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Special Issue Reprint

Innovations in Nursing Education, Practice and Research

Emphasizing Health Literacy

Edited by
Antonio Martinez-Sabater, Elena Chover-Sierra and Carles Saus-Ortega

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Innovations in Nursing Education, Practice and Research: Emphasizing Health Literacy

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Guest Editors

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About the Editors

Antonio Martínez-Sabater

Antonio Martínez-Sabater is a Full Professor at Valencia University, a nurse and health scientist whose work focuses on health literacy, gender equity and the right to health, ageism in hospital care, the digital divide, vulnerability, and cultural competence in sexual and gender diversity. As the founder and director of the GRIECE research group, he has participated in more than thirty competitive research and knowledge-transfer projects and has acted as the principal investigator in several, including the regional coordination of the multicenter project on care complexity in public hospitals funded by the Instituto de Salud Carlos III. His academic career combines extensive teaching across undergraduate, master's, and doctoral programs with the supervision of dissertations and doctoral theses and the direction of the postgraduate program "Care for People with Infection", alongside previous leadership roles as Dean, Head of Department, and coordinator of clinical placements and international programs. His achievements include more than forty articles in high-impact indexed journals, book chapters with leading academic publishers, over 1,000 citations, an h-index of 14, two recognized six-year research periods, major responsibilities in healthcare management as General Nursing Supervisor, and several awards for educational and healthcare innovation, as well as his appointment as a Full Member of the Academy of Nursing of the Valencian Community.

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Elena Chover-Sierra is a Full Professor in the Nursing Department at the Universitat de València and works as a nurse in a heart failure unit in a Spanish hospital. She is a member of the Nursing Care and Education Research Group GRIECE and other collaborative clinical research networks. Her scientific activity focuses on nursing education, health inequalities, gender and sexual diversity, palliative care, and the development and validation of assessment instruments in health research. She has participated in competitive research projects and multidisciplinary studies addressing topics such as nursing interventions for heart failure, transgender people's experiences in the healthcare system, chemsex-related risk behaviors, and sexual and reproductive health, contributing to evidence-based improvements in care and professional training. Her academic output includes publications in indexed international journals and collaborations in multicenter studies, reflecting a sustained trajectory in knowledge generation, data analysis, and the critical revision of scientific work within the fields of nursing and public health.

Carles Saus-Ortega

Carles Saus-Ortega conducts his academic work at the La Fe School of Nursing, affiliated with the University of Valencia, where he participates in teaching and research in healthcare. His main scientific interests focus on maternal and child health, breastfeeding, psychological adjustment, and the study of coherence in breastfeeding women, areas to which he has contributed through reviews and evidence syntheses. He has participated in projects and publications centered on health promotion and the improvement of professional care interventions, especially in hospital and community settings. His scientific output is characterized by interdisciplinary collaboration and the transfer of knowledge to clinical and teaching practice, thereby consolidating a career focused on strengthening the quality of care and advancing the nursing discipline.

Preface

This Reprint brings together a collection of scientific contributions focused on the critical analysis of and advancement of knowledge in healthcare from a contemporary, interdisciplinary, and socially engaged perspective. Its scope encompasses research on health literacy, gender equity and the right to health, aging and ageism in healthcare settings, the digital divide, care for vulnerable populations, and the development of cultural competence in sexual and gender diversity. Through these thematic areas, the volume aims to offer a comprehensive and up-to-date overview of the challenges that healthcare systems and health professions face, as well as the innovative strategies being implemented to address the emerging needs of the populations.

The main purpose of this Reprint is to create a space for scientific reflection and knowledge transfer that improves the quality of care, promotes health equity, and strengthens evidence-based decision-making. The research collected here shares a common focus on clinical practice, healthcare management, professional training, and the design of public policies that are sensitive to social and cultural diversity. In this context, the volume not only presents research results but also highlights methodological approaches, innovative teaching experiences, and intervention models that can be adapted across different national and international settings.

The reasons for preparing this Reprint are linked to the need to highlight lines of research that, although strategic for the development of fairer and more efficient healthcare systems, have not always occupied a central place in the traditional scientific literature. The increasing complexity of care, the impact of demographic and technological transformations, and the persistence of health inequalities make it essential to promote venues for dissemination that integrate knowledge generated from applied research and professional practice. This volume, therefore, arises from a commitment to a people-centered approach to science, with the capacity to influence improvements in healthcare environments and the training of critical, reflective, and socially responsible professionals.

The Reprint is aimed at a broad and specialized audience, including nursing and other health science professionals, researchers, university professors, healthcare managers, public policymakers, and postgraduate students who are interested in care processes, health innovation, and reducing inequalities. It also aims to be a useful tool for those working in healthcare planning and the design of training programs, providing evidence and conceptual frameworks that support the integration of equity and diversity perspectives into daily practice.

This volume also reflects the desire to strengthen collaborative networks among academic institutions, healthcare organizations, and research groups, promoting the exchange of experiences and the development of joint projects. The diversity of approaches, contexts, and methodologies represented in the selected works reflects the richness of the field of care. It highlights the importance of scientific cooperation in addressing complex problems from complementary perspectives.

Overall, this Reprint aims to advance knowledge and transform healthcare practice by placing people and their social and cultural contexts at the center of care. Its publication represents a collective effort to consolidate a research agenda committed to quality, innovation, and social justice in health.

Antonio Martinez-Sabater, Elena Chover-Sierra, and Carles Saus-Ortega

Guest Editors

Editorial

Innovations in Nursing Education, Practice and Research: Emphasising Health Literacy

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Health literacy (HL) is a key determinant of quality, equity, and person-centred health-care. Defined as the ability to access, understand, evaluate, and apply health information to make appropriate decisions, HL directly influences self-care, patient safety, clinical effectiveness, and health outcomes. In nursing, this competence is especially relevant, as practice involves ongoing patient education, communication, and support across the continuum of care [1–6].

The main objective of this Special Issue is to critically analyse how HL and digital health literacy (DHL) can be systematically integrated into nursing education, clinical practice, and research in an evidence-based manner. Specifically, it aims to synthesise empirical evidence and recent systematic reviews on educational programmes to improve them among nursing students and professionals; identify pedagogical, methodological, and evaluative innovations that foster communicative, critical, and digital competencies for person-centred care; and propose conceptual frameworks and strategic directions to guide future educational, research, and organisational initiatives, ultimately promoting safer, more equitable, inclusive, and higher-quality care across healthcare contexts.

HL is strategically significant in nursing education. To communicate effectively with patients, families, and communities, future professionals must be able to interpret complex information and translate it into clear, accessible, and culturally relevant messages. However, evidence indicates that nursing curricula still lack systematic integration of HL content, limiting the preparation of future-generation nurses [4,6,7].

Empirical studies underscore the importance of addressing this gap. Randomised trials show that targeted educational programmes significantly improve nursing students' HL compared with control groups, reinforcing the role of HL training in developing competent health educators. Recent studies have evaluated structured HL-focused educational programmes, clearly describing their content, format, and outcomes. For example, a randomised controlled trial involving 206 nursing students found that a four-week HL education programme significantly increased HL levels compared with controls, supporting its effectiveness within undergraduate curricula [8]. Similarly, combined HL and intercultural competence interventions delivered through classroom teaching and supervised clinical practice demonstrated significant improvements in students' self-efficacy, knowledge, and beliefs related to HL [9]. Evidence from international contexts, such as structured HL training among nursing students in Tanzania, also reported significant gains in HL-related knowledge, skills, and attitudes following pre-post-interventions [10].

Overall, these programmes share explicit didactic content on accessing, understanding, and communicating health information, blended theoretical–practical formats, and cognitive and attitudinal outcomes, providing robust evidence of the effectiveness of HL education in nursing. Reviews further indicate that interventions targeting eHealth literacy enhance access to and use of digital resources, supporting more informed decision-making and appropriate use of health services [4,8,11]. HL should be regarded as a core cross-cutting competence in nursing education, clinical practice, and health policy, as nurses play a central role in adapting communication, facilitating informed decision-making, and supporting patients across diverse care contexts.

Systematic reviews indicate that health literacy (HL) remains underrepresented in nursing curricula, typically beyond general patient education strategies [7,12]. Empirical studies consistently show that many nursing students have notable knowledge gaps regarding HL, despite some ability to apply educational strategies [13,14]. When curricula include explicit HL training, significant improvements are observed even after short periods of guided instruction [8]. Longitudinal studies, including those in Spain, show that although HL levels increase throughout nursing programmes, a substantial proportion of students remain insufficiently prepared, highlighting the need for early and sustained curriculum integration [15]. Evidence-based educational strategies include integrated curricular approaches and active teaching methods. Programmes embedding HL use multimodal strategies, such as analysing patient education materials, creating simplified resources, and conducting guided communication exercises, leading to improvements in practical skills and professional awareness [7].

In eHealth literacy, interventions tailored to specific groups significantly enhance digital literacy (as measured with validated tools such as eHEALS), emphasising the value of critical evaluation and the practical application of digital resources [11]. To inform future education and research, various theoretical frameworks have been proposed. Integrated HL models outline competencies in accessing, understanding, evaluating, and applying health information, providing a basis for structuring programmes and linking HL to health outcomes and professional practice [3]. Frameworks linking HL to psychological factors, such as self-efficacy and decision-making, support training strategies that foster both knowledge and critical behavioural skills, thereby enhancing nursing practice and research [16].

In clinical practice, HL also influences the complexity of care. Patients with lower HL levels present more nursing diagnoses, interventions, and clinical risks, highlighting its direct impact on care planning and outcomes [17]. In this context, validating the nursing outcome of health literacy behaviour represents an important advance, enabling systematic assessment of individuals' ability to navigate health information and healthcare systems [18].

DHL, critical use of social media, evaluation of online resources, and innovative educational environments are reshaping contemporary nursing practice. Integrating these elements not only modernises training but also allows nurses to address clinical and social challenges more effectively. Accordingly, this monograph provides a multidimensional and up-to-date perspective on HL as a driver of transformation in nursing education and practice, thereby promoting a more competent, equitable, and person-centred model of care that is responsive to the needs of individuals and communities [19–21].

In the context of the significant digitalization of health systems, it is essential to clarify the concepts of DHL and innovative educational environments. DHL can be defined as the ability to search for, access, understand, critically evaluate, and apply health-related information from digital environments, including websites, social media, mobile applications, telemedicine platforms, and other electronic resources, to make informed and

confident health decisions [16,22]. This construct extends traditional HL by incorporating digital competencies, critical thinking, and skills to manage information overload and online misinformation. Evidence shows that adequate DHL levels are associated with more effective use of digital health resources, greater autonomy and empowerment of patients and professionals, improved decision-making, and more appropriate use of health services. Conversely, low DHL is linked to increased vulnerability to misinformation, poorer adherence to recommendations, and less favourable health outcomes [4,19].

Innovative educational environments refer to training contexts that integrate digital technologies and active methodologies, such as case-based learning; clinical simulations; and experiential or reflective learning, interactivity, and student-centred approaches, to foster the development of complex competencies transferable to professional practice. Evidence in nursing education indicates that these environments facilitate competencies in DHL, critical thinking, and clinical communication, particularly when they include activities focused on the critical evaluation of digital information and its application in real care settings [4,19]. Accordingly, integrating DHL within innovative educational environments represents a key strategy for preparing future nurses to address the informational, technological, and ethical challenges of contemporary healthcare.

This Special Issue aims to provide an in-depth analysis of how HL can be systematically integrated into nursing education and professional practice. In an increasingly complex healthcare context, characterised by digitalisation, misinformation, climate-related health challenges, and growing psychosocial needs, HL emerges as a strategic competence for both professionals and patients. The included studies underscore the need to renew traditional educational approaches and to conceptualise HL as a core dimension of nursing education with direct implications for communication, shared decision-making, and health system adaptability. The pedagogical innovations described positively impact critical, reflective, and communicative competencies, ranging from introductory courses to structured frameworks for care narration and validated tools to assess digital literacy in social media contexts. These findings support a more participatory and interdisciplinary educational model that prepares nurses to be confident, autonomous, and capable of delivering person-centred care.

Taken together, the studies in this Special Issue identify HL and DHL as core competencies linking educational preparedness with clinical effectiveness and equity. These include DHL Competence Labs delivered through blended learning approaches, incorporating guided searches, fact-checking, and critical evaluation of web-based and social media content, supported by validated tools such as the adapted eHEALS [19]. Introductory courses focused on professional identity can also integrate specific HL objectives, such as ethics, clinical communication, and shared decision-making, using active methodologies, case-based learning, and early clinical exposure to foster professional commitment and role understanding [20]. Additionally, mental HL and stigma reduction modules addressing early problem recognition, care pathway planning, and non-stigmatising language are particularly effective when implemented through interview simulations and role-play [23,24]. Integrating planetary health literacy through problem-based learning on climate change and health, patient and community communication, and adaptation of educational materials for diverse audiences further broadens students' critical and social perspectives [23]. Finally, optimising learning environments using student satisfaction scales allows continuous monitoring and refinement of the contexts in which HL and DHL competencies are developed [25].

In clinical and continuing education contexts, integrating targeted educational interventions into care practice is essential for consolidating and applying HL and DHL competencies. Structured training in clinical communication, based on the RECAP frame-

work, enhances care narration, the use of clear language, the application of the teach-back technique, and uncertainty management through deliberate practice and systematic feedback [18]. Similarly, ethics seminars and debriefing sessions addressing moral distress promote ethical resilience, clinical dilemma analysis, and reflective supervision, supporting safe and person-centred communication practices [26]. For specific populations, gerontological HL modules incorporating supervised intergenerational contact, adapted educational materials, and ageism-sensitive communication assessment have proven effective in improving care quality for older adults [27]. Likewise, systematic HL assessment during pregnancy, combined with tailored educational materials and care pathways—using clear language, multimedia resources, and easy-to-read formats—supports personalised health education and reduces inequalities in maternal and child care [28]. Finally, in perioperative settings, self-management education programmes integrating the teach-back technique and supervised routines improve clinical outcomes and therapeutic adherence, demonstrating the direct impact of applied HL in healthcare practice [29].

Among the articles included in this Special Issue, the study “Validation of the Adapted eHEALS Questionnaire for Assessing Digital Health Literacy in Social Media: A Pilot Study” [19] adapts the eHEALS scale to social media contexts, validating an instrument that assesses critical competencies for the purposes of interpreting online health information. The instrument demonstrated strong content validity and high internal consistency, supporting its suitability for population studies and the design of educational interventions to enhance DHL. This contribution is particularly relevant given the growing reliance on social media as a source of health information and the associated risks of misinformation.

However, HL also includes the ability to communicate clearly, empathetically, and educationally between professionals and patients. In this context, the article “Developing and Implementing a Narration of Care Framework to Teach Nurses When and How to Narrate Care” [21] addresses an identified gap in nursing education: the lack of structured guidance for explaining care to patients and families. Drawing on institutional data, patient satisfaction surveys (HCAHPS), and patient dialogue, the authors developed the RECAP framework (Removing uncertainty, Explaining the environment, Calm and sincere communication, Assume nothing, and Personal connection). Following its implementation across eight hospitals involving 7341 professionals, 99% of them reported improved ability to narrate care, demonstrating the framework’s value in systematising therapeutic communication and enhancing the patient experience.

Another relevant contribution addresses early academic training and professional commitment. The study “Effects of an Innovative Introductory Course on the Professional Commitment of First-Year Undergraduate Nursing Students: A Quasi-Experimental Study” [20] examines the impact of an introductory course on students’ professional commitment. Significant post-course improvements were observed, particularly in willingness to make an effort and adherence to professional values. Case-based learning and visits to healthcare centres were especially valued, indicating that well-designed early training can strengthen professional identity and support student retention.

The integration of environmental health into nursing education is addressed in the article “Spanish Nurses’ Knowledge and Perceptions of Climate Change: A Qualitative Study” [23]. While participants demonstrated awareness of climate-related health risks, the study identified barriers such as limited formal training, eco-anxiety, and insufficient educational resources. These findings underscore the urgency of incorporating planetary health as a core competence in nursing education.

Several studies in this Special Issue address mental HL. The article “Depression: [Mental] Health Literacy, Stigma, and Perceived Barriers to Help-Seeking During Transitions Among Undergraduate Nursing Students” [30] reports low recognition of depression

and limited awareness of support resources among nursing students, underscoring the need to strengthen mental health content in curricula. Complementarily, “Understanding Family Experiences: A Study on Mental Health Literacy in Adolescent Eating Disorder Diagnoses” [24] examines families’ experiences during the diagnostic process and their levels of understanding, support, and capacity for action. Together, these findings highlight that health literacy must extend beyond the individual to include family contexts, support networks, and communities, thereby enhancing prevention, therapeutic adherence, and quality of life for patients and their families.

Emotional, ethical, and attitudinal literacy related to suicide is examined in the study “Evaluation of Attitudinal Beliefs Held by Medical and Nursing Students Towards Suicidal Behaviour” [31]. The findings reveal significant differences between groups: medical students reported more permissive attitudes toward suicide in terminally ill patients, whereas nursing students scored higher on beliefs related to suicide in general. These results underscore the urgent need to integrate targeted training on mental health, suicide prevention, ethical reasoning, and stigma reduction into health sciences education. Such training is essential not only for developing technical competence but also for fostering compassionate, reflective, and responsible professional practice, contributing to safer care environments and improved well-being for individuals at risk.

Conversely, the article “Moral Distress and Its Determinants among Nursing Students in an Italian University: A Cross-Sectional Study” [26] addresses moral distress among nursing students as both an educational concern and an ethical concern. The quantitative study found high levels of moral distress during clinical placements and academic activities, particularly when experiences conflicted with students’ ethical beliefs. Contributing factors included gaps between taught principles and clinical practice, limited resources, and insufficient institutional support for high-quality care. Higher distress levels were also reported among students who had not initially chosen nursing as their first career option, those combining work and study, and those who were separated or divorced, indicating that personal, academic, and contextual factors jointly increase vulnerability to ethical dilemmas. These findings underscore the need for nursing education programmes that systematically integrate content on professional ethics, resilience, and the management of moral distress. They also highlight the importance of providing structured opportunities for reflection, supervision, and emotional support to prepare future professionals not only in technical competencies but also in ethical sustainability, professional integrity, and psychosocial well-being.

Student satisfaction as an indicator of educational quality is examined in “Nursing Student Satisfaction Scale: Evaluation of Measurement Properties in Nursing Degree Programs” [24]. This study validated the Nursing Student Satisfaction Scale (NSSS) in the Italian context, supporting its usefulness for assessing key dimensions of the educational environment, including professional interaction, curriculum and teaching, and the learning context. The NSSS emerges as a reliable tool for evaluating and improving the educational experience, with potential implications for student retention and the quality of future nursing professionals.

Specific themes such as nursing knowledge and preparedness for rare diseases are also addressed. The study “Nurses’ Knowledge of Rare Diseases: A Systematic Review” [25] identifies substantial training gaps that affect care quality, highlighting the need for continuing education and technological resources to support care for patients with complex needs. In the area of maternal and perinatal HL, the study “Health Literacy in Pregnant Women and Its Associations with Personal, Socioeconomic, and Health-Related Factors in Primary Care” [26] examines HL levels among pregnant women and their associations with personal, socioeconomic, and health-related factors in primary care. The findings reveal

marked variability across social determinants, underscoring the need for prenatal care to account for these differences to ensure effective communication, promote adherence to preventive care, and support informed decision-making. Overall, this evidence underscores the importance of assessing HL in vulnerable populations and adapting prenatal health education to reduce inequalities and improve maternal and child outcomes.

Ageism and its determinants in healthcare professionals are analysed in “Ageism and Associated Factors in Healthcare Workers: A Systematic Review” [27]. The review shows that healthcare workers may hold ageist attitudes and prejudices, which are influenced by individual and work-related factors, including limited gerontological training, limited experience in geriatric settings, and demanding working conditions. Although overall levels of ageism were generally low, substantial variability across contexts was observed, along with a consistent association between greater geriatric training or experience and more positive attitudes towards older adults. These findings highlight the importance of incorporating targeted gerontological education, promoting supervised intergenerational contact, and addressing organisational factors to reduce prejudice and improve care quality for ageing populations. Integrating these measures into nursing education also supports HL for older adults by adapting communication, educational materials, and interventions to their needs, ultimately fostering more equitable and person-centred care.

Finally, the practical application of HL is illustrated in the “Propensity Score Analysis of the Utility of Supervised Perioperative Abdominal Wall Exercises for the Prevention of Parastomal Hernia” [28], which evaluates the effectiveness of a supervised abdominal wall exercise programme implemented before and after stoma creation. The results showed a significant reduction in the risk of parastomal hernia among participants performing supervised exercises. These findings highlight the value of incorporating structured, nurse- and physiotherapist-coordinated physiotherapy routines as an integral component of perioperative care, thereby improving surgical outcomes and enhancing long-term quality of life.

Together, the studies in this Special Issue show that HL and DHL are cross-cutting constructs spanning multiple dimensions of nursing education and practice. Although they address diverse topics—including digital literacy assessment using validated instruments [19], care narration and therapeutic communication [21], early training and professional commitment [20], mental health and stigma reduction [30,31], ethics and moral distress [26], climate change and environmental health [23], ageing and ageism [27], and the application of educational programmes to prevent clinical complications [29]—they all share a common focus: developing the capacity to access, understand, critically evaluate, and apply health information in complex, digital, and socially diverse contexts, as described in core HL frameworks [3,4]. From this perspective, HL and DHL extend beyond information transmission and are conceptualised as professional competencies integrating communicative, digital, ethical, and relational skills essential for shared decision-making, person-centred care, and the reduction in health inequalities [17].

This monograph aims to contribute to reflection and the development of strategies that promote HL as a driver of transformation in nursing education and practice, fostering professionals better prepared to address current and future health system challenges and to respond effectively to the needs of individuals and communities.

In conclusion, this Special Issue reinforces the need to conceptualise HL and DHL as core competencies of contemporary nursing, with direct implications for education, clinical practice, and research. Future training initiatives and studies should be grounded in consolidated theoretical frameworks, including integrated HL models [3]; Nutbeam’s distinction between functional, interactive, and critical literacy [32,33]; person-centred care approaches; and DHL models applied to digital environments and social media [4,19]. Available evi-

dence supports the implementation of explicit, longitudinal, and assessable programmes that combine active methodologies, innovative learning environments, and training in clear communication, critical thinking, and responsible use of digital resources [14]. Integrating these strategies can enhance nurses' professional competencies, strengthen patient safety, and contribute to more equitable, resilient, and humanised health systems [17].

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Article

Health Literacy in Pregnant Women and Its Associations with Personal, Socioeconomic, and Health-Related Factors in Primary Care

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Abstract: Background/Objectives: Health literacy (HL) plays a fundamental role in maternal and neonatal outcomes by influencing women's ability to access, understand, and apply health information during pregnancy. However, evidence regarding the determinants of HL among pregnant women remains limited, particularly within the Spanish context. This study aimed to assess HL levels among pregnant women and to examine their association with personal, socioeconomic, and health-related factors. **Methods:** A cross-sectional study was conducted between January 2023 and February 2024 across nine primary care centres within the Vigo Health Area (Spain), including 182 pregnant women receiving prenatal care. HL was measured using the 16-item European Health Literacy Survey Questionnaire (HLS-EU-Q16). Sociodemographic, obstetric, and health-related variables were collected through structured interviews. Descriptive and inferential analyses were performed to explore associations between HL and the selected variables. **Results:** Limited HL was observed in 35.7% of participants. A significant association was found between HL and family income ($p = 0.037$), with limited HL being more frequent among women with a monthly family income below €2000. No associations were identified with other sociodemographic or health-related variables. Thirty-nine per cent of participants visited hospital emergency services on two or more occasions, mostly without admission. The main source of information was healthcare professionals, although Internet use was also relevant. **Conclusions:** The prevalence of limited HL was lower than that reported in other national studies, although inequalities related to family income persisted. These findings highlight the need to incorporate systematic, HL-tailored strategies into prenatal care, based on prior HL assessment, to promote informed decision-making and improve maternal and neonatal outcomes.

Keywords: health literacy; pregnancy; prenatal care; primary health care; maternal health

1. Introduction

Health literacy (HL) is defined as the set of knowledge, motivations, and competencies that enable individuals to access, understand, appraise, and apply health-related information in order to make appropriate decisions in the domains of healthcare, disease prevention, and health promotion [1]. From this perspective, HL represents a fundamental requirement for navigating the increasing demands of contemporary healthcare systems

and for functioning within information environments characterised by their complexity, multiplicity of sources, and progressive digitalisation [2].

Insufficient HL levels are consistently associated with higher rates of hospitalisation, poorer adherence to treatment regimens, lower engagement in preventive behaviours, worse overall health outcomes, increased mortality, and greater healthcare costs, in addition to contributing to widening health inequalities [3,4]. Given its impact on health equity and population wellbeing, the World Health Organization has recognised HL as a key determinant of health, incorporating its promotion among the strategic pillars of the 2030 Agenda for Sustainable Development and considering it an essential component for strengthening public health globally [4,5].

During pregnancy, HL becomes particularly critical, as this period is marked by heightened health demands, multiple informational needs, and decision-making processes that directly influence both maternal and neonatal wellbeing. Pregnant women must navigate diverse sources of health information, often heterogeneous in quality, while communicating effectively with healthcare professionals, making HL an indispensable resource for safely navigating the gestational process [6].

Inadequate HL during pregnancy has been associated with lower adherence to preventive behaviours, such as delayed initiation of prenatal care, inadequate use of pregnancy-specific supplements, or a reduced likelihood of maintaining exclusive breastfeeding [7–9]. It has also been linked to difficulties in reproductive planning, limited involvement in clinical decision-making, and a higher risk of inappropriate use of healthcare services. These limitations may contribute to the development of obstetric complications, including gestational diabetes, hypertension, or maternal depression, as well as adverse neonatal outcomes such as low birth weight and other perinatal health problems [6,10,11].

HL levels during pregnancy show substantial international variability, influenced by cultural, socioeconomic, and educational factors, as well as by the instruments used to assess HL. Reported prevalences range from relatively low values, around 15% in the United States [12], to much higher proportions exceeding 70% in Latin American countries [13]. Elevated levels have also been described in other settings, such as 67% in Iran [14], and intermediate values in African contexts, including 41% in Nigeria [15]. In Europe, although variability is less pronounced, considerable differences persist, with estimates as low as 6.8% in the Netherlands [16], intermediate values around 35% in countries such as Germany [17], and proportions above 45% in southern regions of the continent, including Portugal [18]. In Spain, available evidence on HL in pregnant women remains limited and derives mainly from studies conducted in specific territorial areas of the country, where high proportions of inadequate or limited HL, often above 40%, have been reported [19,20]. However, more recent multicentre research has identified more moderate figures, close to 30% [9], suggesting the existence of variability even within the same healthcare system. This scenario underscores the importance of analysing HL in specific contexts, taking into account the sociodemographic, cultural, and healthcare characteristics of each population.

In this context, the present study aimed to assess HL levels among pregnant women receiving care in the Vigo Health Area and to explore their association with personal, socioeconomic, and health-related factors. Generating data from specific healthcare settings is essential for understanding territorial variability in HL during pregnancy and for supporting the design of strategies aimed at enhancing the comprehension of health information within prenatal care.

2. Materials and Methods

2.1. Study Design

A cross-sectional observational design was used, appropriate for describing health literacy levels and examining their association with different factors, following the approach employed in several previous studies in pregnant populations [7,21]. A consecutive non-probabilistic sampling strategy was applied, a method widely used in primary care research due to its feasibility and its capacity to include all eligible women during the study period [8,22]. Although this sampling approach may limit the generalisability of the findings beyond the healthcare context examined, it represents a common methodological choice in health literacy research.

2.2. Setting

The study was conducted in the Vigo Health Area, one of the seven public healthcare areas in Galicia (north-west Spain), which provides services to approximately 199,500 women of reproductive age. Specialised maternal healthcare is centralised at Álvaro Cunqueiro Hospital, which registers around 3000 births annually. To ensure territorial representativeness, eight geographically distributed primary healthcare centres were selected. Fieldwork was carried out between January 2023 and February 2024.

2.3. Participants

Inclusion criteria: adult pregnant women over 30 weeks of gestation, whose delivery was planned at the reference maternity unit of the health area, and who provided written informed consent to participate.

Exclusion criteria: refusal to participate, insufficient oral or written comprehension of Spanish or Galician to ensure proper participation, or incorrectly completed questionnaires.

2.4. Data Collection

Participants were recruited during group-based prenatal education sessions held at the selected centres. To ensure consistency in questionnaire administration, collaborating healthcare professionals received specific training on the application procedure, inclusion and exclusion criteria, and the management of frequently asked questions. When the questionnaire was not self-administered directly by the researchers, a standardised protocol was followed to guarantee uniformity in data collection.

Participation was voluntary, following the provision of an information sheet and the signing of informed consent. Questionnaires were completed anonymously in a quiet environment, without the presence of companions, and were returned in sealed envelopes. To safeguard confidentiality, all questionnaires were coded using a non-traceable identification system with no link to personal data. Only the research team had access to the dataset, which was stored and managed in accordance with current data protection legislation.

2.5. Variables

Health literacy was assessed using the 16-item version of the European Health Literacy Survey Questionnaire (HLS-EU-Q16) [23], a shortened form of the original instrument developed within the European Health Literacy Survey project [1] and validated in Spain, where it demonstrated a Cronbach's alpha of 0.982 [24]. The instrument comprises 16 items that measure individuals' perceived ability to access, understand, appraise, and apply health-related information across three key domains: healthcare, disease prevention, and health promotion. The HLS-EU-Q16 has also been previously used in studies involving pregnant and perinatal populations, supporting its suitability for assessing health literacy in this context [25,26].

Each item is rated on a four-point Likert scale (from very easy to very difficult). The total score categorises respondents into different HL levels [25]: inadequate (0–8), problematic (9–12), and sufficient (13–16). Following previous research [24], the present study applied a dichotomous classification: inadequate HL (0–12) and adequate HL (13–16).

Additional data were collected on personal variables (age, marital status, type of cohabitation, educational level), socioeconomic variables (area of residence, current occupation, personal monthly income, and family monthly income), and health-related variables (hospital admissions, emergency department visits, and main source of health information).

2.6. Sample Size

The sample size was estimated using the formula for infinite populations, assuming an expected prevalence of 13% inadequate HL based on previous data [27], a 95% confidence level, and a 5% margin of error. The required sample size was calculated as 174 participants. To account for potential losses, the sample was increased by 5%, resulting in 183 recruited participants. In total, 182 women completed the questionnaire correctly and were included in the analysis.

2.7. Statistical Analysis

A descriptive analysis of categorical variables was performed using frequency and percentage distributions. The chi-square test and Fisher's exact test were used to compare categorical variables. A 95% confidence level was assumed for all analyses. Statistical analyses were conducted using IBM SPSS® Statistics for Windows, version 24.0. The level of statistical significance was set at $p < 0.05$.

3. Results

A total of 182 pregnant women participated in the study. The main sociodemographic characteristics are presented in Table 1. The mean age was 34.52 years (SD = 4.44). Most participants were married or living with a partner (91.8%) and nearly half resided in urban areas (48.9%). Higher education was the most frequent level attained (48.4%), and the majority were in paid employment (68.1%). More than two-thirds lived with their partner (68.7%). Personal monthly income most commonly ranged between €1001 and €1500 (51.1%), whereas family income was predominantly between €2001 and €3000 (63.7%).

Regarding healthcare use during pregnancy, only a small proportion required hospital admission (10.4%), yet a considerable number attended emergency services two or more times (39%). Healthcare professionals were the main source of information during pregnancy (64.8%), followed by the Internet (26.9%).

Overall, 64.3% of women presented sufficient health literacy, while 35.7% had limited levels. Within this latter group, 2.2% showed inadequate HL and 33.5% problematic HL.

A statistically significant association was observed between monthly family income and HL level ($\chi^2 = 6.597$; $df = 2$; $p = 0.037$) (Table 2). Among women with a monthly family income below €2000, 54.3% presented limited HL, compared with 29.2% and 29.0% in the two higher income categories. Conversely, adequate HL predominated among women with incomes above €2000. A significant linear trend ($p = 0.028$) further indicated that higher household income was associated with higher HL levels.

Table 1. Sociodemographic characteristics of the participants (n = 182).

Variable	n	%
Age		
>35 years	82	45.1
≤35 years	100	54.9
Marital status		
Single	14	7.7
Married	167	91.8
Divorced	1	0.5
Living arrangements		
With partner	125	68.7
With partner and children/other relatives	49	26.9
Others	8	4.4
Area of residence		
Rural	42	23.1
Semi-rural	51	28.0
Urban	89	48.9
Educational level		
Basic	26	14.3
Intermediate	68	37.4
Higher	88	48.4
Current occupation		
Salaried employment	124	68.1
Self-employed	28	15.4
Receiving benefits/unemployed/unpaid work	30	16.5
Monthly personal income (€)		
<1000	46	25.3
1001–1500	93	51.1
>1500	43	23.6
Monthly family income (€)		
<2000	35	19.2
2001–3000	116	63.7
>3000	31	17.0
Number of hospital admissions		
None	163	89.6
1–2 admissions	19	10.4
Number of emergency service visits		
None	38	20.9
Once	73	40.1
Twice	50	27.5
Three or more times	21	11.5
Main source of information during pregnancy		
Midwife	98	53.8
Gynaecologist	20	11.0
Internet	49	26.9
Others	15	8.2

Note: Data are presented as n (%).

Table 2. Health literacy level according to personal, socioeconomic, and health-related parameters (n = 182).

Variable	Limited HL, n (%)	Adequate HL, n (%)	p Value
Age			
>35 years	27 (32.9)	55 (67.1)	0.477
≤35 years	38 (38.0)	62 (62.0)	
Marital status			
Without partner (single/divorced/widowed)	5 (33.3)	10 (66.7)	0.841
Married or with partner	60 (35.9)	107 (64.1)	
Cohabitation			
With partner	20 (40.8)	29 (59.2)	0.421
With partner and children/other relatives	41 (32.8)	84 (67.2)	
Other	4 (50.0)	4 (50.0)	
Residence			
Rural	15 (35.7)	27 (64.3)	0.997
Semi-rural	18 (35.3)	33 (64.7)	
Urban	32 (36.0)	57 (64.0)	
Educational level			
Basic	13 (50.0)	13 (50.0)	0.235
Intermediate	24 (35.3)	44 (64.7)	
Higher	28 (31.8)	60 (68.2)	
Current occupation			
Paid employment	45 (36.3)	79 (63.7)	0.337
Self-employed	7 (25.0)	21 (75.0)	
Unemployed/receiving benefits/unpaid work	13 (43.3)	17 (56.7)	
Monthly income			
<€1000	20 (43.5)	26 (56.5)	0.309
€1001–1500	33 (35.5)	60 (64.5)	
>€1500	12 (27.9)	31 (72.1)	
Monthly family income			
<€2000	19 (54.3)	16 (45.7)	0.037
€2001–3000	37 (31.9)	79 (68.1)	
>€3000	9 (29.0)	22 (71.0)	
Number of hospital admissions			
None	59 (36.2)	104 (63.8)	0.691
1–2 admissions	6 (31.6)	13 (68.4)	
Number of emergency visits			
None	13 (34.2)	25 (65.8)	0.867
Once	28 (38.4)	45 (61.6)	
Twice	18 (36.0)	32 (64.0)	
Three or more times	6 (28.6)	15 (71.4)	
Main source of information during pregnancy			
Midwife	29 (29.6)	69 (70.4)	0.22
Obstetrician-gynaecologist	7 (35.0)	13 (65.0)	
Internet	23 (46.9)	26 (53.1)	
Other	6 (40.0)	9 (60.0)	

Note: Data are presented as n (%). Statistical significance was set at $p < 0.05$.

For the remaining personal, socioeconomic and health-related variables, no statistically significant associations were identified. However, some descriptive variations were observed. For instance, although women with basic education showed the highest proportion of limited HL (50.0%), this pattern was not consistent across groups. Similarly, limited HL appeared slightly more frequent among women living with a partner compared with those living in extended or other family arrangements, and women relying mainly on the Internet tended to show a higher proportion of limited HL than those who consulted healthcare professionals. These variations did not reach statistical significance and should therefore be interpreted with caution.

4. Discussion

The proportion of pregnant women with limited health literacy found in our study was lower than that reported in most national [19,20,27] and international [16,17] investigations. Such variations, widely documented in the literature, may be explained by differences in assessment instruments, classification criteria, or the sociodemographic characteristics of the populations studied, which complicate direct comparison across contexts. Nevertheless, although the proportion observed in our sample was slightly higher, our findings align with the recent data reported Vila-Candel et al. [9] who identified 30.5% of limited health literacy using the same instrument. This proximity situates our results within the range currently described in the Spanish context.

Regarding the determinants analysed, family income was the only factor significantly associated with health literacy. Women from households with fewer economic resources were more likely to present limited health literacy. This pattern is consistent with studies indicating that material conditions and support structures within the household decisively influence the ability to access, understand, and use health information [1,28–30]. In contrast, individual income showed no association in our study, a finding that mirrors previous research [13,22,25]. Family income appears to better capture the collective, educational, and structural dynamics that shape decision-making during pregnancy. Taken together, these findings suggest that socioeconomic inequalities operate as structural determinants influencing health equity beyond individual attributes.

By contrast, age, educational level, cohabitation, and employment status showed no significant association with health literacy. Although the literature reveals heterogeneous findings, with some studies identifying higher levels among women aged 25–35 years [19,26,31] and others reporting higher literacy among younger women with greater digital competence [32,33], the broader evidence suggests that age functions more as a moderating factor linked to reproductive experience and digital skills than as a direct determinant. A similar pattern is observed for education. Although numerous studies describe it as a key determinant [34–36], other authors highlight that higher academic attainment does not necessarily guarantee adequate health literacy, as functional skills such as reading comprehension, critical reasoning, or digital proficiency may vary considerably among individuals with comparable educational levels [37–39]. With regard to cohabitation, our findings align with studies reporting no direct association [9], despite evidence elsewhere suggesting potential protective effects related to emotional or communicative support within the household [22,40,41]. Overall, these results point to the influence of multicausal dynamics that extend beyond traditional sociodemographic variables.

No significant associations were detected between health literacy and healthcare service use. Although previous literature has reported more frequent emergency visits and longer hospital stays among individuals with limited health literacy [37,42,43], our findings did not reproduce this pattern. This may reflect the universal and accessible nature of the Spanish healthcare system, together with structured prenatal follow-up programmes that

tend to homogenise service utilisation irrespective of health literacy levels. Nonetheless, the high proportion of women who attended emergency services two or more times (39%) suggests the need to examine non-clinical factors such as insecurity, persistent doubts, or difficulties recognising warning signs, which may influence help-seeking behaviour [44]. Furthermore, although no significant differences were found regarding the main source of information, the increasing use of the Internet observed in our sample aligns with previous studies [8] and underscores the importance of strengthening critical appraisal skills in digital environments.

These findings carry relevant implications for clinical practice. First, they highlight the importance of assessing health literacy individually during prenatal follow-up, avoiding assumptions based solely on age, education, or employment status. Second, the association with family income suggests that primary care teams should identify women experiencing socioeconomic vulnerability at an early stage and offer tailored support measures such as accessible educational materials, reinforcement sessions, or community-based interventions. In addition, the growing use of the Internet as a source of information reinforces the need for midwives and obstetricians to guide pregnant women towards reliable and culturally appropriate resources, promoting critical skills to navigate information overload. Finally, the high frequency of emergency department visits indicates the value of strengthening antenatal education on warning signs and doubt resolution, thereby supporting pregnant women's autonomy and safety.

5. Limitations

This study has several limitations that should be considered when interpreting the findings. First, the cross-sectional design does not allow causal relationships to be established between health literacy levels and the variables analysed. Second, although consecutive sampling is commonly used in health literacy research and is appropriate in clinical settings, it limits the generalisability of the results because the sample was drawn from a single health area. Additionally, although the HLS-EU-Q16 enabled a standardised assessment, data were collected through a self-administered questionnaire, which may introduce social desirability or comprehension biases. The study did not incorporate certain potential determinants of health literacy, which should be addressed in future research. Finally, because only one variable showed a significant association in the bivariate analysis, it was not possible to conduct a multivariate analysis to further explore the potential influence of confounding factors.

Despite these limitations, the study provides valuable evidence regarding health literacy during pregnancy in a territorially underrepresented context and offers useful insights for guiding tailored interventions and future research.

6. Conclusions

The findings of this study indicate that although pregnant women in the Vigo Health Area generally display adequate levels of HL, inequalities related to family income persist. This result reinforces the influence of social and economic determinants in the perinatal context and highlights the need to address them comprehensively to ensure equitable, woman-centred care.

Moreover, the importance of consolidating reliable, accessible, and HL-adapted information channels, as well as enhancing healthcare professionals' communication skills, is underscored. The systematic incorporation of strategies based on prior HL assessment into prenatal care could promote informed decision-making, adherence to recommendations, and improved maternal and neonatal outcomes.

Finally, further multicentre and longitudinal research is warranted to explore the factors influencing HL during pregnancy and to evaluate the effectiveness of interventions designed to reduce the identified inequalities and optimise the quality of prenatal care.

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Abbreviations

The following abbreviations are used in this manuscript:

HL	Health literacy
HLS-EU-Q16	European Health Literacy Survey Questionnaire (16-item version)
WHO	World Health Organization

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Article

Validation of the Adapted eHEALS Questionnaire for Assessing Digital Health Literacy in Social Media: A Pilot Study

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Abstract: Background: Digital health literacy is crucial for navigating social media as a primary health information source. However, its interactive and unregulated nature fosters misinformation, requiring critical evaluation skills. Existing tools assess general internet use, but no validated instrument measures competencies specific to social media. This study aimed to adapt and validate the eHealth Literacy Scale (eHEALS) for this context. **Methods:** A content validation process was conducted with 33 experts, who evaluated the clarity, coherence, and relevance of the adapted questionnaire using item-level (I-CVI) and scale-level (S-CVI) content validity indices. A pilot study was then carried out with 250 participants to assess the instrument’s reliability and feasibility, measured through Cronbach’s alpha and McDonald’s Omega. **Results:** The adapted eHEALS demonstrated excellent content validity (S-CVI > 0.90) and high internal consistency (Cronbach’s α = 0.92; McDonald’s Ω = 0.92). The tool effectively captures key competencies for evaluating and applying health information in social media contexts, with exploratory factor analysis confirming a unidimensional structure that explained over 60% of the variance, supporting its robustness for use in population-based studies. **Conclusions:** This validated instrument provides a reliable method for assessing digital health literacy in social media, supporting the development of educational interventions to enhance critical appraisal skills and mitigate the impact of misinformation.

Keywords: digital health; social networking; technology; health literacy; validation; scale

1. Introduction

In recent decades, patterns of information consumption in society have undergone a significant transformation, particularly in the domain of health-related information [1,2]. Social media has emerged as one of the primary sources of information for the general population, substantially displacing traditional media [1,3]. The increasing reliance on platforms such as Facebook, YouTube, and Instagram for health-related information has facilitated more immediate and dynamic access to healthcare content, enabling users to obtain information on diseases, treatments, and well-being in a manner that is both convenient and economical [4–6].

Social media has become a space where people seek health-related information, and this brings both positive aspects and significant challenges. Among the advantages are

users' access not only to a wealth of information, but also to the exchange of experiences and support from others facing similar health concerns [7–9]. These interactions serve as an additional form of health education, offering users practical suggestions and examples that help them feel more confident and capable of managing their own care [10]. Furthermore, when health professionals use these platforms to interact directly with users, communication can strengthen health literacy and encourage the adoption of healthier behaviors in everyday life [7].

However, social media also poses substantial limitations as a source of health information. The lack of stringent regulation and the rapid dissemination of content make it challenging to ensure the accuracy and quality of the information available. The ease of access to platforms where individuals without medical training can publish health-related content contributes to the proliferation of misinformation and pseudoscience, a phenomenon that became particularly evident during public health emergencies, such as the COVID-19 pandemic [11–13]. This “infodemic” on social media represents a tangible public health risk, generating confusion, anxiety, and even encouraging harmful health behaviors [14]. These challenges highlight the urgent need to develop tools that enable users to critically assess the reliability of the health information they encounter on social media.

Given this landscape, it is essential to assess users' digital health literacy in the context of social media to promote the safe use of these platforms and improve the quality of the information they receive. Digital health literacy encompasses not only the ability to access and comprehend health information but also the capacity to critically evaluate and appropriately apply it in daily life [15]. Recent studies indicate that high levels of digital health literacy can protect users from misinformation and enhance their ability to manage their own health, particularly when critical thinking is encouraged and trust in reliable sources is strengthened. As a result, digital health literacy is increasingly recognized as a key determinant of health [16].

In this context, several instruments have been developed to measure digital health literacy in the broader internet environment. Among them, the eHealth Literacy Scale (eHEALS) [17]—originally designed to assess health literacy in relation to internet use—remains the most widely applied and has been adapted across diverse populations and digital settings. Other tools have also been introduced, such as the Digital Health Literacy Instrument (DHLI) developed by van der Vaart and Drossaert (2017) [18] and its Brazilian adaptation for adolescents (DHLI-BrA) validated by Barbosa et al. (2024) [19], which extend the assessment to a wider range of skills and cultural contexts. However, none of these questionnaires specifically addresses the use of social media for health-related purposes. A recent scoping review by Faux-Nightingale et al. (2022) [20] confirmed that, despite the growing relevance of social media as a primary source of health information, no validated instrument currently exists to evaluate digital health literacy in this setting. This gap underscores the need to adapt and validate measurement tools that can capture users' competencies in navigating, appraising, and applying health information within social media environments.

Therefore, this study had two aims: (1) to adapt the eHealth Literacy Scale (eHEALS) to explicitly assess competencies for finding, appraising, and using health information on social media; and (2) to examine its content validity and preliminary reliability and factor structure in a pilot sample from the general population.

2. Material and Methods

Phase 1. Adaptation and Translation Process

Prior to the validation stages, the original English version of the eHEALS was adapted to explicitly assess health information in the context of social media. Each item was reformulated to replace references to “the Internet” with “social media platforms” (e.g., Facebook, Instagram, YouTube), while preserving the original construct. The questionnaire underwent a process of translation and cross-cultural adaptation following international recommendations [21]. First, two independent bilingual translators, native Spanish speakers with advanced English skills, performed a direct translation from the original version. Subsequently, a third translator, a native English speaker with no prior knowledge of the original version, performed the reverse translation.

The versions obtained were reviewed by the research team, made up of professionals in nursing, health communication, and psychometric methodology, selected based on their academic and practical experience in digital health literacy. The panel evaluated the semantic, idiomatic, and conceptual equivalence of each item, proposing adjustments when necessary until consensus was reached.

Finally, a cognitive adaptation was carried out through cognitive interviews with ten participants from the target population, with the aim of verifying the comprehensibility, relevance, and cultural appropriateness of the items. The observations collected were used to refine the final version prior to the content validation phase.

Phase 2. Validation of the instrument's content

Content validity indicates whether the items of an instrument accurately represent the concept being measured. It is usually evaluated by a panel of experts who assess each item for clarity, coherence, and relevance.

Specifically, clarity refers to the comprehensibility of the items in terms of syntax and semantics; coherence assesses the logical alignment of the item with the overall scale; and relevance determines whether the inclusion of the item is necessary to ensure an adequate representation of the construct.

Selection of the expert panel

The questionnaire validation was conducted through the selection of an expert panel using purposive sampling, following predefined criteria. Experts ($n = 16$) were selected through purposive sampling, following the methodological recommendations of Polit and Beck (2004) [22]. Eligibility criteria included: (a) advanced academic or professional training in nursing, psychology, communication, or health sciences; (b) research or professional experience in health literacy, digital communication, or education; and (c) at least three years of professional experience. Candidates were identified through academic networks and professional associations and invited via institutional mailing lists. Only those who provided informed consent participated. In addition, a complementary panel of lay participants ($n = 17$) with high digital literacy was recruited to evaluate comprehension and cultural relevance. Lay participants were selected based on high digital literacy, assessed through a short screening questionnaire adapted from the Digital Health Literacy Instrument (DHLI). The screening evaluated frequency of social media use, diversity of platforms used, and self-reported ability to search, critically evaluate, and share health-related information online. Only individuals scoring above the 75th percentile were included in this group. Their participation contributed to assessing the clarity, comprehensibility, and cultural relevance of the adapted questionnaire from the perspective of the target audience.

Validation session

After the research team presented the study objectives, the expert panel assessed the clarity, coherence, and relevance of each questionnaire item using a survey administered via Google Forms. To ensure ethical compliance, all participants signed an informed consent form prior to their involvement.

During the validation session, each item of the questionnaire was evaluated independently for clarity, coherence, and relevance. These three dimensions were assessed separately using a 4-point Likert scale (1 = not at all clear/coherent/relevant, 4 = very clear/coherent/relevant). This procedure allowed the computation of item-level (I-CVI) and scale-level (S-CVI) Content Validity Indices for each dimension. In addition, an open-ended section was included to collect comments and suggestions for improving the items.

Data analysis

The statistical analysis involved calculating both the Item-Level Content Validity Index (I-CVI) and the Scale-Level Content Validity Index (S-CVI). The I-CVI reflected the proportion of experts who rated an item as valid, with values above 0.78 indicating excellent content validity [22].

To assess the overall validity of the instrument, the S-CVI was computed as the mean of all I-CVI values. An S-CVI greater than 0.90 was interpreted as evidence of excellent content validity for the entire questionnaire [22].

Preliminary Version of the Questionnaire

Following an in-depth analysis and the incorporation of recommendations obtained during the peer-review phase, the preliminary version of the questionnaire was developed. This version included both original items and revised elements, ensuring greater clarity, coherence, and representativeness of the construct. The preliminary questionnaire consisted of only eight items.

Phase 3. Pilot study

Following the integration of expert feedback, a pilot study ($n = 250$) was carried out between February and March 2024 using a non-probabilistic convenience sample.

Data were collected online through Google Forms, and the questionnaire was completed individually and anonymously, without the presence of a researcher. Recruitment was carried out via institutional mailing lists and social media platforms. Participation was voluntary and without incentives.

The objective of the pilot study was to validate the revised version of the instrument and assess key aspects such as question comprehension, language clarity, completion time, and any other relevant observations for further improvement, to assess the reliability of the instrument and its factor structure.

Data analysis

The data obtained from the pilot study were used to evaluate the instrument's reliability through Cronbach's alpha and McDonald's Omega [23], which assess internal consistency. A preliminary analysis was also conducted to estimate the required sample size for future studies at the population level. This phase helped identify areas for improvement and reinforced the methodological soundness of the instrument for broader application.

To explore the underlying factor structure of the digital health literacy in social media questionnaire, an exploratory factor analysis (EFA) was performed using Principal Components as the extraction method. Prior to conducting the EFA, the adequacy of the data was assessed through Bartlett's test of sphericity and the Kaiser–Meyer–Olkin (KMO) measure. The number of factors retained was determined using the Kaiser criterion (eigenvalues

greater than 1) and by examining the inflection point of the scree plot [24]. All data analyses were performed with SPSS v29.

3. Results

Phase 1. Adaptation and translation

The forward–backward translation process confirmed the semantic equivalence between the Spanish version and the original English eHEALS. Minor wording adjustments were made during cognitive pre-testing ($n = 10$) to improve readability and contextual clarity, particularly replacing general references to “the Internet” with “social media platforms.” All items were considered comprehensible and relevant by participants, and no item was excluded at this stage. The final adapted Spanish version was then submitted to expert validation.

Phase 2. Validation of the instrument’s content

The validation sample comprised two complementary groups. The first group consisted of 16 experts with professional profiles in health, teaching, and communication, including university professors, nurses, midwives, psychologists, and health content creators. Of these participants, 56.3% were women and 43.7% men, with a mean age of 31.4 years. Of the 16 experts, nine (56.3%) held doctoral degrees and seven (43.7%) were university professors. Their fields of expertise were nursing ($n = 5$), psychology ($n = 3$), communication ($n = 2$), and health sciences education ($n = 6$). This profile ensured that the panel provided both academic and professional expertise relevant to digital health literacy and instrument validation.

The second group included 17 lay participants from the general population with high digital literacy and frequent social media use. In this group, 52.9% were female and 47.1% male, with a mean age of 26 years. Regarding educational level, 70.6% had university studies, 17.6% vocational training, and 11.8% secondary education.

The results of the validation process for the adaptation of the eHEALS questionnaire for use in social media are presented in Table 1, which displays the item-level content validity index (I-CVI) for clarity, coherence, and relevance. Across all three evaluated aspects (clarity, coherence, and relevance), all questionnaire items achieved I-CVI values exceeding 0.78, indicating excellent content validity according to established criteria. The calculated scale-level content validity index (S-CVI) for each dimension was 0.93 for clarity, 0.95 for coherence, and 0.98 for relevance, reinforcing the overall quality of the instrument in terms of item representativeness and appropriateness. These findings demonstrate that the questionnaire meets high standards of excellence in its design and content.

The items that received the highest scores in terms of relevance were items 1 and 4–8. Items 3–7 achieved the highest scores for clarity, while items 4–7 obtained the maximum score for coherence. However, it is important to note that none of these items were excluded, as their I-CVI values were deemed acceptable.

In the panel composed from the general population, the results were even more favourable (Table 2), with both the I-CVI and S-CVI reaching the maximum value of 1 across all dimensions—clarity, coherence, and relevance.

Phase 3. Pilot study

The questionnaire was administered to a pilot sample of 250 individuals from the general population (Table 3) to assess the clarity, applicability, and feasibility of the instrument, as well as to identify any potential difficulties in its administration. This phase aimed to ensure that respondents fully understood the questions and to determine the time required to complete the questionnaire. Based on the results obtained from the pilot sample,

necessary modifications were made to the final version of the questionnaire, including adjustments to the wording and the order of certain questions.

Table 1. Content Validity Indexes (I-CVI and S-CVI)–Specialists.

Item	Clarity		Coherence		Relevance	
	I-CVI	Expert Agreeing	I-CVI	Expert Agreeing	I-CVI	Expert Agreeing
1. - Conozco qué recursos sobre salud están disponibles en redes sociales	0.81	13/16	0.88	14/16	1.00	16/16
2. - Sé dónde puedo encontrar recursos útiles sobre salud en redes sociales	0.88	14/16	0.94	15/16	0.94	15/16
3. - Sé cómo puedo encontrar recursos útiles sobre salud en redes sociales	1.00	16/16	0.94	15/16	0.94	15/16
4. - Sé cómo utilizar las redes sociales para encontrar respuestas a mis cuestiones de salud	1.00	16/16	1.00	16/16	1.00	16/16
5. - Sé cómo utilizar la información sobre salud que encuentro en redes sociales para que me ayude	1.00	16/16	1.00	16/16	1.00	16/16
6. - Tengo las habilidades necesarias para evaluar los recursos sobre salud que encuentro en redes sociales	1.00	16/16	1.00	16/16	1.00	16/16
7. - Puedo distinguir los recursos de salud de alta calidad de los recursos de salud de baja calidad que se encuentran en redes sociales	1.00	16/16	1.00	16/16	1.00	16/16
8. - Tengo confianza a la hora de utilizar la información de redes sociales para tomar decisiones sobre salud	0.75	12/16	0.88	14/16	1.00	15/16
S-CVI *	0.93		0.95		0.98	

* S-CVI = average of the I-CVIs.

Table 2. Content Validity Indexes (I-CVI and S-CVI) in the General Population.

Item	Clarity		Coherence		Relevance	
	I-CVI	Expert Agreeing	I-CVI	Expert Agreeing	I-CVI	Expert Agreeing
Item 1	1.00	16/16	1.00	16/16	1.00	16/16
Item 2	1.00	16/16	1.00	16/16	1.00	16/16
Item 3	1.00	16/16	1.00	16/16	1.00	16/16
Item 4	1.00	16/16	1.00	16/16	1.00	16/16
Item 5	1.00	16/16	1.00	16/16	1.00	16/16
Item 6	1.00	16/16	1.00	16/16	1.00	16/16
Item 7	1.00	16/16	1.00	16/16	1.00	16/16
Item 8	1.00	16/16	1.00	16/16	1.00	16/16
S-CVI *	1.00		1.00		1.00	

* S-CVI = average of the I-CVIs.

Both the Cronbach's alpha and McDonald's omega showed high internal consistency ($\alpha = 0.92$; $\Omega = 0.92$). A preliminary estimate indicated that 69.6% of participants used social media for health information, which was used to calculate the required sample size for a larger population-based study ($n = 913$).

Table 3. Sociodemographic characteristics of the pilot sample.

Variable	$n = 250$
Gender	data
Female	48.8
Male	50.0
Other	1.2
Age	35.2 ± 15.4
Educational level	
No studies	1.2
Primary studies	0.4
Secondary studies	16.0
Vocational training	20.0
University studies	55.2
Other	7.2

Quantitative variable (age) is expressed as median (IQR). Qualitative variables are expressed as frequency (n) and percentage (%).

Exploratory factor analysis (EFA)

The KMO value was 0.884, which is considered meritorious [24] and indicates a high proportion of common variance among the items. The χ^2 value of Bartlett's sphericity test was statistically significant ($\chi^2_{28} = 1475.78$, $p < 0.001$), which indicated that the results were suitable for exploratory factor analysis. The scree plot revealed the presence of a single factor (Figure 1) with an eigenvalue of 5.11 which accounted for 63.87% of the total variance, which is over the threshold of 60% to consider the model adequate [25]. The communalities of the items were all above 0.50 (0.514–0.772) suggesting that the items explain a substantial proportion of their variance through the common factor. All item loadings were >0.70 (Table 4), so the 8 items were retained.

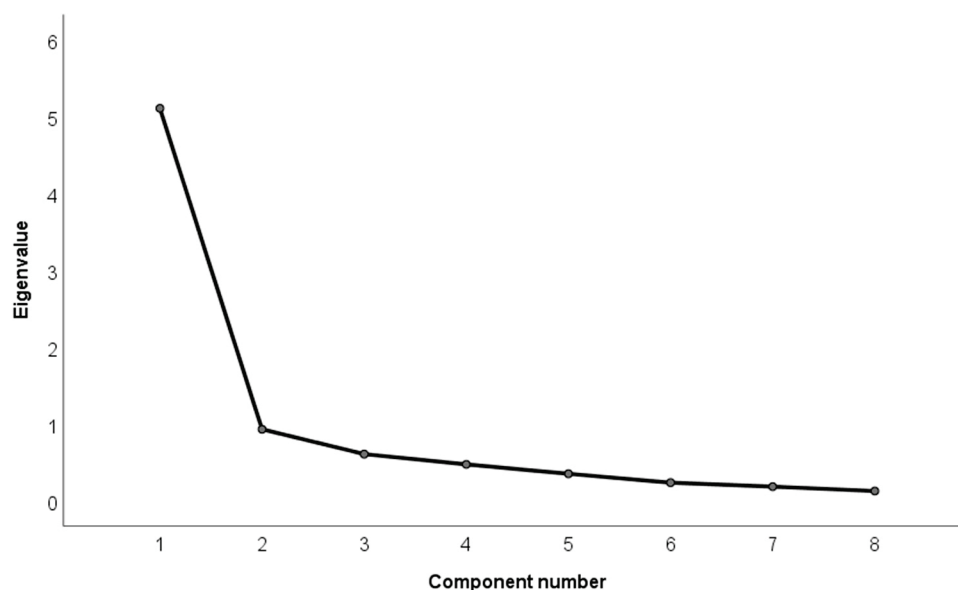


Figure 1. Scree plot of the factors of the eHEALS questionnaire for use in social media extracted by principal component analysis.

Table 4. EFA Factor Loadings of Digital Health Literacy in Social Media Items.

Items	Mean (sd)	Loadings	Communalities
1	2.57 (1.18)	0.732	0.536
2	2.65 (1.15)	0.857	0.735
3	2.73 (1.19)	0.879	0.772
4	2.76 (1.16)	0.853	0.728
5	2.87 (1.17)	0.844	0.713
6	2.97 (1.27)	0.765	0.586
7	3.10 (1.25)	0.725	0.525
8	2.57 (1.22)	0.717	0.514

4. Discussion

Access to health information has undergone significant transformations in recent decades, not only altering the sources used by the population but also reshaping how this information is interpreted and applied in decision-making [26]. The continuous increase in social media use has contributed to the emergence of a new landscape, enabling a constant flow of digital content—often without users actively seeking it [27]. This shift presents unique challenges regarding digital health literacy, a field that has been extensively studied in general internet contexts but remains insufficiently explored within the specific domain of social media. The present study addresses this gap by providing an adapted and validated tool to assess critical competencies in a dynamic and frequently misinformation-prone environment.

Norman and Skinner [17], in their initial validation of the eHEALS, demonstrated that this instrument is a useful tool for measuring how users perceive their ability to search for, comprehend, and apply online health information. However, its design does not account for interaction, virality, or the social dynamics inherent to social media—factors that justified the need for this study.

Our results indicate that the adaptation and validation of the eHEALS maintain its optimal internal consistency (Cronbach's $\alpha = 0.92$; McDonalds $\Omega = 0.92$), aligning with values reported in the instrument's original validation [17]. At the same time, as highlighted by previous research, digital health literacy is a key determinant in improving health behaviors and reducing vulnerability to misinformation [28]. These findings are comparable to studies that have validated similar instruments, such as the Digital Health Literacy Instrument (DHLLI-BrA) used by Barbosa [19] to measure digital health competencies among adolescents in internet-based settings. However, the adapted eHEALS has the distinct advantage of focusing specifically on social media, addressing a gap identified by other authors [29], who emphasized the need to develop specialized tools for interactive environments, recognizing the increasing influence of social media and other digital platforms in shaping how young individuals access and utilize health information.

The content validity analysis, supported by the I-CVI and S-CVI indices, confirms that experts deemed the questionnaire items to be relevant, clear, and coherent in assessing digital health literacy within social media contexts. This suggests that the semantic adaptation has not compromised the instrument's ability to accurately measure this construct.

Recent studies have identified that digital health literacy in social media is not solely dependent on information-seeking abilities but also on the capacity to interpret, filter, and share content within an interactive ecosystem—where social validation and message virality can distort perceptions of informational accuracy [30]. In this regard, adapting the eHEALS questionnaire to the social media context represents a significant methodological advancement, as it enables a more precise evaluation of users' ability to distinguish reliable sources in highly dynamic and misinformation-prone environments.

The adaptation and validation of the eHEALS, therefore, represent an important step in identifying factors that may predispose individuals to uncritical consumption of health-related information—an insight that could be pivotal for designing evidence-based educational interventions. Additionally, this validation provides key data on the digital competencies required to assess the quality of health information shared on social media and its impact on health decision-making. Finally, the questionnaire's validation reinforces the idea that direct equivalencies cannot be assumed between digital health literacy in general internet use and in social media, as interaction dynamics, information overload, and content validation mechanisms function differently in each environment [31–33].

Finally, the exploratory factor analysis showed that the adapted scale maintains a unidimensional structure. This factorial solution is aligned with the theoretical structure of the original eHEALS scale, which also identified a single factor, thus favoring its applicability and comparability in different contexts. This result also indicates that the items assessed cluster coherently around a single construct: digital health literacy in the specific context of social networks. The strong correlation between the items suggests that they all contribute significantly to measuring this competency, which is particularly relevant to meet the study's objective of having a useful and specific tool to assess such skills in today's digital environment. The high internal consistency among the items, reflected in their high factor loadings, indicates that they all contribute significantly to the measurement of the same concept.

This study contributes to an emerging field of research by offering a validated tool that enables a more precise evaluation of digital health literacy in social media, facilitating the development of strategies aimed at enhancing the population's critical capacity to counteract health-related misinformation.

This study has several limitations. The use of expert judgment introduces subjectivity, and the predominance of young and highly educated participants may limit the generalizability of the findings. Additionally, as the questionnaire was developed within a single cultural context, cross-cultural adaptations will be necessary for international use. Furthermore, since the instrument is based on self-report and administered through a convenience sample, participants' responses may reflect subjective perceptions rather than actual digital health literacy skills. These aspects should be considered when interpreting the findings, and future studies should aim to include more representative samples and combine self-reported measures with objective performance-based assessments.

Finally, although the exploratory factor analysis supported a unidimensional structure consistent with the original version of the instrument, this unidimensionality could limit the questionnaire's ability to capture more nuanced aspects of digital health literacy in social networks, such as critical thinking, interactive skills or trust in information sources. Future research could explore the presence of subdimensions through confirmatory factor analysis or other measurement models.

Although our design included an exploratory factor analysis (EFA), we acknowledge that a confirmatory factor analysis (CFA) on an independent sample would provide stronger evidence for the structure of the instrument. We have noted this as a limitation and suggested that future studies should incorporate CFA or, at minimum, parallel analysis to enhance robustness.

Finally, beyond these psychometric considerations, it would be important for future studies to explore the role of artificial intelligence (AI) in shaping the health information available on social media. Future research should consider how to integrate AI into health literacy frameworks, given its rapid evolution and influence on social platforms.

5. Conclusions

Our results suggest that the adaptation and validation of the eHEALS questionnaire for the context of social media constitutes a reliable and valid instrument for measuring digital health literacy, facilitating the identification of training needs and the design of educational interventions aimed at the safe and effective use of these platforms.

The implications of this study on digital health literacy are numerous and significant, particularly in the design of educational interventions. The findings can guide the development of educational programs and resources aimed at enhancing digital health literacy skills, especially among populations with low educational attainment and limited access to technology. The tool developed in this study provides a foundation for identifying specific digital competencies that should be reinforced in educational campaigns.

Moreover, addressing disparities in digital health literacy is crucial to ensuring equitable and effective access to digital health tools. Enhancing digital literacy can have a positive impact on health outcomes and quality of life by facilitating the comprehension and use of digital health resources, improving communication with healthcare professionals, and promoting healthy behaviors.

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Institutional Review Board Statement: This study was conducted in accordance with the Declaration of Helsinki (2013) and the Spanish Organic Law 3/2018 of 5 December on the Protection of Personal Data and Guarantee of Digital Rights. The present study did not involve clinical interventions, drug trials, or the collection of sensitive personal data, and all data were anonymized prior to analysis. The study involved voluntary participation by nursing professionals through anonymized questionnaires, without patient involvement, physical procedures, or any psychological or legal risk. Therefore, in accordance with Royal Decree 1090/2015 (which regulates clinical trials and Research Ethics Committees for Medicinal Products), Law 14/2007 on Biomedical Research, and Regulation (EU) 2016/679 (GDPR), formal review by an ethics committee was not required.

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Article

Effects of an Innovative Introductory Course on the Professional Commitment of First-Year Undergraduate Nursing Students: A Quasi-Experimental Study

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Abstract: **Aim:** We aimed to assess the impact of a Health and Nursing course on the professional commitment of first-year undergraduate nursing students and obtain quantitative and qualitative feedback on teaching. **Design:** This study employed a quasi-experimental design. **Methods:** Fifty first-year undergraduate nursing students who attended the Health and Nursing course were recruited. A self-designed basic information questionnaire, the Nursing Professional Commitment Scale, the Students' Perceived Teaching Quality Questionnaire, and two quick open-ended questions were used to collect the data. Professional commitment before and after the intervention was compared using an independent samples *t*-test. The correlation between the students' perceived teaching quality and professional commitment was assessed using Pearson's correlation coefficient. Content analysis was used to analyze qualitative feedback. **Results:** The participants experienced a significant improvement in their professional commitment. The students' perceived teaching quality was significantly correlated with their professional commitment. According to the students' feedback, the most impressive aspects of the course were case-based learning and visits to healthcare institutions. **Conclusions:** A Health and Nursing course with high-quality teaching increased the professional commitment of first-year undergraduate nursing students. The findings suggest that nursing educators should consider the external macro-sociopolitical environment when designing an introductory course to equip students with a broader perspective on nursing professional development. Teaching content and pedagogy should be improved to promote knowledge delivery and internalization.

Keywords: introductory course; nursing student; pre-post study; professional commitment

1. Introduction

Shortages in the nursing workforce plague the Chinese healthcare system and those of many other countries worldwide [1]. Approximately 31 million men and women constitute the global nursing and midwifery workforce [2]. Despite their large numbers, nurses and midwives represent more than 50% of the current shortage of healthcare workers [2]. One potential approach to addressing the shortage of healthcare professionals is to enhance professional commitment [3]. Professional commitment refers to an individual's psychological response to their profession and is a known predictor of professional competence, job satisfaction, and turnover intention [4,5]. Undergraduate education is an important stage for nursing students to develop a professional commitment to their profession [6]. Enabling

students to understand nurses' contributions to the health field and build positive professional cognition as early as their first contact with the nursing profession is imperative for their professional commitment development and career decision-making [7,8].

To deepen professional commitment, it is essential for students to grasp the broader contexts in which nurses operate, including global health challenges and national health policies. Understanding these factors not only broadens perspectives but also reinforces recognition of nurses' vital roles in healthcare and promotion, which strengthens their professional commitment. Global health is an essential competency for nurses, and its importance has continuously increased [9], especially after the COVID-19 pandemic. It is an area of study, research, and practice that prioritizes improving health and achieving health equity for all people worldwide [10]. Educators in the USA, Canada, and India have highlighted the importance of integrating global health concepts into nursing curricula [11–13]. However, most undergraduate nursing curricula lack a core course on global health [14,15]. Looking at global health challenges also involves addressing domestic health inequities through local policies and practices, as exemplified by initiatives such as Healthy China 2030. Launched in 2019, this important initiative aims to ensure that the Chinese population has access to health by advocating for the whole society's participation in the concept of "Health for All, and All for Health" [16]. Nurses contribute to preventing diseases, assist in diagnosis and treatment, reduce pain and suffering, and promote rehabilitation, playing an essential role in implementing health policies and achieving public health goals [17]. As future nurses, nursing students should develop an understanding of global and national health policies and practices early in their studies, as this knowledge situates their personal career development within a broader international and national sociopolitical context and contributes to fostering their professional identity and commitment [11,15].

To respond to these needs, a Health and Nursing course was developed as an innovative introductory class in 2020, immediately after the launch of Healthy China 2030. This course aims to help nursing students perceive their professional environment and understand how policies are implemented in nursing practice. It is offered as the first specialized course in the first semester at university, serving as the initial step in shaping students' understanding of the nursing major. In this course, nursing students learn about the concepts of global health and Healthy China 2030, the current conditions of the nursing profession, and the potential future nursing opportunities and challenges to renew their views of the profession based on their surroundings and social media. This course is part of a large teaching reform project that aims to improve the professional commitment of nursing students by redesigning and innovating nursing curricula.

Background

Traditionally, the first specialized course for nursing students in China and other countries has been titled "Introduction to Nursing" or "Fundamentals of Nursing," which covers the history, basic concepts, and fundamental knowledge and skills of nursing [18–20]. However, as the sociopolitical context of healthcare delivery changes, nurses must transform their roles and adapt to keep pace with such changes in society, as well as to respond to financial challenges to best manage resources and ensure safe, high-quality patient care [21]. Health policies reflect people's health needs and provide a context for nurses' practices, roles, and knowledge. Guiding nursing students to learn about general concepts and knowledge of health and become familiar with the external environment for health profession development is helpful in explaining specialized nursing concepts in subsequent courses. An innovative introductory course is needed to provide a broader perspective of the entire health field, rather than just the nursing profession, to equip future nurses with a strong sense of duty in health promotion.

The Health and Nursing course was developed based on the Nursing Metaparadigm, which identifies four major concepts that are frequently interrelated and fundamental to nursing theory: person, environment, health, and nursing [22]. The metaparadigm provides a theoretical foundation for the course's framework [23]. The course content was framed around these four concepts and incorporated essential, advanced, and macro-knowledge of Health and Nursing (Figure 1). The course content echoes the aim of all nursing education, which is to ensure that graduates not only receive the necessary knowledge and skills to provide safe patient care but also establish a professional commitment to demonstrate continuous effort in nursing [24].

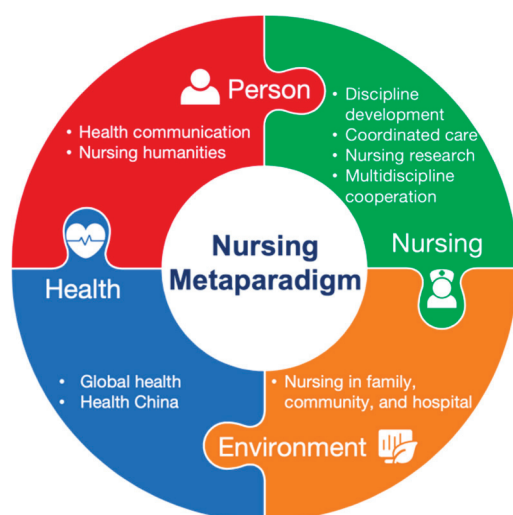


Figure 1. Course framework guided by the Nursing Metaparadigm.

Professional commitment is a psychological reaction to a person's profession that is initially shaped by basic education [25]. Students with higher professional commitment tend to exhibit higher professional commitment after graduation and are more willing to engage in nursing careers. Unfortunately, undergraduate nursing students in China have moderate levels of professional commitment [26,27]. According to research examining the factors influencing nursing students' professional commitment, education plays a significant role [28]. The previous study conducted by the authors, which surveyed three educational institutions, suggested that the academic faculty's beliefs about nursing were positively correlated with nursing students' professional commitment. Other studies have suggested that students' satisfaction with learning, teachers' pedagogical skills, and the pedagogical atmosphere are positively related to perceived professional commitment [29,30].

Professional commitment in nursing is an ongoing, dynamic process that is shaped as students enter university. The first year is a crucial phase for correcting students' previous cognitive biases, improving their value in the nursing profession, and building professional commitment. The literature and our previous study suggest that only a small percentage of students chose nursing majors because of their interest, whereas the majority chose them because of family suggestion, the good job prospects the nursing major offers, employment opportunity considerations, and professional transfer rather than their interests and ideals, resulting in low professional commitment [27,31]. In addition, their stereotypical images of nursing before they were enrolled in nursing schools were influenced by people who were unfamiliar with the profession [32]. Therefore, educators should pay more attention to cultivating professional commitment, clarifying misunderstandings, and promoting a conceptual and systematic understanding of nursing in students as early as their entry into university, particularly for those who are ambivalent about nursing as a career.

Most studies have focused on third- or fourth-year students and examined the effect of internship experience on their professional commitment [27,31]. These studies generally show a decline in professional commitment after internships, attributed to gaps between expectations and reality, unpleasant clinical experiences, and negative relationships with clinical instructors. However, fewer studies have investigated first-year students, even though this initial phase is crucial for shaping professional commitment. Research comparing students at different academic levels suggests that professional commitment tends to decrease as students advance to higher years [33]. For example, Kong et al. (2016) and Yu et al. (2023) found that the professional commitment of first-year students was higher than that of second-year students, which may be a result of increased academic pressure and decreased passion [34,35]. Therefore, nursing educators need to focus more on early-stage students by using innovative approaches to challenge preconceived notions and stereotypes. Providing an accurate and comprehensive image of the nursing profession that summarizes current trends and career opportunities can foster a stable and lasting professional commitment from the outset and counteract the decline seen in later years [36].

Some intervention studies have aimed to increase professional commitment by improving teaching content or procedures. Chang et al. (2024) reported that dialog with senior nursing students increased first-year nursing students' professional commitment by helping them reflect on the role of nursing and establish professional values and responsibilities [37]. In another study, a one-week structured exemplar education program significantly improved the commitment of third-year students [26]. This research suggests that courses or programs aimed at increasing accurate and comprehensive awareness of the role and functions of professional nurses in promoting health could be effective in shaping students' professional commitment.

The primary aim of this study was to examine whether the professional commitment of first-year undergraduate nursing students improved after taking the Health and Nursing course. The secondary aim was to evaluate the students' perceived teaching quality and analyze qualitative feedback on this course.

2. Materials and Methods

2.1. Study Design

This is a quasi-experimental study without a control group, using pre- and post-intervention measurements.

2.2. Participants and Ethical Considerations

This study was set in a school of nursing at a top-ranking public university in Shanghai, a large metropolitan city in eastern China. Non-randomized convenience sampling was used to recruit participants. The students decided on the nursing major when they applied for the university through the national college entrance examination. The annual enrollment for the nursing school at this university is approximately 50 students due to its highly selective admission process. Because Health and Nursing is a compulsory course, all 50 of the first-year undergraduate nursing students who were required to take the course in the autumn quarter of 2023 were invited to participate in the pre- and post-tests. Before the pre-intervention test, students were informed of the purpose of the course and their freedom to withdraw from the study at any time. Informed consent was obtained from all participants. All surveys were anonymous, and the investigators could not see the students' information. Ethical approval was obtained from the ethics committee of the university. To avoid any potential influence or concerns from students, none of the instructors teaching the Health and Nursing course was involved in the collection or analysis of research data. Participation was entirely voluntary, and no incentives or financial benefits were provided

to the students. All 50 agreed to participate in this study and completed the pre-intervention survey. Two students who did not volunteer to complete the post-intervention survey were excluded.

2.3. The Health and Nursing Course

The Health and Nursing course included 34 class hours with two credits. The course lasted for eight weeks. The expected learning outcomes of the Health and Nursing course were as follows: develop an understanding of global and national health policies and practices; recognize the roles and contributions of nurses in healthcare delivery and health promotion; foster early professional identity and commitment to the nursing profession. These outcomes guided the course design and informed the evaluation of its impact on first-year nursing students. Four sequential modules were designed to gradually internalize the knowledge, skills, and values of the profession: expert lectures, visiting healthcare institutions, case-based learning (CBL), and team presentations (see Figure 2).

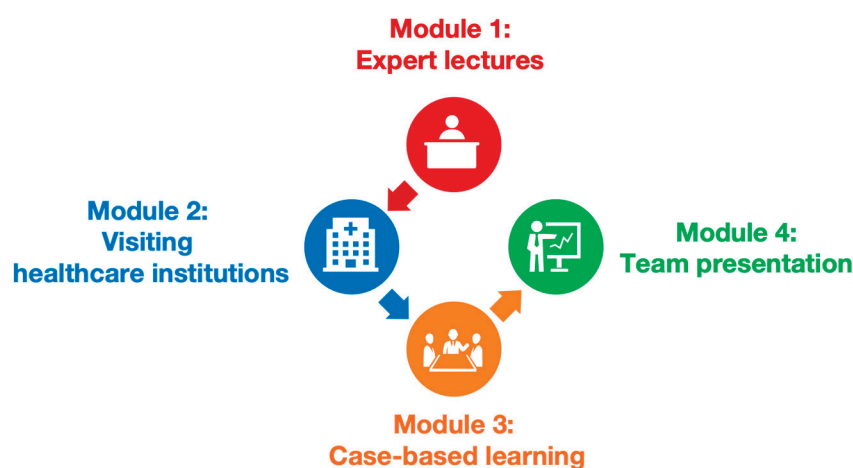


Figure 2. Outline of the organization of the Health and Nursing course.

In Module One, seven professors with significant work experience from different disciplines, including nursing, public health, and public administration, gave lectures lasting three class hours on a specific topic. Seven topics were identified according to the Nursing Metaparadigm (Figure 1): global health and nursing, nursing's role in promoting Healthy China, nursing discipline development, nursing humanities and One Health, health communication, multidisciplinary cooperation to promote health, and nursing research in promoting population health. Through this module of 21 class hours, the students learned about the basic knowledge of global health and health policies, core concepts in nursing practice, and advanced development in the nursing discipline.

In Module Two, two healthcare institutions were visited. One was a community-embedded elderly care institution, and the other was a proton therapy center. These two visits helped students understand the context of geriatric and oncological care, which are recognized as key areas of concern in public health. During the visits, students were guided by staff through the facilities and services; engaged in communication with patients; and held discussions with faculty regarding institutional services, patient care, and career development in specialized nursing fields. Through this module, students combined the theoretical knowledge they acquired in Module One with the practice context using a reflective process.

In Module Three, two separate CBL sessions were conducted, each lasting three class hours. In each session, students worked in teams to analyze and discuss a single thematic case scenario. CBL is an established approach used across disciplines in which students

apply their knowledge to real-world scenarios, promoting higher levels of cognition [38,39]. The cases presented disciplinary problems for students to devise solutions using the knowledge they had learned in Modules One and Two. A total of 50 students were randomly grouped into four teams with 12 or 13 students per team. Each team was supervised in a single classroom by two instructors [38].

In Module Four, the students in each team worked together and created 15 min presentations. After completing the two CBL sessions, the four student teams drew lots to fairly determine which of the two case scenarios each team would present. Then, they had one week to prepare the presentation. They presented their understanding, analysis, and solutions regarding the problems in the case; their feelings about the health field or nursing profession; their ideas about their own career development; and their reflections during this course. Through this module, students cooperated in teams, communicated their thoughts across teams, and deeply reflected on the course.

2.4. Measures

2.4.1. Participant Characteristics

A self-designed questionnaire was used to collect sociodemographic factors (gender, residence, and only-child status), academic-related factors (whether the participant was a student leader), and questions about the students' and their families' previous and current cognition and attitudes toward the nursing major. The survey items were determined based on our previous research on nursing students' professional commitment, reviewing the relevant literature, and consulting with nursing education experts to ensure their validity and reliability.

2.4.2. Professional Commitment

Professional commitment was evaluated using the self-reported Nursing Professional Commitment Scale developed by Lu et al. (2000) [40]. This instrument has been used in multiple nursing education studies to assess professional commitment among students (e.g., Wang et al., 2024; Kaya et al., 2022; Duran et al., 2021) [41–43]. It consists of 34 items with four dimensions: "willingness to make an effort" (16 items) evaluates the extent to which one individual is willing to exert considerable effort on behalf of the organization; "desire to stay in the profession" (8 items) reflects the degree to which a nursing student would like to remain in their current job; "intrinsic positive value of work" (5 items) reflects the individual's perceived or calculated value of their current work; and "belief in goals and values" (5 items) evaluates a student's belief in the goals and values of the nursing profession. All items were scored on a 4-point scale ranging from 1 (strongly disagree) to 4 (strongly agree), with higher scores indicating stronger professional commitment. The overall score for professional commitment is the sum of the scores of the four dimensions. Scores ranged from 34 to 136.

2.4.3. Students' Perceived Teaching Quality

The students' perceived teaching quality was evaluated using a self-designed questionnaire. The questionnaire was newly developed for this study, based on a thorough literature review, the authors' teaching experience, and consultation with experts in the field. A total of 20 items were used to assess students' appraisal of the organization of the class, teaching attitudes, teaching skills, class content, course materials, and modalities. Each item was scored on a 4-point scale ranging from 1 (strongly disagree) to 4 (strongly agree), with higher scores indicating stronger teaching quality. The overall score for perceived teaching quality was the sum of all item scores and ranged from 20 to 80.

2.4.4. Qualitative Feedback

Two quick open-ended questions were used to obtain the students' qualitative feedback on this course: these were "What impresses you most in this course?" and "What can be improved through this course?" The questions were designed to complement the quantitative measures of perceived teaching qualities by allowing students to describe their impressions of the course, the teaching strategies, and the learning environment. This qualitative feedback can inform future improvements in teaching quality.

2.5. Data Collection

Participant characteristics (tool described in Section 2.4.1) and professional commitment (Section 2.4.2) were assessed as pre-test data one day before the first class. Post-test data collected three days after Module Four included participant characteristics (Section 2.4.1), professional commitment (Section 2.4.2), students' perceived teaching quality (Section 2.4.3), and qualitative feedback from the two open-ended questions (Section 2.4.4). All data were collected via the Wenjuanxing online questionnaire system, and all items had to be completed before submission. The researchers responsible for the data collection and analysis were not connected to the "Health and Nursing" course but were actively involved in teaching other courses to nursing students, with over five years of nursing education experience. They were invited based on their familiarity with this study, expertise in undergraduate nursing curriculum, and teaching experience.

2.6. Data Analysis

This study was conducted using an anonymous survey design, which means that we could not match the pre-test and post-test responses to individual students. As a result, although two students did not participate in the post-test, we could not identify which specific students withdrew. Therefore, all 50 students were included in the pre-test analysis, and 48 students were included in the post-test analysis.

SPSS Statistics version 19.0 (IBM Corp., Armonk, NY, USA) was used to analyze the data. The Shapiro–Wilk test and Q-Q plot were used to assess the normality of professional commitment and students' perceived teaching quality. The Shapiro–Wilk test indicated that the data were normally distributed ($p > 0.05$), which was consistent with the results of the Q-Q plots. Therefore, the mean and standard deviation were calculated to describe the distribution and central tendency of professional commitment and the students' perceived teaching quality. Counts (n) and percentages (%) were used to describe the participants' characteristics, which are independent variables. Qualitative feedback was analyzed using content analysis. A word cloud was generated based on the qualitative data to show the most frequently mentioned terms.

Professional commitment before and after the intervention was compared using an independent-sample *t*-test. To assess the magnitude of the course's effect on professional commitment, Cohen's *d* was calculated for all pre- and post-test comparisons. Pearson's correlation analysis was used to examine whether there was a correlation between students' perceived teaching quality and professional commitment. *p*-values < 0.05 were considered statistically significant.

3. Results

3.1. Participant Characteristics

All 50 students completed the pre-intervention survey, and 48 completed the post-intervention survey. The average time to complete the survey was approximately 6 min. The students' basic characteristics are shown in Table 1. They and their families' cognition and attitudes regarding the nursing major are shown in Table 2. Of the 50 students, the

majority were female (36, 72.0%) and from urban areas (40, 80.0%). Thirteen (26.0%) students chose their major based on their own decisions, and eight (16.0%) were very interested in nursing when choosing a major. Approximately half the students (52.0%) knew well about their major when choosing it.

Table 1. Characteristics of the participating students ($N_{pre} = 50$).

Variable	n_{pre} (%)
Gender	
Male	14 (28.0)
Female	36 (72.0)
Residence	
Urban	40 (80.0)
Rural	10 (20.0)
Have sibling	
Yes	27 (54.0)
No	23 (46.0)
Being a student leader	
Yes	12 (24.0)
No	38 (76.0)

Table 2. Students' and their families' cognition and attitudes regarding the nursing major ($N_{pre} = 50$, $N_{post} = 48$).

Variable	n_{pre} (%)	n_{post} (%)
Reason for majoring in nursing		
Own decision	13 (26.0)	13 (27.1)
Parents' suggestion	11 (22.0)	10 (21.0)
Consideration for employment	9 (18.0)	9 (18.8)
Being assigned	7 (14.0)	6 (12.5)
Other reasons	10 (20.0)	10 (21.0)
Interested in the nursing major when choosing the major		
Not interested	12 (24.0)	10 (20.8)
Somewhat interested	30 (60.0)	30 (62.5)
Very interested	8 (16.0)	8 (16.7)
Parents and siblings' current attitudes toward majoring in nursing		
Not supportive	14 (28.0)	13 (27.0)
Somewhat supportive	23 (46.0)	15 (31.3)
Very supportive	13 (26.0)	20 (41.7)
Knowledge about nursing when choosing the major		
Do not know well	24 (48.0)	22 (45.8)
Know well	26 (52.0)	26 (54.2)
Knowledge about nursing at present		
Do not know well	18 (36.0)	3 (6.2)
Know well	32 (64.0)	45 (93.8)

Two students did not respond to the post-intervention survey. After the course, the percentage of those who chose "very supportive" for their parents and siblings' current attitudes toward their majoring in nursing increased from 26.0% to 41.7%, while those who chose "somewhat supportive" decreased from 46.0% to 31.3%. The percentage of students who knew a lot about their major upon completing the survey increased from 64.0% to 93.8%.

3.2. Professional Commitment Before and After the Course

In the present study, the Cronbach's α value of the dimensions ranged from 0.711 to 0.981, indicating strong internal consistency. Before the course, the mean score for professional commitment was 93.00 (SD = 17.89), and the average score per item was 2.74

(SD = 0.53). Among the four dimensions, “belief in goals and values” scored the highest, while “willingness to make an effort” scored the lowest (Table 3). After the course, the mean score of professional commitment was 100.92 (SD = 20.27), and the average score per item was 2.97 (SD = 0.60). The “belief in goals and values” dimension scored the highest, while “desire to stay in the profession” scored the lowest.

Table 3. Comparison of the total score and the dimension scores for professional commitment per item between the pre- and post-test groups.

Variable	Before Intervention (n = 50)	After Intervention (n = 48)	<i>t</i>	<i>p</i>	Cohen’s <i>d</i>
WC (Mean ± SD)	2.58 ± 0.61	2.96 ± 0.82	−2.602	0.011	0.53
DC (Mean ± SD)	2.74 ± 0.59	2.75 ± 0.85	−0.050	0.961	0.02
IC (Mean ± SD)	2.79 ± 0.63	2.92 ± 0.64	−0.971	0.334	0.21
BC (Mean ± SD)	3.17 ± 0.57	3.41 ± 0.57	−2.081	0.040	0.42
PC (Mean ± SD)	2.74 ± 0.53	2.97 ± 0.60	−2.052	0.043	0.41

Note. WC: “willingness to make an effort” dimension; DC: “desire to stay in the profession” dimension; IC: “intrinsic positive value of work” dimension; BC: “belief in goals and values” dimension; PC: total score of professional commitment.

The total score for professional commitment post-intervention was significantly higher than that of pre-intervention ($p < 0.05$, Cohen’s $d = 0.41$). Among the four dimensions, the differences in “willingness to make an effort” and “belief in goals and values” dimensions were significant ($p < 0.05$, Cohen’s $d = 0.53$), while the differences in “desire to stay in the profession” and “intrinsic positive value of work” dimensions were not ($p > 0.05$). The scores for professional commitment before and after the intervention are shown in detail in Table 3.

3.3. Students’ Perceived Teaching Quality

The Cronbach’s α value of the questionnaire was 0.965, indicating strong internal consistency. The mean total score for students’ perceived teaching quality was 73.94 (SD = 8.52), while the full score was 80. The mean item score ranged from 3.50 to 3.83 (Table 4). The items “The faculty respected students” and “The faculty responded to students’ comments and questions” scored the highest. The items “Fully online teaching can achieve the same learning outcomes as the current blended course format” and “Course content and materials could motivate learning enthusiasm and interest” scored the lowest (Table 4).

Table 4. Item scores for the students' perceived teaching quality.

	Score (Mean $\pm$ SD)
1. The faculty prepared for the class well, and the teaching organization was good.	3.77 $\pm$ 0.43
2. The course content was delivered clearly and easy to understand.	3.69 $\pm$ 0.55
3. The depth of course content was suitable for students.	3.63 $\pm$ 0.61
4. The proportion of class hours of lectures, visiting healthcare institutions, and CBL was appropriate.	3.62 $\pm$ 0.61
5. The content of lectures was rational and conforms to the course objectives.	3.60 $\pm$ 0.68
6. The arrangement of visiting healthcare institutions was rational and conforms to the course objectives.	3.73 $\pm$ 0.45
7. The content of the CBL was rational and conforms to the course objectives.	3.62 $\pm$ 0.64
8. Fully online teaching can achieve the same learning outcomes as the current blended course format.	3.50 $\pm$ 0.74
9. The faculty motivated and encouraged the students to think independently.	3.79 $\pm$ 0.46
10. The faculty delivered the knowledge by combining theory with practice.	3.79 $\pm$ 0.41
11. Course content and materials reflected the latest knowledge.	3.63 $\pm$ 0.61
12. Course content and materials could motivate learning enthusiasm and interest.	3.56 $\pm$ 0.74
13. The faculty provided students with adequate opportunities to ask questions.	3.71 $\pm$ 0.50
14. The faculty encouraged students to take an active part in discussions.	3.75 $\pm$ 0.49
15. The faculty responded to students' comments and questions.	3.81 $\pm$ 0.39
16. The faculty respected students.	3.83 $\pm$ 0.38
17. The faculty delivered positive professional values to students.	3.79 $\pm$ 0.46
18. The evaluation (in-class tests, assignments, etc.) reflected the course content and objectives.	3.71 $\pm$ 0.58
19. The number of assignments and assessments is suitable.	3.67 $\pm$ 0.60
20. Online resources were helpful for understanding the course content.	3.73 $\pm$ 0.45

3.4. Correlation Between Professional Commitment and Students' Perceived Teaching Quality

The total score for the students' perceived teaching quality was positively correlated with the total score ($r = 0.310$, $p = 0.032$), as well as the "willingness to make an effort" ($r = 0.380$, $p = 0.008$) and "belief in goals and values" ($r = 0.423$, $p = 0.003$) dimensions of professional commitment. However, the other two dimensions were not ($p > 0.05$). The detailed results are shown in Table 5.

Table 5. Pearson's correlation analysis results between professional commitment and students' perceived teaching quality.

	Pearson's r to Students' Perceived Teaching Quality	p
WC	0.380	0.008
DC	−0.012	0.933
IC	0.423	0.003
BC	0.062	0.676
PC	0.310	0.032

Note. WC: "willingness to make an effort" dimension; DC: "desire to stay in the profession" dimension; IC: "intrinsic positive value of work" dimension; BC: "belief in goals and values" dimension; PC: total score of professional commitment.

3.5. Qualitative Feedback on the Course

According to the students' answers to the two open-ended questions, what most impressed them about the course were CBL and its group discussion form, visiting healthcare institutions, nursing humanities, and hospice care. Their suggestions for the course included the following: more visiting activities should be arranged; more credit hours for this course should be expected; CBL should be deeper; and student–faculty interactions, cases to help understand nursing knowledge, and student enthusiasm should be improved in lectures (see Figure 3).



Figure 3. Word cloud of answers to the two questions. **Left:** answers to “What impresses you most in this course?” **Right:** answers to “What can be improved through this course?”.

4. Discussion

Using a quasi-experimental design, this study tested the effect of an innovative introductory course for undergraduate nursing students and found a significantly positive impact on students’ professional commitment. The students’ perceived teaching quality was positively correlated with their professional commitment. In addition, the students provided constructive feedback on their learning experiences by answering qualitative questions.

4.1. The Effect of the Course on Professional Commitment

The total score for professional commitment improved significantly after the Health and Nursing course, which is consistent with a previous study finding that introductory courses help with the decision to pursue nursing as a career [36,37]. Among the four dimensions, “willingness to make an effort” and “belief in goals and values” increased significantly, while “desire to stay in the profession” and “intrinsic positive value of work” did not. This suggests that, after the course, the students had a clearer understanding of the nursing profession and a greater intention to participate in future professional studies. This is consistent with a study suggesting that learning engagement and motivation are positively related to professional commitment [44]. The dimensions “desire to stay in the profession” and “intrinsic positive value of work” are about job and career commitment, which are used to evaluate if an individual is satisfied with their current work and willing to remain in that profession. The reason the two dimensions did not increase might be that first-year students were not deeply engaged in the profession and had no experience working in it. It is difficult for them to make a clear decision about their future work and to have a significant attitude change about this work during the initial stage of shaping professional commitments.

According to the participants’ characteristics, cognition, attitudes, and family members’ attitudes toward the nursing profession improved. This suggests that the course effectively corrected students’ and their families’ previous misunderstandings and highlighted interesting career paths in nursing. This was a new finding, as other studies have not examined changes in family attitudes. In fact, a family’s influence on a student’s attitude toward the profession could last until graduation and job-seeking [45]. The previous study (2022) of the authors’ team revealed that the family’s attitude toward nursing majors was positively associated with professional commitment at the time of graduation. According to the findings of this study, a student’s improved cognition and attitudes might affect their family, which needs to be explored in future studies.

4.2. Perceived Teaching Quality Level

The students’ perceived teaching quality was high, suggesting that they were mostly satisfied with the course and faculty. According to Table 3, “The faculty respected students,” “The faculty responded to students’ comments and questions,” “The faculty delivered positive professional values to students”, and “The faculty motivated and encouraged

the students to think independently” scored the highest. These items suggest that faculty members had a positive attitude toward teaching and encouraged students’ critical thinking. It is useful to build a good student–instructor relationship, as this affects the quality of the teaching–learning process and plays a crucial role in shaping commitment through its impact on professional identity [46,47]. In addition, the results suggest that faculty members act as good role models with positive professional cognition. Social identity theory assumes that individuals are motivated to seek group membership to help define who they are and foster a positive self-image [48]. The faculty’s strong belief in the nursing profession is related to students’ professional commitment, as suggested by our previous study and others [49].

The items “Online learning would also achieve the expected effect” and “Course content and materials could motivate learning enthusiasm and interest” scored the lowest. The former suggests that a face-to-face format is irreplaceable. With the development of technology, online learning has become increasingly popular, particularly after COVID-19. However, in this course, the clinical visits and CBL were welcomed and highly appraised by the students; these offline teaching activities provided them with the opportunity to interact with healthcare staff, patients, and other students to build positive cognition of the nursing profession and strengthen professional commitment [20]. The latter item scored the highest, possibly because the course content is about the development of the Health and Nursing profession as it relates to sociopolitical contexts, which is somewhat boring and difficult for students to understand. This suggests that instructors should use cases or scenarios to stimulate interest and help students understand their course content. In addition, boredom can be decreased by a good learning environment and student–instructor interactions [50]. Combined with strategies such as humor, concern, and compassion, appropriate teaching pedagogy can lead to positive emotional results that increase student motivation and engagement and, in turn, professional commitment [51].

4.3. Correlation Between Perceived Teaching Quality and Professional Commitment

The total score for professional commitment and the dimensions “willingness to make an effort” and “belief in goals and values” were significantly correlated with the students’ perceived teaching quality, while the dimensions “desire to stay in the profession” and “intrinsic positive value of work” were not. These results are consistent with the *t*-test findings and may reflect both the timing of the intervention—early in the first semester—and the curriculum content, which focused on introducing the profession, promoting reflection, and fostering an understanding of professional roles. Consequently, it had more influence on “willingness to make an effort” and “belief in goals and values” than on longer-term career aspirations or intrinsic motivations. Previous studies focusing on senior students show that a good internship experience increases all dimensions of professional commitment, suggesting that the third and fourth year might shape commitment to future work [27,30]. An exemplary education program effectively increases all dimensions of professional commitment among third-year nursing students [26]. Other factors influencing the dimensions “desire to stay in the profession” and “intrinsic positive value of work” might exist, and interventions targeting them could be explored in the future.

Overall, the perceived teaching quality was positively related to professional commitment. Although there are few intervention studies to refer to, cross-sectional studies have demonstrated the descriptive finding that teaching quality is a positive indicator of professional commitment [29,30,51]. Professional commitment improvement is encouraged by the enthusiastic attitude of teachers and their ability to keep students interested, engaged, and excited about working in their chosen field [51]. Student feedback reflects preferences for pedagogy, serving as an important reference for faculty to improve teaching

quality and, thus, students' professional commitment. The correlation between students' perception of teaching quality and professional commitment was positive but of low to moderate strength, indicating an association rather than causality. Future studies with larger samples and more rigorous designs are needed to clarify the impact of course quality on professional commitment.

4.4. Qualitative Feedback on the Course

The qualitative feedback on the course has implications for future development. The students were most impressed by CBL with group collaboration and clinical visits and expressed interest in extending the time spent on both the course and clinical visit modules. This suggests that the modules were well received. For most students, this was the first time they went to a healthcare institution and solved a health-related problem regarding their roles as future professional staff. CBL and clinical visits involved them in the real context of patient care, as expected when we designed the course. This authentic scenario aided them in learning what they can do to help people, with or without illness, solve health problems using their knowledge of health policy, coordinated care, and nursing humanities, which they learned in Module One.

The students suggested that the content of the cases should be deeper. We considered that first-year students have limited medical and nursing knowledge, so the CBL cases were designed to be easy to understand and contained minimal professional terminology. However, solving the cases still required students to apply critical thinking and seek relevant information. Interestingly, students tended to perceive the cases as lacking depth rather than recognizing their inherent challenges. We acknowledge and respect the students' feedback and will continue to refine both the case content and overall CBL process in future iterations.

Nursing humanities is another type of content that impressed the students. This content was new to them and broadened their understanding of the nursing profession. Compared with other lecture content, nursing humanities are easier to comprehend and attract more interest because they require less specialized knowledge to understand, using many real scenarios. Integrating the humanities into the nursing curriculum increases the ability of nursing students to see patients holistically, enhances their understanding of themselves, increases sensitivity to the voices of others, and facilitates alternative ways of learning [52]. Nursing students must be prepared to understand the complexities of nursing practice beyond acute care and examine the influence of sociocultural determinants and their links on the health behaviors of various patient populations [53].

The students also provided suggestions for teaching pedagogy in the lecture module. First, cases are needed to help understand theoretical knowledge. Teaching pedagogy positively impacts students' knowledge and interest in learning. The suggestion about the use of authentic cases is consistent with evidence suggesting that using clinical scenarios that integrate knowledge is helpful for first-year students to understand content and increase their satisfaction and learning motivation [39]. Additionally, more class interactions between instructors and students are expected to improve student enthusiasm and engagement. Empathetic interaction, which asks the teachers to put themselves in their students' positions, reduces the separation and boredom of students in the learning environment during intensive interaction and leads to a deeper understanding of the processes and consequences of education [54]. Immediacy refers to teachers' verbal and nonverbal behaviors that decrease the perceived psychological distance between teachers and students [50]. Training in teaching immediacy is suggested for faculty members to help them improve instructional effectiveness.

4.5. Limitations

A major limitation of the pre-post design is that it cannot prove causality, and there may be changes in the outcome variables that are not due to the course. The lack of a control group further limits our ability to attribute observed changes solely to the intervention. However, there were no concurrent nursing specialized courses in this study; therefore, we can exclude the influence of other major-related factors. In addition, quantitative and qualitative feedback on teaching quality were examined to provide a comprehensive understanding of the results. However, a longitudinal study is needed to examine how professional commitment develops over the four years of undergraduate education and whether the effect of the course on professional commitment can be maintained in the long term. Another limitation was the small sample size. Although we obtained the consent of all 50 students to participate, the effectiveness of the course on professional commitment should be examined by applying it to a larger sample at other universities. Moreover, we used convenience sampling, which may limit the generalizability of the findings. Finally, due to the small number of students in each cohort, the questionnaire used to assess the students' perceived teaching quality was not formally validated before this study. Therefore, reliability (e.g., test-retest reliability) and validity (e.g., content and construct validity) were not established. We will test the reliability and validity of the questionnaire in the future.

5. Conclusions

A newly developed introductory course, incorporating sociopolitical concepts of health and advanced nursing knowledge, had a positive effect on the professional commitment of first-year undergraduate nursing students. The students had a satisfactory experience with a multi-module course that combines theory with practice. Although this study was conducted in the context of Healthy China 2030, its implications may be useful in a larger community, as every country has its own national health policy and is developing under the promotion of global health. The findings suggest that nursing educators should consider the external macro-sociopolitical environment when designing an introductory course to equip students with a broader perspective on nursing professional development. Teaching pedagogy should be improved to make students interested, engaged, and excited in the course, as well as to internalize the knowledge effectively to achieve the ultimate goal of improving professional commitment.

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Article

Developing and Implementing a Narration of Care Framework to Teach Nurses When and How to Narrate Care

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Abstract: Background: It is generally well-known that narration of care is critically important to high-quality nursing care. Narration of care is loosely defined as a nurse's ability to describe to patients and families the clinical purpose behind nursing practice, what is hoped to be achieved, and the "why" (or clinical rationale) behind nursing activities. Despite the importance of narration of care, there is little practical guidance given to nurses about how to narrate care—what makes for effective or ineffective narration of care. **Objective:** Our aim was to develop a framework for teaching nurses and patient care assistants (PCAs) on how to effectively narrate care. In this article, we provide a practical framework for teaching nurses and PCAs how to narrate care. We describe the process of developing the framework as part of quality improvement efforts and implementing a course for eight hospitals based on the framework. **Methods:** Consistent with a Plan-Do-Study Act (PDSA) quality improvement approach, we developed the framework by first conducting a data and literature review, then convening a taskforce, discussing with patients on our existing committees, and finally formulating a framework. We then drafted supplementary cases and course material and implemented a course to teach nurses and PCAs how to narrate care. **Results:** The narration of care framework (NOC) that we developed and implemented consisted of the following five principles, which can be called RECAP as an acronym: 1. The "R" in RECAP stands for removing uncertainty. 2. The "E" in RECAP stands for explaining the environment. 3. The "C" in RECAP stands for being calm and sincere. 4. The "A" in RECAP stands for assume nothing. 5. The "P" in RECAP stands for personal connection. As for the course developed based on the RECAP principles, there was a total of 276 course offerings conducted by 30 facilitators, and 7341 nurses and PCAs completed the course. The evaluations reflected that 99% of learners believed their learning was improved by the course. **Discussion:** There are several multifaceted benefits to NOC: nurses' and PCAs' capability to narrate care well shows empathy and compassion to patients; it strengthens patient understanding and education that can lead to improved patient outcomes; and it helps allay patients' uncertainties and anxieties. In essence, narrating care in an effective manner cultivates a strong nurse–patient therapeutic relationship. Yet, in the absence of any practical guidance, nurses and PCAs are left to develop narration skills on their own, learning by trial and error, and, in doing so, perhaps failing to meet patients' needs and failing to fully derive the many benefits that the NOC is designed to achieve. Our hope is that, if hospital systems adopt our work, nurses and PCAs can comfortably and confidently enter the profession knowing the purpose or narrating

care, its many benefits, and how to practically conduct sufficient narration, and what would constitute insufficient narration. Hospitals, in turn, can specify and clearly articulate their expectations for nurses and PCAs narrating with patients—what would make for a strong, compassionate process and what would be inadequate. For more experienced nurses, they can use the RECAP framework to reflect on their own practices and perhaps strengthen or refreshen existing skills. **Conclusions:** NOC is acknowledged, somewhat implicitly, as being critical to nursing and PCA practice, yet practical instruction and specified principles are lacking. We aimed to fill this gap by developing, implementing, and teaching a practical framework, armed with many tools nurses can use.

Keywords: nursing communication; nursing education; nursing framework; nurse–patient relationship; patient care assistant

1. Introduction

There is general agreement that developing and sustaining a caring nurse–patient relationship is essential to delivering high-quality nursing care [1]. To cultivate a therapeutic nurse–patient relationship, the nurse must possess and demonstrate appropriate caring behaviors, including a caring attitude, empathy, and strong communication (verbal, non-verbal, and listening) skills [2].

There are three stages of developing and maintaining a nurse–patient relationship [3]. First, during the orientation phase, the nurse establishes a relationship and sets the tone for future interactions by eliciting information via assessment, history-gathering, and patient interviewing. Second, during the working phase, the nurse offers information and education to promote patient learning, enhance recovery, and strengthen well-being. The third and final stage involves terminating the relationship by summarizing care information and providing work closure between the nurse and the patient [4].

It is the second phase—the working phase—that is likely the most substantive component of the nurse–patient relationship, and yet, it is the phase that is most underdeveloped. There is research available on the behavioral aspects (what the nurse carries out) during the working phase, and measures exist to evaluate behavioral aspects, attitude, and affect [4]. A significant gap in the literature exists in that, to our knowledge, little has been written on the communication aspect (what the nurse says) during the working phase to promote and maintain a healthy and therapeutic relationship.

There seems to be an implicit understanding that narrating care is important for patient education during the working phase. A recent Google search for “nursing patient education” yielded over 566,000 results. Yet, it is unclear how nursing and patient care assistant (PCA) staff should learn what to say to patients during the working phase. In other words, without explicit guidance on how to narrate care, the nursing and PCA staff are prone to narrating in a way that is substandard, thereby undermining the working phase of the nurse–patient therapeutic relationship.

To fill this gap, our aim was to develop a framework for teaching nurses and PCAs on how to narrate care. In this article, we describe the process of developing the framework as part of quality improvement efforts and implementing a course for eight hospitals based on the framework. Our quality improvement goal was to teach nurses and PCAs how to narrate care, i.e., what to say and when to say it, during the working phase, to promote and maintain the nurse–patient relationship.

There is, to our knowledge, no established definition of what it means to narrate care. Therefore, we define it as the nursing and PCA staff’s ability to describe to patients

and families the clinical purpose behind nursing and PCA practice, what is hoped to be achieved, and the rationale for staff tasks and behaviors, a definition we formulated through the task force efforts discussed in the Section 2 below.

2. Methods

2.1. Developing a Framework

1. Conducting a Data Review and Literature Review

Plan-Do-Study-Act (PDSA) is a quality improvement process that allows organizations to implement change in four phases: First, planning to test a change (plan), carrying out a project or process change (do), observing and analyzing results of the project through measured tools (study), and then deciding whether to scale-up the initiative as is, sun-set it as is, or make modifications and refinements before scaling [5].

Consistent with robust data gathering that would be needed as part of the planning phases, we first assessed whether and to what extent there was a narration of care deficiency in our hospitals. The Hospital Consumer Assessment of Healthcare Providers and Systems survey (or HCAHPS) is a national, government-mandated, public-reported survey of patients' perspectives of hospital care [6]. In reviewing our HCAHPS data across seven hospitals in July 2023, we noticed that "nurse explanation and information" and "nurse addressed concerns" were flagged as high correlation coefficients impacting overall scores. Specifically, on the questions, "I understood how to manage my care", and "understood purposes and side effects of medication", and "ease of finding someone to talk to in order to address concerns", were all flagged as having correlation coefficients above 0.55, meaning that they were all correlated with "overall rating of care", and yet all falling outside of the top 25% of national percentile ranks.

This was our first indication that there was likely a deficiency in how our nursing and PCA staff were narrating care during the working phase and that extensive quality improvement efforts were needed. The second indication was found in a thematic analysis we conducted of patient comments in HCAHPS surveys between 2022 and 2023, which elucidated that patients felt "anxious", "uncertain", and "did not know what to expect", suggesting that healthcare professionals were missing opportunities to identify patients' non-verbal and verbal cues indicating uncertainty and alleviating them through the effective NOC during the working phase. Thematic analysis is a method wherein coders elicit key themes that emerge from statements, using an inductive approach, to allow for new themes to emerge without an existing framework [7].

2. Convening a Task Force

Recognizing that there was likely a systemic issue requiring a quality improvement intervention at our hospitals, we continued the planning efforts of the PDSA model by convening a task force of 25 nurse leaders, patient experience specialists, and education specialists (called as the "NOC Committee") from across the system to define and articulate what it means to narrate well. To build the Committee, we elicited (and purposively selected) the involvement of acute care nurse leaders from each hospital, and we asked them to identify other members of their team who were strong narrators who would have an interest participating in the project. The patient experience team consisted of 1–2 people already hired into a patient experience position who served in that role for their hospital. By selecting individuals from each hospital, we could ensure a multidisciplinary, multi-institutional Committee.

3. Conducting Patient Discussions

The second task of the NOC Committee was to meet with patients. To ground this work, we met with our patient and family advisory councils that already preexist as part of

our hospitals' quality improvement efforts, who we meet with routinely to reflect on their hospital experiences and to guide where and how we need to improve.

During these Council meetings, along with our daily rounding practices, we were able to purposively sample 50 diverse, English-speaking patients, with a range of medical conditions and surgical procedures, who had previously indicated they were anxious, uncertain, or felt a lack of preparedness. We handwrote notes to avoid sensitivities introduced by having a tape-recorder in a patient room and destroyed these notes after compiling the data into Microsoft Excel; coding was then performed using thematic analysis techniques, a process described above.

Several researchers have noted the important role that patient education and therefore, by extension, likely NOC, can have on reducing patient anxieties [8,9], and the frequency of patient comments suggested that narration was substandard.

Consistent with other researchers' findings, in our patient discussions, we found that several patients felt that nursing and PCA staff were primarily focused on tasks and made assumptions about patients' needs and concerns and, in doing so, missed opportunities to narrate care in a way that would reduce anxieties and uncertainties [10].

Task-driven behaviors have been a critique lately in the nursing literature [11], with several researchers contending that, as administrative nursing tasks and patient-volume workloads have increased, nurses have had to find shortcuts to complete their work [12,13]. In doing so, they may shorten their nurse–patient interactions, explanations, or narrations in order to complete their mandatory clinical or administrative tasks.

There is some support for this finding in that many of our patients relayed that the listening component of communication was sometimes missing in their nurse–patient interactions. Specifically, attending behavior, defined as a physical demonstration of nurses' readiness and willingness to listen was, in the minds of many of our patients, a critical element that was missing in some nurse–patient interactions. Consistent with findings from other researchers, our patients noted that many nurses were so task-focused due to the complexity of care that non-verbal behaviors signaling approachability and a genuine interest in understanding the patient were occasionally overlooked or insufficiently demonstrated.

Thus, the patient discussions and our in-depth review of HCAHPS scores and comments informed the development of our framework in that we knew three things:

4. Unilateral communication, in which clinical staff speak *at* or *to*, rather than *with* patients, can give the impression that staff are primarily task-oriented rather than person-centered. To address this, NOC must extend beyond one-way patient education and incorporate elements of presence and connection, emphasizing relational engagement over transactional interaction.
5. NOC would need to include an "uncertainty" component. Anxiety, lack of preparedness, and uncertainty were prominent themes tied to HCAHPS nursing communication scores, particularly questions about "education" and "information", which suggested that patients viewed nursing staff as being integral to relieving their anxieties and uncertainties through the use of patient education and information, or narration.
6. NOC would need to include some component of listening. Since our patients noted a perceived lack of attentive behaviors, we knew that non-verbal and verbal behaviors suggesting approachability would need to be incorporated.
7. Formulating a Consensus Framework

Armed with the findings from our HCAHPS data, patient survey comments, patient discussions, and literature review, our NOC Committee met several times to iteratively develop our NOC and cases, thereby undertaking the "Do" component of the PDSA quality improvement framework.

As described above, we knew that removing uncertainty and alleviating patient anxieties would be foundational to the framework, as well as using non-verbal and verbal behaviors to demonstrate approachability.

Thus, at this point in our work, we were able to develop 3 elements of the NOC framework:

8. *Remove Uncertainty*: By explaining what we are performing, what the patient can anticipate, and why it is important for their care.
9. *Calm and Sincere*: Leave your own negative emotions at the door, including conveying a sense that you are rushed. When speaking with patients, convey calmness in your tone and sincerity with your posture by being open, facing them, moving close, and making eye contact.
10. *Personal Connection*: Make a personal connection by making notes of what is important to your patient to reference later and listen intently to matters that concern them. Updating the patient communication board with what they share is most important for them for the day (rest, contacting a family member, etc.). When patients feel cared about, they share concerns and feelings—details that can lead to safer care and better outcomes.

To further refine our concept, we met with two system-shared governance councils (the Magnet Council and the System Acute Care Council), which consisted of 30 bedside nurses, PCAs, and nurse leaders, to learn more from nurses on high-performing HCAHPS on *how* they would remove uncertainty. Many of them noted that they explicitly refer to equipment, safety measures, or other unique hospital environmental factors that could create uncertainty for their patients to explain the purpose behind them. By explaining the “why” and “how” behind the environment, they felt that their patients were more assured.

Other nursing and PCA staff noted that they make no assumptions about their patients. Regardless of the patients’ experiences, the nurses start with foundational concepts to explain why they were performing a particular task and what was hoped to be achieved. By assuming nothing, they felt their patients were more at ease with their narrations.

Based on the feedback from these two councils, we iteratively revised the NOC framework to include two additional components:

11. *Explain the Environment*: By providing the purpose behind equipment, monitor readings, and alarms, and reassuring patients of their safety if an alarm is triggered or readings vary.
12. *Assume Nothing*: Just because your patient has been in the hospital before, is a health-care worker, has higher education, or has chronic conditions, do not assume they are confident and proficient in their state of being or care. Always give clear verbal information to describe what is happening, what to expect, and why it is occurring, so that the patient is able to understand.

Thus, in summary, the NOC framework we developed consists of the following 5 principles, which can be called RECAP as an acronym:

1. The “R” in RECAP stands for removing uncertainty.
2. The “E” in RECAP stands for explaining the environment.
3. The “C” in RECAP stands for being calm and sincere.
4. The “A” in RECAP stands for assume nothing.
5. The “P” in RECAP stands for personal connection.

2.2. Designing the NOC Course

At this point, in the quality improvement project process, the RECAP principles we wrote and the framework we developed were designed, refined, modified, and ready to be implemented with nursing and PCA staff. There is general agreement that didactic learning

should be supplemented with case-based scenarios or simulation-based teachings to allow learners to apply the concepts previously taught through didactic methodologies [14–16]. There is less agreement on what type of case-based learning is best: standardized patients, role play, or drafted scenarios for group discussion. Even in controlled cluster-randomized trials, there was little appreciable difference in nursing staff knowledge, skills, or self-efficacy when comparing role play-based learning and standardized patients [17].

Recognizing the mixed study results from the literature, as well as recognizing the impracticality of using standardized patients to conduct NOC education with thousands of staff across the healthcare system, we opted to create case-based learning that would not rely on standardized patients. We also recognized that roleplay is time-intensive, typically requiring one-on-one or small group sessions, making it impractical to implement with system-wide staff within a six-month timeframe.

Nonetheless, we committed to the best practice of case-based learning, allowing nursing and PCA staff to apply the concepts previously taught through didactic methodologies. Therefore, we created a three-part learning. For the first component of learning, we developed an NOC video to contextualize why NOC is crucial to patient and family experience and key to promoting safety. Nursing and PCA staff watched this 10 min video module, involving one of our nurses explaining how she felt as a patient in our hospital and how she used those learnings to inspire her to approach NOC differently as a nurse.

For the second part of the learning, we conducted 1 h, live, in-person instructor-led courses where nursing and PCA staff learned the NOC principles (the RECAP model discussed above), and then they applied those learnings through rich reviews and small- and large-group discussions of case studies we wrote. The cases were written by our NOC Committee using real-life scenarios they experienced as nursing and PCA staff, coupled with patient feedback we received through the HCAHPS survey or informally through nurse recollections.

An example of one case scenario that we wrote was using a “fake” PCA named Ben. Ben tells his patient, Mr. Gibson, that he needs to “check vitals and turn him”. When Mr. Gibson asks why, Ben responds, “It’s one of the things we have to do every two hours. . .” As course facilitators, we asked the PCA participants in the class to elaborate on why this NOC was insufficient and what could have been said to make the ideal experience using RECAP principles.

Then, facilitators continued with the same encounter to add complexity to the case by having Ben pull the pillow from behind Mr. Gibson, saying, “Mr. Gibson, I’m going to remove this pillow. You may feel like you’re falling as I grab the turn sheet and pull you my way. Don’t worry, you aren’t going to fall out of bed. I’ve got you and I’m going to keep you safe”. At this juncture, facilitators asked the PCA participants to describe which RECAP principles were used and how they were used. Facilitators asked participants to describe how the patient would feel as a result of this explanation.

Facilitators continued with the case. As Ben turns Mr. Gibson, Mr. Gibson says, “Wait! Hold on! I’m not ready!” Yet, Ben continues to turn him, moving him from his left side to his right side. Ben says, “It’s OK. We’re already done”, and puts the pillow behind Mr. Gibson. Annoyed, Mr. Gibson states, “This hurts my old shoulder injury. I was more comfortable on my other side”. Ben states, “Our policy says you have to change sides every two hours. I’ll be back around 10 to turn you back.”

To close this case, facilitators asked PCA participants how this NOC was insufficient and what could have been executed better. To deepen the learning, facilitators asked participants to reflect on how patients feel when healthcare professionals reference policy or practice without further elaboration. Facilitators asked participants why it is important to confirm the patient is ready before we perform any physical activity, with facilitators

prompting learners that, in the absence of confirming the patient is ready for physical adjustments, they could feel like we are conducting something *to* them rather than *for* them. The facilitator would then ask the group to explain the importance of assessing patient comfort levels after we perform any physical activity.

Other cases provided during this second component of the NOC course were directed at eliciting pain needs and narrating pain management plans, narrating medication purposes and side effects, and how to narrate when there are language barriers on the part of the healthcare professional or the patient. All case studies were written in a way to prompt learner small-group and large-group discussions.

The third component of the course was validations and coaching, which is similar to auditing, but we prefer the term “validating” because it connotes a collaborative, two-way process between the nurse or PCA learner and the person conducting the observations, whereas “observing” or “auditing” can feel as though the learner is “on stage” or being graded. Specifically, after the learners watched the 10 min video and attended and participated in the 1 h case-based discussion course, validators (who were all trained by members of the NOC Committee) observed and coached nursing and PCA staff in real-time on the floor. Using a template we designed to assess the quality of the narration (Figure A1 in Appendix A), validators observed the nursing staff in approximately three different patient interactions involving NOC, and validators provided them with constructive feedback after observations.

The coaching was designed to be collaborative and interactive—an experience where the learner described where or how she or he struggled in narration and what specifically she or he would like feedback on. To that end, we termed this component of the learning as “validations”, to suggest constructive, affirming teaching, rather than “auditing”, recognizing that most learners found “auditing” to be associated with personal failure or personal critique.

To reinforce the constructive–collaborative teaching model, the validator provided several affirming, positive behaviors they identified during the staff observations, and the validators were encouraged to identify up to three opportunities to maintain a positive collaborative coaching experience. Finally, validators were trained to avoid checklisting, because the NOC Committee contends that conforming to a checklist can unintentionally promote the very task-based communication behaviors our patients described as feeling rote and transactional.

3. Results

Assessing the Outcomes

The next component of the PDSA quality improvement process requires studying the impacts of the project. The initial systemwide launch across seven hospitals occurred within a 6-month timeframe between February 2023 and July 2024. There was a total of 276 course offerings conducted by 30 facilitators, and 7341 nurses and PCAs completed the course. The evaluations reflected that 99% of learners believed their learning was improved by the course, with comments such as these: “I believe the Narration of Care (NOC) course has had a significant impact on our teams. By keeping this valuable information readily accessible to staff through NOC courses and reinforcing it through consistent hardwiring by our nursing leaders, we’ve seen sustained success in the nursing communication domain. While leading these classes, I frequently heard team members express that they learned something new and were excited to incorporate it into their daily practice. It’s inspiring to witness their enthusiasm for enhancing their communication with patients”.

Approximately 30% of staff were validated within that same timeframe, with validators finding that staff excellently maintained a calm, sincere attitude, and easily developed

and maintained personal connections. The validators' main areas of opportunity for staff highlighted the importance of removing uncertainty and explaining the environment. Specifically, these were the main areas of opportunity identified by validators:

- Narrate the side effects of medications;
- Narrate why you are turning off alarms, and whether the readings are normal or not;
- Narrate intravenous flushing with saline and potential discomforts it may cause;
- Narrate pain management plans—what you will do to address pain needs, within what timeframes, how you will reassess pain needs, and when you will escalate.

We describe the pre- and post-intervention impacts to HCAHPS scores in detail in a companion article, which should be printed in this same journal. As a system, there was a 3-point improvement of scores in relevant nursing communication domains.

In the companion article, we also detail the feedback from learners, both immediately post-course, as well as re-assessments six months later. The companion article provides a more detailed comment thematic analysis of participants' and validators' feedback, as well as scores across all HCAHPS questions and all nurse evaluations.

4. Discussion

Our aim was to develop a framework for teaching nurses and PCAs on how to effectively narrate care. We noticed a gap in the literature providing practical guidance and felt that nurses and PCAs would be left to develop narration skills on their own, learning by trial and error, and, in doing so, perhaps failing to meet patients' needs, which was supported by our HCAHPS data and discussions with patients.

The preliminary results of the implemented RECAP framework, which will be discussed more elsewhere, suggests that nurses and PCAs felt the course teaching them how to use the RECAP framework advanced their skills and provided many practical strategies for where, how, and when to effectively narrate care.

That said, there were several barriers and unforeseen challenges in the rollout and development of the course. For instance, the courses were very discussion-based with high degrees of audience engagement. But, with high degrees of audience engagement, there is a high degree of unpredictability in how long the course will run, how best to redirect the audience to finish the learning, and how to best facilitate discussion where the learners become "stuck" on a particular concept or case.

For instance, one of the more challenging cases involved a language barrier on the part of the nurse. The patient in our hypothetical case expresses frustration about not being able to understand the nurse's discharge education due to her accent. When we asked learners what the nurse could do to narrate differently or more effectively to meet the patient's learning needs, several learners believed that by expressing frustration and dissatisfaction, the patient was acting inappropriately. What the facilitators intended to elicit—which required significant prompting—is that, when the patient has the language barrier, we often provide assistive resources, like interpreters or translation technology services, but, when the healthcare professional is the one that exhibits a language barrier, we should be equally language-aware and resourceful to maintain equity. The nurse, in our example, could have acknowledged her accent in talking with the patient, made the patient feel comfortable in asking questions, and used teach-back methods to elicit patient understanding. As other researchers have noted, cultural competency requires deep inner-reflection and awareness [18,19], which our facilitators found challenging to cultivate in one case, suggesting a need for deeper, more extensive learning over time.

An additional challenge was that, during some course sessions, facilitators detected PCA and nursing differences in opinion over whose responsibility it would be to narrate when there are pain needs. For instance, several PCAs felt that, when a patient expresses

pain, they should be able to defer that entirely to the nurse. Our facilitators, on the other hand, taught PCAs that they too should narrate—by acknowledging and sympathizing with the expression of pain, quickly addressing it in real-time by calling the nurse inside of the room, and describing how and when she as the PCA would make sure that pain needs were fully addressed.

Unfortunately, there has been limited research on the impact of nurse–PCA relationships on patient safety and clinical outcomes [20]. Systematic reviews suggest a need for heightened delegation practices and clear role delineation between nursing and PCAs and linking such interventions to patient outcomes, a recommendation we would support given what could be perceived as a lack of clear role delineation between nurses and PCAs on patient expressions of pain needs.

Despite these and other challenges, the RECAP principles and framework were taught and received well by learners. There are implications for nursing and PCA practice in using and maintaining the RECAP framework. If organizations implement and adopt a version of our work, nurses and PCAs can comfortably and confidently enter the profession knowing the purpose or narrating care, its many benefits, and how to practically go about sufficiently narrating, and what would constitute insufficient narration. Newly graduated nurses want to be accepted into the team, and some research suggests that their own uncertainty and self-doubt undermines their ability to feel included [21]. By providing more certainty and confidence in narration skills, perhaps new graduates can feel included earlier in their work transition.

If the RECAP framework and course are implemented for new hires during the orientation process, hospitals, in turn, can specify and clearly articulate their expectations for nursing and PCA staff's narration with patients, what would make for a strong, compassionate process, and what would be inadequate from the perspective of nurse leaders. By covering the course during orientation, there would be a culture of excellence standard set throughout the organization and hopefully maintained through refreshers on a routine basis.

For more experienced nurses, they can use the RECAP framework to reflect on their own practices and perhaps strengthen or refreshen existing skills. Previous research has demonstrated that experienced nurses report being unaware of self-directed learning and believe that educational activities are not well tailored to meet their needs [21]. However, they are most receptive to courses that highlight patient-specific outcomes and patient needs. Narration of care is patient-focused and can positively impact clinical outcomes [21]. By providing refresher courses with how narration of care influenced patient outcomes in a positive or negative way, perhaps experienced nurses would be inclined to take refresher courses to strengthen or refresh existing skills.

By developing a structured approach, using the RECAP principles, and developing and implementing a course that allows nurses and PCAs to apply the RECAP principles to real-life examples, our hope is to cultivate a sense of confidence and competence in nurses' and PCAs' narration skills across a range of specialties and years of practice or experience.

5. Conclusions and Future Research

The working phase in the nurse–patient relationship is likely the most substantive component of the nurse–patient relationship, and yet it is the phase that is most underdeveloped. While the behavioral aspects (what the nurse carries out) during the working phase has received attention, little has been written on the communication aspect (what the nurse says) during the working phase to promote and maintain a healthy, therapeutic relationship. Instead, there are oblique references to “patient-centered care” and “communication”, without delineating what and how to say it.

We contend that, without practical guidance on how to narrate care, nursing and PCA staff are prone to narrating in a way that likely resembles performative, task-driven, and rote-like communication behaviors that have already been identified in the literature as prevalent in healthcare [12,17] and also supported by our internal data and patient discussions. When this style of communication occurs, the nurse–patient relationship becomes fractured or undermined [22,23].

In an effort to promote healthy communication practices and provide practical guidance, we developed a framework that can be implemented in any organizational setting. In our appendix, we provide course and validation materials that can be implemented seamlessly, in the hope that other organizations and the nursing practice at large can benefit from this work. Future work should focus on sustainment and iterative empirical investigation over time—whether and how an NOC course can be sustained and whether and how “refresher” mini-courses with different case vignettes can be maintained.

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Informed Consent Statement: Verbal informed consent was obtained from the participants. The rationale for utilizing verbal consent is the feedback was obtained during the rounding quality improvement inspection process.

Data Availability Statement: The data presented in this study are available on request from the corresponding author due to the fact that the data will be published in a forthcoming, companion article.

Public Involvement Statement: Patients’ comments were used, and we spoke with patients about the quality improvement aspect of this project to include their perspective.

Guidelines and Standards Statement: This manuscript was drafted under the SCOPE Guidelines for research.

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Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A

RECAP Narration of Care Coaching and Mentoring Tool

Coach: _____ Staff Member: _____ Dept/Unit: _____ Date: _____



These behaviors stood out! (Up to 5)

Focus on refining these behaviors.
(No more than 2)



Standards	Demonstrated Skill				
	Opportunity → Strength				
Calm and Sincere <i>Before a word is spoken, convey calmness and sincerity with posture, eye contact, and smile.</i>	1	2	3	4	5
Personal Connection <i>Makes a personal connection by listening intently and making note of something important to your patient (people, places, pets, possessions) to reference later.</i>	1	2	3	4	5
Explain Environment <i>Present their room/procedural area as a foreign environment by using words to explain what can be seen, heard, or felt.</i>	1	2	3	4	5
Remove Uncertainty <i>Words can remove uncertainty if you include why the task is necessary and what they will see, hear, feel, expect, and/or smell.</i>	1	2	3	4	5
Assume Nothing <i>Assume nothing about the patients' medical literacy or comfort in the environment and ask meaningful questions to close the loop.</i>	1	2	3	4	5

- 1 -
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Figure A1. Narration of care rounding template tool.

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Article

Spanish Nurses' Knowledge and Perceptions of Climate Change: A Qualitative Study

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Abstract: Background/Objective: Nurses play a critical role in addressing climate change. They are instrumental in both mitigation and adaptation to its effects. Through care provision, education, management, policy development, and research, nurses can undertake a variety of specific actions in response to climate change. However, their perceptions of this challenge remain under-researched. This study aims to investigate Spanish nurses' knowledge of climate change and its impact on health. **Methods:** This is a qualitative descriptive study based on the constructivist paradigm. Purposive and snowball sampling strategies were used to recruit nurses from emergency services, geriatrics, cardiology, respiratory medicine and primary care in nine different regions of Spain. Semi-structured online interviews were conducted. Data analysis was carried out by three researchers via a three-stage inductive thematic analysis approach. **Results:** The sample consisted of 31 nurses, predominantly women (77.42%), with a mean age of 41 years. Seventy percent of the participants had less than 15 years of experience in the service. Four categories were identified: (i) general knowledge of climate change; (ii) knowledge of climate change and health; (iii) knowledge of actions to address climate change; and (iv) knowledge development. Overall, the nurses demonstrated awareness of the risks posed by climate change as well as actions to respond. However, barriers such as a lack of formal training and eco-anxiety affect their knowledge acquisition. **Conclusions:** Nurses play an important role in the response to climate change. However, more comprehensive and higher-quality educational programmes, provided by academic institutions, workplaces, and professional associations, are needed. This study was prospectively registered with the Clinical Research Ethics Committee of the Cuenca Health Area on 25 January 2022 (registration number 2021/PI3721).

Keywords: climate change; climate crisis; nursing education; health literacy; qualitative research

1. Introduction

It is unequivocal that human activity has caused changes in the Earth's climate [1,2]. These climatic changes have both direct and indirect impacts on human health, affecting millions of people worldwide [2–4]. According to van Daalen et al. in The 2024 Europe Report of the Lancet Countdown on Health and Climate Change, “climate change is not a far-in-the future theoretical scenario: it is here, and it kills” [5]. Southern European countries are experiencing more intense climate change effects than other regions of the continent [5]. For instance, this region experienced the highest relative increase in heat vulnerability in Europe—an 11% rise between 1990 and 2022 [5]. In Spain, some consequences of climate change—such as heatwaves [6], floods [7,8], air pollution [9], and the spread of climate-sensitive infectious diseases and their vectors [10,11]—already cause thousands of deaths annually. Owing to its severe health impacts, climate change is regarded as “the biggest global health threat of the 21st century” [12]. In recognition of its public health implications, climate change was formally declared a public health emergency by the Regional Office for Europe of the World Health Organization in July 2023 [4].

According to Watts et al., “tackling climate change could be the greatest global health opportunity of the 21st century” [13]. Nurses, as the largest professional group within the healthcare workforce [14], play a pivotal role in addressing climate change [15]. They are well positioned to lead the response through their work as clinicians, educators, researchers, policy advocates, and healthcare executives [16]. Nurses play a vital and multifaceted role in responding to climate change, both individually and collectively through professional associations. From a planetary health and climate justice perspective, their responsibilities include addressing the health consequences of climate change and strengthening the resilience of health systems [16,17]. Resilient health systems are those capable of absorbing shocks, maintaining core functions, and reorganising effectively in the face of crises such as climate-related events [18]. Nurses are also key actors in education, equipping healthcare professionals and communities with the knowledge required for climate mitigation and adaptation [19]. Moreover, nurses are called to lead sustainability initiatives within healthcare systems and to engage in policy advocacy and public activism [16,19]. They contribute to research and evidence dissemination, and promote sustainable practices and intersectoral collaboration to enhance climate action [16]. Adopting a planetary health framework enables nurses to integrate ecological awareness into professional practice and to advocate for equitable and effective responses to climate threats [17].

To date, several studies—mainly quantitative—have explored nurses' knowledge of climate change in different countries. The findings of these studies indicate significant variations in the levels of knowledge demonstrated. However, they consistently reflect a strong interest in the subject among nurses [20,21]. Qualitative methodology—particularly within the constructivist paradigm—has demonstrated its value in exploring perceptions from the perspective of the individuals under study [22]. Each person's perception of climate change is understood as a construct shaped by their contextual circumstances and individual background [23]. In southern Europe, apart from studies involving healthcare professionals without distinguishing by profession [24,25], qualitative methodology has only been applied to explore graduate nurses' perceptions in Turkey [26]. In Spain, a study conducted by Luque-Alcaraz et al. in 2024 [27] employed a mixed-method approach to examine the environmental awareness of Spanish nurses. The study identified nurses' perceived lack of competencies related to environmental awareness, particularly regarding knowledge, skills, and attitudes. Despite its relevance to climate change, this study focused specifically on environmental awareness and the efficacy of Green Teams. These Green Teams are multidisciplinary teams, often led by nurses, which promote sustainable practices and carbon footprint reduction within healthcare settings [27].

Therefore, our study is the first to explore the knowledge of graduate nurses in Spain concerning climate change and its health effects, drawing on the depth afforded by qualitative methodology. Thus, the aim of this study was to investigate Spanish nurses' knowledge of climate change and its impact on health. To achieve this objective, the following research question was posed: What do Spanish nurses know about and how do they perceive climate change and its effects on health?

2. Materials and Methods

2.1. Design, Participants and Setting

This was a qualitative descriptive study [28,29] based on the paradigm of constructivism [30]. Consistent with this paradigm, the influence of the research team and the contextual setting on the final results was acknowledged. This influence was reflexively managed throughout the entire research process in a continuous, collaborative, and multi-faceted manner [31]. The detailed protocol of this study is available for consultation [32].

The sample included nurses from various regions and public healthcare services across Spain. The selected services were primary care, emergency services, geriatrics, cardiology, and respiratory medicine. The selection of these services was made on the basis that they constitute points of entry into the Spanish healthcare system, or due to their association with population groups and health conditions that are most vulnerable to the impacts of climate change [32]. The selected regions were chosen based on their levels of air pollution. The zoning criteria for air quality followed those employed by the Ministry for Ecological Transition and the Demographic Challenge of the Spanish Government, as well as by the European Environment Agency. Air pollution levels were determined according to the concentration of NO₂ in the atmosphere. NO₂ concentration records from 2021 were used, as they were the most recent available ones at the time of drafting the research protocol. The regions were categorised into three levels of air pollution—high, medium, or low. Three regions were selected for each pollution level: the three with the highest NO₂ concentrations, the three with the lowest concentrations, and three with intermediate values [32]. All the participants were adults, had at least one year of experience in the service where they were working at the time of the interview, and were able to express themselves in Spanish and connect to the online interview. Purposive and snowball sampling strategies were used. The assistance of collaborators close to the units of interest was essential in the recruitment of volunteers interested in the subject of this study. Each volunteer was subsequently contacted by email, phone, or text message. The objective of this contact was to explain this study in more detail, confirm the suitability of the volunteer, and schedule a future interview. The sample consisted of 31 nurses who agreed to be interviewed. In addition, contact was lost with eight individuals who had initially expressed an interest in participating in this study. A further four individuals indicated their decision not to proceed due to scheduling constraints. One additional individual was excluded on the basis of being employed in a privately managed healthcare facility.

The interviews were conducted via the Microsoft Teams platform. This allowed the interviewees the flexibility to choose the environment from which to participate. All the interviews were conducted by the same researcher (A.M.C-B). The interviewer was a male nurse with a master's degree in health and social research and over six years of professional experience. He also had prior experience in qualitative research and in the field of climate change and its impacts on health. His knowledge and professional background facilitated his understanding of the ideas expressed by the interviewees. No personal information about the interviewer was disclosed beyond their name and the name of their institution. Aside from the initial contact to explain this study's objective, confirm the volunteer's eligibility, and schedule the interview, there was little further communication before the

interview. Pre-interview contact was limited to those who required technical assistance to join the video call. Only the interviewer and the interviewee were present during the interviews.

2.2. Data Collection

Data were collected via semi-structured interviews. To this end, the authors developed an interview guide on the basis of the reviewed literature (Figure A1). The guide was piloted with three nurses independent from this study [22]. The interviews were video-recorded via Microsoft Teams' built-in tools. The researchers' affiliated institution provided access to this application and a secure digital environment for recording the interviews. As an additional security measure, the recordings were transferred to an external drive within minutes of each interview's conclusion. Notes were taken during and after the interviews in a field notebook. These notes included codes and reflexive annotations. The average interview duration was 60 min, with a maximum of 90 min and a minimum of 45 min. The interviews were conducted between February 2023 and April 2024. The final number of interviewed nurses was determined by the achievement of data saturation. Data saturation was considered to have been reached after no new codes emerged in the final five interviews conducted. The determination of data saturation was reached by consensus among the three researchers responsible for coding. The interviewees received a transcript of their interview to allow for comments or corrections. None of the participants expressed any wish to comment or correct anything.

2.3. Data Analysis

Three researchers (A.M.C-B, M.M-A and I.M-T) conducted a consensus-based qualitative data analysis following the logic of three-step inductive thematic analysis [28,33,34]. The researchers analysed the data independently and then discussed the findings until a consensus was reached [28,33]. Initially, units of meaning were identified and assigned one or more codes. These codes were then grouped by affinity into emerging categories. Finally, themes were identified from the emerging categories [28,29,33,35]. All three researchers were nursing graduates with experience in qualitative research and in the field of climate change and health. Reflexivity regarding the researchers' influence on data analysis was constant throughout the process, both individually and collectively. The third researcher enabled triangulation in cases of discrepancy between the first two analysts [33]. In addition, the field notebook served as an additional source of data triangulation [28,35]. Data analysis was conducted via ATLAS.ti 25 software (ATLAS.ti Scientific Software Development GmbH, Berlin, Germany). The interviewed nurses were provided with preliminary results during the coding process. No comments were received regarding these preliminary results.

2.4. Ethical Considerations

The research protocol was approved by the Clinical Research Ethics Committee of the Cuenca Health Area (REG. 2021/PI3721). This study was designed in accordance with the Declaration of Helsinki. The volunteers were informed during the initial contact that the interview would be recorded and of their right to request the deletion of their interview material at any time during this study. Informed consent, both verbal and written, was obtained prior to the interview. The interview transcripts were anonymised by the same researcher who conducted them. Each interviewee received a copy of their anonymised transcript and of the preliminary results obtained during the coding process.

2.5. Quality and Rigour

Various strategies were followed to ensure the quality and rigour of this study. The research team engaged in a conscious effort of reflexivity throughout the entire research

process. This reflexivity encompassed aspects such as the researchers' influence on data collection and interpretation, as well as the influence of the chosen methodology on the responses obtained [31]. The reflexive process was shared among the researchers and cross-checked against notes recorded in the field notebook.

A purposive sample with heterogeneous characteristics was established to ensure representativeness [36]. The potential influence of contextual factors on interviewees' responses was considered in the selection of areas with varying levels of pollution and different nursing specialities while ensuring homogeneity across other contextual aspects such as nationality, language, professional background, and employment in public institutions. The influence of both the contextual elements common to all participants and the variation across groups was explicitly addressed during the data analysis phase.

The adoption of a qualitative descriptive approach within a constructivist paradigm was a deliberate decision, aligned with the aim of exploring knowledge and perceptions as constructed through lived experience. The research team engaged in reflexive discussions regarding the potential influence of the chosen methodology on the findings. Methodological decisions were grounded in the relevant literature and subjected to critical review throughout the research process.

The potential influence of the interviewer on participants was also taken into account. There was no prior relationship between the interviewer and the interviewees. To minimise this potential influence, efforts were made to foster a relationship of openness and trust. A context of trust was created by allowing participants to choose the setting in which the interview took place, ensuring that no researchers other than the interviewer were present, and safeguarding the anonymity of the data. Furthermore, the participants were explicitly reassured of the value of all contributions, and active-listening techniques were employed throughout. Semi-structured interviews were conducted by the same researcher via a guide developed on the basis of the literature and previously piloted [22,28,33]. As a self-reflexive exercise, the interviewer recorded their reflections in a field notebook during and after the interviews. These notes were subsequently discussed among the researchers during the data analysis phase.

The researchers' prior knowledge and experiences may also have influenced the data analysis process. Three expert researchers (A.M.C-B; M.M-A; I. M-T), all of whom are nurses and qualitative researchers, analysed the data independently and then discussed the findings until a consensus was reached [28,33]. This process of discussion among the researchers enabled the identification and critical examination of some of these potential influences. In addition, the interviewees received both a copy of the anonymised transcript of their interviews and the preliminary results to avoid bias [37].

The COREQ (Consolidated Criteria for Reporting Qualitative Research) guidelines were followed in the drafting of this manuscript [37].

3. Results

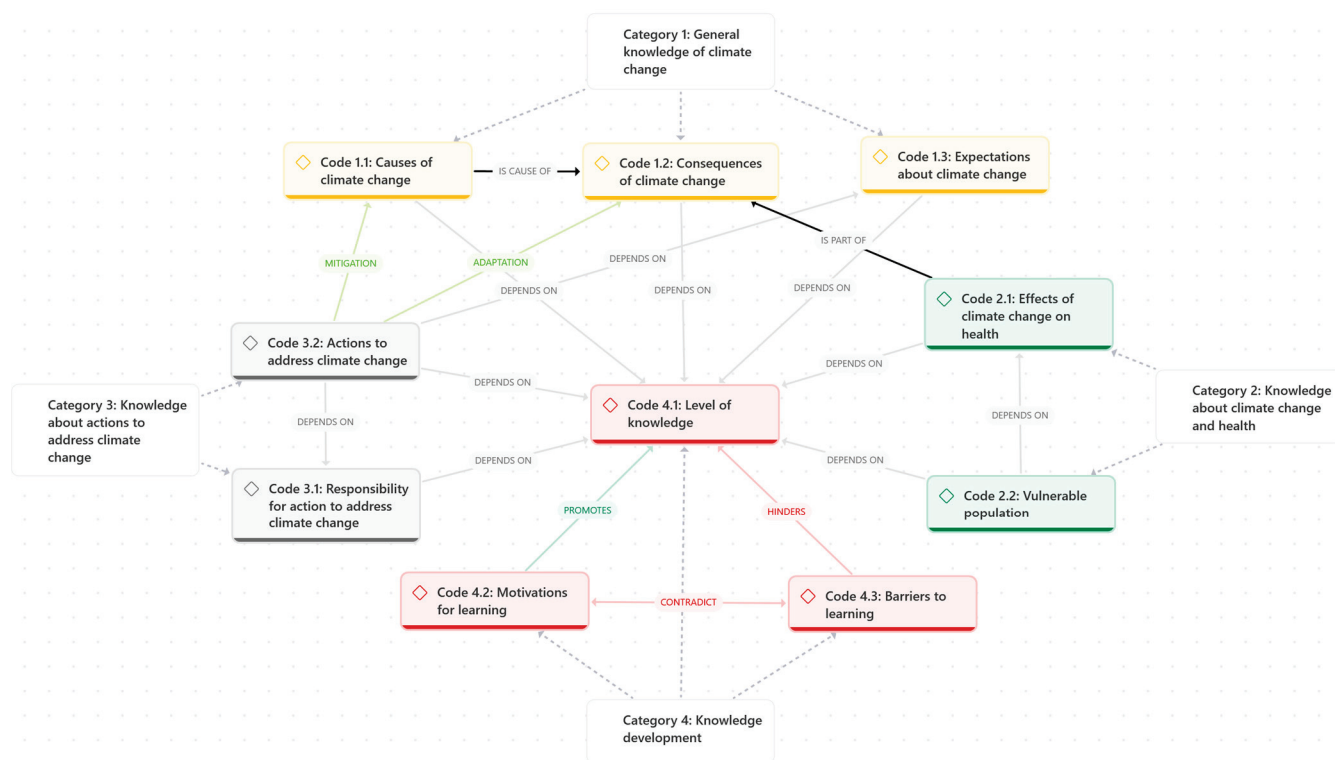
A total of 31 nurses from five different specialities within the public healthcare services of nine regions in Spain were interviewed. The sample consisted predominantly of women ($n = 24$, 77.42%), with a mean age of 41 years (range: 26–60). The average length of service experience was 12 years (range: 1–32), with 70.97% of participants having less than 15 years of experience (Table 1). The individualised demographic data can be found in Appendix B (Table A1).

Table 1. Demographic data.

Variable	Category	Frequency	(Percentage)
Sex	Female	24	(77.42%)
	Male	7	(22.58%)
Age ¹	20–29	4	(12.90%)
	30–39	10	(32.26%)
	40–49	9	(29.03%)
	50–59	5	(16.13%)
	60–69	1	(3.23%)
Speciality	Geriatrics	8	(25.81%)
	Primary care	6	(19.35%)
	Respiratory medicine	6	(19.35%)
	Cardiology	6	(19.35%)
	Emergency services	5	(16.13%)
Experience in the speciality	<5	11	(35.48%)
	5–15	11	(35.48%)
	>15	9	(29.03%)
Pollution level	High	9	(29.03%)
	Medium	11	(35.48%)
	Low	11	(35.48%)

¹ Age was not recorded for two interviewees.

Ten codes were identified and grouped into the four categories outlined below (Figure 1):

**Figure 1.** Code map.

3.1. Category 1: General Knowledge of Climate Change

3.1.1. Code 1.1: Causes of Climate Change

All the participants acknowledged the existence of climate change. Although ten interviewees considered the possibility of a natural origin, all agreed that—regardless of its root cause—climate change has been intensified and accelerated by human activity. The participants identified several key ways in which human activity has contributed to climate change. These included pollution, excessive resource consumption, the manner in which resources are utilised, and high levels of waste production.

When discussing pollution, they tended to use the term in a broad sense—referring to air, soil, or water—without making clear distinctions. It was common for them to conflate concepts such as pollution, waste, greenhouse gases, and ozone layer depletion.

“I think it’s a bit of everything. As human beings, we sort of assume the Earth belongs to us, and we do all sorts of outrageous things. . . with oil, with energy, with the sun, with electricity and all that. But also, I believe there’s a natural component from the planet itself.” (N21)

“Maybe it is a natural cycle, but mankind’s hand is speeding it up a little—with so many factories, all the planes, the transport, and all those things that, really, didn’t exist before.” (N2)

“I mean, the air pollution—which we ourselves are creating—yes, it does cause this climate change because we’re damaging the ozone layer and ending up with less natural protection from the planet.” (N21)

“Well, my perception is that it’s like a layer [. . .] that we’re creating in the atmosphere through consumption, [. . .] like cars, fuel, for generating energy—we’re not using renewable energy, I mean, it’s all gas burning [. . .].” (N12)

3.1.2. Code 1.2: Consequences of Climate Change

The increase in temperature was the most frequently cited consequence of climate change. Other effects mentioned included sudden shifts in extreme temperatures, droughts, and a general rise in pollution, though participants did not specify the type. They also noted increases in both the frequency and intensity of Saharan dust intrusions and extreme weather phenomena.

The collateral effects mentioned by the participants included disruptions in agricultural and fishing yields, food scarcity, and increased reliance on fertilisers and phytosanitary products to maintain production. The interviewees also highlighted glacial melting, rising sea levels, and an extended pollen season as consequences of high temperatures.

“That we reach much higher temperatures, that there’s no water in the rivers like we’re used to, [. . .] and that, of course, affects the entire ecosystem, impacting other areas as well, you know? Microorganisms, animals, plants.” (N18)

“Well, pollution and, yeah, all these changes, many of which are already plain to see. The lack of rain, the extreme heat. . . These strange weather changes we’re having. . . And well, the melting of the polar ice caps.” (N16)

“It seems we’re experiencing periods of torrential rain, periods of drought. . . the global temperature has risen. [. . .] It seems like we’re heading towards extreme climates. [. . .] What we can say in Spain, [. . .] is that the temperature is rising. [. . .] And also, it’s very dry.” (N24)

3.1.3. Code 1.3: Expectations Regarding Climate Change

According to the participants, the phenomenon of anthropogenic climate change is not a recent one, but rather has become increasingly evident in recent years. They expressed pessimistic views about the future, believing that the effects of climate change will continue to intensify and could ultimately render the Earth uninhabitable. Although they acknowledged current climate effects, they did not believe that they would personally witness the most severe consequences.

“We’ve been witnessing climate change for... for many years now. [...] With phenomena that may be used to happen once every so often, and now we’re seeing them more and more. But it’s not something in the future. It’s something that’s happening now and that, with time, will get worse. It will get worse.” (N9)

“My first impression is that it’s unstoppable. That it’s been unstoppable for years now and that it’s been like the boy who cried wolf, hasn’t it? Always saying it’s coming, it’s coming—but people didn’t believe it, and now there’s no turning back.” (N19)

“I’m pessimistic about this in the long run. Will I selfishly not be around? Yes. And I hope so. Because otherwise, it would be unbearable.” (N9)

3.2. Category 2: Knowledge Regarding Climate Change and Health

3.2.1. Code 2.1: Health Effects of Climate Change

The participants identified health deterioration as the primary consequence of climate change for humans. Respiratory issues were most frequently cited, with allergies and exacerbation of conditions such as asthma and COPD linked to increased pollen and pollution. This was followed by hyperthermia, dehydration, and heatstroke, which are attributed to rising temperatures. Mental health impacts, such as anxiety and depression, were also frequently mentioned.

Drought and pollution are perceived to negatively impact nutrition—both through reduced food access by contributing to food contamination. Extreme temperatures and weather events were associated with disruptions to daily life, including physical inactivity, isolation, sleep disturbance, economic hardship, spread of infections, and climate-induced migration. Less frequently mentioned effects included cancer—mainly linked to pollution—and dermatological issues—associated with ozone layer depletion.

“Lung diseases come first. [...] Increases in cases that weren’t diagnosed before... Many types of cancer, [...]. And anxiety... depressions... [...] I imagine it’s due to air pollution, [...] and then the temperature changes. [...] Even climate change in the ‘calima’ [airborne dust] that comes from North Africa.” (N5)

“Temperature, drought, a change in how all these conditions affect people’s health. Heat strokes in older people, decompensations in people with heart failure. They decompensate far more in the summer months, far more. And mental health in general, especially among young people, right? This anxiety about the harsh conditions and not having any kind of future project.” (N18)

“The fact that it’s raining less, [...] farming becomes more difficult, [...]. To give you an example, [...] the olive harvest was awful this year, so the price of olive oil will go up, [...] and I’ll end up cooking with palm oil, which is much worse for your health, or with margarine, or another kind. I’ll be replacing the healthier oil—or at least the one I consider healthier—with one that’s cheaper.” (N22)

“It’s just really hard to sleep when it’s over thirty degrees. [...] So, just imagine the sleep cycle—all those patients who already sleep poorly, all those who need benzodiazepines or anything else to sleep. If you add such high temperatures to that, it’s the perfect breeding ground for someone to throw themselves out the window. [...] It should even be considered whether it really has an impact on, for example, bipolar patients, depressive patients, patients with any type of disorder.” (N8)

3.2.2. Code 2.2: Vulnerable Populations

There was a clear perception that climate-related health impacts are already evident. Although all populations were considered potentially affected, the nurses identified particularly vulnerable groups: elderly individuals, chronically ill individuals, children, economically disadvantaged individuals, outdoor workers, and residents in specific areas.

“Because... any change affects people, but right now, in the case of an elderly person, a sudden rise in temperature brings about a whole range of changes—I mean, it affects all the systems in an older person’s body.” (N30)

“I don’t know... for example, older people or very young children—those who are more vulnerable—being exposed to high temperatures, well, that causes dehydration, doesn’t it? Just as an example.” (N27)

“It can also affect us, especially those who are more vulnerable, particularly elderly individuals, people who already have some chronic illness or who are immunosuppressed, cancer patients...” (N28)

3.3. Category 3: Knowledge Relating to Actions Against Climate Change

3.3.1. Code 3.1: Responsibility for Action on Climate Change

The interviewees believed that action against climate change is possible, although they noted that such action is already overdue. Both mitigation and adaptation were viewed as essential. They consistently emphasised the importance of individual responsibility, stating that everyone can and should contribute from their own position. However, they stressed that a truly effective response must be collective. Governments, in particular, were seen as key actors through their leadership, policy development, and enforcement of global agreements. Nevertheless, confidence in governmental institutions taking on this responsibility was minimal. The participants expressed mistrust, pessimism, and frustration toward political leaders and international authorities.

“I mean, there’s no real intention behind anything [...] it’s absolute hypocrisy, isn’t it? I mean, stop holding more climate change summits—you all meet up for four days, eat like pigs, everyone flies in by plane, and then you don’t reach any agreement, you know? Honestly, there’s nothing more hypocritical than climate change conventions—completely. [...] And it’s not even because they’re not going to do anything—I’m not going to do anything either, you know? [...] So you focus on what’s close to you and the group of humans you belong to—my family, my workplace, the population I care for... well, let’s see what we can do here, right?” (N18)

“The problem is that I can do my little bit, and everyone can do a little bit, but the issue is with the major powers or the people who actually have the ability to take action. I mean, these climate summits—how many years have they been going on? And what agreements have they reached? ‘No, we’ll postpone it to 2020.’ ‘No, let’s push it to 2035.’ Oh come on, for fuck’s sake! Postpone it to 2050 and by then we won’t even have a climate left, we won’t have anything. Sure,

you as an individual can do small things, but if nothing is done on a large or macroeconomic scale, it doesn't matter how much you do individually. . . does it?" (N25)

"On an individual level, I can do my bit, but that's all it is—a grain of sand. So it needs to be large groups who are clear about this and truly convinced that we are influencing climate change. Until that happens, well, it's difficult." (N24)

3.3.2. Code 3.2: Actions Against Climate Change

The participants were aware of several practical actions that could be taken to address climate change. Recycling was the most commonly cited action, followed by reducing the use of private vehicles; managing water, electricity, and heat usage; avoiding unnecessary purchases; using renewable energy; and opting for plant-based, local, and seasonal diets over meat products.

Most participants reported implementing several of these actions with varying degrees of consistency. However, their motivations often stemmed from economic savings, personal habits, upbringing, or health reasons rather than from environmental awareness. These motivations frequently resulted in nurses unconsciously transferring their personal habits into their workplace or consciously adapting them to their professional environment.

"I mean, waste management. Erm. . . well, electricity—I'm quite obsessive about lights being on when they're not needed. Then water—responsible water use. [. . .] Also. . . I don't know, when it comes to consumption, I'm increasingly aware—or at least I try to be more aware—of responsible consumption. Right? Plastics. . . [. . .]. Eating seasonal fruit, local fruit, [. . .]." (N6)

"I recycle, I try to reduce energy use, try to cut down on petrol consumption, electricity, water. I try to do those little things—and to teach them to my daughter." (N21)

"So, you try to cut down on consumption—also for one reason, because all these energy sources are so expensive that we've been forced to cut back, but because of our wallets. Not so much because we're convinced of how harmful they are, but because it's hitting our finances." (N24)

"I don't behave any differently at work than I do at home. Just like I have the habit of recycling at home, I recycle lids at work, I recycle the little glass jars, I recycle the plastic, I recycle the paper." (N20)

3.4. Category 4: Development of Knowledge

3.4.1. Code 4.1: Level of Knowledge

Although the level of knowledge about climate change varied considerably, most interviewees demonstrated a medium level of understanding. Nevertheless, they generally perceived their own knowledge to be low, regardless of its actual adequacy. Despite expressing interest in the topic, most did not actively seek out information. Their understanding came from conversations within their social circle, the media or social networks. Only a minority pursued further information from scientific or academic sources, typically only when prompted by something they had read or heard. Another key source of knowledge is the direct observation of climate change effects.

"What little I know comes from the news, what you see [. . .]. My partner is often more interested in the topic and talks to me about it. [. . .] Honestly, I haven't picked up an article or a book to read about climate change—so it's really just from news and the odd conversation that comes up." (N28)

"I mostly do, well, maybe it's more of an indirect search. I look up a lot of stuff about food and nutrition. [...] So, as the phone and computer always show you related things, I end up getting news alerts and they catch my interest, and I click on them. No, it's not like I actively search for it directly every day." (N5)

"It's something you come to notice through evidence—things you hear, things you read, things you see on the internet and in the news—and then you start to realise in your daily life, you think, oh right, it's true." (N31)

3.4.2. Code 4.2: Motivations for Learning

The interviewed nurses expressed a clear interest in continuing to develop their knowledge about climate change, its effects, and the role of nursing. Their motivation primarily stemmed from personal interest in environmental issues, the preservation of natural surroundings, and the relationship between health and the environment. Other significant motivators included concerns for future generations and personal health. However, being a healthcare professional was not, in itself, a sufficient reason for further study on the topic.

"I would love to receive a session on climate change from the perspective we're talking about here [...] I mean, as a nurse and in the environment I work in, it wouldn't have occurred to me—but yes, of course, yes." (N7)

"But the thing is, there will still be people after me. I mean, for example, I'm not a mother, but other people will still be here." (N9)

"And I think a lot about what we're going to leave for our children, and I believe that... [...] maybe not my children, but I'm not sure in what conditions my grandchildren will live." (N5)

"Concern, information... mainly about things that affect health. If this affects me, why does it affect me, and what do I need to avoid so that it doesn't?" (N20)

3.4.3. Code 4.3: Barriers to Learning

Despite their interest, many nurses identified eco-anxiety as a significant barrier to engaging more deeply with the topic. Consideration of climate change has been shown to evoke a range of emotions, including feelings of distress, insecurity, pessimism, frustration, anger, fear, distrust, uncertainty, powerlessness, and disappointment. To avoid these unpleasant emotions, several participants admitted to consciously limiting their exposure to climate-related information.

"In general, my feeling is one of fear, uncertainty, and mistrust—not knowing what's going to happen." (N15)

"Honestly, it makes me really sad and really angry. Truly an overwhelming sense of helplessness." (N8)

"I don't go into it too deeply. So I don't get overwhelmed either." (N9)

"I try to read about the topic. Not too much, because to be honest, I end up feeling really hopeless seeing that nothing is improving. And sometimes I'd almost rather live in ignorance. That's it. It's harsh, but it's the reality. It's really because... because I feel so powerless seeing that we're not moving forward... I'd almost rather not know anything." (N5)

However, accessing reliable sources of knowledge is not straightforward. Notably, the current workplace, academic curriculum and professional association offerings do not include training on climate change. Consequently, nurses must independently seek out information, which exposes them to an overwhelming volume of content. This, if not effectively managed, can contribute to the development of eco-anxiety.

“I studied nursing from 2014 to 2018—climate change already existed, it was already a current issue—and I don’t remember any subject where it was discussed. So, they could have instilled the topic a bit more from university onwards. [...] I think the problem is ignorance, a lot of the time.” (N28)

‘INTERVIEWER: What’s the first thing that comes to mind when you hear ‘climate change’?

INTERVIEWEE: The first thing, mm, maybe anxiety. [...] Anxiety, because it’s something that feels uncontrollable, right? And... and well, also because of the news—the way they report what’s happening with climate change. [...] It’s like a bombardment of news, right? And told in a somewhat catastrophising way. [...] I often try, well, not... or to stay informed, but maybe in another way. A radio show or headlines, but without going too deep.” (N4)

4. Discussion

This study aims to explore Spanish nurses’ knowledge of climate change and its effects on health. The interviewed nurses demonstrate a range of knowledge regarding climate change and its health implications, with the majority recognising its anthropogenic origins and associated health risks. The interviewed nurses demonstrate a higher level of knowledge than participants in other studies [21]. This may be explained by their residing in one of the regions of Europe most affected by climate change [5,38,39]. Overall, their perceptions of climate change are similar to those of health professionals in other southern European countries, such as Italy [24] and Portugal [40]. Despite their knowledge, and in line with other studies, our participants also conflate terms when referring to climate change [21,41] or overestimate natural causes as the origin of climate change [40,41]. Nonetheless, as also reported in larger-scale studies [42–44], the proportion of our sample that attributes climate change to natural causes is minimal. The interactions between different codes highlight the central role of knowledge level, upon which all other codes depend—except for those of motivators and barriers to learning, which either promote or hinder it, respectively (Figure 1).

4.1. Nursing Potential and Areas in Need of Strengthening

The interviewed nurses identify the groups most vulnerable to the effects of climate change. To varying degrees, nurses demonstrate the knowledge, capacity, and sense of climate justice necessary to map the groups most vulnerable to climate change within their environment [45]. These qualities make nurses essential figures in the design of mitigation and adaptation strategies. However, the heterogeneity of knowledge among nurses also becomes evident, highlighting the need to reinforce basic knowledge of climate change, including its anthropogenic origins.

4.2. The Influence of Demographic Data

No significant associations were observed between the demographic variables collected and the findings obtained. Notably, those nurses working in community settings demonstrate a heightened perception of economic vulnerability as a risk factor [41]. The provision of longitudinal care by primary care and geriatric nurses may allow for the identification of socioeconomic vulnerabilities, which are more challenging to discern than biological ones. Irrespective of the air quality zone, speciality, age, sex, or years of experience, the interviewees prioritise aspects that directly affect them—perceived empirically. They then consider those impacting their immediate environment, such as their workplace, city, or region—perceived through their social circle—and, finally, more distant consequences—known only through media and social networks.

4.3. *The Significance of the Audience's Context*

Our findings reveal a strong contradiction between the local perception of certain aspects of climate change and the distant way in which others are conceived (e.g., the emphasis on local environmental problems throughout the interviews versus solutions to the climate emergency often expressed as dependent on distant entities such as national or supranational bodies). Among the nurses interviewed, this contrast appears to be linked to the sources of information they use. The influence of empirical perception on how intensely a phenomenon is perceived is well documented [46]. The influence of empirical perception and the local environment highlights the need to tailor training to each audience's context to develop a planetary health perspective. This process should begin with a local frame of reference, leveraging personal interest to cultivate sustainable habits. Starting with local climate issues that are of significance to nurses facilitates the establishment of meaningful connections, thereby enabling the progression of their training towards a more comprehensive understanding of planetary health or a One Health approach. Berubé et al. [20] likewise underscore the potential influence of personal interests in their review of the scientific literature and official documents issued by nursing associations, which examine nurses' engagement with climate change.

4.4. *Informal Knowledge Sources and Their Consequences*

The use of informal knowledge sources and the lack of formal training are common barriers [20,21,24,41]. According to a review conducted by Yeboah et al. [21], social media constitutes the primary source of information on climate change used by nurses. A survey of 1200 Japanese nurses reported that 73.8% of respondents had acquired their knowledge of climate change through mass media such as television [47]. The media serve as a powerful tool for raising awareness about the climate crisis but often provide biased information [48–51]. A bias that is often amplified by the media is the politicisation of climate change [48,51], which is widely regarded as a barrier to effective action [40,42,52]. Another common distortion is the media's tendency to prioritise or exaggerate the most negative aspects of the issue [53–55], generating anxiety and rejection among the public [56]. The lack of formal training leaves nurses vulnerable to misinformation, hoaxes, or anxiety from information overload. This underscores the responsibility of educational institutions, workplaces, and professional associations to provide nurses with high-quality training on climate change.

4.5. *Eco-Anxiety*

The level of eco-anxiety expressed by the interviewed nurses is shared by more than half of the Spanish population, with the highest levels reported among women aged 60–69 with high educational attainment [57]. In our findings, those expressing the most eco-anxiety are women aged between 35 and 55. However, it should be noted that women in that age range make up the majority of our sample. Although eco-anxiety can produce symptoms similar to other forms of anxiety, in most cases, it cannot be considered pathological [58]. Rather than being a state to be avoided, eco-anxiety is frequently associated with greater engagement in pro-environmental actions [58,59]. It is not negative for nurses and society to feel anxious about the climate crisis. Nevertheless, it can be reframed as a potential driver for action. When eco-anxiety is correctly understood and supported, it has the potential to act as a catalyst, transforming emotional distress into motivation to respond to the climate emergency. For this to happen, it is vital to provide nurses with the right environment and tools to channel their emotions and transform them into a desired and healthy state of responsiveness to the climate crisis [58].

4.6. Leadership Gap

The need for greater governmental involvement is a view shared by both health professionals and the general population, at national and international levels [39,44,60,61]. This perception is also reflected in the articles included in the review conducted by Yeboah et al. [21]. Furthermore, a survey of 1022 Korean nurses observed the influence of leaders who take initiative. Nurses working in institutions where leadership had promoted climate action demonstrated greater awareness and knowledge of climate change [62]. The nurses express frustration with the lack of leadership and decisive measures from governments and political institutions. However, nurses themselves rarely take the initiative to fill this leadership gap, as the alternatives they propose tend to rely on individual action [20].

4.7. Individual Actions and Motivation

In addition to mere resignation in the face of a lack of collective action, nurses recognise the importance of individual responsibility. The interviewees mention individual actions against climate change similar to those described by other nurses [21]. While recycling is the most frequently mentioned action, only a few nurses mention the importance of reducing waste generation as a higher priority than recycling [63,64]. The main motivations for undertaking these individual actions are financial savings and habits acquired in the private sphere. Concern for future generations, also reported by Bérubé et al. [20], is another motivation mentioned by the interviewees. Savings as a personal motivator represent an opportunity to align individual motivations with institutional goals. The influence of habits acquired during childhood and in private environments indicates the need to expand nursing education beyond the professional context. Training nurses on climate change should focus not only on the health effects of climate change and the nursing role but also on instilling transversal habits applicable to personal life. Once integrated into individual routines, these habits may serve as catalysts for action within the workplace [27,65].

4.8. Limitations

One limitation of this study may be the number of participants. Nevertheless, the use of a qualitative methodology is a strength, as it enables deeper insight and prioritises the richness and saturation of data over sample size. Although the sampling techniques used might have encouraged the recruitment of participants with greater interest in the topic, this approach may have resulted in more enriching data. Despite the limited geographical and speciality representation, efforts were made to ensure sample representativeness by establishing a purposive sample with heterogeneous characteristics in terms of the air quality zone and speciality. Moreover, as a cross-sectional study, it is possible that external events may have influenced the responses. However, the interviews were conducted on different dates, alternating specialities and air quality zones over fourteen months, thereby minimising biases related to seasonal weather or media events. Furthermore, the choice of interviews as a data collection technique could have given rise to social desirability bias since anonymity between the interviewee and interviewer could not be maintained. Nevertheless, the interviews proved to be a highly effective tool for stimulating reflection among the nurses, as reported by participants in this and other studies [41]. To mitigate this limitation, efforts were made to establish a climate of trust. All interviews were conducted by the same researcher, who was also responsible for producing the transcripts. Interviews took place in locations chosen by each participant, without the presence of other researchers. The transcripts were anonymised before being shared with other members of the research team. Finally, the participants were invited to contact the research team should any concerns arise after reviewing the transcript of their interview or the preliminary results. No participants made contact. The absence of any participant responses was

interpreted by the team, based on their experience, as an indication of consent for both the transcription and the preliminary results. Furthermore, the triangulation strategy was addressed through complementary means, including blind consensus coding by three researchers and reflexive engagement with the field notebook.

4.9. Implications for Clinical Practice

In clinical practice, nurses are not only able to address the health effects of climate change on the population but, as our results indicate, are also well suited to identifying vulnerable groups and mitigating the healthcare system's carbon footprint. Our findings underscore the value of nurses' holistic perspective in the planning and implementation of climate change mitigation and adaptation strategies. This highlights the opportunity to include nurses in public health policy development teams. However, nurses' basic knowledge of climate change and its health effects must be strengthened. Nurses' education should be developed within a planetary health and One Health framework. This training should be continuous, both pre- and postgraduate, and adapted to the specific competencies required to tackle the diverse impacts of climate change in different healthcare contexts. Academic institutions, healthcare centres, and professional organisations must actively promote this education.

Moreover, nurses should receive training in the skills needed to enhance their professional role, such as communication, research, negotiation, and leadership [66–69]. Nurses could address the leadership gap through greater political and social participation, for instance, by forming climate action groups such as Green Teams within healthcare institutions [27]. These groups would promote proactive integration of climate change into daily discussions. This will prevent the issue from being relegated to isolated training sessions or superficial media coverage [3,70].

In conclusion, our findings highlight both the barriers to and opportunities for the development of the educational curriculum for nurses, as well as for policy initiatives in response to climate change. We have identified pedagogical enhancements such as the integration of the planetary health perspective and the imperative to cultivate key competencies including communication and negotiation. Furthermore, we have underscored the importance of enhanced political engagement and the value of incorporating nurses into the planning and formulation of public health policies. It is our hope that these proposals will be duly considered by those responsible for educational programmes and other relevant decision-makers.

Future studies may direct their objectives towards exploring nurses' self-perceived role in the face of climate change, the perceptions of barriers hindering nursing action in response to climate change, or the development of strategies to promote the leadership role of nursing in the context of the climate emergency. One concrete example could be a qualitative descriptive study exploring perceived barriers to nursing leadership in the context of climate change. A sample of particular interest for such a study might include nurses in managerial or leadership positions. Another potential avenue for future research could be a national survey examining Spanish nurses' perceptions and knowledge regarding climate change. This quantitative study could refine its questionnaire based on the findings of our research, thereby addressing the limitations in generalisability inherent in our design.

5. Conclusions

Despite the variation in knowledge among participants, the nurses interviewed showed a medium level of understanding and a strong interest in further development. However, most of their knowledge came from informal sources. Therefore, it is crucial to reinforce and expand this understanding through formal training provided by academic institutions, healthcare centres, and professional associations.

Although further development of their competencies is needed, nurses' understanding of the health–disease process and its social determinants, together with their psychosocial approach to adaptation, positions them as essential stakeholders in the formulation of public policies to address this challenge. By enhancing both the knowledge and skills necessary to channel eco-anxiety productively, it is possible to cultivate the full potential of nursing—including underdeveloped roles such as leadership in climate response. Strengthening nurses' knowledge of climate change is therefore essential for building climate-resilient healthcare systems.

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Institutional Review Board Statement: This study was conducted in accordance with the Declaration of Helsinki and approved by the Clinical Research Ethics Committee of the Cuenca Health Area on 25 January 2022 with registration number 2021/PI3721.

Informed Consent Statement: Informed consent was obtained from all the subjects involved in this study.

Data Availability Statement: The data are unavailable due to privacy and ethical restrictions.

Public Involvement Statement: This study involved nurses recruited through purposive and snow-ball sampling methods with the support of collaborating nurses. The participants received an information sheet and an informed consent form prior to the interviews, which were conducted online. They were provided with anonymised transcripts of their interviews and with preliminary results. They were also informed about the publication of the final findings.

Guidelines and Standards Statement: This manuscript was drafted following the COREQ (Consolidated Criteria for Reporting Qualitative Research) for qualitative research.

Use of Artificial Intelligence: ChatGPT-4 and Grammarly v1.2.169.1689 were used for language translation, language editing, and grammar. No tools were utilised for generating any text, analysis, or content within this study.

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Appendix A

General Knowledge about Climate Change

- What is the first thing that comes to mind when you hear the term “climate change”?
- What is climate change?
- What causes it? What is happening? Who or what is responsible?
- What can we do in response to climate change?

Climate Change and Health

- In what ways could climate change affect human beings?
- How do you think climate change can impact health?
- What signs of the health effects of climate change have you observed in your surroundings? (either personal or professional)

Climate Change and Nursing

- Does nursing have an impact on climate change? Does climate change affect the daily work of nurses?
- What can nurses do in response to climate change?
- What do you personally do about climate change in your private life? (Recycling, diet, transport)
- What do you do about climate change in your workplace?
- How is climate change addressed in your work environment? (At the service or management level) (Both mitigation and adaptation measures)
- What barriers exist to taking action on climate change in your work environment? Is there organisational and peer support?
- How do you know so much about climate change?
- Where have you obtained information about climate change? Official sources?

Figure A1. English translation of the questions included in the interview guide. Originally in Spanish; translated for appendix.

Appendix B

Table A1. Individualised demographic data.

Id	Sex	Age ¹	Speciality	Experience in the Speciality ¹	Pollution Level
N1	Female	-	Urgency	19	Medium
N2	Male	-	Respiratory medicine	11	Medium
N3	Male	33	Cardiology	6	Medium
N4	Female	48	Geriatrics	4	Medium
N5	Female	37	Primary care	14	Medium
N6	Female	42	Primary care	4	Low
N7	Female	51	Geriatrics	12	Low
N8	Male	49	Cardiology	10	High
N9	Female	43	Respiratory medicine	3	Low
N10	Female	50	Primary care	29	High
N11	Male	26	Respiratory medicine	4	Medium
N12	Female	45	Geriatrics	13	High
N13	Female	27	Emergency services	1	Low
N14	Female	45	Geriatrics	20	Low
N15	Female	36	Geriatrics	1	Medium
N16	Female	31	Primary care	4	High
N17	Female	39	Emergency services	4	Low
N18	Female	54	Primary care	18	High

Table A1. Cont.

Id	Sex	Age ¹	Speciality	Experience in the Speciality ¹	Pollution Level
N19	Female	54	Cardiology	30	High
N20	Female	49	Geriatrics	25	High
N21	Female	36	Respiratory medicine	2	High
N22	Male	29	Geriatrics	4	High
N23	Female	33	Cardiology	13	Low
N24	Male	60	Emergency services	32	Medium
N25	Female	44	Respiratory medicine	8	Low
N26	Female	37	Respiratory medicine	12	Low
N27	Female	29	Cardiology	3	Low
N28	Male	31	Emergency services	5	Low
N29	Female	37	Cardiology	17	Medium
N30	Female	44	Geriatrics	10	Medium
N31	Female	52	Primary care	27	Medium

¹ Age and experience in the speciality expressed in years.

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Article

Depression: [Mental] Health Literacy, Stigma, and Perceived Barriers to Help-Seeking During Transitions Among Undergraduate Nursing Students

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Abstract: Background/Objectives: Mental health literacy (MHL) plays a crucial role in transitional processes, influencing, for example, students' adaptation to higher education and, later, their transition into the workforce. This study assesses MHL about depression among first- and fourth-year nursing students and identifies which MHL components and related variables are associated with a higher likelihood of being in either academic year. **Methods:** A cross-sectional descriptive correlational study was conducted with 478 nursing students (59.4% first-year students; 40.6% fourth-year students), predominantly female (82.2%), with a mean age of 20.41 years (SD = 4.71) and a median age of 19.0 years. **Results:** The results revealed a low level of recognition of depression and knowledge of mental health first aid (MHFA) strategies, including health literacy. Students tended not to hold beliefs based on myths and stereotypes about mental illness and individuals with mental illness and did not have highly stigmatizing views. MHL varied by year of study, with fourth-year students having more adequate MHL levels. **Conclusions:** These findings highlight the need to integrate MHL as a key element of academic success. Health education initiatives that promote mental health, prevention, and MHFA training may serve as effective strategies to enhance MHL among nursing students.

Keywords: nursing; mental health literacy; depression; transitions; higher education

1. Introduction

First introduced by Jorm et al. [1] in Australia, mental health literacy (MHL) refers to the beliefs and knowledge about mental disorders (including mental health problems) that enable individuals to recognize, manage, and/or prevent these problems in everyday life [1]. This concept includes five core components: (a) recognition of mental health problems (and mental disorders) to facilitate help-seeking; (b) knowledge of professional help and available treatments; (c) knowledge of effective self-help strategies; (d) knowledge and skills to provide support and first aid to others; (e) knowledge of how to prevent mental illness [2,3].

More recently, the inclusion of other components in the concept, namely positive mental health, has been suggested [4,5] to adopt a salutogenic perspective, focusing interventions on mental health promotion and aligning MHL with health literacy (HL) [6].

More than 25 years after its initial introduction, MHL has assumed a prominent role in the field of public health. It is now recognized both as a social determinant of health and as a foundation for interventions aimed at reducing social stigma and discrimination associated with mental and psychiatric disorders [6].

The MHL of higher education (HE) students, particularly those enrolled in health-related programs such as nursing, has become a growing concern for educational institutions [7–9]. This concern is largely driven by evidence of the high prevalence of mental health problems among students [10,11], which may compromise academic success and even threaten their future careers. Common issues include stress, anxiety, depression, and substance abuse, particularly alcohol [12,13]. Notably, some students enter higher education with pre-existing mental health diagnoses, while in other cases, such issues emerge or worsen during their academic journey.

There is limited evidence on the MHL of nursing students, and existing studies suggest modest levels of MHL identical to those of the general population [7–9,14–18]. Research has also shown that students often share common beliefs and attitudes toward mental illness that may influence their future work as nurses [8,9]. Investing in MHL is essential, as evidence indicates that individuals with adequate MHL levels are more likely to maintain greater control over their mental state, recognize signs and assess symptoms of psychological distress, and seek help when necessary [2].

Although nursing students face academic challenges and expectations similar to those in other HE programs, the unique nature and characteristics of nursing education place them at greater risk of developing or exacerbating mental health problems. Contributing factors include exposure to human vulnerability and suffering, confrontation with mortality, excessive academic workload, and the continuous need to enhance technical and human skills [19].

Therefore, greater emphasis should be placed on supporting the mental health of nursing students throughout their training, especially at two key moments: the first year, when students enter HE, and the final year, when they graduate and transition to the workforce [20–24].

Among final-year students, factors such as the academic pressures of graduation, uncertainty about their professional future, competitiveness, increased autonomy and decision-making, and responsibility for patient care contribute to the development—or worsening—of mental health problems.

Based on the assumption that MHL increases as students advance in their training and given that final-year students usually have greater theoretical knowledge, more experience in nursing care, reduced social stigma, and enhanced personal and professional skills than first-year students, this study aimed to assess MHL about depression among first- and fourth-year nursing students. Specifically, this study compared the following aspects: (a) the ability to recognize depression in order to facilitate help-seeking and (b) knowledge about the provision of mental health first aid (MHFA).

This study also aimed to evaluate perceived barriers to help-seeking, the intention to seek help, and levels of personal and perceived stigma associated with depression. It also aimed to analyze positive MHL and beliefs about mental illness and individuals with mental illness.

Finally, this study sought to determine whether these variables serve as predictors of students' year of study. This analysis helps to assess whether fourth-year students have higher levels of MHL compared to first-year students and to explore how this change occurs, including the influence of related variables.

The following steps were undertaken:

- To assess differences in the ability to recognize depression and in the knowledge to provide MHFA, according to the year of study;
- To analyze differences in perceived barriers to help-seeking, intention to seek help, personal and perceived stigma associated with depression, positive MHL and beliefs about mental illness and individuals with mental illness, according to the year of study;

- To identify sociodemographic and MHL-related variables, including familiarity with depression, that are associated with a higher likelihood of being in either the first or fourth year of study.

2. Materials and Methods

2.1. Research Design

This study used a descriptive, correlational design with a quantitative approach [25]. The STROBE checklist for cross-sectional studies was used to report the findings of this study [26].

2.2. Sample and Setting

Data were collected at an HE institution located in the central region of mainland Portugal between September and October 2024. All first- and fourth-year students were invited to participate in the study. All fourth-year students received both theoretical and practical training in psychiatry during the previous year (third year), including clinical placements in mental health institutions.

2.3. Data Collection

Data were collected in classroom settings using the Google Forms platform. Researchers were present during each questionnaire administration session. Access to the questionnaire was provided through a QR code. Participants provided electronic informed consent, confirming their understanding of the study's objectives and their voluntary participation. The average time to complete the questionnaires was 25.17 min.

2.4. Instruments

Sociodemographic questionnaire: It includes a set of variables such as year of study, age, gender, and parents' education level.

Questionnaire for Assessment of Mental Health Literacy—QuALiSMental [27].

This questionnaire, validated for the Portuguese population, assesses the five components of MHL as defined by Jorm [1]. Psychometric studies conducted in the Portuguese context have demonstrated good reliability and a factor structure consistent with the theoretical components of MHL. The questionnaire is preceded by a clinical vignette describing the case of a 21-year-old woman, Joana, who meets the diagnostic criteria for depression according to the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders [28]:

Joana is a 21-year-old woman who has been feeling unusually sad for the last few weeks. She is tired all the time and has trouble falling asleep or staying asleep. She doesn't feel like eating and has lost weight. She has trouble concentrating on her studies and her grades have sunk. Even day-to-day tasks seem too much for her, so she has put off making decisions. Her parents and friends are very concerned about her.

This study assessed only two components of the QuALiSMental instrument: (a) recognition of disorders, which includes multiple-choice labels (e.g., depression, *nervous breakdown*, *age crisis*, *psychosis*, etc.); and (b) knowledge and skills to provide support and first aid to others, which includes 10 items rated as "helpful", "harmful", or "neither helpful nor harmful" (see Tables 2 and 3 for a list of the labels and the content of the items).

Personal stigma and perceived stigma scales [29].

The personal stigma and perceived stigma scales [30,31] have been validated for the Portuguese population. However, in the Portuguese version, each scale consists of 7 items

rated on a Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The personal stigma items are preceded by the phrase “In my opinion”, while the perceived stigma items use “Most people believe”. Both scales use the same items. Each scale is composed of two factors: “weak-not-sick” and “dangerous/unpredictable.”

Positive Mental Health Literacy Questionnaire—PosMHLit [32]

This questionnaire consists of 20 items that assess positive MHL and well-being, rated on a Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). In line with the original authors’ recommendations, this study used the total score. Studies conducted in the Portuguese context have demonstrated good reliability and construct validity.

Beliefs Toward Mental Illness Questionnaire—BtMIq [33]

The BtMIq was developed in the Portuguese context. Its short version consists of 23 items rated on a Likert scale from 1 (*strongly disagree*) to 6 (*strongly agree*). The questionnaire covers the following seven beliefs: belief in dangerousness (BtMIq1), including items such as “People with diagnosed mental illnesses tend to be dangerous.”; belief in inferiority and inability to live in society (BtMIq2), including items such as “People with mental illness have limited ability to live independently because they are unable to take on responsibilities.”; belief in the benefits of patients’ social integration and involvement (BtMIq3), including items such as “People with mental illness are capable of living in their communities if they receive the appropriate support.”; belief in individual responsibility (BtMIq4), including items such as “If people take care of themselves, they can prevent mental illnesses”; belief about psychotropic drugs (BtMIq5), including items such as “The initial treatment of mental illnesses requires the use of medication”; belief in chronicity/incurability (BtMIq6), including items such as “Mental illnesses are cyclical (they return periodically)”; and belief in the efficacy of treatment and rehabilitation (BtMIq7), including items such as “Medication is effective in the improvement of symptoms of mental illness”.

In terms of reliability, Cronbach’s alpha coefficients were as follows: $\alpha = 0.81$ in the BtMIq1 factor, $\alpha = 0.83$ in the BtMIq2 factor, $\alpha = 0.79$ in the BtMIq3 factor, $\alpha = 0.71$ in the BtMIq4 factor, $\alpha = 0.92$ in the BtMIq5 factor, $\alpha = 0.73$ in the BtMIq6 factor, and $\alpha = 0.78$ in the BtMIq7 factor.

European Health Literacy Survey—HLS-EU-PT-Q 16 [34]

The Health Literacy Survey, validated for the Portuguese population, is the short form of the HLS-EU-PT-Q47. It comprises 16 items assessing health literacy across three domains: healthcare, disease prevention, and health promotion. Items are rated on a Likert scale from 1 (*very difficult*) to 4 (*very easy*). In line with the original authors’ recommendations, this study used the total score of the scale [34].

Barriers to Mental Health Help-Seeking Questionnaire—BMHHSQ [15]

This instrument, used as an annex to QuALiSMental, does not fit specifically into any component but has been applied in various studies [1,35,36]. In this study, its psychometric properties were evaluated through analyses of reliability and construct validity using exploratory factor analysis (EFA). It consists of 9 items rated on a Likert scale from 1 (*completely disagree*) to 5 (*completely agree*) and is preceded by the following instructions: “Below are different statements about barriers that may stop you from seeking professional help in mental health. If you had a problem like Joana, what would stop you from seeking help?”

The EFA was performed using the principal components method with Varimax orthogonal rotation, revealing a two-factor solution that explained 54.77% of total variance. The first factor, with five items, is called *Personal barriers to seeking help* and explains 33.26% of the variance. This factor includes items such as “Concern that the person might feel negatively about me” and “concern about what other people might think”. The second

factor is called *Barriers to accessing specialized professional help* and includes items such as “Concern that I might have difficulties getting an appointment”. It explains 21.52% of the total variance. In terms of reliability, the value of internal consistency using Cronbach’s alpha coefficient was $\alpha = 0.83$ for the first factor and $\alpha = 0.71$ for the second factor.

2.5. Data Analysis

Data were analyzed using SPSS, Version 29.

Appropriate summary statistics were calculated, as well as absolute and percentage frequencies where appropriate based on variable type. The normality of the distribution was assessed using the Lilliefors-corrected Kolmogorov–Smirnov test. Homogeneity of variance was assessed using Levene’s test.

To address the study’s main objectives, the following tests were used:

- Two-proportion z-test, with Cohen’s h as the measure of effect size [37], where $h = 0.20$: small effect size; $h = 0.50$: medium effect size; and $h = 0.80$: large effect size.
- Chi-square test for RxC contingency tables using Cramer’s V as the effect size with $Df = 2$, where $CV = 0.07$: small effect size; $CV = 0.21$: medium effect size; and $CV = 0.35$: large effect size [37].
- Student’s t -test for independent samples, with Cohen’s d as the effect size, where $d = 0.20$: small effect size; $d = 0.50$: medium effect size; and $d = 0.80$: large effect size [38].
- Binary logistic regression (BLR) by blocks using the forward method. Validation of the BRL assumptions was carried out by analyzing the residuals and diagnosing influential cases [39]. Prior to analysis, the nominal qualitative variables were dichotomized (coded as “0” and “1”). The criterion or predictor variable was coded as “0” for the first-year group and as “1” for the fourth-year group. LRA analysis was selected due to its suitability for binary outcome variables, allowing for the classification of students into either the first or fourth year. This model enabled the identification of key predictor variables influencing the likelihood of a nursing student belonging to a specific academic year.

2.6. Ethical Considerations

This study was conducted in accordance with the principles outlined in the Declaration of Helsinki for research involving human subjects. It was approved by the Ethics Committee of the Health Sciences Research Unit: Nursing of the Nursing School of Coimbra, Portugal. All participants remained anonymous, and data were stored in a secure, encrypted online archive accessible only to the study’s authors. The survey included an electronic informed consent form for students to sign. The consent form also included permission for the publication of the research data.

3. Results

The sample consisted of 478 nursing students, of whom 284 (59.4%) were enrolled in the first year and 194 (40.6%) in the fourth year. Regarding gender, 82 (17.2%) were male and 396 (82.8%) were female. The mean age was 20.41 years ($SD = 4.71$), with a median age of 19.0 years.

In terms of familiarity with mental health, 315 students (66.0%) reported having a family member or close friend in a situation similar to that described in the vignette, while 163 students (34.0%) did not. Additionally, 242 students (50.7%) had sought or received treatment for mental health problems. A total of 115 students (24.11%) had a friend in a similar situation and had sought professional help themselves.

Concerning the first objective, “to assess the differences in the ability to recognize depression, as well as in the knowledge to provide first aid to others, according to the year of study”, Table 1 indicates significant differences in the use of the following labels: *age crisis* ($z = 5.186$; $p < 0.001$; $h = 0.52$), *nervous breakdown* ($z = 4.160$; $p < 0.001$; $h = 0.39$), and *anxiety* ($z = 2.416$; $p < 0.05$; $h = 0.22$). In all three cases, these labels were cited more frequently by first-year students. All effect sizes (h) were in the medium range.

Table 1. Absolute and percentage distribution of the labels used to identify the problem described in the vignette, according to the year of study ($N = 478$).

Labels	Year		z (a)	ES (b)
	First Year ($N = 284$)	Fourth Year ($N = 194$)		
Age crisis	84 (29.7)	19 (9.8)	5.186 ***	0.52
Mental illness	162 (57.2)	124 (63.9)	−1.461 ns	0.14
Bulimia	23 (8.2)	14 (7.2)	0.365 ns	0.03
Stress	266 (94.0)	178 (91.8)	0.947 ns	0.09
Nervous breakdown	221 (78.8)	119 (61.3)	4.160 ***	0.39
Alcohol abuse	7 (2.5)	6 (3.1)	−0.408 ns	0.04
Psychosis	15 (5.3)	8 (4.1)	0.589 ns	0.06
Psychological problems	255 (90.1)	175 (90.2)	−0.036 ns	0.01
Anorexia	67 (23.7)	36 (18.6)	1.334 ns	0.13
Anxiety	271 (95.8)	175 (90.2)	2.416 *	0.22
Depression	234 (82.7)	162 (83.5)	−0.234 ns	0.02
Schizophrenia	5 (1.8)	2 (1.0)	0.657 ns	0.07
Correct identification	34 (12.0)	53 (27.3)	−4.252 ***	0.39

(a) two proportion z -test; (b) effect size h measure; * $p < 0.05$; *** $p < 0.001$; ns: non-significant

Another relevant finding is the low rate of correct identification of the vignette as a case of depression: 12.0% of first-year students correctly identified the case as depression, rising to 27.3% among fourth-year students. The differences were statistically significant, with a medium effect size ($z = -4.252$; $p < 0.001$; $h = 0.39$).

A large proportion of students mentioned the labels *nervous breakdown* (78.8% in the first year and 61.3% in the fourth year) and *anorexia* (23.7% in the first year and 18.6% in the fourth year).

Regarding *knowledge to provide first aid to others, according to the year of study*, the chi-square test results (Table 2) revealed statistically significant differences in the following items: “Talk to her firmly about getting her act together” [MHFA_i2] ($\chi^2_{(2)} = 71.350$; $p < 0.001$; $CV = 0.39$), “Ask her whether she is feeling suicidal” [MHFA_i5] ($\chi^2_{(2)} = 14.963$; $p < 0.001$; $CV = 0.18$), “Not acknowledge her problem, ignoring her while she gets over it” [MHFA_i8] ($\chi^2_{(2)} = 6.284$; $p < 0.05$; $CV = 0.11$), “Keep her busy to keep her mind off problems” [MHFA_i9] ($\chi^2_{(2)} = 35.924$; $p < 0.001$; $CV = 0.28$), and “Encourage her to become more physically active” [MHFA_i10] ($\chi^2_{(2)} = 16.806$; $p < 0.001$; $CV = 0.18$).

In all items with statistically significant differences, more adequate knowledge was associated with fourth-year students. Effect sizes ranged from 0.18 to 0.28, indicating medium effects.

Regarding the objective “To analyze the differences in the perceived barriers to mental health help-seeking, the intention to seek help, the personal and perceived stigma associated with depression, positive MHL, and beliefs about mental illness and people with mental illness, according to the year of study”, several t -tests for independent samples were performed. As shown in Table 3, statistically significant differences were found in the following beliefs: dangerousness ($t = 2.996$; $p < 0.05$; $d = 0.28$), inferiority and inability to

live in society ($t = 7.449$; $p < 0.001$; $d = 0.69$), social integration and involvement ($t = -4.263$; $p < 0.001$; $d = 0.40$), efficacy of psychotropic drugs ($t = -3.262$; $p < 0.001$; $d = 0.30$), chronicity/incurability ($t = 2.828$; $p < 0.01$; $d = 0.26$), and efficacy of treatment and rehabilitation ($t = -3.291$; $p < 0.05$; $d = 0.31$). Effect sizes ranged from $d = 0.26$ to $d = 0.69$, corresponding to small ($d = 0.26$; $d = 0.28$; $d = 0.30$; $d = 0.31$; and $d = 0.40$) and medium ($d = 0.69$) effect sizes.

Table 2. Absolute and percentage distribution of students' opinions on strategies for providing MHFA, according to the year of study ($N = 478$).

Knowledge About MHFA	Year	Helpful	Harmful	NHH ^(a)	χ^2	ES
1. Listen to her problems in an understanding way [MHFA_i1]	1st 4th	277 (58.7) 195 (41.3)	1 (33.3) 2 (66.7)	3 (100.0) --- (0.0)	2.563 ⁽¹⁾ (ns)	0.08
Total % in row		98.7	0.6	0.6		
2. Talk to her firmly about getting her act together [MHFA_i2]	1st 4th	52 (96.3) ^(b) 2 (3.7)	116 (43.1) 153 (56.9) ^(b)	113 (72.9) ^(a) 42 (27.1)	71.350 ***	0.39
Total % in row		11.5	56.4	32.3		
3. Suggest she seek professional help [MHFA_i3]	1st 4th	253 (57.6) 186 (42.4)	5 (62.5) 3 (37.5)	23 (74.2) 8 (25.8)	3.334 ⁽¹⁾ (ns)	0.08
Total % in row		91.8	1.7	6.5		
4. Make an appointment for her to see a GP with her knowledge [MHFA_i4]	1st 4th	203 (57.7) 149 (42.3)	23 (74.2) 8 (25.8)	55 (57.9) 40 (42.1)	3.249 (ns)	0.08
Total % in row		73.4	6.5	20.1		
5. Ask her whether she is feeling suicidal [MHFA_i5]	1st 4th	82 (47.7) 90 (52.3) ^(b)	105 (68.2) ^(b) 49 (31.8)	94 (61.8) 58 (38.2)	14.963 ***	0.18
Total % in row		35.4	33.2	33.2		
6. Suggest she have a few drinks to forget her troubles [MHFA_i6]	1st 4th	5 (71.4) 2 (28.6)	263 (58.1) 190 (41.9)	13 (72.2) 5 (27.8)	1.762 (ns)	0.06
Total % in row		1.5	94.8	3.8		
7. Rally friends to cheer her up [MHFA_i7]	1st 4th	177 (59.8) 119 (40.2)	21 (63.6) 12 (36.4)	83 (55.7) 66 (44.3)	1.029 (ns)	0.05
Total % in row		62.1	6.9	31.0		
8. Not acknowledge her problem, ignoring her [MHFA_i8]	1st 4th	3 (100.0) --- (0.0)	264 (57.6) 194 (42.4) ^(b)	14 (82.4) ^(b) 3 (17.6)	6.284 **	0.11
Total % in row		0.6	95.8	3.6		
9. Keep her busy to keep her mind off problems [MHFA_i9]	1st 4th	133 (71.1) ^(b) 54 (28.9)	53 (38.4) 85 (61.6) ^(b)	95 (62.1) 58 (37.9)	35.924 ***	0.28
Total % in row		39.2	28.7	32.1		
10. Encourage her to become more physically active [MHFA_i10]	1st 4th	207 (54.3) 174 (62.5) ^(b)	5 (62.5) 3 (37.5)	69 (77.5) ^(b) 20 (22.5)	16.806 ⁽¹⁾ ***	0.18
Total % in row		79.7	1.7	18.7		

^(a) NHH = neither helpful nor harmful; ^(b) adjusted residuals > 1.96 ; ES: effect size; ⁽¹⁾ based on the Fisher–Freeman–Halton Exact Test; ns: non-significant; ** $p < 0.01$; *** $p < 0.001$. ns: non-significant.

The mean scores for adjusted and positive beliefs, such as the belief in *social integration and involvement* and the *efficacy of psychotropic drugs*, were higher among fourth-year students. In contrast, the mean scores for negative beliefs were higher among first-year students.

Table 3. Beliefs about mental illness and people with mental illness, personal and perceived stigma, barriers to seeking help, health literacy, and positive mental health literacy by year of study (N = 478).

	Year	Mean	SD	t	ES
<i>Beliefs about mental illness and people with mental illness</i>					
Dangerousness (BtMIq1)	1st 4th	2.17 1.96	0.78 0.73	2.996 *	0.28
Inferiority and inability to live in society (BtMIq2)	1st 4th	2.66 2.29	0.55 0.52	7.449 ***	0.69
Social integration and involvement (BtMIq3)	1st 4th	4.09 4.30	0.52 0.53	−4.263 ***	0.40
Individual responsibility (BtMIq4)	1st 4th	2.32 2.30	0.65 0.54	0.274 ^{ns}	0.03
Efficacy of psychotropic drugs (BtMIq5)	1st 4th	2.44 2.66	0.74 0.65	−3.262 **	0.30
Chronicity/incurability (BtMIq6)	1st 4th	2.82 2.67	0.60 0.60	2.828 **	0.26
Efficacy of treatment and rehabilitation (BtMIq7)	1st 4th	3.61 3.80	0.63 0.55	−3.291 *	0.31
<i>Personal stigma</i>					
Weak-not-sick	1st 4th	1.82 1.59	0.60 0.47	4.576 ***	0.43
Dangerous/unpredictable	1st 4th	1.63 1.51	0.52 0.51	2.633 **	0.25
<i>Perceived stigma</i>					
Weak-not-sick	1st 4th	2.89 3.11	0.88 0.89	−2.750 **	0.26
Dangerous/unpredictable	1st 4th	2.48 2.53	0.74 0.78	−0.670	0.06
<i>Barriers to mental health help-seeking</i>					
Personal barriers to seeking help (PBHSS-1)	1st 4th	3.28 3.00	0.96 0.99	3.058 **	0.29
Barriers to accessing specialized professional help (PBHSS-2)	1st 4th	2.52 2.78	0.80 0.86	−3.449 ***	0.32
<i>Other variables</i>					
Positive mental health literacy (PosMHLit)	1st 4th	84.28 87.82	8.90 8.47	−4.362 ***	0.28
Health literacy (HLS-EU-PT-Q)	1st 4th	11.38 12.45	4.13 3.58	−2.948 **	0.41

ns: non-significant; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Regarding personal stigma, statistically significant differences were found in both subscales: *weak-not-sick* ($t = 4.576$; $p < 0.001$; $d = 0.43$) and *dangerous/unpredictable* ($t = 2.633$; $p < 0.01$; $d = 0.25$). For perceived stigma, statistically significant differences were found only in the *weak-not-sick* subscale ($t = −2.750$; $p < 0.01$; $d = 0.26$).

Regarding barriers to mental health help-seeking associated with depression, statistically significant differences were found in two dimensions: *personal barriers to seeking help* ($t = −3.058$; $p < 0.01$; $d = 0.29$) and *barriers to seeking professional help* ($t = −3.449$; $p < 0.001$; $d = 0.29$). In both cases, effect sizes were small.

Statistically significant differences were also found in the last two variables: *positive mental health* ($t = -4.362$; $p < 0.001$; $d = 0.28$) and *health literacy* ($t = -2.948$; $p < 0.01$; $d = 0.41$), with higher mean scores among fourth-year students.

The HL variable was categorized according to the authors' proposal [34]. Therefore, 19.1% of students had an inadequate level of HL, 29.8% had a problematic level, and 51.2% had an adequate level. As regards the level of HL by year of study, a statistically significant association was found ($\chi^2_{(2)} = 6.613$; $p = 0.037$; $CV = 0.12$), which shows a tendency for most first-year students to have inadequate HL levels, while most fourth-year students were more likely to have adequate HL levels.

Finally, to identify which sociodemographic variables and MHL-related variables (including familiarity with depression) predict students' year of study (first or fourth year), a binary LRA was conducted using a blockwise approach.

Table 4 shows that the predictors involved in the model are, related to the recognition of disorders, the *age crisis* ($b = -1.18$; $p < 0.001$; $OR = 0.31$) and *nervous breakdown* ($b = -0.57$; $p < 0.05$; $OR = 0.31$) labels, as well as the following items related to knowledge and skills about MHFA: *talk to her firmly about getting her act together*—MHFA_i2 ($b = -3.31$; $p < 0.001$; $OR = 0.04$), *ask her whether she is feeling suicidal*—MHFA_i5 ($b = 0.71$; $p < 0.01$; $OR = 2.02$), *keep her busy to keep her mind off problems*—MHFA_i9 ($b = -0.79$; $p < 0.001$; $OR = 0.45$), and *encourage her to become more physically active*—MHFA_i10 ($b = 1.37$; $p < 0.001$; $OR = 3.94$).

Table 4. Logit coefficients of the binary logistic regression model of the variable: year of study according to the sociodemographic variables, variables related to MHL, beliefs, stigma, and HL (N = 478).

Variables	B	SE	Wald	df	p	OR	Lower	Upper
Age crisis	−1.18	0.32	13.872	1	<0.001	0.31	0.17	0.57
Nervous breakdown	−0.57	0.26	4.993	1	<0.05	0.56	0.34	0.93
MHFA_i2 (helpful)	−3.31	0.80	17.069	1	<0.001	0.04	0.01	0.18
MHFA_i5 (helpful)	0.71	0.25	7.916	1	<0.01	2.02	1.24	3.31
MHFA_i9 (helpful)	−0.79	0.25	10.224	1	<0.001	0.45	0.28	0.74
MHFA_i10 (helpful)	1.37	0.31	19.592	1	<0.001	3.94	2.15	7.23
BtMIq2	−1.23	0.24	26.123	1	<0.001	0.29	0.18	0.47
BtMIq3	0.56	0.24	5.235	1	<0.05	1.74	1.08	2.80
BtMIq5	0.47	0.17	7.406	1	<0.01	1.60	1.14	2.24
BtMIq7	0.47	0.21	5.181	1	<0.05	1.60	1.07	2.41
Perc. stigma (weak-not-sick)	0.35	0.14	6.512	1	<0.01	1.42	1.09	1.86
Constant	−3.94	1.40	7.945	1	0.005	0.019		

Regarding the beliefs, the predictors were the belief in inferiority and inability to live in society—BtMIq2 ($b = -1.23$; $p < 0.001$; $OR = 0.29$), belief in social integration and involvement—BtMIq3 ($b = 0.56$; $p < 0.05$; $OR = 1.74$), belief in efficacy of psychotropic drugs—BtMIq5 ($b = 0.47$; $p < 0.01$; $OR = 1.60$), and belief in efficacy of treatment and rehabilitation ($b = 0.47$; $p < 0.05$; $OR = 1.59$). The last variable to enter the model was the weak-not-sick subscale of the perceived stigma scale ($b = 0.35$; $p < 0.01$; $OR = 1.42$).

Model fit was assessed using pseudo-R-square measures: the Cox–Snell and Nagelkerke R-square. The scores indicated good model fit: $R^2_{\text{Cox-Snell}} = 0.33$ and $R^2_{\text{Nagelkerke}} = 0.45$. The area under the curve (AUC) was 0.86, indicating very good discrimination and a strong model.

4. Discussion

The following discussion considers that the nursing students who participated in this study reported a high level of familiarity with mental illness, particularly through

family members and/or close friends with such diagnoses. Half of the sample reported having sought or received treatment for mental health problems. Although traditionally viewed as a facilitator of MHL, this familiarity may paradoxically hinder it—either due to negative experiences with mental health services or professionals or as a result of excessive normalization stemming from close exposure to individuals with mental illness (family/friends). This normalization can lead to the trivialization of symptoms and reduce the capacity to recognize problems and disorders.

As a component of MHL, the ability to recognize a mental health problem or disorder is a prerequisite for seeking help [1–3]. The findings in this study are consistent with previous research [7–9,40], particularly regarding the frequency of labels considered appropriate. While the prevalence of the *depression* label was over 80.0% in both academic years, the most frequently chosen labels were *stress*, *anxiety*, and *psychological, mental, and emotional problems*.

A careful reading of the vignette indicates that the symptoms described are consistent with a diagnosis of depression according to the DSM-5 criteria [28]. Although depression may co-occur with anxiety, they are distinct clinical conditions.

Two labels generally considered inappropriate—*age crisis* and *nervous breakdown*—showed significant differences between first- and fourth-year students, with the *age crisis* label being more frequent ($h > 0.50$). *Anorexia* was also a frequent label.

The *nervous breakdown* label was more frequent among first-year students (approximately 4/5 of the sample), but it is still used by more than half (>60.0%) of fourth-year students. This non-specific label is commonly used in everyday language to describe any change in mental health. In this context, these labels hinder accurate identification.

While the percentage of students who correctly identified depression increased from 12.0% in the first year to 27.3% in the fourth, this result can be interpreted in two ways. On the one hand, the overall rate of accurate identification of depression remains modest (18.3%), consistent with findings from previous studies [41–43]. On the other hand, progression through the nursing program appears to improve MHL, albeit to a lesser extent than desirable [44,45].

Regarding the component of knowledge on how to provide first aid and support to others, the findings are consistent with those reported in previous studies [41–43]. Active listening was favored and perceived by nearly all participants as useful in the process of helping others, which is aligned with the guidelines of the MHFA program [46,47]. It is also encouraging that a substantial majority of students considered it helpful to *suggest she seek professional help and make an appointment for her to see a GP with her knowledge*. Similar findings have been reported in other studies [7–9,40–43,47].

Among other positive or help-seeking interventions, *Ask her whether she is feeling suicidal* stands out. This result has also been reported in several studies conducted across diverse contexts [7–9,40,46]. Slightly more than one-third of participants perceived this strategy as helpful. This finding is concerning, as many individuals—including nursing students, students from other academic programs, and even health professionals—consider this action to be harmful or fail to recognize its importance. This hesitation is commonly rooted in the misconception that directly asking someone about suicidal thoughts may trigger or encourage such behavior [40].

For strategies such as *talk to her firmly about getting her act together*, *not acknowledge her problem*, *ignoring her*, and *keep her busy to keep her mind off problems*, the results indicate a substantial effect of training. The findings suggest that students' academic progression can improve MHL, particularly in challenging myths and stereotypes associated with mental illness. This finding is consistent with previous research [46].

Concerning beliefs about mental illness, individuals affected by it, and even the associated social stigma, most studies indicate that students tend to initially endorse attitudes that foster stigma and social distancing [48,49].

In the present study, however, the scores related to beliefs, as well as personal and perceived stigma, do not suggest that nursing students hold particularly negative or stigmatizing views of mental illness. These findings are partly consistent with previous research [50–53].

Mean scores reflect consistency with positive beliefs and inconsistency with negative ones. As shown in previous studies [52,53], students' progression through the nursing program seems to reduce negative beliefs and promote positive ones. This effect was especially significant for the *belief in inferiority and inability to live in society* (effect size = 0.69).

Participation in the program contributed to greater endorsement of positive beliefs about mental illness (belief in social integration and involvement, belief in efficacy of psychotropic drugs, belief in efficacy of treatment and rehabilitation), while also reducing negative beliefs (belief in dangerousness and belief in chronicity/incurability). These changes suggest that evidence-based training within nursing education helps challenge common myths and stereotypes. This shift is supported by academic exposure to mental health and psychiatric content, including clinical placements, which progressively encourage students to reconsider pre-existing beliefs.

In addition to the negative beliefs previously discussed, systematic literature reviews [48,49] have shown that young people often demonstrate limited knowledge of mental health issues, hold negative beliefs, and have high levels of personal stigma. They do not see depression as an illness but rather as a sign of personal weakness and say that people suffering from depression can even be dangerous to themselves and others.

In the present study, both personal and perceived stigma scores were lower among fourth-year students than first-year students, which suggests that attending the program can reduce social stigma, a finding that aligns with previous research [54,55].

Regarding perceived barriers to help-seeking, research shows that a significant number of young people are reluctant to seek mental health help [1–3,56]. The most frequently cited reason is personal stigma [57], followed by limited access to mental health services and professionals. Nursing students are no exception [58], and the results of this study are consistent with the evidence [57–59]. Participants reported higher scores for personal barriers to help-seeking than for access to professional help. Fourth-year students demonstrated a reduced influence of personal factors, while first-year students were more affected by access-related personal factors.

Research on positive mental health literacy (MHL) among nursing students remains limited, largely because this approach is relatively new compared to traditional MHL approaches stemming from Jorm's work [6]. Nonetheless, the findings from this study indicate overall satisfactory results, with high average scores—particularly among fourth-year students—indicating good knowledge of MHL in both academic years.

HL is also recognized as an important variable for nursing students, particularly in relation to how HE institutions incorporate HL into their curricula [60]. Existing literature suggests that between 35.0% and 45.0% of nursing students have inadequate or even problematic levels of HL [61–64]. In this study, these figures were around 50% of the sample, which is a worrying result for nursing students.

Finally, the findings from the model suggest that the nursing program has a mitigating effect on factors associated with students' low MHL. Specifically, being a fourth-year student is associated with a 69% lower likelihood of selecting the *age crisis* label and a 44.0% lower likelihood of reporting the *nervous breakdown* label when compared to first-year students.

With regard to MHFA strategies, fourth-year students were 96% less likely to find the strategy *talk to her firmly about getting her act together* helpful and 55.0% less likely to find the strategy *keep her busy to keep her mind off problems* helpful when compared to first-year students.

Fourth-year students were 102.0% more likely to find the strategy *ask her whether she is feeling suicidal* helpful and 294.0% more likely to find the strategy *encourage her to become more physically active* helpful compared to first-year students.

In terms of beliefs, the greater the student's *belief in inferiority and inability of patients to live in society*, the less likely they were to be in the fourth year. For each one-point increase in the *belief in social integration and involvement of patients*, the likelihood of being a fourth-year student increased by 74%; for each one-point increase in the *belief in efficacy of psychotropic drugs*, the likelihood of being a fourth-year student increased by 60.0%; for each one-point increase in the *belief in efficacy of treatment and rehabilitation*, the probability of the student being in the fourth year increased by 60.0%; and, finally, for each one-point increase in *perceived stigma*, specifically in the *weak-not-sick* dimension, the likelihood of being a fourth-year student increased by 42.0%.

These findings support the idea that, as students progress through the program, positive beliefs become stronger and more balanced, while negative beliefs become less prevalent. The data also suggest that the program plays a key role in reducing negative beliefs and in increasing students' knowledge of MHFA. Additionally, students demonstrate improved recognition of symptoms and a greater appreciation of their importance, which is particularly evident in the decline in the use of inappropriate labels that often perpetuate stigma surrounding mental illness.

It is important to note that the fourth-year students underwent theoretical training in psychiatry and mental health, as well as clinical training in psychiatry, during the previous academic year (third year), a factor that may contribute to the interpretation of these results.

5. Conclusions

The results of this study offer a valuable contribution to HE institutions focused on nursing education. They highlight the importance of investing in MHL from the onset of academic training, as this promotes MH, well-being, and academic success in its multiple dimensions.

In line with the conceptual definition of MHL, which encompasses both knowledge and beliefs about mental disorders, this study reveals two key findings. First, there is no indication of a strong social stigma among students regarding mental illness, which is encouraging for future healthcare professionals whose daily work will focus on human relationships. Second, there is a limited ability to recognize depression, potentially reflecting a devaluation of the symptoms. This is particularly concerning given that half of the students have inadequate or problematic MHL levels.

Although participants had some knowledge of MHFA strategies, a significant proportion reported being unfamiliar with them. This finding highlights the need to implement MHFA programs that reinforce specific components where knowledge gaps exist. The results also underscore the importance of integrating MHL into nursing curricula.

Future research should assess MHL across all academic years and explore other variables, such as students' MH status and well-being.

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Data Availability Statement: Data supporting the findings of this study are available from the corresponding author upon request.

Public Involvement Statement: There was no public involvement in any aspect of this research.

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Abbreviations

The following abbreviations are used in this manuscript:

BLR	binary logistic regression analysis
DSM	Diagnostic and Statistical Manual of Mental Disorders
HE	higher education
HL	health literacy
MH	mental health
MHFA	mental health first aid
MHL	mental health literacy

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Article

Nursing Student Satisfaction Scale: Evaluation of Measurement Properties in Nursing Degree Programs

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Abstract: Background/Objectives: Satisfaction among undergraduate nursing students plays a crucial role in student retention, helping to mitigate nursing shortages in the workforce, reduce academic costs, and uphold universities' reputations. The Nursing Student Satisfaction Scale (NSSS) measures three theoretical domains: Professional Social Interaction, Curriculum and Teaching, and Learning Environment. Although the NSSS has demonstrated reliability and validity with respect to American nursing students, its psychometric properties have not been tested on a population of Italian nursing students. Therefore, this study aimed to determine the reliability and validity of the NSSS in regard to Italian nursing students. **Methods:** A multicenter observational study was conducted on undergraduate nursing students in Central Italy. A confirmatory approach was used to assess structural validity. The construct validity, internal consistency, test–retest reliability, and responsiveness to change of the NSSS were evaluated using correlation analyses, reliability coefficients, and measurement error determination. **Results:** Confirmatory factor analysis supported the three-factor first-order structure of the NSSS as well as the presence of a single second-order factor. Reliability was adequate for all the coefficients computed (with values ranging from 0.924 to 0.974). Construct validity was supported. The measurement error was adequate. **Conclusions:** The NSSS exhibited robust measurement properties, confirming its validity and reliability as an instrument for assessing nursing student satisfaction in the Italian context. Furthermore, our results indicate that, after the translation and cultural adaptation of the scale, the construct of nursing student satisfaction remains consistent with the theoretical model.

Keywords: satisfaction; nursing student; nursing education; validity; reliability; Nursing Student Satisfaction Scale (NSSS)

1. Introduction

Satisfaction within an academic context is a complex, multidimensional [1–3], and dynamic construct [4,5]. Student satisfaction can be defined as a subjective assessment

made by a student and determined by the gap between the student's expectations and their perception of their educational experiences [6,7]. According to Chen et al. [4], student satisfaction is the result of a dynamic process influenced by the interaction between students, faculty, and the educational environment, structured around four core dimensions: curriculum, faculty, social interaction, and learning environment.

Student satisfaction is a recognized indicator of program quality in higher education [8] and a key component in monitoring and continuously improving educational quality, as outlined by the European Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) [9]. Universities that engage in continuous quality assurance activities should meet students' expectations and needs [10], as these aspects significantly influence student retention rates, a critical challenge, particularly in nursing degree programs due to the high academic demands, emotional burden, and the complexity of clinical training, which may lead to increased stress levels and withdrawal intentions [11, 12]. Several studies have highlighted that student satisfaction is associated with factors that promote retention in nursing education, including perceived institutional and peer support, the presence of effective and stimulating learning environments, and high-quality clinical experiences [13–15]. Satisfied students are more likely to achieve both academic and social integration, which have been identified as protective factors with respect to program attrition. Such integration not only contributes to individual success but may also help mitigate the broader issue of nursing workforce shortages, a growing concern at the national and international level [16,17]. Furthermore, program attrition entails significant costs for educational institutions, leading to suboptimal utilization of available resources and potentially damaging the reputation of nursing programs, especially since high dropout rates are perceived as indicators of inadequate educational quality [13]. On the contrary, nursing student satisfaction contributes to enhancing students' self-confidence and self-efficacy, which are essential for the development of knowledge, clinical competencies, and academic performance [18,19]. Additionally, satisfaction is associated with increased motivation and engagement, factors widely recognized as fundamental drivers of effective learning processes and academic achievement [20].

Currently, the available instruments for measuring nursing student satisfaction often lack alignment with theoretical reference models and fail to follow a rigorous methodology for their development and validation [21]. A systematic review conducted by Rossini et al. [22] has identified five instruments used to assess nursing student satisfaction in nursing education. However, the validation processes of these instruments rarely involved the employment of a confirmatory approach to assess structural validity, and none of the studies examined measurement error or criterion validity. Despite these methodological limitations, Rossini et al. [22] concluded that the best available instrument for measuring nursing student satisfaction was the Nursing Student Satisfaction Scale (NSSS), originally developed in 2012 by Chen et al. [4], due to its solid theoretical model and the rigor of its development process.

The NSSS was developed and tested using 303 American nursing students [4]. Its construct validity was tested using Principal Component Analysis (PCA), while its internal consistency reliability was evaluated through Cronbach's alpha. The results showed a three-factor factorial structure: Professional Social Interaction (which involves interpersonal relationships, interaction, respect, trust, and active participation in the teaching–learning process in educational settings), Curriculum and Teaching (regarding faculty qualifications, curriculum structure and coherence, teaching methodologies, and the alignment between theory and practice), and Environment (which concerns the teaching resources and facilities, along with the procurement and upkeep of equipment). An adequate internal consistency reliability (a Cronbach's alpha ranging from 0.86 to 0.93 for the three factors) was shown [4].

In addition, Hirsch and colleagues [23] tested the NSSS on a sample of 123 Brazil undergraduate nursing students. Its construct validity was tested by using exploratory factorial analysis (EFA), while internal consistency reliability was tested by using Cronbach's alpha coefficient. The EFA results showed a three-factor factorial structure (curriculum and teaching; professional social interaction; and learning environment factors) after eight items were deleted. One item ("Program prepared me to take the NCLEX-RN") was reformulated to culturally adapt it to the context of Brazilian students. The Cronbach's alpha ranged from 0.88 to 0.93.

To the best of our knowledge, no previous study has evaluated the construct validity of the NSSS for a sample of undergraduate nursing students by using a confirmatory statistical approach, which is recommended for testing hypothesized factorial structures and validating theoretically based measurement models. Unlike exploratory methods such as Exploratory Factor Analysis (EFA) or Principal Component Analysis (PCA), confirmatory approaches allow for theory-driven validation by testing pre-specified factor structures according to the theories, assessing model fit through standardized indices, and generating robust and replicable evidence of construct validity across different samples [24]. Furthermore, no prior research has investigated the internal consistency reliability of the NSSS while accounting for its multidimensional structure. Estimating reliability using coefficients specifically designed for multidimensional scales (i.e., those that incorporate factor loadings and inter-factor correlations) yields more precise and theoretically appropriate estimates than the traditional unidimensional indices previously tested.

In this context, measuring nursing student satisfaction through reliable and valid instruments becomes crucial not only for monitoring educational quality but also for informing targeted interventions aimed at improving learning environments, reducing attrition, and ultimately contributing to the preparation of competent nursing professionals capable of responding to current and future healthcare challenges.

Therefore, in this study, we aimed to test the psychometric characteristics (structural validity, construct validity, and internal consistency reliability) of the NSSS using a sample of undergraduate nursing students.

2. Materials and Methods

2.1. Design

A multicenter observational study was performed. This study is reported in compliance with the EQUATOR guidelines, specifically following the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for cross-sectional studies [25].

2.2. Participants and Setting

A convenience sample of undergraduate nursing students was recruited from multiple educational sites offering nursing degree programs in Central Italy. Eligible participants were those enrolled regularly in the program, with no restrictions based on the year of enrollment, and those had provided informed consent to participate in this study. The students who had expressed an intention to change their field of study were excluded.

2.3. Data Collection

Data collection was carried out during scheduled classroom sessions at the end of the second semester of the academic year, allowing students to provide a more comprehensive and informed evaluation of their learning experience; each session lasted an average of 30 min and was held between April and May 2024. Data collection was carried out by research assistants who were all PhD students in nursing. These assistants were not

involved in the educational activities of the participants and were adequately trained by the research team in standardized data collection procedures. During the administration of the questionnaire, the research assistants were present and available to respond to any questions or clarify potential doubts raised by the participants, thereby ensuring consistency and accuracy in data collection.

2.4. Measurements

The NSSS [4] is a self-report measure designed to evaluate nursing student satisfaction. It consists of 30 items scored on a 6-point Likert-type scale (ranging from 1, “not satisfied”, to 6, “very satisfied”) grouped into three factors that measure “Professional Social Interaction” (9 items), “Curriculum and Teaching” (13 items), and “Environment” (7 items). Cronbach’s alphas were 0.91, 0.90, and 0.86, for Professional Social Interaction, Curriculum and Teaching, and Environment, respectively, while the value was 0.93 for the overall scale.

The Italian version was translated from the original English version in accordance with the Principles of Good Practice for the Translation and Cultural Adaptation Process for Patient-Reported Outcomes (PRO) measures [26]. The process commenced with two bilingual translators independently translating the instrument from English to Italian. A third translator, in collaboration with the research team, reviewed and harmonized the translations to ensure consistency and accuracy. Subsequently, two additional translators independently back-translated the reconciled Italian version into English to verify its accuracy. The research team then carefully reviewed and refined the back-translated version, resolving any ambiguities in collaboration with the translators. According to a previous study [23], we used a 5-point Likert scale ranging from 1 (“very dissatisfied”) to 5 (“very satisfied”), where higher scores indicate higher nursing student satisfaction.

The Academic Nurse Self-Efficacy scale (ANSEs) [27] is a self-report instrument used to evaluate the academic self-efficacy of nursing students. It consists of 14 items grouped into four factors: auto-regulatory behavior (4 items), external emotion management (4 items), collegiality (3 items), and internal emotion management (3 items). The scale has good reliability, with Cronbach’s alpha coefficients of 0.72, 0.83, 0.73, and 0.80 for external emotion management, collegiality, and internal emotion management, respectively [27]. The total scale has a Cronbach’s alpha of 0.84. In this study, the ANSEs was used to test the construct validity of the NSSS.

Socio-demographic variables such as age, gender, year of enrollment, marital status, number of children, housing situation, employment status, and whether a nursing degree was the participant’s first choice were collected using a questionnaire specifically developed by the research team to characterize the sample and provide context for the interpretation of the factorial analysis.

2.5. Ethical Considerations

This study was carried out in accordance with the principles outlined in the Declaration of Helsinki and in compliance with current clinical trial regulations. The research protocol received approval from the Ethics Committee (No. 254/22). All potential participants were thoroughly informed about the study’s objectives and assured of the confidentiality of their data. Written informed consent was obtained from all participants prior to their involvement in the study.

2.6. Data Analysis

Descriptive statistics, including frequency, percentage, mean, and standard deviation (SD) coefficients where appropriate, were calculated to characterize the sample and the NSSS items. The normality of the NSSS items was assessed by evaluating kurtosis and

skewness [28]. In line with the recent literature, the analysis began with an assessment of the scale's structural validity, followed by an evaluation of its reliability [29].

A confirmatory approach was used to test the structural validity of the scale. Specifically, a confirmatory factor analysis (CFA) was conducted. Due to the non-normal distribution of the NSSS items, the maximum likelihood robust (ML-r) estimator was used for parameter estimation [30]. According to the structural model proposed by Chen during the development of the NSSS, a three-factor model ("Professional and Social Interaction", "Curriculum and Teaching", and "Environment") was tested. Additionally, considering the correlations between factors, a second-order model was hypothesized. Model fit was examined by using the following fit indices: comparative fit index (CFI), Tucker and Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR) [31,32]. The chi-square statistics were also considered together with the indices above. The goodness-of-fit values were interpreted in accordance with recommendations from the existing literature [33,34].

The construct validity of the NSSS was assessed through hypothesis testing by examining the correlations among the scales. Pearson's correlation coefficient was employed to test the hypotheses. Correlation coefficients were interpreted as follows: values between 0.10 and 0.29 indicated weak correlations, values between 0.30 and 0.50 indicated moderate correlations, and values greater than 0.50 indicated strong correlations [35]. Several hypotheses were posed: (i) the scores of each factor comprising the NSSS will be positively correlated; (ii) there will be positive correlations between the scores of ANSEs and each NSSS factor. The rationale underlying these hypotheses is that self-efficacy contributes to making a student's overall educational experience more satisfying by strengthening the key variables that influence the learning process [36].

The internal consistency reliability of the NSSS was assessed by calculating the composite reliability coefficient for each factor [37]. The global reliability index for multidimensional scales [38], a more appropriate reliability coefficient that considers the scale's multidimensionality, was also computed to test the reliability of the overall NSSS. Values ≥ 0.70 were considered adequate [39].

To assess the stability of the NSSS, test-retest reliability was evaluated by administering the instrument to a subset of nursing students over a two-week interval. Intraclass correlation coefficients (ICCs) were calculated for each scale using a two-way random-effects model. An ICC value of ≥ 0.75 was interpreted as indicating good reliability, while a value of ≥ 0.90 was considered indicative of excellent reliability [40].

To assess responsiveness to change, the precision of the NSSS instrument was evaluated by calculating the measurement error, specifically the standard error of measurement (SEM) and the smallest detectable change (SDC). The SEM was determined using the following formula: standard deviation (SD) $\times \sqrt{(1 - \text{reliability coefficient})}$ [41], where the SD refers to the NSSS score, and the reliability coefficient corresponds to the composite reliability. Lower values of SEM and SDC indicate greater precision of the instrument.

Statistical analyses were conducted using SPSS Version 26, with the exception of the CFA, which was performed using Mplus Version 8.4 [42].

3. Results

3.1. Characteristics of the Sample

Table 1 presents the characteristics of the total sample (N = 724). In brief, the students had a mean age of 23.6 (± 5.7) years, were mostly female (74.0%), were enrolled in the first year of the nursing program (36.2%), were single (82.2%), did not have children (95.0%), lived with other students (56.1%), were unemployed (87.3%), and reported that nursing was their first choice (68.0%).

Table 1. Socio-demographic characteristics of the undergraduate nursing students (N = 724).

Variable	N (%)
Sex	
Female	536 (74.0)
Male	188 (26.0)
Year of the course attended	
First	262 (36.2)
Second	248 (34.3)
Third	214 (29.6)
Marital status	
Single	595 (82.2)
Married	122 (16.9)
Divorced	7 (1.0)
Have Children	
No	688 (95.0)
Yes	36 (5.0)
Housing situation	
Alone	44 (6.1)
Living with other students	406 (56.1)
Living with family members	274 (37.8)
Working condition	
Unemployed	632 (87.3)
Employed	92 (12.7)
Nursing was the first choice of degree program	
No	232 (32.0)
Yes	492 (68.0)
	Mean ($\pm$ SD)
Age	23.56 (5.66)

Legend. SD, standard deviation.

3.2. Descriptive Analysis of the Items of the Nursing Student Satisfaction Scale (Italian Version)

Table 2 presents the characteristics of the sample and the items of the NSSS. The mean score of each item ranged from 2.64 to 3.91. The lowest mean scores (indicating lower satisfaction) were found for the following items: #16 (2.64, SD 1.22), #12 (2.80, SD 1.25), #20 (2.89, SD 1.25), and #7 (2.87, SD 1.25). The highest means scores (indicating higher satisfaction) were found for the following items: #23 (3.91, SD 0.86), #9 (3.66, SD 0.97), #2 (3.64, SD 1.00), and #25 (3.60, SD 0.95). Three items had kurtosis indices $> |1|$, showing the non-normality of item distribution.

Table 2. Description of the items of the Italian version of the Nursing Student Satisfaction Scale (n = 724).

Items	M	SD	Skewness	Kurtosis
1. I Had positive professional interactions with my faculty	3.41	0.96	−0.54	0.15
2. I Was respected by the nursing staff in the clinical setting	3.64	1.00	−0.63	−0.01
3. Faculty was a positive role model of professional nursing	3.47	1.00	−0.52	−0.09
4. The Program progressed logically from simple to complex concepts	3.46	0.99	−0.55	−0.04

Table 2. Cont.

Items	M	SD	Skewness	Kurtosis
5. I Felt trusted by my nursing faculty	3.57	0.97	−0.60	0.15
6. Syllabus clearly described what was expected by me	3.36	1.05	−0.38	−0.44
7. Sufficient equipment in the nursing lab	2.97	1.27	−0.09	−1.00
8. Faculties collaboratively worked each other	3.18	1.04	−0.27	−0.30
9. Faculty prepared me to become a professional nurse	3.66	0.97	−0.75	0.38
10. Program prepared me to take the professional habilitation	3.39	1.04	−0.56	−0.08
11. I Felt comfortable asking questions of faculty	3.42	1.11	−0.54	−0.36
12. Classroom environment was comfortable	2.80	1.25	−0.01	−1.08
13. I was respected by the faculty	3.45	1.04	−0.53	−0.18
14. Faculty makes their topics interesting	3.36	0.95	−0.47	0.07
15. Equipment in the nursing lab was in good repair	3.14	1.21	−0.29	−0.76
16. Library resources were adequate for my learning needs	2.64	1.22	0.13	−0.87
17. Faculty encouraged my learning	3.15	1.07	−0.32	−0.42
18. Program enhanced my problem solving skills	3.34	1.00	−0.34	−0.26
19. Faculty effectively explained essential concepts	3.55	0.94	−0.67	0.30
20. Nursing lab had ample space	2.89	1.25	−0.11	−0.97
21. Faculty were fair/unbiased in their assessment of my learning	3.06	1.15	−0.29	−0.71
22. Program helped me improve my communication skills	3.45	1.00	−0.62	0.09
23. Faculty were knowledgeable	3.91	0.86	−0.84	1.11
24. Equipment in the nursing lab was up to date	3.01	1.23	−0.16	−0.84
25. Program was relevant to current nursing practice	3.60	0.95	−0.68	0.31
26. Classrooms had a wide space	3.19	1.14	−0.39	−0.63
27. Faculty effectively used technology to enhance my learning	3.21	1.01	−0.32	−0.26
28. I was prepared to use the nursing process in my clinical practice	3.52	0.98	−0.67	0.29
29. Faculty had reasonable expectations of my performance	3.28	0.98	−0.45	0.18
30. I felt confident about my ability to practice in clinical	3.55	1.00	−0.58	0.00

Legend. M, mean; SD, standard deviation.

3.3. Testing the Structural Validity of the Nursing Student Satisfaction Scale (Italian Version)

According to the structural model identified in previous studies conducted by Chen et al. [4], a three-factor model was tested, namely, Professional Social Interaction (#3, #21, #29, #13, #2, #11, #7#, #1, and #5), Curriculum and Teaching (#18, #23, #8, #27, #19, #14, #22, #28, #30, #10, #9, #25, #6, and #4), and Environment (#7, #15, #20, #24, #26, #16, and #12).

The goodness-of-fit indices of this model were adequate, as shown by the following metrics: χ^2 (401, N = 724) = 1112.600, $p < 0.001$, CFI = 0.940, TLI = 0.935, RMSEA = 0.042 (90% CI = 0.046–0.053, $p < 0.605$), and SRMR = 0.042. An inspection of the modification indices reveals excessive residual covariance among the following pairs of items: #15 and #7; #18 and #17; #26 and #12; and #28 and #9. We specified these covariances, and the fit model improved considerably: χ^2 (398, N = 724) = 976.823, $p < 0.001$, CFI = 0.951, TLI = 0.946, RMSEA = 0.045 (90% CI = 0.041–0.048, $p < 0.992$), and SRMR = 0.042. All factor loadings were significant and greater than 0.480. Given the significant correlations among the three factors (ranging from 0.572 to 0.902, $p < 0.01$), a second-order model was specified, resulting in fit indices comparable to those of the first-order model. This finding suggests that the NSSS exhibits a three-factor structure at the first-order level while demonstrating one-dimensionality at the second-order level (Figure 1).

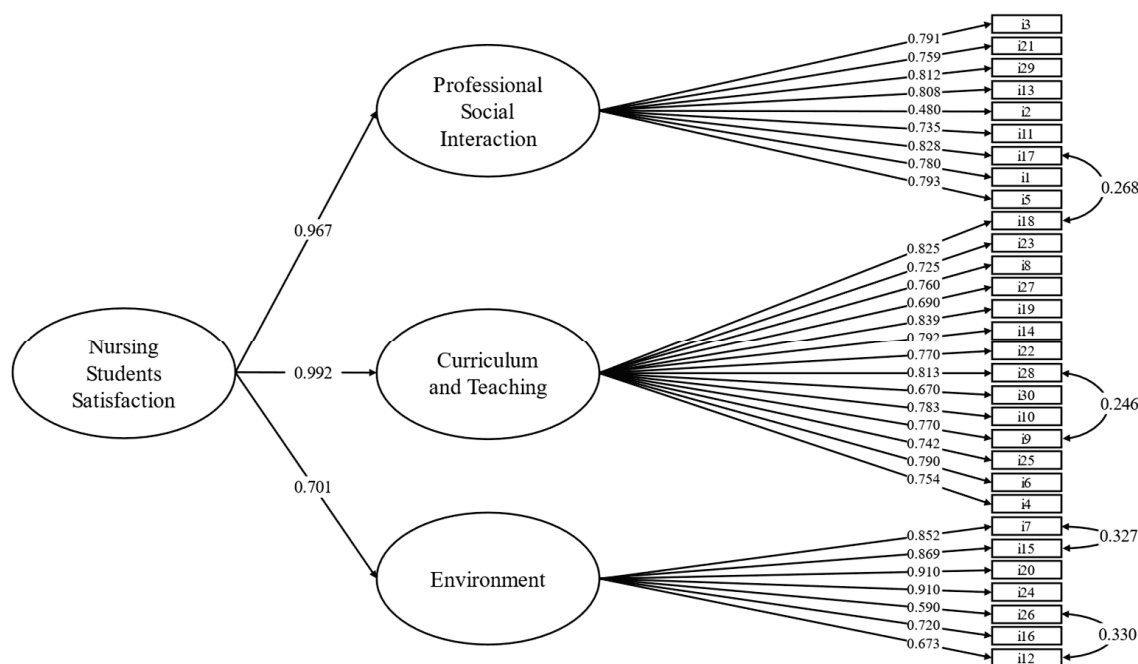


Figure 1. Graphical representation of the confirmatory factor analysis of the Nursing Student Satisfaction Scale (N = 721).

Construct Validity

Construct validity was assessed by examining the patterns of correlations among the three factors of the NSSS and between each factor and the total NSSS score. As expected, the scores of the three NSSS factors presented statistically significant and positive correlations between themselves and the NSSS total score; the correlations ranged from 0.572 to 0.969, with $p < 0.01$. These results support the internal structure of the instrument, confirming that the three dimensions are related but distinct components of the overarching construct measured by the NSSS.

Moreover, as theoretically expected, the NSSS total score exhibited statistically significant positive correlations with the ANSEs scores, with coefficients ranging from 0.217 to 0.355 ($p < 0.01$) (Table 3). This result suggests that higher levels of perceived stress among nursing students are associated with higher levels of self-reported academic self-efficacy among undergraduate nursing students.

Table 3. Results regarding the construct validity of the Nursing Student Satisfaction Scale (N = 724 nursing students).

Variable	1	2	3	4
1. Professional and Social Interaction	-			
2. Curriculum and Teaching	0.902			
3. Environment	0.572	0.602		
4. NSSS	0.946	0.969	0.726	
5. ANSEs	0.355	0.346	0.217	0.347

Legend. NSSS, Nursing Student Satisfaction Scale; ANSEs, Academic Nursing Self-efficacy scale. Note. All correlations are significant at the 0.01 level (two-tailed).

3.4. Reliability of the Nursing Student Satisfaction Scale (Italian Version)

Internal Consistency Reliability and Stability

The internal consistency reliability values computed with the composite reliability coefficients of the three NSSS factors were all adequate and equal to 0.924, 0.951, and 0.926

for the Professional and Social Interaction, Curriculum and Teaching, and Environment factors, respectively (Table 4). The global reliability index for multidimensional scales was adequate and equal to 0.974. The reliability of the NSSS was evaluated through test–retest analysis by re-administering the instrument to a subsample of 50 nursing students two weeks after the initial administration. High consistency between the two administrations was found, as indicated by the intraclass correlation coefficient (ICC) of 0.933.

Table 4. Internal consistency reliability of the Nursing Student Satisfaction Scale.

	Composite Reliability Coefficient	Global Reliability Index for Multidimensional Scales
NSSS		0.974
Professional and Social Interaction	0.924	
Curriculum and Teaching	0.951	
Environment	0.926	

Legend. NSSS, Nursing Student Satisfaction Scale.

3.5. Testing the Measurement Errors of the Nursing Student Satisfaction Scale (Italian Version)

The measurement errors of the NSSS (Italian version) were examined by calculating the SEM and the SDC, which are essential indicators of the precision and responsiveness of a measurement instrument. All the SEM values fell within acceptable psychometric thresholds, supporting the reliability of the scale. Specifically, the SEMs were 0.22 for Professional and Social Interaction, 0.17 for Curriculum and Teaching, 0.26 for Environment, and 0.11 for the overall NSSS score. Similarly, the SDC values were adequate. Specifically, the SDCs were 0.47, 0.73, and 0.31 for the Professional and Social Interaction, Curriculum and Teaching, and Environment factors, respectively, and 0.62 for the overall NSSS.

4. Discussion

The aim of this study was to test the psychometric properties of the NSSS, an instrument designed to measure nursing student satisfaction, by examining its structural validity, construct validity, and internal consistency reliability. To the best of our knowledge, this is the first study to test the factor structure of the NSSS using a confirmatory statistical approach. The findings indicate that the NSSS exhibits strong validity, confirming the multidimensional nature of nursing student satisfaction, which comprises the factors Professional and Social Interaction, Curriculum and Teaching, and Environment, in line with the theoretical model originally proposed by Chen et al. [4]. These results are particularly significant as they demonstrate the stability of the factorial structure following the translation and cultural adaptation process, thereby reinforcing the cross-cultural validity and conceptual coherence of the NSSS. Furthermore, we found evidence of a second-order factorial structure, further supporting the theoretical robustness of the instrument and its use of a total score, which serves as a concise yet comprehensive indicator for evaluating nursing student satisfaction in nursing education contexts.

As for structural validity, we found an excessive residual variance between four pairs of items: #15 and #7, #18 and #17, #26 and #12, and #28 and #9. This suggests that nursing students consider these elements to be related. In particular, #15 (Equipment in the nursing lab was in a good state of repair) and #7 (Sufficient equipment in the nursing lab), as well as #26 (Classrooms had ample space) and #12 (Classroom environment was comfortable), exhibit semantic redundancy, as their wording is very similar, particularly due to the repetition of terms such as “equipment” and “laboratory”. Items #28 (Prepared me to use

the nursing process in my clinical practice) and #9 (Prepared me to become a professional nurse) exhibit a conceptual overlap, as the nursing process is widely recognized as a key competency of the nursing profession. Consequently, effective preparation in applying the nursing process is inherently linked to the development of the skills required to assume the professional role of a nurse. Finally, the covariance between item #17 (Faculty encouraged my learning) and item #18 (Program enhanced my problem solving skills) can be explained by the relationship between instructional support and skill development [43]. Students who perceive that they have greater support from faculty are more likely to develop higher-order cognitive skills, thereby explaining the covariance observed. In addition, the “proximity effect” [44], which refers to the influence that the distance between items exerts on participants’ responses to a questionnaire, may have increased the shared variance between the two items. While residual correlations typically suggest potential redundancy and could indicate a need for item reconsideration or removal, this was not deemed necessary in the present study. Indeed, all the items in these pairs demonstrated strong standardized factor loadings, ranging from 0.590 to 0.673, even after correlated residuals were considered, clearly indicating that each item serves as an important and distinct indicator of the underlying construct. Consequently, removing these items could adversely affect the accuracy of construct measurement for the student population studied and is therefore not recommended.

As for the construct validity of the NSSS, several hypotheses were tested. Positive correlations were observed between the three factors and the overall scale, aligning with the theoretical framework proposed by Chen. Furthermore, the results also confirmed our hypothesis that the ANSE would be positively associated with each factor of the NSSS. This finding aligns with prior theoretical and empirical research. According to Pajares and Schunk [45], self-efficacy plays a fundamental role in enhancing individual well-being and motivation, particularly in academic contexts. Self-efficacy traits are known to influence the degree of stress and anxiety experienced while engaging in tasks [46], which may also apply to students’ engagement in academic programs. These results reinforce the relevance of self-efficacy as a determinant of perceived satisfaction in nursing education and confirm the convergent validity of the NSSS.

Our findings confirm that the NSSS demonstrates good reliability in terms of internal consistency, as measured by indices that account for both the factorial structure and multidimensionality of the scales, specifically the composite coefficients and the global reliability index for multidimensional scales. To the best of our knowledge, no previous studies have evaluated the reliability of the NSSS using these appropriate reliability coefficients. These findings confirm that the NSSS is psychometrically sound, ensuring that it accurately and consistently captures the satisfaction of nursing students. In addition, our findings demonstrate that the NSSS possesses strong test–retest reliability, making it a reliable instrument for repeated use in research and educational applications. Finally, the SEM and SDC values of the NSSS indicate an acceptable level of measurement error and that the instrument is capable of detecting significant changes.

These findings support the applicability of this scale in both research and educational contexts for assessing and monitoring nursing student satisfaction. Moreover, considering that student satisfaction may also reflect perceptions of professional identity formation and career development support, the use of this measure could offer valuable insights into how educational experiences influence students’ readiness for future nursing roles. This is in line with the findings of Kajander-Unkuri et al. [47], who showed that satisfaction with nursing education among recent graduates is positively associated with job satisfaction and retention in the nursing profession.

Limitations and Strengths

Several limitations should be considered when interpreting these findings. First, the use of a convenient and balanced sample obtained through multicenter enrollment resulted in a predominance of female participants, which may have affected the generalizability of the results. Further research involving larger, more diverse, and more representative samples is necessary to adequately evaluate psychometric properties, taking into account the participants' sociodemographic characteristics. Secondly, the students were asked to rate their satisfaction; thus, the findings may have been affected by recall bias. A key strength of this study was our application of robust analyses and instruments for assessing construct validity.

5. Conclusions

The NSSS exhibited robust measurement properties, confirming its validity and reliability as an instrument for assessing nursing student satisfaction within the Italian context. Furthermore, our results indicate that after the translation and cultural adaptation of the scale, the construct of nursing student satisfaction remained consistent with the theoretical model. The NSSS could be valuable for both educational practice and research.

Finally, the NSSS could be useful for screening nursing students with low levels of satisfaction with the curriculum, who may fail to complete their academic duties [18,19]. This screening could support the design of personalized interventions in specific satisfaction domains to support students in their learning.

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Abbreviations

The following abbreviations are used in this manuscript:

NSSS	Nursing Student Satisfaction Scale
ANSEs	Academic Nursing Self-Efficacy Scale
SEM	Standard Error of Measurement
SDC	Smallest detectable change

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Article

Propensity Score Analysis of the Utility of Supervised Perioperative Abdominal Wall Exercises for the Prevention of Parastomal Hernia

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Abstract: Retrospective studies have suggested that performing perioperative abdominal wall exercises may decrease the incidence of parastomal hernias. **Objectives:** This study seeks to assess the usefulness of supervised preoperative and postoperative abdominal wall exercises in the prevention of parastomal hernia. **Methods:** An observational study of patients who underwent a stoma, temporary or permanent, between January 2019 and December 2020, was performed. Minimum follow-up was 12 months. During the first 12 months of recruitment, patients were enrolled on a consecutive basis and assigned to the control group, and the remaining patients were assigned to the intervention group. A propensity score matching was performed to obtain totally comparable groups. A set of exercises was designed by the Rehabilitation Department, and their performance was supervised by physiotherapists and stoma therapists. The diagnosis of parastomal hernia was made by physical examination and computed axial tomography. Descriptive statistics of the study group were performed. Subsequently, prediction models for the occurrence of parastomal hernia were created based on binary logistic regression and classification trees. **Results:** After propensity matching and inclusion criteria, 64 patients were included (colostomy: $n = 39$, ileostomy: $n = 25$). Independent prognostic variables for parastomal hernias in colostomy were age ($p = 0.044$) and perioperative exercises ($p = 0.003$). The binary logistic regression model based on these variables gave an AUC of 97.6. The classification tree model included only perioperative exercises with an AUC of 92.5%. In the case of ileostomy, perioperative exercises were the only independent prognostic variable identified. The classification-tree-based model reported an AUC of 84%. **Conclusions:** The performance of supervised abdominal wall training and strengthening exercises may be useful in the prevention of parastomal hernias.

Keywords: abdominal exercise; propensity score matching; supervised; parastomal hernia; prophylactic measures

1. Introduction

Despite important advances in the management of digestive and urinary pathology, a significant percentage of patients still require a definitive stoma for the treatment of their

disease. The most frequent postoperative complication of a stoma is parastomal hernia (PSH), with an unclear incidence, due to different definitions of this problem and the diagnostic method used. According to the General Nursing Council, the incidence of stoma creation in Spain is approximately 16,000 new cases annually, and the current number of ostomized patients in the country is estimated at 70,000 cases.

The frequency of PSH varies according to the type of stoma performed. The highest incidence would correspond to terminal colostomies performed in Hartmann's procedures or abdominoperineal amputations, with rates reaching up to 40% at two years [1], followed by ileostomies or Brooke urostomies, with figures ranging from 10 to 35% [2–4]. Identified risk factors for developing a PSH include body mass index (BMI), female sex, preoperative albumin level, prolonged surgical times, postoperative renal failure, patients with a history of previous laparotomies, tobacco consumption, use of prophylactic mesh, type of hospital where the procedure is performed, and parastomal wound infection [2,3,5,6]. PSH prediction systems have also been developed to identify patients at higher risk [3].

Published works on preventive measures advised by stoma therapists during the perioperative period, such as physical exercise and clothing, suggest that they could decrease the risk of PSH [3,7–9]. These publications have shown that patients who underwent a series of abdominal wall training exercises and those who engaged in regular exercise had a lower incidence of PSH. Recent publications have suggested a relationship between possible atrophy of the abdominal wall musculature and the development of PSH [10], leading to speculation that abdominal wall muscle training may be associated with a reduced risk of PSH.

The aim of this study was to assess whether performing perioperative abdominal wall training exercises could reduce the risk of developing postoperative parastomal herniation.

2. Materials and Methods

2.1. Study Design and Population

This was a prospective observational study involving patients undergoing stoma surgery between 1 January 2019 and 31 December 2020. Patients were consecutively enrolled in the control group for the first 12 months and the exercise group for the remaining months. All patients referred for stoma marking were offered participation in the study. Therefore, only the stoma therapists and physiotherapists were aware of the group assignment. This study included patients aged 18 years and older who underwent stoma surgery due to a preoperative diagnosis of colorectal or bladder cancer, both in elective and urgent settings, with a minimum follow-up period of 12 months. Patients with psychiatric history or cognitive impairments, patients with mobility restrictions, patients with prophylactic meshes, cases resulting in death, and patients who underwent intestinal transit reconstruction before completing the follow-up were excluded.

The study was conducted in accordance with the guidelines of the Declaration of Helsinki, and the study protocol was approved by the local Ethics Committee (Hospital Clinic de Valencia, reference number: 2019/170). All participants gave written informed consent before being included in the study.

2.2. Sample Size

The sample size was calculated based on preliminary findings from the Coloproctology Unit. The method employed was a two-tailed comparison of proportions between the two study groups using a 1:1 ratio. The observed incidence of parastomal hernias at 12 months was 52%, and an expected reduction of 60% was anticipated with the abdominal wall strengthening exercise. With a significance level (alpha) of 5%, a power (beta) of 80%, and

an estimated dropout rate of approximately 10%, the calculated sample size was 48 cases per group.

2.3. Data Collection

The study variables included patient-dependent factors such as age, preoperative hemoglobin, preoperative albumin, body mass index (BMI), arterial hypertension (HTN), diabetes mellitus, smoking history, physical status (regular physical exercise: at least 150 min per week), and primary diagnosis. Surgical-technique-related variables were also included, such as the surgical approach (open or laparoscopic), wound contamination grade, and postoperative hemoglobin levels. Complications were recorded according to the Clavien–Dindo classification, with specific documentation of wound infections, postoperative intraperitoneal complications (hemoperitoneum, diffuse peritonitis, intra-abdominal abscesses, paralytic ileus, intestinal ischemia, pancreatitis, cholecystitis, and urinary tract iatrogenic injuries), and stoma-related complications, including peristomal infection, necrosis, and stoma detachment. Additionally, the need for immediate postoperative reintervention and readmission was recorded. The outcome variable was the presence of parastomal hernia.

Patients were followed up on an outpatient basis at the Coloproctology and Stoma Care Unit. All patients underwent biannual CT scans following the oncology protocol for colorectal or urological cancers. In cases where clinical suspicion of parastomal hernia arose, complementary CT scans were performed to confirm the diagnosis. Both the surgeon who performed the initial operation and subsequent postoperative care, as well as the radiologist conducting the follow-up CT scans, were unaware of the patient's group allocation.

The outcome variable was the presence of parastomal hernia. Parastomal hernia was defined as the protrusion of any intraperitoneal contents through the stoma orifice, assessed using computed tomography (CT) scanning.

The study group consisted of prospective cases in which patients received abdominal wall training through perioperative exercises, while the control group comprised retrospective cases where no additional perioperative measures were implemented. The abdominal wall training protocol was designed by the Physiotherapy and Rehabilitation Service of the hospital. Patients in the study group were provided with a set of exercises to be performed and were instructed by a physical therapist on how to perform them at home. Additionally, they were given a data collection diary in which they recorded their daily exercise sessions and the number of training sessions. A stomatherapist verified the correct performance of the exercises and their compliance.

2.4. Description and Pattern of Abdominal Work

A.Y.S., M.M., and R.N.M. developed an original preoperative exercise program for abdominal wall muscle strengthening with the goal of reducing the risk of PSH. The initiation of exercise was a minimum of six weeks prior to surgery, with monitoring of performance for a minimum of twelve months after surgery.

Starting from 7 basic exercises, the patient was asked to perform a minimum of 4, performing at least a series of 10 repetitions of each one. The work was performed in two sessions (morning and afternoon). If the patient performed only 4 exercises, they were not to be the same every day. The exercises were as follows:

1. Connect with the trunk: In supine position with flexed legs and hands on the abdomen, the patient breathes very slowly, lengthening the exhalation until feeling a slight contraction of the deep abdominal musculature. This contraction should last 3 to 5 s before exhaling. This exercise works the internal, external, and transverse oblique muscles of the abdomen.

2. Pelvic rotation: In supine position with flexed legs, the patient performs pelvic retroversion and anteversion while keeping the legs relaxed. This exercise works the anterior rectus muscle.
3. Knee rotation: In supine position with flexed legs, the patient performs a lateral inclination of the knees with the legs bent. This exercise works internal and external obliques muscles working unilaterally.
4. Elevation of the arm: Sitting, with the back as straight as possible, the patient slowly raises and lowers their arms in full extension. This exercise works the rectus femoris muscle.
5. Elevation of knees: Sitting, in upright posture, the patient slowly flexes their hip with the knee flexed, initially without resistance and then applying progressive resistance by the patient with their hand. This exercise works the psoas-iliac muscle.
6. Get up from the chair: Sitting on the edge of the chair (or bed, at first) with hands on the armrest (if available) or on the thighs, the patient performs a slight inclination of the trunk forward, looking up. Then, using this inclination as an impulse, the patient stands up, placing one foot slightly forward. This exercise works the quadriceps, gluteus maximus, and trunk erectors muscles.
7. Foot swing: Standing with one foot slightly forward and maintaining an upright posture with a slight contraction of the abdominal area, the patient begins to rock with their feet. This exercise works balance and proprioception.

2.5. Statistical Analysis

A descriptive statistic of the study group was conducted. Quantitative variables were expressed as median (range) if the variable data did not follow a normal distribution and as mean $\pm$ standard deviation otherwise. The normality of the distribution of quantitative variables was assessed using graphical methods (Q-Q plot) in conjunction with the Shapiro–Wilk test. Qualitative variables were expressed as absolute frequency (relative frequency). The relationship between quantitative and qualitative variables was analyzed using non-parametric tests (Mann–Whitney U test), while the relationship between qualitative variables was assessed using the Chi-square test with calculation of odds ratios when necessary.

Propensity score matching was performed to obtain completely comparable groups with respect to the study variables. Logistic regression was used as the estimation algorithm, and the method of matching was nearest neighbor and a caliper of 0.2. Case assignment was 1:1 without restitution.

A binary logistic regression model was used to predict the occurrence of parastomal hernia. The model validation was performed through cross-validation. ROC curves and graphics of validation were calculated. A model based on the CHAID classification tree with cross-validation was made. The main objective of this model was to show relations between study and outcome variables. A representation of the model and ROC curves was realized. A p -value ≤ 0.05 was considered statistically significant. The software used was R (version 4.3.0) for Windows 11 and IBM SPSS (version 26 to Windows 11).

3. Results

3.1. Global Analysis

During the study period, a total of 117 stomas were performed, of which 92 met the inclusion criteria for the study (Figure 1). Colostomy was performed in 53 cases (57.6%), and abdominal wall training exercises were conducted by 45 patients (48.9%). The diagnosis of PSH in the entire study group using CT was made in 50 cases (54.3%).

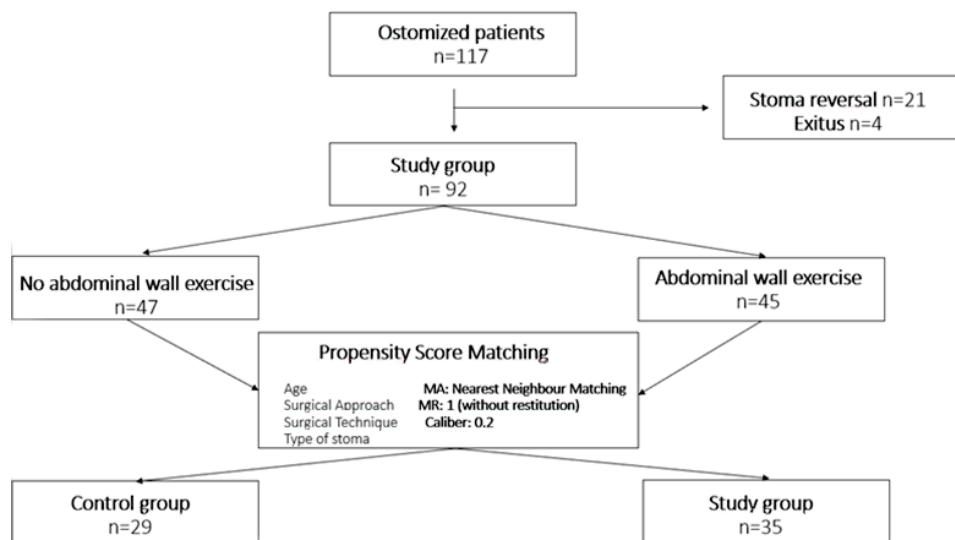


Figure 1. Flowchart of study patients with propensity score matching.

Patients with PSH had a higher median age ($p = 0.001$) and BMI ($p = 0.045$) compared to patients without this complication. Differences were also observed in terms of perioperative exercise performance ($p < 0.001$), the surgical technique employed ($p = 0.007$), and the type of stoma created ($p = 0.001$) (Table 1).

Table 1. Epidemiological and clinical characteristics of the study group before propensity score matching.

	Parastomal Hernia 54.35% ($n = 50$)	Non-Hernia 45.65% ($n = 42$)	p -Value
Age (years)	76 (47)	66 (59)	0.001
IMC (kg/m^2)	26.39 (29.61)	25.1 (15.9)	0.045
Hemoglobin (mg/dL)	13.5 (8.4)	13.45 (6.5)	0.440
Albumin (g/dL)	4.3 (2.1)	4.1 (2.8)	0.189
Diabetes	16 (32%)	7 (16.7%)	0.146
Smoking	16 (32%)	14 (33.3%)	1
Hypertension	16 (32%)	15 (35.7)	0.825
Previous surgery	16 (32%)	9 (21.4%)	0.347
Physical status active	18 (36%)	23 (54.8%)	0.093
ASA			0.323
I	-	1 (2.4%)	
II	28 (56%)	29 (69%)	
III	19 (38%)	11 (26.2%)	
IV	3 (6%)	1 (2.4%)	
Abdominal training	6 (12%)	39 (92.9%)	<0.001
Elective surgery	44 (88%)	34 (81%)	0.393
Surgical approach (laparoscopic)	31 (62%)	20 (47.6%)	0.208
Operative time (minutes)			0.875
≤120 min	8 (16%)	5 (11.9%)	
121–240 min	16 (32%)	14 (33.3%)	

Table 1. Cont.

	Parastomal Hernia 54.35% (n = 50)	Non-Hernia 45.65% (n = 42)	p-Value
241–360 min	18 (36%)	14 (33.3%)	0.355
>360 min	8 (16%)	9 (21.4%)	
Diagnosis			
Malignant neoplasm	42 (84%)	29 (69%)	
IBD	4 (8%)	4 (9.5%)	
Peritonitis	-	2 (4.8%)	0.007
Entero-genital or entero-urinary fistula	2 (4%)	2 (4.8%)	
Benign neoplasm	1 (2%)	4 (9.5%)	
Ischemic colitis	1 (2%)	1 (2.4%)	
Surgical technique			
Abdominoperineal resection	23 (46%)	7 (16.7%)	
Anterior rectum resection	8 (16%)	13 (31%)	
Radical cystectomy	2 (4%)	7 (16.7%)	
Subtotal colectomy with ileostomy and mucosal fistula	1 (2%)	3 (7.1%)	
Total colectomy with Brooke ileostomy	2 (4%)	2 (4.8%)	
Hartmann's procedure	13 (26%)	5 (11.9%)	0.001
Colostomy and mucosal fistula	1 (2%)	4 (9.5%)	
Colectomy with double colostomy	-	1 (2.4%)	
Colostomy	37 (74%)	17 (40.5%)	
Postoperative complications			
Surgical wound infection	7 (14%)	6 (14.3%)	1
Paralyticus ileus	16 (32%)	13 (31%)	1
Parastomal wound infection	12 (24%)	10 (23.8%)	1

Data are expressed mean (SD) and *n* (%) of each subgroup. Significant results are indicated in bold ($p < 0.05$).

However, when comparing the group of patients who performed abdominal wall training exercises, statistically significant differences were observed in terms of age ($p = 0.038$), history of previous interventions ($p = 0.047$), surgical approach ($p = 0.021$), surgical technique ($p = 0.005$), and type of stoma created ($p = 0.006$) (Table 2).

Table 2. Comparison of epidemiological and clinical characteristics of the study group according to the performance of abdominal wall muscle training exercises before and after matching cases.

	Pre-Propensity Score Matching			Propensity Score Matching		
	Abdominal Training <i>n</i> = 45 (48.91%)	Non-Exercise <i>n</i> = 47 (51.09%)	<i>p</i> -Value	Abdominal Training <i>n</i> = 29 (45.3%)	Non-Exercise <i>n</i> = 35 (54.7%)	<i>p</i> -Value
Age (years)	68 (66)	75 (44)	0.038	68 (45)	68 (44)	0.491
IMC (kg/m ²)	25.4 (15.9)	26.35 (29.61)	0.43	25.1 (15.9)	26.35 (29.61)	0.161
Hemoglobin (mg/dL)	13.4 (6.7)	13.5 (8)	0.154	13.5 (5.9)	13.6 (7.6)	0.240
Albumin (g/dL)	4.1 (2.8)	4.3 (2.1)	0.465	4.1 (2.6)	4.3 (2.1)	0.622
Diabetes	11 (24.4%)	12 (25.5%)	1	5 (17.2%)	7 (20%)	1
Smoking	14 (31.1%)	16 (34%)	0.826	10 (24.5%)	12 (34.3%)	1

Table 2. Cont.

	Pre-Propensity Score Matching			Propensity Score Matching		
	Abdominal Training <i>n</i> = 45 (48.91%)	Non-Exercise <i>n</i> = 47 (51.09%)	<i>p</i> -Value	Abdominal Training <i>n</i> = 29 (45.3%)	Non-Exercise <i>n</i> = 35 (54.7%)	<i>p</i> -Value
Hypertension	16 (35.6%)	15 (31.9%)	0.826	11 (37.9%)	10 (28.6%)	0.593
Previous surgery	8 (17.8%)	17 (36.2%)	0.062	5 (17.2%)	15 (42.9%)	0.033
Physical status Active	23 (51.1%)	18 (38.3%)	0.294	14 (48.3%)	15 (42.9%)	0.802
ASA			0.550			0.100
I	1 (2.2%)	-		1 (3.4%)	-	
II	29 (64.4%)	28 (59.6%)		23 (79.3%)	20 (57.1%)	
III	14 (31.1%)	16 (34%)		5 (17.2%)	13 (37.1%)	
IV	1 (2.2%)	3 (6.4%)		-	2 (5.7%)	
Elective surgery	36 (80%)	42 (89%)	0.254	22 (75.9%)	30 (85.7%)	0.247
Surgical approach (laparoscopic)	19 (42.2%)	32 (68.1%)	0.021	14 (48.3%)	20 (57.1%)	0.616
Operative time (minutes)			0.717			0.632
≤120 min	7 (15.6%)	6 (12.8%)		3 (10.3%)	6 (17.1%)	
121–240 min	16 (35.6%)	14 (29.8%)		12 (41.4%)	10 (28.6%)	
241–360 min	13 (28.9%)	19 (40.4%)		9 (31%)	14 (40%)	
>360 min	9 (20%)	8 (17%)		5 (17.2%)	5 (14.3%)	
Diagnosis			0.369			0.586
Malignant neoplasm	31 (68.9%)	40 (85.1%)		21 (72.4%)	29 (82.9%)	
IBD	5 (11.1%)	3 (6.4%)		2 (6.9%)	2 (5.7%)	
Peritonitis	2 (4.4%)	-		1 (3.4%)	-	
Entero-genital or entero-urinary fistula	2 (4.4%)	2 (4.3%)		2 (6.9%)	2 (5.7%)	
Benign neoplasm	4 (8.9%)	1 (2.1%)		3 (10.3%)	1 (2.9%)	
Ischemic colitis	1 (2.2%)	1 (2.1%)		-	1 (2.9%)	
Surgical technique			0.005			0.424
Abdominoperineal resection	7 (15.6%)	23 (48.9%)		6 (20.7%)	14 (40%)	
Anterior rectum resection	13 (28.9%)	8 (17%)		7 (24.1%)	8 (22.9%)	
Radical cystectomy	7 (15.6%)	2 (4.3%)		4 (13.8%)	2 (5.7%)	
Subtotal colectomy with ileostomy and mucosal fistula	4 (8.9%)	-		1 (3.4%)	-	
Total colectomy with Brooke ileostomy	2 (4.4%)	2 (4.3%)		1 (3.4%)	2 (5.7%)	
Hartmann's procedure	7 (15.6%)	11 (23.4%)		6 (20.7%)	8 (22.9%)	
Colostomy and mucosal fistula	4 (8.9%)	1 (2.1%)		3 (10.3%)	1 (2.9%)	
Colectomy with double colostomy	1 (2.2%)	-		1 (3.4%)	-	
Type of stoma (colostomy)	19 (42.2%)	35 (74.5%)	0.003	16 (56.2%)	23 (65.7%)	0.447
Parastomal hernia	6 (12%)	39 (92.9%)	<0.001	4 (13.8%)	32 (91.4%)	<0.001
Postoperative Complications						
Surgical wound infection	6 (13.9%)	7 (14.9%)	1	4 (13.8%)	7 (20%)	0.741
Paralyticus ileus	16 (35.6%)	13 (27.7%)	0.503	10 (34.5%)	10 (28.6%)	0.787
Parastomal wound infection	13 (28.3%)	9 (19.1%)	0.332	9 (31%)	6 (17.1%)	0.242

Data are expressed mean (SD) and *n* (%) of each subgroup. Significant results are indicated in bold (*p* < 0.05).

After performing propensity score matching based on variables that differed between the two groups (age, surgical approach (laparoscopic), surgical technique performed, and type of stoma), a new group of 64 patients was obtained, fully comparable in terms of all study variables (Figure 1). The overall analysis of this group showed that age

($p = 0.044$), BMI ($p = 0.014$), ASA surgical risk assessment ($p = 0.013$), and perioperative exercise performance ($p < 0.001$, OR: 0.124, 95% CI: 0.049–0.316) were variables related to PSH. Independent prognostic factors for PSH were age ($p = 0.040$) and perioperative exercise performance ($p < 0.001$). The obtained binary logistic regression model showed a sensitivity of 88.3%, a specificity of 89.3%, an accuracy of 89.1%, and an AUC of 94.4 ± 0.031 (95% CI: 90.5%–1) (Figure 2a). Cross-validation of the model yielded a mean absolute error of 0.032 and a mean squared error of 0.002 (Figure 2b).

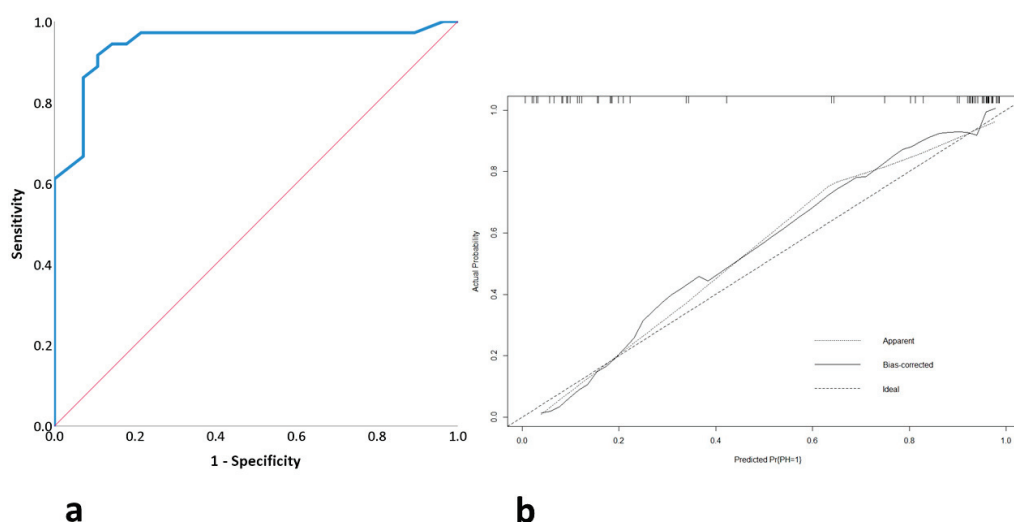


Figure 2. (a) ROC curve of logistic binary model of study group after matching cases. (b) Cross-validation of same model.

In the classification tree model of PSH and study variables (Figure 3a), perioperative exercise was the first variable introduced. In the group of patients who performed exercises, the occurrence of postoperative stoma infection was associated with a higher number of PSH cases. In the case of the group of patients who did not perform exercises, the variable of tobacco consumption was included, and within the subgroup of tobacco consumers, ASA III patients had the highest risk of PSH. This model had a sensitivity of 83.3%, a specificity of 100%, an accuracy of 90.6%, and an AUC of $96.1\% \pm 0.023\%$ (95% CI: 91.6%–1) (Figure 3b).

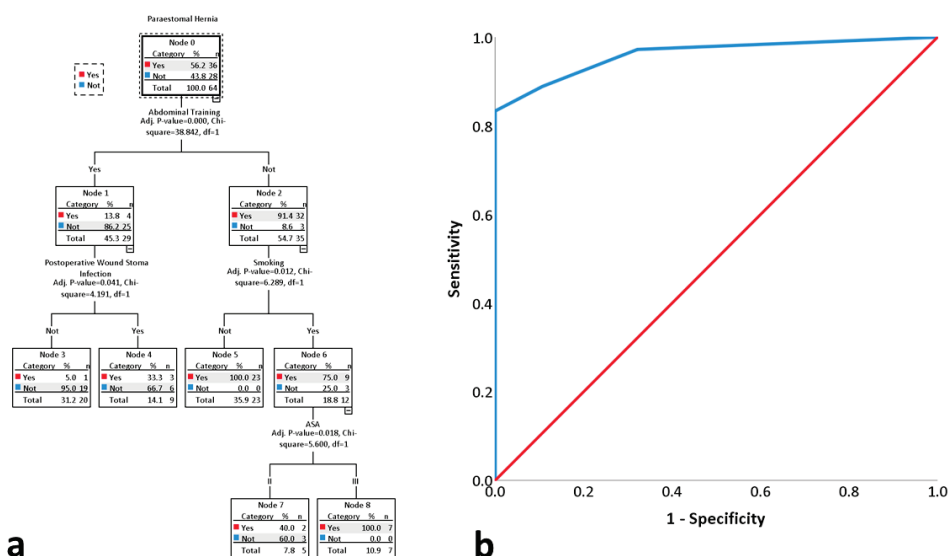


Figure 3. (a) ROC curve of CHAID classification tree model of study group after matching cases. (b) ROC curve of same model.

Following this, a subanalysis of PSH risk based on the type of stoma created was performed (Table 3).

Table 3. Comparison of epidemiologic and clinical characteristics of the groups according to exercise performance after empirical studies by matching cases.

	Colostomy			Ileostomy		
	Abdominal Training <i>n</i> = 16 (41%)	Non-Exercise <i>n</i> = 23 (59%)	<i>p</i> -Value	Abdominal Training <i>n</i> = 13 (52%)	Non-Exercise <i>n</i> = 12 (48%)	<i>p</i> -Value
Age (years)	66.5 (45)	68 (38)	0.301	72 (27)	70.5 (37)	0.894
IMC (kg/m ²)	22.5 (12.7)	26.4 (27.66)	0.001	27.3 (14.8)	26 (11.55)	0.098
Hemoglobin (mg/dL)	13.1 (5.6)	13.6 (7.5)	0.507	13.5 (4.1)	13.75 (6.8)	0.347
Albumin (g/dL)	3.95 (2.6)	4.3 (2)	0.507	4.1 (2.4)	4.35 (1.9)	0.979
Diabetes	2 (12.5%)	4 (17.4%)	1	3 (23.1%)	3 (25%)	1
Smoking	4 (25%)	6 (26.1%)	1	6 (46.2%)	6 (50%)	1
Hypertension	4 (25%)	8 (34.8%)	0.726	7 (53.8%)	2 (16.7%)	0.097
Previous surgery	5 (31.3%)	9 (39.1%)	0.740	-	6 (50%)	0.005
Physical status active	8 (50%)	9 (39.1%)	0.531	6 (46.2%)	6 (50%)	1
ASA			0.242			0.367
I	-	-		1 (7.7%)	-	
II	13 (81.3%)	13 (56.5%)		10 (76.9%)	7 (58.3%)	
III	3 (18.8%)	9 (29.1%)		2 (15.4%)	4 (33.3%)	
IV	-	1 (4.3%)		-	1 (8.3%)	
Elective surgery	12 (75%)	21 (91.3%)	0.205	10 (76.9%)	9 (75%)	1
Surgical approach	7 (43.8%)	12 (52.2%)	0.748	7 (53.8%)	8 (66.7%)	0.688
Operative time (minutes)			0.649			0.084
≤120 min	3 (18.8%)	3 (13%)		-	3 (25%)	
121–240 min	7 (43.8%)	9 (39.1%)		5 (38.5%)	1(8.3%)	
241–360 min	6 (37.5%)	9 (39.1%)		3 (23.1%)	5 (41.7%)	
>360 min	-	2 (8.7%)		5 (38.5%)	3 (25%)	
Diagnosis			0.418			0.367
Malignant neoplasm	9 (56.3%)	18 (78.3%)		12 (92.3%)	11 (91.7%)	
IBD	2 (12.5%)	2 (8.7%)		-	-	
Peritonitis	-	-		1 (7.7%)	-	
Entero-genital or entero-urinary fistula	2 (12.5%)	2 (8.7%)		-	-	
Benign neoplasm	3 (18.8%)	1 (4.3%)		-	-	
Ischemic colitis	-	-		-	1 (8.3%)	
Surgical technique			0.224			0.566
Abdominoperineal resection	6 (37.5%)	14 (60.9%)		-	-	
Anterior rectum resection	-	-		7 (53.8%)	8 (66.7%)	
Radical cystectomy	-	-		4 (30.8%)	2 (16.7%)	
Subtotal colectomy with ileostomy and mucosal fistula	-	-		1 (7.7%)	-	
Total colectomy with Brooke ileostomy	-	-		1 (7.7%)	2 (16.7%)	
Hartmann's procedure	6 (37.5%)	8 (34.8%)		-	-	
Colostomy and mucosal fistula	3 (18.8%)	1 (4.3%)		-	-	
Colectomy with double colostomy	1 (6.3%)	-		-	-	
Parastomal hernia	2 (12.5%)	22 (95.7%)	<0.001	2 (15.4%)	10 (83.3%)	0.001
Postoperative Complications						
Surgical wound infection	2 (12.5%)	3 (13%)	1	2 (15.4%)	4 (33.3%)	0.378

Table 3. Cont.

	Colostomy			Ileostomy		
	Abdominal Training <i>n</i> = 16 (41%)	Non-Exercise <i>n</i> = 23 (59%)	<i>p</i> -Value	Abdominal Training <i>n</i> = 13 (52%)	Non-Exercise <i>n</i> = 12 (48%)	<i>p</i> -Value
Paralyticus ileus	4 (25%)	5 (21.7%)	1	6 (46.2%)	5 (41.7%)	1
Parastomal wound infection	4 (25%)	2 (8.7%)	0.205	5 (38.5%)	4 (33.3%)	1

Data are expressed mean (SD) and *n* (%) of each subgroup. Significant results are indicated in bold (*p* < 0.05).

3.2. Colostomy Analysis

After propensity score matching, a total of thirty-nine colostomies were performed. Statistical analysis revealed that age (*p* = 0.26), BMI (*p* < 0.001) and perioperative exercises (*p* < 0.001, OR: 0.089, 95% CI: 0.024–0.339) were variables related to PSH (Table 4).

Table 4. Comparison of the epidemiological, clinical characteristics, and clinical outcomes of the groups according to the type of stoma performed and (colostomy or ileostomy) after matching cases.

	Colostomy			Ileostomy		
	Parastomal Hernia <i>n</i> = 24 (61.5%)	Non-Hernia <i>n</i> = 15 (38.5%)	<i>p</i> -Value	Parastomal Hernia <i>n</i> = 12 (48%)	Non-Hernia <i>n</i> = 13 (52%)	<i>p</i> -Value
Age (years)	72 (38)	66 (41)	0.026	73.5 (37)	69 (32)	0.538
IMC (kg/m ²)	26.54 (27.66)	21.3 (12.7)	<0.001	26.21 (16.25)	27.1 (15.2)	0.574
Hemoglobin (mg/dL)	13.55 (7.5)	13.5 (5.6)	0.831	13.5 (6.2)	13.4 (4.1)	0.225
Albumin (g/dL)	4.3 (2)	3.8 (2.6)	0.432	4.35 (2)	4.1 (2.4)	0.406
Diabetes	5	1	0.376	4	2	0.378
Smoking	5	5	0.463	6	6	1
Hypertension	8	4	0.734	3	6	0.411
Previous surgery	9	5	1	5	1	0.073
Physical status active	9	8	0.508	5	7	0.695
Abdominal Training	2	14	<0.001	2	11	0.001
ASA			0.106			0.107
I	-	-		-	1	
II	13	13		6	11	
III	10	2		5	1	
IV	1	-		1	-	
Elective surgery	21	12	0.658	9	10	1
Surgical approach	12	7	1	6	9	0.428
Operative time (minutes)			0.626			0.084
≤120 min	4	2		3	-	
121–240 min	10	6		1	5	
241–360 min	8	7		5	3	
>360 min	2	-		3	5	
Diagnosis			0.309			0.367
Malignant neoplasm	19	8		11	12	
IBD	2	2		-	-	
Peritonitis	-	-		-	1	
Entero-genital or entero-urinary fistula	2	2		-	-	
Benign neoplasm	1	3		-	-	
Ischemic colitis	-	-		1		
Surgical technique			0.212			0.566

Table 4. Cont.

	Colostomy			Ileostomy		
	Parastomal Hernia <i>n</i> = 24 (61.5%)	Non-Hernia <i>n</i> = 15 (38.5%)	<i>p</i> -Value	Parastomal Hernia <i>n</i> = 12 (48%)	Non-Hernia <i>n</i> = 13 (52%)	<i>p</i> -Value
Abdominoperineal resection	14	6		-	-	
Anterior rectum resection	-	-		8	7	
Radical cystectomy	-	-		2	4	
Subtotal colectomy with ileostomy and mucosal fistula	-	-		-	1	
Total colectomy with Brooke ileostomy	-	-		2	1	
Hartmann's procedure	9	5		-	-	
Colostomy and mucosal fistula	1	3		-	-	
Colectomy with double colostomy	-	1		-	-	
Postoperative Complications						
Surgical wound infection	3	2	1	3	3	1
Paralytic ileus	7	2	0.437	5	6	1
Parastomal wound infection	4	2	1	4	5	1

Data are expressed mean (SD) and *n* (%) of each subgroup.

Among these variables, age ($p = 0.044$) and perioperative exercises ($p = 0.003$) were independent prognostic factors for the occurrence of PSH. The binary logistic regression model based on these variables showed a sensitivity of 95.8%, a specificity of 93.3%, an accuracy of 94.9%, and an AUC of $97.6 \pm 0.023\%$ (95% CI: 93–100) (Figure 4a). Cross-validation of the model yielded a mean absolute error of 0.016 and a mean squared error of 0.028 (Figure 4b). The classification tree model included only perioperative exercise performance. This model had a sensitivity of 91.7%, a specificity of 93.3%, an accuracy of 92.3%, and an AUC of $92.5\% \pm 0.5$ (95% CI: 82.7–100).

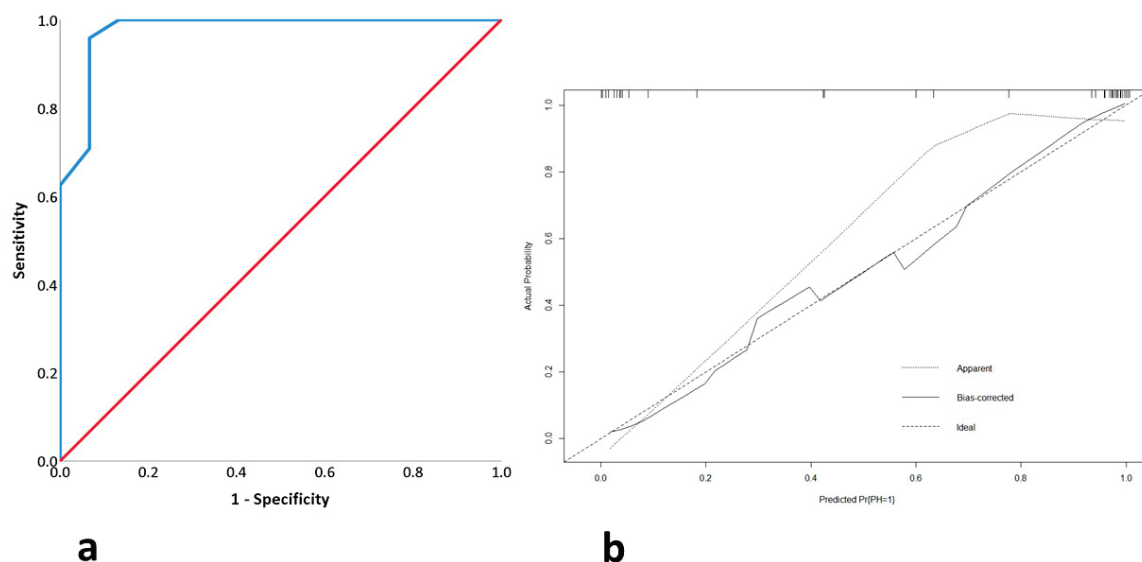


Figure 4. (a) ROC curve of logistic binary model of colostomy group after matching cases. (b) Cross-validation of same model.

3.3. Ileostomy Analysis

The number of ileostomies performed in the matched cases group was twenty-five. The only variable related to the occurrence of PSH was perioperative exercises ($p = 0.001$, OR: 0.197, 95% CI: 0.054–0.713), which was also an independent prognostic factor ($p = 0.002$).

The classification tree model based on CHAID showed that the only included variable was perioperative exercise performance. This model had a sensitivity of 83.3%, a specificity of 84.6%, an accuracy of 84%, and an AUC of $84\% \pm 0.087$ (95% CI: 67–100%).

4. Discussion

In this study, factors initially identified as related to the occurrence of PSH were age, BMI, perioperative abdominal exercise training, surgical technique, and stoma type. These results confirm previous studies that also found female gender, ASA status, the presence of aneurysms, and paralytic ileus to be associated with PSH occurrence [6].

The prevention of parastomal hernia occurrence is still an unresolved issue. Various technical options have been proposed to reduce the incidence of PSH, such as the SMART technique [11,12], extraperitoneal stomas [13–17], transrectal location [18], stoma size [19], or stoma incision type [20]. However, there is no consensus in the clinical guidelines regarding their utility due to a lack of significant evidence [1,21,22]. The use of prophylactic meshes for PSH prevention is highly controversial, with no clear evidence of their utility. Scientific societies support the use of prophylactic meshes to prevent PSH occurrence [1,21,22] with a moderate-to-strong level of evidence. However, recent studies and clinical trials have shown no significant differences in PSH incidence with the use of prophylactic meshes, raising questions about their routine use [23–28].

The abdominal wall musculature has likely been underestimated in ostomy patient management guidelines [1,21,22,29]. Atrophy of the abdominal wall and elevated BMI have been identified as risk factors for PSH development [10]. Consequently, it is logical to assume that strengthening this musculature should decrease the risk of PSH [30]. Previous nursing studies have shown that postoperative exercise training is associated with a lower incidence of PSH. However, these studies lacked supervision or systematic exercise programs [7,9,30–32]. In this study, both pre- and postoperative abdominal wall exercise training was designed by the Rehabilitation Service, and exercise performance was supervised by nurses from the Stoma Therapy Unit. Additionally, the occurrence of PSH was assessed by an expert radiologist to avoid bias or interpretation errors, rather than relying on patient or stoma therapist self-reports, as in previous studies.

The incidence of PSH in this study was 54.3%, like in reports by other authors [33–35]. Previous studies have shown that CT scans diagnose more cases of PSH compared to physical examination, with approximately 64% of cases coinciding [34,36]. In this study, the incidence of PSH was higher in the colostomy group compared to the ileostomy group (61.54% vs. 48%), consistent with previous findings [37]. As a result, colostomies and ileostomies (digestive or urologic) were studied independently. It was not possible to study digestive ileostomies and urostomies separately due to the limited sample size. Previous studies reported a 30% incidence of PSH in urostomies with 12 months of follow-up [38]. It is possible that this incidence would have been higher with a longer follow-up period.

For colostomies, age, BMI, and perioperative abdominal exercises were identified as related factors, with only age and perioperative abdominal exercises being independent prognostic factors. The classification tree showed that patients with a lower likelihood of developing PSH were those who performed exercises and did not have infectious stoma complications. Interestingly, the highest-risk group consisted of patients without a history of tobacco use and ASA III. In the case of ileostomies, perioperative abdominal wall training was the only identified risk factor. Some authors have reported that in the case of urostomies, factors associated with PSH were female gender, diabetes, COPD, and elevated BMI [38].

In this study, it was observed that abdominal wall training exercises were associated with a lower incidence of PSH and were an independent prognostic factor for this compli-

cation regardless of the type of stoma performed. These results support previous studies that indicated the potential utility of abdominal wall training exercises in preventing the occurrence of PSH [7,9,30–32]. Additionally, it has also been noted that patients who engage in regular physical exercise have a lower incidence of PSH compared to those with a more sedentary lifestyle (30). The incidence of PSH in the group of patients who performed abdominal wall exercises falls within the range of clinical trials (0–52%) included in recent meta-analyses [39–48].

The originality of this study lies in the supervised design and implementation of a series of abdominal wall training exercises aimed at reducing the risk of PSHs. The use of propensity score matching techniques helped reduce biases and subsequently allowed for a detailed study of patients in subgroups according to the type of stoma performed.

PSM reduces confounding in observational studies, but it has important limitations. It cannot account for unmeasured confounders, is dependent on the correct specification of the propensity score model, and often results in a loss of sample size, which reduces the power of the study. Poor overlap in propensity scores can limit matching and introduce bias. Balancing on the score itself may not ensure covariate balance. PSM also has problems with time-dependent confounding and post-treatment variables.

However, the limitations of this study include its observational nature, loss of cases in follow-up that reduced the sample size, the limited number of patients with ileostomy, and the limited follow-up of 12 months, although this follow-up period is the most reported in clinical trials and meta-analyses.

The results of this study suggest the possibility of conducting new prospective, randomized, multicenter studies to confirm these findings, and if confirmed, it could be a complementary measure to help select patients at higher risk who would benefit most from the use of a prophylactic mesh to reduce the risk of PSH, within prehabilitation and ERAS programs.

5. Conclusions

The performance of supervised perioperative abdominal wall training and strengthening exercises may be useful in the prevention of parastomal hernias. The findings of this study have significant implications for nursing practice, particularly for nurses from the Stoma Therapy Unit, who play a vital role in the postoperative care and rehabilitation of stoma patients. By demonstrating that supervised abdominal wall training exercises during the perioperative period can significantly reduce the incidence of PSH, stoma therapists can incorporate these exercises into patient care protocols. This proactive approach not only improves outcomes for patients but also empowers them through education and active participation in their recovery process.

In addition, these findings highlight the importance of interdisciplinary collaboration between nursing, physical therapists, and surgical teams, fostering comprehensive care that addresses both rehabilitation and the psychosocial support needed for stoma patients. Together, these strategies contribute to optimizing patient care and implementing effective preventive measures against complications associated with stomas.

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Article

Understanding Family Experiences: A Study on Mental Health Literacy in Adolescent Eating Disorder Diagnoses

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Abstract: Background: Adolescent eating disorders pose a significant public health challenge and strongly affect both physical and emotional well-being. Early diagnosis is important for improving treatment outcomes, though it remains complex due to multiple influencing factors. The family perspective is essential in this process, as it provides valuable insights into changes in adolescents' habits and emotional health. Methods: A descriptive qualitative study was conducted between January and February 2023. Interviews were conducted with 12 participants using a phenomenological approach to explore the experiences and perspectives of family members of adolescents with eating disorders. Results: Four thematic blocks comprising several categories were identified: (T1) diagnosis, (T2) family, (T3) resources, and (T4) treatment. The participants emphasized the need for early intervention and a multidisciplinary approach to the treatment of eating disorders. Family therapy was recognized as vital to treatment, and common dissatisfaction with the public health structure underscores the need for greater investment in research and access to specialists. Mental health nurse practitioners play an important role in providing comprehensive care and support, as well as mental health literacy. Conclusions: A holistic, patient-centered approach, including family involvement and appropriate support systems, is key to improving the outcomes and quality of life of adolescents undergoing treatment for eating disorders. Improving healthcare resources and addressing the challenges faced by families is essential. In addition, mental health literacy is critical, as it enables families to understand the disease better, make informed decisions, and actively participate in the recovery process, thus contributing to improved therapeutic outcomes and quality of life for patients.

Keywords: family therapy; nursing; eating disorders; qualitative research; mental health literacy

1. Introduction

Eating disorders (EDs) are prevalent psychiatric illnesses that usually manifest during adolescence, a critical stage of neural development, physical and psychological growth, and self-exploration [1,2]. This period of life, marked by significant physical, emotional, and social changes, makes adolescents particularly vulnerable to developing these disorders, which profoundly affect their relationship with food, body image, and overall well-being [3].

According to the latest update of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5-TR) published in 2022 [4], the main eating disorders include anorexia nervosa

(AN), bulimia nervosa (BN), and binge eating disorder (BED). AN is defined by the extreme restriction of energy intake, resulting in a significantly low body weight, an intense fear of weight gain, and a distorted perception of one's body image. For BN, the diagnostic criteria include recurrent episodes of binge eating, where the person consumes an excessive amount of food in a short period, followed by inappropriate compensatory behaviors, such as self-induced vomiting, laxative use, or excessive exercise, occurring at least once a week for three months. BED is characterized by recurrent episodes of uncontrolled food intake, accompanied by significant emotional distress, without the presence of compensatory behaviors, and must also occur at least once a week for a minimum period of three months [4]. Recent advances have linked anorexia nervosa (AN) symptoms such as hyperactivity and food obsession to hypoleptinemia, a biological response to fat loss [5]. This insight can improve families' understanding by showing that these behaviors are biological, not deliberate. Enhanced empathy may strengthen family support, aligning with their crucial role in treatment.

The prevalence of EDs has increased significantly in recent decades [6,7] and further exacerbated by the COVID-19 pandemic [3]. During COVID-19, an increased incidence of restrictive eating behaviors, binge eating, and excessive exercise was reported in patients with eating disorders [8]. A recent review of epidemiological studies confirmed that the incidence of AN is increasing in young individuals worldwide, especially in those under 15 years of age, with a peak age of onset between 13 [9] and 18 years [10]. These disorders differ in their onset [11], with AN manifesting at younger ages than BN [12]. The lifetime prevalence of AN is 4% in the female population and 0.3% in the male population. The lifetime prevalence of BN is up to 3% in the female population and more than 1% in the male population, with symptoms increasing among girls aged 14 to 16 years and among boys aged 16 years and older [9,10].

The etiopathogenesis of EDs is multifactorial, involving both genetic and environmental factors [3]. Sociocultural influences, such as social pressure to conform to beauty standards, the impact of social media, and the overvaluation of thinness, exacerbate these disorders, making adolescents more vulnerable to dysfunctional eating behaviors [3,13]. Early diagnosis and appropriate intervention are necessary to improve prognosis and reduce associated risks, such as severe malnutrition, physical complications, and chronic emotional problems. Given their prevalence, severity, and tendency to become chronic, EDs represent a serious public health issue requiring specialized treatment [14]. In this context, mental health literacy (MHL) is essential for effective ED management. This concept is defined as the ability to obtain, process, and understand the knowledge and skills necessary to promote mental health [15]. For ED patients and their families [16,17], adequate MHL is essential for understanding the nature of the disorder, the importance of timely treatment, and how to meet the challenges of recovery, ultimately improving both physical and psychological outcomes [18–20].

Equally important is the role of the family, which is a key pillar in eating disorder (ED) care, especially in observing the early signs of the disorder and providing support throughout diagnosis, treatment, and recovery [21]. A supportive family environment and active involvement positively influence treatment outcomes [22] and are important both at home and in the hospital setting. However, for families to provide effective support, they need information, emotional help, and tools to manage these complex diseases. In this regard, nursing professionals play a key role, acting as intermediaries in identifying symptoms, providing ongoing support, and educating families on how to manage these disorders [23,24]. In hospital settings, nurses are fundamental in the implementation of therapeutic strategies and in the follow-up to prevent relapses. However, in other settings, such as primary or outpatient care, the role of nurses is complemented by other health professionals, such as physicians, psychologists, and nutritionists. As part of multidisciplinary teams, nursing professionals facilitate communication between adolescents, their families, and other healthcare professionals, ensuring a comprehensive and collaborative approach to treatment [23,25].

In this study, the authors sought to explore family perspectives on the diagnosis of adolescent EDs by applying a qualitative approach to understanding the experiences, challenges, and emotional needs of families in this process. In providing these insights, the aim is to highlight the importance of a holistic approach, where families and nursing professionals work together to improve outcomes in the treatment of adolescent EDs.

2. Methods

2.1. Study Design

A descriptive qualitative study based on the theoretical/methodological orientation of phenomenology was conducted to explore the experiences of family members of adolescent patients diagnosed with EDs [26]. Phenomenology, which aims to understand the essence of a phenomenon through first-person-narrated experiences, provides the framework for obtaining a detailed description of a family's lived experiences [27]. This study was conducted in accordance with the Consolidated Criteria for Reporting Qualitative Studies (COREQ) and the Standards for Reporting Qualitative Research [28] (see Supplementary File S1).

2.2. Experience and Role of Researchers

The research team consisted of four women and three men, including four nurses with experience in qualitative research design (E.G.C.-B, E.M-M, A.T-R, and C.G-M) and two researchers with clinical and research experience in mental health (P.D.-H and C.G.-N). Data were triangulated by two external researchers (E.V-V and C.G.-N). None of the research team members had prior relationships with the participants. The theoretical framework for this qualitative research, as well as the researchers' viewpoints and their reasons for conducting the study, were defined before starting the research [28].

2.3. Participants and Setting

A snowball-based, purposive sampling approach [29] was employed to recruit relatives of adolescents aged 12 to 19 years diagnosed with EDs. Participants who had not lived with the patient since the diagnosis and those whose family members were diagnosed less than one year ago were excluded. Relatives were recruited through posters displayed in a social-health center and posts on social media. In addition, adolescents diagnosed with EDs were initially identified and contacted through the health team involved in their care. With the consent of the adolescents, the health team facilitated contact with their relatives. To improve the snowball-based, purposive sampling method, participants were encouraged to recommend other relatives in similar situations who might be interested in participating in the study. Data saturation was reached at participant number twelve when further coding was no longer feasible with additional new information [30]. Therefore, the researchers did not seek to recruit more participants. No dropouts occurred during the study. Table 1 shows the demographic data.

Table 1. Participant characteristics ($n = 12$).

Participant	Sex of Interviewee	Age of Interviewee	Relationship	ED Diagnosis	Age at Diagnosis	Adolescent Gender
E 1	Woman	56	Mother	Anorexia nervosa	19	male
E 2	Woman	51	Mother	Anorexia nervosa	17	female
E 3	Man	54	Father	Anorexia nervosa	17	female
E 4	Woman	21	Sister	Anorexia nervosa	18	female
E 5	Man	75	Grandfather	Bulimia nervosa	17	female
E 6	Woman	49	Mother	Anorexia nervosa	17	female
E 7	Man	50	Father	Anorexia nervosa	17	female
E 8	Woman	25	Sister	Bulimia nervosa	18	female
E 9	Woman	54	Mother	Anorexia nervosa	17	female
E 10	Man	51	Father	Anorexia nervosa	17	female
E 11	Woman	57	Mother	Anorexia nervosa	18	female
E 12	Man	52	Father	Bulimia nervosa	17	female

E: interview.

2.4. Data Collection Instrument

Data were collected between January and February 2023 through in-depth interviews and field notes. These interviews were conducted in a semi-structured manner, following a question guide designed to explore specific topics of interest (Table 2).

Table 2. Semi-structured interview script.

Research Area	Interview Questions
Diagnostic feeling	1. How did you feel when you were informed of the diagnosis?
	2. How did you realize that your family member had an ED?
	3. Do you think you would have approached the problem differently today?
Family relations	4. What was your family relationship like before the diagnosis?
	5. Do you consider that this family relationship has changed since the time of diagnosis? If so, how has it changed?
	6. Have you noticed any impact on the coexistence within the family nucleus since the diagnosis was made?
Assistance	7. What challenges or difficulties have you faced as a family since the diagnosis and how have you dealt with these changes together?
	8. Do you think that the resources/assistance provided by the socio-health services have been sufficient for the patient and the family?
	9. How do you think support for these patients and their families could be improved?
Treatment	10. Do you consider the involvement of the family in the treatment of a patient with EDs to be important?
	11. Did you feel involved in the treatment your family member received?
	12. Have you been actively involved in treatment? If so, what has your experience been like in that process?

Semi-structured in-depth interviews were used as the primary data collection method. A question guide based on the existing literature (Table 2) facilitated an in-depth exploration of participants' thoughts and experiences of the phenomenon [29]. Its flexible nature allows participants to express themselves freely while the researcher probes into areas of interest [31]. Individual interviews were conducted by two researchers (E.G.C-B and C.G-M) either face to face at the preferred place and time or via video call, depending on the participant's preferences. Due to the topic's sensitive nature, family members were informed that they could stop the interview at any time if they found it emotionally distressing. On average, each interview lasted approximately 57 min. Field notes were also collected by the researchers, providing additional insights into participants' personal experiences and behaviors during data collection, as well as the researchers' reflections on methodological aspects [32]. The transcripts were returned to the participants for additional comments, and all transcripts and field notes were securely stored in a digital location with restricted access.

2.5. Data Analysis

A qualitative analysis of each interview and the researchers' field notes was performed using an inductive thematic approach [33]. Codes were generated to identify the most descriptive content, which was then reduced and grouped to identify common categories representing significant content units. This process led to the emergence of thematic areas describing the experiences of the study participants. Double and independent coding was carried out by five researchers (E.G.C-B, C.G-M, A.T-R, E.M-M, and P.D.-H) on each interview and each field note. They then met to discuss, compare, and refine their findings. Subsequently, the same process was carried out with the themes. In addition, joint meetings were held to consolidate the analysis results and represent the parents' experiences, and an external audit was performed by an independent researcher to ensure validity. All coding processes were discussed by the research team until a consensus was reached on the

main categories and themes, creating a final matrix of categories. The computer program ATLAS-TI-24 was used for the analysis [34].

2.6. Quality and Rigor Criteria

This study was conducted in accordance with the Consolidated Criteria for Reporting Qualitative Research [28] and the Standards for Reporting Qualitative Research [35]. The rigor and reliability of the qualitative data were ensured by applying the criteria of Guba and Lincoln (see Table 3).

Table 3. Rigor criteria.

Criteria	Techniques and Procedures Used
Credibility	-Researcher triangulation: Each interview was analyzed by five researchers (E.G.C.-B., C.G.-M., A.T.-R., E.M.-M., and P.D.-H.) and two researchers with clinical and research experience in mental health (P.D.-H. and C.G.-N.). Team meetings were held to compare analyses and identify categories and themes with the rest of the team; -The analysis was carried out by five researchers and an external auditor (E.V.-V.); -Triangulation of data collection methods: Semi-structured interviews were conducted, and field notes were taken by the researchers; -Participant validation (member checking): Participants were offered the opportunity to review the audio recordings to confirm their experiences. No additional comments were made by any of the participants.
Transferability	-Detailed description of the study conducted: The characteristics of the researchers, participants, settings, sampling strategies, and data collection and analysis procedures were described in detail.
Reliability/Trustworthiness	-External researcher audit: An external researcher (E.V.-V.) assessed the research protocol, focusing on the methods applied and the study design.
Confirmability	-Researcher triangulation, member checking, and data collection triangulation were performed.

2.7. Ethical Considerations

The study was conducted according to the Declaration of Helsinki and received ethical approval from the Research Ethics Committee of the University Hospital (PIC015-23FJD). All participants were informed of the objectives of the study and signed a written informed consent form before the interviews, assuring them that they had the right to withdraw at any time without consequences. The interviews were conducted anonymously, voluntarily, and confidentially, without collecting personal data or devices that could identify the informants, and were recorded with the permission of the participants and then transcribed verbatim. The information obtained was treated anonymously and confidentially, complying with the General Data Protection Regulation (EU) 2016/679 of the European Parliament and Organic Law 3/2018. The researchers did not report any ethical, moral, or legal conflicts, nor did they receive financial compensation, just as the participants did not receive compensation for their collaboration in the study.

3. Results

Twelve individual interviews were conducted with family members of patients with eating disorders. More than half (58.33%) were female interviewees, with an average age of 44.7 years. Of the patients in question, 75% were diagnosed with AN, while 25% were diagnosed with BN, with an average age at diagnosis of 17.4 years.

3.1. Themes

Four thematic blocks comprising several categories were identified: (T1) diagnosis, (T2) family, (T3) resources, and (T4) treatment (see Table 4).

Table 4. Themes and categories.

	Themes (T)	Categories
T1	Diagnosis	Triggers Personality traits Behavioral changes Impact
T2	Family	Family relationship Marriage Change of role Role of the primary caregiver Involvement
T3	Resources	Scarce public resources Private costs Multidisciplinary team Nursing care
T4	Treatment	Approaching the situation Seeking assistance and coping Needs for improvement

3.2. Theme 1: Diagnosis

During the interviews, the participants shared their perspectives on possible triggers for ED development in their family members and the circumstances surrounding the onset of the disorder. Some mentioned the influence of social media and comparisons with peers as influential factors.

“My relative compared herself to girls her age, questioning why they could eat without gaining weight, while she felt that she gained weight even when eating minimal amounts of food.” E6

Additionally, traumatic events, such as the death of a loved one, were highlighted as possible triggers for ED:

“My relative faced a difficult emotional circumstance after her father’s death. She had a significant bereavement problem, which led her to self-harm and injure her wrists.” E2

Confinement due to the COVID-19 pandemic was not considered a triggering or aggravating factor, but it did complicate the situation experienced, and in some cases, this led many families to realize that their adolescents had an ED.

“Well, of course, you see yourself locked up at home without being able to go out, without being able to do sport, locked up like a family therapy beast everything. We all eat lunch, breakfast, and dinner at the same time and there is no way to escape.... So, yes, it was very traumatic then because she didn’t want to leave the room, she cried...” E2

The participants also identified personality traits such as high levels of control and low self-esteem as influential factors in ED-related behaviors.

“She exercised, she went to the gym a lot, she is a very active person, very controlling, if she leaves something somewhere she wants to see it there, she has everything very controlled.” E10

Some agreed that low self-esteem was an underlying cause of their relatives’ illness. In their opinion, an ED could manifest as a problem related to self-acceptance and self-esteem, including perfectionism. For them, the ED represents a more profound problem beyond the simple relationship with food.

“(...) but it is not about being fat or thin; it is a deeper problem of accepting yourself as you are, that is to say, that the manifestation is food, but the origin is something else.” E11

They also noticed significant changes in the behavior of their loved ones:

“She used to be a cheerful and outgoing adolescent, but as a result of this whole process, she became defensive, bad-tempered, overreacting to any comment and even crying. The situation became complicated for everyone.” E6

The situation became complex for everyone involved, as these emotional and behavioral changes profoundly impacted family dynamics. Furthermore, the family members noted that their affected loved ones exhibited emotions and behaviors characterized by isolation, avoidance, and frequent bouts of bad moods. They described a shift in the individual's responses and noted that they became more defensive:

“I have always kept joking, and she has always played along with me... but I remember once I made a comment about her and her reaction was to start crying inconsolably. Apart from that, she was continually defensive.” E7

When asked about their initial reaction to receiving their relative's diagnosis and its impact, more than half of the participants said that they did not experience any significant change in their emotions. This lack of surprise was attributed to their pre-existing suspicions about the condition. One family member expressed this sentiment by saying,

“Mmm, I did not feel any special way because I already suspected it.” E9

They noticed certain signs and symptoms that led them to anticipate the possibility of an eating disorder.

However, there were participants who, despite having some suspicions, still expressed surprise at the formal diagnosis. They acknowledged that they were expecting the news, but the severity of their relative's health situation surpassed their expectations. One participant explained,

“Well, the truth is that I was surprised because we were waiting to be told that, but I did not think it was or she was in such a serious moment.” E4

This unexpected seriousness added an extra layer of complexity and concern to their emotions.

Furthermore, some family members admitted feeling confused in response to the diagnosis. They were unsure about how to handle the situation and what steps to take. The gravity of the situation and the unfamiliarity of dealing with an eating disorder led to a sense of uncertainty and unease. One participant shared their experience, saying,

“I felt confused at the time of diagnosis because I did not know what to do...” E7

The lack of clarity in understanding the disorder and its implications added to their emotional challenge in coping with the diagnosis.

Overall, the reactions to the diagnosis varied among family members, with some confirming their suspicions, others being surprised by the severity, and a few feeling unsure and confused about how to proceed. These emotions reflected the complexity of facing an eating disorder diagnosis within the family unit.

3.3. Theme 2: Family

First, we explored family structure and relationships, identifying both families with traditional, stable structures and those with more complex family situations. One participant described his family as a traditional nucleus, consisting of parents and a sibling, while another noted that, after the death of his father, he experienced problems at home, which led him to want to leave home.

“We are family, the family nucleus in this case is structured, his father and I are together, and we have another son...” E1

“His father had died [...], he began to have a lot of problems at home, with his mother, he did not want to be with her, he wanted to leave home.” E8

Regarding the pre-existing relationship with their relative before the illness, all participants reported having a good relationship characterized by trust and open communication.

There were no instances of problematic relationships before the disorder emerged, as most participants described it as a typical and healthy family dynamic.

"A normal relationship, of trust, of asking for your opinion, advice... I mean, each adolescent is different, but it was a normal relationship." E12

Interestingly, in one case, the illness seemed to have strengthened the family bond, making them feel more united and resilient:

"No, it didn't change, it hasn't changed. Not at all, it has strengthened; on the contrary, it has made us stronger." E1

However, for most participants, the illness had a negative impact, leading to a breakdown in trust and a less intimate relationship. They attributed this change to the necessity of lying that often accompanies the development of the disorder.

"To act on the illness you need to lie, don't you? And then, of course, everything changed." E9

The impact of the illness extended beyond family relationships and permeated various aspects of daily life. Family members shared experiences of adjusting their routines and habits to accommodate the challenges posed by the illness. For some, holidays became stressful, as they had to navigate unfamiliar territories and disrupted routines. Additionally, the marital relationship was heavily affected, causing disagreements and conflicts over the best approach to support their loved one's recovery:

"I had to change my daily life." E4

"The first year of holidays I remember it as a nightmare, we took her out of her comfort zone and it was chaotic." E6

"It worsened my relationship with my wife." E7

"We had many problems within the family nucleus, as my wife and I did not agree on the best way for her to be cured. We argued every day, we cried out of helplessness and although our aim was the same, we could not agree." E7

"Above all, we saw that it was fundamental to be well in the marriage. That was paramount. And then, if you are well, you can help your children, but if not, you can't." E3

In several cases, family members took on new roles, with siblings becoming caregivers. This change in role brought about feelings of being overwhelmed, hopeless, and unsure of how to handle the situation. Some expressed frustration when their relative refused help, leaving them feeling powerless and desperate to assist.

"She changed with his siblings, because also siblings at the beginning tend to.... to watch over... and the role of siblings is not that." E4

"You see that a person is drowning and you throw them a float, and they don't catch it." E4

Furthermore, the slow progress of recovery from the illness added to the uncertainty and anxiety experienced by family caregivers. Eating disorders are often unpredictable, and not knowing what to expect or how to effectively support their loved one further compounds the burden that family members carry.

"Feeling hopeless... hopeless, I didn't see myself as capable." E7

Despite the challenges, family involvement in the treatment process was highly valued and considered vital to the patient's recovery. Family members expressed a genuine interest in actively participating in their relative's treatment, often suggesting joint sessions or seeking educational resources to enhance their support, emphasizing the importance of family therapy and support in the recovery journey:

"(. . .) there were courses for families on how to deal with Christmas, meetings. . . and, believe me, that was fundamental to me and I truly believe, it was very important for her also." E2

Most participants felt deeply involved in the treatment and considered their contribution highly valuable. Some expressed satisfaction with their involvement, while others expressed a strong sense of commitment.

3.4. Theme 3: Resources

All participants unanimously agreed that the public health system has scarce resources to effectively address the complexities of this type of pathology. Although they initially sought help from public services, none of their relatives received treatment there. They attributed this issue to the overwhelming number of patients and the lack of adequately trained staff, resulting in a saturated system and the experience of what is known as scarce public resources.

"The public health system, in my opinion, has very few resources for this type of patient." E7

Participants highlighted the sluggishness of the services, including long waiting times for appointments and consultations, which hindered effective follow-up and continuity of care:

"Because of social security, they offered us a psychologist almost for the following year." E12

Although they expressed satisfaction with the treatment and resources available during hospitalization, they emphasized that such care was only temporary at the hospital level and did not extend to outpatient settings, creating a gap in the long-term management of the disorder:

"(. . .) Yes, during her hospitalization, yes. . . she was very grateful because all the professionals in the hospital helped her a lot, they were great, but after that... mmm... I think it was not enough, she did not have a proper follow-up." E5

Moreover, they raised concerns about the lack of resources and support available for patients who transitioned to adulthood and were no longer eligible for pediatric treatments. According to their perception, resources for adults were less comprehensive than those available for adolescents, and searching for appropriate resources was challenging upon reaching adulthood.

When seeking therapies or consultations with specialists in the field, they discovered that the options were predominantly in private health services, leaving them to navigate this situation on their own, which incurred additional costs:

"She has been managing it privately, she has had to struggle and look for help on her own." E4

Based on their experiences, the participants agreed that an effective treatment approach should involve a multidisciplinary team comprising psychologists, psychiatrists, nutritionists, mental health nurse practitioners, and other professionals. However, this comprehensive approach is hindered by the high costs of such services, making them inaccessible to many individuals and families:

"I was shocked at the prices charged by each one, there are few of them, and on top of that, they are very expensive privately." E7

The role of nursing in the treatment process was highly regarded by those who had had direct contact with mental health nurse practitioners, especially during hospitalization, where they had more contact with them, as well as in outpatient follow-ups:

"Nursing professionals have an essential role in the approach." E4

However, some participants admitted that they were not fully aware of the specific role of mental health nurse practitioners in this area, as they had not had direct contact with nursing professionals during the course of the disease:

"Honestly, I don't know because... surely yes, it is possible that nursing plays an important role, but so far we have not had the opportunity to learn about it." E7

Others recognized the significance of nurses working in parallel with doctors, emphasizing the importance of continuous and individualized care, which includes regular follow-up through calls or consultations, complementing medical treatment:

"It is very important that the doctor sees you, but the follow-up by the nurse..." E1

3.5. Theme 4: Treatment

The vast majority of family members currently acknowledge that they would approach the situation differently based on their learning and experiences. As one participant aptly stated,

"Experience is the mother of science." E2

They unanimously agreed on the importance of timely intervention in treating the illness, emphasizing the need to act swiftly without dismissing the possibility of the disorder, even in seemingly idyllic situations:

"Act quickly and don't keep thinking that it can't be because your daughter is idyllic... because you think that it can't happen to her and it does happen, and that ends up prejudicing the diagnosis of her illness." E6

Over time, participants gradually became more aware of the challenges that they were facing and had to confront, prompting them to seek assistance and coping strategies through various channels, ranging from primary care to the hospitalization of their relative. To address the complexities of the illness, family members embraced a multidisciplinary approach, seeking assistance from various professionals. They acknowledged the significance of incorporating family members into the therapeutic process, recognizing their role as essential caregivers:

"I think this help could be improved by doing family therapy, group therapy, or including family members in some kind of consultation or information session... to include them in the treatment as they are going to be the main caregivers." E4

Despite this recognition, it was noted that none of the participants' relatives had received family-based therapy.

When asked about potential improvements to the healthcare resources for EDs, the responses varied. However, they unanimously agreed on the necessity of increasing the number of professionals to lower the doctor/nurse–patient ratio and ensure quality care with adequate time allocation for each individual's needs.

"I would like everything to be easier and quicker." E6

They emphasized the importance of personalized attention, akin to treating other medical conditions where tailored treatment is provided.

"Like when you have a cold and they prescribe paracetamol, just the same." E1

Moreover, given the significant impact of this issue on so many individuals, the participants underscored the need for increased investment and research in EDs. They acknowledged the scarcity of information about these disorders and believed that further research could lead to the development of alternative and more effective treatment methods.

"I've read that it's what we know the least about; maybe they need to do more research." E5

These results illustrate the complexity of families' perceptions and experiences of adolescent eating disorders. Figure 1 shows a map of agents and interactions and allows us to establish the following themes: The first theme involves the diagnosis (triggers, personality traits, behavioral changes, and impact). The second theme deals with the family (family relationship, marriage, change of role, role of the primary caregiver, and involvement). The third theme deals with resources (scarce public resources, private costs, multidisciplinary teams, and nursing care), and the fourth theme deals with treatment (approaching the situation, seeking assistance and coping, and needs for improvement).

All of these are related to each other and to eating disorders. The ATLAS-TI program was used to code and synthesize the data, and a graphic designer prepared the results in the form of a map of agents and interactions, as shown in Figure 1.

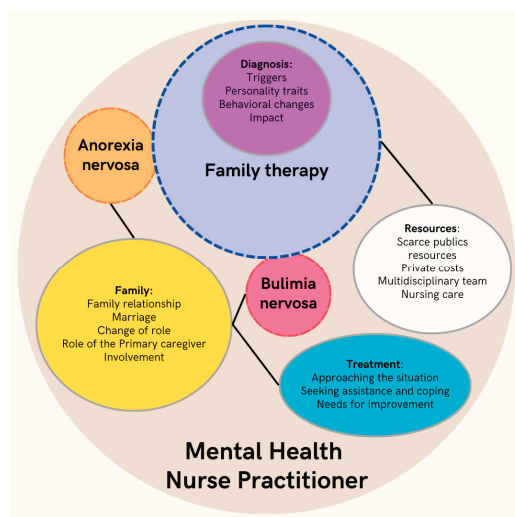


Figure 1. Map of agents and interactions.

Figure 1 presents a map of agents and interactions that synthesizes the main findings of the study, highlighting the relationships between the four identified themes and their connection to eating disorders (EDs). These themes are (I) diagnosis, which covers triggers, personality traits, behavioral changes, and the impact of the diagnosis; (II) family, which explores family dynamics, role changes, the role of the primary caregiver, and involvement in treatment; (III) resources, which details limitations in public resources, private costs, the need for a multidisciplinary team, and the role of nursing; and (IV) treatment, which addresses the initial approach, coping strategies, and needs for improvement in services. All these themes are interrelated: for example, the diagnosis impacts the family dynamics, the perception of available resources, and treatment strategies. The graphic representation uses circles and arrows to illustrate these relationships, highlighting the interaction and mutual influence between the factors, facilitating a comprehensive understanding of the families' experience, and integrating the different elements that make up the management of EDs.

4. Discussion

EDs are complex diseases influenced by biological, environmental, social, psychological, and cultural factors [36,37]. This study highlights the importance of family perspectives in understanding how these factors interact in the diagnosis and treatment processes. Among the most relevant findings, the family members identified triggers, such as low self-esteem and the impact of social networks, that promote unrealistic beauty ideals. In addition, the COVID-19 pandemic exacerbated these risk factors, revealing previously unidentified eating behavior problems in some patients.

A central theme in this study is the role of the family as the primary caregiver. The participants expressed feelings of helplessness, overload, and hopelessness, in line with previous research evidencing the emotional impact of these responsibilities on family members' quality of life [38,39]. This analysis of family responses provides valuable insight into how they perceive the effects of the ED on their personal experience, family dynamics, and their interaction with the healthcare system. For example, fathers often expressed a greater sense of helplessness compared to mothers, whereas sisters emphasized changes in sibling relationships and roles assumed within the family. This diversity of perspectives could enrich the understanding of the needs and challenges of families as a

whole, allowing the design of more comprehensive intervention strategies tailored to the reality of each member.

An important finding of the study is the need to integrate the entire family into the patient's recovery process. EDs affect not only the individual sufferer but also the family dynamics, generating tensions, feelings of guilt, and misunderstanding. Involving family members in therapy can address these challenges, provide education about the nature of the disorder, and empower them to be active partners in recovery [40,41]. This involvement may also identify dysfunctional patterns in communication or behavior that perpetuate the problem, and addressing these issues promotes positive changes within the family.

Mental health literacy is a key aspect in helping families understand EDs and effectively support patients. In the same vein, the NICE clinical practice guideline supports adult caregivers through appropriate programs, information, and psychosocial support [42]. However, the results show that many participants lacked sufficient information about the disorder and did not know how to collaborate with the healthcare team. Improving the level of MHL could empower families, reduce the stigma associated with these disorders, and encourage greater adherence to treatment [16,18–20,24]. In addition, recent advances in the biological understanding of EDs, such as the role of hypoleptinemia in anorexia nervosa [43], underscore the importance of integrating biological knowledge into educational strategies aimed at family members [44]. This holistic approach could strengthen collaboration between patients, families, and healthcare professionals.

Widespread family dissatisfaction with available resources was a recurring theme. The limitations of the public health system, the need to use private services, and difficulties in the transition from pediatric to adult care are significant barriers to ensuring a continuum of quality care [39,45,46]. The participants highlighted the need for a multidisciplinary and individualized approach that includes physicians, psychologists, nutritionists, and specialized nurses. In this regard, nurses not only impart quality care but also promote informed decision making [47]. In addition, nurses help patients develop skills to recognize harmful behaviors and thoughts, teaching them to make healthier dietary and self-care decisions, such as identifying warning signs, which is important for restoring balanced eating patterns, together with the multidisciplinary team [17,18,20,24,47].

Providing family members with clear and accessible information about the biological aspects of the disorder not only facilitates their understanding but also provides them with the necessary tools to participate more actively and effectively in the treatment process. Along these lines, the treatment of EDs should evolve to integrate the most recent advances in biology, such as the findings on hypoleptinemia in AN, according to Hebebrand et al. (2024) [43]. This biological knowledge provides a deeper understanding of the physical basis of the disorders, which can significantly improve mental health literacy strategies aimed at families. By understanding that EDs have both biological and psychological roots, the stigma associated with these disorders can be reduced, fostering a more collaborative and empathetic environment both within the family and in the healthcare setting [43]. Several studies have highlighted widespread dissatisfaction among family members regarding the care and resources available for EDs [39,45]. The transition from care in adolescence to care in adulthood poses challenges, resulting in a significant decrease in available resources upon reaching adulthood [46]. To ensure the continuity of care, a multidisciplinary and individualized approach is essential for meeting the demands expressed by the family members interviewed who sought comprehensive care with diverse perspectives [38,44].

The importance of nursing in the management of EDs, especially the critical role of mental health nurses, has been highlighted by various sources [48,49]. These patients often present complex challenges that require staff with specific expertise. Nurses play a key role in health education, promoting self-care, patient autonomy, and healthy eating habits, making them indispensable members of multidisciplinary teams [48–50]. This study revealed that, although many families were not fully aware of the extent of the nurses' roles, they perceived their contributions as essential in the care of their loved ones. It

highlighted the close relationship that these professionals develop with patients, facilitating a patient–professional bond that is valuable in providing effective care, emotional support, and continuous follow-up throughout the treatment process. This involvement not only improves clinical outcomes but also empowers patients to take charge of their well-being, promoting positive lifestyle changes and better adherence to treatment [17–19,49,50].

However, the role of nurses should be understood as part of a comprehensive, multidisciplinary approach that also requires the active inclusion of families in the recovery process. Collaboration between multidisciplinary teams and the continuity of care, especially in the transition from pediatric to adult care, are crucial for optimizing outcomes for patients with EDs. In addition, addressing the challenges faced by family caregivers by providing adequate support and resources is essential for the effective management of these complex diseases. Increasing investment in research and public healthcare resources is equally imperative to meet the growing demand for specialized treatment and ensure comprehensive care for both patients and their families [16,20].

4.1. Strengths and Limitations

This study provides valuable insight into the experiences and perceptions of family caregivers of individuals with eating disorders. Through its qualitative approach, a comprehensive and in-depth understanding of the challenges and needs faced by these families is achieved. By considering the views of diverse family members and health professionals, the study provides a multidisciplinary perspective on the treatment of eating disorders, enriching the overall understanding of the topic. In addition, the study provides practical recommendations, such as the importance of family therapy and the key role of nursing in treatment. These suggestions may inform future treatment protocols and interventions for eating disorders.

This study has limitations in that further research with larger and more diverse samples is needed to validate the results in different populations. The small sample size and possible lack of diversity among participants may limit the generalizability of the findings. Because the study relied on family members' accounts of their experiences, there is the potential for recall bias. Family members may not accurately recall all events or may perceive them differently from how they occurred. In addition, the qualitative nature of the data collected may introduce subjectivity into the interpretation of participants' responses. It is essential to ensure rigor in the analysis and interpretation of the data to minimize possible biases.

In addition, the method adopted in this study, which consisted of interviewing individual family members, proved to be highly productive in allowing an in-depth analysis of their personal perspectives and experiences. However, this approach did not directly capture the dynamics of family interactions, a central aspect of most family therapy interventions. These interactions may reveal patterns of communication, conflict, and support that significantly influence the management of eating disorders. Future research might consider incorporating methods that explore family interactions, such as group interviews or observational sessions, to complement individual findings and provide a more holistic view of the family experience in this context.

4.2. Nursing Implications

This study highlights the importance of adopting a personalized therapeutic approach for patients with eating disorders, emphasizing the need for healthcare professionals, such as psychologists, psychiatrists, nutritionists, and nurses, to work in a multidisciplinary team to address the multifactorial causes of these disorders. This approach will ensure that patients receive comprehensive and individualized care, promoting improved treatment outcomes. In addition, the research highlights the critical role of family members in the treatment process, indicating that healthcare professionals should actively involve families in therapy sessions, support groups, and educational programs to improve patient care.

Recognizing and addressing family dynamics can contribute significantly to the patient's recovery and overall well-being.

Likewise, the dissatisfaction expressed by family members about the insufficiency of public resources for the treatment of eating disorders requires urgent attention, and health authorities should invest in increasing the availability of resources and specialized personnel to provide timely and quality care. Mental health nurse practitioners play a key role in the treatment of eating disorders by building strong therapeutic relationships and promoting self-discipline and healthy eating habits. Patient empowerment is another area where MHL and nursing intertwine; nurses teach self-care skills that enable patients to take control of their recovery, including recognizing relapse symptoms and planning healthy meals.

In addition, they play a central role in the coordination of multidisciplinary care by ensuring that medical indications are translated into understandable terms for patients and families, which facilitates greater adherence to treatment. Finally, nurses are key in the prevention and early detection of eating disorders, as they can intervene in community or school settings to promote MHL at early stages, enabling people to recognize the initial signs of an ED in themselves or others, which contributes to early diagnoses and more effective treatment.

5. Conclusions

In conclusion, our study shows the complexity of EDs, which have no single trigger, highlighting the need for personalized and tailored care to achieve effective therapeutic outcomes. EDs affect not only the individual but also the family dynamics, underscoring the importance of involving families in the treatment process, both to support the patient and to address the significant psychological implications faced by caregivers. Dissatisfaction with public resources highlights the urgency of increasing the availability of specialized personnel and improving health system services. In this context, MHL emerges as an essential component, with nursing professionals being a fundamental pillar in providing care, emotional support, and psychoeducation to family members, in addition to coordinating patient follow-up, together with the multidisciplinary team. These interventions not only improve the prognosis of patients but also contribute to preventing relapses and promote a better long-term quality of life for patients and family members.

Future studies should evaluate the efficacy of family therapy in the treatment of EDs and explore the impact of increased investment in public health and in the recruitment of specialized professionals. This more holistic approach, combining family support, MHL, and a strengthened health system, has the potential to generate more effective treatments and provide significant benefits for both patients and their families.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/nursrep14040302/s1>. The supporting information can be reviewed in the COREQ Checklist document.

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Article

Evaluation of Attitudinal Beliefs Held by Medical and Nursing Students Towards Suicidal Behavior

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Abstract: Background/Objectives: A favorable attitude towards suicidal behavior is associated with an increased risk of suicidal behavior in youth populations. Hence, the aim of the present study was to analyze attitudinal beliefs about suicidal behavior among Mexican medical and nursing students. We also compared attitudinal beliefs about suicidal behavior according to the religious affiliation of the participants. Methods: This is a cross-sectional observational study. Attitudinal beliefs about suicidal behavior were assessed using the Attitudinal Beliefs Questionnaire about Suicide Behavior (CCCS-18). We evaluated personal and family histories of suicide using the Spanish version of the MINI International Neuropsychiatric Interview. Comparative analysis between nursing and medical students was performed, using Chi-square tests for categorical variables and Student *t*-tests for continuous variables. Results: A total of 195 (52.2%) medical students and 178 (47.8%) nursing students participated. Medicine students reported a higher prevalence of a family history of suicide attempts and knowing someone who had tried to die by suicide compared to nursing students ($p = 0.001$). Regarding attitudinal beliefs—specifically, suicide in terminal patients—medical students reported higher scores than nursing students (9.50 ± 5.91 vs. 11.23 ± 6.38 , $p < 0.001$), while the latter exhibited higher scores in attitudinal beliefs related to suicide itself (9.55 ± 4.45 vs. 7.28 ± 4.09 , $p < 0.001$). Both groups display similar scores when compared by religious affiliation. Conclusions: Our findings show differences in attitudinal beliefs about suicidal behavior between medical and nursing students. Medical students exhibited more positive responses toward suicide in terminal patients, while nursing students had higher values for attitudinal beliefs related to suicide itself. These results could be considered in the planning of health sciences curricula in order to positively impact future suicide prevention efforts. This study was retrospectively registered at the Universidad Juárez Autónoma de Tabasco, with the registration number 20240063 on 8 June 2024.

Keywords: nursing; medical; students; suicide; attitudinal beliefs

1. Introduction

Every year, nearly 800,000 people die by suicide. The incidence of suicide deaths is higher in developing countries than in developed countries [1]. The magnitude and seriousness of suicidal behavior continue to make suicide a leading cause of death worldwide. For example, epidemiological data show a mortality rate of 11.3 per 100,000 in Poland and a rate between 10.3 and 16.3 per 100,000 in India, with a higher risk in men than in women [2,3]. Furthermore, North, Central, and South America have experienced a significant increase in suicide mortality over the past 20 years [4]. Furthermore, death by suicide is the second cause of death among individuals aged 10–14 and 25–34 years in the United State, and the third cause of death among individuals aged 15–24 years [5,6]. In Mexico, death by suicide has increased over the last 5 years, particularly among young populations aged 15–24 years [7]. Also, recent studies reported a 600% increase in suicide attempts among Mexican adolescents from 2006 to 2022 [8].

Despite its importance in terms of public health, suicidal behavior is often met with misunderstanding and negativity. It has been suggested that actions to prevent deaths by suicide should include training healthcare personnel to detect and treat the risk of suicide in patients [9,10]. Healthcare professionals play a pivotal role in the support and prevention of mental illnesses, including suicide [11]. This is especially important as healthcare providers influence the motivation to treat patients during a suicidal crisis [11,12]. However, attitudes towards suicidal behavior may differ between health professions, such as nurses and doctors [12,13]. The transition from adolescence to adulthood is a significant period of psychological change, during which suicidal ideation is a critical issue to address in medical and nursing students, who face numerous stressors during their education. Health students need to acquire skills to manage the stressors they may encounter during their academic formation, as these can affect their mental health and well-being [14,15].

Moreover, it has been suggested that stressful events are associated with an increased risk of suicidal behavior, while spiritual experiences may provide protection against suicidal behavior [16,17]. Spirituality has been observed as a protective factor in university students in several regions of the world [18–20]. Nevertheless, the role of spirituality as a protective factor against suicidal behavior has not been widely studied. Medical and nursing students are often exposed to several factors that could increase their stress. Studies show that individuals may respond to suicidal behavior based on their personal attitudes toward it [21]. Therefore, it is possible that a lack of knowledge and negative attitudes toward suicide can have a negative impact on healthcare care and individual's safety [22].

Negative attitudes toward suicidal behavior are associated with a lack of professional preparation, stigma, and even discrimination, which may impair the quality of patient care. Therefore, it is essential to examine attitudinal beliefs about suicide in healthcare students [23]. This would enable the development of strategies to improve their academic experience and, consequently, the quality of care and patient safety provided when they begin clinical practice and social service. Similarly, attitudes toward suicide are associated with the likelihood of a suicide attempt or death by suicide.

Suicidal behavior is more prevalent among healthcare workers than in the general population [24]. Depression, anxiety, and suicidal behavior have also been observed in nursing students [25]. Given these findings, it is important to evaluate the attitudes of nursing and medical students toward suicide prevention [26]. However, many factors remain unclear, such as the role of attitudinal beliefs, which are expressed in attitudes toward suicide. The CCCS-18 (Attitudinal Beliefs Questionnaire about Suicide Behavior) is an effective tool with which to evaluate and detect self-critical thoughts, as well as to assess their progression before an attempt is made [27]. Therefore, the aim of the present study is to measure the attitudinal beliefs about suicide behavior in nursing and medical students. Furthermore, we consider it important to assess whether the religiosity of healthcare students has an impact on their attitudinal beliefs about suicidal behavior.

2. Materials and Methods

2.1. Ethics Statement

First, this study was submitted for consideration to the ethics committee of the Juarez Autonomous University of Tabasco, which approved the study. Second, all students included in the study received detailed information about the objectives of the study. Students who decided to participate read and signed an informed consent form. Participation in the study was voluntary and participants did not receive any financial remuneration.

2.2. Design of This Study

This is a school-based cross-sectional conducted among students from public schools in Comalcalco, Tabasco, México. The present study used a non-probabilistic sampling approach.

2.3. Participants

In the present study, students from all academic levels were included to ensure a balanced representation of information. We assessed students from a faculty of the University of Tabasco, Mexico.

2.4. Assessment Procedure

Data collection took place from March to July 2024, during the spring semester. A semi-structured data sheet was designed. The first section collected and assessed sociodemographic information, personal characteristics, lifestyle habits, and other factors, which were documented. Sociodemographic variables included sex, marital status, socioeconomic status, and participation in other activities. The attendance of religious services, including the specific religion followed by the student, was also inquired. This question was based on the cultural context and the most commonly practiced religions in the region (INEGI) [28].

The students were asked about their personal and family history of suicide. To assess personal suicide history, we used the MINI International Neuropsychiatric Interview in Spanish, as reported elsewhere [26]. For the family history of suicide attempts, we included questions such as “Do you have a sibling who has attempted to die by suicide?” and “Do you have a parent who has attempted to die by suicide?” For the broader family history of suicide, we asked “Do you know anyone who has tried to die by suicide?” and “Do you know anyone who has died by suicide?” The questionnaire was administered face-to-face by trained interviewers.

2.5. Attitudes Toward Suicidal Behavior

Attitudes toward suicidal behavior were assessed using the Attitudinal Beliefs Questionnaire about Suicide Behavior (CCCS-18) [27]. This instrument was validated in Spanish [29]. The CCCS-18 comprises 18 items rated on a 7-point Likert scale (ranging from 1 = strongly disagree to 7 = strongly agree) and has 4 factors: the legitimization of suicide (Cronbach’s $\alpha = 0.84$), suicide in terminal patients (Cronbach’s $\alpha = 0.82$), the moral dimension of suicide (Cronbach’s $\alpha = 0.78$), and suicide itself (Cronbach’s $\alpha = 0.73$). The legitimization of suicide refers to the acceptance of suicidal behavior, with higher scores reflecting greater acceptance. Death by suicide in terminal patients reflects the acceptance of suicide in individuals with no further possibilities for survival. Regarding the moral dimension of suicide, higher scores indicate disagreement with moral statements. Finally, higher scores on suicide itself reflect the view that suicide is an escape from a given situation [30].

2.6. Statistical Analysis

Demographics, religious service attendance, and suicide history are presented, with frequencies and percentages given for categorical variables. All continuous variables are presented with means and standard deviation (SD) values. The Kolmogorov–Smirnov test was used to analyze whether continuous variables followed a normal distribution, with a p -value of $p > 0.08$ indicating normality. The comparison of categorical variables between nursing and medical students was performed with Chi-square tests, while Student

t-tests were used for the comparison of continuous variables [31]. A multivariate general linear model was used to identify differences in attitudinal beliefs about suicidal behavior between nursing and medical students and by religion.

To determine the power of the analysis, we used the G*Power software, Version 3.1.9.7 (Heinrich Heine Universität Düsseldorf, Düsseldorf, Germany) specifying two-tailed tests and an effect size (*d*) of 0.5. The sample size for medical students was 195 participants and that for nursing students was 178, with a power of 0.98. The significance for all tests was set to $p \leq 0.05$.

3. Results

3.1. Description of the Sociodemographic and Academic Features

This study included 373 students. Of these, 195 (52.2%) were medical students and 178 (47.8%) were nursing students. The majority of the subjects in our sample were women ($n = 229$, 61.4%) and single ($n = 351$, 64.1%), which reflects the fact that most nursing students are women. The majority of the sample were university students who also engaged in activities outside of their academic life ($n = 320$, 85.8%). These activities included full-time employment ($n = 159$, 42.6%), part-time employment ($n = 119$, 31.9%), participation in sports groups ($n = 31$, 8.4%), and involvement in active religious roles ($n = 11$, 2.9%). Most of the sample ($n = 334$, 90.3%) attended religious services. The majority identified as Catholic ($n = 214$, 57.5%), followed by Pentecostal and Presbyterian ($n = 92$, 24.7%), Adventist, or Jehovah's Witness ($n = 30$, 8.1%). Only 36 students (9.7%) did not report any religious affiliation (See Table 1).

Table 1. Sociodemographic and academic characteristics of the student participants.

Characteristics	All Sample	Nursing $n = 178$	Medicine $n = 195$	Statistics
Sex				$\chi^2 = 19.45, p < 0.001$
Men	144 (38.6%)	48 (27.0%)	96 (49.2%)	
Women	229 (61.4%)	130 (73.0%)	99 (50.8%)	
Marital Status				$\chi^2 = 2.62, p = 0.26$
Single	351 (94.1%)	164 (92.1%)	187 (53.3%)	
Married/living with a partner	18 (4.8%)	11 (6.2%)	7 (3.6%)	
Divorced/separated	4 (1.1%)	3 (1.7%)	1 (0.5%)	
Additional activities to study				$\chi^2 = 47.82, p < 0.001$
Yes	320 (85.8%)	176 (98.9%)	144 (73.8%)	
No	53 (14.2%)	2 (1.1%)	51 (26.2%)	
Type of activity				$\chi^2 = 61.06, p < 0.001$
Full-time employment	159 (42.6%)	120 (67.4%)	39 (20.0%)	
Part-time employment	119 (31.9%)	49 (27.5%)	70 (35.9%)	
Sports	31 (8.4%)	5 (2.8%)	26 (13.3%)	
Religious	11 (2.9%)	2 (1.1%)	9 (4.6%)	
Socioeconomic level				$\chi^2 = 16.7, p < 0.001$
High	12 (3.2%)	6 (3.4%)	6 (3.1%)	
Medium	294 (78.8%)	125 (70.2%)	169 (86.7%)	
Low	67 (18.0%)	47 (26.4%)	20 (10.3%)	
Have you failed any school subject?				$\chi^2 = 4.28, p = 0.03$
Yes	159 (42.6%)	66 (37.1%)	93 (47.7%)	
No	214 (57.4%)	112 (62.9%)	102 (52.3%)	
Attendance of religious services				$\chi^2 = 6.48, p = 0.01$
Yes	336 (90.3%)	153 (85.9%)	183 (93.7%)	
No	37 (9.7%)	25 (14.1%)	12 (6.2%)	
Religion identified with				$\chi^2 = 11.03, p = 0.01$
Pentecostal and Presbyterian	92 (24.7%)	33 (18.6%)	59 (30.3%)	
Catholic	214 (57.5%)	107 (60.5%)	107 (54.8%)	
Adventist or Witness	30 (8.1%)	13 (7.3%)	17 (8.7%)	
Not religion	36 (9.7%)	24 (13.4%)	12 (6.1%)	
Age	20.47 ± 1.84	19.80 ± 1.53	21.08 ± 1.89	$t = -7.21, p < 0.001$

3.2. Personal History of Suicide Behavior Details

A description of the personal history of suicidal behavior in nursing and medical students is shown in Table 2. Medical students ($n = 33$, 16.9%) had a higher family history of suicide attempts compared to nursing students ($n = 15$, 8.4%). When asked whether they knew anyone who had tried to die by suicide, medical students ($n = 98$, 50.3%) were more likely to respond affirmatively than nursing students ($n = 59$, 33.1%).

Table 2. Personal history of suicidal behavior.

	All Sample	Nursing $n = 178$	Medicine $n = 195$	Statistics
Personal history of suicide attempt	42 (11.3%)	20 (11.2%)	22 (11.3%)	$\chi^2 = 0, p = 1$
Family history of suicide attempt	48 (12.9%)	15 (8.4%)	33 (16.9%)	$\chi^2 = 5.99, p = 0.01$
Family history of death by suicide	22 (5.9%)	11 (6.2%)	11 (5.6%)	$\chi^2 = 0.04, p = 0.82$
Do you know anyone who tried to die by suicide?	157 (42.1%)	59 (33.1%)	98 (50.3%)	$\chi^2 = 11.17, p = 0.001$
Do you know anyone who died by suicide?	138 (37.0%)	64 (36.0%)	74 (37.9%)	$\chi^2 = 0.15, p = 0.69$

3.3. Attitudinal Beliefs on Suicide Behavior by Groups

The comparative analysis of attitudinal beliefs about suicidal behavior between nursing and medical students revealed differences in the attitudinal beliefs of the two groups. The medical student group showed higher values for “suicide in terminal patients”, while the nursing group had higher values for “suicide itself”. No differences between groups were observed in terms of the “legitimization of suicide” and the “moral dimension of suicide” (see Table 3).

Table 3. Comparative analysis of attitudinal beliefs on Suicidal Behavior between nursing and medical students.

Attitudinal Beliefs	All Sample Mean $\pm$ SD	Nursing $n = 178$ Mean $\pm$ SD	Medicine $n = 195$ Mean $\pm$ SD	Statistic
Legitimization of suicide	12.18 $\pm$ 6.11	12.48 $\pm$ 5.98	11.98 $\pm$ 6.23	$t = 0.90, p = 0.36$
Suicide in terminal patients	10.44 $\pm$ 6.22	9.50 $\pm$ 5.91	11.23 $\pm$ 6.38	$t = -2.80, p = 0.005$
Moral dimension of suicide	12.98 $\pm$ 4.35	12.97 $\pm$ 4.50	13.00 $\pm$ 4.22	$t = -0.05, p = 0.96$
Suicide itself	8.36 $\pm$ 4.41	9.55 $\pm$ 4.45	7.28 $\pm$ 4.09	$t = 5.12, p < 0.001$

3.4. Attitudinal Beliefs on Suicide Behavior by Religion of the Participant

In the comparison of groups based on the participant’s religion, similar scores were found between groups (see Table 4).

Table 4. Comparison of attitudinal belief on suicide behavior by religion.

Attitudinal Beliefs	Pentecostal and Presbyterian Mean $\pm$ SD	Catholic Mean $\pm$ SD	Adventist or Witness Mean $\pm$ SD	Non-Religious Mean $\pm$ SD	Statistic	
					F	p-Value
Legitimization of suicide	12.84 $\pm$ 6.90	12.08 $\pm$ 5.87	11.90 $\pm$ 6.88	11.41 $\pm$ 4.74	0.54	0.65
Suicide in terminal patients	10.87 $\pm$ 6.60	10.12 $\pm$ 6.05	11.56 $\pm$ 6.55	10.33 $\pm$ 6.06	0.65	0.58
Moral dimension of suicide	13.07 $\pm$ 4.58	12.99 $\pm$ 4.20	13.30 $\pm$ 4.54	12.75 $\pm$ 4.37	0.09	0.96
Suicide itself	8.15 $\pm$ 4.56	8.56 $\pm$ 4.49	8.10 $\pm$ 4.29	8.08 $\pm$ 3.69	0.29	0.83

Finally, we assessed whether the attitudinal beliefs could be modified by the interaction between a nursing or medical student and the participant’s religion. No interaction effects were found (see Table 5).

Table 5. Variable effects using multivariate ANOVA.

Factor/Dependent Variable	F	p-Value	Power
Nursing or medical student			
Legitimization of suicide	0.64	0.42	0.12
Suicide in terminal patients	6.15	0.01	0.69
Moral dimension of suicide	0.99	0.32	0.16
Suicide itself	14.64	0.001	0.96
Religion of the participant			
Legitimization of suicide	0.84	0.47	0.23
Suicide in terminal patients	0.32	0.80	0.11
Moral dimension of suicide	0.06	0.97	0.06
Suicide itself	0.34	0.79	0.11
Nursing or medic student x religion of the participant			
Legitimization of suicide	0.32	0.81	0.11
Suicide in terminal patients	2.48	0.06	0.61
Moral dimension of suicide	1.59	0.19	0.41
Suicide itself	0.06	0.98	0.06

Bold type denotes significant values.

4. Discussion

The objectives of the present study were to evaluate the attitudinal beliefs about suicidal behavior among medical and nursing students. Additionally, we analyzed these beliefs according to participants' religion. Healthcare workers play a pivotal role in suicide prevention; however, it has been shown that sometimes they hold unfavorable attitudes toward suicide. Therefore, it is crucial to understand attitudes and beliefs about suicide in medical and health science students [32], as detecting unfavorable attitudes toward suicide could help to develop strategies to improve their educational formation. Thus, the findings presented in this study are highly relevant.

When recording the personal history of suicide, medical students reported a higher percentage of positive responses regarding a family history of suicide attempts and knowing someone who had tried to die by suicide. This personal background is important to highlight as it has a direct link to attitudinal beliefs. For example, it has been reported that individuals who had experienced a suicide within their immediate family or among other relative are more likely to believe that suicide is unpreventable than those who have not had this experience [33,34]. Based on this, we could hypothesize that such individuals may become desensitized to the emotionally painful event, which could reduce their fear of death. Therefore, it is important to consider the family history of suicide and exposure to suicide attempts when designing professional education programs for mental health [15].

Our findings recognize a primary difference between nursing and medical students. Nurses are more likely to accept the idea of suicide, while medical students show more positive attitudes toward suicide in terminal patients. This highlights the importance of incorporating specific curricula tailored to each profession to improve mental health education, which will directly impact future patient care [35,36]. Furthermore, it is well documented that gender can be a significant predictor of psychological health. Epidemiological data show that women experience suicidal behavior at higher rates than men [37,38]. Given that nursing is predominantly performed by women, it would be beneficial to include topics in the nursing curriculum that address these gender-related differences [39].

Additionally, our results show that medical students have a more positive attitude toward suicide in terminal patients than nursing students, aligning with findings reported in the literature. For example, medical students from Serbia were found to have a more favorable attitude toward euthanasia [40]. This suggests that proper education in palliative care and end-of-life topics could enhance the communication skills of medical students.

On the other hand, a particularly interesting finding is that nursing students had a more positive attitude toward suicide itself than medical students. It is necessary to consider that nursing students may face pressure from colleagues, supervisors, and teachers,

which can increase stress and potentially lead to depression [41]. Thus, it is essential to assess both beliefs and attitudes toward suicide in order to guide prevention programs and curricula for medical and nursing students, especially for those nursing students who exhibit high levels of positive attitudes toward suicide itself. This could help to prevent deaths by suicide [42]. Attitudes toward suicide are very complex, involving multiple factors such as genetics, biology, social influences, and the environment. In our study, we found that nursing students (73%) were predominantly women compared to medical students (50.8%). There is evidence supporting marked differences between men and women regarding attitudes toward suicide prevention, with men generally having more positive attitudes toward preventative measures [43]. Consequently, it is proposed that the attitudes of nursing and medical students toward suicide influence their motivation to treat patients in suicidal crises [22].

There is growing evidence that religiosity directly impacts mental health outcomes [16,44,45]. In this study, we evaluated the relationship between religion and attitudinal beliefs about suicide. Despite Mexico's high religious population and the powerful influence of religion on the nation's culture [46], we did not find a correlation between religiosity and attitudes toward suicide. One explanation for this could be the homogeneity of religious practice in Mexico, where most religious affiliations are Christian. Religious beliefs may be deeply embedded in everyday life, making it difficult to detect a distinct statistical association with attitudes toward suicide. Previous studies suggest that religiosity is linked to suicide prevention, as it provides a support system that can reduce the likelihood of suicide behavior [18,47,48]. However, in the present study, no significant differences were found between the religious affiliations of nursing and medical students. This could be due to the cultural normalization of religion in Mexico, where religious practices are common across many sectors of the society.

We would like to highlight some limitations of the study. Our sample was limited to students from the Juarez Autonomous University of Tabasco, a public university in Mexico. Therefore, the findings are not representative of all students enrolled in universities across Mexico. Furthermore, since the data were self-reported, there may be potential biases due to social desirability, leading to inaccuracies arising from underreported information. Moreover, as a cross-sectional study, we can only establish associations and cannot infer causality. Nevertheless, the findings provide valuable insights into attitudinal beliefs about suicide. Future research employing different methodologies is needed to further explore the challenges faced by nursing and medical students in Mexico.

5. Conclusions

To sum up, medical students showed a more positive response to suicide in terminal patients compared to nursing students. On the other hand, nursing students had a more positive response toward suicide itself. These differences should be considered when planning the curriculum for health science students. Additionally, factors such as gender or religious practice should be taken into account when evaluating attitudinal beliefs about suicidal behavior. Addressing these differences can help to improve suicide prevention efforts and future patient care.

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Article

Moral Distress and Its Determinants among Nursing Students in an Italian University: A Cross-Sectional Study

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Abstract: Background: Moral Distress (MD) is a unique form of distress that occurs when people believe they know the ethically correct action to take but are constrained from doing so. Limited clinical experience and insufficient ethical knowledge contribute to nursing students’ MD, which can potentially cause negative outcomes. The aims of this study are: (1) to describe the MD intensity of nursing students, and (2) to analyze differences and associations between MD intensity and socio-demographic and academic variables. Methods: A cross-sectional study design with a convenience sample of the second, third, and delayed graduation students was included; only students willing to participate and who had attended their scheduled internships in the last six months were eligible for inclusion. To measure the level of MD, we used the It-ESMEE. We collected socio-demographic and academic variables. The data collection occurred from January 2024 to March 2024. Results: The students who adhered to the collection were N = 344. The findings reveal that the students perceived a high level of MD in situations related to clinical internship and class. They perceived higher levels of MD when nursing was not their first career choice, were separated or divorced, did not have children, and were not an employed student. The overall MD score is statistically significantly lower among students who had nursing as their first career choice ($\beta = -0.267$, $p < 0.05$), have children ($\beta = -0.470$, $p < 0.01$), and are employed ($\beta = -0.417$, $p < 0.01$). In contrast, being separated or divorced ($\beta = 0.274$, $p < 0.01$) was associated with a higher MD score. Conclusions: This study has some limitations: data reflect a local context, and the findings may not be generalizable to other regions or educational environments. Additionally, students’ recollections of their experiences could be influenced by the passage of time, and there may be a selection bias since only students willing to participate were included. The findings suggest that nursing education programs should incorporate more robust training in ethical decision-making and stress management to better prepare students for the moral challenges in their professional practice.

Keywords: nursing; moral distress; nursing students; cross-sectional

1. Introduction

1.1. Background and Rationale

Moral Distress (MD) is a unique form of distress that occurs when people believe they know the ethically correct action to take but are constrained from doing so; obstacles may lie in institutional structures and conflicts with co-workers [1]. Among students, it is caused by a situation in which the student perceives behaviors as morally inappropriate, disrespectful of subjects and their rights, and/or incompatible with the standards during academic training but cannot do anything about the situation due to a lack of

experience or knowledge, situational constraints, hierarchical decision-making, lack of resources, or holding a subordinate position in the team [2]. MD is a particularly heinous form of distress, especially among healthcare professionals, because it threatens their core values and has ethical implications. It has been linked to burnout occurrence, job leaving, and poorer delivery of care towards patients [3,4]. MD presents a significant challenge in any healthcare environment, especially where ethical and moral complexities are prevalent [5,6]. As a result of their role and responsibilities, nurses often experience MD in clinical practice due to frequent encounters with situations that demand ethical and moral decision-making [7]. The causes and consequences of MD among nurses are well represented, and while various definitions are available, McCarthy and Gastmans describe MD as a broad concept encompassing the psychological and emotional suffering that occurs when individuals act in ways that conflict with their deeply held ethical values, principles, or moral commitments [8,9]. Jameton defined MD as the negative emotions that emerge when an individual recognizes the morally appropriate response to a situation but cannot act due to institutional or hierarchical constraints [10]. Conceptually, MD is understood as a feeling of powerlessness that stems from the inability to take an action perceived as ethically appropriate; it arises when individuals are unable to act in accordance with their judgment and values, leading them to view their moral involvement as inadequate [11].

In the nursing field, the Canadian Nurses Association (2008) expanded this definition, highlighting that MD can affect professionals' values, commitments, and moral identity. Both practicing nurses and nursing students experience ethical dilemmas and MD. Although ethics courses are an integral part of undergraduate nursing curricula, nursing education programs often do not sufficiently prepare future professionals to face and manage ethical dilemmas and morally distressing situations [12]. Although nursing students are taught ethical theories and principles and how to address dilemmas, applying this knowledge can be difficult due to inter-professional and hierarchical conflicts, fear of repercussions, and insufficient guidance in clinical environments [13,14]. Limited clinical experience, low self-confidence, inadequate professional judgment, and insufficient ethical knowledge and training all contribute to nursing students' inability to cope with MD [13,15]. This inability can ultimately diminish their moral sensitivity and capacity for moral courage, potentially leading them to enter the workplace already experiencing apathy and compassion fatigue. The consequences of MD in nursing students may include collective incivility of students, cheating and copying, bullying, communication problems with patients, and a pervasive feeling of impotence [8,16]. These and other effects of moral distress have been linked to a decline in quality of care and higher turnover rates [17]. Consequently, nursing students need the skills and abilities to effectively manage MD, and it is the responsibility of nursing educators to prepare future nurses by providing learning experiences that enable them to reflect on and address ethical dilemmas [12].

1.2. Study Objectives

While a lot of studies delve into professionals' MD experience, few primary studies are focused on healthcare students, and even less among nurses. Most of the current literature is centered on qualitative and descriptive presentations, and there are few quantitative primary studies available, usually with tiny samples that make difficult to generalize on conclusions [18,19]. We decided to explore and analyze the experiences of MD in nursing students to inform educators and clinical instructors about the challenges students face in morally distressing situations. The findings of this study will assist in enhancing the ethical competencies of nursing students, equipping them with the necessary skills for their daily professional practice. The aims of this study are:

1. To describe the MD intensity of nursing students;
2. To analyze the differences in MD in socio-demographic and academic variables;
3. To identify the most significant domains within MD occurrence.

2. Materials and Methods

2.1. Study Design

A cross-sectional study design was adopted and is reported here in accordance with the STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) for cross-sectional studies [20].

2.2. Setting

We investigated the bachelor's degree program in nursing at an Italian university that enrolls up to 500 new students per year, with a total of 1500 students in the program.

2.3. Participants

A convenience sample of the second-year, third-year, and delayed graduation students were eligible. The sample included nursing students who:

- (a) were enrolled in the studied program from the 2021–2022 academic year (or previous academic years, but were still attending still attending their bachelor's course);
- (b) had attended at least one internship (worth at least 10 European Credit Transfer System—ECTS) in the six months before data collection;
- (c) were willing to participate in the study.

2.4. Measurement

The questionnaire collects sociodemographic (age, gender, marital status, parental status, and employment condition) and academic data (year of the program, nursing as a first career choice, previous university courses, the condition of passing all exams in relation to the year of the course, the mean Grade Point Average (0–30), and ECTS obtained at the time of data collection). In Italy, the nursing bachelor's degree is a three year program, totaling 180 ECTS. Each year, students complete 60 ECTS through a combination of theory and internship. To measure the level of MD, we used the Italian Moral Distress Scale for Nursing Students scale (It-ESMEE), validated by Mazzotta et al. among Italian nursing students [21]. The reason for choosing this scale is that it was translated and culturally adapted for nursing students in the Italian context. The It-ESMEE has five dimensions (Disrespect for the ethical dimension of vocational training, Authoritarian teaching practices, Lack of competence of the teacher, Improper institutional conditions to teach user care, Commitment of ethical dimension of user care), and a second-order factor for the overall It-ESMEE score for intensity and frequency. The first three dimensions (Disrespect for the Ethical Dimension of Vocational Training, Authoritarian Teaching Practices, and Lack of Teacher Competence) are related to the assessment of MD concerning classroom activities and the competence perceived by the student in the teacher. In contrast, the remaining two dimensions (Improper Institutional Conditions for Teaching Patient Care and Commitment to the Ethical Dimension of Patient Care) are related to internship activities and the students' relationships with the healthcare team. This scale was derived by translation and cultural adaptation of the original ESMEE developed by Bordignon et al. [22]. The It-ESMEE consisted of 31 items relating to MD assessment in academic environments (with teachers), organizational environments, and clinical practice. Each item had two scales: one for MD intensity and one for frequency, using a 7-point Likert-type scale (ranging from 0 = "no distress" to 6 = "severe distress"). High scores indicated high levels of MD intensity and frequency [21]. For this study, we modified the assessment of frequency to a two-point Likert scale (0 = no exposure to the situation, 1 = exposure to the situation), and included in the analysis only those students who reported exposure to the situation.

2.5. Data Collection Procedures and Ethical Issues

Data collection occurred from January 2024 to March 2024 through a series of structured online surveys using a Google Form. The surveys were collected during live meetings after university lessons, where two researchers (GB and VB) explained the aim of the survey. They also provided the students with instructions for completing the MD assessment and

clarified that intensity assessment was required for each item. For frequency, students indicated if they were exposed to the specific situation (0 = not exposed; 1 = exposed). During the data collection period, the researchers were available to address any students' clarification request.

2.6. Statistical Analysis

Statistical analyses were performed using SPSS 26 (IBM Corp. Armonk, NY, USA). The socio-demographic and academic characteristics of the students were analyzed using frequencies and percentages for categorical variables, and means and standard deviations (SD, $\pm$), and also Medians and Inter-Quartile Range (IQR), for continuous variables. To report the global frequency of exposure among nursing students, the frequency of studied events was simplified into a dichotomous form (0: not exposed; ≥ 1 : exposed).

We excluded subjects who reported 0 on the frequency scale, as they had no direct experience with the situation described in the 31 It-ESMREE items. Univariable and multivariable analysis were conducted for all dimensions and for the overall result of It-ESMREE to examine possible predictors of the reported MD intensity. A univariate analysis assessed the effect of each variable individually, and those with a possibly significant effect ($p \leq 0.15$) were included into the multivariate model.

To test for differences among categorical variables, we applied *t*-test or one-way analysis of variance (ANOVA) when appropriate. All the required assumptions for *t*-test and ANOVA were evaluated (no significant outliers, dependent variable normally distributed, and homogeneity of variance) [23]. A Bonferroni correction was applied to *p*-values for pairwise comparisons. Normal distribution was assessed through visual inspection of the Normal Q-Q plot.

3. Results

3.1. Participants Characteristics

Among the 1000 second-year, third-year, and delayed in graduation students, 57.6% ($n = 576$) were potentially eligible for inclusion; 346 answered the survey (60.06%), and 2 of them refused to give consent for data analysis and were therefore excluded. The final response rate was 59.7% (344).

The sample characteristics are indicated in Table 1. A total of 344 nursing students participated in the study. They mostly attended the second- (75.29%) and third-year (18.6%) of the program, while 6.1% were delayed in graduation. They had a mean age of 23.12 years (± 5.3) with a range of 18–53 years. In total, 73.26% were female, 86.92% were single, 95.03% did not have children, 79.65% were employed students during the program, and 77.03% had attended previous university courses before the nursing program; 64.24% attended the nursing program as their first career choice, and 64.83% passed every exam of the previous year, with a mean Grade Point Average (GPA) of 25.43 (± 1.49) and a mean of 70.27 (± 24.58) ECTS attended.

Table 1. Sample characteristics ($N = 344$). GPA: Grade Points average. ECTS: European Credits Transfer System.

Variable		N (%) or Mean $\pm$ SD (Min–Max)
Program year	2nd year	259 (75.29%)
	3rd year	64 (18.6%)
	Delayed Graduation	21 (6.1%)
Age		23.12 $\pm$ 5.3 (18–53)
Gender	Male	92 (26.74%)
	Female	252 (73.26%)

Table 1. Cont.

Variable		N (%) or Mean $\pm$ SD (Min–Max)
Marital status	Single	299 (86.92%)
	Married/with partner	3 (0.87%)
	Separated/divorced	42 (12.21%)
Parental status	No children	330 (95.93%)
	1 child	6 (1.74%)
	2 children or more	7 (2.03%)
	3	1 (0.29%)
Employment status during program	Employed	274 (79.65%)
	Not employed	70 (20.35%)
Nursing as first career choice	Yes	221 (64.24%)
	No	123 (35.76%)
Previous University program	Attended	79 (22.97%)
	Not attended	265 (77.03%)
Passed all exams of previous year	Yes	223 (64.83%)
	No	121 (35.17%)
GPA		25.43 $\pm$ 1.49 (21–29.33)
ECTS		70.27 $\pm$ 24.58 (4–153)

3.2. Moral Distress Intensity

The situations in which the students experienced higher levels of MD were in Q7 (Perceiving divergences between the way clinical nurses and teachers perform procedures) and Q10 (Identifying users' access difficulties to care, such as long waiting lists, no hospital beds, or long waits in the emergency room), with mean scores above 3.00. Other situations in which the students perceived high levels of MD, with scores ≥ 2.8 , were in Q4 (Identifying a mismatch between theoretical knowledge and practical application in one's teaching–learning process) and Q12 (Improvising to cope with a lack of material in user care). The lower score below 2.3 mean was in item Q2 (Perceive change of a fellow student's grades, by the teacher, to avoid failure), Q16 (Observe improper user care provided by students), Q19 (Observe inappropriate information to the user—e.g., about therapeutic project, discharge), Q22 (Observe a breach of confidentiality/professional secret of the user's personal information), and Q30 (Experience delegation of nursing care to users' relatives—e.g., asking relatives to do hygienic care for nursing workload). The MD intensity levels for all items and their respective dimensions, as perceived by nursing students, are detailed in Supplementary Table S1. We removed the students who had not experienced the specific situation described in the item; for each item, we indicated the number of subjects who actually responded.

D4 (“Improper institutional condition to teach user care”) and D3 (“Lack of competence of the teacher”) had the highest mean scores, while the lowest score was reported in D5 (“Commitment of the ethical dimension of care”) (Figure 1).

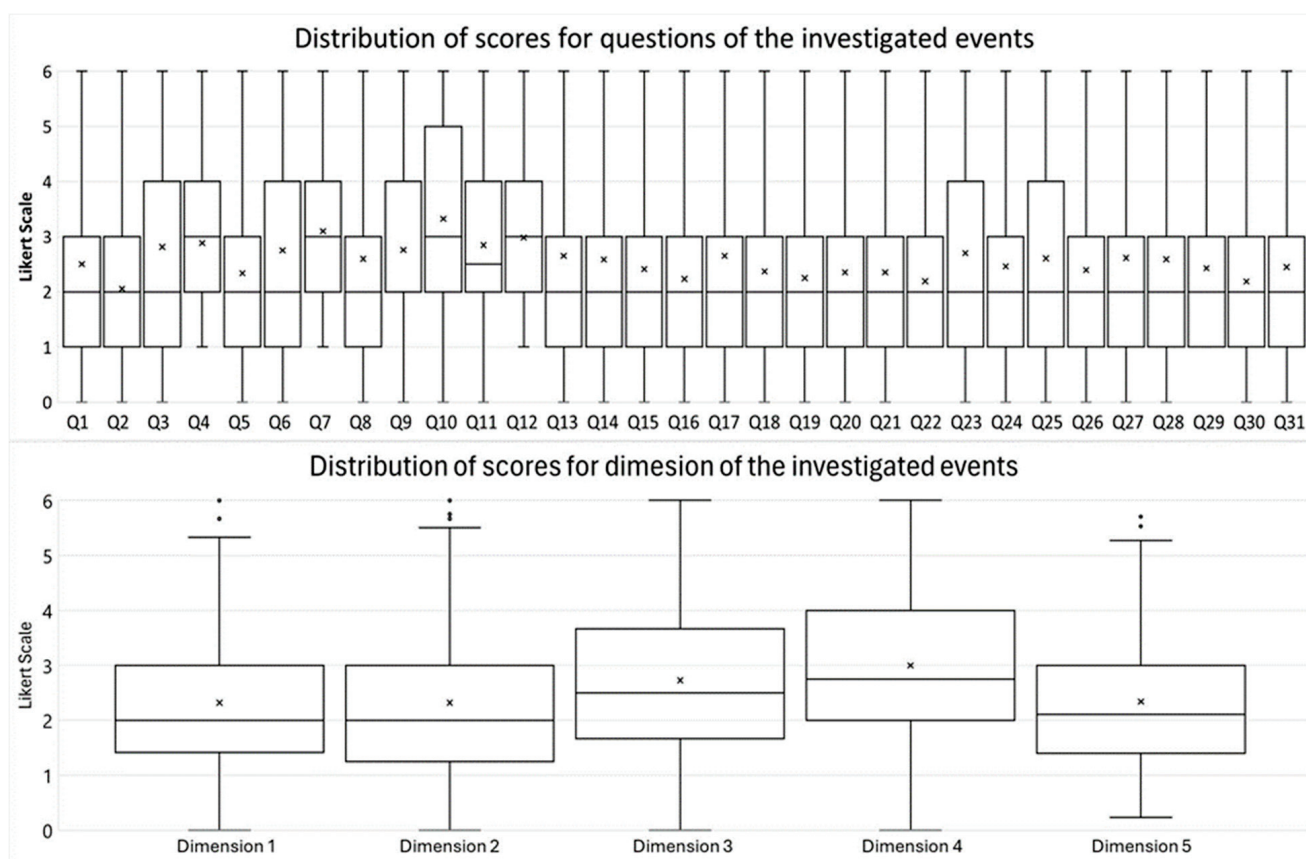


Figure 1. Distribution of scores for questions of the investigated events. The box plot illustrates the median, interquartile range (IQR), and minimum and maximum values. The mean score for each dimension is indicated by 'x'. For each Question and Dimension definition, see Supplementary Table S1.

3.3. Determinants of Moral Distress Intensity by Socio-Demographic and Academic Variables

In Table 2, we present the differences in MD intensity among nursing students based on socio-demographic and academic variables. MD intensity varies significantly among different groups of students.

Employment Status: students who are employed during their nursing program experience lower MD intensity compared to those who are not employed. This is reflected consistently across all dimensions and in the overall MD score.

Marital Status: significant differences were observed in the “Improper institutional conditions to teach user care” dimension. Single and separated or divorced students perceive higher MD intensity than their married counterparts or those with a partner.

Nursing as First Career Choice: Students who selected nursing as their first career choice report lower MD intensity in the dimensions of “Authoritarian teaching practice” and “Lack of competence of the teacher”, as well as in their overall MD score.

The overall MD score is statistically significantly lower among those students who had nursing as their first career choice ($\beta = -0.267, p < 0.05$), have children ($\beta = -0.470, p < 0.01$), and are employed students ($\beta = -0.417, p < 0.01$); in contrast, the condition of separated/divorced ($\beta = 0.274, p < 0.01$) was related to a higher MD. The same variables are associated to the “Disrespect for the ethical dimension of vocational training” dimension. The “Authoritarian teaching practice” dimension is significantly associated to the career choice ($\beta = -0.437, p < 0.01$), and to employment status ($\beta = -0.473, p < 0.01$). Other explored associations are shown in Table 3.

Table 2. Moral Distress intensity by Socio-demographic and academic variables. For each Dimension definition, see Supplementary Table S1. Statistically significant *p*-values are in bold.

Variables	Dimension 1	<i>p</i> -Value	Dimension 2	<i>p</i> -Value	Dimension 3	<i>p</i> -Value	Dimension 4	<i>p</i> -Value	Dimension 5	<i>p</i> -Value	Overall Moral Distress	<i>p</i> -Value
Immatriolation Year	2nd year	2.48 ± 1.22	2.52 ± 1.33		2.75 ± 1.31		3.06 ± 1.37		2.39 ± 1.15		2.54 ± 1.07	
	3rd year	2.37 ± 1.13	2.28 ± 1.17	0.353	2.77 ± 1.31	0.452	2.96 ± 1.38	0.312	2.2 ± 1.04	0.179	2.4 ± 1.04	0.285
	Delayed in graduation	1.93 ± 0.87	2.29 ± 1.06		2.39 ± 0.94		2.61 ± 1.1		2.13 ± 1.02		2.21 ± 0.9	
Gender	Male	2.46 ± 1.2	2.42 ± 1.27	0.446	2.73 ± 1.25	0.964	3.05 ± 1.34	0.401	2.31 ± 1.07	0.405	2.48 ± 1.03	0.68
	Female	2.32 ± 1.16	2.55 ± 1.33		2.74 ± 1.4		2.91 ± 1.4		2.43 ± 1.27		2.53 ± 1.15	
Marital status	Single	2.41 ± 1.16	2.47 ± 1.3		2.72 ± 1.28		3 ± 1.34		2.31 ± 1.11		2.48 ± 1.04	
	Married/with partner	1.5 ± 0.71	1.17 ± 0.29	0.216	1.39 ± 0.35	0.142	1.25 ± 0.25	0.049	1.45 ± 0.11	0.072	1.4 ± 0.16	0.084
	Separated/divorced	2.53 ± 1.38	2.44 ± 1.23		2.89 ± 1.36		3.22 ± 1.41		2.65 ± 1.22		2.7 ± 1.14	
Parental status	No child	2.45 ± 1.19	2.48 ± 1.29		2.76 ± 1.29		3.05 ± 1.35		2.36 ± 1.13		2.52 ± 1.06	
	1 child	1.7 ± 0.45	1.06 ± 0.13	0.157	1.57 ± 0.37	0.144	1.56 ± 0.43	0.057	1.21 ± 0.2	0.196	1.46 ± 0.36	0.74
	2 children or more	1.57 ± 1.22	2.13 ± 1.39		2.29 ± 1.51		2.32 ± 1.32		2.06 ± 0.83		1.99 ± 0.7	
Employment Condition	Yes	2.01 ± 1.09	2 ± 1.19	0.003	2.36 ± 1.22	0.001	2.58 ± 1.21	0.004	2 ± 0.91	0.005	2.14 ± 0.88	0.002
	No	2.52 ± 1.19	2.57 ± 1.29		2.82 ± 1.29		3.11 ± 1.37		2.43 ± 1.16		2.58 ± 1.08	
Nursing as first career choice	Yes	2.33 ± 1.18	2.3 ± 1.23	0.005	2.62 ± 1.28	0.026	2.92 ± 1.38	0.92	2.26 ± 1.11	0.079	2.4 ± 1.05	0.031
	No	2.59 ± 1.2	2.73 ± 1.34		2.94 ± 1.29		3.18 ± 1.3		2.48 ± 1.14		2.66 ± 1.07	
Previous University program	Yes	2.41 ± 1.18	2.49 ± 1.28	0.795	2.78 ± 1.3	0.266	3.05 ± 1.35	0.408	2.37 ± 1.11	0.457	2.51 ± 1.04	0.512
	No	2.45 ± 1.24	2.35 ± 1.31		2.59 ± 1.26		2.9 ± 1.37		2.26 ± 1.19		2.43 ± 1.12	
Passed all exams of previous year	Yes	2.29 ± 1.02	2.37 ± 1.21	0.129	2.7 ± 1.3	0.699	2.86 ± 1.32	0.139	2.21 ± 1.03	0.122	2.38 ± 0.96	0.155
	No	2.5 ± 1.27	2.51 ± 1.33		2.75 ± 1.29		3.09 ± 1.37		2.41 ± 1.17		2.55 ± 1.11	

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4. Discussion

4.1. Key Results

The findings indicate that students reported high levels of MD intensity in scenarios encountered during their internships and classroom activities, while reporting lower scores in dimensions related to patient safety and privacy. Statistically significant differences in MD intensity were found between students who were employed versus those who were not, those who selected nursing as their first career choice versus those who did not, and those who were partnered or married versus those who were single or divorced/separated. Moreover, some socio-demographic and academic variables are associated with MD intensity. The mean MD intensity ranged from 2.34 to 3.01 across all five dimensions. The dimensions of Improper institutional condition to teach user care and Lack of competence of the teacher had the highest scores, consistent with findings from Bordignon et al. [22].

Nursing students identified two main issues of moral impact: one related to their internship and one related to their classroom experience. During their internship, they perceived MD when patients faced difficulties in accessing appropriate care, there were a lack of materials to provide care, a lack of continuity in patient care, and discrepancies between the procedures performed by clinical nurses and those taught by teachers. Specifically, students felt a high level of MD regarding the difficulties patients face in accessing appropriate care, such as long waiting lists, lack of hospital beds, and extended waiting times in the emergency room. These challenges not only cause significant distress to patients but also hinder the overall effectiveness of the healthcare system. This is a national problem recognized at various levels of government and within healthcare institutions, as it carries difficulties in clinical patient management, hospital wards administration, and even the delivery of urgent care [24,25]. In response, the Italian government has implemented a recent law aimed at reducing waiting lists and improving the allocation of resources within the healthcare system [26].

The second issue pertains to classroom experience, where students faced challenges due to having a teacher lacking sufficient competence. Factor and Guzman reported that professional competence requires teachers to be proficient in both theoretical knowledge and clinical skills [27]. Nursing students consider professional competence of their teachers to be one of the most important characteristics [28]. In Italy, nursing teachers can be employed either with temporary contracts, requiring a Master of Science in Nursing (ANVUR, 2011), or as part of the nursing faculty. These professionals often have roles in administration, such as leadership or risk management, rather than working directly in clinical settings. It is important for nursing educators to have confidence in the clinical activities they teach and to remain engaged in clinical practice. They also need support to maintain their competence and effectiveness in both educational and clinical settings [29]. By ensuring that nursing educators are well-supported and confident, educational institutions can enhance the quality of clinical education, thereby better preparing nursing students for the complexities of clinical practice.

The lowest average score in our study pertains to “Commitment of the ethical dimension of care” (2.34), differently from Bordignon et al., in which the dimension with the lowest score was “Disrespect for the ethical dimension of vocational training” (1.87) [22]. This dimension refers to situations related to the patient privacy, safety, dignity, or to observe students that perform procedures merely to improve their skills. We believe that students perceive lower MD in these situations because they do not feel directly responsible for this situation.

Our study also identifies an absence of existing literature concerning the association between high levels of MD and specific socio-demographic factors such as marital status (e.g., being separated or divorced), having no children, and not being an employed student. The finding that students experiencing these conditions reported higher levels of MD suggests that these factors might contribute to the emotional and ethical challenges faced by nursing students. This may indicate that the presence of a supportive partner or family responsibilities could play a role in mitigating MD. A partner or children might provide

emotional support or create a sense of stability that helps buffer the stress associated with clinical and academic demands. Conversely, the absence of these support systems might exacerbate feelings of MD.

In our study, nursing students perceived higher levels of MD when nursing was not their first career choice, were separated or divorced, did not have children, and were not employed students. This study reveals a notable gap in the literature regarding the association between MD and nursing as first career choice. Our findings suggest that students for whom nursing was not their first career choice experienced higher levels of MD. This may indicate a lack of awareness or understanding of the nursing role and the challenging contexts in which nurses operate.

4.2. Strengths and Limitations

Nursing students experienced MD during their clinical internships, and the findings of this study could be very useful for informing educators and clinical instructors. This, in turn, could enhance the ethical competencies of nursing students, equipping them with the necessary skills for their daily professional practice [30]. There is a paucity of research focusing on MD among nursing students, making this one of the few extant published studies in this domain.

This study has several limitations that should be acknowledged. First, data collection was conducted at an Italian university, reflecting a local context. Consequently, the findings are specific to this setting and may not be generalizable to other regions or educational environments. Second, the study included only students who had attended at least one internship within the six months preceding data collection. This criterion may have introduced recall bias, as students' recollections of their experiences could be influenced by the passage of time. Additionally, the inclusion criteria may have further introduced selection bias, as only those students willing to participate were included, potentially skewing the results [31]. Furthermore, this is a cross-sectional study, which captures data at a single point in time. As such, it reflects specific conditions and emotive states of the students at the time of data collection, which may not represent their experiences or attitudes over a longer period. These factors limit the external validity of the study, and caution should be exercised when attempting to apply these findings to broader populations or different contexts.

4.3. Nursing Clinical Implications

Nursing is an ethical profession with attention paid to the values, rights, duties, and responsibilities of its professionals [32]. Any situation that nursing students perceived as morally inappropriate causes high level of suffering, resulting in high MD intensity [10]; a recent study by Timmins also found that daily practices, such as pain control or the decision to restrain patients, can be a source of MD when deficient professional ethics from healthcare professionals is sensed by the student [33]. MD must be treated as a systemic problem requiring organizational solutions; individual responses and personal virtues are, at best, mild answers to the occurrence of the phenomenon, as organization's policies may be contributing to many morally distressing situations [34,35].

Given the high levels of MD reported by students in clinical and classroom settings, it is crucial for nursing education programs to integrate comprehensive ethical training into the curriculum. Educators should focus on developing students' ability to navigate ethical dilemmas, emphasizing practical approaches to resolving conflicts between ethical obligations and institutional constraints. The educators should include counseling services and peer support networks to help mitigate the impact of personal stressors on academic performance and MD [8].

The finding that students who chose nursing as their first career option experience lower MD suggests that a strong professional identity may buffer against ethical stress. Educators should therefore emphasize career choice and professional identity formation early in the program. Activities such as mentoring, reflective practice, and early exposure

to clinical settings may help reinforce students' commitment to the profession and reduce MD [8].

The results highlight the need for stress management training as part of the nursing curriculum. Nursing educators should provide students with tools and strategies to manage stress effectively, including mindfulness practices, resilience training, and access to mental health resources. This can help students better cope with the ethical and emotional challenges of their clinical experiences. To address the ongoing challenge of MD, educators should consider implementing regular assessments of students' MD levels throughout their education. This can help identify students who may be at risk of experiencing high MD and allow for timely interventions, such as providing additional support or adjusting learning environments.

Longitudinal studies on MD should be a priority in research to track the development and progression of MD over time, particularly as students transition from education to professional practice. This could provide deeper insights into the long-term effects of MD and the effectiveness of interventions.

The study suggests that certain factors, such as having nursing as a first career choice, are associated with lower MD. Further research is needed to explore these protective factors in more depth, including how they can be cultivated or strengthened in educational and professional settings.

Since the study reflects a specific local context, comparative studies in different regions or educational environments are necessary to determine the generalizability of the findings. Such research could identify context-specific factors influencing MD and inform more tailored interventions.

Research should focus on evaluating the effectiveness of various ethical training programs in reducing MD among nursing students. This includes assessing different pedagogical approaches, such as simulation-based learning or interdisciplinary ethics education, to determine what methods are most effective in preparing students for the ethical challenges of their careers.

The influence of socio-demographic variables, such as marital status and employment, on MD warrants further investigation. Research could explore how these variables interact with other factors, like cultural background, financial stress, and social support systems, to provide a more comprehensive understanding of their impact on MD. By addressing these implications in practice and research, healthcare educators and institutions can better support nursing students and professionals in managing MD, ultimately leading to improved patient care and staff well-being.

5. Conclusions

The study identifies that certain groups of nursing students are more prone to higher levels of MD, indicating a need for targeted interventions. Educators and clinical instructors should focus on providing additional support and resources to these groups to enhance their ethical competencies and emotional resilience. The findings suggest that nursing education programs should incorporate more robust training in ethical decision-making and stress management to better prepare students for the moral challenges they will encounter during their professional practice. Such enhancements could help mitigate the risk of apathy and compassion fatigue.

Future research should evaluate the effectiveness of interventions aimed at reducing MD among nursing students. Additionally, longitudinal studies could provide deeper insights into how MD develops and changes as students transition from academic settings to professional practice.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/nursrep14030160/s1>, Table S1: Moral Distress intensity in nursing students.

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Systematic Review

Nurses' Knowledge of Rare Diseases: A Systematic Review

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Abstract: Background: Rare diseases affect fewer than 1 in 2000 people, but collectively, they impact millions. Their diagnosis and management present challenges due to low prevalence, clinical heterogeneity, and a lack of standardized protocols. Nurses play a key role in assisting and caring for these patients by providing direct care, emotional support, and health education. **Objective:** The objective of this systematic review is to update the existing knowledge on nurses' level of understanding regarding rare diseases, as a decline in their training can compromise the quality of care and access to early detection. **Methodology:** A bibliographic search was conducted in Scopus, PubMed, CINAHL, Scielo, and Cochrane Library, selecting studies published between 2014 and 2024 on rare disease knowledge. The PRISMA model was followed, and the review was registered with PROSPERO under code CRD42024580656. **Result:** Ultimately, 24 studies were included. The main results showed a significant gap in nursing education concerning rare diseases. **Conclusions:** Continuous education, telemedicine, and the integration of health technologies were highlighted as improving competencies in rare diseases. Therefore, it is a priority to increase nursing training in rare diseases at all levels.

Keywords: rare diseases; nursing; level of knowledge; health literacy

1. Introduction

1.1. Background

Rare diseases, also known as infrequent or orphan diseases, represent a significant challenge in public health due to their low prevalence and a general lack of widespread knowledge. These pathologies, affecting a small proportion of the population, exhibit significant heterogeneity in their clinical manifestations and treatment needs. Globally, it is estimated that there are between 6000 and 8000 rare diseases, collectively affecting approximately 300 million people worldwide. Although each of these diseases generally has a low prevalence (affecting fewer than 1 in 2000 people), their combined impact poses a major medical and social challenge due to diagnostic complexity, limited knowledge among healthcare professionals, and a scarcity of effective treatments [1,2].

In Europe, the prevalence of these diseases is similar, with an estimated 30 million people affected, according to the European Organization for Rare Diseases (EURORDIS). This organization highlights that the management of these pathologies in Europe requires a collaborative, interdisciplinary approach involving researchers and public health policies that promote the establishment of care networks and specialized centers. Within the

European Union, a rare disease is defined as one affecting fewer than 5 people per 10,000, making cross-country cooperation essential for research and treatment [2].

In Spain, estimated figures indicate that approximately three million people suffer from a rare disease. This context underscores an urgent need for adequate training and resources, particularly within the nursing field, where direct patient care is essential. In this regard, national rare disease associations and health policies are moving toward greater visibility and support for these patients, although significant challenges persist [3].

The role of nurses is fundamental in the management of patients with rare diseases, as nurses often provide direct care, emotional support, and health education to both patients and their families. However, the limited knowledge of these pathologies among nurses constitutes a significant barrier to providing optimal care. Specific training in rare diseases is scarce, and most educational programs do not include specialized content in this field. This gap in formal education contributes to diagnostic uncertainty, a lack of skills for adequate clinical management, and ultimately, a lower quality of care for patients suffering from these diseases [4]. In this context, the key question guiding this review arises: what is the level of knowledge of rare diseases possessed by nurses?

This problem is exacerbated by the complex and frequently multisystemic characteristics of rare diseases, which demand a multidisciplinary and specialized approach. Nurses, being in close contact with patients, are in a privileged position to detect symptoms, identify specific needs, and coordinate care with other health professionals. However, this competence can only be effectively exercised if they possess the necessary knowledge to recognize the particularities of rare diseases and understand their clinical and social implications [5].

Nurses' knowledge of rare diseases is a topic that has gained relevance in recent years due to the increasing need to improve care and the early diagnosis of these pathologies [6]. As rare diseases affect a small proportion of the population, they tend to be poorly understood among healthcare professionals, which impacts the quality of care patients receive. The scientific literature has begun to address this issue, highlighting the importance of specialized nursing education [7].

The necessity for nurses to be trained in the approach to rare diseases is emphasized, given its direct influence on the quality of care and the health outcomes of affected patients [8–10].

1.2. Objective

The objective of this systematic review is to update the existing knowledge regarding nurses' understanding of rare diseases.

2. Methodology

2.1. Review Protocol

The methodology used for this report was a systematic review of the scientific literature on nurses' knowledge of rare diseases. We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol, which consists of a 27-item checklist covering the most representative sections of an original article, as well as their development process. This review was registered in the PROSPERO international prospective register of systematic reviews 2024 with the code CRD42024580656, available at https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024580656 (accessed on 1 July 2025).

2.2. Eligibility Criteria

We selected articles published between 2014 and 2024 that presented information on nurses' knowledge of rare diseases. No restrictions were placed on the language of publication or the research design of those articles.

2.3. Information Sources

The bibliographic search was conducted in the Scopus, PubMed, CINAHL, SciELO, and Cochrane Library databases. A manual search was also performed using reference lists from the included studies to identify additional relevant articles.

The structured language for the search was derived from Medical Subject Headings (MeSH) terms and Health Descriptors (DeCS). The MeSH terms used were "Rare Diseases", "Nursing", and "Level of Knowledge". The Boolean operators OR and AND were utilized.

2.4. Search Strategy

The following table (Table 1) presents the search strategy used for this systematic review.

Table 1. Search string.

Database	Search String
SCOPUS	((TITLE-ABS-KEY ("rare diseases" OR TITLE-ABS-KEY ("orphan diseases") AND TITLE-ABS-KEY ("knowledge") OR TITLE-ABS-KEY("awareness") AND TITLE-ABS-KEY("nurses") OR TITLE-ABS-KEY ("nursing"))
PUBMED	Search: (("rare diseases" (MESH) OR "orphan diseases" (MESH) OR "rare diseases" (Title/Abstract) AND ("knowledge" (MESH)) OR ("awareness" (MESH)OR "perception" (MESH)) OR "knowledge" (Title/Abstract) OR "awareness" (Title/Abstract) OR "perception" (Title/Abstract)) AND ("nurses" (MESH) OR "nursing" (MESH) OR "nurses" (Title/Abstract) OR "nursing" (Title/Abstract))
SCIELO	TS = ("rare diseases" OR "orphan diseases") AND TS = ("knowledge" OR "awareness" OR "perception") AND TS =("nurses" OR "nursing" OR "health professionals")
CINAHL	TI ("rare diseases" OR "orphan disease") AND AB ("knowledge" OR "awareness" OR "perception") AND MH ("nurses" OR "nursing")
COCHRANE LIBRARY	TI ("rare diseases" OR "orphan diseases") AND TI ("knowledge" OR "awareness") AND TI ("nurses" OR "nursing")

2.5. Data Extraction Process

Following the implementation of the search strategy, from June to July 2025, the identified articles were transferred to the Mendeley web application using Mendeley's web importer tool. Subsequently, they were organized into folders based on their source database, and all duplicates were removed.

Articles on nurses' knowledge of rare diseases, published between 2014 and 2024, were included. Two reviewers (IMS and JCM) extracted data from the title, abstract, and keywords of each identified study. These reviewers independently examined each study and applied the inclusion and exclusion criteria.

For potentially eligible studies, the same procedure was applied to full-text articles. Any queries about a particular article were resolved through discussion with the project supervisor (JCM). Data on quality, patient characteristics, interventions, and relevant

outcomes were extracted by IMS under the supervision of the project supervisor (JCM). Discrepancies between reviewers were resolved by a third reviewer.

2.6. Data Collection Process and Collected Data

Two reviewers extracted the most relevant data from each article, including authorship, publication year, article title, study objectives, and obtained results. The strengths and weaknesses of each study were also assessed. The Results section provides a more detailed explanation of the article selection process.

2.7. Risk of Bias in Studies

To evaluate the methodological quality of the selected articles, a structured analysis was conducted based on the design and methodology of each study. It is true that articles sometimes have structures that blend several research designs. To classify these articles and perform the methodological evaluation, we focused on the dominant design and used the relevant scale. Of the 24 articles selected for this systematic review, 3 were systematic reviews [11–13], 2 were clinical practice guidelines [14,15], 7 were observational and descriptive studies [16–22], 4 were qualitative studies [23–26], 1 was a case study [27], 2 were mixed-methods studies [28,29], and 5 were non-randomized intervention or implementation studies [30–34]. Each group was evaluated using a specific scale to determine its methodological rigor and associated risk of bias.

The methodological quality of the systematic reviews (Table 2) was evaluated using the AMSTAR-2 Scale (Assessing the Methodological Quality of Systematic Reviews). Through 16 domains assessing methodological rigor, transparency, and replicability, studies were classified as high, moderate, low, or critically low confidence. Of the selected studies, most exhibited moderate to high confidence, with only 2 reviews rated at a low level.

Table 2. Methodological evaluation of systematic reviews (AMSTAR-2 Scale).

Article	Score
Pelentsov et al. [11]	Moderate
Czech et al. [12]	Moderate
Tsitsani et al. [13]	High

The AGREE II scale was used for the clinical practice guidelines (Table 3), which is a tool for evaluating the methodological quality of clinical practice guidelines. It serves to assess the rigor of their development, the clarity of the recommendations, and the management of conflicts of interest, allowing reviewers to determine if a guideline is reliable and applicable. The scoring is based on 23 items grouped into 6 domains, with a final rating that helps reviewers decide whether the guideline is recommended for use.

Table 3. Methodological evaluation of clinical practice guidelines (AGREE II).

Article	Score
Mantovani et al. [14]	6.8 Strongly recommended
Claahsen et al. [15]	5.3 Recommended

To evaluate the methodological quality of descriptive studies, the STROBE scale (Strengthening the Reporting of Observational studies in Epidemiology) was used (Table 4). It is not a scoring scale, but a 22-item checklist. Its main objective is to improve the quality of reporting for observational studies, such as cohort, case–control, and cross-sectional studies.

Table 4. Methodological evaluation of descriptive studies (STROBE).

Article	Score
Walkowiak et al. [16]	17/22
Sinan et al. [17]	19/22
Lozano et al. [18]	21/22
Figueiredo et al. [19]	20/22
Gómez- Díaz et al. [20]	15/22
Günner et al. [21]	16/22
Jahanshahi et al. [22]	20/22

For the articles with a qualitative design, the CASP (Critical Appraisal Skills Programme) scale was used. It is a checklist designed to assess the quality of qualitative research. Unlike tools that score numerically, CASP uses a series of questions to guide the evaluator in assessing the rigor, relevance, and credibility of a qualitative study. The methodological quality of the qualitative studies [23–26] was evaluated with this scale. In general, the studies showed good rigor in describing the research objectives and in selecting participants, which strengthens the credibility of their findings. However, weaknesses were identified in the discussion of the relationship between the researcher and participants, and in the validation of findings with participants. Although these methodological limitations were observed in some articles, they did not affect the internal validity of the body of evidence. The results are considered sufficiently rigorous to be included in this review, as they provide a deep understanding of the experiences and perspectives of caregivers and nurses.

The CARE (CAsE REport) scale is a 13-item checklist designed to improve the quality of case reports in the medical literature. The main purpose of the CARE checklist is to ensure that the authors of case reports include all the necessary information so that the reader can assess the validity of the case and its findings. A well-documented case report can be invaluable to medical knowledge, especially in the context of rare diseases, new disease presentations, or unusual side effects. This scale was used to evaluate the methodological quality of the clinical case report by Medina-Ortega et al. [27], which included 11 out of the 13 items proposed in this scale.

The articles by Morris et al. [28] and Guccione et al. [29] are mixed-methods articles; the MMAT scale was used for them. The MMAT (Mixed Methods Appraisal Tool) scale is a tool used to evaluate the methodological quality of studies that combine different research designs, including qualitative, quantitative, and mixed-methods studies. Its purpose is to determine the reliability of a study's conclusions that integrate multiple methods. It does not assign a numerical score; instead, it assesses the rigor of each component with a "Yes", "No", or "Can't tell" response, allowing for a descriptive analysis of the study's strengths and weaknesses. The study by Morris et al. [28] demonstrates high methodological quality in its mixed-methods design. The qualitative and quantitative components are well-defined, and the integration between them is logical and strengthens the findings. While there might be limitations in the quantitative component (such as the response rate), the rigor and coherence of the overall design make its results reliable for the purposes of this review. The protocol by Guccione et al. [29] demonstrates high methodological quality in its design, despite being an early-phase study. Although its quantitative design is not randomized (which would be a weakness in a later-phase trial), it is appropriate for the study's objective (feasibility and safety). The integration of the qualitative and quantitative components is solid and well-justified, suggesting that the study, once conducted, could yield reliable findings.

Finally, for non-randomized intervention or implementation studies, the TREND scale was used (Table 5). The TREND (Transparent Reporting of Evaluations with Nonrandomized Designs) scale is a 22-item checklist designed to improve the quality and transparency of reporting for intervention or implementation studies that do not use randomization. The main goal of the TREND checklist is to ensure that authors of non-randomized studies present all the necessary information so that other researchers and healthcare professionals can evaluate the validity of their results.

Table 5. Methodological evaluation of non-randomized intervention or implementation studies (TREND).

Article	Score
Kis et al. [30]	15/22
Ferreira et al. [31]	17/22
Kamm et al. [32]	20/22
Pinto et al. [33]	14/22
Ward et al. [34]	16/22

3. Results

The flowchart of this systematic review is presented below (Figure 1).

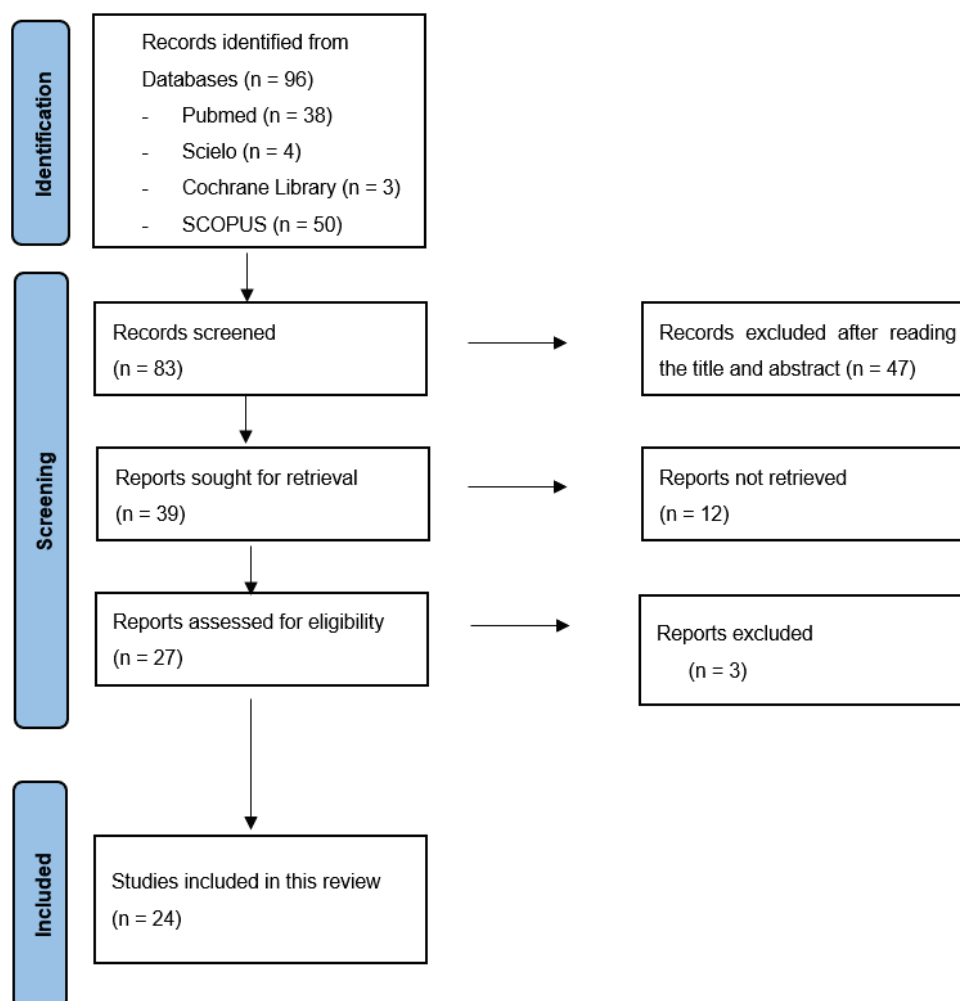


Figure 1. Flow diagram.

The following table (Table 6) presents a summary of the main results.

Table 6. Results table.

Author	Date	Article Title	Objective	Result	Conclusion
Walkowiak et al. [16]	2020	Needs assessment study of rare disease education for nurses and nursing students in Poland	To analyze the knowledge and opinions of rare diseases among Polish nurses and nursing students	Neither group felt well-prepared to deal with patients with rare diseases, with 75% of nurses and up to 85% of nursing students expressing concern.	Both nurses and nursing students show insufficient knowledge of rare diseases.
Sinan et al., [17]	2023	Knowledge and Awareness of Rare Diseases Among Healthcare Professionals in the Kingdom of Bahrain	To assess the general awareness and knowledge of healthcare professionals regarding rare diseases in a tertiary hospital in the Kingdom of Bahrain	Most participants (87.4%) were aware of and had heard the term “rare diseases” before this survey.	This study highlights the need to improve rare disease knowledge among healthcare professionals, aligning with the global knowledge landscape.
Kis et al. [30]	2019	A pilot nurse-led telephone triage line of patients with rheumatologic rare diseases.	To evaluate the impact of a nurse-led telephone line in managing patients with rare rheumatologic diseases	Improvements in care coordination occurred (61% of calls related to scheduling, 33% were referred to specialists, and 7% were handled by emergency services).	Importance of continuous training in triage for specialized nurses and communication skills to address uncommon diseases
Lozano et al. [18]	2021	Inclusive Educational Best Practices for Students with Rare Diseases.	To identify successful educational strategies for the inclusion of students with rare diseases	The teacher–student relationship is key for integral development, fostering empathy and solidarity.	Interdisciplinary collaboration and continuous training improve inclusion and support for students with special needs.
De Souza et al. [23]	2021	Duality of living with systemic lupus erythematosus (LES)	To explore the perceptions of people with SLE regarding their experience with the disease	Living with SLE involves facing emotional and physical ups and downs, highlighting the importance of professional, social, and family support.	Empathetic and comprehensive care significantly improves the quality of life of patients with chronic diseases like SLE.
Pelentsov et al. [11]	2015	The supportive care needs of parents caring for a child with a rare disease.	To identify the supportive care needs of parents caring for children with rare diseases	Main needs: social (72%), information (65%), and emotional (62%)	Importance of specific support strategies for families of children with rare diseases, including psychosocial and educational care

Table 6. Cont.

Author	Date	Article Title	Objective	Result	Conclusion
Mantovani et al., [14]	2018	Diagnosis and management of pseudo-hypoparathyroidism and related disorders.	To examine the diagnosis and treatment of pseudo-hypoparathyroidism (PHP) and related disorders	Multidisciplinary collaboration allows problems to be addressed throughout the life of patients with rare genetic diseases.	Emphasizes the need to implement patient registries and improve knowledge of the natural history of these diseases for better care.
Martínez et al. [24]	2020	Needs of caregivers and family members of individuals with orphan diseases based on a theoretical model.	To establish the needs of caregivers	Physical, psychological, social, educational, and economic needs were identified.	Nursing theory helps develop multidisciplinary interventions to care for caregivers, improving the quality of life for families.
Claahsen et al. [15]	2020	Current Knowledge on Congenital Adrenal Hyperplasia (CAH).	To provide updated information on advances in CAH and its management	Disease registries have increased data availability, highlighting psychosocial needs and advances in comprehensive management.	It is important for nursing professionals to update their knowledge to improve care for patients with rare diseases.
Medina-Ortega et al. [27]	2023	Clinical Case on Interstitial Pneumatosis.	To describe a rare clinical case to highlight approaches in nursing treatment	Adequate treatment allowed patient recovery, demonstrating the importance of individualized care in rare diseases.	Highlights the importance of specialized nursing knowledge for managing unusual clinical cases
Herbert et al. [25]	2021	Experience in Developing a Course for Nurses in the Care of Children with Genetic Diseases.	To describe the experience of developing a qualification course for nurses in the care of children with genetic diseases	The course covered the following topics: introduction to genetics in nursing; uncommon diseases; inborn errors of metabolism; neonatal screening program; and microcephaly.	Specialized training is crucial for addressing genetic diseases, promoting knowledge and leadership in nursing for treating these uncommon conditions.
Pleutim et al. [26]	2024	Person-Centered Care Practices for Individuals with Huntington's Disease.	To explore care practices for people with Huntington's disease from a patient- and family-centered approach	Families highlighted the need to adapt environments and actively seek knowledge about the disease to improve care. Specialized knowledge enables nurses to offer personalized and compassionate care to patients with rare diseases.	Online training modules on rare diseases were used, and participation in webinars and self-study modules reportedly increased the understanding of these pathologies by 78%.

Table 6. Cont.

Author	Date	Article Title	Objective	Result	Conclusion
Figueiredo et al. [19]	2020	Knowledge and Nursing Care Practices for Children with Pompe Disease in Intensive Care.	To examine nursing knowledge and practices in the care of children with Pompe disease in intensive care	Comprehensive care seeks to humanize care for children, highlighting the importance of specific knowledge of rare diseases.	Deep knowledge of the nursing team improves the quality and integration of intensive care in rare diseases like Pompe disease.
Gómez-Díaz et al. [20]	2023	Assessing knowledge, perceptions, awareness and attitudes on rare diseases among health care providers and health students in Mexico.	To evaluate the level of knowledge, perceptions, and attitudes of healthcare professionals and students in Mexico	A reliable questionnaire was administered to 200 healthcare professionals and students in Mexico to assess their level of knowledge, perceptions, awareness, and attitudes regarding rare diseases.	The study showed satisfactory knowledge levels and significant differences in perceptions, awareness, and attitudes among the study groups. The percentage of correct answers on a rare disease knowledge evaluation increased from 38% before the intervention to 93% after training.
Güner et al. [21]	2019	Survey Study Evaluating and Comparing Health Literacy Knowledge and Communication Skills Used by Nurses and Physicians.	To evaluate healthcare professionals' knowledge and attitudes about health literacy, their communication skills, their effects on their practices, and to compare findings between healthcare professional subgroups	Most participants expressed willingness to receive information/training on the topic and to know the level of healthcare and whether it would change their approach and patient outcomes.	Both postgraduate and continuing education programs should be modified to improve the knowledge of all healthcare professionals and their positive effects on medical care.
Ferreira et al. [31]	2023	The utilisation of primary health care system concepts positively impacts the assistance of patients with rare diseases despite limited knowledge and experience by health care professionals: A qualitative synopsis of the evidence including approximately 78,000 individuals.	To compile available evidence on the impact of primary health care on patients with rare diseases and summarize published information from multiple stakeholders on the perceived usefulness and barriers to effective use of the primary care system	Primary healthcare teams are essential for guiding patients and families on emergency events. Technology-related concepts were reported in 19 publications, emphasizing their effectiveness in early diagnosis.	We provide valuable information on the effectiveness of primary healthcare in fostering a creative, inclusive, and supportive environment for patients with rare diseases. Our results can be useful for various stakeholders in deciding what actions are pending to achieve a solid and positive experience for patients with rare diseases in primary healthcare.

Table 6. Cont.

Author	Date	Article Title	Objective	Result	Conclusion
Morris et al. [28]	2022	Coordinated care for people affected by rare diseases: the CONCORD mixed-methods study.	To explore how care for people with rare diseases is coordinated in the UK and in what ways, and how people affected by rare diseases would like care to be coordinated	Care for people affected by rare diseases was found not to be well coordinated. For example, only 12% of 760 adult patients affected by a rare disease reported having a formal care coordinator, 32% reported attending a specialist center, and 10% reported having a care plan.	There is evidence of a lack of coordination in care for people affected by rare diseases, which can have negative impacts on the physical and mental health of patients and their families, as well as their economic well-being.
Czech et al. [12]	2020	A Review of Rare Disease Policies and Orphan Drug Reimbursement Systems in 12 Eurasian Countries.	To create a comprehensive and detailed overview of rare disease policies and MOH reimbursement in a selection of 12 countries in the Western Eurasian region: Armenia, France, Germany, Kazakhstan, Latvia, the Netherlands, Poland, Romania, Russia, Turkey, Ukraine, and the United Kingdom	The number of rare disease registries is increasing as a result of national plans (EU) and greater international scientific cooperation. Screening programs are widely implemented, but the number of diseases screened differs significantly (2–35 diseases), whether between EU and non-EU countries, among EU member states, and sometimes even within the same country.	Inequality in patient access to new OMPs still exists due to variations in national policies, healthcare budgets, health insurance, and reimbursement systems. The observed differences are a challenge for rare disease patients, health authorities, and manufacturers alike.
Tsitsani et al. [13]	2023	Barriers to and Facilitators of Providing Care for Adolescents Suffering from Rare Diseases: A Mixed Systematic Review.	To explore the barriers and facilitators to effective care for adolescents with rare diseases as perceived by patients and their parents	Institutional and public policy barriers were highlighted as the most frequently cited, resulting in unmet care needs and frustrating family dynamics.	National and regional rare healthcare policies are rarely truly linked to pragmatic intervention programs with a measurable impact on patient well-being.
Jahanshahi et al. [22]	2022	Iranian future healthcare professionals' knowledge and opinions about rare diseases: cross-sectional study.	To investigate the knowledge and opinions of future Iranian healthcare professionals regarding rare diseases	Nearly 85% of participants rated their knowledge of rare diseases as poor or insufficient. Meanwhile, almost 70% of participants took courses on rare diseases at university.	A total of 72.7% of future healthcare professionals did not feel prepared to care for a patient with a rare disease. This highlights a gap in Iranian medical students' knowledge of rare diseases.

Table 6. Cont.

Author	Date	Article Title	Objective	Result	Conclusion
Kamm et al. [32]	2020	Appendiceal Mucinous Neoplasm: Nurse Education About a Rare and Complex Disease.	To describe the diagnostic and treatment process for this disease, which is not well-known by most healthcare providers	Minimal information exists in the nursing literature on appendiceal mucinous neoplasm and the complexity of surgical treatment.	Nurses play an important role in the care of these patients and their specific needs, both pre- and post-surgery.
Pinto et al. [33]	2023	Implementation of genomic medicine for rare disease in a tertiary healthcare system: Mayo Clinic Program for Rare and Undiagnosed Diseases (PRaUD).	To integrate genomics into subspecialty practice, including specific genetic testing, research, and education	A total of 1152 patients were evaluated, with an overall resolution or probable resolution rate of 17.5%, and up to 66.7% depending on the phenotype. A total of 42.7% of patients with probable resolution underwent changes in medical treatment and outcomes.	The implementation of PRaUD (Program for Rare and Undiagnosed Diseases) and GTAC (Genomic Testing and Counseling) has allowed subspecialty practices to advance specialization in rare diseases, where historically genetic counselors have not been present.
Ward et al. [34]	2022	Designing rare disease care pathways in the Republic of Ireland: a co-operative model.	To explore the best approach to developing national rare disease care pathways within the Irish health system in the context of a lack of a consensual methodology	The roles of specialist nurse, psychology, medical social work, and database administrator were considered essential for all care pathways. Twenty-nine rare diseases across eighteen ERNs were selected for the development of care pathways.	Common needs of patients with renal diseases and interventions by healthcare professionals across all care pathways were identified. Key stakeholders in renal diseases have endorsed this national care pathway initiative.
Guccione et al. [29]	2019	Defining the Supportive Care Needs and Psychological Morbidity of Patients with Functioning Versus Nonfunctioning Neuroendocrine Tumors: Protocol for a Phase 1 Trial of a Nurse-Led Online and Phone-Based Intervention.	To describe the protocol for a study aimed at better understanding the outcomes and experiences of patients diagnosed with neuroendocrine tumors and to develop and test a nurse-led online and phone-based intervention that will provide personalized supportive care tailored to subgroups of patients with neuroendocrine tumors (functioning vs. nonfunctioning)	The limited research on patients with neuroendocrine tumors suggests that quality of life and patient experiences are significantly impaired compared to the general population.	The availability of disease-specific information was improved, as was the design of a nurse-led online and phone-based supportive care interventions tailored to the unique needs of the neuroendocrine tumor patient population.

Of the 24 articles selected for this systematic review, 45.83% was from Europe [12–16,18,27,28,30,31,34]; 8.3% was from the USA [32,33]; the same percentage, 8.3%, was from Australia [11,29]; 12.5% was from the Asian continent [17,21,22]; and finally, 25% was from South America [19,20,23–26]. It is certainly difficult to study the origin of an article since many cases are reports with shared authorship. For this reason, this classification was based on the affiliation of the first author of each article.

The analyzed studies reveal a significant gap in nursing education concerning rare diseases. Walkowiak et al. assessed nursing knowledge in Poland, with 120 nurses and 150 nursing students participating. Their findings showed that 75% of nurses and 85% of students did not feel prepared to care for patients with rare diseases [16]. Another study by Gómez-Díaz et al. in Mexico, which designed a training program, included 200 students and professionals and found that the percentage of correct answers in a rare disease knowledge evaluation increased from 38% before the intervention to 93% after training [20]. Awareness and knowledge were also explored in the study by Sinan et al., who examined awareness and knowledge among 350 healthcare professionals in a tertiary hospital in Bahrain. They found that 87.4% of respondents recognized the term “rare diseases”, although their training in this area was limited [17]. Similarly, Jahanshahi et al., studying the perception of rare disease knowledge among 180 future healthcare professionals in Iran, found that 72% of participants did not feel prepared to care for these patients, despite 70% having received some content on these pathologies during their university education [22]. The importance of training quality has also been examined, revealing differences in the availability of such content across regions. A study by Claahsen et al. evaluated multiple registries that examined the integration of training modules on rare diseases into nursing curricula in several European countries [15].

Another aspect emphasized by some of the analyzed studies pertains to interventions in care models. Pleutim et al. explored practices based on person-centered care models for Huntington’s disease from the perspective of family caregivers, focusing on adapting care environments and specialized training. Online rare disease training modules were utilized, and participation in webinars and self-study modules reportedly increased the understanding of these pathologies by 78% [26]. In this context, Ward et al. demonstrated that the integration of nurses into multidisciplinary teams and their role in care coordination were essential, following an evaluation of their participation in interprofessional teams in Ireland. They documented that collaboration with social workers and psychologists fosters better organization of care for patients with rare diseases [34]. Similarly, Morris et al. examined the access of 760 patients with rare diseases to specialized services in the UK and found that only 12% of patients had a formal care coordinator, and 32% attended a specialized center [28].

Regarding nurses’ roles in patient and family education, a study by Kis et al. analyzed the operation of a nurse-led telephone counseling line, through which 300 calls were made to patients with rare rheumatological diseases. It showed that 61% of inquiries were related to appointment scheduling, 33% to specialist referrals, and 7% to urgent care [30]. In the same vein, Martínez Reyes et al. examined the needs of 150 caregivers of individuals with rare diseases and concluded that nurses play a key role in providing information on symptomatic management, treatment administration, and access to psychosocial support [24]. The importance of professional support and patient well-being is highlighted in studies like that by De Souza et al., where 200 patients with autoimmune diseases were selected to assess the impacts of emotional and social support on their quality of life [23]. Additionally, the absence of specialized knowledge limits the guidance and support that professionals can offer caregivers, as reflected in the study by Pelentsov et al. This study evaluated the support needs of parents caring for children with rare diseases. Key findings

included social needs (72% of parents expressed social isolation due to lack of adequate support networks), information needs (65% reported difficulty accessing reliable, specific information about their children's disease), and emotional needs (62% reported high levels of stress and anxiety related to diagnostic uncertainty and nurses' lack of preparedness to address these pathologies) [11].

Finally, concerning the applications of new technologies, Pinto et al. assessed the impact of integrating genomics into clinical practice for 1152 patients through five-week programs that utilized simulation and collaboration with geneticists. They reported a 17.5% increase in diagnostic resolution rates, reaching up to 66.7% for certain phenotypes [33]. Similarly, the work by Ferreira et al. studied the use of telemedicine in primary healthcare for rare diseases. Including 78,000 patients, they found that 20- to 30-min virtual consultations facilitated early diagnosis and improved the continuity of patient follow-up [31]. Additionally, a study by Herbert et al., which implemented a hybrid training program on genetics and differential diagnosis involving 85 nurses, found that the most relevant result was that 85% of participants improved their ability to identify clinical signs of rare diseases, and 67% expressed greater confidence in their clinical practice [25].

4. Discussion

The literature analysis reveals that the care of patients with rare diseases faces significant structural challenges that go beyond mere access to diagnostics and treatments. The main conclusion of this systematic review is that the absence of standardized training and the scarcity of specific educational strategies for nursing staff not only affect the clinical response but also perpetuate inequalities in access to specialized care. This training gap, identified by studies such as those by Walkowiak et al. and Sinan et al. [16,17], shows a marked heterogeneity that results in significant deficiencies in clinical management and patient education.

The lack of knowledge and specialization has a direct impact on patients' perception of care quality. Bogart et al.'s findings [8] suggest that the perception of deficient care can negatively influence therapeutic adherence and psychosocial well-being. This perspective is reinforced by Pelentsov et al. and Sousa et al. [11,23], who document that the lack of professionals with specific training creates a deep sense of isolation for patients and their families, who often face additional barriers in finding support and guidance. Gómez-Díaz et al. [20] further add that this lack of training contributes to care fragmentation, creating variability in care depending on the institution, which increases the vulnerability of these patients.

Despite these barriers, the literature also offers promising solutions. Vicente et al. [7] and Kis et al. [30] demonstrate that continuous training in rare diseases and the implementation of innovative care interventions, such as nurse-led telephone triage lines, can improve early detection capabilities and optimize the management of complex cases.

At the level of health policies, this review highlights the lack of a global consensus on nursing training in rare diseases. Czech et al. [12] point out that the absence of specific training programs, the lack of reliable epidemiological registries, and disparities in access to orphan treatments remain critical barriers to equitable care. Tsitsani et al. and Jahanshahi et al. [13,22] complement this view by arguing that if training in rare diseases is not integrated into formal nursing education, the healthcare system's capacity to respond to these pathologies will remain limited.

However, the growing integration of digital health and genomic medicine in the management of rare diseases presents an opportunity to overcome these barriers. Studies by Pinto et al. and Ferreira et al. [31,33] suggest that the use of advanced clinical databases and telemedicine can contribute to better identification of clinical patterns, facilitating a

more comprehensive and personalized approach. To leverage these advances, the discussion focuses on the need for nursing training programs to include specific content on these technologies.

4.1. Limitations

Despite the rigorous selection and analysis process, this systematic review has certain limitations that should be considered. The main one is the scarcity of specific publications on nursing education for rare diseases, which restricted the sample size and, therefore, the generalizability of the findings. Additionally, a notable variability in the research designs of the included articles was identified, ranging from observational and qualitative studies to clinical guidelines and case reports. This methodological heterogeneity makes direct comparison between studies difficult and could influence the robustness of the conclusions, as the evidence does not come from a single, standardized research design.

4.2. Future Research Areas Derived from This Study

A priority research area for the future could be the validation of tools to assess nurses' knowledge of rare diseases. The design of a specific questionnaire addressing this aspect would not only allow for quantifying existing training gaps but also for evaluating the effectiveness of specific educational interventions.

Likewise, the development of longitudinal studies is recommended to analyze the impact of rare disease training on the quality of care and patient experience, allowing for the establishment of evidence-based strategies for the continuous improvement of care in this field.

4.3. Implications for Clinical and Academic Practice

The findings of this systematic review reveal the urgent need to address knowledge gaps in nursing regarding rare diseases.

- Continuing Education and Protocols: It is crucial to implement continuing education programs and standardized protocols. This improves the ability of professionals in early detection, clinical management, and care coordination.

- Reducing Inequities: Strengthening the role of nursing through specialized training helps reduce care fragmentation and inequities in care, which translates into improved therapeutic adherence and patient well-being.

- Validation of Instruments: Validation of standardized evaluation tools is necessary to objectively measure nursing staff's knowledge of rare diseases. This will allow for quantifying knowledge gaps and evaluating the effectiveness of future educational interventions.

- Longitudinal Studies: Longitudinal studies are recommended to analyze how training in rare diseases translates into tangible improvements in care quality and patient experience over the long term.

5. Conclusions

This systematic review highlights a critical need to improve training and available resources for healthcare professionals, particularly nurses, in the management of rare diseases.

A lack of specific knowledge and protocols is identified, along with the limited availability of reliable information due to the scarcity of registries in this regard. These factors affect the quality of care and generate uncertainties at multiple levels, from diagnosis to treatment and patient support.

It is essential that undergraduate nursing education programs include content on rare diseases and promote evidence-based research, as well as the implementation of specific training courses.

It is considered necessary to promote collaborative initiatives among healthcare institutions, academic bodies, and patient associations. Furthermore, the integration of new technologies could offer promising solutions to reduce these uncertainties, provided they are implemented within an appropriate regulatory framework. Improving the training and support for healthcare professionals in this area will not only benefit patients but also contribute to more equitable and efficient care within the healthcare system.

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Systematic Review

Ageism and Associated Factors in Healthcare Workers: A Systematic Review

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Abstract: Background: Ageism refers to the presence of stereotypes, prejudices, and discrimination against older adults based on their age. In healthcare settings it negatively impacts opportunities for treatment, rehabilitation, and cure opportunities. This study aims to assess the presence of ageism among healthcare workers toward older patients and to identify the associated sociodemographic, personal, and work-related factors. **Methods:** A systematic review of the literature was performed using PubMed, Embase, CINAHL, and Scopus. Studies that assessed the presence of ageism among healthcare professionals through a quantitative or mixed methodology and published between 2014 and 2024 were included. **Results:** Fifteen articles met the inclusion criteria. Healthcare workers generally exhibited low rates of ageism; however, results varied across studies. Although the available literature is limited, workers with less knowledge about aging and less experience, especially in geriatric units, showed higher ageism scores. Intergenerational contact and a wish to work with older people appeared to be important factors for promoting a positive relationship with older adults. Other sociodemographic and sociocultural factors, such as age and sex, were not related to ageism. Workload and work-related factors, such as stress or lack of personnel, might be associated with ageism, but few studies were found to be available to confirm these results. **Conclusions:** Ageism scores among professionals were low. Gerontological education and clinical and family experience could help reduce ageist attitudes toward older patients among health professionals.

Keywords: ageism; healthcare workers; geriatric care; geriatric education

1. Introduction

It is undeniable that the aging of the global population has become a major public health concern in the 21st century. Projections indicate that the number of people over 60 is expected to double, while the number of individuals aged 80 or older is projected to triple between 2020 and 2050 [1]. For the prosperity of the global population and its adaptation to the ongoing epidemiological transition, geriatric issues must be considered of vital priority. However, older adults continue to face discriminatory and stereotypical attitudes, both explicitly and implicitly. The interactions they experience with these stereotypes, prejudices, and discrimination are commonly referred to collectively as ageism [2]. Ageism is fundamentally based on issues related to cognitive, affective, and behavioral perspectives [3]. The term “ageism” was first used by Butler, (1969) [4] defining it as an ideology and a process that could evolve into discrimination against the elderly due to their advanced age, similar to the prejudices and stereotypes inherent in racism and sexism.

In Western countries, aging is associated with beliefs of frailty, weakness, dependency, and unproductivity, among others. Moreover, health issues in older adults are naturalized and considered inherent to the aging process [5]. Consequently, numerous studies have been conducted in recent years to identify the determinants related to the presence of ageism. A systematic review conducted by Marques et al. [2] found that individual characteristics, such as anxiety about aging or fear of death, are associated with more ageist attitudes. Similarly, other individual determinants, such as being younger, male, and other sociodemographic characteristics, like lower educational level, low socioeconomic status, and single civil status, have proven inconclusive in determining their influence on ageism, although numerous studies associate their presence with more negative attitudes towards old age [2]. In terms of the cultural context, there is evidence that having a high proportion of older people in the environment acts as a protective factor against ageism [6]. Cultural origin, ethnicity, and religiosity could similarly be linked to less ageist attitudes, especially in collectivist countries where older people are respected and revered [7].

Just as in the general population, discrimination against older adults is also present in healthcare, becoming particularly evident during the COVID-19 situation [8]. In this context, the effects of ageism experienced by older adults are well documented, leading to restricted access for them and their families to various existing resources, and reducing opportunities for treatment, rehabilitation, and cure. This impacts the quality of life and well-being of older adults, exposing them to worse health conditions, reduced longevity, health risk behaviors, poor social relationships, physical and mental illnesses, and cognitive decline [9,10]. Moreover, this also leads to self-stigmatization in these patients [11].

Therefore, various studies have been conducted to understand the presence of ageist attitudes among healthcare professionals when caring for older adults. The results have shown a range of attitudes, from negative [12,13] to slightly positive, [14] and to positive [15,16]. Additionally, these studies found that factors such as insufficient training in aging and lower educational levels [17], as well as erroneous beliefs—like the perception that older adults are less competent and more difficult to treat [18]—are associated with age discrimination in healthcare. Indeed, several studies report that healthcare workers prefer to work with younger patients [19]. However, most studies conducted to date have focused primarily on nurses [19]. To our knowledge, only one qualitative systematic review has explored ageism among all healthcare professionals. This review revealed that doctors perceive the care of older adults as complex and dependent, while nurses described it as a significant workload [20]. Nevertheless, no review has described the current state of ageism among all healthcare professionals from a quantitative perspective, using validated scales that comprehensively address all aspects of ageism (negative attitudes, prejudices, and discrimination). Furthermore, to date, there is a lack of systematic knowledge about which personal and job-related factors are associated with higher levels of ageism among different healthcare professionals toward older patients. A more precise understanding of these factors may facilitate the development of targeted interventions to address them, thereby ensuring quality, inclusive, and respectful care, with the ultimate goal of enhancing the well-being of older adults and promoting more positive attitudes toward them.

2. Aims

The primary aim was to assess the presence of ageism among healthcare workers toward older patients and to identify the sociodemographic, personal, and work-related factors associated with the presence of ageism.

3. Methodology

This study was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) [21]. This protocol was published in the International Prospective Register of Systematic Reviews (PROSPERO) with the ID number CRD42024548783. Studies describing discrimination against the elderly population in healthcare settings were included, according to the following inclusion and exclusion criteria:

(i) Studies assessing the presence of ageism among different healthcare professionals toward older patients; (ii) primary studies; (iii) quantitative or mixed-method studies; (iv) studies published between 2014 and 2024; and (v) studies in English or Spanish. Exclusion criteria were (i) studies that included health sciences students or faculty members; (ii) studies with a qualitative methodology; and (iii) studies of low quality when assessed by the Joanna Briggs Institute Critical Appraisal Tools checklist (JBI) for cross-sectional studies.

3.1. Search Strategy

A literature search was conducted in four of the most important databases: PubMed, EMBASE, Cinahl, and Scopus (see Figure 1). Key terms were developed considering the population (healthcare workers), context (healthcare services), and objective (discrimination, disparity, and inequality towards the elderly) through a consensus among experts (see Table 1). Additional records were found through a manual search of reference lists of included studies. The last search was conducted on 15 February 2024.

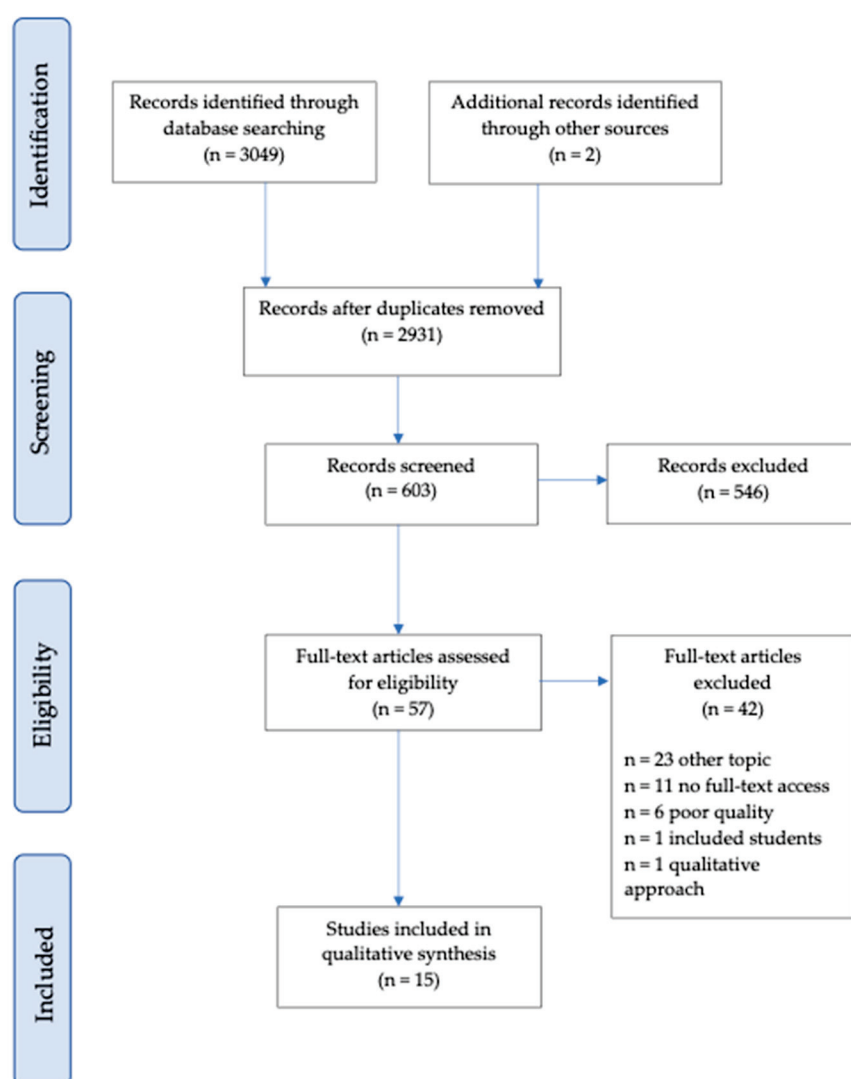


Figure 1. Flow diagram.

Table 1. Search strategies in each of the databases.

Medline (PubMed)	((“Ageism”[Title/ Abstract] OR “Ageist”[Title/ Abstract] OR “Aged”[Title/ Abstract] OR “elder*”[Title/ Abstract] OR “Aging”[Title/ Abstract] OR “Older”[Title/ Abstract] OR “Senior”[Title/ Abstract] OR “Ageism”[MeSH Terms]) AND ((“Discrimination”[Title/ Abstract] OR “Disparities”[Title/ Abstract] OR “Stigma”[Title/ Abstract] OR “stereoty*”[Title/ Abstract] OR “Prejudice”[Title/ Abstract] OR “attitude*”[Title/ Abstract] OR “Ageism”[Title/ Abstract] OR “Ageist”[Title/ Abstract]) AND ((“Health care personnel”[Title/ Abstract] OR “Health care staff”[Title/ Abstract] OR “health care provider*”[Title/ Abstract] OR “Health care”[Title/ Abstract] OR “Health services”[Title/ Abstract] OR “health occupations”[MeSH Terms]))
Scopus	ABS/TIT/KEY (ageism OR ageist OR aged OR elder* OR aging OR older OR senior) AND ABS/TIT/KEY (discrimination OR disparities OR stigma* OR stereoty* OR prejudice OR attitude* OR ageism OR ageist) AND ABS/TIT/KEY (“Health care personnel” OR “Health care staff” OR “health care provider” OR “health care” OR “health services”)
EMBASE	(ageism:ab,ti OR ageist:ab,ti OR aged:ab,ti OR elder*:ab,ti OR aging:ab,ti OR older:ab,ti OR senior:ab,ti) AND (discrimination:ab,ti OR disparities:ab,ti OR stigma*:ab,ti OR stereoty*:ab,ti OR prejudice:ab,ti OR attitude*:ab,ti OR ageism:ab,ti OR ageist:ab,ti) AND (‘health care personnel’:ab,ti OR ‘health care staff’:ab,ti OR ‘health care provider’:ab,ti OR ‘health care’:ab,ti OR ‘health services’:ab,ti)
Cinahl	TI (Ageism OR Ageist OR Aged OR elder* OR Aging OR Older OR Senior) AND TI (Discrimination OR Disparities OR Stigma* OR stereoty* OR Prejudice OR attitude* OR Ageism OR Ageist) AND TI (“Health care personnel” OR “Health care staff” OR “health care provider*” OR “Health care” OR “Health services”)

3.2. Data Extraction

Articles were imported into the bibliographic manager RefWorks, where duplicates were removed. Two members of the research team independently reviewed the titles and abstracts of the retrieved articles and determined their inclusion based on the inclusion and exclusion criteria.

In the second phase of screening, two authors independently examined the full text of the articles for final inclusion. Any doubts or discrepancies regarding the selection of an article were resolved through discussion, and, when necessary, a third evaluator was involved to make the final decision. To minimize subjectivity in recording the reasons for exclusion, we employed the technique of prioritization and sequential exclusion.

Data were extracted using a predefined tool with a format developed through the consensus of the reviewers. Two members of the team independently extracted the data using this format. Then, data were merged, and any discrepancies were resolved by a third reviewer. The extracted study data included authors, year of publication, geographic region, study design, study population, type of healthcare workers, workplace and personal characteristics, and an ageism scale. Results were extracted in terms of the mean scale score or the prevalence of ageism, when available. All variables studied as potentially influencing levels of ageism were included and described in terms of results (crude and adjusted association analyses). Data were analyzed separately for each type of healthcare worker when available.

3.3. Risk-of-Bias Assessment

The quality of the articles was independently evaluated by two authors using the Joanna Briggs Institute Critical Appraisal Tools checklist (JBI) for cross-sectional studies [22]. Each criterion was classified as present or absent, as well as unclear or not applicable. The Joanna Briggs Institute tool evaluates the quality of articles by measuring the representativeness of the source population, sample size, sampling method, study design, use of statistical tests, declaration of conflicts of interest, and declaration of funding sources. To optimize the level of evidence available for this review, only studies of moderate to high quality were included in the analysis. High-quality studies were identified based on a previous meta-analysis [23], which classified studies according to their JBI score, where those scoring above 70% were classified as high quality, between 50% and 69.9% as medium quality, and below 50% as low quality. The results of this evaluation are detailed in Supplementary File S1.

4. Results

4.1. Participants and Settings

Fifteen studies met the inclusion criteria and are included in this review (see Figure 1). These studies represent a wide range of countries, with nearly half originating from the Middle East (see Table 2). All studies employed a cross-sectional design, except for the study by Afolabi et al. [24], which also incorporated a qualitative approach. The majority of these studies (13 out of 15) aimed to determine ageism in healthcare workers towards older patients and its related factors, while the remaining two focused on ageism as a secondary outcome (see Table 2 for study characteristics and results).

Table 2. Study characteristics and results (n = 15).

Author (Year) Country	Study Design	Sample	Sample Characteristics	Scales	Results
Afolabi et al. (2020) [24] Nigeria	Mixed Aim: to assess nurses' knowledge and attitudes toward the care of elderly patients with dementia and explore associated factors	n = 100 Nurses and midwives in one hospital	50% female 54% 30–39 years 82% married 93% Christians 38% bachelor degree 72% < 10 years work experience 71% no previous elderly care experience	Ageism: KOP Aging knowledge: FAQ	The majority of the nurses have good knowledge and attitudes toward the care of elderly patients. No factors affected nurses' FAQ (all p 's > 0.05). No previous experience in special care unit for elderly was associated with worse attitudes (KOP) (p < 0.001). Adjusted analysis showed an elevated aOR = 2.90 (p < 0.05) for this parameter.
Altın and Buran (2022) [25] Turkey	Cross-sectional Aim: to investigate the attitudes of physicians and nurses about ageism in the COVID-19 pandemic	n = 308 Physicians (n = 154) and nurses (n = 154) from different units in two hospitals	58.1% > 35 years 76.6% women 62.7% married 57.5% living with elderly relatives 23.7% preferred young patients 20.1% geriatrics education (56% of these were nurses)	Ageism: UCLA-GAS Subscales: - Social values - Medical care - Compassion - Resource distribution	Physicians preferred young patients when compared with nurses (p < 0.001). Younger and less experienced workers showed more ageism attitudes assessed by UCLA-GAS and its subscales (all p 's < 0.01). Married workers showed less UCLA-GAS and compassion and medical care subscales (p 's < 0.01). Nurses showed better resource distribution subscale scores than physicians (p < 0.01). Different units showed different ageism levels (p < 0.01), with worse levels found in ER.

Table 2. Cont.

Author (Year) Country	Study Design	Sample	Sample Characteristics	Scales	Results
Bulut et al. (2016) [26] Turkey	Cross-sectional Aim: to determine surgical nurses’ attitudes towards the elderly	n = 337 Surgical nurses in seven different hospitals	64.7% 18–35 years 87.5% female 61.5% married 57% post-graduate degree 79% less than 11 working years	Ageism: AAS Subscales: - Restricting the elderly: AAS-RE - Positive: AAS-PA - Negative: AAS-NA Self-reported ageism related factors (lack of personnel, job fatigue and stress, unsuitable working conditions, lack of knowledge, cultural and religious factors, prejudice)	AAS: 85.0 ± 7.7 AAS-RE: 36.5 ± 3.7 AAS-PA: 30.4 ± 4.4 AAS-NA: 18.0 ± 3.1 Self-reported ageism related factors: lack of personnel (82.2%), job fatigue (77.2%), stress (68.5%), and working conditions (56.4%). Ageism decreased with educational level (AAS, AAS-RE and AAS-NA $p < 0.001$), though this was not significant for AAS-PA. Ageism decreased with “wish to work with aged people” (AAS, AAS-RE and AAS-PA $p < 0.001$), though this was not significant for AAS-NA.
Hwang and Kim (2021) [27] South Korea	Cross-sectional Aim: to identify factors influencing nurses’ ageism attitudes	n = 162 Nurses (17.3%) and nurse managers (82.7%) in two general hospitals	35.36 $\pm$ 8.84 years 100% females 51.9% married 74.7% bachelor degree 58% religious years 10.37 $\pm$ 8.96 work experience 93.2% geriatric work experience 91.4% did not cohabite with older adults, while 54.9% had in the past 71% gerontological education	Ageism: FSA Subscales: - Emotional avoidance: FSA-EA - Discrimination: FSA-D - Stereotype: FSA-S Emotional intelligence: WLEIS Experience with older people: frequency (CEP-CF) and quality (CEP-CQ) Anxiety about aging: fear of old people (AnAS-FOP), psychological concerns (AnAS-PC), physical appearance (AnAS-PA) and fear of loss (AnAS-FL)	FSA 2.6 ± 0.36 FSA-EA 2.6 ± 0.50 FSA-D 2.5 ± 0.40 FSA-S 2.7 ± 0.45 WLEIS 3.4 ± 0.42 CEP 4.0 ± 1.15 AnAS 2.9 ± 0.42 FSA was associated with cohabitation with an old adult in the past ($p < 0.05$). FSA correlated with CEP ($r =$ -0.28) and its subscales ($p < 0.001$) and AnAS ($r = 0.37$) and its subscales ($p < 0.001$), with the exception of AnAS-PC; WLEIS did not correlate. Factors influencing FSA were AnAS-FOP ($\beta = 0.34$) and AnAS-FL ($\beta = 0.28$) (p ’s < 0.001).

Table 2. Cont.

Author (Year) Country	Study Design	Sample	Sample Characteristics	Scales	Results
Lan et al. (2019) [28] China	Cross-sectional Aim: to assess the attitude of nurses toward the care of older adults	n = 1367 Nurses of five tertiary hospitals	30.9 ± 7.08 years 97.5% female Junior college 48.9% 47.2% < 5 years work experience 81.5% geriatrics experienced 80.4% live with an older adult 62.3% were cared for by older adults 60.2% self-referred a good relationship with older adults	Ageism: KOP Aging knowledge: FAQ	KOP 155.1 ± 21.94 FAQ 7.1 ± 4.36 Non-experienced nurses, those who self-referred as not having good relationships with older adults, those who reported not having been cared by older adults ($p < 0.001$), low FAQ adults ($p < 0.01$), and those who did not live with older adults ($p < 0.05$) showed worse KOP scores. Those who reported a bad relationship with older adults (aOR = 2.44; 95% CI: 1.81–3.29) and those who have not cared for older adults (aOR = 1.55; 95% CI: 1.13–2.11) remained significant after adjusting for confusing factors.
Liu et al. (2014) [29] UK	Cross-sectional Aim: to establish an explanatory model of nurses' attitudes towards older people and working with older patients	n = 579 Nurses attending professional education courses within a large university	36.9% 30–39 years 89.6% female 89.8% did not live with an older person 81.2% worked in a hospital 9.6 ± 8.21 work experience years 49.2% bachelor's degree 32.4% surgical wards 57.2% staff nurses	Ageism: KOP Aging knowledge: FAQ Anxiety about aging: AnAS Attitudes towards healthcare resources allocation scale Wish to work with older people	KOP 170.7 ± 18.88 Worse KOP scores were associated with worse AnAS scores, attitudes towards healthcare resources allocation, black background ($p < 0.001$), staff nurses, and less FAQ ($p < 0.05$). Regression analysis for the desire to work with older people showed a significant association with ageism (KOP) (aOR = 1.03; 95% CI: 1.01–1.05; $p < 0.01$).

Table 2. *Cont.*

Author (Year) Country	Study Design	Sample	Sample Characteristics	Scales	Results
Modarres Sadraei et al. (2022) [30] Iran	Cross-sectional Aim: to identify the perception and attitude of nurses toward elderly care and their correlation with professional responsibility in nurses	n = 252 ER nurses in eight different hospitals	31.8 ± 6.27 years 81% female 8.4 ± 5.74 work experience years 4.1 ± 3.03 ER experience years (61.2% only ER experience) 92.8% clinical nurse 74.1% shift workers 86.7% bachelor's degree 90.1% did not receive geriatrics course 86.1% live with an elderly person	Ageism: GerINCO Subscales: - Perception - Attitude - Professional responsibility	45.42 ± 7.53 for perception Nurses' perceptions were not associated with any sociodemographic characteristic. 56.14 ± 12.35 for attitude Attitudes were associated with living with the elderly ($p < 0.01$) and gender ($p < 0.05$). 39.62 ± 9.86 for responsibility Professional responsibility was associated with gender, living with the elderly, age and job experience ($p < 0.05$). Regression model for professional responsibility found that perception ($\beta = 0.08$), attitude ($\beta = 0.06$), job experience ($\beta = 0.04$), age ($\beta = 0.02$) ($p < 0.001$), and living with the elderly ($\beta = 0.04$) were predictors for ageism ($p < 0.01$).
Ozel Bilim and Kutlu (2021) [31] Turkey	Cross-sectional Aim: to determine the psychometric properties, factor analysis, and cut-off value for the FSA in a sampling of healthcare workers	n = 814 Nurses (n = 545) and physicians (n = 269) in state and university hospitals	38.0 ± 9.12 years 26.7% female 177.6 ± 43.50 working hours per month 15.4 ± 9.57 working years 38.2% bachelor's degree 65.8% state hospitals 67% nurses 62% worked on call 75.1% satisfied with work	Ageism: FSA	Women, less educated, nurses, employees at state hospitals, employees unsatisfied with their jobs ($p < 0.001$), those who live in nuclear families, and employees working on call ($p < 0.01$) showed worse FSA scores.

Table 2. Cont.

Author (Year) Country	Study Design	Sample	Sample Characteristics	Scales	Results
Podhorecka et al. (2022) [32] Poland	Cross-sectional Aim: to assess the approach of Polish physiotherapists to the elderly and to analyze the factors influencing it	n = 252 Physiotherapist in Poland's National Chamber of Physiotherapists	75% female 41.67% 30–39 years 55.16% married 76.19% master's degree 35.71% < 5 years work experience 40.87% working at home 65.87% living with an older person	Ageism: KOP Empathy: JSE	KOP 100.7 ± 17.46 JSE 106.31 ± 12.38 82.54% self-referred personal and 86.51% professional contact with older people. 59.13% self-reported that keeping contact with older people is important. JSE ($\beta = 0.12$) and relevance of contacts with elderly people ($\beta = 1.24$) were associated with KOP punctuation.
Polat et al. (2014) [33] Turkey	Cross-sectional Aim: to determine the perceptions of elderliness and the prevalence of ageism among nurses and physicians	n = 167 Nurses (n = 110) and physicians (n = 57) in medical and surgical units of a university hospital	Nurses/physicians 52.7%/49.1% 28–35 years 94.5%/63.2% female 53.6%/28.1% married 94.5%/100% undergraduate 50.9%/59.6% lived with an older person 60.9%/15.8% > 5 years work experience 51.8%/68.4% medical units 92.7%/77.2% currently working in older patient units 68.2%/64.9% satisfied by serving older people 71.8%/—did not receive geriatrics course	Ageism: AAS Subscales: AAS-NA AAS-PA AAS-RE	Nurses AAS 80.02 ± 7.64 Physicians AAS 83.17 ± 9.09 Physicians showed less ageism than nurses when measured by AAS, and AAS-RE ($p < 0.05$). Previous work in older patients units was associated with less ageism in nurses (only for AAS-RE) and physicians (only for AAS-NA) ($p < 0.05$).

Table 2. Cont.

Author (Year) Country	Study Design	Sample	Sample Characteristics	Scales	Results
Rababa et al. (2020a) [34] Jordan	Cross-sectional Aim: to examine how the sociodemographic and professional characteristics of nurses correlate with their levels of knowledge, attitudes, and ageism toward older adults.	N = 317 Nurses in medical, surgical, ER, and ICU in two different hospitals	31.1 ± 4.75 years 44.2% female 60.9% bachelor's degree 7.4 ± 4.39 years of work experience 50.6% living with an elderly person	Ageism: ROPE- Negative ageism Ageism: FSA Aging knowledge: FAQ1	ROPE 19.1 ± 4.9 FSA 69.5 ± 13.8 FAQ1 11.8 ± 3.3, higher in married nurses and ICU ($p < 0.01$). Lower education level ($p < 0.01$) and public hospitals ($p < 0.05$) were associated with worse ROPE, and FSA outcomes. Multivariate analysis revealed that negative ageism (ROPE) was only associated with FAQ1 ($\beta = -0.178$) and FSA ($\beta = 0.517$) ($p < 0.001$) but education level was not included in the model.
Salia et al. (2022) [35] Ghana	Cross-sectional Aim: to assess factors affecting the care of elderly patients among nursing staff	n = 142 Nurses (n = 134) and nurse assistants (n = 8) in several units at a tertiary hospital	38.7% 31–40 years 70.4% female 51.4% married 50% had at least master's degree 12% were geriatrics specialized nurses 45.8% 6–10 years work experience	Ageism: Self-designed questionnaire which included attitude and barriers towards older age Self-designed questionnaire which included aging knowledge, characteristics or facilities	84.5% had a positive caring attitude towards the elderly and 88.7% good knowledge in elderly care. Nurse assistants showed less positive caring attitudes (more ageism than nurses) (aOR = 0.16, $p < 0.05$). Good aging knowledge (aOR = 4.13, $p < 0.05$) and nursing managers showed more positive attitudes towards older age (aOR = 6.80, $p < 0.05$).

Table 2. Cont.

Author (Year) Country	Study Design	Sample	Sample Characteristics	Scales	Results
Tavares et al. (2017) [36] Portugal	Cross-sectional Aim: to analyze the relationship between the perceptions of nurses about the geriatric care environment and geriatric nurses' knowledge and attitudes according to unit type and regions	n = 1068 Nurses in medical units, surgical units, and ICU/ER in five hospitals	79.7% female 34.1 ± 8.5 years 45.4% single 11.3 ± 8.4 years of work experience 10 ± 8.1 years of work experience in the current institution 7.5 ± 6.5 years of work experience in the current unit 88.8% degree in nursing 86.3% not gerontological education	Ageism: GIAP Subscales: - Geriatric nursing knowledge/attitudes scale - Geriatric care environment - Professional issues	No differences were found in geriatric nursing knowledge and attitudes subscale. The geriatric care environment subscale was different only between north and central ICU/ER nurses (north showed better scores) ($p < 0.05$). The professional issues subscale was different only between north and central medical units nurses (central showed better scores) ($p < 0.05$).
Tufan et al. (2015) [37] Turkey	Cross-sectional Aim: to investigate the attitudes of internal medicine residents toward older people	n = 274 Internal medicine residents in six public university hospitals	50.3% female 28 ± 2 years 2 ± 2.58 years of work experience 53.6% did not receive gerontological education 39.1% made a rotation in geriatrics during residence 90.1% had elderly relatives 8.4% lived with elderly relatives	Ageism: UCLA-GAS	83.6% had positive attitudes toward older people. Undertaking of a geriatrics course was associated with positive attitudes ($p < 0.05$). Geriatrics rotation during residency arose as a protector factor for ageism (cOR = 2.6; $p < 0.05$).

Table 2. Cont.

Author (Year) Country	Study Design	Sample	Sample Characteristics	Scales	Results
Yakubu et al. (2022) [38] Ghana	Cross-sectional Aim: to evaluate nurses' attitudes towards older adults	n = 160 Nurses in a tertiary hospital in any of the medical and surgical wards	30.1 ± 3.8 years 58.1% female 4.4 ± 3.3 years of work experience 52.5% diploma nurses 48.1% Christian	Ageism: AAS Subscales: - Restricting the elderly: AAS-RE - Positive: AAS-PA - Negative: AAS-NA	AAS: 66.9 ± 6.05 AAS-RE: 30.59 ± 3.7 AAS-PA: 24.26 ± 3.3 AAS-NA: 12.16 ± 2.4 More educated nurses showed less ageism in the AAS-RE ($r = -0.296$; $p < 0.01$) and AAS-NA ($r = -0.161$; $p < 0.05$) subscales. Experienced nurses showed less ageism than less experienced nurses ($r = 0.672$; $p < 0.05$). Female nurses showed less ageism than male counterparts ($p < 0.05$).
AAS: Ageism Attitude Scale; AAS-NA: AAS subscale negative ageism; AAS-PA: AAS subscale positive ageism; AAS-RE: AAS subscale restricting the life of the elderly; AnAS: Anxiety about Aging Scale; AnAS-FL: AnAS subscale fear of loss; AnAS-FOP: AnAS subscale fear of old people; AnAS-PA: AnAS subscale physical appearance; AnAS-PC: AnAS subscale psychological concerns; aOR: adjusted odds ratio; CEP: Contact with Elderly People; CEP-CF: CEP subscale contact frequency; CEP-CQ: CEP subscale contact quality; cOR = crude odds ratio; ER: emergency room; FAQ: Palmore's Facts on Aging Quiz; FSA: Fraboni Scale of Ageism; FSA-D: FSA subscale discrimination; FSA-EA: FSA subscale emotional avoidance; FSA-S: FSA subscale stereotype; GerINCQ: The modified version of the Geriatric In-Hospital Nursing Care Questionnaire; GIAP: Geriatric Institutional Assessment Profile; JSE: the Jefferson Empathy Scale; ICU: intensive care unit; KOP: Kogan's Older People Scale; ROPE: Relating to Older People Evaluation; UCLA-GAS: University of California at Los Angeles Geriatrics Attitudes Scale; WLEIS: The Wong and Law Emotional Intelligence Scale.					

Participants ranged from $n = 100$ [24] to $n = 1367$ healthcare workers [28]. Most participants were nurses [24–36,38] followed by physicians [25,31,32,37], nursing assistants [35], and other healthcare workers such as physiotherapists [32]. The settings varied widely, with most studies being conducted in specialized centers (e.g., hospitals). The majority of participants were young, female, and relatively inexperienced workers (less than 10 years).

4.2. Ageism Assessment

Ageism among healthcare workers was assessed using multiple scales, most of which were specific to ageism—the Ageism Attitude Scale (AAS), the Fraboni Scale of Ageism (FSA), the modified version of the Geriatric In-Hospital Nursing Care Questionnaire (GerINCQ), the Kogan’s Older People Scale (KOP), the Relating to Older People Evaluation (ROPE), and the University of California at Los Angeles Geriatrics Attitudes Scale (UCLA-GAS). Others were developed for different purposes—the Geriatric Institutional Assessment Profile (GIAP)—or were questions ad hoc to identify attitudes and barriers toward older age [35].

4.3. Ageist Perceptions and Attitudes in Health Workers Towards Older Patients

The KOP was the most widely used tool. While most studies reported relatively good scores among their workers [24,28,29], the study by Podhorecka et al. [32] in Poland found neutral mean attitudes in physiotherapists (range 34–204 points). Using the AAS scale (range 23–115 points), Bulut et al. [26] found the best scores in nurses (85 points). Polat et al. [32] found similar results in both nurses and physicians (80.02 and 83.17 points, respectively). However, a study conducted in Ghana by Yakubu et al. [38] reported lower scores in nurses (66.9 points). Another three studies used different versions of the FSA scale to assess ageism. Two of these found neutral attitudes in nurses [27,34]. Other scales also found adequate perceptions and attitudes among nurses using the GerINCQ (45.42 and 56.14 points, respectively) [30], the UCLA-GAS (83.6% positive attitudes) [37] and self-designed questionnaires to assess attitudes and barriers towards the elderly (84.5% positive caring attitude) [35]. Lastly, three studies did not adequately describe their results, even though they aimed to describe ageism among participants [25,36], leaving some participant characteristics unknown [31]. Therefore, although most studies report that healthcare workers generally had a positive caring attitude toward the elderly, their results vary depending on the scale used and the study setting.

4.4. Factors Associated with Ageism

To facilitate the synthesis of the results, the various factors analyzed were grouped into three categories: sociodemographic, socioeconomic, and sociocultural factors; personal factors; and work-related factors.

4.4.1. Sociodemographic, Socioeconomic, and Sociocultural Factors

High heterogeneity was observed in the assessment of factors related to ageism. Regarding sociodemographic factors, nine out of fifteen studies analyzed age as a potentially associated factor. However, only two studies (one with multivariate analyses) found a positive association between younger age and negative attitudes toward older people in at least one ageism subscale [25,30]. Less experienced workers were also found to be commonly associated with ageism in these studies, as well as in the studies by Afolabi et al. [24] and Yakubu et al. [38], likely due to the relationship between these variables.

Three out of eleven studies found that male healthcare workers exhibited more ageist attitudes than female workers [30,31,38]. Additionally, the study by Altın and Buran [25] found raw associations between ageist attitudes and being single.

Regarding education-related variables, we must differentiate between three different exposures. First, 10 studies analyzed the relationship between the level of education and ageism within the same category (e.g., bachelor’s degree, master’s degree, specialist training course). These studies showed mixed results, with half indicating lower levels of

ageism with higher education levels [19,26,31,34,38], while the other half did not find any relationship [24,27,28,30,32]. Second, four studies examined this relationship, but compared different professional categories. In this regard, two studies found that physicians showed less ageism than nurses [31,32], while another study found opposite results (nurses showed less ageism than physicians) [25]. For its part, the study by Salia et al. [35] found that nurses showed less ageism than nursing assistants. However, only the study by Altın and Buran [25] appropriately described the differences in specific geriatric training across professional profiles. Lastly, nine studies addressed this relationship between education and ageism but regarding specific geriatric training courses or aging knowledge. This question was addressed mainly using the Palmore's Facts on Aging Quiz (FAQ) [24,28,29,34] or ad hoc questions [25,27,30,35,37]. Most of the studies using the FAQ found a relationship between better aging knowledge and fewer ageist attitudes, with the exception of the study by Afolabi et al. [24] in nurses. However, studies using ad hoc questions found inconsistent results.

Other social-related factors, such as religion, ethnicity, or economic status, were less frequently explored and did not appear to have a strong relationship with ageism levels.

4.4.2. Personal Factors

The most extensively explored factor was family experience and/or the quality and quantity of contact with older adults. This variable was primarily measured using ad hoc questions or the Contact with Elderly People Scale (CEP) [27]. Many studies found a relationship between contact frequency or experience with older people and the presence of ageist perceptions or attitudes [27,28,30–32]. However, some studies did not find this relationship, likely due to the heterogeneity in how this aspect was measured.

Three studies explored the relationship between personality characteristics and ageism. They found that empathy [32] and anxiety about aging (using the Anxiety about Aging Scale (AnAS)) [27,29] were associated with ageist attitudes.

Another variable that was generally associated with ageism was the desire to work with older people. Although it was only assessed in six studies, four of these found a significant association [26,28,29,31].

4.4.3. Work-Related Factors

Most of the studies included workplace factors in their investigations, primarily aiming to compare situations across different settings.

Regarding various hospitals and units, it is worth noting that only three studies assessed differences between units. These studies found that ER nurses [25] and healthcare workers who had not worked in geriatric units exhibited higher levels of ageism [24,33,39]. Furthermore, two studies conducted in the Middle East also identified differences based on the type of hospital, with public hospitals being rated the worst [31,34].

Workload was not explored in any of the studies. However, other variables related to workload, such as shift work, were not associated with ageism [30]. Additionally, the study by Bulut et al. [26] investigated self-reported factors associated with ageism. The most significant factors identified were lack of personnel, job fatigue, stress, and working conditions.

4.4.4. Predictive Factors of Ageism

Predictive factors for the presence of ageism were as follows (see Table 2 for details): younger workers [30], less educated [34,35], less experienced in work [24,30] and less experienced in elder relationships [28,30,32]. Additionally, those who did not wish to work with older people [28,29,40], those who showed less empathy [32] and those who exhibited anxiety about aging [27] were also predictive factors for the presence of ageism.

4.4.5. Study Quality

Only four studies were determined to be of high quality (≥ 6 out of 8 items), whereas the remaining were found to be of moderate quality (4 to 6 items).

The vast majority of the studies described their participants and settings in detail. All participants were healthcare workers exposed to geriatric care. Although many types of healthcare workers were analyzed, most of them exhibited similar sociodemographic characteristics, facilitating comparison between studies. However, some biases were detected during the review process. For example, the study by Salia et al. [35], compared nurses ($n = 134$) versus nurse assistants ($n = 8$), but the representativeness of nurse assistants may be compromised.

In relation to this, some studies were found to report high levels of rejection among their participants [36] or did not provide details about the final sample [24,25,32–34]. This could introduce sampling bias.

The study by Salia et al. [35] used ad hoc questions to evaluate ageism among their workers; however, its primary aim was to determine which factors affect the care of elderly patients. Additionally, many other variables were also evaluated ad hoc, such as aging education or knowledge, which may lead to erroneous associations.

Most of the studies did not identify all potential confounding factors related to ageism. In fact, only the studies by Altın and Buran [25] and Polat et al. [33] reported this information comprehensively. However, both studies provided poor analysis to properly determine which factors were related to the presence of ageism.

Lastly, only eight studies used multivariate analysis to explore the association of the described variables with ageism levels [24,27–30,32,34,35]. Nevertheless, Rababa et al. [34] did not include education level in their model, even though it was statistically associated with ageism levels assessed by FSA.

5. Discussion

The primary objective of our review was to assess the presence of ageism among healthcare professionals and to identify the factors associated with its presence.

Generally, relatively low levels of ageism were found in our review among healthcare professionals, although these results varied across studies. The heterogeneity of results may be related to the different cultural contexts in which they were conducted. Almost half of the studies in our review were conducted in the Middle East; therefore, we acknowledge that there is limited understanding of the situation of ageism in other continents, where sociocultural factors may play a significant role. In cultures that value the elderly and promote their integration into family and community life, such as many Asian societies, the degree of ageism tends to be lower [41]. Conversely, in societies with social structures that foster the segregation of the elderly, such as nursing homes rather than multigenerational living arrangements, a higher degree of ageism may be experienced [42]. Despite the potential impact of cultural context on the level of ageism within a population, factors related to society, such as religion, ethnic origin, or economic status, were less explored in our review. This underscores the need for further exploration of the influence of cultural context on the development of ageism. Future studies should investigate the situation in other countries around the world and whether cultural context also influences negative attitudes towards older adults within the healthcare population.

Regarding the other sociodemographic variables explored, age and gender did not show any significant relationship with ageism in our review. Another review of ageism in nurses also found inconsistent results concerning the demographic characteristics of nurses and the presence of ageism [43]. Additionally, regarding education-related variables, our review found mixed results regarding the level of education in general, as well as among different professional categories. This is likely due both to the differences in how these variables are addressed across studies and to the varying curricula for each profession in different countries, which differ significantly. However, a significant relationship was identified between aging knowledge (assessed by the FAQ) and ageism among healthcare

workers [28,29,34]. The available literature on nurses aligns with these findings [43], indicating that advanced geriatric training can foster a deeper understanding and recognition of aging issues even among undergraduate students across various disciplines [44,45]. Therefore, specific training in geriatrics is crucial to ensure the well-being and quality of life of our elderly population [46].

In terms of overall professional experience, our review did not identify any strong associations with ageism scores. This finding may be influenced by the relatively young age of the participants in most of the included studies. Limited evidence was found suggesting that related variables, such as experience in geriatric units [24,33], family experience, or contact with older adults [27,28,30–32], were associated with lower levels of ageism. However, not all studies analyzing these relationships reported positive results. This inconsistency may stem from differences in cultural contexts and the varied approaches used to measure personal and professional experience with older adults, with only one study employing a validated scale to assess these variables [27]. Such experiences may contribute to reducing stereotypical beliefs and discriminatory behaviors by fostering greater understanding and empathy toward older adults [47]. On the other hand, individuals expressing interest and a desire to work with older adults may inherently exhibit fewer ageist beliefs and behaviors [48,49]. This trend was also observed in our review among those expressing a willingness to work with older patients [26,28,29,31].

Other personal factors, such as sexism and anxiety about aging, may also be linked to ageism in healthcare professionals, just as they are in students [50]. Similarly, age discrimination in the healthcare system could be exacerbated by issues of ethnicity or racism [51]. However, in our review, only two articles explored the association between ageism and anxiety about aging, both reporting positive results [27,29]. Other factors, such as sexism or racism, remain unexplored. Therefore, future studies should determine whether sexism and racism coexist with ageism among healthcare professionals.

Lastly, job-related factors such as workload or understaffing could be associated with ageism among healthcare professionals, although only one study has considered this variable subjectively in its analyses [26]. Indeed, a qualitative systematic review describes healthcare for older adults as a significant workload for nurses [20]. Consequently, future research should investigate the relationship between socioeconomic conditions, work environments (e.g., hospital versus primary care), and individual job satisfaction with ageism among healthcare professionals, issues that remain largely unaddressed to date.

5.1. Practical Implications

Healthcare institutions must recognize that the problem of ageism among their professionals is a reality and conduct studies aimed at determining its presence. These studies must investigate both personal (internal) and cultural and job-related (external) factors associated with its presence, which may negatively impact the care provided to older patients. This evidence should serve as a foundation for developing targeted strategies to address this issue. Approaches based on geriatric education, contact with older adults, or a combination of both are considered effective in reducing prejudice and negative attitudes toward older adults in the general population [52] and among students in health and social sciences [53,54]. Consequently, it is reasonable to expect that educational programs could also be effective for licensed professionals. The ultimate goal, therefore, should be to ensure interactions free from stereotypes, prejudices, and discrimination against older patients.

5.2. Study Limitations

The present review has several limitations.

First, it is important to note that our review aimed to identify ageism and related factors across a diverse range of healthcare workers. Due to the design of the studies, it has not always been possible to differentiate the results based on the type of healthcare worker. Consequently, the participants, aims, and settings varied significantly from one

study to another. However, this review provides, for the first time, a general overview of this phenomenon among the population studied.

Second, and with regard to ageism, the literature identifies three dimensions: stereotypes, prejudices, and discrimination. According to a recent review, not all scales assess all of these dimensions [55]. Although the Kogan's Attitudes Towards Older People Scale (KOP) is the most commonly used in this review [56], it only assesses stereotypes and prejudices. In contrast, only three studies utilized the Fraboni Scale of Ageism [57], which is designed to assess all three dimensions. Additionally, the study by Salia et al. [35] did not use a validated scale to assess ageism. This limitation may impact the results reported here by potentially underestimating the magnitude of the problem. Similarly, sociodemographic, socioeconomic, personal, and workplace factors potentially associated with ageism vary widely across studies. The fact that nearly half of the studies in this review were conducted in the Middle East may lead to a limited understanding of the situation in other parts of the world, where social and cultural characteristics could differ. Moreover, some studies did not present robust analyses to confirm the presence of associations, limiting the generalizability of the findings.

Lastly, although studies were of moderate-to-high quality (as assessed by the JBI), some did not report their data adequately (in terms of inclusion and exclusion criteria, participants' characteristics, healthcare type, and/or ageism scores). Furthermore, the majority of the studies were conducted with nurses. Therefore, the healthcare workers represented here may not fully reflect the broader reality of health professionals. Nonetheless, low rates of ageism were found among health care professionals, as was the association of ageism with these professionals' education and experience of aging. This aligns with the general population and thus gives reliability to this review. Further research should compare different types of professionals and address all potential confounders to better understand this phenomenon.

6. Conclusions

Healthcare workers generally had a positive caring attitude toward elderly patients, though the literature on this topic remains scarce and the results could vary depending on the cultural context. The main factors associated with ageism were specialized training in geriatrics and the years of experience in geriatric units. Other factors, such as intergenerational contact and a desire to work with older patients, may also be linked to a lower presence of ageism among healthcare professionals. Further studies are needed to confirm these results, along with the development of interventions aimed at providing respectful and equitable healthcare.

Supplementary Materials: The following supporting information can be downloaded at <https://www.mdpi.com/article/10.3390/nursrep14040295/s1>, File S1: Study quality assessed by the JBI cross-sectional checklist (n = 15).

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