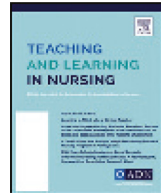




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Full Length Article

An immersive research activity for undergraduate nursing students: an educational innovation

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ABSTRACT

Background: Undergraduate research projects can be used as powerful teaching–learning strategies to connect students with real-world nursing practice. This educational innovation was developed as a final-year nursing project that engaged students in a community-based health assessment in a rural school in Galicia, Spain.

Innovation: The project guided an undergraduate nursing student through the full research process—needs assessment, data collection, analysis, and intervention design—under faculty supervision. Using validated tools on adolescent health behaviors (diet, activity, sleep, and substance use), the experience helped the student apply standardized nursing languages (NANDA-I, NIC, NOC) and translate evidence into a school-based intervention plan.

Implications: The project fostered critical thinking, professional identity, and social accountability by integrating academic learning with community engagement.

Conclusions: Undergraduate projects that embed students in real-world contexts can enhance competence in research and health promotion while strengthening the link between nursing education and community practice.

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Introduction

Undergraduate nursing research projects, particularly those developed as final-year capstones, can play a transformative role in bridging academic learning with real-world health challenges. When designed as authentic teaching–learning experiences, these projects enable students to address community health needs, apply evidence-based practice, and engage directly with underserved populations (Moriel-Galarza & Nava-González, 2023). Beyond their educational function, such initiatives can generate actionable recommendations for public health, strengthen community partnerships, and showcase the potential of nursing students as active contributors to local health systems.

Adolescence is a critical developmental stage in which health behaviors—such as diet, physical activity, sleep, and substance use—can shape long-term wellbeing (World Health Organization [WHO], 2005). Schools are a strategic setting for health promotion, especially in rural areas where access to healthcare services is limited and preventive interventions are often scarce (Simovska & Dadaczynski, 2022). In these contexts, school-based nursing has the potential to address inequities and promote lifelong healthy habits, yet the role of

the school nurse remains underdeveloped or absent in many countries, including Spain (Asociación Española de Enfermería Comunitaria, 2024).

In Europe, and globally, there is growing recognition that nursing curricula should integrate competencies in school and community health, in line with WHO and International Council of Nurses (ICN) recommendations (WHO, 2021; ICN, 2023). Embedding undergraduate students in real-world school health projects not only develops clinical reasoning, communication skills, and social accountability, but can also increase the visibility of school nursing as a professional role and inspire future career pathways in community health.

This article presents a teaching–learning experience derived from a final-year undergraduate nursing project conducted in collaboration with a rural secondary school in northwestern Spain. The project assessed adolescent health behaviors using validated tools and developed school-based nursing interventions tailored to local needs. Beyond reporting health findings, this paper positions the project as a replicable educational model that combines academic rigor, experiential learning, and social impact, offering a template for integrating community-engaged research into undergraduate nursing education internationally.

Although the project generated valuable data on adolescent health behaviors, the primary purpose of this article is to highlight how the experience engaged undergraduate nursing students in

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research and community health practice. The focus is therefore placed on student learning outcomes—how the project contributed to competence development, professional identity, and the application of standardized nursing languages—rather than on the specific findings from the adolescent sample.

Innovation

This educational innovation was developed to strengthen undergraduate nursing students' research and community health competencies through immersive, real-world learning. The innovation responded to a gap identified in the undergraduate curriculum, where research activities were often limited to classroom simulations rather than authentic community engagement.

The innovation was designed as a final-year project connecting students with a rural secondary school to assess adolescent health behaviors and design a nursing intervention. Following principles of experiential learning and faculty-guided reflection, the project integrated data collection, analysis, and the use of standardized nursing languages (NANDA-I, NIC, NOC) to translate evidence into actionable school health strategies.

This article is based on a final-year undergraduate nursing project that integrated academic research with a real-world health promotion initiative. The project followed a descriptive, cross-sectional design to explore adolescent lifestyle habits in a rural school setting. In parallel, it was conceived as a teaching-learning experience, fostering critical thinking, clinical reasoning, and community engagement among nursing students.

The educational design emphasized experiential learning, student autonomy, and faculty-guided reflection. The project aligned with national nursing education goals and responded to current recommendations to integrate health promotion and social accountability into undergraduate curricula (Martil Marcos et al., 2019). Specifically, the methodological structure and educational process were informed by the school-based community nursing intervention model described by Martil Marcos et al. (2019), which combines evidence-based assessment, participatory planning, and reflective learning to strengthen students' competencies in health promotion and community practice.

Setting and Participants

The study was conducted in the only public secondary school of Guntín, a rural municipality in northwestern Spain. The school served as the educational setting and community partner, facilitating access to students and supporting the implementation of the project during regular school hours.

A total of 52 adolescents aged 12–16 participated voluntarily, representing 94.5% of the school's total enrollment in compulsory secondary education. Census sampling was used. Participation was anonymous and nonintrusive, and data collection procedures were approved by the school administration.

Instruments

Data were collected using a digital, self-administered questionnaire composed of four validated tools adapted to the adolescent population:

- KIDMED index, to assess adherence to the Mediterranean diet (Serra-Majem et al., 2004);
- PAQ-A, the Physical Activity Questionnaire for Adolescents (Martínez-Gómez et al., 2009);
- BEARS, a brief tool for detecting common sleep disturbances (Cruz Navarro et al., 2013);

- CRAFFT, a validated screening questionnaire for risky alcohol and drug use (Rial et al., 2019).

Self-reported anthropometric data (height and weight) were used to calculate Body Mass Index (BMI) following WHO growth reference criteria (World Health Organization, 2007).

Educational Process and Supervision

The student researcher, a final-year undergraduate nursing student enrolled in the capstone research course, conducted all fieldwork, including tool selection, communication with the school, and data analysis, under the academic supervision of a nursing faculty member. The project was framed within the final-year research course and evaluated according to institutional rubrics.

Additional learning outcomes included:

- Practical application of standardized nursing language (NANDA-I, NIC, NOC);
- Development of a structured intervention plan (included as an annex);
- Reflection on ethical issues and health promotion challenges in rural settings.

The process was documented through field notes, academic feedback, and student reflection journals.

Data Analysis

Descriptive statistics (frequencies, percentages, means, standard deviations) and chi-square tests were conducted using JASP software (version 0.18.3). Associations were tested between sex or age and behavioral indicators, with significance set at $p < 0.05$.

Ethical Considerations

The project was conducted as part of an academic activity authorized by the school administration. No identifiable or sensitive personal data were collected, and participation was voluntary, anonymous, and nonclinical. Ethical principles of autonomy, confidentiality, and nonmaleficence were respected in accordance with the Spanish Code of Nursing Ethics (Consejo General de Enfermería de España, 2023).

Results

The undergraduate nursing project served as both a research and learning experience, generating findings across four key behavioral domains that provided a framework for student learning and competence development. These data provided a basis for designing a school-based intervention while simultaneously offering a rich teaching-learning opportunity for the student researcher. Table 1 summarizes the main clinical findings and educational outcomes of the project.

The results showed a favorable profile in terms of diet and physical activity: 67.3% of students scored high on the KIDMED index for Mediterranean diet adherence, and 61.5% engaged in moderate physical activity according to the PAQ-A. However, sleep quality emerged as a significant concern, with 65.4% of students presenting positive BEARS indicators, including daytime sleepiness and nighttime awakenings. Substance use was reported by 15.4% of participants, with half of those reaching clinical risk thresholds on the CRAFFT scale (≥ 2).

In terms of body mass index (BMI), 21% of students were classified as overweight or obese based on self-reported data, a figure consistent with national estimates (Ministerio de Sanidad, 2025). A

Table 1
Clinical Findings and Teaching-Learning Outcomes From the Undergraduate Nursing Project.

Clinical Findings	Teaching-Learning Outcomes
67% showed good adherence to the Mediterranean diet	Developed skills in data collection and community engagement
62% had moderate physical activity levels	Applied standardized nursing languages (NANDA-I, NIC, NOC)
65% reported sleep disturbances (BEARS positive)	Strengthened analytical and critical thinking skills
15% reported substance use; 7.7% at clinical risk	Gained experience in real-world school nursing challenges
21% had overweight or obesity (self-reported BMI)	Produced a structured nursing intervention proposal

Note. Data collected using validated self-report instruments (KIDMED, PAQ-A, BEARS, CRAFFT). Educational outcomes refer to student learning processes during the final-year research project.

statistically significant association was found between sex and physical activity levels ($\chi^2 = 7.63$, $p = 0.022$), with male students reporting higher levels of activity.

From an educational standpoint, the project enabled the nursing student to complete a full research cycle, from literature review to data analysis and intervention planning. The integration of standardized nursing taxonomies (NANDA-I, NIC, NOC) into the intervention proposal helped translate findings into actionable nursing diagnoses and strategies. The student also reflected on the ethical and practical dimensions of school health promotion in underserved rural contexts.

Based on the health behavior data collected, a structured set of nursing diagnoses, interventions, and expected outcomes was developed using NANDA-I, NIC, and NOC frameworks. These elements were proposed as part of the student's final intervention plan and are summarized in [Table 2](#).

Discussion

This undergraduate nursing project illustrates how a final-year capstone can function primarily as an educational innovation, strengthening student competencies in research, health promotion, and community engagement, while also producing valuable insights for local health promotion. By conducting a school-based health assessment in a rural setting, the nursing student applied validated assessment tools, engaged with community stakeholders, and translated findings into an actionable intervention plan using standardized nursing classifications (NANDA-I, NIC, NOC). These outcomes reflect prior research on the benefits of experiential, community-based learning for developing critical thinking, clinical reasoning, and population health competencies (Martil Marcos et al., 2019; Arriscado Alsina et al., 2015).

The findings revealed both strengths and vulnerabilities in adolescent health behaviors. Encouraging levels of Mediterranean diet adherence and physical activity contrasted with high rates of sleep disturbances and early substance use, underscoring the need for tailored school health interventions (López-González, Reig-Ferrer, &

Martí, 2023). In rural contexts, where healthcare access is limited, schools become key platforms for promoting adolescent health, and nursing students—under faculty supervision—can bridge service gaps while building their professional identity.

From an educational standpoint, the project provided a complete research-to-action cycle, reinforcing the student's ability to collect and analyze data, apply nursing taxonomies, and consider ethical dimensions of community health promotion. The use of NANDA-I, NIC, and NOC terminology bridged theory and practice, fostering a professional approach to care planning that is increasingly advocated in international nursing education frameworks (Simovska & Dadaczynski, 2022; ICN, 2023).

Despite the relevance of school health, the institutionalization of the school nurse role remains inconsistent across Europe, and largely absent in Spain (Asociación Española de Enfermería Comunitaria, 2024). This project illustrates how nursing students, through structured educational initiatives, can act as health ambassadors, increasing the visibility and perceived value of school nursing.

Educational Model and International Transferability

The design of this TFG can be adapted to a variety of contexts as a replicable educational model that merges academic rigor with community engagement. Key transferable elements include:

1. Collaboration with a community partner.
2. Use of validated assessment tools adapted to the target population.
3. Integration of NANDA-I, NIC, and NOC into intervention planning.
4. Structured reflection to consolidate learning outcomes.

Comparable models exist internationally. In **Canada** and **Australia**, community placements embed students in school health assessments, fostering both clinical and public health skills (Halcomb et al., 2021; Nguyen et al., 2017). In the **United Kingdom**, the “Students as Researchers” model engages undergraduates in co-designing interventions with local authorities (McSherry et al., 2022). In **low- and middle-income countries** (LMICs), school health programmes often depend on community health workers; integrating nursing students into these settings can strengthen both services and workforce readiness (WHO, 2021).

This approach aligns with global directives from WHO (2021) and ICN (2023) to integrate health promotion, interprofessional collaboration, and social accountability into nursing education. By embedding undergraduate research into school health contexts, nursing programs can develop graduates prepared to address inequities, advocate for the institutionalization of school nursing, and contribute to healthier communities worldwide.

Implications for Teaching and Learning in Nursing

These improvements were evidenced through the student's reflection journal and faculty evaluation reports, which highlighted an enhanced ability to interpret community data, communicate

Table 2
Nursing Diagnoses, Interventions, and Outcomes Derived From Study Findings.

Identified Problem	NANDA-I Diagnosis	NIC Intervention	NOC Outcome
Sleep disturbances	00095 – sleep pattern disturbance	1850 – sleep enhancement	0004 – sleep
Risky substance use	00078 – risk for substance use	4510 – substance use prevention	1406 – impulse control
Sedentary lifestyle	00168 – sedentary lifestyle	0200 – exercise promotion	0005 – activity tolerance
Overweight/Obesity	00001 – imbalanced nutrition: more than body requirements	1260 – weight management	1001 – nutritional status: BMI

Note. Diagnoses, interventions, and outcomes selected according to NANDA-I, NIC, and NOC classifications, based on behavioral data collected in the rural school setting.

findings to school staff, and plan interventions using standardized nursing language. This project illustrates how undergraduate research, when grounded in real-life school settings, can foster essential nursing competencies beyond the classroom. Engaging students in health promotion with rural adolescents not only enhances their clinical reasoning and communication skills but also cultivates a strong sense of social accountability. Nursing curricula should prioritize community-based projects that allow students to experience population health challenges first-hand, particularly in underserved areas (Halcomb et al., 2021; McSherry et al., 2022).

Embedding standardized nursing taxonomies (NANDA-I, NIC, NOC) into educational research enhances critical thinking, supports care planning from an early stage in professional development, and aligns with competency frameworks for school and community health nursing (ICN, 2023; WHO, 2021). Moreover, student-led initiatives like this can serve as a bridge to reinforce the visibility of school nursing, a field that remains underrecognized in many health systems. Encouraging such experiences may contribute to advocacy for formal school nurse roles and expand nursing students' career perspectives toward public and community health (Nguyen et al., 2017).

In many low- and middle-income countries (LMICs), school health services are fragmented or nonexistent. Undergraduate student involvement in such contexts may serve as an entry point to strengthen school health infrastructure and policy advocacy (WHO, 2021).

Replicating the model: A step-by-step guide for nursing educators

Step	Action	Key considerations
1	Identify community partner	Select a school or youth organization with unmet health needs; establish formal agreements.
2	Co-design project scope	Collaborate with school staff to define target behaviors (e.g., diet, physical activity, sleep, substance use) and agree on logistics.
3	Select assessment tools	Use validated instruments appropriate for the age group and cultural context; adapt language if necessary.
4	Prepare the student	Provide training in data collection, ethics, communication, and use of NANDA-I, NIC, NOC for planning interventions.
5	Implement fieldwork	Allow student autonomy with structured supervision; maintain regular check-ins for guidance and problem-solving.
6	Analyze and interpret data	Support the student in statistical analysis and synthesis of findings; ensure results are presented in a way that is understandable for the community partner.
7	Develop intervention plan	Use NANDA-I diagnoses, NIC interventions, and NOC outcomes to translate findings into actionable strategies.
8	Reflect and evaluate	Include student self-reflection, feedback from the community partner, and faculty evaluation to assess both learning outcomes and community impact.

Illustrative Student Reflections

"This project made me realize how much health promotion can be done in schools, especially in rural areas where nurses are rarely present."

"Applying NANDA-I and NIC in a real setting made the theory from class come alive—it felt like actual nursing work, not just an assignment."

These reflections illustrate the potential of the model to shift students' perception of nursing roles in community settings, enhancing motivation and professional identity.

By embedding such experiences in undergraduate curricula, nursing programs can meet WHO and ICN recommendations for equipping graduates with competencies in health promotion,

interprofessional collaboration, and culturally sensitive care. Furthermore, projects like this can strengthen advocacy for institutionalizing school nursing roles, particularly in rural and underserved contexts (ICN, 2023; WHO, 2021).

Limitations and Future Directions

This study has several limitations that should be considered when interpreting its findings. First, it was conducted in a single rural secondary school with a relatively small sample, which may limit the generalizability of the results to other settings. Second, the educational outcomes were primarily assessed through student self-reflection and faculty feedback, without the use of validated instruments to quantitatively measure competence development. Third, the cross-sectional design provides a snapshot of adolescent health behaviors and student learning at a single point in time, precluding assessment of long-term changes or sustained impact.

Future research should aim to replicate this teaching–learning model in diverse contexts, including urban schools, other regions of Spain, and international settings, particularly in low- and middle-income countries. Incorporating mixed-methods approaches with validated assessment tools could strengthen the evidence on student competency gains and professional identity development. Longitudinal studies could explore whether participation in such projects influences graduates' career trajectories, particularly their engagement in school and community health roles. Additionally, comparative studies could examine the impact of final-year projects like this one against other community-based learning experiences, informing best practices for integrating community-engaged research into undergraduate nursing curricula.

Ethics Approval and Consent to Participate

This study was conducted in accordance with the ethical principles of the Declaration of Helsinki. As it was implemented within an academic framework and involved no clinical intervention or collection of sensitive personal data, formal approval from an external ethics committee was not required under institutional regulations. Written authorization was obtained from the school principal prior to data collection. Informed consent was obtained from all student participants and their legal guardians.

Consent for Publication

Not applicable. This manuscript does not contain identifiable personal data from any individual.

Availability of Data and Materials

The datasets generated and analyzed during the current study are not publicly available to protect participant confidentiality, but de-identified excerpts and aggregated data may be provided by the corresponding author upon reasonable request.

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Declaration of competing interest

The authors declare that they have no known competing personal relationships or financial interests that may have influenced the study reported in this paper. This study was conducted as part of an academic final-year nursing project, without any external funding or commercial involvement. The authors have no financial or personal relationships that could inappropriately influence the work reported in this paper.

CRediT authorship contribution statement

Lucía Villar Pérez: Conceptualization, Investigation, Data curation, Writing – original draft, Visualization. **María José Ferreira Díaz:** Writing – review & editing, Writing – original draft, Supervision, Methodology.

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