the integration of hybrid teaching strategies, combining in-person and virtual sessions. This collaborative effort allowed for the consolidation of a methodology adaptable to different educational environments, ensuring its applicability in Latin American institutions.

Teacher training was conducted using digital tools, implementing active learning strategies, and assessing students' digital skills.

Validation through piloting to ensure effectiveness. Three pilot phases were conducted with faculty and students at partner universities (Smolander et al., 2024). **The first phase was a proof-of-concept phase (2021).** Active learning methods were applied in digital virtual environments. Initial experiences with the methodology by faculty and students were evaluated. Qualitative and quantitative data on the model's usability and effectiveness were collected. **The second phase was a larger-scale implementation phase (2022).** It was integrated into the curriculum of subjects related to health promotion and chronic disease care. The impact on student learning was measured through assessments and surveys. Adjustments to the methodology were made based on the feedback received. **The third phase was a final evaluation and adjustment phase (2023).** Best practices were documented, and recommendations for adoption were developed. The methodology was presented in academic forums, and the results were published in a book (Smolander et al., 2024).

DEVELOPMENT

SmartNurse project emerged as a response to the need to modernize nursing education in Latin America, especially in the context of the digitalization of healthcare and the increase in chronic diseases. Educators in the region identify significant gaps in teaching, including a lack of digital skills among teachers and students, and the need to integrate active methodologies into the nursing curriculum (González Flores et al., 2023).

Limited access to health services in the region, combined with deficiencies in self-management of chronic diseases, highlighted the importance of developing an innovative educational approach. In this regard, SmartNurse was designed to train future nursing professionals with digital tools that would facilitate health promotion and primary care for patients with chronic diseases (Luna Gómez et al., 2023).

The project was funded by the European Union through the Erasmus+ program and lasted three years (2020-2023). It was coordinated by Tampere University of Applied Sciences (TAMK) in Finland, with the participation of seven Higher Education Institutions (HEIs) from Latin America and Europe (Proyecto SmartNurse, 2020).

Each institution played a key role in the development and implementation of the methodology, ensuring the transfer of knowledge and the exchange of experiences between Europe and Latin America.

The development of the SmartNurse project was based on three fundamental pillars:

- Exploratory research (2020-2022): Bibliographic reviews were carried out to establish the theoretical framework of the methodology, identifying effective active learning and digitalization strategies in nursing education (Smolander et al., 2024).
- Interdisciplinary collaboration: An innovative pedagogical model was designed through joint work between experts in nursing education, educational technology and primary health care (Smolander et al., 2024).
- Validation through piloting: Three testing phases were carried out with teachers and students at partner institutions, evaluating the applicability and effectiveness of the methodology (Smolander et al., 2024).

This approach allowed us to develop a methodology that integrates digital tools and active learning strategies, ensuring its adaptability to different educational contexts. The experiences of students and teachers demonstrate the need to apply active methodologies in digital learning to achieve meaningful learning (Díaz Artiga et al., 2023).

The implementation and evaluation of the project was structured in various stages to ensure its effective implementation, among which the following stand out: Development and application of the **SmartNurse methodology.** Where teachers were trained in digital methods and innovative pedagogical strategies. **Integration of digital tools.** In the application of these tools during classes and clinical simulations that would be applied with students; so that in the future, they use them with users in care. **Pilot tests.** It was carried out with students to evaluate the effectiveness of the model and the application of the methodology. (Smolander et al., 2024).

The process was carried out in three phases.

- Phase 1: Conceptual Test (2021). Initial implementation in small groups.

- Phase 2: Full-scale implementation (2022). Integration into regular nursing courses.
- Phase 3: Final Evaluation (2023). Final adjustments and publication of results

The project's most significant outcomes include Development and publication of the SmartNurse methodology. Updating the nursing curriculum with a digital approach. Training of faculty in digital pedagogical competencies. Publication of recommendations for nursing education in Latin America (Smolander et al., 2024).

The impact and sustainability of the project was reflected on three main levels:

1. At the academic level: Modernization of nursing curricula at participating institutions. Implementation of active and digital teaching methodologies.
2. At the professional level: Development of digital skills in teachers and students. Improvement in the training of nurses with skills in health promotion and primary care.
3. At the institutional and social level: Strengthening international cooperation in health education. Creation of an academic consortium with a focus on future educational innovation initiatives (Smolander et al., 2024).

In the long term, SmartNurse will contribute to improving the quality of nursing education in Latin America by promoting digitalization as a key tool in the training of healthcare professionals.

CONCLUSIONS

SmartNurse project represents a significant advance in nursing education, combining pedagogical innovation and digitalization to improve teaching and primary health care. Its evidence-based approach, international collaboration, and validation through pilot studies have enabled the development of an adaptable and effective methodology.

The results obtained have not only impacted the partner institutions but have also laid the groundwork for future initiatives in the modernization of nursing education in Latin America. The SmartNurse methodology will continue to evolve, promoting the use of digital tools and active methodologies to train nurses with greater competencies in the 21st century.

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Conflicts of Interest:

The author declares no conflicts of interest.

Author Contribution:

Karen Elizabeth Sánchez-Núñez: conception and design of the study, data acquisition, analysis and interpretation, manuscript writing, critical review of content, statistical analysis, and overall supervision of the study.