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AIM AND SCOPE

Journal of Education and Research in Nursing (J Educ Res Nurs) is an international, scientific, open access, online-only periodical published in accordance with independent, unbiased, and double-blinded peer-review principles. The journal is the official publication of Koç University Semahat Arsel Nursing Education, Practice and Research Center (SANERC), published quarterly in March, June, September, and December. The publication language of the journal is English and the journal accepts English manuscripts only.

All expenses of the journal are covered by SANERC. Processing and publication are free of charge with the journal. No fees are requested from the authors at any point throughout the evaluation and publication process. All manuscripts must be submitted via the online submission system, which is available at http://jer-nursing.org/. The journal guidelines, technical information, and the required forms are available on the journal's web page.

Journal of Education and Research in Nursing aims to share the experience and the knowledge from Türkiye and different cultures through original studies in nursing and healthcare as well as protect and improve the public health and strengthen the nursing profession by providing the opportunity to transfer current knowledge into practice. The journal contributes to the literature by publishing manuscripts at the highest scientific and clinical value in nursing research, practice, and education. The journal publishes original articles, reviews, case reports, and letters to the editors that are prepared in accordance with ethical guidelines. The journal also welcomes contributions from other healthcare professionals on issues that have a direct impact on nursing practice.

The target audience of the journal is primarily researchers, practitioners, educators and executive nurses as well as other healthcare professionals, policy makers and students of nursing and health.

Journal of Education and Research in Nursing currently indexed in GALE (2010), Tubitak Ulakbim Medicine (2012), EBSCO (2017), CINAHL (2017), DOAJ (2021), Research4Life (2021), Hinari (2021), SCILIT (2021), OUCI (2021), CNKI (2022), MIAR (2024), SUDOC (2024), Zeitschriften Datenbank (2024), Electronic Journal Library (2024), and EmCare (2025).

The editorial and publication processes of the journal are shaped in accordance with the guidelines of the International Committee of Medical Journal Editors (ICMJE), World Association of Medical Editors (WAME), Council of Science Editors (CSE), Committee on Publication Ethics (COPE), European Association of Science Editors (EASE), and National Information Standards Organization (NISO). The journal is in conformity with the Principles of Transparency and Best Practice in Scholarly Publishing (doaj.org/bestpractice).

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Journal of Education and Research in Nursing can publish advertisement images in the journal's website upon the approval of the Editor in Chief. Potential advertisers should contact the Editorial Office. Advertisers have no effect on the editorial decisions or advertising policies.

Disclaimer

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INSTRUCTIONS TO AUTHORS

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All expenses of the journal are covered by SANERC. Processing and publication are free of charge with the journal. No fees are requested from the authors at any point throughout the evaluation and publication process. All manuscripts must be submitted via the online submission system, which is available at http://jer-nursing.org. The journal guidelines, technical information, and the required forms are available on the journal's web page.

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EDITORIAL AND PUBLICATION PROCESS

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Originality, high scientific quality, and citation potential are the most important criteria for a manuscript to be accepted for publication. Manuscripts submitted for evaluation should not have been previously presented or already published in an electronic or printed medium. The journal should be informed of manuscripts that have been submitted to another journal for evaluation and rejected for publication. The submission of previous reviewer reports will expedite the evaluation process. Manuscripts that have been presented in a meeting should be submitted with detailed information on the organization, including the name, date, and location of the organization.

PEER REVIEW PROCESS

Manuscripts submitted to Journal of Education and Research in Nursing will go through a double-blind peer-review process. Each submission will be reviewed by at least two external, independent peer reviewers who are experts in their fields in order to ensure an unbiased evaluation process. The editorial board will invite an external and independent editor to manage the evaluation processes of manuscripts submitted by editors or by the editorial board members of the journal. The Editor in Chief is the final authority in the decision-making process for all submissions. Reviewers who seek assistance from a trainee or colleague in the performance of a review should acknowledge these individuals' contributions in the written comments submitted to the editor. Reviewers must maintain the confidentiality of the manuscript, which may prohibit the uploading of the manuscript to software or other AI technologies where confidentiality cannot be assured. Reviewers must request permission from the journal prior to using AI technology to facilitate their review.

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At submission, the journal should require authors to disclose whether they used artificial intelligence (AI)– assisted technologies (such as Large Language Models [LLMs], chatbots, or image creators) in the production of submitted work. Authors who use such technology should describe, in both the cover letter and the submitted work, how they used it. Use of AI for writing assistance should be reported in the acknowledgment section. Authors who used AI technology to conduct the study should describe its use in the methods section in sufficient detail to enable replication to the approach, including the tool used, version, and prompts where applicable. Chatbots (such as ChatGPT) should not be listed as authors because they cannot be responsible for the accuracy, integrity, and originality of the work, and these responsibilities are required for authorship. Therefore, humans are responsible for any submitted material that included the use of AI-assisted technologies. Authors should carefully review and edit the result because AI can generate authoritative-sounding output that can be incorrect, incomplete, or biased. Authors should not list AI and Alassisted technologies as an author or co-author, nor cite AI as an author. Authors should be able to assert that there is no plagiarism in their paper, including in text and images produced by the AI. Humans must ensure there is appropriate attribution of all quoted material, including full citations.

ETHICAL GUIDELINES

An approval of research protocols by the Ethics Committee in accordance with international agreements (World Medical Association Declaration of Helsinki "Ethical Principles for Medical Research Involving Human Subjects," amended in October 2013, www.wma.net) is required for experimental, clinical, and drug studies and for some case reports. If required, ethics committee reports, or an equivalent official document will be requested from the authors. Submissions which do not have ethical approval will be reviewed according to COPE's Research, Audit and Service Evaluations guideline.

Such manuscripts can be rejected after editorial review due to the lack of ethics committee approval.

For manuscripts concerning experimental research on humans, a statement should be included that written informed consent of patients and volunteers was obtained following a detailed explanation of the procedures that they may undergo.

It is the authors' responsibility to protect the patients' anonymity carefully. For photographs that may reveal the identity of the patients, signed releases of the patient or their legal representative should be enclosed, and the publication approval must be provided in the Methods section.

For studies carried out on animals, an approval research protocols by the Ethics Committee in accordance with international agreements (Guide for the care and use of laboratory animals, 8th edition, 2011" and/or "Interna-

tional Guiding Principles for Biomedical Research Involving Animals, 2012") is required. Also, the measures taken to prevent pain and suffering of the animals should be stated clearly in such studies.

Information on patient consent, the name of the ethics committee, and the ethics committee approval number and date should also be stated in the Methods section of the manuscript.

PLAGIARISM AND ETHICAL MISCONDUCT

Journal of Education and Research in Nursing is extremely sensitive about plagiarism. All submissions are screened by a similarity detection software (iThenticate by Cross-Check) at any point during the peer-review and/or production process.

When you are discussing others' (or your own) previous work, please make sure that you cite the material correctly in every instance.

Authors are strongly recommended to avoid any form plagiarism and ethical misconduct that are exemplified below.

Self-plagiarism (text-recycling): Overlapping sections or sentences with the author's previous publications without citing them. Even if you are the author of the phrases or sentences, the text should not have unacceptable similarity with the previously published data.

Salami slicing: Using the same data of a research into several different articles. Reporting the same hypotheses, population, and methods of a study is into different papers is not acceptable.

Data Fabrication: It is the addition of data that never occurred during the gathering of data or the experiments. Results and their interpretation must be based on the complete data sets and reported accordingly.

Data Manipulation/Falsification: It means manipulating research data with the intention of giving a false impression. This includes manipulating images (e.g. micrographs, gels, radiological images), removing outliers or 'inconvenient' results, changing data points, etc.

In the event of alleged or suspected research misconduct, e.g., plagiarism, citation manipulation, and data falsification/fabrication, the Editorial Board will follow and act according to COPE flowcharts.

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Journal of Education and Research in Nursing does not consider preprint publications as prior publication. In other words, authors are allowed to present and discuss their findings on a non-commercial preprint server before submission to a journal.

Authors must provide the journal with the pre-print server deposition of their article accompanying its DOI during initial submission.

If the article is published in the Journal of Education and Research in Nursing, it is the responsibility of the authors to update the archived preprint and link it to the published version of the article.

AUTHORSHIP

Each person listed as an author should fulfill the authorship criteria recommended by the International Committee of Medical Journal Editors (ICMJE - www.icmje.org). The ICMJE recommends that authorship is based on the following four criteria:

1. Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
2. Drafting the work or revising it critically for important intellectual content; AND
3. Final approval of the version to be published; AND
4. Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

In addition to being accountable for the parts of the work he/she has done, an author should be able to identify which co-authors are responsible for specific other parts of the work. Also, authors should have confidence in the integrity of the contributions of their co-authors.

All those designated as authors should meet all four criteria for authorship, and all who meet the four criteria should be identified as authors. Those who do not meet all four criteria should be acknowledged in the title page of the manuscript.

Journal of Education and Research in Nursing requires corresponding authors to submit a signed and scanned version of the Copyright Agreement and Acknowledgement of Authorship form (available for download at http://jer-nursing.org) during the initial submission process to act appropriately on authorship rights and to prevent ghost or honorary authorship. If the editorial board suspects a case of "gift authorship," the submission will be rejected without further review. As part of the submission of the manuscript, the corresponding author should also send a short statement declaring that he/she accepts to undertake all the responsibility for authorship during the submission and review stages of the manuscript.

CHANGE OF AUTHORSHIP

Journal of Education and Research in Nursing reviews the authorship according to the author's declaration in the Title Page, thus it is the authors responsibility to send the final order of the complete author names. Requests in the change of authorship (e.g. removal/addition of the authors, change in the order etc) after submission are subject to editorial approval. Editorial Board will investigate this kind of cases and act following COPE flowcharts.

Change of authorship requests should be submitted to the Editorial Office with an official letter stating the reasons of the change. The letter must be signed by all authors and include their approval on the change in authorship. If the request is approved by the Editorial Board, authors need to submit a new Copyright Agreement Form according to the final order list.

DECLARATION OF INTEREST

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APPEALS AND COMPLAINT

The Editorial Board of the journal handles all appeal and complaint cases within the scope of COPE guidelines. In such cases, authors should get in direct contact with the editorial office regarding their appeals and com-

plaints. When needed, an ombudsperson may be assigned to resolve claims that cannot be resolved internally. The Editor in Chief is the final authority in the decision-making process for all appeals and complaints.

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Article Withdrawal Process

In accordance with the publication policies of the Journal of Education and Research in Nursing, the duties and responsibilities of the author(s) and the editorial board during the withdrawal of an article are given below.

Responsibilities of the Authors

The author(s) has an obligation to cooperate with the journal editor in the withdrawal process if he/she notices an error or mistake in the pre-checking stage of the manuscript or in a published work. Withdrawal requests will not be considered for a manuscript in the review process or in the publication phase. Author(s) who wish to withdraw their study outside of the review process or the publication phase are obliged to fill out and send the Withdrawal Form via e-mail at kare@karepb.com. The Editorial Board will review the withdrawal notification and respond within 15 days at the latest. Authors cannot submit their manuscripts to another journal for evaluation unless the editorial board approves the withdrawal request for manuscripts whose copyrights have been transferred to the Journal of Education and Research in Nursing at the submission stage.

Responsibilities of the Editorial Board

The editorial board of the Journal of Education and Research in Nursing has the obligation to initiate an investigation into any suspected copyright infringement, ethical statement violation, or plagiarism regarding studies that are published ahead of print, or under review. If the editorial board determines that there is a violation of copyright, ethical statement, or plagiarism in the work under evaluation, it withdraws the work from the evaluation and returns it to the authors by citing the detected situations in detail. In the event that copyright infringement or plagiarism is determined to have occurred in a published work or a work in early view, the Editorial Board may recommend to the publishers or editorial boards, of which study was previously published, to ensure the validity and reliability of the published studies or to withdraw them.

MANUSCRIPT PREPARATION

The manuscripts should be prepared in accordance with ICM-JE-Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals (updated in December 2018 - http://www.icmje.org/icmje-recommen-dations.pdf). Authors are required to prepare manuscripts in accordance with the CONSORT guidelines for randomized research studies, STROBE guidelines for observational original research studies, STARD guidelines for studies on diagnostic accuracy, PRISMA guidelines for systematic reviews and meta-analysis, ARRIVE guidelines for experimental animal studies, and TREND guidelines for non-randomized public behavior. To find the right guideline for your research, please complete the questionnaire by Equator Network here.

The style of the manuscripts should be prepared according to AMA Manual of Style 11th Edition.

Manuscripts can only be submitted through the journal's online manuscript submission and evaluation system, available at jern.manuscriptmanager.net. Manuscripts submitted via any other medium and submissions by anyone other than one of the authors will not be evaluated.

Manuscripts submitted to the journal will first go through a technical evaluation process where the editorial office staff will ensure that the manuscript has been prepared and submitted in accordance with the journal's guidelines. Submissions that do not conform to the journal's guidelines will be returned to the submitting author with technical correction requests.

Authors are required to submit the following:

- Copyright Agreement and Acknowledgement of Authorship Form, and
- ICMJE Potential Conflict of Interest Disclosure Form (should be filled in by all contributing authors) during the initial submission. These forms are available for download at http://jer-nursing.org.

Preparation of the Manuscript

Title page: A separate title page should be submitted with all submissions and this page should include:

- The full title of the manuscript as well as a short title (running head) of no more than 50 characters,
- Name(s), affiliations, highest academic degree(s), and ORCID IDs of the author(s),
- Grant information and detailed information on the other sources of support,
- Name, address, telephone (including the mobile phone number), and email address of the corresponding author,
- Acknowledgment of the individuals who contributed to the preparation of the manuscript but who do not fulfill the authorship criteria.

Abstract: An abstract should be submitted with all submissions except for Letters to the Editor. The abstract of Research Articles should be structured with subheadings (Background, Methods, Results, and Conclusion). Please check Table 1 below for word count specifications.

Keywords: Each submission must be accompanied by a minimum of three to a maximum of five keywords for subject indexing at the end of the abstract. The keywords should be listed in full without abbreviations. The keywords should be selected from the National Library of Medicine, Medical Subject Headings database (https://www.nlm.nih.gov/mesh/MBrowser.html).

Manuscript Types

Research Articles: This is the most important type of article since it provides new information based on original research.

Acceptance of original papers will be based upon the originality and importance of the investigation. The main text of original articles should be structured with Introduction, Material and Methods, Results, and Discussion subheadings. Please check Table 1 for the limitations for Original Articles.

Clinical Trials

Journal of Education and Research in Nursing adopts the ICMJE's clinical trial registration policy, which requires that clinical trials must be registered in a publicly accessible registry that is a primary register of the WHO International Trials Registry Platform (ICTRP) or in ClinicalTrials.gov.

Instructions for the clinical trials are listed below.

- Clinical trial registry is only required for the prospective research projects that study the relationship between a health-related intervention and an outcome by assigning people.
- To have their manuscript evaluated in the journal, author should register their research to a public registry at or before the time of first patient enrollment.
- Based on most up to date ICMJE recommendations, Journal of Education and Research in Nursing accepts public registries that include minimum acceptable 24-item trial registration dataset.
- Authors are required to state a data sharing plan for the clinical trial registration. Please see details under "Data Sharing" section.
- For further details, please check ICMJE Clinical Trial Policy at http://www.icmje.org/recommendations/browse/publishing-and-editorial-issues/clinical-trial-registration.html

Data Sharing

As of 1 January 2019, a data sharing statement is required for the registration of clinical trials. Authors are required to provide a data sharing statement for the articles that reports the results of a clinical trial. The data sharing statement should indicate the items below according to the ICMJE data sharing policy:

- Whether individual deidentified participant data will be shared,
- What data in particular will be shared,
- Whether additional, related documents will be available,
- When the data will be available and for how long,
- By what access criteria will be shared.

Authors are recommended to check the ICMJE data sharing examples at

http://www.icmje.org/recommendations/browse/publishing-and-editorial-issues/clinical-trial-registration.html

While submitting a clinical trial to Journal of Education and Research in Nursing,

- Authors are required to make registration to a publicly accessible registry according to ICMJE recommendations and the instructions above.
- The name of the registry and the registration number should be provided in the Title Page during the initial submission.
- Data sharing statement should also be stated in the Title Page even the authors do not plan to share it.

Clinical trial and data sharing policy of the journal will be valid for the articles submitted from 1 March 2021.

Reporting Statistical Analysis

Statistical analysis to support conclusions is usually necessary. Statistical analyses must be conducted in accordance with international statistical reporting standards (Altman DG, Gore SM, Gardner MJ, Pocock SJ. Statistical guidelines for contributors to medical journals. Br Med J 1983: 7; 1489-93). Information on statistical analyses should be provided with a separate subheading under the Materials and Methods section and the statistical software that was used during the process must be specified.

Values for reporting statistical data, such as p values and CIs should be presented and rounded appropriately. P values should be expressed to 2 digits to the right of the decimal point unless the first 2 digits are zeros, in which case 3 digits to the right of the decimal place should be provided (eg, instead of $p<0.01$, report as $p=0.002$). However, values close to 0.05 may be reported to 3 decimal places because the 0.05 is an arbitrary cut point for statistical significance (eg, $p=0.053$). P values less than 0.001 should be designated as $p<0.001$ rather than exact values (eg, $p=0.000006$).

Units should be prepared in accordance with the International System of Units (SI).

Editorial Comments: Invited brief editorial comments on selected articles are published in the Journal of Education and Research in Nursing. Editorials should not be longer than 1000 words excluding references. Editorial comments aim to provide a brief critical commentary by reviewers with expertise or with high reputation in the topic of the research article published in the journal. Authors are selected and invited by the journal to provide such comments. Abstract, Keywords, and Tables, Figures, Images, and other media are not included.

Review Articles: Reviews prepared by authors who have extensive knowledge on a particular field and whose scientific background has been translated into a high volume of publications with a high citation potential are welcomed. These authors may even be invited by the journal. Reviews should describe, discuss, and evaluate the current level of knowledge of a topic in clinical practice and should guide future studies. The subheadings of the review articles should be planned by the authors. However, each review article should include an "Introduction" and a "Conclusion" section. Please check Table 1 for the limitations for Review Articles.

Case Reports: There is limited space for case reports in the journal and reports on rare cases or conditions that constitute challenges in diagnosis and treatment, those offering new therapies or revealing knowledge not included in the literature, and interesting and educative case reports are accepted for publication. The text should include Introduction, Case Presentation, and Discussion with an unstructured abstract. Please check Table 1 for the limitations for Case Reports.

Letters to the Editor: This type of manuscript discusses important parts, overlooked aspects, or lacking parts of a previously published article. Articles on subjects within the scope of the journal that might attract the readers' attention, particularly educative cases, may also be submitted in the form of a "Letter to the Editor." Readers can also present their comments on the published manuscripts in the form of a "Letter to the Editor." Abstract, Keywords, and Tables, Figures, Images, and other media should not be included. The text should be unstructured. The manuscript that is being commented on must be properly cited within this manuscript.

Table 1. Limitations for each manuscript type

Type of manuscript	Word limit*	Abstract word limit	Reference limit	Table limit	Figure limit
Research Article	4000	250 (Structured)	35	5	10
Review Article	5000	250	50	5	10
Case Report	1200	200	15	No tables	5
Letter to the Editor	400	No abstract	5	No tables	No media

*: Word limit should not include the abstract, references, tables, and figure legends.

Tables

Tables should be included in the main document, presented after the reference list, and they should be numbered consecutively in the order they are referred to within the main text. A descriptive title must be placed above the tables. Abbreviations used in the tables should be defined below the tables by footnotes (even if they are defined within the main text). Tables should be created using the "insert table" command of the word processing software and they should be arranged clearly to provide easy reading. Data presented in the tables should not be a repetition of the data presented within the main text but should be supporting the main text.

Figures and Figure Legends

Figures, graphics, and photographs should be submitted as separate files (in TIFF or JPEG format) through the submission system. The files should not be embedded in a Word document or the main document. When there are figure subunits, the subunits should not be merged to form a single image. Each subunit should be submitted separately through the submission system. Images should not be labeled (a, b, c, etc.) to indicate figure subunits. Thick and thin arrows, arrowheads, stars, asterisks, and similar marks can be used on the images to support figure legends. Like the rest of the submission, the figures too should be blind. Any information within the images that may indicate an individual or institution should be blinded. The minimum resolution of each submitted figure should be 300 DPI. To prevent delays in the evaluation process, all submitted figures should be clear in resolution and large in size (minimum dimensions: 100 × 100 mm). Figure legends should be listed at the end of the main document.

All acronyms and abbreviations used in the manuscript should be defined at first use, both in the abstract and in the main text. The abbreviation should be provided in parentheses following the definition.

When a drug, product, hardware, or software program is mentioned within the main text, product information, including the name of the product, the producer of the product, and city and the country of the company (including the state if in USA), should be provided in parentheses in the following format: "Discovery St PET/CT scanner (General Electric, Milwaukee, WI, USA)"

All references, tables, and figures should be referred to within the main text, and they should be numbered consecutively in the order they are referred to within the main text.

Limitations, drawbacks, and the shortcomings of original articles should be mentioned in the Discussion section before the conclusion paragraph.

References

Both in-text citations and the references must be prepared according to the AMA Manual of Style 11th Edition.

While citing publications, preference should be given to the latest, most up-to-date publications. Authors are responsible for the accuracy of references If an ahead-of-print publication is cited, the DOI number should be provided. Journal titles should be abbreviated in accordance with the journal abbreviations in Index Medicus/MEDLINE/PubMed. When there are six or fewer authors, all authors should be listed. If there are seven or more authors, the first three authors should be listed followed by "et al." In the main text of the manuscript, references should be cited in superscript after punctuation. The reference styles for different types of publications are presented in the following examples.

Journal Article: Campbell MR, Fisher J, Anderson L, Kreppel E. Implementation of early exercise and progressive mobility: Step to success. Crit Care Nurse. 2015;35(1):82-88.

Book Section: Fikremariam D, Serafini M. Multidisciplinary approach to pain management. In: Vadivelu N, Urman RD, Hines RL, eds. Essentials of Pain Management. New York, NY: Springer New York; 2011:17-28.

Books with a Single Author: Patterson JW. Weedon's Skin Pathology. 4th ed. Churchill Livingstone; 2016.

Editor(s) as Author: Etzel RA, Balk SJ, eds. Pediatric Environmental Health. American Academy of Pediatrics; 2011.

Conference Proceedings: Morales M, Zhou X. Health practices of immigrant women: indigenous knowledge in an urban environment. Paper presented at: 78th Association for Information Science and Technology Annual Meeting; November 6-10; 2015; St Louis, MO. Accessed March 15, 2016. https://www.asist.org/files/meetings/am15/proceedings/openpage15.html

Thesis: Maiti N. Association Between Behaviours, Health Characteristics and Injuries Among Adolescents in the United States. Dissertation. Palo Alto University; 2010.

Online Journal Articles: Tamburini S, Shen N, Chih Wu H, Clemente KC. The microbiome in early life: implications for health outcomes. Nat Med. Published online July 7, 2016. doi:10.1038/nm4142

Websites: International Society for Infectious Diseases. ProMed-mail. Accessed February 10, 2016. http://www. promedmail.org

Epub Ahead of Print Articles: Cai L, Yeh BM, Westphalen AC, Roberts JP, Wang ZJ. Adult living donor liver imaging. Diagn Interv Radiol. 2016 Feb 24. doi: 10.5152/dir.2016.15323. [Epub ahead of print].

REVISIONS

When submitting a revised version of a paper, the author must submit a detailed "Response to the reviewers" that states point by point how each issue raised by the reviewers has been covered and where it can be found (each reviewer's comment, followed by the author's reply and line numbers where the changes have been made) as well as an annotated copy of the main document. Revised manuscripts must be submitted within 30 days from the date of the decision letter. If the revised version of the manuscript is not submitted within the allocated time, the revision option may be canceled. If the submitting author(s) believe that additional time is required, they should request this extension before the initial 30-day period is over.

Accepted manuscripts are copy-edited for grammar, punctuation, and format. Once the publication process of a manuscript is completed, it is published online on the journal's webpage as an ahead-of-print publication before it is included in its scheduled issue. A PDF proof of the accepted manuscript is sent to the corresponding author and their publication approval is requested within 2 days of their receipt of the proof.

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JERN Journal of Education and Research in Nursing

EDITORIAL

Dear Readers,

We are pleased to share with you the 2026 Issue 2 (Volume 23, Issue 2, June 2026) of the *Journal of Education and Research in Nursing*.

The studies included in this issue address current and significant topics that contribute to the advancement of nursing science in the fields of education, clinical practice, research, and public health. The articles examine issues that directly affect the quality of care, including the use of phytotherapy during cancer treatment, symptom burden among older adults with cancer receiving palliative care, strengthening care in diabetic foot ulcers, postoperative pain management, classification of pressure injuries, dementia care, job stress among psychiatric nurses, and the therapeutic relationship. In this respect, these studies once again highlight the importance of nurses' use of current scientific evidence in clinical decision-making processes and of maintaining nursing care practices based on patient safety, ethical responsibility, and person-centered care. This issue also includes studies on topics closely related to the future of nursing education, such as nursing students' attitudes toward artificial intelligence, technology and internet use, 21st-century learner skills, intercultural sensitivity, and future anxiety. In today's healthcare systems, where digitalization, artificial intelligence applications, and cultural diversity are becoming increasingly prominent, nurses are expected to strengthen not only their clinical knowledge and skills but also their competencies in critical thinking, ethical reasoning, communication, cultural sensitivity, and lifelong learning.

I am pleased to announce that our journal is indexed in the databases of Tubitak Ulakbim Medicine (2012), EBSCO (2017), CINAHL (2017), DOAJ (2021), Research4Life (2021), Hinari (2021), GALE (2022), CNKI (2022), SCILIT (2023), OUCI (2023), MIAR (2024), SUDOC (2024), Zeitschriften Datenbank (2024), Electronic Journal Library (2024), and EmCare (2025), and we are working to publish our journal within the framework of international academic publishing standards. The studies with a high level of evidence from you have been instrumental in achieving these goals, and we know how important the valuable contributions of our journal's stakeholders, readers, editors, managing director, and advisory board members are.

As for our June 2026 issue, a total of 12 valuable original studies, one systematic review, and one review article are presented in this issue. The titles of the articles are as follows:

The original articles are titled "The Use of Phytotherapy (Herbal Treatment) During Cancer Treatment: A Sample from Türkiye", "Non-Communicating Children's Pain Checklist–Revised: Turkish Validity and Reliability Study", "Assessment of Nursing Students' Knowledge Levels and Determinants Related to Pressure Injury Classification and Staging", "Learning to Care, Fearing What Lies Ahead: Future Anxiety Among Student Nurses", "The Impact of Simulation-Based Postoperative Pain Management Education on Nursing Students: A Quasi-Experimental Study", "Effect of Aromatherapy Inhalation on Therapeutic Relationship and Job Stress Levels of Psychiatric Nurses: A Randomized Controlled Study", "Nursing Students' Attitudes Toward Artificial Intelligence, Technology, and Internet Addiction: A Descriptive and Relational Study", "Health and Social Care Professionals' Experiences of Community-Based Dementia Care: A Qualitative Study of Needs, Barriers, and Ethical Challenges", "Nursing Students' 21st-Century Learner Skills and Their Attitudes Toward Artificial Intelligence", "The Impact of Motivational Interviewing Guided by Watson's Theory of Human Caring on Adherence, Self-Efficacy, and Satisfaction in Patients with Diabetic Foot Ulcers: A Randomized Controlled Trial Protocol", "Knowledge and Attitudes of Nursing Students Regarding Postoperative Pain Management: A Cross-Sectional Study", and "Assessment of Intercultural Sensitivity Among Nursing Students".

A systematic review is titled "Symptom Prevalence in Older Adults Diagnosed with Cancer Receiving Palliative Care: A Systematic Review and Meta-Analysis".

A review article is titled "Storytelling for Cyberbullying Prevention in Adolescents: A Literature Review".

I would like to express my sincere thanks to our authors, who have contributed to presenting updated information obtained from the results of their studies to our readers in order to provide quality and safe nursing care services to society; to the members of the editorial board, who have contributed to the publication of our journal; and to the members of the advisory board, who have carefully evaluated each article.

"The future demands flexibility, imagination, and a sense of humor."
Martha E. Rogers

Kind regards,
Prof. Sevilay Şenol Çelik, PhD, RN

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Original Article

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The Use of Phytotherapy (Herbal Treatment) During Cancer Treatment: A Sample from Türkiye

Abstract

Background: Patients with cancer may consider using herbal products to alleviate symptoms and support their treatment; however, careful consideration is required, as these products may interact with conventional therapies and cause adverse effects. In this context, nurses play a critical role in assessing the use of herbal therapies, educating patients, and promoting safe, evidence-based practices.

Aim: This study aimed to determine the practices and perceptions of patients undergoing cancer treatment regarding phytotherapy.

Methods: This descriptive study was conducted with 149 patients with cancer receiving treatment at the medical oncology clinics of a university hospital and a training and research hospital in Türkiye between January 2022 and October 2023. Data were collected using three forms developed by the researchers. Descriptive statistics were presented as numbers and percentages, and the chi-square test was used to compare phytotherapy users and non-users.

Results: The patients had a mean age of 55.64 years, and 53.7% were male. A total of 44.3% had a university-level education or higher. Most patients (81.2%) were receiving chemotherapy, and 12.1% used phytotherapy. Only 17.4% were evaluated by an oncology professional regarding phytotherapy. Among users, 60% used phytotherapy to boost immunity, and 64.7% consulted a specialist, most commonly an oncologist. Phytotherapy use was not significantly associated with sociodemographic or medical characteristics.

Conclusion: Healthcare professionals should provide patients with evidence-based information about phytotherapy, and unsupervised use of herbal products should be prevented. Oncology nurses should assess patients' use of phytotherapy products and provide guidance as needed.

Keywords: Cancer, complementary and integrative medicine, nursing, phytotherapy, survey

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Introduction

The use of plants for therapeutic purposes has progressed through trial and error and forms the basis of today's pharmaceutical industry. In addition, traditional medical approaches developed in Chinese, Indian, Japanese, Arab, and European societies through the use of herbs for healing. These practices are still widely used in less-developed countries due to limited access to healthcare services or the high cost of conventional medicines.[1,2] Today, plant-based treatment is one of the traditional and complementary medicine methods and is referred to as phytotherapy or herbal treatment. The use of therapeutic parts of plants in fresh or dried forms, or the use of extracts obtained from these parts as modern treatment methods in various forms such as drops, dragees, capsules, syrups, or tablets, falls within the scope of phytotherapy.[3]

Although phytotherapy is used as a complementary therapy in many conditions such as hypertension, diabetes, and chronic bowel diseases, it has also become an option for patients with cancer. A meta-analysis showed that the pooled prevalence of herbal medicine use among patients with cancer is 22%, with higher rates reported in low- and middle-income countries.[4] Herbal medicines are widely used to relieve the side effects of chemotherapy or radiotherapy (e.g., nausea, vomiting) and to improve quality of life in patients diagnosed with cancer. Other reported positive effects of phytotherapy include increasing patients' appetite, strengthening the immune system, and facilitating general recovery.[5] The increasing demand for herbal products is attributed to the harmful and life-threatening side effects of cytotoxic anticancer drugs, the search for natural agents with antitumor activity and fewer side effects, and the growing number of scientific studies demonstrating the anticancer effects of various plants.[6] Patients diagnosed with cancer may consider using only plants or herbal products during the treatment process or may benefit from phytotherapy as a supportive approach alongside medical treatment. However, it should not be overlooked that herbs may cause unexpected or adverse effects by interacting with other drugs, especially chemotherapeutic agents,[7] and may also reduce the therapeutic effectiveness of conventional cancer treatments.[8] Because these products are often perceived as harmless and may be used without professional supervision, they can pose significant risks for patients with cancer. Therefore, their use should be carefully evaluated, particularly by oncology nurses, who maintain continuous clinical interaction with patients. Although numerous studies in the literature focus on the effects of phytotherapeutic agents on cancer cells,[9-11] there are relatively few studies examining the perceptions, practices, and information sources of patients diagnosed with cancer regarding phytotherapy.[12,13]

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This study aims to provide guidance by exploring the perceptions and practices of patients with cancer regarding phytotherapy and to support the development of educational and evaluative strategies that optimize its safe use.

The research questions of this study are as follows:

1. What are the phytotherapy use practices of patients undergoing chemotherapy?
2. What are the perceptions of patients undergoing chemotherapy regarding phytotherapy?

Materials and Methods

Study Design

This descriptive cross-sectional study examines the perceptions, practices, and opinions of patients with cancer regarding phytotherapy. Data were collected at a single point in time to provide a snapshot of participants' characteristics and behaviors.

Sample and Setting

Based on a similar study[14] in the literature and calculations performed using G*Power, the required sample size for this research was determined to be 215 patients, with a 95% confidence level and a 5% margin of error. Due to practical constraints in the clinical setting, a convenience sampling method was employed. The study population consisted of patients receiving treatment in the medical oncology clinics of a university hospital and a training and research hospital. Inclusion criteria were being aged 18 years or older, being aware of one's cancer diagnosis, and currently receiving cancer-related treatment. Patients who were unwell during treatment or had communication barriers were excluded. Despite the planned sample size, only 149 patients could be reached during the study period due to factors such as treatment-related fatigue, nausea, and weakness; conflicts with treatment schedules; psychological or emotional state; and personal preference.

Data Collection Tools

The data for this study were collected using a Patient Information Form, a Herbal Product Form, and an Opinion and Suggestion Form.

Patient Information Form: This form consisted of 18 questions in total: four questions on sociodemographic characteristics (age, gender, education level, occupation), eight questions on clinical characteristics (diagnosis, date of diagnosis, stage, current treatment, previous treatments, chronic diseases, allergies, medications), and six questions related to phytotherapy (knowledge, use, evaluation, and related issues).

Herbal Product Form: This form consisted of nine questions completed by patients who used herbal products while receiving chemotherapy. It assessed the name of the herbal product used, its source, purpose of use, effectiveness, side effects, whether a specialist was consulted beforehand, and whether the patient would recommend the product to others.

Opinion and Suggestion Form: In addition, patients were provided with an optional open-ended question to express their thoughts, recommendations, and expectations regarding phytotherapy.

Data Collection

The study was conducted with patients with cancer receiving treatment at the medical oncology clinics of a university hospital and a training and research hospital between January 2022 and October 2023. These hospitals serve patients from diverse regions and sociodemographic backgrounds, enhancing the inclusiveness of the study sample and supporting broader representation of patients with cancer. Data were collected through face-to-face interviews using three forms developed by the authors based on a review of current national and international literature: the Patient Information Form, the Herbal Product Form, and the Opinion and Suggestion Form. Completion of all forms took approximately 10–15 minutes per patient.

Data Analysis

Statistical analyses were performed using IBM SPSS Statistics for Windows, Version 28.0 (IBM Corporation, Armonk, NY, USA). Descriptive findings were presented as numbers and percentages. The chi-square test was used to compare the characteristics of participants who used phytotherapy with those who did not. A significance level of 0.05 (p value) was accepted for statistical analyses.

Ethics

This study was approved by the Social Sciences Research Ethics Committee of Koç University (Approval Number: 2021.452.IRB3.214; Date: 16.12.2021). Informed consent was obtained in writing from each participant. All principles of the Declaration of Helsinki were followed throughout the study.

Results

The demographic characteristics of the participants are summarized in Table 1. Among the participants, 43.6% were aged 40–59 years. In addition, 53.7% were men, and 44.3% had a university degree or higher. Active employment was reported by 43% of the participants. Among the patients, 30.2% were diagnosed with gastrointestinal system cancer. The most common cancer stage was stage IV (35.6%). Chemotherapy was administered to 81.2% of the participants, and nearly half of these patients (49%) had previously undergone a surgical procedure. Regarding previous treatments, 40.9% had received chemotherapy and 31.5% had received radiotherapy. Comorbid diseases were present in 49.7% of participants, allergies to any agent in 12.8%, and regular medication use in 67.8%. The most common comorbid diseases were hypertension and diabetes.

The characteristics of participants' phytotherapy use are summarized in Table 2. Prior knowledge of phytotherapy was reported by 69.1% of the participants, and 29.5% had considered using phytotherapy during the chemotherapy process. Only 17.4% of participants (n=26) stated that they had been evaluated by an oncology physician or nurse regarding their use of herbal products; of these, 23 reported satisfaction with the evaluation.

Only 12.1% of participants (n=18) actively used herbal products. Among these users, ten participants used a single product, seven used two products, and one participant used four different products. The characteristics of the herbal products used by participants engaging in phytotherapy are summarized in Table 3.

The average age of the 18 participants who used phytotherapy was 55 years; 11 were men and seven were women. Most were actively receiving chemotherapy (n=16), while one participant was receiving radiotherapy and five were receiving immunotherapy or targeted therapy. Breast cancer was diagnosed in five participants, gastrointestinal cancer in eight, and lung cancer in three. Eleven participants had a university degree or higher. Comorbid diseases were present in six participants, and none reported allergies. Only seven of the herbal product users had been evaluated by a physician or nurse regarding their use of these products.

Herbal product use was analyzed based on the first product used by participants. Among the 18 users, 55.6% consumed herbal products in medicinal form, while the remainder used vegetables or fruits. The most common sources of information about herbal products were family and relatives, followed by physicians and the internet. A majority of participants (60%) reported using herbal products to enhance immunity, and 94.4% perceived the products as effective without experiencing any side effects.

Only 11 participants consulted a specialist before using herbal products, with oncologists being the most frequently consulted. Ten of these participants considered the specialist's opinion sufficient. Among the five who did not consult a specialist, most indicated that they did not feel it was necessary.

Regarding recommendations, 13 participants stated that they would recommend the products they used to others, citing perceived safety, relaxation, and beneficial effects. Two participants reported that they would not recommend herbal products, explaining that they were not experts and were unsure about potential effects on others.

Phytotherapy use did not differ according to participants' sociodemographic or clinical characteristics (p>0.05) (Table 4).

Approximately one-third of the participants (n=50) completed the Opinion and Suggestion Form. Responses to the open-ended questions indicated that most patients reported limited knowledge about phytotherapy or had not received recommendations from their physicians. Other concerns included insufficient evidence regarding

Table 1. Sociodemographic and medical characteristics of participants (n=149)

Characteristics	n	%	Characteristics	n	%
Age (years)			Stage III	30	20.1
18-39	20	13.4	Stage IV	53	35.6
40-59	65	43.6	Unknown	43	28.9
≥60	64	43.0	Current treatment**		
Gender			Chemotherapy	121	81.2
Female	69	46.3	Radiotherapy	13	8.7
Male	80	53.7	Immunotherapy/targeted therapy	50	33.6
Education level			Other	3	2.1
Less than high school	39	26.2	Previous treatment**		
High school	44	29.5	Surgery	73	49
University and higher	66	44.3	Chemotherapy	61	40.9
Employment status			Radiotherapy	47	31.5
Employed	64	43	Immunotherapy/targeted therapy	18	12.1
Unemployed	31	20.8	Other	2	1.4
Retired	54	36.2	Comorbid disease***		
Cancer diagnosis			Yes	74	49.7
Lung cancer	37	24.8	No	75	50.3
Breast cancer	31	20.8	Allergy		
Gastrointestinal system cancer	45	30.2	Yes	19	12.8
Urinary tract cancer	19	12.8	No	130	87.2
Other*	17	11.4	Oral medication use		
Cancer stage			Yes	101	67.8
Stage I	10	6.7	No	48	32.2
Stage II	13	8.7			

*: Ovarian cancer, melanoma, sarcoma, nasopharyngeal cancer, paraganglioma, lymphoma, multiple myeloma, Ewing sarcoma, **: Some patients received more than one treatment concurrently, ***: Includes hypertension, diabetes, heart disease, thyroid disease, hypercholesterolemia, heart failure, kidney failure, asthma, insulin resistance, and other conditions.

the benefits and risks of herbal products and a lack of trust in companies marketing these products. Some participants believed that herbal products could be beneficial if supported by scientific evidence and used under medical guidance. Many emphasized that they rely on their physicians' advice and expressed a need for clearer, evidence-based information on phytotherapy.

Discussion

Various studies have shown that phytotherapy is the most commonly used complementary and integrative medicine method.[15-18] In our study, although nearly one-third of participants considered using phytotherapy during chemotherapy, only a small proportion actually used it, and most of these individuals were receiving chemotherapy at the time. Previous research similarly indicates that approximately half of patients with cancer who use phytotherapy concurrently receive chemotherapy.[15,19] Consistent with national data, phytotherapy remains the most familiar and preferred complementary approach in Türkiye,[17] and, similar to previous findings, the primary reasons for its use include reducing chemotherapy side effects, supporting treatment, and strengthening the immune system.[19,20] This aligns with our finding that 60% of users reported using phytotherapy to boost immunity.

Although our study did not identify a significant association between sociodemographic or clinical characteristics and phytotherapy use, the international literature presents inconsistent findings, reporting associations with factors such as education level, employment status, income, comorbidities, medication use, and age.[19-21] Some studies have shown higher use among individuals with comorbidities and regular medication use,[19] while others indicate more frequent use among younger, well-educated, and economically advantaged patients.[20] In contrast, a review from Morocco reported more common use among women, individuals aged 40–60 years, and low-income groups.[21] Education level is particularly emphasized, as individuals with higher education may feel more confident seeking independent information—especially online—and may therefore continue using herbal products without professional consultation.[20] However, despite the relatively high education level of participants in our study, professional assessment remained limited, indicating that education alone does not ensure safe or evidence-based use. Overall, these findings suggest that sociodemographic influences may be culture specific and underscore the need to identify commonly used herbal products and critically evaluate the supporting evidence to guide safe clinical practice.[12]

Table 2. Characteristics of phytotherapy use among participants (n=149)

Phytotherapy use	n	%
Heard of phytotherapy previously		
Yes	103	69.1
No	46	30.9
Considered using phytotherapy during chemotherapy		
Yes	44	29.5
No	105	70.5
Currently using herbal products		
Yes	18	12.1
No	131	87.9
Evaluated by an oncology physician or nurse for herbal use		
Yes	26	17.4
No	123	82.6
Satisfaction with oncology physician/nurse evaluation (n=25*)		
Yes	23	92
No	2	8

*: One response missing.

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Table 3. Characteristics of herbal products used by participants practicing phytotherapy (n=18)

	n	%
Herbal product group		
Vegetables/fruits	8	44.4
Medicinal herbal products	10	55.6
Source for information about the herbal product (n=17)*		
Family/relatives	5	29.4
Neighbors	0	0
Friends	0	0
Physician	3	17.6
Nurse	0	0
Television	2	11.8
Internet	3	17.6
Other oncology patients	1	5.9
Books	1	5.9
Other people	2	11.8
Other	2	11.8
Purpose of herbal product use (n=15)*		
Enhancing immunity	9	60
Reducing/destroying tumor	2	13.3
Symptom management	4	26.7
Other	1	6.7
Effectiveness of the herbal product (n=18)		
Effective	17	94.4
Ineffective	0	0
Unknown	1	5.6
Experienced side effects (n=17)		
Yes	0	0
No	17	100
Consulted a specialist before herbal product use (n=17)		
Yes	11	64.7
No	6	35.3
Type of consultant (n=11)*		
Oncologist	8	72.7
Oncology nurse	1	9.1
Dietitian	2	18.2
Other	1	9.1
Competence of consultant (n=10)		
Yes	10	100
No	0	0
Would recommend herbal product to others (n=16)		
Yes	13	81.3
No	3	18.8

*: Some participants selected more than one response option.

Table 4. Comparison of phytotherapy use by sociodemographic and clinical characteristics

	Using herbal products		Not using herbal products	
	n	%	n	%
Age (years)				
18–39	3	16.7	17	13
40–59	9	50	56	42.7
≥60	6	33.3	58	44.3
Total	18	100	131	100
p - χ^2	0.673–0.792			
Gender				
Female	7	38.9	62	47.3
Male	11	61.1	69	52.7
Total	18	100	131	100
p - χ^2	0.501–0.453			
Education level				
<High school	2	11.1	37	28.2
High school	5	27.8	39	29.8
University and higher	11	61.1	55	42
Total	18	100	131	100
p - χ^2	0.212–3.103			
Employment status				
Employed	8	44.4	56	42.7
Unemployed	3	16.7	28	21.4
Retired	7	38.9	47	35.9
Total	18	100	131	100
p - χ^2	0.896–0.219			
Cancer diagnosis				
Lung cancer	3	16.7	34	26
Breast cancer	5	27.8	26	19.8
Gastrointestinal system cancer	8	44.4	37	28.2
Urinary tract cancer	0	0	19	14.5
Other	2	11.1	15	11.5
Total	18	100	131	100
p - χ^2	0.286–5.016			
Comorbid disease				
Yes	6	33.3	68	51.9
No	12	66.7	63	48.1
Total	18	100	131	100
p - χ^2	0.208–2.184			
Allergy				
Yes	0	0	19	14.5
No	18	100	112	85.5
Total	18	100	131	100
p - χ^2	0.130–2.992			
Oral medication use				
Yes	12	66.7	89	67.9
No	6	33.3	42	32.1
Total	18	100	131	100
p - χ^2	1.000–0.012			

Beyond usage patterns, the source of information is also critical. Previous studies indicate that many patients learn about herbal products from family members, social networks, and media platforms, while healthcare professionals are rarely consulted.[22] Consistent with these findings, most participants in our study reported receiving information from non-professional sources. Given their close and continuous contact with patients, oncology nurses play a key role in providing reliable information, correcting misinformation, and supporting safe decision-making regarding phytotherapy.

Regarding perceived effectiveness, the literature reports mixed results. A study from Türkiye found that 37.9% of patients perceived benefit, whereas 42.8% did not and 19.3% were unsure.[15] In contrast, most participants in our study reported positive effects without side effects, suggesting more favorable perceptions compared with findings from Turkish, Arab, and Western populations, where reported benefit rates were approximately 50–55% and negative effects were also documented.[20,23,24] These differences may be related to variations in patient characteristics, types of herbal products used, or cultural attitudes toward phytotherapy.

Despite these positive perceptions, concerns remain regarding long-term safety, appropriate dosing, and potential interactions with cytotoxic treatments.[19,25] The limited number of randomized controlled trials contributes to ongoing professional skepticism,[11,26] highlighting the need for well-designed, large-scale, long-term clinical studies to support the safe integration of phytotherapy into oncology care.

From a clinical perspective, consultation with healthcare professionals is essential. Although more than half of the participants in this study sought professional advice, a substantial proportion continued phytotherapy without guidance. Similarly, a multicountry review reported that patients' self-disclosure of herbal product use varies across countries. For example, while most patients in the United States and the United Kingdom do not inform their physicians about herbal product use, the majority of patients in Australia do disclose this information.[20] In Türkiye, a systematic review reported that 44% of hospitalized patients and 60% of outpatients used herbal products without informing healthcare providers.[18] Unfortunately, the literature indicates that oncology healthcare professionals are often unaware of patients' phytotherapy use. Previous Turkish studies similarly report low professional awareness and inadequate clinical assessment.[19,27] For instance, in Yarar's study, 29.4% of physicians had only partial knowledge, and 66% had no information about their patients' herbal product use.[27] Consistently, another Turkish study conducted in 2017 found that 81.7% of patients were not assessed by a physician or nurse regarding herbal use during chemotherapy,[19] whereas in our study only 17.4% received such an assessment. This limited evaluation may reflect clinicians' hesitations due to insufficient evidence, concerns about adverse effects, and potential interactions with conventional treatments.[28] Overall, these findings emphasize the need for routine and systematic evaluation of herbal product use in oncology practice, including nursing-led assessments, to enhance patient safety.

Limitations

This study contributes to the limited literature on phytotherapy use among patients with cancer and offers meaningful insights into their knowledge, practices, and opinions. However, the findings should be interpreted with caution due to the limited sample size, reliance on self-reported data that may involve recall bias or underreporting, and the lack of expert validation of the data collection tools.

Conclusion

Phytotherapy use among patients with cancer was limited, and most participants lacked professional guidance. As nurses maintain continuous contact with patients, their role in informing patients about phytotherapy, delivering evidence-based information, and ensuring patient safety is critically important. Therefore, structured training programs for nurses are essential to enhance their competence in this area and to support the safe integration of phytotherapy into oncology practice.

Ethics Committee Approval: The study was approved by the Social Sciences Research Ethics Committee of Koç University (Approval Number: 2021.452.IRB3.214, Date: 16.12.2021).

Informed Consent: Informed consent was obtained in writing from each participant.

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References

1. Azaizeh H, Saad B, Cooper E, Said O. Traditional Arabic and Islamic Medicine, a Re-emerging Health Aid. Evid Based Complement Alternat Med. 2010;7(4):419–424. [CrossRef]
2. Fürst R, Zündorf I. Evidence-Based Phytotherapy in Europe: Where Do We Stand? Planta Med. 2015;81(12–13):962–967. [CrossRef]
3. Zengin S, Kahraman S. The use of traditional plant-based in coronary artery patients who have undergone angiography. GETATDER. 2019;1(3):9–15.
4. Asiimwe JB, Nagendrappa PB, Atukunda EC, et al. Prevalence of the Use of Herbal Medicines among Patients with Cancer: A Systematic Review and Meta-Analysis. Evid Based Complement Alternat Med. 2021;2021:9963038. [CrossRef]
5. Lopes CM, Dourado A, Oliveira R. Phytotherapy and Nutritional Supplements on Breast Cancer. Biomed Res Int. 2017;2017:7207983. [CrossRef]
6. Lam CS, Koon HK, Ma CT, et al. Real-world data on herb-drug interactions in oncology: A scoping review of pharmacoepidemiological studies. Phytomedicine. 2022;103:154247. [CrossRef]
7. Ben-Arye E, Samuels N, Goldstein LH, et al. Potential risks associated with traditional herbal medicine use in cancer care: A study of Middle Eastern oncology health care professionals. Cancer. 2016;122(4):598–610. [CrossRef]
8. Naja F, Fadel RA, Alameddine M, et al. Complementary and alternative medicine use and its association with quality of life among Lebanese breast cancer patients: a cross-sectional study. BMC Complement Altern Med. 2015;15:444. [CrossRef]
9. Efferth T, Saeed MEM, Mirghani E, et al. Integration of phytochemicals and phytotherapy into cancer precision medicine. Oncotarget. 2017;8(30):50284–50304. [CrossRef]
10. Bahmani M, Shirzad H, Shahinfard N, Sheivandi L, Rafieian-Kopaei M. Cancer Phytotherapy: Recent Views on the Role of Antioxidant and Angiogenesis Activities. J Evid Based Complementary Altern Med. 2017;22(2):299–309. [CrossRef]
11. Salehi B, Zucca P, Sharifi-Rad M, et al. Phytotherapeutics in cancer invasion and metastasis. Phytother Res. 2018;32(8):1425–1449. [CrossRef]
12. Ritschel ML, Hübner J, Wurm-Kuczera R, Büntzel J. Phytotherapy known and applied by head-neck cancer patients and medical students to treat oral discomfort in Germany: an observational study. J Cancer Res Clin Oncol. 2023;149(5):2057–2070. [CrossRef]
13. Rojas Rojas T, Bourdy G, Ruiz E, et al. Herbal Medicine Practices of Patients with Liver Cancer in Peru: A Comprehensive Study Toward Integrative Cancer Management. Integr Cancer Ther. 2018;17(1):52–64. [CrossRef]
14. Üstündağ S. Uses of complementary therapy in symptom management of cancer patients who receive chemotherapy. Master's Thesis. Ankara University; 2013.
15. Kucukoner M, Bilge Z, Isikdogan A, Kaplan MA, Inal A, Urakci Z. Complementary and alternative medicine usage in cancer patients in southeast of Turkey. Afr J Tradit Complement Altern Med. 2012;10(1):21–25. [CrossRef]
16. Irmak Z, Tanrıverdi Ö, Ödemiş H, Uysal DD. Use of complementary and alternative medicine and quality of life of cancer patients who received chemotherapy in Turkey. Complement Ther Med. 2019;44:143–150. [CrossRef]
17. İnci H, İnci F. Complementary and alternative medicine awareness in cancer patients receiving chemotherapy. WCRJ. 2020;7:e1752.
18. Laurent V, Saillard J, Thierry M, Lepelletier A, Fronteau C, Huon JF. Anticancer agents and phytotherapy: Interactions that are often unrecognized. J Oncol Pharm Pract. 2021;27(2):322–328. [CrossRef]
19. Koçaşlı S, Demircan Z. Herbal Product Use by The Cancer Patients in Both the Pre and Post Surgery Periods and During Chemotherapy. Afr J Tradit Complement Altern Med. 2017;14(2):325–333. [CrossRef]
20. Poonthananiwatkul B, Howard RL, Williamson EM, Lim RH. Cancer patients taking herbal medicines: A review of clinical purposes, associated factors, and perceptions of benefit or harm. J Ethnopharmacol. 2015;175:58–66. [CrossRef]
21. Aboufaras M, Selmaoui K, Ouzennou N. Use of complementary traditional phytotherapy to manage cancer in Morocco: A decade-long review of ethnopharmacological studies. J Herb Med. 2021;29(100494):100494. [CrossRef]
22. Bonow CT, Ceolin T, Lopes, CV, Zillmer JGV, Vargas NRC, Heck RM. Medicinal Plants Used in Self-Care by People with Cancer in Palliative Care. Texto & Contexto – Enfermagem. 2020;29(2). [CrossRef]
23. Ali-Shtayeh MS, Jamous RM, Salameh NM, Jamous RM, Hamadeh AM. Complementary and alternative medicine use among cancer patients in Palestine with special reference to safety-related concerns. J Ethnopharmacol. 2016;187:104–122. [CrossRef]
24. Afifi FU, Wazaify M, Jabr M, Treish E. The use of herbal preparations as complementary and alternative medicine (CAM) in a sample of patients with cancer in Jordan. Complement Ther Clin Pract. 2010;16(4):208–212. [CrossRef]
25. Hosseini A, Ghorbani A. Cancer therapy with phytochemicals: evidence from clinical studies. Avicenna J Phytomed. 2015;5(2):84–97.
26. Triantafillidis JK, Triantafyllidi E, Sideris M, Pittaras T, Papalois AE. Herbals and Plants in the Treatment of Pancreatic Cancer: A Systematic Review of Experimental and Clinical Studies. Nutrients. 2022;14(3):619. [CrossRef]
27. Yarar F. A review of the approaches, knowledge and experience of the family physicians and family medicine specialists on nutrition and use of herbal remedies in cancer patients. Medical Specialization. Ondokuz Mayıs University; 2014.
28. Muecke R, Paul M, Conrad C, et al.; PRIO (Working Group Prevention and Integrative Oncology of the German Cancer Society). Complementary and Alternative Medicine in Palliative Care: A Comparison of Data From Surveys Among Patients and Professionals. Integr Cancer Ther. 2016;15(1):10–16. [CrossRef]

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Non-Communicating Children's Pain Checklist–Revised: Turkish Validity and Reliability Study

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Abstract

Background: Pain is frequently experienced by children in intensive care units. Healthcare professionals often have difficulty assessing pain in children who are unable to communicate.

Aim: This study aimed to evaluate the validity and reliability of the Turkish version of the Non-Communicating Children's Pain Checklist–Revised (NCCPC-R).

Methods: This methodological study was conducted in a pediatric intensive care unit between May 8, 2023 and April 8, 2024. A total of 50 children aged 3–18 years participated in the study. Data were collected using the Sociodemographic Data Form, the NCCPC-R, and the Face, Legs, Activity, Cry, and Consolability (FLACC) Scale. The NCCPC-R was translated and back-translated to establish linguistic validity, and the content validity index (CVI) was calculated. Criterion validity was evaluated by examining correlations between NCCPC-R and FLACC scores. Reliability was assessed using Cronbach's alpha, the intraclass correlation coefficient (ICC), and test-retest analyses conducted by two independent observers at two-week intervals.

Results: The mean age of the participants was 9.08±5.31 years, and 62.0% were male. The primary medical diagnosis was neurological disorders in 64% of the children. The NCCPC-R demonstrated a CVI of 0.958. Significant positive correlations were found between NCCPC-R and FLACC scores ($p<0.001$). Cronbach's alpha coefficient was 0.970. The ICC values for interrater agreement and consistency were 0.988 and 0.994, respectively ($p<0.001$). Test-retest reliability showed strong positive correlations for Observer 1 ($r=0.811$) and Observer 2 ($r=0.804$) ($p<0.001$).

Conclusion: The Turkish version of the NCCPC-R is a valid and reliable tool for assessing pain in children who are unable to communicate.

Keywords: Children, communication, pain assessment, reliability, validity

Introduction

Pain is a multifaceted sensory and emotional experience associated with actual or potential tissue damage and is shaped by individual factors such as previous pain experiences and perception.[1,2] In pediatric populations, pain is a prevalent concern, frequently resulting from acute medical conditions, trauma, and invasive procedures, particularly among critically ill children receiving care in Pediatric Intensive Care Units (PICUs). These children often experience severe acute pain due to mechanical ventilation, surgical interventions, and life-saving procedures; however, their ability to communicate pain is frequently compromised. When unrecognized and untreated, pain in PICU patients may lead to serious complications, including prolonged hospitalization, physiological instability, and long-term psychological distress.[1–4]

Effective pain management begins with accurate and individualized pain assessment.[1,5,6] Although self-reported verbal pain assessments are considered the gold standard, they are not feasible for many critically ill children in PICUs, as patients may be sedated, intubated, or neurologically impaired. These children, including those with cognitive impairments, retain the full capacity to experience pain but face significant barriers to expressing it. In such cases, nurses and caregivers must rely on nonverbal indicators such as facial expressions, vocalizations, changes in activity levels, physiological responses, and disruptions in sleep or eating patterns.[7,8] However, the subjective interpretation of these cues may result in inconsistencies in pain assessment. To address this challenge, the use of standardized and validated observational tools is essential to ensure objective and reliable evaluations, particularly in high-risk settings such as PICUs.[1,9,10]

The Non-Communicating Children's Pain Checklist–Revised (NCCPC-R), developed by Breau et al.,[11] is a widely recognized instrument for assessing pain in children aged 3–18 years with cognitive impairments that limit verbal communication. This 30-item checklist evaluates pain based on observable behaviors and is designed for use by both caregivers and healthcare professionals without requiring specialized training, making it highly applicable in both clinical and caregiving settings.[11] Pain communication varies significantly among non-speaking children. Some children can express pain through augmentative and alternative communication devices, communication boards, or gestures, whereas others may be unable to communicate pain even through symbolic or alternative means. For example, children with neurological conditions such as cerebral palsy may be unable to speak but can still participate in pain assessment to some extent.[11,12]

**This study was prepared as a master thesis.*

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Therefore, it is essential to clarify that the NCCPC-R is particularly suited for children who cannot verbally communicate pain and are also unable to report pain through alternative communication methods.[11] While some children in PICUs who are intubated or have cognitive impairments may still engage in pain assessment, this tool is especially valuable for those who lack the ability to intentionally communicate using speech, symbols, or other expressive methods.[12]

The NCCPC-R has been successfully validated in several languages, including Italian[13] and German,[14] and is used internationally. However, to date, a validated Turkish version of this tool does not exist, which poses a significant barrier for healthcare providers, particularly those working in intensive care settings, where rapid and accurate pain assessment is critical.

This study aims to address this gap by adapting and validating the NCCPC-R for Turkish-speaking populations. By providing a culturally and linguistically validated instrument, this study seeks to support healthcare professionals and caregivers in PICUs and other acute care settings in achieving accurate and timely pain assessments for children who are unable to communicate verbally. The availability of a Turkish version of the NCCPC-R is expected to enhance the quality of pain management and overall care for non-communicating children in intensive care settings, ultimately contributing to improved patient outcomes.

Research Questions

1. Is the Turkish version of the NCCPC-R a valid tool for pain assessment in non-communicating pediatric patients in the PICU?
2. Is the Turkish version of the NCCPC-R a reliable tool for pain assessment in non-communicating pediatric patients in the PICU?

Materials and Methods

Study Aim and Design

This methodological study aimed to evaluate the validity and reliability of the Turkish version of the Non-Communicating Children's Pain Checklist–Revised in non-communicating pediatric patients hospitalized in a PICU, with the goal of providing a valid instrument for pain assessment in this population.

Setting and Participants

The study was conducted between May 8, 2023 and April 8, 2024, in the PICU of a university hospital in western Türkiye. Initially, 70 pediatric patients aged 3–18 years were enrolled. Six patients were excluded due to mortality, and 14 were transferred or discharged before study completion. Ultimately, 50 patients who met the inclusion criteria completed the study. For the a priori sample size calculation for correlation analysis, a direct reference was not available in the literature. Therefore, an effect size considered practically significant was adopted, and the study was designed to detect at least a high-level correlation (ρ=0.50). For a two-tailed test with α=0.05 and power=0.95, the minimum required sample size was calculated as n=46. A post hoc power analysis based on the relationship between Face, Legs, Activity, Cry, and Consolability (FLACC) and NCCPC-R scores, assuming a two-tailed test with ρ=0.756, α=0.05, and n=50, yielded a power (1–β) of 0.99, indicating that the sample size was more than sufficient to detect the examined correlation. The sample size is consistent with previous NCCPC-R validation studies (range: 24–71 participants) and represents a robust achievement given the selective nature of the PICU population.[11,13,14]

Inclusion Criteria

- Parental consent obtained for participation,
- Age between 3 and 18 years,
- Presence of a medical condition (e.g., intubation) or diagnosis (e.g., cognitive impairment, intellectual disability, cerebral palsy) resulting in severely limited verbal communication,
- Inability to consciously report pain using gestures, facial expressions, symbols, or augmentative and alternative communication methods,
- Experience of one or more events during routine care or medical procedures (e.g., endotracheal suctioning, repositioning, wound care, invasive procedures) considered clinically painful by the nurse or treatment team,
- Hospitalization in the PICU for a minimum of two weeks prior to assessment.

Exclusion Criteria

- Ability to communicate pain verbally or nonverbally,
- Being under the effects of sedation at the time of data collection.

Instruments

Sociodemographic Data Form: This form consisted of 12 items addressing the sociodemographic characteristics of the patients (e.g., age, sex, family structure, parental education, and occupation) as well as clinical information (e.g., diagnosis and length of hospitalization).[13,15,16] This form was developed to identify factors that may influence pain perception and pain reporting in pediatric patients.

Non-Communicating Children's Pain Checklist–Revised: The NCCPC-R is a 30-item pain checklist developed specifically for children who are unable to verbally communicate and who have cognitive impairments.[11,17,18] The original validation studies of the NCCPC-R included children aged 3–18 years with a range of cognitive impairments, such as moderate to severe intellectual disabilities, cerebral palsy, and other neurological conditions that significantly limited their ability to communicate. The scale was tested in both clinical and home settings, with pain assessments conducted by caregivers and healthcare professionals. The validation process demonstrated that the NCCPC-R effectively detects pain-related behaviors in children with varying levels of cognitive impairment and communication limitations.[11,17,18] The NCCPC-R consists of seven subscales: vocal, social, facial, activity, body and limb movements, physiological status, and eating/sleeping parameters. Each subscale multiple items, for a total of 30 items. Observers using the NCCPC-R respond to the question, "How frequently did the child display these behaviors within the last two hours?" Each item is scored on a scale from 0 to 3 (0=not present at all during the observation period; 1=seen or heard rarely but present; 2=seen or heard several times but not continuously; and 3=seen or heard often, almost continuously). A total score greater than 7 indicates that the child is experiencing pain.[11] The NCCPC-R was selected for this study because it was specifically developed and validated for non-communicating children with cognitive impairments, making it appropriate for pain assessment in this population.

Face, Legs, Activity, Cry, and Consolability (FLACC) Scale: The FLACC Scale was developed by Merkel et al.[19] and linguistically validated in Turkish by Şenaylı et al.[20] This observational scale assesses five behavioral categories in children and classifies pain severity (mild, moderate, severe) based on total scores ranging from 0 to 10. The FLACC Scale was selected because it is a widely used observational pain assessment tool that does not rely on verbal communication, making it suitable for children with communication barriers. It was originally validated in both verbal and nonverbal pediatric populations, including children with cognitive impairments and communication difficulties.[19,20]

Data Collection Procedure

The study followed a structured four-stage process:

1. **Translation (Stage 1):** Using the translation-back translation method, 11 bilingual experts independently translated the NCCPC-R into Turkish. Of these experts, four were pediatric nurses with PhD degrees in nursing, two were pediatric physicians, and five were English–Turkish linguists, ensuring both linguistic and conceptual accuracy. Following a consensus review by the researchers and a linguist, a final Turkish version was produced. The back-translated version, completed by a bilingual expert, was compared with the original scale and confirmed to be linguistically equivalent.
2. **Content Validity (Stage 2):** Eleven experts (seven pediatric nursing faculty members and four pediatric medicine faculty members) evaluated the content validity of the scale in terms of language appropriateness and scientific accuracy using a 4-point rating scale. The Davis technique was employed to calculate the Content Validity Index (CVI) for each item, based on the proportion of experts rating the item as "not relevant," "item needs major revision," "relevant but needs minor revision," or "highly relevant." Reliability coefficients range from 0 to 1, with a coefficient of 1 indicating perfect agreement and a coefficient of 0 indicating no agreement. Test-retest analysis and alternate forms are commonly used to calculate reliability through statistical correlation tests.[21] This method was selected because it provides a standardized and objective evaluation of content validity and ensures that the items are conceptually appropriate for the target population. Detailed CVI results are presented as supplementary material (Appendix 1).

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Table 1. Sociodemographic characteristics of patients and their parents (n=50)

		Min-max	Mean±SD
Age		3.00–18.00	9.08±5.31
Number of children in the family		1.00–5.00	2.44±0.81
Length of PICU stay at first assessment (days)		1–225	12.90±3.00
		n	%
Sex	Male	31	62.0
	Female	19	38.0
Education level (patient)	Not in school yet	35	70.0
	Preschool	1	2.0
	Primary/middle school	14	28.0
Education level (father)	Middle school or lower	6	12.0
	High school graduate	34	68.0
	University graduate	10	20.0
Education level (mother)	Middle school or lower	18	36.0
	High school graduate	28	56.0
	University graduate	4	8.0
Working status (father)	Working	47	94.0
	Not working	0	0.0
	Other	3	6.0
Working status (mother)	Working	13	26.0
	Not working	37	74.0
	Other	0	0.0
Primary reason for hospital admission/ medical diagnosis	Neurological diseases[1]	32	64.0
	Genetic diseases[2]	6	12.0
	Oncological diseases[3]	3	6.0
	Respiratory diseases[4]	3	6.0
	Gastrointestinal diseases[5]	2	4.0
	Musculoskeletal diseases[6]	2	4.0
	Cardiovascular diseases[7]	2	4.0
Secondary medical diagnosis	Neurological diseases	15	30.0
	Respiratory diseases	14	28.0
	Dehydration	4	8.0
	Trauma	4	8.0
	Loss of consciousness	2	4.0
	Infection	2	4.0
	No secondary diagnosis	8	18.0
Total		50	100

[1]: Cerebral palsy, epilepsy, encephalitis, meningitis, cerebral hemorrhage, leukodystrophy, [2]: West syndrome, phenylketonuria, mucopolysaccharidosis type I, [3]: Wilms tumor, brain tumor, [4]: Pneumonia, [5]: Poisoning, dehydration, [6]: Spinal muscular atrophy, Duchenne muscular dystrophy, [7]: Congenital heart disease. SD: Standard deviation, PICU: Pediatric intensive care units.

Table 2. Correlations between NCCPC-R subscales and FLACC scores (Observer 1)

Scales		FLACC					
NCCPC-R		**Face**	**Legs**	**Activity**	**Cry**	**Consolability**	**FLACC**
Vocal	r	0.641[a]	0.611[a]	0.553a	0.695[a]	0.605[a]	0.744[a]
	p	0.000*	0.000*	0.000*	0.000*	0.000**	0.000
Social	r	0.715[a]	0.643[a]	0.651a	0.758[a]	0.695[a]	0.830[a]
	p	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*
Facial	r	0.700[a]	0.625[a]	0.554[a]	0.626[a]	0.446[a]	0.711[a]
	p	0.000*	0.000*	0.000*	0.000*	0.001	0.000*
Activity	r	0.674[a]	0.582[a]	0.545[a]	0.535[a]	0.442[a]	0.665[a]
	p	0.000*	0.000*	0.000*	0.000*	0.001	0.000*
Body and limb movements*	r	0.668[a]	0.681[a]	0.639[a]	0.765[a]	0.593[a]	0.809[a]
	p	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*
Physiological status	r	0.700[a]	0.684[a]	0.665a	0.701[a]	0.581[a]	0.803[a]
	p	0.0000*	0.000*	0.000*	0.000*	0.000*	0.000*
Eating/ sleeping	r	0.596[a]	0.705[a]	0.540[a]	0.655[a]	0.483[a]	0.721[a]
	p	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*
Total	r	0.766[a]	0.739[a]	0.683[a]	0.786[a]	0.639[a]	0.870[a]
	p	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*

[a]: Pearson correlation, *: p<0.001. NCCPC-R: Non-communicating children's pain checklist–revised, FLACC: Face, legs, activity, cry, and consolability.

Table 3. Internal consistency of the NCCPC-R total scale and subscales

NCCPC-R subscales		Cronbach's Alpha Coefficient
Vocal	Observer 1	0.952
	Observer 2	0.957
Social	Observer 1	0.891
	Observer 2	0.897
Facial	Observer 1	0.916
	Observer 2	0.915
Activity	Observer 1	0.614
	Observer 2	0.541
Body and limb movements	Observer 1	0.882
	Observer 2	0.882
Physiological status	Observer 1	0.884
	Observer 2	0.880
Eating/sleeping	Observer 1	0.553
	Observer 2	0.597
Total	Observer 1	0.970
	Observer 2	0.970

NCCPC-R: Non-communicating children's pain checklist–revised.

3. **Pilot Implementation (Stage 3):** To assess clarity and applicability, the Turkish version of the NCCPC-R was pilot-tested with 10 pediatric patients who met the inclusion criteria but were not included in the main study sample. The pilot implementation was completed over a three-week period. Observations were conducted exclusively in the PICU to evaluate the scale's feasibility in a critical care environment. Each patient was observed for a total of two hours, during which pain-related behaviors were assessed. Two experienced pediatric nurses (a clinical nurse with 10 years of experience and a head nurse with 20 years of experience) independently observed each patient and completed

Table 4. Interobserver agreement in NCCPC-R scoring

NCCPC-R		ICC	95% Confidence interval		[a]F-test	p
			Lower	Upper		
Vocal	Absolute agreement	0.983	0.969	0.990	1130.616	0.000*
	Internal consistency	0.991	0.984	0.995	1130.616	0.000*
Social	Absolute agreement	0.949	0.912	0.971	380.125	0.000*
	Internal consistency	0.974	0.954	0.985	380.125	0.000*
Facial	Absolute agreement	0.957	0.926	0.976	450.860	0.000*
	Internal consistency	0.978	0.962	0.988	450.860	0.000*
Activity	Absolute agreement	0.948	0.911	0.970	370.810	0.000*
	Internal consistency	0.974	0.953	0.985	370.810	0.000*
Body and limb movements	Absolute agreement	0.958	0.927	0.976	460.383	0.000*
	Internal consistency	0.978	0.962	0.988	460.383	0.000*
Physiological status	Absolute agreement	0.967	0.942	0.981	590.247	0.000*
	Internal consistency	0.983	0.970	0.990	590.247	0.000*
Eating/sleeping	Absolute agreement	0.956	0.923	0.975	440.176	0.000*
	Internal consistency	0.977	0.960	0.987	440.176	0.000*
Total	Absolute agreement	0.988	0.979	0.993	1680.027	0.000*
	Internal consistency	0.994	0.990	0.997	1680.027	0.000*

[a]: ANOVA, *: p<0.001. NCCPC-R: Non-communicating children's pain checklist–revised, ICC: Intraclass correlation coefficient.

the NCCPC-R forms separately to prevent bias. After the observations, the two nurses compared their assessments and discussed their evaluations. No major discrepancies were identified, and both confirmed that the scale was comprehensible and applicable in the PICU setting. Based on these findings, the scale was deemed suitable for the main implementation phase without further modification (Appendices 2 and 3).

4. **Main Implementation (Stage 4):** Two experienced clinical observers (a clinical nurse with 10 years of experience and a head nurse with 20 years of experience) administered the NCCPC-R and FLACC scales to 50 participants. Assessments were conducted in the same clinical setting, while the two observers completed their ratings independently. To evaluate test-retest reliability, pain assessments were repeated two weeks after the initial assessment. This interval was selected to provide a meaningful evaluation of reliability while minimizing the effects of short-term fluctuations in pain-related behaviors.[22] The interval between assessments made by observers may result in a falsely high correlation if the time between assessments is short, or a low correlation if the interval is long. Therefore, the most appropriate time interval for the assessed trait should be selected. A two-to-four-week interval is considered ideal.[23] Both assessments, conducted two weeks apart, took place during interventions that could cause pain, including intravenous catheterization, aspiration, urinary catheter insertion, and tracheostomy care.

Data Analysis

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 25.0 (IBM Corp., Armonk, NY, USA), with the level of statistical significance set at p<0.05. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize participant characteristics and describe the sample distribution.

Linguistic validity was established using the translation-back translation method to ensure semantic and conceptual equivalence between the original and Turkish versions of the scale. Content validity was evaluated using the Content Validity Index, calculated based on expert ratings to quantify agreement regarding item relevance and clarity.[24]

Criterion validity was examined by analyzing correlations between NCCPC-R and FLACC scores. Pearson's correlation coefficients were calculated to assess the strength and direction of these relationships, providing evidence of concurrent validity for the Turkish version of the NCCPC-R.[25]

To assess the reliability of the scale, multiple statistical methods were applied:

Internal Consistency: Cronbach's alpha coefficient was calculated to evaluate the internal consistency of the scale, assessing whether the items measured a common underlying construct. A coefficient of ≥0.70 was considered indicative of acceptable reliability.[26]

Interrater Reliability: The intraclass correlation coefficient (ICC) was used to determine the level of agreement between the two independent observers.[27]

Test-Retest Reliability: Temporal stability of the scale was assessed by calculating the correlation between scores obtained from repeated assessments at two time points. A high correlation coefficient indicates that the scale yields consistent results over time.[23]

Ethical Considerations

The study was conducted in accordance with the principles of the Declaration of Helsinki. Ethical approval was obtained from Zonguldak Bülent Ecevit University Non-interventional Clinical Research Ethics Committee (Approval Number: 2023/11, Date: 31.05.2023). Written permission was obtained from the institution where the study was conducted, and written informed consent was obtained from the parents of all participating patients. In addition, permission to use the NCCPC-R for validity and reliability analyses was obtained via e-mail from the developers of the original scale.

Results

Characteristics of the Participants

The mean age of the participants was 9.08±5.31 years, and 62.0% were male. It was determined that 70.0% of the patients had not yet started school. Fathers of 68.0% of the patients and mothers of 56.0% were high school graduates. The mean length of PICU stay at the time of the first assessment was 12.90±3.00 days. The primary medical diagnosis was neurological disorders in 64% of the participants, followed by genetic disorders in 12%. Secondary medical diagnoses included neurological disorders in 30% and respiratory disorders in 28% of the participants (Table 1).

Validity

Content Validity: The CVI value of the scale, calculated based on the evaluations of 11 experts, was 0.958 (Appendix 1).

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Table 5. Test-retest analysis of NCCPC-R scores

	NCCPC-R		Mean	SD	t-test statistic	p	r	p
Observer 1	Vocal	Pretest	5.24	4.08	-0.714[a]	0.478	0.883[b]	0.000*
		Retest	5.44	4.10				
	Social	Pretest	7.60	3.06	-0.425[a]	0.673	0.764[b]	0.000*
		Retest	7.72	2.65				
	Facial	Pretest	9.16	3.66	0.154[a]	0.878	0.728[b]	0.000*
		Retest	9.10	3.79				
	Activity	Pretest	2.84	1.42	-1.905[a]	0.063	0.764[b]	0.000*
		Retest	3.10	1.39				
	Body and limb movements	Pretest	10.52	4.11	0.326[a]	0.746	0.668[b]	0.000*
		Retest	10.36	4.38				
	Physiological status	Pretest	9.50	4.30	1.438[a]	0.157	0.689[b]	0.000*
		Retest	8.78	4.64				
	Eating/sleeping	Pretest	4.28	2.14	-0.521[a]	0.604	0.867[b]	0.000*
		Retest	4.36	2.07				
	Total	Pretest	49.14	20.05	0.157[a]	0.876	0.811[b]	0.000*
		Retest	48.86	20.96				
Observer 2	Vocal	Pretest	5.30	4.13	-0.519[a]	0.606	0.860[b]	0.000*
		Retest	5.46	4.10				
	Social	Pretest	7.56	3.00	-0.442[a]	0.661	0.696[b]	0.000*
		Retest	7.70	2.70				
	Facial	Pretest	9.22	3.71	0.312[a]	0.757	0.737[b]	0.000*
		Retest	9.10	3.79				
	Activity	Pretest	2.76	1.35	-1.347[a]	0.184	0.695[b]	0.000*
		Retest	2.96	1.34				
	Body and limb movements	Pretest	10.34	4.08	-0.413[a]	0.681	0.720[b]	0.000*
		Retest	10.52	4.16				
	Physiological status	Pretest	9.36	4.29	1.130a	0.264	0.730[b]	0.000*
		Retest	8.84	4.54				
	Eating/sleeping	Pretest	4.08	2.16	-1.661[a]	0.103	0.884[b]	0.000*
		Retest	4.32	2.06				
	Total	Pretest	48.62	20.06	-0.156[a]	0.877	0.804[b]	0.000*
		Retest	48.90	20.57				

[a]: Paired-samples t-test, [b]: Pearson correlation, *: p<0.001. NCCPC-R: Non-communicating children's pain checklist–revised.

Criterion Validity: In the assessments conducted by Observers 1 and 2, NCCPC-R total and subscale scores demonstrated strong, positive, and statistically significant correlations with FLACC scores (r=0.870; p<0.001). Accordingly, results based on the assessments of Observer 1 are presented in Table 2, while results based on Observer 2 are provided in Appendix 4.

Reliability

Internal Consistency: The overall Cronbach's alpha coefficient of the NCCPC-R was 0.970 for both Observer 1 and Observer 2. Cronbach's alpha coefficients for the NCCPC-R subscales ranged from 0.553 to 0.952 for Observer 1 and from 0.593 to 0.957 for Observer 2 (Table 3).

Inter-Observer Agreement: Based on the total scores of the scale, the ICC for absolute agreement between the observers was 0.988, while the ICC for consistency was 0.994 (p<0.001). The ICC values for interrater agreement across the NCCPC-R subscales ranged from 0.949 to 0.991 (p<0.001) (Table 4).

Test-Retest Reliability: In the assessments conducted by Observer 1, the mean NCCPC-R total score was 49.14±20.05 at pretest and 48.86±20.96 at retest. For Observer 2, the mean total scores were 48.62±20.06 at pretest and 48.90±20.57 at retest. The NCCPC-R total and subscale scores did not show a statistically significant change over time (p>0.001). According to the results of the paired-samples t-test examining the relationship between the two measurements, the overall correlation coefficient for the scale was r=0.811 for Observer 1 and r=0.804 for Observer 2, indicating a statistically significant relationship between the first and second administrations of the scale (Table 5).

When pain was assessed using the FLACC scale by Observer 1, the mean pretest score was 6.28±2.56, and the mean retest score was 6.52±2.54. Similarly, Observer 2 reported a mean pretest score of 6.12±2.45 and a mean retest score of 6.48±2.54 (Table 6).

Discussion

The findings of this study make an important contribution to pediatric pain assessment, particularly in intensive care settings where accurate pain evaluation is critical. The participants had a mean age of approximately nine years, with the majority being male and not yet enrolled in school. These demographic characteristics are consistent with previous studies assessing pain in children with cognitive impairments. For example, a systematic review reported a mean participant age of 9.9 years and a male predominance of 60%.[28] Similarly, Zanchi et al.[29] and Breau et al.[15] reported comparable age distributions. In our study, most participants were hospitalized due to neurological conditions, which aligns with earlier research identifying neurological disorders as the primary diagnosis in similar populations.[11,15,17]

Table 6. Test-retest analysis results of FLACC scores

	FLACC		Mean	SD	t-test statistic	p	r	p
Observer 1	Face	Pretest	1.42	0.50	0.629[a]	0.533	0.619[b]	0.000*
		Retest	1.38	0.53				
	Legs	Pretest	1.18	0.63	0.000[a]	1.000	0.601[b]	0.000*
		Retest	1.18	0.56				
	Activity	Pretest	1.20	0.73	-0.651[a]	0.518	0.581[b]	0.000*
		Retest	1.26	0.69				
	Cry	Pretest	1.14	0.73	-0.256[a]	0.799	0.716b	0.000*
		Retest	1.16	0.74				
	Consolability	Pretest	1.34	0.48	0.000[a]	1.000	0.553[b]	0.000*
		Retest	1.36	0.56				
	Total	Pretest	6.28	2.56	-0.156[a]	0.877	0.743[b]	0.000*
		Retest	6.52	2.55				
Observer 2	Face	Pretest	1.40	0.49	0.330[a]	0.743	0.653[b]	0.000*
		Retest	1.38	0.53				
	Legs	Pretest	1.18	0.60	0.000[a]	1.000	0.574[b]	0.000*
		Retest	1.18	0.56				
	Activity	Pretest	1.16	0.71	-1.043[a]	0.302	0.535[b]	0.000*
		Retest	1.26	0.69				
	Cry	Pretest	1.10	0.71	-0.771[a]	0.444	0.711[b]	0.000*
		Retest	1.16	0.74				
	Consolability	Pretest	1.28	0.45	-0.903[a]	0.371	0.585[b]	0.000*
		Retest	1.34	0.56				
	Total	Pretest	6.12	2.45	-0.738[a]	0.464	0.703[b]	0.000*
		Retest	6.48	2.54				

[a]: Paired-samples t-test, [b]: Pearson correlation, *: p<0.001.

In pediatric intensive care units, pain often results from underlying medical conditions or invasive procedures such as catheter insertion, tracheal aspiration, and wound care.[30] In the NCCPC-R assessments conducted by Observer 1, total scores remained stable between pretest and retest measurements, indicating consistent pain-related behavioral responses over time. Similarly, pain assessments using the FLACC scale by both observers yielded comparable scores, reflecting moderate to high levels of pain severity. The relatively elevated pain levels observed in this study may be attributed to the intensive care environment, where patients are frequently exposed to painful procedures and pain management challenges are more pronounced. Previous research has shown that nurses primarily rely on behavioral indicators such as crying, discomfort, and facial expressions to assess pain in children.[31] These findings underscore the importance of standardized tools such as the NCCPC-R, which offer a systematic approach to identifying pain-related behaviors in non-communicating pediatric patients.

The Turkish version of the NCCPC-R demonstrated strong validity, with a CVI of 0.958, indicating a high level of expert agreement. Criterion validity was supported by significant positive correlations between NCCPC-R and FLACC scores. Similar findings have been reported in studies using alternative reference scales, such as the Numeric Rating Scale (NRS), Visual Analog Scale (VAS), and other standardized instruments.[13,17,32] These consistent results support the validity of the Turkish NCCPC-R as an effective tool for pain assessment in children with communication barriers.

Reliability analyses revealed high internal consistency for the Turkish NCCPC-R, with Cronbach's alpha coefficients exceeding established thresholds. These findings are consistent with previous studies reporting Cronbach's alpha values ranging from 0.741 to 0.97 for the original and adapted versions of the NCCPC-R.[11,13,16] Interrater reliability was also strong, as evidenced by high ICC values, indicating substantial agreement between observers. Notably, the ICC values obtained in this study exceeded those reported in some earlier investigations, particularly those conducted under calmer assessment conditions.[29,33]

The results of the test-retest reliability analyses further supported the temporal stability of the scale, demonstrating strong correlations between scores obtained at two different time points. These results are consistent with those reported by Murgia et al.,[13] who also observed high ICC values in test-retest analyses. In contrast, some studies have reported lower ICC values, particularly under calm conditions, attributing these differences to environmental or procedural factors.[33] The high test-retest reliability observed in the present study underscores the consistency of the Turkish NCCPC-R and supports its use as a reliable instrument in clinical practice.

Limitations

This study has certain limitations. First, as the research was conducted at a single center, the findings may not be generalizable to broader populations. Second, the study sample consisted of non-communicating children receiving intensive care; therefore, the results may not be applicable to other pediatric settings.

Conclusion

The results confirmed that the Turkish version of the NCCPC-R as a valid and reliable instrument for pain assessment in non-communicating children. This study fills an important gap in pediatric intensive care settings, where accurate pain assessment remains a critical challenge for who are unable to communicate.

The availability of this scale will support healthcare professionals in making more objective clinical decisions, potentially improving patient outcomes through timely and appropriate pain interventions. Future multicenter studies are recommended to further generalize these results.

Appendix files may be accessed via the link: https://jag.journalagent.com/jern/abs_files/JERN-50469/JERN-50469_(0)_appendix.pdf

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Informed Consent: Written informed consent was obtained from the parents of all participating patients.

Conflict of Interest: The authors have no conflicts of interest to declare.

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References

1. Grunauer M, Mikesell C, Bustamante G, et al.; PICU-MIC Research Group. Pain Assessment and Management in Pediatric Intensive Care Units Around the World, an International, Multicenter Study. Front Pediatr. 2021;9:746489. [CrossRef]
2. Faye PM, De Jonckheere J, Logier R, et al. Newborn infant pain assessment using heart rate variability analysis. Clin J Pain. 2010;26(9):777-782. [CrossRef]
3. Larsen SM, Terjesen T, Jahnsen RB, Ramstad K. Recurrent pain in adolescents with cerebral palsy: a longitudinal population-based study. Dev Med Child Neurol. 2022;64(3):357-363. [CrossRef]
4. Tsuboi K, Tsuboi N, Yamashita K, Nakagawa S, Yotani N. Nurses' perception of pediatric pain and pain assessment in the Japanese PICU. Pediatr Int. 2023;65(1):e15499. [CrossRef]
5. Fitzpatrick R, McGuire BE, Lydon HK. Improving pain-related communication in children with autism spectrum disorder and intellectual disability. Paediatr Neonatal Pain. 2022;4(1):23-33. [CrossRef]
6. Törüner EK, Büyükgönenç L. Çocuk Sağlığı Temel Hemşirelik Yaklaşımları Genişletilmiş 3rd ed. Ankara Nobel Tıp Kitabevleri;2023. Turkish.
7. Carlsen Misic M, Andersen RD, Strand S, Eriksson M, Olsson E. Nurses' perception, knowledge, and use of neonatal pain assessment. Paediatr Neonatal Pain. 2021;3(2):59-65. [CrossRef]
8. Genik LM, McMurtry CM, Breau L. Psychology works fact sheet: Pain in children with cognitive impairments who are nonverbal. Canadian Psychological Association, 2014. Accessed February 11. 2026. https://www.virtualhospice.ca/Assets/Pain%20in%20Children%20with%20Cognitive%20Impairments%20who%20are%20Nonverbal%20%20-2014_20181016114707.pdf
9. Cahyani SL, Yaputra F, Widyadharma IPE. The Nurse Role in pain assessment and management of pediatric patient: A literature review. Int J Med Rev Case Rep. 2019;3(3):104-108.
10. Yapıcı G, Ayyıldız T. The Effect of Training on Pain Assessment to Nurses Working in Pediatric Services: A Semi-Experimental Study. YIU Saglik Bil Derg. 2023;4(1):1-6. Turkish. [CrossRef]
11. Breau LM, McGrath PJ, Camfield CS, Finley GA. Psychometric properties of the non-communicating children's pain checklist-revised. Pain. 2002;99(1-2):349-357. [CrossRef]
12. Beukelman DR, Light JC. Augmentative & Alternative Communication: Supporting Children and adults with complex communication needs. 5th ed. Baltimore,London,Sydney: Brookes Publishing;2020.
13. Murgia M, Izzo R, Bettinelli A, et al. Validity and Reliability of Italian Version of the Non-Communicating Children's Pain Checklist: Revised Version. Eur J Phys Rehabil Med. 2019;55(1):89-94. [CrossRef]
14. Kleinknecht M. Reliability and validity of the german language version of the "NCCPC-R". Pflege. 2007;20(2):93-102. German. [CrossRef]
15. Breau LM, Camfield CS, McGrath PJ, Finley GA. The incidence of pain in children with severe cognitive impairments. Arch Pediatr Adolesc Med. 2003;157(12):1219-1226. [CrossRef]
16. Palese A, Conforto L, Meloni F, et al. Assessing pain in children with autism spectrum disorders: findings from a preliminary validation study. Scand J Caring Sci. 2021;35(2):457-467. [CrossRef]
17. Breau LM, Finley GA, McGrath PJ, Camfield CS. Validation of the Non-communicating Children's Pain Checklist-Postoperative Version. Anesthesiology. 2002;96(3):528-535. Erratum in: Anesthesiology 2002;97(3):769. [CrossRef]
18. McGrath PJ, Rosmus C, Canfield C, Campbell MA, Hennigar A. Behaviours caregivers use to determine pain in non-verbal, cognitively impaired individuals. Dev Med Child Neurol. 1998;40(5):340-343. [CrossRef]
19. Merkel SI, Voepel-Lewis T, Shayevitz JR, Malviya S. The FLACC: a behavioral scale for scoring postoperative pain in young children. Pediatr Nurs. 1997;23(3):293-297.
20. Şenaylı Y, Özkan F, Şenaylı A, Bıçakçı Ü. Çocuklarda Postoperatif Ağrının FLACC (YBAAT) Ağrı Skalasıyla Değerlendirilmesi. Turkiye Klinikleri J Anest Reanim. 2006;4(1):1-4.
21. Mohajan HK. Two criteria for good measurements in research: Validity and reliability. Annals of Spiru Haret University. Economic Series. 2017;17(4):59-82. [CrossRef]
22. Marx RG, Menezes A, Horovitz L, Jones EC, Warren RF. A comparison of two time intervals for test-retest reliability of health status instruments. J Clin Epidemiol. 2003;56(8):730-735. [CrossRef]
23. Gökdemir F, Yılmaz T. Likert tipi ölçekleri kullanma, modifiye etme, uyarlama ve geliştirme süreçleri. J Nursology. 2023;26(2):148-160.
24. Polit DF, Beck CT. The content validity index: are you sure you know what's being reported? Critique and recommendations. Res Nurs Health. 2006;29(5):489-497. [CrossRef]
25. Streiner DL, Norman GR, Cairney J. Health measurement scales: A practical guide to their development and use. 5th ed. Oxford University Press:2015. [CrossRef]
26. Tavakol M, Dennick R. Making sense of Cronbach's alpha. Int J Med Educ. 2011;2:53-55. [CrossRef]
27. Koo TK, Li MY. A Guideline of Selecting and Reporting Intraclass Correlation Coefficients for Reliability Research. J Chiropr Med. 2016;15(2):155-163. Erratum in: J Chiropr Med. 2017;16(4):346. [CrossRef]
28. Pizzinato A, Liguoro I, Pusiol A, Cogo P, Palese A, Vidal E. Detection and assessment of postoperative pain in children with cognitive impairment: A systematic literature review and meta-analysis. Eur J Pain. 2022;26(5):965-979. [CrossRef]
29. Zanchi C, Massaro M, Ferrara G, et al. Validation of the Italian version of the Non-Communicating Children's Pain Checklist-Postoperative Version. Ital J Pediatr. 2017;43(1):75. [CrossRef]
30. Bozan G, Koşkuzu E, Korulmaz A, Altuğ Ü, Yıldıztaş D. Çocuk Yoğun Bakım Ünitelerinde Sedasyon-Analjezi, Kas Gevşetici Uygulamaları ve Bu Uygulamalar Esnada Gelişen Yoksunluk, Deliryum gibi Klinik Tabloların Yönetimi ve Ortam Optimizasyonuna Yönelik Rehber. Türk Çocuk Acil Tıp ve Yoğun Bakım Derneği, 2024. Turkish. Accessed February 11, 2026. https://cayd.org.tr/files/sedasyon-analjezi-rehber-Mz.pdf
31. McCord H, Norris N, Campbell-Yeo M. Identifying nurse sensitive outcomes related to infant pain care practices: A review of reviews. J Neonatal Nurs. 2025;31(2):101590. [CrossRef]
32. Zabalia M, Breau LM, Wood C, et al. Validation of the French version of the non-communicating children's pain checklist - postoperative version. Can J Anaesth. 2011;58(11):1016-1023. French. [CrossRef]
33. Johansson M, Carlberg EB, Jylli L. Validity and reliability of a Swedish version of the Non-Communicating Children's Pain Checklist--Postoperative Version. Acta Paediatr. 2010;99(6):929-933. [CrossRef]

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Assessment of Nursing Students' Knowledge Levels and Determinants Related to Pressure Injury Classification and Staging

Abstract

Background: Pressure injuries (PIs) are a major patient safety concern associated with increased morbidity, mortality, and healthcare costs. Accurate diagnosis and classification of PIs are crucial for effective prevention and management. However, both nurses and nursing students frequently demonstrate insufficient knowledge and make errors in this area.

Aim: This study aimed to assess nursing students' competence in the classification of PI categories and staging by examining their level of knowledge and the factors influencing it.

Methods: This cross-sectional descriptive study was conducted between December 2022 and July 2023 and included 300 undergraduate nursing students. Data were collected online using the Student Information Form and the 20-item multiple-choice Pressure Injury Test (PI-TEST). Descriptive statistics and independent samples t-tests were performed, and receiver operating characteristic (ROC) analysis was used to determine the optimal cut-off score.

Results: Among the participants, 88.3% were female, 61.3% were nursing students at foundation universities, 55.3% were fourth-year students, and 71.0% had received undergraduate education on PIs. The mean PI-TEST score was 56.36±19.05 out of 100. The highest correct response rates were observed for Stage 1, Stage 4, and Mucosal Membrane PIs, whereas Stage 3 and Deep Tissue PIs had the highest rates of incorrect responses. Participants who had received education on PIs and who had provided care to patients with PIs and at risk for PIs during clinical practice had significantly higher knowledge scores.

Conclusion: These findings suggest that nursing students' knowledge regarding PI is insufficient. The results highlight the need to incorporate both theoretical and practical content on pressure injury-related topics into undergraduate nursing curricula.

Keywords: Classification, nursing students, pressure injury, staging

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Introduction

Pressure injuries (PIs), one of the most common problems affecting skin integrity in clinical settings, are recognized as a significant health concern and a global threat to patient safety.[1] The adverse consequences of PIs, including increased mortality and morbidity rates, prolonged hospitalization, and reduced quality of life for patients and their families, place a substantial burden on healthcare systems worldwide.[2] The prevention and effective management of PIs are considered fundamental quality improvement priorities in healthcare systems and nursing practice. PI prevention is a patient outcome highly sensitive to nursing care.[3] Preventive efforts require interdisciplinary team collaboration within a holistic care approach. A nurse-centered approach enables nurses to enhance their expertise and competencies in providing nursing care, encompassing the assessment, prevention, and management of PIs.[4] Therefore, nurses should possess adequate knowledge, maintain positive attitudes, and adhere to evidence-based practices to improve the quality of patient care and uphold professional standards among healthcare providers.[5]

PIs may present as intact skin or open wounds. Differentiating PIs from other types of wounds is the first step in establishing an appropriate wound treatment plan. This process requires accurate diagnosis, classification, and staging. The National Pressure Injury Advisory Panel (NPIAP) has developed a classification system to standardize diagnostic criteria and promote a common language among healthcare professionals.[6] The NPIAP system was updated in 2016 and describes the extent of skin and tissue damage manifested as a PI.[7] Anatomical knowledge of the skin, subcutaneous, fat, fascia, muscle layers, and supporting structures such as tendons, ligaments, and bones is essential for accurate staging. According to the NPIAP classification system, PIs are categorized as Stage 1 PI, Stage 2 PI, Stage 3 PI, Stage 4 PI, Unstageable PI, Deep Tissue PI, Medical Device-Related PI (MDRPI), and Mucosal Membrane PI.[6,7]

Once a PI has developed, it must be classified according to its category and stage, taking into account the type and depth of the affected tissues.[6,7] In this regard, enhancing nurses' knowledge and skills in classification is critically important for providing appropriate care to patients with PIs.[3] Therefore, nurses should acquire learning experiences related to PI classification skills from the early stages of their education. Current literature indicates that both nurses[8] and nursing students[9,10] demonstrate insufficient knowledge and skills in this area, and errors are frequently reported.[11] Findings from previous studies, along with clinical observations

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and experiences, suggest that nursing students, as well as practicing nurses, often encounter difficulties in diagnosing, assessing, classifying, and staging PIs during routine care. Accurate staging of PIs, however, is recognized as essential for appropriate local wound care and effective treatment management.[12]

Prevention and management of PIs, a critical aspect of nursing care practice, is expected to be an integral component of undergraduate nursing education, with the anticipation that students will graduate with enhanced knowledge and assessment skills.[13] Given the important role of nurses in evaluating etiological factors and preventing PIs, it is essential for nursing students to acquire comprehensive knowledge in this area. Accordingly, nursing students should enhance their knowledge of all aspects of PIs, including etiological factors, the mechanisms of PI formation, assessment, diagnosis, classification, and staging, to effectively prevent and manage PIs in their future professional practice.[14,15]

The relevant literature indicates a need for data identifying the factors that influence nursing students' level of knowledge regarding PI classification.[9] Although several studies have assessed nursing students' general knowledge of PIs,[14–18] most have not specifically examined competence in classification, which is a critical skill for accurate diagnosis and appropriate management. These findings suggest that existing research predominantly evaluates overall PI knowledge rather than the more complex and error-prone process of classification.

A limited number of emerging studies in Türkiye have begun to address this issue; however, their methodological and contextual scope remains restricted. One moulage-based simulation study evaluated nursing students' PI staging performance and satisfaction; however, it did not use the updated NPIAP criteria for accurate benchmarking.[18] Similarly, a descriptive study reported low levels of knowledge and positive attitudes among senior nursing students but did not directly assess staging competence.[10] A recent randomized controlled trial comparing standardized patient and medium-fidelity simulation practices demonstrated improvements in staging performance; however, it focused on short-term performance outcomes rather than criterion-based diagnostic accuracy.[18] Therefore, despite these contributions, there remains no comprehensive, multicenter study aligned with current NPIAP criteria that evaluates Turkish nursing students' true competence in PI classification and staging.

The existing gap underscores the need for strengthened curricula and targeted educational strategies that explicitly address classification proficiency. To this end, raising awareness by analyzing the current situation and identifying training needs will support this process.[19] In this context, the present study focused on nursing students' skills in the classification and staging of PIs. The study aimed to assess nursing students' competence in classifying PI categories and staging by examining their level of knowledge and the factors influencing it. It is anticipated that the findings obtained from this study will contribute to the enhancement of undergraduate nursing curricula at both national and international levels. Additionally, the study may help clarify the level of awareness among future nurses during their undergraduate education regarding the recognition and differentiation of PIs.

Research Questions

The study sought to answer the following questions:

1. What is the level of nursing students' knowledge regarding the classification of PI categories and staging?
2. What factors influence nursing students' level of knowledge regarding the classification of PI categories and staging?

Materials and Methods

Study Design

This study employed a descriptive cross-sectional design.

Study Sample

Purposive sampling was used in this study.[20] The target population comprised third- and fourth-year undergraduate nursing students in Türkiye. Based on data from the Turkish Council of Higher Education for the 2022–2023 academic year (N=68,152),[21] the required sample size was calculated as 382 using the Qualtrics Sample Calculator (α=0.05; margin of error=5%). Preparatory, first-, and second-year students were excluded because they may not yet have completed compulsory nursing courses related to PI.

To reach the target sample, representatives of the Student Nurses Association and the Turkish Nurses Association Student Commission were contacted. Following approval, member students were invited to participate via email. Participation was voluntary, and 300 eligible students were enrolled in the study. The sampling access rate was 78.5% (300/382).

A post hoc power analysis was performed to evaluate the adequacy of the achieved sample size using G*Power 3.1 for a one-sample t-test (two-tailed, α=0.05), based on the observed mean total PI-TEST score and the predefined reference cut-off value. The effect size was calculated as 0.45, and the achieved power was approximately 1.00, indicating that the sample size was more than sufficient to detect this difference.

Data Collection Tools

Data were collected using the Student Information Form and the Pressure Injury Test. The *Student Information Form*, developed by the researchers, consisted of nine questions that gathered descriptive information about the students, including age, gender, type of university, year of study, whether they had received education related to PIs (including classification and staging), and whether they had provided care to patients at risk of and with PIs during clinical practice within the undergraduate curriculum.

The *Pressure Injury Test (PI-TEST)* was used to evaluate students' knowledge regarding the identification, classification, and staging of PIs. The PI-TEST was developed based on the researchers' clinical experience and current literature.[6,7] Currently, there is no measurement tool specifically designed to assess students' competence in the classification and staging of PI categories. Existing assessment tools primarily evaluate general knowledge about PIs and include only a limited number of questions related to classification and staging. Moreover, these tools were developed prior to the most recent NPIAP 2016 classification system.[22,23] Given the need for a comprehensive assessment tool containing target group-specific questions to evaluate competence in PI classification, the PI-TEST was developed. The PI-TEST covers all PI categories. The PI-TEST includes realistic case scenarios and photo-based questions that numerically assess staging. Thus, it provides an alternative tool for evaluating nursing students' competence. During its development, potential confounding factors in measurement and assessment were controlled.[24] Correct answers were evenly distributed across response options, and consecutive correct or incorrect answers were avoided. Questions and case scenarios were structured to ensure that no item revealed the answer to another. The PI-TEST begins with general questions addressing the NPIAP classification system criteria.[6,7] It then proceeds with case scenarios describing different PI categories and severity levels and concludes with photo-based questions assessing PI staging.

The PI-TEST consists of 20 multiple-choice questions, each with five options, designed to assess knowledge and provide characteristic information regarding PI categories and stages in accordance with the NPIAP classification system.[6,7] Participants were instructed to answer the questions based on the information provided in the questions, case descriptions, characteristics, and visuals. The test comprises questions related to identification, classification, and staging as follows: general classification and staging information (2 questions), Stage 1 PI (2 questions), Stage 2 PI (2 questions), Stage 3 PI (3 questions), Stage 4 PI (3 questions), Unstageable PI (3 questions), Deep Tissue PI (3 questions), and Mucosal Membrane PI (2 questions). Two of the items address the identification and staging of MDRPIs. In these questions, participants are expected first to recognize the injury as an MDRPI and then determine its appropriate stage.

Although the primary aim of this study was not to develop a measurement tool, a content validity study was conducted to evaluate the adequacy and suitability of the PI-TEST for the target population. Expert opinions were obtained from five nursing academics specializing in PIs (one professor, two associate professors, and two assistant professors) within the scope of the content validity study. The selection criteria for experts were: 1) holding a doctoral degree in nursing and 2) having educational and publication experience in the field of PIs. Expert evaluations were conducted using the Davis method. Accordingly, a 4-point Likert-type scale (1=inappropriate, 2=somewhat appropriate, 3=appropriate, 4=very appropriate) was used to assess the relevance and clarity of each item. Subsequently, the proportion of experts who rated each item as 3 or 4 was divided by the total number of experts to calculate the Content Validity Index (CVI) for each item. An item was considered to have acceptable content validity if its CVI was at least

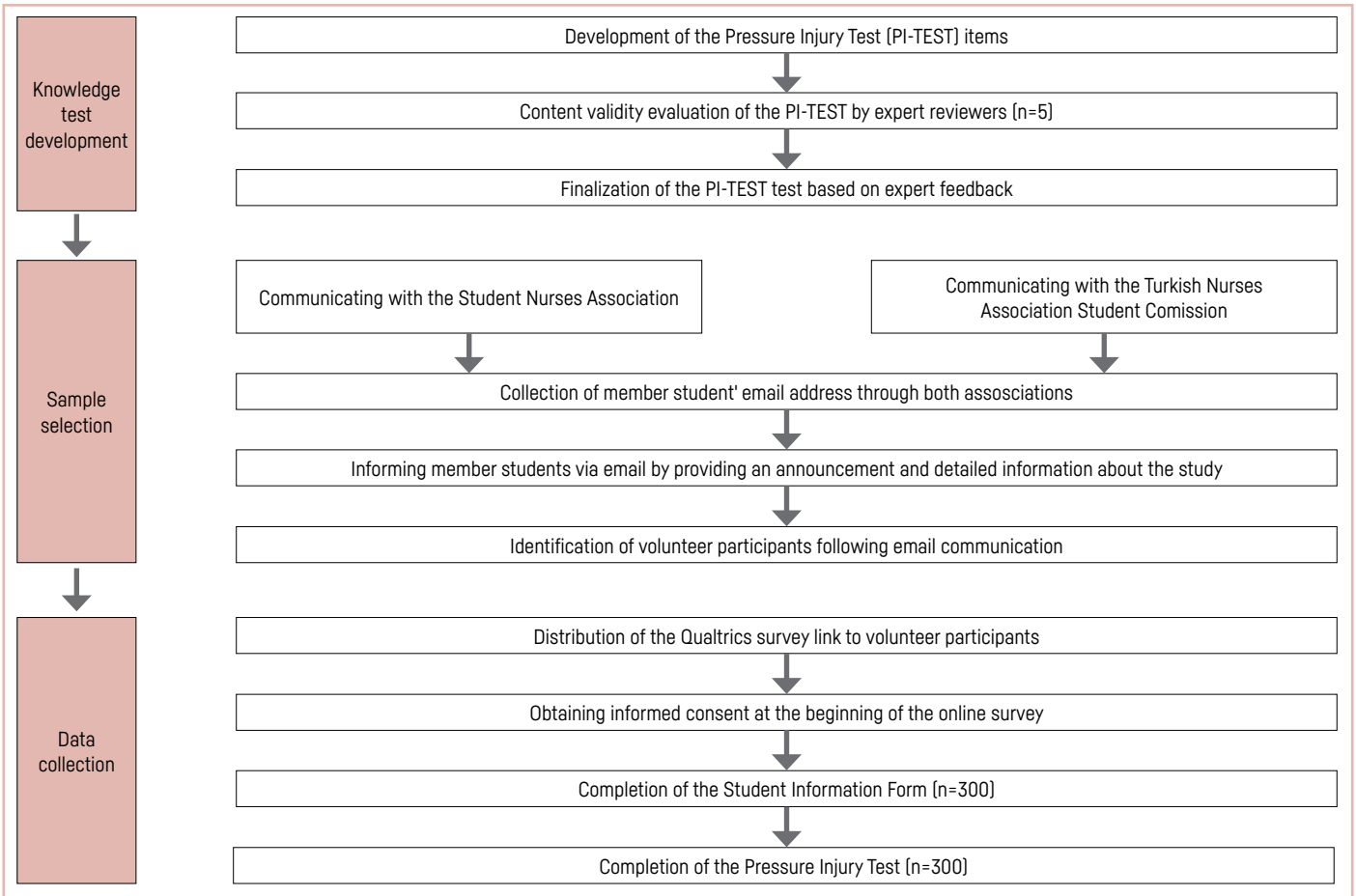

Figure 1. Flow diagram of the study process.

0.80. Accordingly, to ensure consensus, a test item was deemed valid if it received a rating of 3 or 4 at least 80% of the time.[25] The overall CVI for the PI-TEST was calculated as 0.96, indicating an acceptable level of content validity.[25]

The draft PI-TEST items were sent to the experts via email, and they were asked to evaluate each question in terms of suitability, adequacy, and clarity, as well as to provide suggestions. Based on expert feedback, minor revisions were made to enhance clarity and ensure alignment with the NPIAP classification system criteria. These revisions included refining item wording for greater precision in line with expert opinions, ensuring consistency in question stems, and arranging response options to better reflect clinically essential differences among the PI categories. Based on expert opinions, 5 points were awarded for each correct answer and 0 points for each incorrect answer. The maximum total score for the 20 questions was 100. The clarity of the questions was tested with five students from the researchers' network who were not included in the study.

Data Collection

The study was conducted between December 1, 2022 and July 31, 2023. The methodological flow of the study is presented stepwise, including test development, participant recruitment, and data collection procedures (Fig. 1). The research data were collected online. The questions in the Student Information Form and the PI-TEST were transferred to a Qualtrics survey link. This link was shared with student members of the Student Nurses Association and the Turkish Nurses Association Student Commission through electronic communication networks to reach the study sample. The survey link, accompanied by an informed consent form, was distributed to volunteer participants. Students were asked to register with their email address via the link and complete the questions on the Qualtrics platform. Completion of the questionnaire required a maximum of 20 minutes.

Data Analysis

SPSS Statistics, version 27.0 (Armonk, NY: IBM Corp., 2021), was used to analyze the data. Participant responses collected via Qualtrics were transferred to SPSS for analysis. Descriptive statistics included frequencies and percentages for categorical variables and means and standard deviations for continuous numerical data. A normality test was performed to determine whether the study data followed a normal distribution. The Kolmogorov-Smirnov test was used to assess normality. As the data were normally distributed, the independent samples t-test was conducted to compare participants' total PI-TEST scores.

Furthermore, receiver operating characteristic (ROC) analysis was performed to determine the cut-off value, and the area under the curve was calculated for the PI-TEST. Determining this threshold is a common approach in knowledge-based assessment tools, as it helps distinguish participants with adequate competence from those with lower performance in a statistically supported manner.[20] Different threshold values were examined using the ROC curve, and a new cut-off value was established by considering the balance between sensitivity, true positive rate, and false positive rate. Based on the distribution of threshold values , the PI-TEST cut-off point was determined to be 65%.[20]

Ethical Considerations

Ethics committee approval was obtained from the Ethics Committee of Koç University (Approval Number: 2023.114.IRB3.056, Date: 27.03.2023). The online data collection form included study information in its initial section, where participants were asked to confirm their voluntary participation. Written informed consent was obtained from all participants before data collection. The study was conducted in accordance with the Declaration of Helsinki.

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Results

The mean age of the participants was 22.33±1.74 years, and the majority were female (88.3%, n=265). Among the participants, 71.0% (n=213) reported that they had received education related to PIs at the undergraduate level; 65.3% (n=139) stated that this education included classification of PI categories and staging; 83.3% (n=250) indicated that they had provided care to a patient at risk of PI; and 74.7% (n=224) reported providing care to a patient with PI during their clinical practice within the curriculum (Table 1).

The percentage of participants who scored above the 65% cut-off point was low (33.0%, n=99) for the overall sample (Table 2). The mean total PI-TEST knowledge score was 56.36±19.05 out of 100 (Table 3). The most correctly answered PI categories and stages were Stage 1 PI (Question 3, n=275, 89.3%) Stage 4 PI (Question 9, n=193, 64.3%), Unstageable PI (n=185, 61.7%), and Mucosal Membrane PI (Question 16, n=18, 60.3%). In contrast, the most incorrectly answered categories and stages were Stage 3 PI (Question 8, n=189, 63.0%) and Deep Tissue PI (Question 20, n=168, 56.0%) (Table 2).

Statistically significant differences were observed in PI-TEST total knowledge scores according to three variables: receiving PI-related education within the undergraduate curriculum (p=0.019), providing care to patients at risk of PIs (p=0.042), and providing care to patients with PIs (p=0.018). Participants who had received PI-related education had higher knowledge scores compared to those who had not (61.15±20.28 vs. 55.00±20.06; Cohen's d=0.30; 95% confidence interval (CI) [1.08, 11.22]). Similarly, participants who had provided care to patients at risk of PI demonstrated higher scores than those without such experience (60.70±19.96 vs. 54.30±21.50; Cohen's d=0.32; 95% CI [−0.05, 12.85]). In addition, participants who had cared for patients with PI scored higher than those who had not (61.04±20.23 vs. 54.67±20.17; Cohen's d=0.32; 95% CI [1.12, 11.62]).

Table 1. Descriptive characteristics of the participants (n=300)

Descriptive characteristics	n	%
Gender		
Male	35	11.7
Female	265	88.3
Type of university		
Public university	116	38.7
Foundation university	184	61.3
Year of study		
Third year	134	44.7
Fourth year	166	55.3
Receipt of PI-related education		
Yes	213	71.0
No	87	29.0
Type of PI education received (n=213)		
Required course	156	73.2
Elective course	57	26.8
Inclusion of PI classification in education (n=213)		
Yes	139	65.3
No	74	34.7
Provided care to patients at risk of PI		
Yes	250	83.3
No	50	16.7
Provided care to patients with PI		
Yes	224	74.7
No	76	25.3
	Mean±SD	**Min-Max**
Age (years)	22.33±1.74	19-36

n: Number, %: Percentage, PI: Pressure injury, SD: Standard deviation, Min: Minimum, Max: Maximum.

Discussion

The findings of this study indicate that third- and fourth-year nursing students require improved knowledge to accurately classify PI categories and stages. Using a 65% cut-off value for acceptable performance, only one-third of the students scored above the threshold. Participants most accurately identified Stage 1 PI but had difficulty classifying Stage 3 PI and Deep Tissue PI. Consistent with previous studies,[9,26,27] the results of this study revealed that nursing students' knowledge levels regarding PI categories and staging were very low.

In the most recent systematic review and meta-analysis conducted by Wu et al.,[8] which included 20 publications, the knowledge levels of nurses and nursing students regarding PI prevention were examined using the Pressure Ulcer Knowledge Assessment Tool (PUKAT). The study reported that nursing students had low scores in the classification and observation domain of the PUKAT. In a literature review by Bruce et al.,[28] which included 10 publications, difficulties were identified in distinguishing Stage 2 PI from Unstageable PI and Deep Tissue PI, as well as differences in assessment between ward nurses and Wound, Ostomy, and Continence Nurses (WOCNs). Similarly, in a descriptive study by Aydin and Karadag (n=237), majority of nurses experienced difficulty distinguishing Deep Tissue PI.[29] In a non-experimental study by Jesada et al.,[30] 100 digital PI photographs were assessed and staged by four WOCNs. The highest percentage of agreement was observed for Deep Tissue PI. The same study reported that partial- and full-thickness wounds, such as Stage 3 PI and Stage 4 PI, may be easier to identify than superficial injuries, such as Stage 1 PI and Stage 2 PI.

However, the findings of that study are inconsistent with the present results. Nursing students' difficulty in classifying Stage 3 PI and Deep Tissue PI may reflect limited clinical exposure, the complexity of wound assessment, and insufficient theoretical preparation. Although the literature on PI classification and staging remains limited,[31] findings from related studies[28–30] are consistent with the present study. Overall, the results suggest that students who received PI-focused education and gained clinical experience in PI care during undergraduate training demonstrated better knowledge of classification and staging, as well as higher total scores ,than those without such training. Bobbink et al.[16] conducted a quasi-experimental pre-test/post-test study to assess first-year nursing students' (n=21) knowledge of PIs using a blended learning approach. The PUKAT was used to measure PI knowledge at baseline (T_0), after blended learning (T_1), and following clinical practice (T_2). The results showed an increase in correct responses in the "Classification and Observation" domain and in overall scores from T_0 to T_2. Similarly, in a quasi-experimental study by Sezgunsay and Basak[32] evaluating the effect of the moulage simulation method on nursing students' PI assessment skills, fourth-year students (n=73) were included. The study found that PI assessment scores increased significantly in both the intervention and control groups, with higher correct staging percentages observed in the intervention group. It was concluded that this method may contribute to improving nursing students' PI assessment skills and facilitate the transfer of knowledge to the clinical setting.

Nevertheless, although the literature suggests that various learning methods may positively influence nursing students' knowledge and skills related to PI identification, classification, and staging, PI education in undergraduate nursing programs is generally inadequate and varies in content.[27] Possessing fundamental evidence-based knowledge and skills to prevent the occurrence of PIs and to appropriately diagnose, assess, and manage them is among the Nursing Education Program Learning Outcomes of undergraduate nursing programs. This necessitates that nursing educators and academic administrators revise curricula to ensure the development of students' knowledge, skills, and attitudes regarding the prevention and assessment of PIs, thereby facilitating new graduates' adaptation to the clinical environment.[33] In addition, nursing curricula and clinical internships should be structured with appropriate emphasis on the accurate etiological classification of PIs.[26]

Providing education on PIs within undergraduate curricula significantly influences nursing students' knowledge of PI classification and their ability to stage them accurately. The Nursing National Core Education Program in Türkiye, which all nursing programs are required to follow, includes content on tissue damage, healing processes, complications, and injury care.[34] However, the inclusion of wound-related topics varies across institutions. In some schools, PIs are addressed within specific courses, whereas in others, they are covered as part of an elective wound management

Table 2. Knowledge levels regarding classification of pressure injury categories and stages (n=300)

Pressure injury test item	Correct responses		Incorrect responses	
	n	%	n	%
Question 1. Name of the pressure injury classification system	70	23.3	230	76.7
Question 2. Criteria used for staging a PI	268	91.7	32	8.3
Question 3. Case scenario reflecting MDRPI, Stage 1 PI	275	89.3	25	10.7
Question 4. Case scenario reflecting Stage 1 PI	187	62.3	113	37.7
Question 5. Case scenario reflecting Stage 2 PI	144	48.0	156	52.0
Question 6. Case scenario reflecting MDRPI, Stage 2 PI	165	55.0	135	45.0
Question 7. Case scenario reflecting MDRPI, Stage 3 PI	178	59.3	122	40.7
Question 8. Case scenario reflecting Stage 3 PI	111	37.0	189	63.0
Question 9. Case scenario reflecting Stage 4 PI	193	64.3	107	35.7
Question 10. Case scenario reflecting Stage 4 PI	186	62.0	114	38.0
Question 11. Case scenario reflecting Deep Tissue PI	167	55.7	133	44.3
Question 12. Case scenario reflecting Deep Tissue PI	139	46.3	161	53.7
Question 13. Case scenario reflecting Unstageable PI	134	44.7	166	55.3
Question 14. Case scenario reflecting Unstageable PI	163	54.3	137	45.7
Question 15. Case scenario reflecting Mucosal Membrane PI	180	60.0	120	40.0
Question 16. Case scenario reflecting Mucosal Membrane PI	181	60.3	119	39.7
Question 17. Image-based case addressing Stage 3 PI	138	46.0	162	54.0
Question 18. Image-based case addressing Stage 4 PI	162	54.0	138	46.0
Question 19. Image-based case addressing Unstageable PI	185	61.7	115	38.3
Question 20. Image-based case addressing Deep Tissue PI	132	44.0	168	56.0
Proportion of correct responses above the 65% cut-off point	99	33.0	-	-

n: Number, %: Percentage, PI: Pressure injury, MDRPI: Medical-device related pressure injury.

Table 3. Factors influencing knowledge levels regarding classification of pressure injury categories and stages (n=300)

Descriptive variables	n	Mean±SD	Test		Cohen's d	95% CI
			t	p		
Mean total PI-TEST knowledge score	300	56.36±19.05	-	-	-	[54.21–58.52]
Gender			1.616	0.107	−0.29	[-14.04–2.24]
Male	35	54.42±23.50				
Female	265	60.32±19.82				
Type of University			1.416	0.158	−0.17	[-8.18–1.36]
Public University	116	57.54±20.92				
Foundation University	184	60.95±19.89				
Year of study			0.081	0.936	0.01	[-4.43–4.81]
Third year	134	59.73±20.21				
Fourth year	166	59.54±20.45				
Receipt of PI-related education			2.368	0.019*	0.30	[1.08–11.22]
Yes	216	61.15±20.28				
No	84	55.00±20.06				
Provided care to patients at risk of PI			2.043	0.042*	0.32	[-0.05–12.85]
Yes	250	60.70±19.96				
No	50	54.30±21.50				
Provided care to patients with PI			2.376	0.018*	0.32	[1.12–11.62]
Yes	224	61.04±20.23				
No	76	54.67±20.17				

*p<0.05, n: Number, SD: Standard deviation, PI: Pressure injury, t: Student's t-test, CI: Confidence interval.

course or through more comprehensive wound management programs comprising up to four courses totaling 12 credits.[35] Furthermore, accurate identification of PIs is highly dependent on observation and clinical judgment, as is effective education on the topic. Therefore, to enhance nursing students' PI assessment skills, nurse educators should provide sufficient clinical experience.[19,34] The finding that nursing students who cared for patients with PIs during clinical practice had higher total knowledge scores than those who did not highlights the importance of clinical experience.

Nursing students should be familiar with PI categories and staging to improve the quality of patient care and establish and promote standardized care among healthcare providers.5 Accurate staging is essential for implementing appropriate preventive and therapeutic interventions. In this context, innovative educational strategies, enhanced teaching methods, and curricular improvements are necessary to address existing gaps in nursing education related to PI prevention and management. Incorporating innovative approaches such as simulation-based training, case-based learning, and hands-on clinical experiences can significantly contribute to nursing students' acquisition of comprehensive knowledge and skills.

Limitations

This study has certain limitations. Participation was voluntary, not all eligible individuals were included. Additionally, the sample consisted of nursing students from a single country, which may limit generalizability. The PI-TEST included multiple-choice items without an "I do not know" option. Although PI categories and stages were presented in a case-based and non-consecutive format, the inclusion of numerical stage options may have encouraged guessing and influenced response accuracy. Online data collection made it impossible to fully prevent the use of external resources; however, anonymity and instructions emphasizing honest and independent responses were employed to enhance reliability. Furthermore, only CVI was evaluated for the PI-TEST, which should be considered when interpreting the knowledge outcomes. Although multivariable analyses might have identified independent predictors, they were not conducted because the study was descriptive rather than predictive, and the dichotomous, conceptually overlapping independent variables posed a high risk of multicollinearity. Therefore, analyses were limited to descriptive statistics and bivariate comparisons. Although the required sample size was 382, the study was completed with 300 nursing students, likely due to voluntary participation. The smaller-than-planned sample may limit generalizability and should be considered when interpreting the findings.

Conclusion

This study provides updated and comprehensive evidence regarding undergraduate nursing students' competence in the current PI classification system. Knowledge levels were generally low, whereas prior PI-related coursework and clinical experience were associated with higher scores. These findings support the integration of structured PI classification and prevention content into undergraduate curricula using technology-enhanced, multimodal teaching strategies (e.g., simulations, educational games, didactic materials, leaflets, and pocket guides).

A key strength of this study is the development of a topic-specific instrument to assess competency in PI classification and staging, which may serve as a prototype for future assessment tools in this field. Further research should evaluate the PI-TEST's psychometric properties and cross-cultural validity. Although this study included a large and geographically diverse sample from Türkiye, larger multinational studies and randomized controlled trials evaluating structured educational interventions are needed to generate higher-level evidence and further strengthen nursing students' competencies.

Ethics Committee Approval: The study was approved by the Koç University Ethics Committee (Approval Number: 2023.114.IRB3.056, Date: 27.03.2023).

Informed Consent: Written informed consent was obtained from the participants.

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References

1. Ayello EA, Zulkowski K, Capezuti E, Jicman WH, Sibbald RG. Educating Nurses in the United States about Pressure Injuries. Adv Skin Wound Care. 2017;30(2):83–94. [CrossRef]
2. Burston A, Miles SJ, Fulbrook P. Patient and carer experience of living with a pressure injury: A meta-synthesis of qualitative studies. J Clin Nurs. 2023;32(13–14):3233–3247. [CrossRef]
3. Sayar S, Aşkın Ceran M, Demir A. Determining the pressure injury and staging knowledge of nurses at a hospital in Turkey. J Tissue Viability. 2022;31(4):735–740. [CrossRef]
4. Wu J, Wang B, Zhu L, Jia X. Nurses' knowledge on pressure ulcer prevention: An updated systematic review and meta-analysis based on the Pressure Ulcer Knowledge Assessment Tool. Front Public Health. 2022;10:964680. [CrossRef]
5. Aydogan S, Caliskan N. A Descriptive Study of Turkish Intensive Care Nurses' Pressure Ulcer Prevention Knowledge, Attitudes, and Perceived Barriers to Care. Wound Manag Prev. 2019;65(2):39–47. [CrossRef]
6. European Pressure Ulcer Advisory Panel, National Pressure Injury Advisory Panel, Pan Pacific Pressure Injury Alliance. Prevention and treatment of pressure ulcers/injuries: clinical practice guideline. Haesler E, editor. EPUAP/NPIAP/PPPIA; 2019. Accessed February 26, 2026. https://www.andeal.org/files/files/WoundCare/NPUAP-EPUAP-PPPIA%20CPG%202014.pdf
7. Edsberg LE, Black JM, Goldberg M, McNichol L, Moore L, Sieggreen M. Revised National Pressure Ulcer Advisory Panel Pressure Injury Staging System: Revised Pressure Injury Staging System. J Wound Ostomy Continence Nurs. 2016;43(6):585–597. [CrossRef]
8. Wu Z, Song B, Liu Y, Zhai Y, Chen S, Lin F. Barriers and facilitators to pressure injury prevention in hospitals: A mixed methods systematic review. J Tissue Viability. 2023;32(3):355–364. [CrossRef]
9. Dag Sucu G, Firat Kilic H. Knowledge and attitudes of Turkish nursing students towards pressure injury prevention. J Tissue Viability. 2022;31(1):16–23. [CrossRef]
10. Yoltay HE, Özşaker E. Pressure Injury Knowledge and Attitudes of Senior Nursing Students. Adv Skin Wound Care. 2024;37(1):1–5. [CrossRef]
11. Gedamu H, Abate T, Ayalew E, Tegenaw A, Birhanu M, Tafere Y. Level of nurses' knowledge on pressure ulcer prevention: A systematic review and meta-analysis study in Ethiopia. Heliyon. 2021;7(7):e07648. [CrossRef]
12. Tervo-Heikkinen T, Heikkilä A, Koivunen M, et al. Nursing interventions in preventing pressure injuries in acute inpatient care: a cross-sectional national study. BMC Nurs. 2023;22(1):198. [CrossRef]
13. Lindahl E, Holloway S, Bobbink P, et al.; Wound curriculum for student nurses: European Qualification Framework Level 4. J Wound Management. 2021;22(3):Suppl 1.
14. Bahar A, Özgürbüz NE, Akın E. Student nurses' knowledge levels and attitudes regarding pressure injury prevention. J Tissue Viability. 2024;33(4):732–737. [CrossRef]
15. Kara H, Arikan F, Kahyaoglu A. Student Nurse Knowledge of and Attitudes Toward Pressure Injury Prevention: How Sufficient Is Undergraduate Education? Adv Skin Wound Care. 2021;34(9):473–480. [CrossRef]
16. Bobbink P, Gschwind G, Charbonneau L, Guex C, Chabal L, Probst S. Nursing Students' Knowledge on Pressure Injuries Following a Blended-Learning Unit: A Quasi-experimental Study. Adv Skin Wound Care. 2023;36(12):636–641. [CrossRef]
17. Uzelli Yilmaz D, Akin E, Yildirim D, Caliskan S, Hamarat Tuncali S. Nursing Students' Performance and Satisfaction Regarding the Classification of Pressure Injuries Using Simulation With Moulage. JCCNC. 2021;7(4):311–318. [CrossRef]
18. Baran Z, Ayik C, Özden D. Comparison of standardized patient and medium-fidelity simulation practices on nursing students' knowledge, staging, and satisfaction regarding pressure injuries: A randomized controlled trial. Nurse Educ Today. 2025;151:106735. Erratum in: Nurse Educ Today. 2025;152:106783. [CrossRef]
19. Daibes MA, Iblasi AS, Demir Korkmaz F, Oden TN, Elagoz I. Assessing pressure injury knowledge among Jordanian and Turkish nursing students: A cross-cultural comparison. J Tissue Viability. 2024;33(4):706–711. [CrossRef]
20. Grove SK, Cipher DJ. Statistics for Nursing Research: A Workbook for Evidence-Based Practice. 3rd ed. Elsevier; 2020.
21. Arslan Yürümezoğlu H, Kocaman G. The Situation of Nursing Education in Türkiye: Between 2015-2023. EHD. 2024;17(1):148–160. [CrossRef]
22. Manderlier B, Van Damme N, Vanderwee K, Verhaeghe S, Van Hecke A, Beeckman D. Development and psychometric validation of PUKAT 2·0, a knowledge assessment tool for pressure ulcer prevention. Int Wound J. 2017;14(6):1041–1051. [CrossRef]
23. Pieper B, Zulkowski K. The Pieper-Zulkowski pressure ulcer knowledge test. Adv Skin Wound Care. 2014;27(9):413–419. [CrossRef]
24. Touissi Y, Hjiej G, Hajjioui A, Ibrahimi A, Fourtassi M. Does developing multiple-choice Questions Improve Medical Students' Learning? A Systematic Review. Med Educ Online. 2022;27(1):2005505. [CrossRef]
25. Grant JS, Davis LL. Selection and use of content experts for instrument development. Res Nurs Health. 1997;20(3):269–274. [CrossRef]
26. Sankovich K, Hoffmann R, Ren D, Fennimore LA. The impact of education and feedback on the accuracy of pressure injury staging and documentation by bedside nurses. Patient Safety. 2019;1(1):10–17. [CrossRef]

27. Sönmez M, Taşdemir N, Ören N. Pressure injury knowledge of Turkish internship nursing students. J Tissue Viability. 2021;30(4):571–575. [CrossRef]
28. Bruce TA, Shever LL, Tschannen D, Gombert J. Reliability of pressure ulcer staging: a review of literature and 1 institution's strategy. Crit Care Nurs Q. 2012;35(1):85–101. [CrossRef]
29. Aydin AK, Karadağ A. Assessment of nurses' knowledge and practice in prevention and management of deep tissue injury and stage I pressure ulcer. J Wound Ostomy Continence Nurs. 2010;37(5):487–494. [CrossRef]
30. Jesada EC, Warren JI, Goodman D, et al. Staging and defining characteristics of pressure ulcers using photographs by staff nurses in acute care settings. J Wound Ostomy Continence Nurs. 2013;40(2):150–156. [CrossRef]
31. Fulbrook P, Lovegrove J. Reporting accuracy of pressure injury categorisation in an acute tertiary hospital: A four-year analysis. J Clin Nurs. 2023;32(17–18):6403–6414. [CrossRef]
32. Sezgunsay E, Basak T. Is Moulage effective in improving clinical skills of nursing students for the assessment of pressure injury? Nurse Educ Today. 2020;94:104572. [CrossRef]
33. Sengul T, Karadag A, Kilic H. Exploring Nursing Students' First Experiences Providing Wound and Ostomy Care to Patients: A Qualitative Study. Adv Skin Wound Care. 2024;37(6):304–310. [CrossRef]
34. Council of Higher Education. The Nursing National Core Education Program. Accessed Accessed February 26, 2025. https://www.hemed.org.tr/wp-content/uploads/2023/10/hemsirelik_cekirdek_egitim_programi.pdf
35. Koç University Academic Planning and Development Directorate. Major, Double Major, Minor and Track Programs: Stoma and Wound Care Nursing. Accessed February 26, 2026. https://apdd.ku.edu.tr/en/academics/major-double-major-minor-and-track-programs/track-programs/school-of-nursing/stoma-and-wound-care-nursing/

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Learning to Care, Fearing What Lies Ahead: Future Anxiety Among Student Nurses

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Abstract

Background: Nursing students often experience future anxiety as they prepare for professional life. Understanding the factors that influence this anxiety is essential for developing effective support strategies.

Aim: This study aimed to examine future anxiety levels among nursing students and identify associated individual and contextual factors.

Methods: A descriptive study was conducted with 211 nursing students at a foundation university in Istanbul. Data were collected through a Personal Information Form and the Future Anxiety Scale for University Students. Data were collected face-to-face. The Pearson correlation test, analysis of variance (ANOVA), and independent samples t-test were used for data analysis.

Results: The participants had a mean age of 21.29 years and a mean grade point average (GPA) of 3.00. Participants reported moderate levels of future anxiety (mean: 2.85; standard deviation: 0.55), with greater concern about uncertainty than hopelessness. Significant factors associated with elevated anxiety included year of study, living arrangements, career plans, readiness to practice, prior clinical experiences, and perceptions of societal views on nursing. Third-year students and those intending to work as nurses after graduation reported higher levels of fear about the future. Students who had negative clinical experiences or were dissatisfied with the public image of nursing also exhibited higher anxiety levels. No significant associations were found with age, gender, or grade point average.

Conclusion: The findings underscore the need for supportive educational strategies and psychosocial interventions to reduce future anxiety among nursing students.

Keywords: Anxiety, future anxiety, nursing, students

Introduction

Anxiety is a common and universal emotional response experienced across all stages of life. It is typically triggered by perceived threats or uncertainty and is often associated with fear, pessimism, and a sense of hopelessness about the future.[1] According to the American Psychological Association (APA),[2] anxiety involves feelings of tension, worried thoughts, and physical symptoms, often reflecting an individual's concerns about anticipated future events and outcomes. While general anxiety involves a broad state of tension and physiological arousal, future anxiety, defined as a state of worry and fear specifically related to anticipated negative events in the future, is more cognitive in nature than general anxiety and stems from the human capacity to imagine potential catastrophes.[3]

Among university students, nursing students represent a particularly vulnerable group with respect to anxiety.[4] Studies have consistently shown that nursing students frequently experience moderate to high levels of future anxiety.[5–9] For instance, Comparcini et al.[6] reported that 88.5% of nursing students experienced high anxiety levels, while Karaman and Karatepe[7] observed moderate levels of future-related concerns among students in Türkiye.

Future anxiety is shaped by multiple factors, including demographic characteristics, academic performance, socioeconomic status, employment expectations, and perceived preparedness for professional life.[6,7,10,11] Broader societal influences, such as economic instability, natural disasters, armed conflicts, and global pandemics, also play a critical role.[12] The coronavirus disease 2019 (COVID-19) pandemic, in particular, has amplified students' uncertainty regarding their education, career prospects, and overall future.[13]

In Türkiye, studies indicate that nursing students' future anxiety levels are notably high and are influenced by both systemic challenges in nursing education and regional geopolitical factors.[14,15] For example, students in conflict-affected areas or those involved in caring for displaced populations report heightened anxiety levels.[16] Additionally, career-related stressors, such as professional recognition, workplace safety, and communication within healthcare teams, further exacerbate anxiety.[17,18]

Despite the growing body of literature on nursing students' anxiety, few studies have comprehensively examined how clinical, educational, and societal factors collectively shape future anxiety, particularly within the Turkish context. Most existing research focuses on isolated variables or general stress, without exploring the nuanced interplay among professional readiness, social perception, and prior clinical experiences. Given the high levels

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of uncertainty reported by nursing students in Türkiye and the evolving challenges in nursing education, there is a pressing need for evidence that reflects these multidimensional influences. Therefore, this study aims to investigate the future anxiety levels of nursing students and identify key individual and contextual factors associated with heightened anxiety. The findings are expected to inform targeted interventions to enhance students' psychological resilience and professional preparedness.

Research Questions

1. What is the distribution of sociodemographic characteristics among the nursing students included in the study?
2. What are the future anxiety levels of the nursing students included in the study?
3. Do nursing students' future anxiety levels differ according to their sociodemographic characteristics?
4. What is the relationship between nursing students' sociodemographic characteristics and their future anxiety levels?

Materials and Methods

This descriptive study was conducted to examine the future anxiety levels of nursing students in relation to various variables.

Study Population and Sample

The study population consisted of students enrolled in the Nursing Department of the Faculty of Health Sciences at a university in Istanbul during the 2023–2024 academic year (N=345). The sample size was determined using the known population sampling method. At a 98% confidence level, the required sample size was calculated as 211 students.

Inclusion Criteria

- Being actively enrolled in the nursing department during the study period
- Voluntarily agreeing to participate in the study.

Exclusion Criteria

- Not providing consent for participation
- Incompletely completing the data collection forms.

Study Variables

The independent variables of the study were the sociodemographic characteristics of the nursing students. The dependent variable was the score obtained from the Future Anxiety Scale for University Students.

Instruments

Data were collected using the Personal Information Form and the Future Anxiety Scale for University Students.

Personal Information Form: A 22-item questionnaire designed to collect sociodemographic information.

Future Anxiety Scale for University Students: Developed by Geylani and Çiriş Yıldız,[19] this 19-item scale uses a 5-point Likert format and was validated through exploratory and confirmatory factor analyses. The scale consists of two subdimensions: *Fear of the Future* and *Hopelessness About the Future*. The total variance explained by the scale is 63.50%, and the internal consistency coefficient (Cronbach's alpha) is 0.91. Test-retest reliability was evaluated by administering the scale to the same group two weeks apart, yielding a significant correlation coefficient. Confirmatory factor analysis verified the two-factor structure. The minimum possible score on the scale is 13, the maximum is 65, and the midpoint is 39. Higher scores indicate greater future anxiety, whereas lower scores reflect lower anxiety levels. The Cronbach's alpha values obtained in this study were 0.85 for the total future anxiety scale, 0.85 for the *Fear of the Future* subdimension, and 0.90 for the *Hopelessness About the Future* subdimension.

Data Collection

The study data were collected between November 2023 and March 2024. Prior to participation, students were informed about the study and the data collection instruments and were asked to complete the forms. Completion of the data collection instruments took approximately 15–20 minutes. Data were collected face-to-face.

Data Analysis

The data were analyzed using IBM SPSS Statistics for Windows, version 25.0 (IBM Corp., Armonk, NY, USA). The selection of analysis techniques was based on the normality of the data distribution, which was assessed by examining skewness and kurtosis values. A normal distribution was assumed when these values fell within the range of ±2.[20] An independent samples t-test was used to compare future anxiety scale and subdimension scores according to gender and employment status. A one-way analysis of variance (ANOVA) was conducted to compare future anxiety scale and subdimension scores across various categorical variables, including year of study, economic status, housing situation, reasons for choosing nursing, post-graduation career plans, perceived ease of finding employment after graduation, perceptions of the adequacy of undergraduate education for career preparation, perceived readiness to practice the profession, satisfaction with societal perceptions of the profession, concerns regarding the misalignment between clinical and academic training, prior negative experiences in clinical practice, and perceived preparedness for working conditions in the profession. As post hoc analyses, the Games-Howell test, the Least Significant Difference (LSD) test, and the Tukey Honestly Significant Difference (Tukey HSD) test were applied where appropriate. To assess the relationship between age and future anxiety scale and subdimension scores, Spearman's correlation analysis was used. Additionally, Pearson's correlation analysis was performed to examine the relationship between grade point average (GPA) and future anxiety scale and subdimension scores. Statistical significance was set at $p<0.005$.

Ethical Considerations

Ethical approval for the study was obtained from the Ethics Committee of Istanbul Arel University (Approval Number: 2023/24, Date: 29.12.2023). Written informed consent was obtained from all participating students. Permission to use the Future Anxiety Scale for University Students was obtained from the original authors. The study was conducted in accordance with the Declaration of Helsinki.

Results

The participants had a mean age of 21.29 years and a mean grade point average of 3.00. Among them, 74.4% were female, 31.3% were second-year students, and 70.1% reported that their income was equal to their expenses. Additionally, 96.7% were single, 72% were not employed, and 60.2% lived with their families. Furthermore, 59.7% reported choosing the nursing department voluntarily, and 44.5% intended to pursue a nursing career after graduation (Table 1).

It was found that 74.4% of participants believed they would easily find a job after graduation, while 41.2% considered their undergraduate education sufficient to achieve their career goals. Additionally, 28.4% of participants felt ready to practice their profession, whereas 49.3% were dissatisfied with society's perception of the nursing profession. It was also determined that 57.8% had not experienced a negative experience during clinical practice, and 35.5% felt prepared for the working conditions of the profession. Regarding the impact of the COVID-19 pandemic, 54% of participants believed that their education during the pandemic was inadequate, and 34.1% stated that changes in the education system during the pandemic had affected their future plans. Furthermore, 59.7% of students reported following current events both globally and nationally; 50.7% followed news related to climate change, and 64% followed news about natural disasters (Table 1).

The mean future anxiety score was 2.85 (standard deviation [SD]: 0.55). The mean scores for the subdimensions *Fear of the Future* and *Hopelessness About the Future* were 2.96 (SD: 0.72) and 2.61 (SD: 0.81), respectively. Since the skewness and kurtosis values for the future anxiety scale and its subdimensions were within the range of ±2, the data were considered to be normally distributed (Table 2).

No significant relationship was found between future anxiety scores and age ($r=-0.10$, $p>0.05$) or grade point average ($r=-0.03$, $p>0.05$). However, a very strong positive correlation was observed between future anxiety scores and *Fear of the Future* ($r=0.89$, $p<0.01$), and a moderate positive correlation was found between future anxiety scores and *Hopelessness About the Future* ($r=0.45$, $p<0.01$). No significant relationship was found between *Fear of the Future* and *Hopelessness About the Future* scores ($r=-0.02$, $p>0.05$), nor between *Fear of the Future* scores and age ($r=-0.09$, $p>0.05$) or GPA ($r=-0.01$, $p>0.05$). Similarly, *Hopelessness About the Future* scores were not significantly correlated with age ($r=-0.08$, $p>0.05$) or GPA ($r=-0.03$, $p>0.05$). Additionally, no significant correlation was found between age and GPA ($r=-0.08$, $p>0.05$) (Table 3).

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Table 1. Opinions on profession and career (N=211)

Opinions	Yes		No		Partially		Neutral	
	n	%	n	%	n	%	n	%
Perceived ease of finding employment after graduation	157	74.4	8	3.8	35	16.6	11	5.2
Perceived sufficiency of undergraduate education for career preparation	87	41.2	43	20.4	60	28.4	21	10.0
Perceived readiness to practice the profession	60	28.4	48	22.7	81	38.4	22	10.4
Satisfaction with society's perception of the profession	50	23.7	104	49.3	29	13.7	28	13.3
Concerns regarding the misalignment between clinical training and academic education	88	41.7	30	14.2	61	28.9	32	15.2
Prior negative experiences during clinical practice	31	14.7	122	57.8	38	18.0	20	9.5
Perceived preparedness for the working conditions of the profession	75	35.5	44	20.9	52	24.6	40	19.0
Perceived adequacy of education received during the COVID-19 pandemic	38	18.0	114	54.0	30	14.2	29	13.7
Impact of changes in the education system during the pandemic on future career plans	72	34.1	62	29.4	57	27.0	20	9.5
Following current events nationally and globally	126	59.7	13	6.2	58	27.5	14	6.6
Following news related to climate change nationally and globally	107	50.7	21	10.0	63	29.9	20	9.5
Following news about natural disasters nationally and globally	135	64.0	7	3.3	54	25.6	15	7.1

Table 2. Descriptive statistics for future anxiety scale and subdimension scores among nursing students (N=211)

Future anxiety scale	Mean	SD	Min	Max	Skewness	Kurtosis
Future Anxiety	2.85	0.55	1.26	4.42	-0.08	0.41
Fear of the Future	2.96	0.72	1.00	5.00	0.15	0.59
Hopelessness About the Future	2.61	0.81	1.00	4.83	0.16	0.02

SD: Standard deviation.

Table 3. Correlations between age, grade point average, and future anxiety scale and subdimension scores among nursing students (N=211)

Future anxiety scale/age, GPA	Future Anxiety	Fear of the Future	Hopelessness About the Future	Age	Grade Point Average (GPA)
Future anxiety	1				
r					
Fear of the Future	0.89	1			
r	0.00*				
Hopelessness About the Future	0.45	-0.02	1		
r	0.00*	0.78			
Age	-0.10	-0.09	-0.08	1	
r	0.14	0.21	0.25		
Grade point average	-0.03	-0.01	-0.03	-0.08	1
r	0.68	0.84	0.63	0.28	

*: p<0.001. r: Pearson correlation, p: Spearman correlation.

No significant differences were observed in future anxiety scores based on gender, year of study, economic status, employment status, reasons for choosing nursing, perceived ease of finding employment after graduation, perceptions of the adequacy of undergraduate education for career preparation, satisfaction with society's perception of the profession, or concerns regarding the misalignment between clinical training and academic education (p>0.05) (Appendix 1).

However, a significant difference was found in future anxiety scores based on students' living arrangements. Students living with their families had higher future anxiety scores compared to those living with relatives (p<0.05). A significant difference was also observed according to post-graduation career plans; students who intended to pursue a nursing career had higher future anxiety scores than those planning an academic career (p<0.05) (Appendix 1).

Regarding perceived readiness to practice the profession, a significant difference was found in future anxiety scores. Students who did not feel ready to practice their profession had higher scores compared to those who felt ready or partially ready (p<0.05). A significant difference was also found based on prior negative experiences during clinical practice; students who had experienced negative incidents during clinical training had higher future anxiety scores than those who had not (p<0.05). Lastly, a significant difference was observed according to perceived preparedness for the working conditions of the profession, with students who did not feel prepared reported higher future anxiety scores compared to those who felt prepared (p<0.05) (Appendix 1).

No significant differences were observed in *Fear of the Future* scores based on gender, economic status, employment status, reasons for choosing nursing, post-graduation career plans, perceived ease of finding employment after graduation, perceptions of the adequacy of undergraduate education for career preparation, satisfaction with society's perception of the profession, concerns regarding the misalignment between clinical training and academic education, or perceived preparedness for working conditions (p>0.05) (Appendix 2).

However, a significant difference in *Fear of the Future* scores was found according to year of study, with third-year students reporting higher scores than fourth-year students (p<0.05). A significant difference was also observed based on living arrangements; students living with their families had higher *Fear of the Future* scores compared to those living with relatives (p<0.05). Regarding perceived readiness to practice the profession, a significant difference was found in *Fear of the Future* scores. Students who did not feel ready to practice their profession had higher scores compared to those who felt ready or partially ready (p<0.05). Additionally, a significant difference was observed based on prior negative experiences during clinical practice; students who had experienced negative incidents during clinical training reported higher *Fear of the Future* scores than those who had not (p<0.05) (Appendix 2).

No significant differences were observed in *Hopelessness About the Future* scores based on gender, year of study, economic status, employment status, living arrangements, reasons for choosing nursing, post-graduation career plans, perceived ease of finding employment after graduation, perceptions of adequacy of undergraduate education for career preparation, perceived readiness to practice the profession, prior negative experiences during clinical practice, or perceived preparedness for working conditions (p>0.05) (Appendix 3).

However, a significant difference was found in *Hopelessness About the Future* scores based on satisfaction with society's perception of the profession. Students who were satisfied with how society viewed the profession had lower hopelessness scores compared to those who were dissatisfied or uncertain (p<0.05). Additionally, a significant difference was observed in *Hopelessness About the Future* scores based on concerns regarding the misalignment between clinical training and academic education. Students who perceived this misalignment as concerning reported higher hopelessness scores than those who did not (p<0.05) (Appendix 3).

Discussion

The results of this study showed that nursing students experienced moderate levels of future anxiety. The *Fear of the Future* subscale scored slightly higher than the *Hopelessness About the Future* subscale, indicating that students' anxiety was more closely related to uncertainty than to outright hopelessness. Similar to our findings, Karaman and Karatepe[7] also reported moderate levels of future anxiety among nursing students. Consistent with our results, a study conducted with sports science students found similar levels of future anxiety and fear but reported significantly higher levels of hopelessness about the future.[21] Likewise, other studies conducted with university students have reported moderate levels of future anxiety.[22,23] Nursing students worldwide commonly experience future anxiety, characterized by persistent concerns about their careers and life after graduation. Recent studies indicate that anxiety levels among nursing and other healthcare students are strikingly high. For example, Macauley et al.[24] reported that 83% of healthcare students had above-normal state anxiety levels. Similarly, a meta-analysis found that approximately one-third of medical students experience anxiety disorders.[25] Another study[26] revealed that university students with high levels of future anxiety tend to demonstrate low levels of psychological flexibility and cognitive reappraisal, along with high levels of expressive suppression, depression, and stress. These findings show that concerns about the future are widespread among healthcare students. Elevated anxiety may negatively affect learning, academic performance, and overall well-being, making it a critical issue for university populations.[9]

The present study also found that third-year students reported higher *Fear of the Future* scores than fourth-year students. In contrast, Şanlı Kula and Saraç[23] reported no significant association between university students' future anxiety levels and their year of study. Research over the past decade suggests that anxiety about the future tends to increase as students progress through their education. One study reported that senior nursing students experienced significantly higher future anxiety compared to first-year students and noted that self-efficacy was higher in the early years but declined by the fourth year as anxiety about the upcoming career increased.[8] Similarly, a longitudinal study conducted in Türkiye that followed nursing students until graduation found that senior students reported more intense anxiety about their professional future than first-year students.[9] In the present study, students who intended to pursue a nursing career also reported higher levels of anxiety. As graduation approaches, students begin to anticipate assuming full professional responsibility, which may contribute to a decline in their mental well-being. Overall, the progression through nursing education appears to be associated with increased anxiety about the future, particularly among final-year students who are close to entering the workforce.[8] This pattern is consistent with qualitative findings indicating that the final phase of clinical training is perceived as one of the most anxiety-inducing periods in nursing education.[27]

As graduation nears, many students feel uncertain about their next steps, whether to begin working as nurses, pursue further education, or leave the profession altogether. Concerns about securing employment and intense competition for desirable positions further intensify anxiety.[4] Additionally, many students report low confidence in their practical skills, fearing that they may not be sufficiently competent or prepared for real clinical settings.[28] As awareness of these issues has increased, recent literature has increasingly examined how nursing and healthcare students manage future anxiety and career-related stress. Sönmez et al.[9] identified dissatisfaction with social activities, largely due to the demanding nature of health-related education limiting personal time, as a significant risk factor for adverse psychological outcomes. Regarding career stress, one study found that clinical clerkships play a critical role in helping students develop a clearer future work self-concept, thereby reducing career decision-making stress.[29]

In the present study, students living with their families were found to have higher levels of future anxiety. Another study that examined family-related factors in greater detail reported that students who experienced conflicts at home and required greater emotional support from their families had the highest anxiety scores.[30] This finding may be attributed to pressure stemming from family expectations, lack of emotional support, students' perceived lack of independence, and conflicting or stressful family environments, all of which may increase anxiety levels. In contrast to present findings, some studies have reported that students living with their families experienced lower levels of anxiety.[31,32] Strong perceived social support, close family ties, and reduced financial burden associated with living at home may help explain these results.

Consistent with previous research indicating that nursing students are highly concerned about society's insufficient respect for the profession,[5] present study showed that students who were satisfied with society's perception of nursing reported lower levels of *Hopelessness About the Future*. The societal image of a profession can directly influence professional preference. Enhancing the public image of nursing may be facilitated by nurses strengthening their communication skills and consistently demonstrating professional identity and behavior. However, individual efforts alone are insufficient. Nurses remain underrepresented in policymaking and leadership roles. Gender bias and societal stereotypes further contribute to this issue. Students' perceptions of these issues may, in turn, contribute to future anxiety.

In the present study, students who reported negative clinical experiences had higher *Fear of the Future* and overall future anxiety scores. One study found that nursing students encounter a wide range of anxiety-provoking situations during clinical internships.[33] Other studies have shown that problems experienced in clinical settings negatively affect anxiety levels.[34,35] Such negative experiences may lead students to question their professional competence and future success, thereby increasing fears about the future.

In the present study, a moderate positive correlation was observed between hopelessness scores and overall future anxiety. Previous research suggests that hope functions as a protective factor against anxiety and stress, with higher levels of hope associated with lower anxiety.[26,36–38] Similarly, a study conducted with dental and nursing students in Greece identified hope as the strongest predictor of psychological resilience.[36] Another finding of the present study was that students who were satisfied with society's perception of their profession reported lower hopelessness scores. This finding underscores the importance of extrinsic motivation and social support in shaping individuals' perceptions of the future. Another finding of the study was that students who were concerned about inconsistencies between clinical training and academic coursework reported higher hopelessness scores. This suggests that structural uncertainties within the educational process can weaken students' goal-oriented motivation. Similarly, a study conducted with older adults demonstrated that hope serves as a central mechanism in preventing spiritual exhaustion during periods of uncertainty.[38] These findings highlight the importance of incorporating hope-enhancing strategies into the curricula of future healthcare professionals.

The results indicate a critical need to implement targeted support measures aimed at strengthening nursing students' mental health and fostering resilience in the face of future uncertainties.

Study Limitations

The findings may have limited generalizability, as the study was conducted in the nursing department of a single university. Data were based on students' self-reported responses, which may be subject to recall and social desirability bias. In addition, the cross-sectional design limits causal interpretation.

Conclusion

Overall, this study highlights that academic stage, clinical experiences, concerns regarding the misalignment between clinical training and academic education, living arrangements, and societal perceptions of nursing are associated with future anxiety among nursing students. Supportive educational environments, strengthened clinical mentoring, and comprehensive integration of anxiety-related content into the curriculum may help reduce future anxiety and promote psychological well-being among nursing students. Furthermore, nursing curricula should extend beyond theoretical knowledge by incorporating structured training in psychological resilience, professional coping strategies, and hope-enhancement techniques. Such practical educational interventions may equip students with the tools necessary to manage clinical stressors effectively and bridge the gap between academic expectations and professional realities.

Ethics Committee Approval: The study was approved by the Istanbul Arel University Ethics Committee (Approval Number: 2023/24, Date: 29.12.2023).

Informed Consent: Written informed consent was obtained from all participating students.

Conflict of Interest: The authors have no conflicts of interest to declare.

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References

1. Deveci SE, Çalmaz A, Yasemin A. The relationship between anxiety level and health, social and demographical factors in the students of a newly established university in Eastern Anatolia. Dicle Med J. 2012;39(2):189–196. Turkish. [CrossRef]
2. American Psychological Association. Anxiety. https://www.apa.org/topics/anxiety Accessed February 26, 2026.
3. Zaleski Z. Future anxiety: concept, measurement, and preliminary research. Pers Individ Dif. 1996;21(2):165–174. [CrossRef]
4. Kim J, Oh J, Rajaguru V. Job-Seeking Anxiety and Job Preparation Behavior of Undergraduate Students. Healthcare (Basel). 2022;10(2):288. [CrossRef]
5. Dinç S, Yıldız Benlioğlu S, Metin Ö, Turpçu B, Çetin S, Aşçı M. Determining the Occupational and Future Anxiety of Karabuk University Nursing 4th Grade Students: A Qualitative Study. Unika Sag Bil Derg. 2021;1(3):168–179. Turkish.
6. Comparcini D, Tomietto M, Cicolini G, et al. Pre-registration nursing students' anxiety and academic concerns after the second wave of COVID-19 pandemic in Italy: A cross-sectional study. Nurse Educ Today. 2022;118:105520. [CrossRef]
7. Karaman M, Karatepe HK. The Effect of Future Anxiety on Career Optimism in Nursing. BONEYUSBAD. 2024;6(1):32–42. Turkish. [CrossRef]
8. Rabei S, Ramadan S, Abdallah N. Self-efficacy and future anxiety among students of nursing and education colleges of Helwan University. Middle East Curr Psychiatr. 2020;27:39. [CrossRef]
9. Sönmez Y, Akdemir M, Meydanlıoğlu A, Aktekin MR. Psychological distress, depression, and anxiety in nursing students: A longitudinal study. Healthcare (Basel). 2023;11(5):636. [CrossRef]
10. Curtis A, Brown L, Sagong H. Nursing students' perceptions of older adults, confidence, and anxiety level changes with their first clinical rotation: A descriptive pilot study. J Nurs Rep Clin Pract. 2024:2(3):136–140.
11. Shearer JN. Anxiety, Nursing Students, and Simulation: State of the Science. J Nurs Educ. 2016;55(10):551–554. [CrossRef]
12. Purnama A, Anindya I. Future anxiety and immune status in nursing students during COVID-2019 pandemic. J Keperawatan Indones. 2022;25(1):9–16. [CrossRef]
13. Cetinkaya S, Todil T, Kara M. Future anxiety and coping methods of nursing students during COVID-19 pandemic: A cross-sectional study. Medicine (Baltimore). 2022;101(9):e28989. [CrossRef]
14. Erkan FM, Kavak Budak F. The relationship between future anxiety and awareness of global climate change in nursing students. Int J Soc Psychiatry. 2025;71(7):1395–1399. [CrossRef]
15. Gülırmak Güler K, Albayrak Günday E. Nature-friendly hands: The relationship between nursing students' climate change anxiety, intolerance of uncertainty, and anxiety about the future. Public Health Nurs. 2024;41(6):1491–1502. [CrossRef]
16. Özdemir S, Sevinç S. Correlation between cultural competence, xenophobia, and attitudes towards brain drain in nursing students. Nurse Educ Today. 2023;131:105963. [CrossRef]
17. Jafarian-Amiri SR, Zabihi A, Qalehsari MQ. The challenges of supporting nursing students in clinical education. J Educ Health Promot. 2020;9:216. [CrossRef]
18. Yi L, Hu S, Liao M, et al. Prevalence and related factors of compassion fatigue among registered nurses and nursing students during the internship: a systematic review and meta-analysis. BMC Nurs. 2024;23(1):956. [CrossRef]
19. Geylani M, Çiriş Yıldız C. Development of "Future Anxiety Scale in University Students": Validity and Reliability Study. İnönü Üni SHMYOD. 2022;10(1):284–300. Turkish. [CrossRef]
20. George D, Mallery M. SPSS for Windows Step by Step: A Simple Guide and Reference, 17.0 Update. 10th ed. Allyn&Beacon;2010.
21. Koçeroğlu R, Karaduman B, Durmuş B, Ünlü Ç. The Impact of Academic Achievements of Sports Sciences Faculty Students on Levels of Hopelessness and Future Anxiety. GESD. 2024;3(1):1–12.
22. Ağır B, Buran A. The Mediating Role of Psychological Resilience in the Relationship Between Future Anxiety and Psychopathological Symptoms in University Students. SOBIDER. 2025;74(74):521–538. Turkish.
23. Şanlı Kula K, Saraç T. The future anxiety of the university students. HMKUSBED. 2016;13(33):227–242. Turkish.
24. Macauley K, Plummer L, Bemis C, Brock G, Larson C, Spangler J. Prevalence and predictors of anxiety in healthcare professions students. Health Prof Educ. 2018;4(3):176–185. [CrossRef]
25. Quek TT, Tam WW, Tran BX, et al. The Global Prevalence of Anxiety Among Medical Students: A Meta-Analysis. Int J Environ Res Public Health. 2019;16(15):2735. [CrossRef]
26. Öztekin GG, Gómez-Salgado J, Yıldırım M. Future anxiety, depression and stress among undergraduate students: psychological flexibility and emotion regulation as mediators. Front Psychol. 2025;16:1517441. [CrossRef]
27. Yi QF, Yan J, Zhang CJ, Yang GL, Huang H, Yang Y. The experience of anxiety among Chinese undergraduate nursing students in the later period of their internships: findings from a qualitative study. BMC Nurs. 2022;21(1):70. [CrossRef]
28. Lanahan M, Montalvo B, Cohn T. The Perception of Preparedness in Undergraduate Nursing Students During COVID-19. J Prof Nurs. 2022;42:111–121. [CrossRef]
29. Fris DAH, van Vianen AEM, Koen J, de Hoog M,de Pagter APJ. Medical students' career decision-making stress during clinical clerkships. Perspect Med Educ. 2022;11:350–358. [CrossRef]
30. Jaris NH, Razali S, Sham F, Anne SJ, Asih S, Ali IM. From home to campus: How family dynamics influence anxiety in Malaysian university students. Environ Behav Proc J. 2025;10(32):195–202. [CrossRef]
31. Makaremi A. Relation of depression and anxiety to personal and academic problems among Iranian college students. Psychol Rep. 2000;87(2):693–698. [CrossRef]
32. Ozen NS, Ercan I, Irgil E, Sigirli D. Anxiety prevalence and affecting factors among university students. Asia Pac J Public Health. 2010;22(1):127–133. [CrossRef]
33. Wang AH, Lee CT, Espin S. Undergraduate nursing students' experiences of anxiety-producing situations in clinical practicums: A descriptive survey study. Nurse Educ Today. 2019;76:103–108. [CrossRef]
34. Aydın Yıldırım T, Köktürk Dalcalı B. The effect of nursing students' problems in the clinical practice environment on anxiety level and motivation. Int J Caring Sci. 2020;13(3):2054–2063.
35. Sun FK, Phil ALD, Chiang CY, Yang CJ, Lu CY. Nursing graduates' lived experiences of anxiety during their final year at University: a phenomenological study. Nurse Educ Today. 2021;96:104614. [CrossRef]
36. Mangoulia P, Kanellopoulou A, Manta G, et al. Exploring the Levels of Stress, Anxiety, Depression, Resilience, Hope, and Spiritual Well-Being Among Greek Dentistry and Nursing Students in Response to Academic Responsibilities Two Years After the COVID-19 Pandemic. Healthcare (Basel). 2024;13(1):54. [CrossRef]
37. Kaya M, Bayram SS. Determining the impact of earthquakes on university students' hope and anxiety levels. Int J Disaster Risk Reduct. 2024;110(7):104637. [CrossRef]
38. Vural ME, Geçer H, Hacıkeleşoğlu H, Yıldırım M. Holding onto Hope in Times of Crisis: The Mediating Role of Hope in the Link Between Religious Motivation, Pandemic Burnout, and Future Anxiety Among Turkish Older Adults. Religions. 2025;16(6):666. [CrossRef]

Appendix 1. Comparison of future anxiety scores by categorical variables (N=211)

Categorical variables/future anxiety scale		n	Mean	SD	Test Stat.	p	Diff.
Sex	a. Female	157	2.87	0.53	T 1.161	0.25	-
	b. Male	54	2.77	0.60			
Year of study	a. 1st year	53	2.83	0.62			
	b. 2nd year	66	2.90	0.51	F 2.081	0.10	-
	c. 3rd year	29	3.01	0.58			
	d. 4th year	63	2.73	0.50			
Economic status	a. Income lower than expenses	39	2.84	0.51			
	b. Income equal to expenses	148	2.85	0.54	F 0.081	0.92	-
	c. Income higher than expenses	24	2.81	0.72			
Employment status	a. Employed	59	2.89	0.50	T 0.680	0.50	-
	b. Not employed	152	2.83	0.57			
Living Arrangements	a. Dormitory	62	2.79	0.48			
	b. Living with family	127	2.92	0.58	F 3.070	0.03*	c<b
	c. Living with a relative	10	2.50	0.44			
	d. Living with a friend	12	2.63	0.54			
Reason for choosing the nursing department	a. Family influence	35	2.74	0.53			
	b. Personal choice	126	2.83	0.58	F 1.640	0.20	-
	c. Employment opportunities	50	2.95	0.50			
Post-graduation career plans	a. Practice nursing	94	2.85	0.56			
	b. Do not plan to practice nursing	29	3.10	0.47	F 3.176	0.03*	d<b
	c. Work abroad	48	2.81	0.53			
	d. Pursue an academic career	40	2.70	0.56			
Perceived ease of finding employment after graduation	a. Yes	157	2.80	0.58			
	b. No	8	2.86	0.39	F 1.943	0.12	-
	c. Partially	35	3.05	0.46			
	d. Neutral	11	2.86	0.46			
Perceived sufficiency of undergraduate education for career preparation	a. Yes	87	2.86	0.49			
	b. No	43	2.78	0.69	F 0.227	0.88	-
	c. Partially	60	2.86	0.54			
	d. Neutral	21	2.85	0.53			
Readiness to practice the profession	a. Yes	60	2.76	0.53			
	b. No	48	3.08	0.56	F 4.398	0.01*	a, c<b
	c. Partially	81	2.76	0.51			
	d. Neutral	22	2.89	0.59			
Satisfaction with society's perception of the profession	a. Yes	50	2.74	0.52			
	b. No	104	2.86	0.64	F 0.978	0.40	-
	c. Partially	29	2.89	0.43			
	d. Neutral	28	2.94	0.35			
Concerns regarding the misalignment between clinical training and academic education	a. Yes	88	2.90	0.54			
	b. No	30	2.79	0.56	F 0.491	0.69	-
	c. Partially	61	2.80	0.60			
	d. Neutral	32	2.86	0.49			
Prior negative experiences during clinical practice	a. Yes	31	3.14	0.42			
	b. No	122	2.73	0.59	F 5.445	0.00*	b<a
	c. Partially	38	2.92	0.51			
	d. Neutral	20	2.95	0.29			
Preparedness for working conditions	a. Yes	75	2.78	0.63			
	b. No	44	3.06	0.47	F 2.865	0.04*	a<b
	c. Partially	52	2.79	0.48			
	d. Neutral	40	2.81	0.52			

*: p<0.05: Statistically significant at the 0.05 level. Diff: Difference, F: One-way analysis of variance (ANOVA), SD: Standard deviation, Test Stat.: Test statistics, T: Independent samples t-test.

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Appendix 2. Comparison of *Fear of the Future* scores by categorical variables (N=211)

Fear of the future/categorical variables		n	Mean	SD	Test Stat.	p	Diff.
Sex	a. Female	157	2.97	0.69	T 0.482	0.63	-
	b. Male	54	2.91	0.81			
Year of study	a. 1st year	53	2.93	0.94			
	b. 2nd year	66	3.01	0.59	F 3.069	0.03*	d<c
	c. 3rd year	29	3.25	0.71			
	d. 4th year	63	2.79	0.60			
Economic status	a. Income lower than expenses	39	2.93	0.71			
	b. Income equal to expenses	148	2.95	0.71	F 0.277	0.76	-
	c. Income higher than expenses	24	3.06	0.85			
Employment status	a. Employed	59	3.01	0.70	T 0.621	0.54	-
	b. Not employed	152	2.94	0.73			
Living arrangements	a. Dormitory	62	2.86	0.68			
	b. Living with family	127	3.06	0.74	F 2.956	0.03*	c<b
	c. Living with a relative	10	2.59	0.48			
	d. Living with a friend	12	2.65	0.75			
Reason for choosing the nursing department	a. Family influence	35	2.85	0.65			
	b. Personal choice	126	2.92	0.76	F 1.787	0.17	-
	c. Employment opportunities	50	3.12	0.66			
Post-graduation career plans	a. Practice nursing	94	2.96	0.78	F 1.381	0.25	-
	b. Do not plan to practice nursing	29	3.19	0.69			
	c. Work abroad	48	2.90	0.63			
	d. Pursue an academic career	40	2.85	0.70			
Perceived ease of finding employment after graduation	a. Yes	157	2.92	0.76			
	b. No	8	2.85	0.31	F 0.688	0.56	-
	c. Partially	35	3.11	0.67			
	d. Neutral	11	3.00	0.51			
Perceived sufficiency of undergraduate education for career preparation	a. Yes	87	2.99	0.71			
	b. No	43	2.89	0.93	F 0.212	0.89	-
	c. Partially	60	2.94	0.61			
	d. Neutral	21	3.00	0.63			
Readiness to practice the profession	a. Yes	60	2.83	0.77			
	b. No	48	3.24	0.76	F 3.634	0.01*	a, c<b
	c. Partially	81	2.87	0.63			
	d. Neutral	22	3.00	0.69			
Satisfaction with society's perception of the profession	a. Yes	50	2.93	0.76			
	b. No	104	2.94	0.80	F 0.089	0.97	-
	c. Partially	29	3.00	0.54			
	d. Neutral	28	2.99	0.52			
Concerns regarding the misalignment between clinical training and academic education	a. Yes	88	2.93	0.72			
	b. No	30	3.07	0.79	F 0.285	0.84	-
	c. Partially	61	2.95	0.77			
	d. Neutral	32	2.94	0.59			
Prior negative experiences during clinical practice	a. Yes	31	3.25	0.70			
	b. No	122	2.83	0.78	F 3.273	0.02*	b<a
	c. Partially	38	3.06	0.65			
	d. Neutral	20	3.03	0.31			
Preparedness for working conditions	a. Yes	75	2.92	0.87			
	b. No	44	3.18	0.63	F 1.915	0.13	-
	c. Partially	52	2.88	0.62			
	d. Neutral	40	2.87	0.59			

*: p<0.05: Statistically significant at the 0.05 level. Diff: Difference, F: One-way analysis of variance (ANOVA), SD: Standard deviation, Test Stat.: Test statistics, T: Independent samples t-test.

Appendix 3. Comparison of *Hopelessness About the Future* scores by categorical variables (N=211)

Hopelessness about the future/categorical variables		n	Mean	SD	Test Stat.		p	Diff.
Sex	a. Female	157	2.66	0.78	T	1.578	0.12	-
	b. Male	54	2.46	0.88				
Year of study	a. 1st year	53	2.62	1.09				
	b. 2nd year	66	2.66	0.70	F	0.324	0.81	-
	c. 3rd year	29	2.48	0.65				
	d. 4th year	63	2.60	0.70				
Economic status	a. Income lower than expenses	39	2.64	0.80				
	b. Income equal to expenses	148	2.66	0.78	F	2.513	0.08	-
	c. Income higher than expenses	24	2.26	0.90				
Employment status	a. Employed	59	2.63	0.82	T	0.266	0.79	-
	b. Not employed	152	2.60	0.80				
Living arrangements	a. Dormitory	62	2.64	0.82				
	b. Living with family	127	2.62	0.83	F	0.527	0.66	-
	c. Living with a relative	10	2.30	0.68				
	d. Living with a friend	12	2.58	0.58				
Reason for choosing the nursing department	a. Family influence	35	2.50	0.82				
	b. Personal choice	126	2.64	0.84	F	0.442	0.64	-
	c. Employment opportunities	50	2.60	0.72				
Post-graduation career plan	a. Practice nursing	94	2.61	0.87				
	b. Do not plan to practice nursing	29	2.91	0.63	F	2.599	0.053	-
	c. Work abroad	48	2.63	0.85				
	d. Pursue an academic career	40	2.37	0.63				
Perceived ease of finding employment after graduation	a. Yes	157	2.53	0.81				
	b. No	8	2.90	0.80	F	2.576	0.06	-
	c. Partially	35	2.91	0.82				
	d. Neutral	11	2.56	0.48				
Perceived sufficiency of undergraduate education for career preparation	a. Yes	87	2.59	0.84				
	b. No	43	2.55	0.79	F	0.468	0.71	-
	c. Partially	60	2.71	0.81				
	d. Neutral	21	2.51	0.72				
Readiness to practice the profession	a. Yes	60	2.61	0.95	F	0.814	0.49	-
	b. No	48	2.75	0.73				
	c. Partially	81	2.52	0.77				
	d. Neutral	22	2.64	0.69				
Satisfaction with society's perception of the profession	a. Yes	50	2.32	0.79				
	b. No	104	2.68	0.85	F	3.163	0.03*	b, d>a
	c. Partially	29	2.64	0.70				
	d. Neutral	28	2.83	0.68				
Concerns regarding the misalignment between clinical training and academic education	a. Yes	88	2.82	0.81				
	b. No	30	2.19	0.82	F	5.822	0.00*	b<a
	c. Partially	61	2.46	0.75				
	d. Neutral	32	2.68	0.71				
Prior negative experiences during clinical practice	a. Yes	31	2.90	0.82				
	b. No	122	2.51	0.89	F	2.318	0.08	-
	c. Partially	38	2.61	0.60				
	d. Neutral	20	2.77	0.44				
Preparedness for working conditions	a. Yes	75	2.47	0.94				
	b. No	44	2.79	0.67	F	1.637	0.18	-
	c. Partially	52	2.60	0.70				
	d. Neutral	40	2.69	0.77				

*: p<0.05: Statistically significant at the 0.05 level. Diff: Difference, F: One-way analysis of variance (ANOVA), SD: Standard deviation, Test Stat.: Test statistics, T: Independent samples t-test.

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The Impact of Simulation-Based Postoperative Pain Management Education on Nursing Students: A Quasi-Experimental Study

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Abstract

Background: Undergraduate nursing programs commonly include pain management education. However, studies indicate that nursing curricula often do not provide sufficient content and effective instructional methods to adequately prepare students for managing patients' pain. Simulation-based education offers experiential learning opportunities and is recognized as an effective strategy for enhancing learning outcomes.

Aim: This study aimed to compare the effects of simulation-based education and traditional instruction on nursing students' knowledge, attitudes, and self-efficacy related to postoperative pain management.

Methods: A quasi-experimental, comparative research design was employed. Students were assigned to groups based on the last digit of their student identification number. A total of 103 students participated in the study. Data were collected using the Descriptive Information Form, the Knowledge and Attitudes Survey Regarding Pain, and the Pain Management Self-Efficacy Scale. The educational program lasted four weeks and covered key topics in postoperative pain management. In addition to traditional instruction, the experimental group received high-fidelity simulation training. Data were analyzed using the independent samples t-test, Mann-Whitney U test, and Wilcoxon signed-rank test.

Results: The mean age of participants in both groups was 21 years. In response to the item "Participants' Opinions on the Effectiveness Level of Nurses in Pain Management," 68.6% of the experimental group and 71.2% of the control group rated it as "Effective." The experimental group demonstrated significantly higher scores in knowledge and attitudes toward postoperative pain management compared to the control group. However, no significant difference was observed between the groups in terms of self-efficacy. Notably, both groups showed an increase in self-efficacy levels over time.

Conclusion: Simulation-based training enhances knowledge and attitudes related to postoperative pain management; however, it does not produce short-term improvements in self-efficacy. Future research should investigate the long-term effects of simulation-based education on clinical competence.

Keywords: High-fidelity simulation training, nursing education, nursing student, postoperative pain, simulation

Introduction

Pain is defined as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage," according to the International Association for the Study of Pain (IASP).[1] However, due to its inherently subjective nature, pain assessment remains challenging, as individuals may perceive and express pain differently.[2,3] Generally, pain arises from any stimulus that causes or has the potential to cause tissue damage. In addition, it functions as a warning mechanism, alerting individuals to pathological conditions in the body and enabling them to avoid harmful stimuli or pathogens. However, when this intrinsic warning system malfunctions and pain becomes chronic, it may evolve into a debilitating condition, exerting adverse effects on both physical health and psychological well-being.[2] Among the various types of pain, postoperative pain remains one of the most common and clinically significant challenges encountered in hospital settings. To prevent pain-related complications, it is essential to ensure that postoperative pain management is delivered appropriately, effectively, and with timely interventions.[3]

Given their continuous and close contact with patients, nurses are uniquely positioned to implement effective postoperative pain management strategies. These strategies are not only vital for patient comfort but also serve as indicators of the quality of care provided. Effective postoperative pain management reduces existing pain, accelerates recovery, shortens hospital stays, and improves quality of life and patient satisfaction.[4,5] However, numerous studies in the literature suggest that nurses often lack sufficient knowledge regarding pain management and may hold inappropriate attitudes toward it.[4,7] These gaps in nurses' knowledge and attitudes underscore the importance of undergraduate nursing education as a foundational stage for developing effective pain management competencies.

Undergraduate nursing programs commonly include pain management education. However, studies indicate that nursing curricula frequently do not provide sufficient depth or scope to adequately prepare students for effective pain management.[8,9] Enhancing nursing students' understanding of this topic is essential for promoting effective pain management practices in both clinical training and professional practice. Research examining the impact of pain education has demonstrated positive effects on nursing students' knowledge, attitudes

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toward pain management, and self-efficacy.[10] Despite the recognized importance of knowledge, attitudes, and self-efficacy in effective postoperative pain management, traditional didactic teaching methods may be insufficient to fully support the development of these competencies in nursing students. Postoperative pain management requires not only cognitive understanding but also clinical judgment, confidence, and the ability to apply knowledge in complex and dynamic patient situations. Educational approaches that rely primarily on theoretical instruction may limit opportunities for experiential learning, reflective practice, and the integration of cognitive and affective skills essential for effective pain management. Such limitations may influence not only students' knowledge levels but also their confidence in applying this knowledge in clinical settings. Consequently, self-efficacy emerges as a central construct in postoperative pain management education.

Bandura[11] conceptualized self-efficacy as individuals' beliefs in their capability to organize and execute the actions required to achieve specific goals. According to this theory, individuals' behaviors and performance vary based on their perceived level of self-efficacy, with lower self-efficacy often associated with reduced motivation and diminished self-confidence.[12] Within Bandura's framework,[11] self-efficacy is regarded as a dynamic construct that develops through learning and experience. Importantly, it is shaped by four principal sources: mastery experiences, vicarious experiences, verbal persuasion, and physiological and affective states. Simulation-based education is particularly well aligned with these sources. First, simulation provides mastery experiences by enabling nursing students to actively perform postoperative pain assessment and management interventions in a realistic yet controlled environment. Second, vicarious experiences are supported through exposure to modeled clinical practices embedded in standardized simulation scenarios, allowing students to observe and internalize effective pain management behaviors. Third, verbal persuasion is facilitated through immediate, structured feedback and guided debriefing processes that reinforce learners' confidence in their clinical capabilities. Finally, simulation enables students to experience and reinterpret physiological and emotional responses, such as stress or anxiety, within a safe learning environment, thereby reducing negative self-appraisals and strengthening adaptive efficacy beliefs. Through these mechanisms, simulation-based education is theoretically positioned as a more effective approach than traditional didactic instruction for enhancing nursing students' self-efficacy in postoperative pain management.[11]

In this context, providing nursing students with targeted education and structured guidance in pain management may contribute not only to improved knowledge but also to greater confidence in assessing and managing postoperative pain. Therefore, examining the effects of simulation-enhanced education on nursing students' knowledge, attitudes, and self-efficacy related to postoperative pain management is essential for informing evidence-based educational strategies and improving the quality of pain management in clinical practice.

Hypotheses

This study tested the following hypotheses:

H_1: There is a difference between the experimental and control groups in terms of students' knowledge and attitudes regarding postoperative pain management.

H_2: There is a difference between the experimental and control groups in terms of students' perceived self-efficacy regarding postoperative pain management.

Materials and Methods

Study Design and Setting

This study employed a quasi-experimental design. It compared the effects of traditional postoperative pain education alone with those of traditional education combined with simulation-based training among students enrolled in the Surgical Nursing course. The study was conducted during the 2023–2024 academic year in the nursing faculty of a public university located in northwestern Türkiye. Data collection took place between April and June 2024. Participants were recruited at the beginning of the semester, and outcome assessments were conducted upon completion of the intervention phase. The study was completed as planned without premature termination or major modifications to the design. The manuscript was prepared in accordance with the TREND (Transparent Reporting of Evaluations with Nonrandomized Designs) reporting guidelines.

Study Sample

Students enrolled in the Surgical Nursing course were invited to participate in the study. Although the intervention was conducted outside the formal course curriculum, only students registered for the Surgical Nursing course during the study period were eligible, as prior completion of this course was considered an exclusion criterion. The inclusion criteria were: a) enrollment in the Surgical Nursing course for the first time, b) no prior education on postoperative pain management, and c) provision of written informed consent before participation.

To determine the sample size, G*Power 3.1 software was used. To estimate the effect size, we calculated the mean effect size derived from previous quasi-experimental studies investigating similar interventions in nursing education.[13–15] Using this average effect size, a power analysis was conducted with α=0.05 and ß=0.80, indicating that a minimum of 35–40 participants per group would be sufficient to detect a meaningful effect. However, to increase statistical power, enhance the reliability of the results, and improve the generalizability of the findings, we aimed to include all eligible students enrolled in the Surgical Nursing course. Of the 120 students registered for the course,[13] were excluded because they were repeating the course, and 4 declined to participate due to time constraints. A total of 103 nursing students who met the inclusion criteria were recruited and included in the final analysis (Experimental=51; Control=52). The experimental group received both Postoperative Pain Education and Simulation Training, whereas the control group received only Postoperative Pain Education. The intervention was completed by all participants, and no attrition occurred during the study period.

Randomization and Allocation

Assignment to the experimental and control groups were not performed using a true randomization procedure. Instead, students were allocated based on the last digit of their student identification number: those with even numbers were assigned to one group, and those with odd numbers were assigned to the other. As this allocation method does not constitute full randomization, the study is classified as quasi-experimental.[16] Accordingly, no blinding procedures were implemented, and both participants and researchers were aware of group assignments. To minimize potential bias, data analysis was conducted by an independent biostatistician who was blinded to group allocation.

Data Collection Tools

Student Description Form: This form consisted of three questions assessing the sociodemographic characteristics of nursing students (age and gender) and their perspectives on the effectiveness of nurses in pain management.

Knowledge and Attitudes Survey Regarding Pain (NKASRP): Originally developed by Ferrell et al.,[17] this instrument was designed to measure nurses' knowledge and attitudes regarding pain management. The Turkish version, validated and tested for reliability by Yıldırım et al.,[18] consists of 39 items assessing knowledge of pain control as well as attitudes toward pharmacological and non-pharmacological pain management strategies. Of these items, 22 are in a true/false format,[14] are multiple-choice, and 2 are case-based items, each containing two sub-questions. Each correct response was scored as 1 point, whereas incorrect or unanswered items were scored as 0. The minimum possible score on the scale is 0, and the maximum is 39. Higher scores indicate a more accurate understanding of and more appropriate attitudes toward pain management.[18] In the present study, the Cronbach's alpha coefficient for this scale was 0.50. Although this value is relatively low, Cronbach's alpha assumes a unidimensional and internally consistent scale structure. The NKASRP comprises heterogeneous item formats and multiple content domains designed to assess knowledge and attitudes related to pain management rather than a single latent construct, which may limit the suitability of Cronbach's alpha as the sole indicator of internal consistency.[19]

Pain Management Self-Efficacy Scale (PMSEQ): The scale was originally developed by Macindo et al.[20] and subsequently adapted into Turkish and validated by Aydın Sayılan et al.[21] It consists of 21 items grouped into three subscales: 14 items under "Comprehensive Pain Management Self-Efficacy," 4 under "Assessment Pain Management Self-Efficacy," and 3 under "Supportive Pain Management Self-Efficacy." Responses are rated on a 6-point Likert scale ranging from 0 ("not confident at all") to 5 ("completely confident"). Total and subscale scores are calculated by summing the item scores, with all items positively worded.[20,21] In our study, the Cronbach's alpha coefficient for the PMSEQ was 0.94.

Table 1. Postoperative pain management training program

Postoperative pain management training program	Content	Learning Outcomes
- Day 1 - Duration: 40 minutes	- What is pain? - Physiology of pain - Types of pain	- Understanding the fundamental definition and mechanisms of pain - Gaining knowledge about the physiological processes involved in pain - Identifying and distinguishing between different types of pain
- Day 2 - Duration: 40 minutes	- What is postoperative pain? - Why is postoperative pain management important? - Assessment of postoperative pain - Scales used in the assessment of postoperative pain	- Understanding the characteristics and importance of postoperative pain management - Learning methods for assessing postoperative pain - Developing the ability to recognize and use pain assessment scales
- Day 3 - Duration: 40 minutes	- Approach to patients with postoperative pain - Treatment of postoperative pain - Pharmacological and non-pharmacological methods used in postoperative pain management	- Developing an appropriate approach to patients experiencing postoperative pain - Differentiating between pharmacological and non-pharmacological treatment methods for postoperative pain - Formulating an effective pain management plan
- Day 4 - Duration: 40 minutes	- Evaluation of pain treatment - Discharge education	- Assessing the effectiveness of pain management interventions - Providing patient education on pain management at discharge - Promoting patient awareness of pain management during the postoperative period
- Teaching strategies	- Lecture - PowerPoint presentation - Group discussion and feedback	

Intervention

During the course registration week, researchers invited students to participate in the study. It was clearly stated that participation was voluntary and would not affect academic evaluations. After obtaining written informed consent, students were assigned to their respective groups. In the first session, students in both groups completed the Student Description Form and the Pain Management Self-Efficacy Scale. All students received postoperative pain management training at a scheduled time.

Both groups participated in a standardized four-week theoretical education program on postoperative pain management, delivered through lectures covering pain assessment, pharmacological and non-pharmacological interventions, and nursing responsibilities (Table 1). Students in the control group received no additional educational intervention beyond this theoretical training. In contrast, students in the experimental group participated in an individual simulation-based training session focused on postoperative pain management. The simulation was conducted using a high-fidelity patient simulator and followed a predefined clinical scenario designed to reinforce pain assessment, intervention selection, and clinical decision-making skills. Each simulation session was delivered individually and followed a standardized sequence consisting of scenario implementation and structured debriefing. The duration and content of the simulation sessions were consistent for all participants. Post-test assessments were conducted one week after completion of the theoretical education in the control group and one week after the simulation session in the experimental group to ensure equivalent timing between the intervention and outcome measurement (Fig. 1).

Intervention Fidelity

To ensure intervention fidelity, all students in the experimental group participated in individual simulation sessions based on a single predefined postoperative pain management scenario. The same scenario structure, learning objectives, clinical cues, and expected nursing interventions were applied consistently across all 52 simulation sessions. Each session followed an identical implementation framework, including standardized scenario delivery and structured debriefing. A uniform feedback protocol was used for all participants, focusing on pain assessment, selection of appropriate interventions, and clinical decision-making in postoperative pain management.

All simulation sessions were facilitated by the same researchers throughout the study. Prior to data collection, calibration meetings were conducted to standardize scenario delivery, student guidance, and feedback procedures, thereby minimizing inter-session variability. The Pain Management Self-Efficacy Scale and the Knowledge and Attitudes Survey Regarding Pain were administered one week after completion of the respective educational interventions in both groups, ensuring consistency in the time interval between intervention exposure and outcome assessment.

Data Analysis

Data were analyzed using SPSS version 25.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics included means, standard deviations, frequencies, percentages, medians, and minimum and maximum values. The normality of data distribution was assessed using histogram visualizations and the Kolmogorov-Smirnov test. Between-group differences were examined using the independent samples t-test and the Mann-Whitney U test, depending on the normality assumption. Within-group changes for continuous variables were evaluated using the Wilcoxon signed-rank test. Statistical significance was set at $p<0.05$ for all analyses.

Ethical Considerations

Ethical approval for the study was obtained from Kastamonu University Non-interventional Ethics Committee (Approval Number: 2024-KAEK-47, Date: 06.03.2024), along with administrative permission from the faculty dean's office. Participation was voluntary, and students were assured that their involvement would not affect their academic evaluations or examination outcomes. Prior to participation, written informed consent was obtained from all participants, who were informed of their right to withdraw from the study at any time without penalty or academic disadvantage. The study was conducted in accordance with the Declaration of Helsinki.

Results

The mean age of participants in both groups was 21 years. In the experimental group, 66.7% of participants were female, while 65.4% of the control group were female. In response to the item "Participants' Opinions on the Effectiveness Level of Nurses in Pain Management," 68.6% of the experimental group and 71.2% of the control group rated nurses as "Effective." Statistical analysis revealed no significant differences between the groups in this perception or in other descriptive variables ($p>0.05$) (Table 2).

The mean pre-test PMSEQ scores were 78.98 (11.77) in the simulation (experimental) group and 77.13 (13.54) in the traditional education (control) group. Post-test mean PMSEQ scores were 84.90 (14.09) for the experimental group and 83.55 (11.26) for the control group. Between-group analysis did not demonstrate a statistically significant difference in PMSEQ scores. The difference in post-test PMSEQ scores between groups was negligible (Cohen's $d=0.11$, 95% confidence interval (CI) [−0.28, 0.50]). Regarding NKASRP scores, students in the simulation group achieved higher mean scores than those in the traditional education group (23.25 (3.09) vs. 21.63 (4.36), respectively). This difference was statistically significant ($p=0.032$) and corresponded to a moderate effect size (Cohen's $d=0.34$, 95% CI [−0.05, 0.73]) (Table 3).

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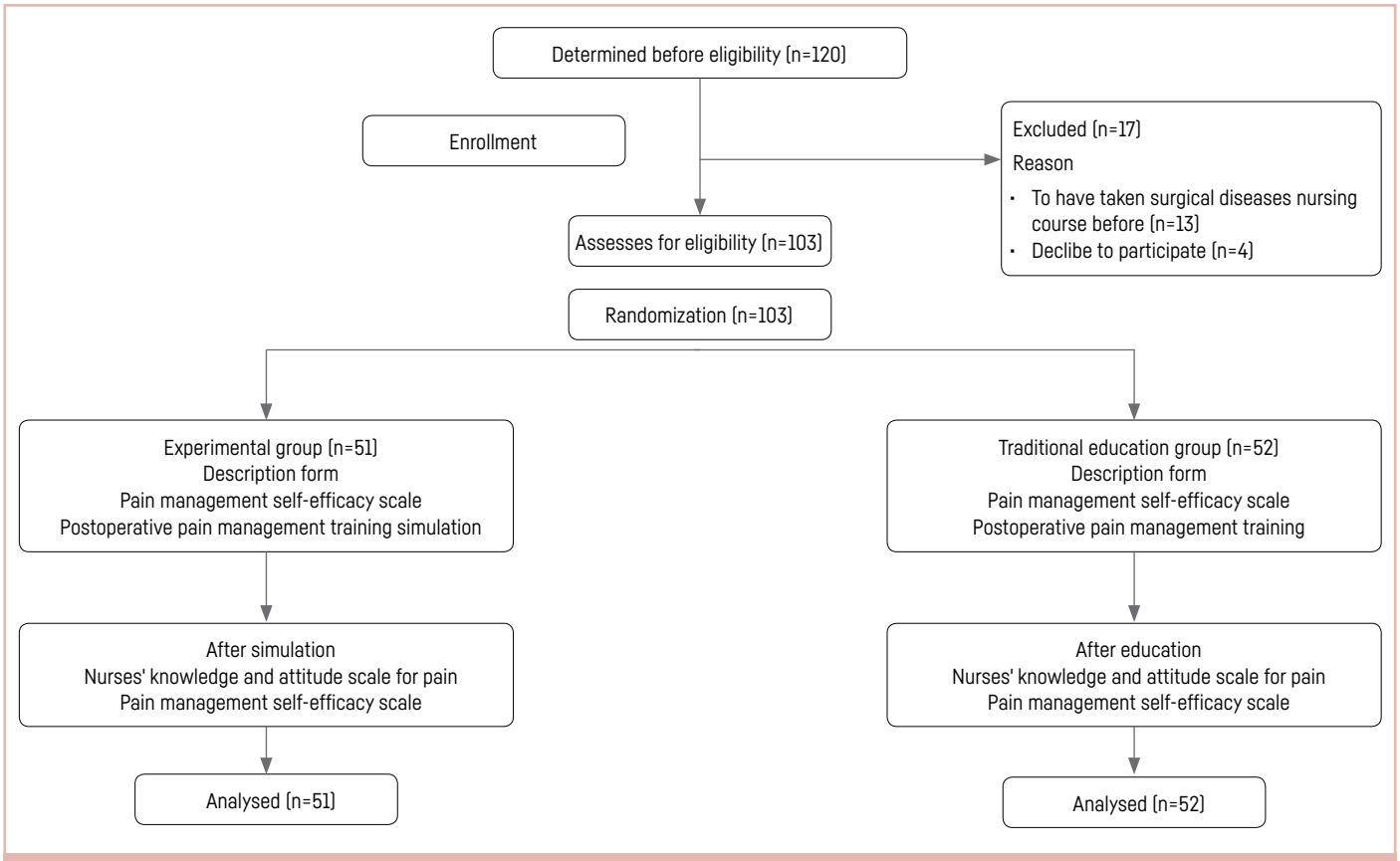

Figure 1. Study flowchart.

Table 2. Participants' characteristics

Characteristics	Experimental group (n=51)	Control group (n=52)	p
Age (mean (SD))	21.02 (1.46)	20.79 (1.47)	0.80*
	n (%)	n (%)	
Sex			0.89**
Male	17 (33.3)	18 (34.60)	
Female	34 (66.7)	34 (65.40)	
Participants' opinions on the effectiveness of nurses in pain management			0.11**
Less effective	2 (3.9)	7 (13.5)	
Effective	35 (68.6)	37 (71.2)	
Very effective	14 (27.5)	8 (15.4)	

*: Pearson's chi square test, **: Independent samples t-test. n: Frequency, %: Percentage, SD: Standard deviation.

Table 3. Comparison of pain management self-efficacy and knowledge-attitude mean scores between groups

Scale	Experimental group (n=51)		Control group (n=52)		Z	p
	Mean (SD)	Median (Min-Max)	Mean (SD)	Median (Min-Max)		
Pain management self-efficacy scale pre-test	78.98 (11.77)	80 (54–103)	77.13 (13.5)	76 (42–101)	-0.825*	0.41
Pain management self-efficacy scale post-test	84.90 (14.09)	85 (51–104)	83.55 (11.26)	83 (55–102)	-0.888*	0.37
Mean difference (% change)	+5.92 (+7.5%)		+6.42 (+8.3%)			
Knowledge and attitudes regarding pain scale	23.25 (3.09)	23 (18–31)	21.63 (4.36)	22 (22–31)	2.176**	**0.032**

*: Mann–Whitney U test, **: Independent samples t-test. SD: Standard deviation.

Table 4. Within-group comparison of pre-test and post-test mean scores on the pain management self-efficacy Scale in the experimental and control groups

Scale	Experimental group (n=51)		Control group (n=52)	
	Z	p	Z	p
Pain management self-efficacy scale pre-test vs. post-test	-3.086*	**0.002**	-3.916*	**<0.001**

*: Wilcoxon test.

Although no significant difference was found between the groups in terms of PMSEQ scores, both the experimental (p=0.002) and control (p<0.001) groups demonstrated significant within-group improvements from pre-test to post-test (Table 4).

Discussion

This study aimed to evaluate the comparative effectiveness of different educational modalities on nursing students' pain management self-efficacy and clinical knowledge and attitude. The parity observed between the groups in self-efficacy improvements suggests that any structured educational intervention can enhance a student's perceived capability. However, the distinct advantage of the simulation group in knowledge and attitudes underscores a potential gap between 'feeling confident' and 'being clinically informed.' These results imply that while traditional methods may suffice for building self-assurance, simulation-based training is a more robust catalyst for rectifying misconceptions and internalizing evidence-based pain management principles.

Direct comparisons of traditional and simulation-based education in relation to PMSEQ outcomes are scarce. Nevertheless, the present findings should be interpreted in light of previous studies examining self-efficacy outcomes in nursing education.[22,23] For instance, Mohamed and Fashafsheh[22] reported a marked increase in nursing students' self-efficacy following simulation-based training. Similarly, Kim[23] found that simulation-based practical education enhanced nursing students' self-efficacy levels. Simulation provides students with opportunities to engage in realistic clinical scenarios, thereby strengthening problem-solving and clinical decision-making skills; as these competencies develop, corresponding increases in perceived self-efficacy may occur.[24] As these skills improve, an increase in perceived self-efficacy may be observed.[11] In this study, although both the experimental and control groups demonstrated significant increases in PMSEQ mean scores, between-group comparisons revealed no statistically significant difference in PMSEQ scores, indicating comparable effects across the two educational approaches. This finding suggests that simulation-based training may not confer a distinct short-term advantage over traditional instruction in terms of pain management self-efficacy. According to Bandura,[11] sustained improvements in self-efficacy require repeated mastery experiences, opportunities for autonomous performance, and continuous reinforcement over time. In the present study, simulation was delivered as a time-limited educational component, which may have been sufficient to enhance knowledge and attitudes but insufficient to produce a distinct advantage in self-efficacy beyond that achieved through theoretical instruction alone. Thus, the absence of a between-group difference in self-efficacy should not be interpreted as a contradiction of Bandura's theory;[11] rather, it may indicate that the development of self-efficacy requires more prolonged and repeated experiential learning opportunities than those provided within the scope of this intervention. Indeed, previous studies in the literature suggest that repeated simulation experiences can enhance students' self-efficacy levels over the long term.[25,26] Shin et al.[27] reported that students initially experienced difficulties when exposed to active learning and simulation-based approaches; however, as they became more familiar with these methods, improvements in skill performance and learning engagement were observed.

In contrast to the self-efficacy findings, the present study demonstrated a clear advantage of simulation-based education over traditional instruction in terms of pain-related knowledge and attitudes, as reflected by significantly higher NKAS-RP scores. Although limited, existing literature comparing traditional and simulation-based education in relation to nursing students' pain-related knowledge and attitudes supports these findings. For example, in evaluating the effects of simulation training on knowledge and attitudes related to pain, Tawalbeh[14] found that integrating simulation into both theoretical and clinical curricula had a more pronounced impact on nursing students' competence and confidence in performing critical tasks than traditional education alone. Similarly, Salameh et al.[28] demonstrated that high-fidelity simulation significantly outperformed traditional methods in enhancing students' clinical knowledge, critical thinking, and decision-making skills in a cohort of 151 nursing students. Simulation-based learning has also been shown to influence learners' affective orientations and attitudes toward clinical practice. The observed improvement in attitudes toward pain management in the simulation group may be attributed to the experiential and affective components of simulation-based learning. Unlike traditional instruction, simulation requires active engagement in realistic clinical scenarios, thereby promoting emotional involvement, reflection, and perspective-taking. Previous research has shown that immersive and virtual simulation environments enhance learning presence and self-directed learning, both of which are closely associated with more positive learning attitudes and greater affective engagement among nursing students.[29]

In pain management education, simulated clinical encounters may help students internalize patients' pain experiences, foster empathy, and reconsider preconceived beliefs about pain assessment and control.[30] Consequently, simulation-based education may facilitate attitudinal change by bridging cognitive understanding with emotional experience, which may explain the higher attitude-related outcomes observed in the simulation group. Although empirical studies specifically examining attitudes toward pain in the context of simulation-based learning are few in number, the literature generally emphasizes the potential of high-quality simulation to promote positive attitudinal change among students.[31,32] The findings of the present study are consistent with the existing literature.

Limitations

This study has several limitations. First, the sample consisted solely of nursing students from a single university, which may limit the generalizability of the findings to other educational settings and student populations. Second, outcomes were assessed only in the short term following the educational interventions; therefore, the sustainability of changes in self-efficacy, knowledge, and attitudes toward pain management could not be evaluated.

Conclusion and Recommendations

The differential effects observed across outcome domains highlight the distinct ways in which simulation-enhanced education may contribute to the development of nursing competence. While simulation appears particularly effective in strengthening knowledge and attitudinal aspects of pain management, self-efficacy may represent a more stable construct that requires sustained experiential exposure to change meaningfully. These findings suggest that simulation-supported learning may primarily facilitate knowledge integration and attitudinal refinement in the short term, whereas perceptions of self-efficacy may evolve more gradually through repeated and prolonged clinical engagement.

Importantly, the implications of these findings extend beyond undergraduate nursing education. Given the complexity and dynamic nature of pain management in clinical practice, simulation-based education offers a valuable platform not only for students but also for practicing nurses. By providing opportunities for experiential learning, reflective practice, and clinical decision-making within a controlled and low-risk environment, simulation may support the ongoing development of professional competence and confidence in pain management across different career stages.

To advance understanding of the durability and progression of learning outcomes associated with simulation-enhanced education, future research should employ longitudinal designs that assess changes over extended periods. Investigating the long-term impact of repeated and sustained simulation exposure may provide important insights into its role in promoting enduring knowledge retention, skill maintenance, and effective transfer of competencies to real-world clinical settings. Larger, randomized, and multi-site studies comparing diverse educational strategies would further strengthen the evidence base and inform the optimization of undergraduate nursing curricula as well as continuing professional development programs.

Ethics Committee Approval: The study was approved by the Kastamonu University Non-interventional Ethics Committee (Approval Number: 2024-KAEK-47, Date: 06.03.2024).

Informed Consent: Written informed consent was obtained from all the participants.

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References

1. International Association for the Study of Pain (IASP). IASP Announces Revised Definition of Pain, 2020. Accessed March 6, 2026. https://www.iasp-pain.org/publications/iasp-news/iasp-announces-revised-definition-of-pain/
2. Lee GI, Neumeister MW. Pain: Pathways and Physiology. Clin Plast Surg. 2020;47(2):173–180. [CrossRef]
3. Small C, Laycock H. Acute postoperative pain management. Br J Surg. 2020;107(2):e70–e80. [CrossRef]
4. Aslan FE, Şahin SK, Secginli S, Bülbüloğlu S. Patients' satisfaction levels with nursing practices regarding postoperative pain management: A systematic review. Agri. 2018;30(3):105–115.
5. Erol Ursavaş F, Karayurt Ö. The effects of pain management education on knowledge, attitudes, and beliefs in nursing students in Turkey: A quasi-experimental study. Perspect Psychiatr Care. 2021;57(2):499–506. [CrossRef]
6. Kahsay DT, Pitkäjärvi M. Emergency nurses´ knowledge, attitude and perceived barriers regarding pain Management in Resource-Limited Settings: cross-sectional study. BMC Nurs. 2019;18:56. [CrossRef]
7. Samarkandi OA. Knowledge and attitudes of nurses toward pain management. Saudi J Anaesth. 2018;12(2):220–226. [CrossRef]
8. Chow KM, Chan JC. Pain knowledge and attitudes of nursing students: a literature review. Nurse Educ Today. 2015;35(2):366–372. [CrossRef]
9. Mackintosh-Franklin C. Pain: A content review of undergraduate pre-registration nurse education in the United Kingdom. Nurse Educ Today. 2017;48:84–89. [CrossRef]
10. Aldossary E. The Impact of a Pain Educational Intervention on Nursing Students' Knowledge, Attitudes and Self-Efficacy Regarding Pain Management. Dissertation. Kingston (ON): Queen's University; 2019.
11. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. Psychol Rev. 1977;84(2):191–215. [CrossRef]
12. Zulkosky K. Self-efficacy: a concept analysis. Nurs Forum. 2009;44(2):93–102. [CrossRef]
13. Araújo MS, Medeiros SM, Costa RR, Coutinho VR, Mazzo A, Sousa YG. Effect of clinical simulation on the knowledge retention of nursing students. Acta Paul Enferm. 2021;34:eAPE000955. [CrossRef]
14. Tawalbeh LI. Effect of simulation modules on Jordanian nursing student knowledge and confidence in performing critical care skills: A randomized controlled trial. Int J Afr Nurs Sci. 2020;13:100242. [CrossRef]
15. Tseng LP, Hou TH, Huang LP, Ou YK. Effectiveness of applying clinical simulation scenarios and integrating information technology in medical-surgical nursing and critical nursing courses. BMC Nurs. 2021;20(1):229. [CrossRef]
16. Harris AD, McGregor JC, Perencevich EN, et al. The use and interpretation of quasi-experimental studies in medical informatics. J Am Med Inform Assoc. 2006;13(1):16–23. [CrossRef]
17. Ferrell BR, McGuire DB, Donovan MI. Knowledge and beliefs regarding pain in a sample of nursing faculty. J Prof Nurs. 1993;9(2):79–88. [CrossRef]
18. Yildirim YK, Cicek F, Uyar M. Knowledge and attitudes of Turkish oncology nurses about cancer pain management. Pain Manag Nurs. 2008;9(1):17–25. [CrossRef]
19. Tavakol M, Dennick R. Making sense of Cronbach's alpha. Int J Med Educ. 2011;2:53–55. [CrossRef]
20. Macindo JR, Soriano CA, Gonzales HR, Simbulan PJ, Torres GC, Que JC. Development and psychometric appraisal of the pain management self-efficacy questionnaire. J Adv Nurs. 2018;74(1):1993–2004. [CrossRef]
21. Aydın Sayılan A, Eşkin Bacaksız F, Seyhan Ak E, Kulakaç N, Macindo JRB. Adaptation of the pain management self-efficacy questionnaire into Turkish. Agri. 2022;34(2):91–99.
22. Mohamed SA, Fashafsheh IH. The effect of simulation-based training on nursing students' communication skill, self-efficacy and clinical competence for nursing practice. Open J Nurs. 2019;9(8):855. [CrossRef]
23. Kim I. The Effects of Simulation Based Practical Education on Nursing Students' Self-efficacy, Performance Confidence, and Educational Satisfaction. Phys Ther Rehabil Sci. 2024;13(1):18–25. [CrossRef]
24. Tosterud R, Hall-Lord ML, Petzäll K, Hedelin B. Debriefing in simulation conducted in small and large groups–Nursing students' experiences. J Nurs Educ Pract. 2014;4(9):83. [CrossRef]
25. Guerrero JG, Hafiz AH, Eltohamy NA, Gomma N, Al Jarrah I. Repeated exposure to high-fidelity simulation and nursing interns' clinical performance: impact on practice readiness. Clin Simul Nurs. 2021;60:18–24. [CrossRef]
26. E J SK, Purva M, Chander M S, Parameswari A. Impact of repeated simulation on learning curve characteristics of residents exposed to rare life threatening situations. BMJ Simul Technol Enhanc Learn. 2020;6(6):351–355. [CrossRef]
27. Shin H, Sok S, Hyun KS, Kim MJ. Competency and an active learning program in undergraduate nursing education. J Adv Nurs. 2015;71(3):591–598. [CrossRef]
28. Salameh B, Ayed A, Kassabry M, Lasater K. Effects of a Complex Case Study and High-Fidelity Simulation on Mechanical Ventilation on Knowledge and Clinical Judgment of Undergraduate Nursing Students. Nurse Educ. 2021;46(4):E64–E69. [CrossRef]
29. Kim HJ, Oh J, Lee S. Effect of Virtual Game-Based Integrated Clinical Practice Simulation Program on Undergraduate Nursing Students' Attitude Toward Learning. Comput Inform Nurs. 2024;42(3):218–225. [CrossRef]
30. Almutairi AA, Alodhailah AM, Alahmedi SH. Cultural empathy development through simulation-based education: a qualitative exploration of Saudi nursing students' and academics' experiences. BMC Nurs. 2025;24(1):1290. [CrossRef]
31. Evans CB, Mixon DK. The Evaluation of Undergraduate Nursing Students' Knowledge of Post-op Pain Management after Participation in Simulation. Pain Manag Nurs. 2015;16(6):930–937. [CrossRef]
32. Arrogante O, Velarde-García JF, Blázquez-González P, Nieves Moro-Tejedor M. The effects of high-fidelity simulation training on empathy and attitudes toward older people among undergraduate nursing students: A quasi-experimental study. Nurse Educ Pract. 2022;64:103441. [CrossRef]

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Effect of Aromatherapy Inhalation on Therapeutic Relationship and Job Stress Levels of Psychiatric Nurses: A Randomized Controlled Study

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Abstract

Background: Psychiatric nurses experience high levels of job stress, which negatively affect therapeutic relationships. Aromatherapy has shown promise in reducing stress; however, its impact on therapeutic engagement remains underexplored.

Aim: This experimental study aimed to examine the effects of aromatherapy inhalation on the therapeutic relationship and job stress levels of psychiatric nurses.

Methods: This study was designed as a randomized controlled trial with a control group. Participants were randomly assigned to either the experimental group (n=33) or the control group (n=33) from among psychiatric nurses working in a psychiatric clinic in Ankara between January 1 and March 31, 2025. The experimental group received lavender essential oil inhalation three times per week on alternate days. Data were collected using the Introductory Information Form, General Job Stress Scale, and the Therapeutic Relationship Evaluation Scale–Nursing Form. Statistical analyses included the chi-square test, Independent Samples t-test, Paired Samples t-test, and Wilcoxon Signed-Rank test.

Results: The groups were homogeneous; however, a statistically significant difference was found in gender distribution (p=0.027). Following lavender essential oil inhalation, the experimental group demonstrated a statistically significant increase in post-intervention therapeutic relationship scores compared to the control group (p=0.042), particularly in the "participation in care" subdimension (p=0.001). No significant difference was observed between groups in terms of job stress levels after the lavender essential oil inhalation (p>0.05).

Conclusion: Aromatherapy inhalation was found to enhance the therapeutic relationship. It may support psychiatric nurses in strengthening therapeutic relationships by promoting empathy and engagement.

Keywords: Aromatherapy, job stress, psychiatric nursing, randomized controlled trial, therapeutic relationship

Introduction

Psychiatric nurses are frequently exposed to high levels of occupational stress due to the emotionally intense, unpredictable, and demanding nature of psychiatric care. Managing psychiatric crises, responding to aggressive behaviors, and maintaining therapeutic boundaries place a substantial psychological burden on nurses.[1] Persistent exposure to these stressors has been associated with burnout, reduced job satisfaction, and decreased quality of patient care.[2,3] Importantly, high levels of job stress may negatively affect the therapeutic relationship, which is a core component of effective psychiatric nursing practice.[4]

The therapeutic relationship is defined as a structured, purposeful, and collaborative interaction between the nurse and the patient aimed at promoting recovery. Disruptions in this relationship—particularly those arising from nurse-related psychological strain—may impair treatment outcomes and hinder the recovery process.[5] Therefore, interventions that reduce job stress and support nurses' psychological well-being are essential for sustaining effective therapeutic engagement in psychiatric settings. Various stress-reduction strategies, including mindfulness-based interventions, cognitive-behavioral stress management, and organizational support programs, have been shown to benefit nurses. However, the widespread implementation of these approaches is often limited by time constraints, staffing shortages, and insufficient institutional resources. As a result, easily accessible and low-cost complementary interventions have gained increasing attention.[6–8]

Aromatherapy is a complementary therapy that involves the use of essential oils derived from aromatic plants to promote physical and psychological well-being. Essential oils may be administered through various methods (chemical and physical), including inhalation, topical application, and massage. The term "aromatherapy" originates from the French word "Aromathérapie" and is defined as "scent therapy" according to the Turkish Language Association.[9–11] Inhalation aromatherapy, in particular, is considered a practical method that can be easily integrated into clinical routines without disrupting workflow. Aromatherapy using essential oils derived from various plants can be administered through several methods, including inhalation (breathing), topical application (on the skin), compresses (pressure), baths, and oral ingestion.[9,12]

In the literature, aromatherapy using essential oils such as lavender,[13–16] rose,[15,17] and bergamot,[18] administered through various inhalation methods such as diffusers, cotton pads, or small bottles attached to clothing, has been shown to reduce stress and anxiety among nurses.[13–16] A recent systematic review highlighted the potential of aromatherapy for stress reduction while emphasizing the need for high-quality randomized controlled trials.[19] Despite

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this emerging evidence, few studies have examined the effects of aromatherapy on the quality of the therapeutic relationship, particularly in psychiatric settings. Although some findings suggest that aromatherapy may improve the clinical environment and enhance nurse satisfaction, direct evaluations of its impact on therapeutic engagement remain scarce.[16] Furthermore, there is a scarcity of research specifically investigating aromatherapy inhalation among psychiatric nurses, and only a small number of studies have addressed both job stress and the therapeutic relationship within this context. The unique contribution of the present study lies in its use of lavender essential oil inhalation supported by a structured, time-controlled intervention protocol and its specific application among psychiatric nurses working in inpatient mental health settings, a population often overlooked in aromatherapy research. Therefore, this study aims to evaluate the effects of aromatherapy inhalation on the job stress levels and the quality of the therapeutic relationship among psychiatric nurses.

Study Hypotheses

Hypothesis 1_0: There is no statistically significant difference in job stress scores between the experimental group that received aromatherapy inhalation and the control group.

Hypothesis 1_1: There is a statistically significant difference in job stress scores between the experimental group that received aromatherapy inhalation and the control group.

Hypothesis 2_0: There is no statistically significant difference in therapeutic relationship quality scores between the experimental group that received aromatherapy inhalation and the control group.

Hypothesis 2_1: There is a statistically significant difference in therapeutic relationship quality scores between the experimental group that received aromatherapy inhalation and the control group.

Materials and Methods

Design

The study was designed as an experimental research study employing a pre-test–post-test randomized controlled design to evaluate the effects of aromatherapy inhalation on the job stress levels and therapeutic relationship quality of psychiatric nurses. Trial registration was prospectively obtained from ClinicalTrils.gov (NCT06761859). The study was conducted in accordance with the Consolidated Standards of Reporting Trials (CONSORT) checklist.[20]

Participants and Setting

The study population consisted of 93 psychiatric nurses working in the psychiatry clinic of a city hospital in Ankara, Türkiye. The psychiatry department included six adult psychiatry units and two child and adolescent psychiatry units. The required sample size was calculated using G*Power 3.1.9.4 software. Based on the primary outcome variable (General Job Stress Scale [GJSS] total score), assuming an effect size of 0.80, a power of 0.80, and a significance level of 0.05 for an independent samples t-test, a minimum of 26 participants per group was required. The final sample included a total of 52 participants, which met the calculated requirement. To account for potential attrition and non-compliance, the sample size was increased by 25%. Accordingly, 14 additional psychiatric nurses were included in the study, consistent with prior research in similar settings reporting dropout rates of approximately 20–25% for comparable interventions.[21] This adjustment ensured that the study retained sufficient statistical power despite potential participant attrition. The final sample consisted of 66 psychiatric nurses (Fig. 1). Participants were required to meet the following inclusion criteria: providing written informed consent; having at least one year of work experience in a psychiatric unit; actively working in the psychiatric unit during the data collection period; and reporting no known sensi-

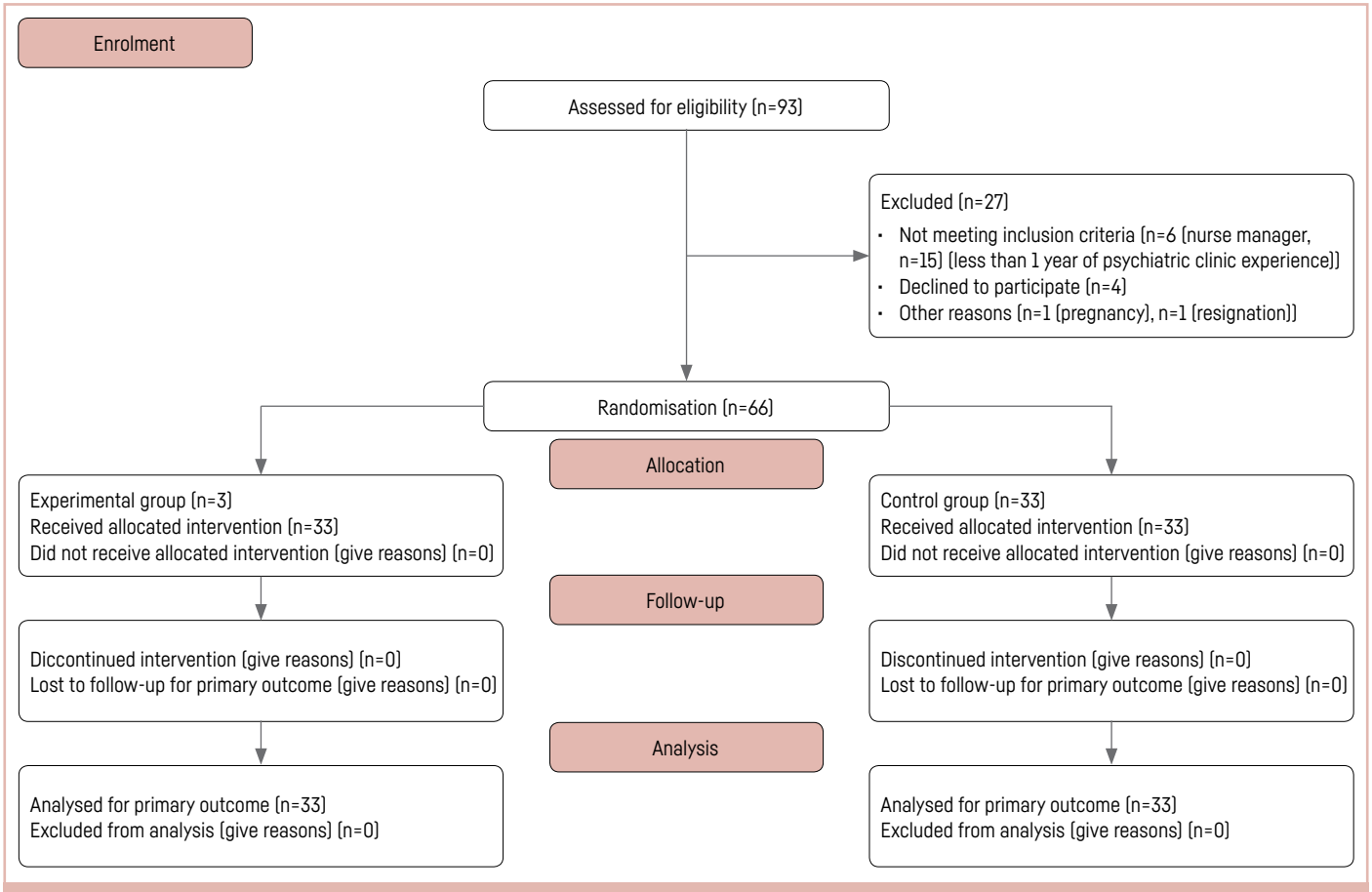

Figure 1. CONSORT flow chart.

Table 1. Comparison of sociodemographic characteristics of psychiatric nurses in the experimental and control groups

	Experimental group (n=33)		Control group (n=33)		U	p
	Mean±SD	Median (Min-Max)	Mean±SD	Median (Min-Max)		
Age[a]	25.97±3.57	25.00 (24.00–43.00)	27.42±5.52	25.00 (24.00–48.00)	459.50	0.262
Professional experience[a]	2.92±2.92	2.00 (2.00–18.50)	4.11±4.54	2.00 (2.00–23.00)	446.00	0.137
Psychiatric clinic experience[a]	2.17±0.44	2.00 (2.00–4.00)	2.95±2.03	2.00 (1.00–10.00)	471.50	0.223
Weekly working hours[a]	49.70±8.36	48.00 (40.00–72.00)	49.30±8.78	48.00 (36.00–64.00)	526.50	0.814
	Experimental group (n=33)		Control group (n=33)		χ^2	p
	n	%	n	%		
Sex[b]					4.889	0.027*
Female	28	84.85	20	60.61		
Male	5	15.15	13	39.39		
Marital status[b]					1.981	0.159
Married	6	18.18	11	33.33		
Single	27	81.82	22	66.67		
Having children[c]					–	0.355
Yes	1	3.03	4	12.12		
No	32	96.97	29	87.88		
Income status[b]					1.331	0.514
Income lower than expenses	10	30.30	6	18.18		
Income equal to expenses	19	57.58	22	66.67		
Income higher than expenses	4	12.12	5	15.15		
Educational level[c]					–	1.00
Associate's or Bachelor's degree	29	87.88	28	84.85		
Postgraduate degree	4	12.12	5	15.15		
Presence of allergic disease[b]					0.471	0.492
Yes	6	18.18	4	12.12		
No	27	81.82	29	87.88		

[a]: Mann–Whitney U test, [b]: Chi-square test, [c]: Fisher's Exact test.

tivity or adverse reactions to lavender essential oil. The exclusion criteria were as follows: not being directly involved in patient care; having prior experience with aromatherapy interventions; voluntarily withdrawing during the intervention period; not actively working in the unit during the study period due to transfer, resignation, or leave; experiencing significant changes in general health status; or receiving psychological or psychiatric support during the study period. Participants were asked about any known allergies before the intervention. Individuals with allergies related to essential oils or fragrances were excluded. The allergies reported within the sample were primarily seasonal or food-related and did not interfere with the aromatherapy intervention.

Randomization and Blinding

Between January 1 and March 31, 2025, a total of 93 psychiatric nurses were employed at the psychiatry clinic of a city hospital in Ankara. Of these, 25 psychiatric nurses did not meet the inclusion criteria for various reasons (n=6 nurse managers, n=15 with less than one year of psychiatric clinic experience, n=4 who declined to participate). Informed consent was obtained from 68 psychiatric nurses who met the inclusion criteria. However, one nurse was pregnant and one nurse resigned before randomization; therefore, 66 psychiatric nurses were included in the randomization process.

The allocation of participants to the experimental and control groups was conducted using stratified randomization. Randomization ensured that the groups were comparable in terms of both known and unknown confounding variables, thereby allowing for an unbiased evaluation of the intervention's effect.[22] A block randomization method was employed to ensure equal group sizes and balanced allocation. An independent statistician determined the block size and performed the randomization for the experimental and control groups. Six four-letter block sequences were predefined using the letters "A" and "B" as follows: (1) ABAB, (2) ABBA, (3) BBAA, (4) AABB, (5) BAAB, and (6) BABA. The online tool randomizer.org was used to generate 17 random block sequences (66/4=16.5), resulting in 68 allocations. The first 66 assignments derived from these randomized blocks were used to allocate participants to the groups. Group identities were determined by drawing lots: "A" was designated as the control group and "B" as the experimental group.

After randomization, the homogeneity between the experimental and control groups was assessed. A statistically significant association was found between gender and group allocation (p=0.027). Although randomization was implemented, some baseline differences (e.g., gender distribution) may occur by chance and do not necessarily indicate a failure of the randomization process. Apart from gender, no statistically significant differences were observed between the groups at baseline, indicating successful randomization and overall group comparability (p>0.05) (Table 1).

Due to the researcher's direct involvement in administering the aromatherapy intervention and collecting the data, as well as the participants' awareness of receiving the intervention in the experimental group, blinding of the researcher and participants was not feasible. To minimize bias, allocation concealment was ensured using sealed envelopes prepared and managed by an independent researcher. After obtaining informed consent, the researcher opened the corresponding envelope to reveal the participant's group assignment. Following data collection, an independent statistician who was blinded to group allocation performed the statistical analyses, thereby ensuing objectivity in data interpretation.

Data Collection Tools

Data were collected using the Introductory Information Form, the General Job Stress Scale, and the Therapeutic Relationship Assessment Scale–Nurse Form (TRAS-NF).

Introductory Information Form: The Introductory Information Form was prepared by the researcher in accordance with the literature.[23,24] It was designed to assess the sociodemographic characteristics of psychiatric nurses. The form consists of 12 items, including age, gender, marital status, profession, parental status, income level, education level, total years of professional experience, years of experience in psychiatric wards, weekly working hours, and the presence of chronic or allergic diseases.

General Job Stress Scale (GJSS): The General Job Stress Scale was developed by De Bruin[25] and validated for the Turkish population by Teleş.[26] The scale consists of 9 items rated on a 5-point Likert-type scale ranging from 1 (Never) to 5 (Always). It evaluates the emotional, cognitive, motivational, and social impacts of work-related stress. Total scores range from 9 to 45, with higher scores indicating greater levels of job stress. Cronbach's alpha was reported as 0.91 in the Turkish adaptation.26 In the present study, Cronbach's alpha was 0.91 for the pre-test and 0.92 for the post-test.

Therapeutic Relationship Assessment Scale–Nurse Form (TRAS-NF): The Therapeutic Relationship Assessment Scale–Nurse Form was developed by Coelho et al.[27] and validated for the Turkish population by Duran and Polat.[28] It is used to evaluate the therapeutic relationship between psychiatric nurses and patients. The scale consists of 25 items rated on a 5-point Likert scale ranging from 1 (Never) to 5 (Always). It can be used either as a single-factor measure or across four subdimensions: empathy (items 7–11), self-awareness (items 12–17), participation in care (items 18–25), and orientation/direction (items 1–6). Higher scores indicate a stronger therapeutic relationship. Cronbach's alpha for the Turkish version was reported as 0.93.28 In the current study, Cronbach's alpha coefficients were as follows: Total scale: 0.92 (pre-test), 0.93 (post-test); Empathy: 0.85 (pre-test), 0.80 (post-test); Self-awareness: 0.77 (pre-test), 0.86 (post-test); Participation in care: 0.89 (pre-test), 0.88 (post-test); Orientation: 0.64 (pre-test), 0.77 (post-test).

Intervention

Pilot Study

Prior to data collection, the researcher successfully completed a "120-Hour Aromatic Oils and Formulation" training program and obtained a certified practitioner license. Before initiating the main study, a pilot study was conducted with three psychiatric nurses from a related hospital who met the inclusion criteria between December 20 and 30, 2024. The purpose of the pilot study was to assess the clarity and feasibility of the data collection tools and to evaluate the safety of the aromatherapy intervention. This small sample size was selected pragmatically to identify and resolve any practical issues before commencing the main study. No negative feedback was reported.

Experimental Group

Aromatherapy inhalation using 2% diluted lavender oil (*Lavandula angustifolia*) was administered to psychiatric nurses in the experimental group over a one-week period on alternate days, for a total of three sessions. The intervention was delivered via a cotton pad affixed to the participant's clothing. Each session was conducted once per day, and no participant received more than one application on the same day. Three drops of lavender oil were applied to a cotton pad, which was pinned to the nurse's clothing approximately 20 cm from the nose. Each session lasted approximately 30 minutes. All interventions were performed before the psychiatric nurses' clinical shifts began to ensure that the procedure did not interfere with working hours. After the intervention session, participants continued with their routine clinical duties. Pre-test measurements (Introductory Information Form, GJSS, and TRAS-NF) were collected prior to the initiation of the intervention. Post-test measurements (GJSS and TRAS-NF) were conducted after completion of the one-week intervention period, following all three sessions. Although the intervention took place within the same clinical unit, applications were conducted individually, with only one participant receiving the intervention at a time. This procedure was implemented to prevent interaction among participants and to minimize potential contamination or interaction bias. Participants were informed that the study involved exposure to lavender aroma; however, they were not provided with detailed information regarding the expected therapeutic effects to minimize expectancy bias.

Control Group

Psychiatric nurses in the control group completed the same data collection instruments as those in the experimental group at two time points: pre-test (prior to the intervention) and post-test (following completion of the intervention period in the experimental group). During the one-week period in which the experimental group received lavender aromatherapy inhalation, no intervention was administered to the control group, and participants continued their routine clinical duties. After post-test data collection was completed for both groups, lavender aromatherapy materials were provided to the control group. Nurses who consented were given instructions on the personal use of the intervention.

Data Analysis

Data were analyzed using SPSS version 21.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics for continuous variables (e.g., age, total scores) were reported as mean, standard deviation, median, minimum, and maximum values, whereas categorical variables (e.g., gender) were summarized using frequencies and percentages. Group homogeneity for categorical variables was assessed using the chi-square test, while the Independent Samples t-test was used for continuous variables. Normality of continuous variables was evaluated using skewness and kurtosis values (with values between -1 and +1 considered acceptable), the Kolmogorov–Smirnov test, and visual inspection of histograms. For between-group comparisons, the Independent Samples t-test was applied to normally distributed variables, whereas the Mann–Whitney U test was used for non-normally distributed variables, specifically the GJSS and TRAS-NF scores. For within-group comparisons, the Paired Samples t-test was used for normally distributed variables, and the Wilcoxon Signed-Rank test was applied to non-normally distributed variables. A p-value <0.05 was considered statistically significant. When statistically significant differences were identified, effect sizes were calculated using Cohen's d (0.20=small, 0.50=medium, 0.80=large) to quantify the magnitude of the effects.[21]

Ethical Statement

Ethics committee approval for the study was obtained from Çankırı Karatekin University Health Sciences Ethics Committee (Approval Number: 17, Date: 04.12.2024), and institutional permission was granted by the hospital where the research was conducted on December 5, 2024. All participating psychiatric nurses were informed about the purpose of the study, the aromatherapy inhalation procedure, their right to withdraw at any stage without any consequences, and the confidentiality of the collected data. Written informed consent was obtained from all participants prior to the initiation of the intervention. Permission to use the measurement instruments was obtained from the original authors via email. The study was conducted in accordance with the principles outlined in the Declaration of Helsinki.

Results

No statistically significant difference was found between the experimental and control groups in terms of post-test GJSS total scores ($p>0.05$). In the within-group comparisons, no statistically significant differences were observed between pre-test and post-test GJSS total scores in either the experimental group ($p>0.05$) or the control group ($p>0.05$) (Table 2, Fig. 2).

Statistically significant differences were identified between the experimental and control groups in post-test TRAS-NF total scores ($p=0.042$) and in the "participation in care" subdimension ($p=0.001$). Psychiatric nurses who received aromatherapy inhalation demonstrated higher mean scores in both the "participation in care" subdimension and the total therapeutic relationship score compared to those who did not receive the intervention. No statistically significant differences were found between the groups in the post-test scores of the TRAS-NF subdimensions of "empathy," "self-awareness," and "orientation/direction" ($p>0.05$). When within-group comparisons were examined, the experimental group demonstrated statistically significant increases in TRAS-NF total scores ($p<0.001$) and in the subdimensions of "empathy" ($p=0.025$), "self-awareness" ($p<0.001$), "participation in care" ($p=0.002$), and "orientation/direction" ($p=0.027$) in the post-test compared to the pre-test. In contrast, no statistically significant differences were observed between the pre-test and post-test scores in the control group (Table 3, Fig. 3).

Table 2. Inter- and intra-group comparison of GJSS total scores at pre-test and post-test

Scale	Group	Measurement				Test/Significance (intra-group comparison)		
		Pre-test		Post-test		z	p	r
		Mean±SD	Median (Min-Max)	Mean±SD	Median (Min-Max)			
GJSS total score	Experimental	2.17±0.69	2.00 (1.11–3.78)	2.09±0.73	2.00 (1.00–3.78)	-1.074	0.283	0.13
	Control	2.40±0.88	2.11 (1.22–4.56)	2.44±0.92	2.11 (1.00–4.67)	-0.124	0.901	0.02
Test/Significance (inter-group comparison)	U	475.00		432.50				
	p	0.372		0.150				
	r	0.11		0.18				

Test/Significance (inter-group comparisons): The Mann–Whitney U test was used for the GJSS total score. Test/Significance (intra-group comparisons): The Wilcoxon Signed-Rank test was used for the GJSS total score.

Table 3. Inter- and intra-group comparison of TRAS-NF total and subdimension total at pre-test and post-test

Scale and dub-dimensions	Group	Measurement				Test/Significance (intra-group)		
		Pre-test		Post-test		z/t	p	r/d
		Mean±SD	Median (Min-Max)	Mean±SD	Median (Min-Max)			
Empathy	Experimental	20.85±3.12	20.00 (11.00–25.00)	22.00±2.49	22.00 (16.00–25.00)	-2.249	0.025*	0.28
	Control	21.45±2.25	22.00 (17.00–25.00)	21.73±2.04	22.00 (18.00–25.00)	-1.238	0.216	0.15
Test/Significance (inter-group)	U	498.50		486.50				
	p	0.550		0.450				
	r	0.07		0.09				
Self-awareness	Experimental	24.85±3.71	24.00 (14.00–30.00)	26.21±3.30	26.00 (16.00–30.00)	-3.639	<0.001*	0.45
	Control	24.24±2.14	24.00 (21.00–30.00)	25.18±2.56	25.00 (20.00–30.00)	-1.856	0.064	0.23
Test/Significance (inter-group)	U	451.50		416.00				
	p	0.227		0.096				
	r	0.15		0.02				
Participation in care	Experimental	33.18±4.67	32.00 (21.00–40.00)	35.82±3.64	36.00 (29.00–40.00)	-3.147	0.002*	0.39
	Control	33.33±3.36	32.00 (28.00–40.00)	32.42±3.44	32.00 (25.00–40.00)	-1.360	0.174	0.17
Test/Significance (inter-group)	U	512.50		289.00				
	p	0.680		0.001*				
	r	0.05		0.40				
Orientation/direction	Experimental	25.52±2.79	26.00 (18.00–30.00)	26.79±2.32	27.00 (22.00–30.00)	-2.940	0.003*	0.36
	Control	25.85±2.35	26.00 (21.00–30.00)	26.67±2.62	27.00 (22.00–30.00)	-2.217	0.051	0.32
Test/Significance (inter-group)	U	525.50		535.50				
	p	0.806		0.907				
	r	0.03		0.01				
TRAS-NF total score	Experimental	104.39±12.98	103.00 (64.00–123.00)	110.82±10.14	114.00 (91.00–125.00)	-4.110	<0.001*	-0.55
	Control	104.88±7.49	105.00 (93.00–117.00)	106.00±8.67	108.00 (89.00–122.00)	-1.089	0.284	-0.14
Test/Significance (inter-group)	t	-0.186		2.074				
	p	0.853		0.042*				
	d	0.05		0.51				

Test/Significance (intra-group comparisons): An Independent Samples t-test was used for the TRAS-NF total score, and the Mann–Whitney U test was used for other subdimensions. Test/Significance (intra-group comparisons): A Paired Samples t-test was used for the TRAS-NF total score, and the Wilcoxon Signed-Rank test was used for other subdimensions.

Discussion

The results of this study provide a foundation for discussing the potential role of complementary interventions in psychiatric nursing practice. The findings suggest that lavender aromatherapy may enhance psychiatric nurses' engagement in patient care, particularly in terms of participation in care and overall therapeutic relationship quality. This finding supports the acceptance of Hypothesis 2_1 and highlights the potential value of complementary interventions in strengthening nursing practice within psychiatric settings. Within this framework, the therapeutic relationship constitutes a central component of psychiatric nursing practice, serving as a fundamental mechanism through which trust, empathy, and collaboration are established.[28,29] Although only a limited number of studies have directly examined the

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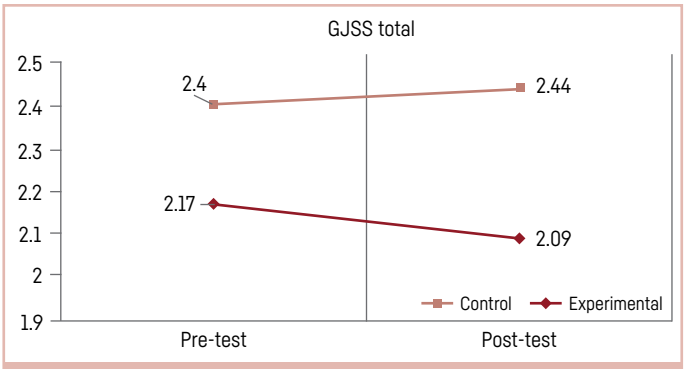

Figure 2. Comparison of the pre-test and post-test total GJSS scores of psychiatric nurses in the experimental and control groups.

GJSS: General Job Stress Scale.

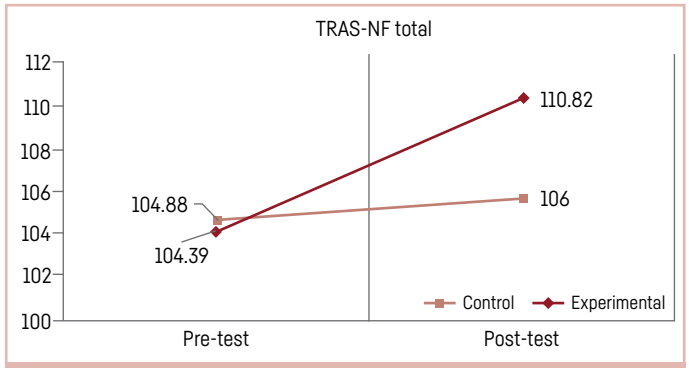

Figure 3. Comparison of the pre-test and post-test TRAS-NF total scores of psychiatric nurses in the experimental and control groups.

TRAS-NF: Therapeutic Relationship Assessment Scale–Nurse Form.

impact of aromatherapy on therapeutic relationships in psychiatric nursing, existing literature from other clinical contexts supports its potential benefits. For instance, Johnson et al.[16] reported that lavender aromatherapy reduced job stress among nurses, indirectly enhancing communication and therapeutic engagement. Similarly, Maddocks[30] suggested that aromatherapy may improve emotional clarity and reduce anxiety, thereby facilitating more effective interpersonal interactions. These findings are consistent with our results, suggesting that sensory-based interventions such as aromatherapy may strengthen nurses' emotional regulation capacities and, consequently, enhance the quality of therapeutic relationships.

Essential oils such as lavender have been shown to alleviate anxiety and promote emotional stability.[15,31] By reducing stress levels and promoting calmness, aromatherapy may positively influence behavioral markers such as tone of voice, body language, and responsiveness—factors that are readily perceived by patients and are crucial for the development of a therapeutic alliance. Furthermore, institutional efforts to integrate aromatherapy into holistic nursing practice have demonstrated promising outcomes. For example, in a program supported by the American Holistic Nurses Association and the Institute of Integrative Aromatherapy, nurses who received aromatherapy training reported increased awareness of non-pharmacological care approaches and greater confidence in recommending these techniques to patients.[32] Enhancing nurses' self-care practices and professional satisfaction may, in turn, foster empathy and strengthen therapeutic engagement. In a study by Kerr et al.,[33] the use of various citrus-based essential oils in a diffusion protocol over eight weeks resulted in improved mood and reduced distress among participating nurses. These emotional improvements contributed to the perception of a more therapeutic care environment. Taken together, these findings suggest that aromatherapy, although often conceptualized as an individual self-care intervention, may also enhance therapeutic interpersonal processes in psychiatric nursing, particularly by improving participation in care, communication, and emotional attunement.

No statistically significant difference in job stress was observed between the group receiving the lavender intervention and the control group. This finding does not support Hypothesis 1_1. Several studies have reported positive effects of aromatherapy in reducing work-related stress among nurses in intensive care or surgical units.[14–16,34] For example, Pemberton and Turpin[34] reported a reduction in stress levels following inhalation of lavender and clary sage oils among intensive care nurses. Similarly, in a randomized controlled study involving 110 nurses, Chen et al.[14] found that lavender inhalation reduced perceived stress and physical symptoms over four consecutive days. Emadikhalaf et al.[15] also observed significant reductions in stress after four weeks of daily inhalation of rose and lavender oils.

However, not all studies have confirmed the effectiveness of aromatherapy in reducing work-related stress. Barış Eren and Öztunç[32] and Montibeler et al.[35] reported no significant changes in stress levels among intensive care and surgical nurses, respectively, following aromatherapy interventions. In the present study, the short duration of lavender oil application may have been insufficient to counteract deeply rooted stress mechanisms in psychiatric settings. Another possible explanation for the limited effect observed is the use of a single essential oil rather than a blended or individualized approach. Previous research indicates that individual responses to aromatherapy are highly variable and may be influenced by factors such as olfactory sensitivity, prior exposure, and cultural beliefs regarding complementary and alternative medicine (CAM).[36–38] In this context, some participants may have experienced temporary relief, whereas others may not have perceived any benefit. Additionally, the persistence of active stressors within the psychiatric clinic during the intervention period may have attenuated the potential soothing effects of aromatherapy. Although participants may have experienced transient relaxation, the effect may not have been sustained long enough to produce measurable changes in overall stress levels.[36–38] The cultural context also merits consideration. While aromatherapy and other CAM approaches are widely accepted and integrated into clinical care in countries such as China, these practices are less embedded in Turkish nursing culture. Participants' limited familiarity with or belief in aromatherapy may have influenced the intervention's effectiveness.[39,40] Additionally, persistent stressors within the psychiatric clinic during the intervention period may have masked the potential soothing effects of aromatherapy. Although participants may have experienced transient relaxation, the effect may not have been sustained long enough to produce measurable differences in overall stress levels.

Limitations

This study has several limitations. The intervention was conducted over a short period and involved only a single essential oil (lavender) administered via inhalation, which may limit both its effectiveness and generalizability. The absence of long-term follow-up prevents the assessment of sustained effects over time. The study relied exclusively on self-reported measures without incorporating physiological or behavioral indicators, rendering the findings susceptible to bias and potential placebo effects. Environmental and structural factors, such as staffing levels and workload intensity, were not fully controlled. Although participants were not informed about the expected effects of lavender aromatherapy to minimize expectancy bias, the subjective nature of the outcome measures may still have allowed for placebo effects. Additionally, a statistically significant difference in gender distribution was observed between the groups, which may represent a potential confounding factor and should be considered when interpreting the findings. This constitutes a notable limitation of the study. Finally, the study was conducted exclusively among psychiatric nurses working in specific clinical settings in Türkiye, which may limit the generalizability of the results to other nursing populations.

Conclusion

This study highlights the potential value of aromatherapy inhalation as a complementary intervention to support emotional and interpersonal functioning in psychiatric nursing practice. In emotionally demanding care environments, strategies that foster emotional awareness, presence, and therapeutic engagement may meaningfully contribute to person-centered and emotionally responsive care. Aromatherapy inhalation may be better conceptualized not as a primary intervention for managing occupational stress, but as a supportive approach that enhances nurses' capacity to remain emotionally attuned during therapeutic interactions. The ease of implementa-

tion and low cost of aromatherapy inhalation suggest that it is a feasible intervention for integration into clinical practice and educational initiatives. Incorporating such interventions into training programs focused on emotional regulation, self-awareness, and therapeutic communication may promote more sustainable nursing practice and ultimately contribute to improved quality of care. Future research should adopt more comprehensive and methodologically rigorous approaches to further clarify the role of aromatherapy in psychiatric nursing. Combining aromatherapy with established stress management strategies—such as mindfulness-based interventions, cognitive-behavioral techniques, or structured clinical supervision—may produce synergistic effects and enhance outcomes related to both nurse well-being and therapeutic relationships. Longitudinal study designs incorporating repeated measurements are recommended to capture potential delayed or cumulative effects of aromatherapy. Additionally, the use of multidimensional assessment tools that address cognitive, emotional, and physiological aspects of stress would provide a more nuanced understanding of intervention outcomes. Tailoring aromatherapy protocols to individual preferences and evaluating adherence and acceptability may further enhance intervention effectiveness and clinical applicability.

Ethics Committee Approval: The study was approved by the Çankırı Karatekin University Health Sciences Ethics Committee (Approval Number: 17, Date: 04.12.2024).

Informed Consent: Written informed consent was obtained from all participants prior to the initiation of the intervention.

Conflict of Interest: The authors have no conflicts of interest to declare.

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References

1. Hamaideh SH. Occupational stress, social support, and quality of life among Jordanian mental health nurses. Issues Ment Health Nurs. 2012;33(1):15–23. [CrossRef]
2. Kurt S, Öztürk H, Balık T. Causes of stress experienced by nurses and its effects on nurses. New Trends and Issues Proceedings on Humanities and Social Sciences. 2017;4(2):1-10. Paper presented at: 1st International Congress on Nursing (ICON-2017); March 16-18; 2017; Antalya, Türkiye. Accessed March 5, 2026. https://un-pub.eu/ojs/index.php/pntsbs/article/view/2312
3. Wang SM, Lai CY, Chang YY, Huang CY, Zauszniewski JA, Yu CY. The relationships among work stress, resourcefulness, and depression level in psychiatric nurses. Arch Psychiatr Nurs. 2015;29(1):64–70. [CrossRef]
4. Babapour AR, Gahassab-Mozaffari N, Fathnezhad-Kazemi A. Nurses' job stress and its impact on quality of life and caring behaviors: a cross-sectional study. BMC Nurs. 2022;21(1):75. [CrossRef]
5. Çam O, Engin E, eds. Ruh sağlığı ve hastalıkları psikiyatri hemşireliği: Bakım sanatı. 3rd ed. Istanbul Medical Bookstore; 2021. Turkish.
6. Ghawadra SF, Lim Abdullah K, Choo WY, Danaee M, Phang CK. The effect of mindfulness-based training on stress, anxiety, depression and job satisfaction among ward nurses: A randomized control trial. J Nurs Manag. 2020;28(5):1088–1097. [CrossRef]
7. Alkhawaldeh JM, Soh KL, Mukhtar F, et al. Stress management training program for stress reduction and coping improvement in public health nurses: A randomized controlled trial. J Adv Nurs. 2020;76(11):3123–3135. [CrossRef]
8. van der Riet P, Levett-Jones T, Aquino-Russell C. The effectiveness of mindfulness meditation for nurses and nursing students: An integrated literature review. Nurse Educ Today. 2018;65:201–211. [CrossRef]
9. National Association for Holistic Aromatherapy (NAHA). What Therapeutic Benefits Do Essential Oils Have?. Accessed March 5, 2026. https://naha.org/explore-aromatherapy/about-aromatherapy/what-therapeutic-benefits-do-essential-oils-have/
10. Turkish Language Association (TDK). Aromaterapi. Turkish. Accessed March 5, 2026. https://sozluk.gov.tr/?ara=Aromaterapi
11. International Federation of Aromatherapists (IFA). Introduction to Aromathreaphy. Accessed March 5, 2026. https://ifaroma.org/en_GB/home/courses-training/introduction-to-aromatherapy
12. Farrar AJ, Farrar FC. Clinical Aromatherapy. Nurs Clin North Am. 2020;55(4):489–504. [CrossRef]
13. Amanak K, Gökduman Keleş M, Altınkaya SÖ. Effects of Aromatherapy Through Inhalation on Work Stress and Job Satisfaction Among Health Professionals. Holist Nurs Pract. 2025;39(1):32–39. [CrossRef]
14. Chen MC, Fang SH, Fang L. The effects of aromatherapy in relieving symptoms related to job stress among nurses. Int J Nurs Pract. 2015;21(1):87–93. [CrossRef]
15. Emadikhalaf M, Ghods AA, Sotodeh-Asl N, Mirmohamadkhani M, Vaismoradi M. Effects of rose and lavender scents on nurses' job stress: A randomized controlled trial. Explore (NY). 2023;19(3):371–375. [CrossRef]
16. Johnson K, West T, Diana S, et al. Use of aromatherapy to promote a therapeutic nurse environment. Intensive Crit Care Nurs. 2017;40:18–25. [CrossRef]
17. Farsi Z, Rajai N, Teymouri F, Holami M. Effect of aromatherapy with rosa Damascena essential oil on nurses' occupational stress in the emergency department: A randomized controlled trial. Prev Care Nurs Midwifery J. 2021;11(3):46–54. [CrossRef]
18. Hung CL, Lin YL, Chou CM, Wang CJ. Efficacy of Aromatherapy at Relieving the Work-Related Stress of Nursing Staff from Various Hospital Departments during COVID-19. Healthcare (Basel). 2023;11(2):157. [CrossRef]
19. Li H, Zhao M, Shi Y, et al. The effectiveness of aromatherapy and massage on stress management in nurses: A systematic review. J Clin Nurs. 2019;28(3–4):372–385. [CrossRef]
20. Hopewell S, Chan AW, Collins GS, et al. CONSORT 2025 statement: updated guideline for reporting randomised trials. Lancet. 2025:S0140–6736(25)00672–5.
21. Tabachnick BG, Fidell LS. Using Multivariate Statistics. 6th ed. Boston, MA: Pearson; 2013.
22. Lim CY, In J. Randomization in clinical studies. Korean J Anesthesiol. 2019 Jun;72(3):221–232. Erratum in: Korean J Anesthesiol. 2019;72(4):396. [CrossRef]
23. Babaii A, Mohammadi E, Sadooghiasl A. The Meaning of the Empathetic Nurse-Patient Communication: A Qualitative Study. J Patient Exp. 2021;8:23743735211056432. [CrossRef]
24. Bhui KS, Aslam RW, Palinski A, et al. Interventions to improve therapeutic communications between Black and minority ethnic patients and professionals in psychiatric services: systematic review. Br J Psychiatry. 2015;207(2):95–103. [CrossRef]
25. De Bruin GP. The dimensionality of the general work stress scale: a hierarchical exploratory factor analysis. SA J Ind Psychol. 2006;32(4):68–75. [CrossRef]
26. Teleş M. Validity and reliability of the Turkish version of the General Work Stress Scale. J Nurs Manag. 2021;29(4):710–720. [CrossRef]
27. Coelho JCF, Sampaio FMC, Nogueira MJC, et al. Development and psychometric properties of the Therapeutic Relationship Assessment Scale-Nurse. J Psychiatr Ment Health Nurs. 2021;28(6):981–994. [CrossRef]
28. Duran S, Polat S. Psychometric properties of the Turkish version of the therapeutic relationship assessment scale for nurses. J Res Nurs. 2023;28(8):630–641. [CrossRef]
29. Hartley S, Raphael J, Lovell K, Berry K. Effective nurse-patient relationships in mental health care: A systematic review of interventions to improve the therapeutic alliance. Int J Nurs Stud. 2020;102:103490. [CrossRef]
30. Maddocks W. Aromatherapy in Nursing and Midwifery Practice: A Scoping Review of Published Studies Since 2005. J Holist Nurs. 2023;41(1):62–89. [CrossRef]
31. Boyce VJ, Natschke M. Establishing a Comprehensive Aromatherapy Program in Patient Care Settings. Pain Manag Nurs. 2019;20(6):532–540. [CrossRef]
32. Barış Eren N, Öztunç G. The effects of aromatherapy on the stress and anxiety levels of nurses working in intensive care units. Int J Caring Sci. 2017;10(3):1615–1623.
33. Kerr D, Hegg M, Mohebbi M. Effects of diffused essential oils for reducing stress and improving mood for clinical nurses: An interventional time series study. Nurs Forum. 2021;56(2):305–312. [CrossRef]
34. Pemberton E, Turpin PG. The effect of essential oils on work-related stress in intensive care unit nurses. Holist Nurs Pract. 2008;22(2):97–102. [CrossRef]
35. Montibeler J, Domingos TDS, Braga EM, Gnatta JR, Kurebayashi LFS, Kurebayashi AK. Effectiveness of aromatherapy massage on the stress of the surgical center nursing team: a pilot study. Rev Esc Enferm USP. 2018;52:03348. Portuguese, English. [CrossRef]
36. Chen J, Zhang N, Pei S, Yao L. Odor perception of aromatherapy essential oils with different chemical types: Influence of gender and two cultural characteristics. Front Psychol. 2022;13:998612. [CrossRef]
37. Laohakangvalvit T, Sripian P, Nakagawa Y, et al. Study on the Psychological States of Olfactory Stimuli Using Electroencephalography and Heart Rate Variability. Sensors (Basel). 2023;23(8):4026. [CrossRef]
38. Karaarslan İ, Karaarslan F, Çalışkan U, Çalışkan U. Aromatherapeutics with Sedative and Anxiolytic Effects: A Review of Clinical Studies Between 2011–2023: A Systematic Review. J Tradit Med Complement. 2024;7(1):100–112. [CrossRef]
39. Hu X, Gu Y, Lee HW, et al. A national survey on the integration of traditional Chinese medicine and artificial intelligence: attitudes and perceptions from the individuals with health needs. Integr Med Res. 2025;14(4):101219. [CrossRef]
40. Gok Metin Z, Izgu N, Karadas C, Arikan Donmez A. Perspectives of Oncology Nurses on Complementary and Alternative Medicine in Turkey: A Cross-Sectional Survey. Holist Nurs Pract. 2018;32(2):107–113. [CrossRef]

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Nursing Students' Attitudes Toward Artificial Intelligence, Technology, and Internet Addiction: A Descriptive and Relational Study

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Abstract

Background: The increasing integration of artificial intelligence (AI) in healthcare has highlighted the importance of nursing students' attitudes toward these technologies. In this context, technology and internet addiction may act as influential factors shaping these attitudes.

Aim: This study aimed to determine the levels of technology addiction, internet addiction, and attitudes toward AI among nursing students, and to examine the relationships between these variables.

Methods: This descriptive and correlational study was conducted with 608 nursing students enrolled at the Faculty of Nursing of Gazi university. Data were collected face-to-face. The Spearman correlation test, Mann-Whitney U test, and Kruskal-Wallis H test were used for data analysis.

Results: The mean age of the students was 20.72±2.11 years; 84.0% were female, 28.9% were first-year students, and 37.5% had a moderate grade point average (GPA) (2.50–3.00). AI was used by 84.4% of the students, primarily for homework (56.5%). A strong positive correlation was found between internet addiction and technology addiction, whereas negative attitudes toward AI were weakly and negatively correlated with these addictions. Male students had higher technology addiction scores, and AI users demonstrated significantly more positive attitudes toward AI.

Conclusion: The majority of nursing students reported using AI, primarily for homework purposes. They demonstrated low levels of internet addiction and moderate levels of technology addiction. These findings suggest that the conscious and ethical use of AI should be promoted in nursing education, along with increased awareness initiatives addressing technology addiction.

Keywords: Artificial intelligence, digital addiction, nursing education, quantitative methods, technology

Introduction

Rapid technological developments have profoundly affected individuals' daily habits and educational systems.[1] Especially in applied fields such as nursing, students rely heavily on the internet and mobile devices for both theoretical and clinical training.[2,3] For example, Khalil et al.[4] reported that 38.4% of nursing students had moderate internet addiction and 2.1% had severe internet addiction. However, such widespread use also increases the risk of internet and technology addiction.[5]

Internet addiction involves uncontrolled and persistent internet use that can negatively affect academic performance and overall well-being.[6,7] Technology addiction refers to the excessive use of digital devices, which may disrupt communication and learning processes.[8,9] Artificial intelligence (AI), on the other hand, involves the simulation of human intelligence by machines and is increasingly utilized in healthcare to improve diagnostic accuracy, optimize workflows, and support clinical decision-making.[1,10,11] In nursing education, students' attitudes toward AI influence how effectively they adopt and utilize these technologies in their future professional practice.[11,12] Recent studies from Türkiye further emphasize this point. For instance, Gülırmak Güler and Şen Atasayar[13] found that nursing students' attitudes toward AI were significantly associated with their creative personality traits, highlighting how individual characteristics can shape readiness for AI integration into nursing practice. Additionally, recent studies suggest that individuals with higher levels of technology dependence tend to exhibit more favorable attitudes toward AI applications.[1,14] For example, Farghaly Abdelaliem et al.[1] reported that nursing students with high levels of smart device dependency had more positive perceptions of AI.

These findings suggest a potential relationship between technology addiction and attitudes toward AI. However, internet and technology addiction are also associated with negative academic and psychological outcomes, such as absenteeism, fatigue, poor concentration, and reduced academic performance.[1,3,6,8] In a study conducted in Türkiye, students with high levels of internet addiction demonstrated lower academic achievement and increased fatigue.[3] Celikkalp et al.[9] also reported that technology addiction negatively affects communication skills and emphasized that this addiction poses a threat to both learning processes and professional competencies. Moreover, addiction may affect not only academic success but also clinical decision-making and empathetic communication–key components of nursing education.[6,8,14]

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With the expansion of digital health, AI technologies are becoming increasingly integrated into nursing practice. From monitoring systems to decision-support tools, the use of AI can improve care quality and reduce workload.[1,10,11] Although these variables have demonstrated significant impacts, most studies continue to examine internet addiction, technology addiction, or attitudes toward AI independently. For example, Farghaly Abdelaliem et al.[1] addressed smart device use and AI perception but did not examine internet addiction. Akca Sumengen et al.[11] explored attitudes toward AI without considering digital usage behaviors. Recent studies further illustrate this gap: Sağlam et al.[15] examined AI usage and AI-less phobia but did not address technology addiction, while Arslan et al.[16] linked attitudes toward AI to social media use. Han et al.[17] and Ali et al.[18] investigated AI use and digital behaviors among nursing students; however, neither study examined internet addiction, technology addiction, and attitudes toward AI together within an integrated model.

Therefore, this study aims to address this gap by examining the interrelationships among internet addiction, technology addiction, and attitudes toward AI among nursing students. By identifying patterns and correlations among these variables, the study seeks to provide a more holistic understanding of how digital dependencies may influence readiness to engage with emerging technologies in healthcare. Ultimately, this research provides insights that may guide curriculum development and the design of educational strategies aimed at balancing technology use with professional competency development.

Aim of the Study

This study aimed to determine the levels of technology addiction, internet addiction, and attitudes toward AI among nursing students, as well as the relationships among these variables.

Research Questions

- What is the level of technology addiction among nursing students?
- What is the level of internet addiction among nursing students?
- What is the level of nursing students' attitudes toward AI?
- What is the relationship among technology addiction, internet addiction, and attitudes toward AI in nursing students?

Materials and Methods

Study Design

This study employed a descriptive and correlational design.

Population and Sample

The study population consisted of 1,011 nursing students enrolled at the Faculty of Nursing of Gazi university in Ankara. An a priori power analysis was conducted to determine the required sample size. The analysis, performed using G*Power 3.1 software, was based on a correlational research design and informed by the study conducted by Farghaly Abdelaliem et al.[1] For a two-tailed Pearson correlation analysis, assuming a moderate effect size (r=0.30), a significance level of 5% (α=0.05), and a statistical power of 95% (1-β=0.95), the minimum required sample size was calculated as 138 participants. As the study aimed to reach the entire student population, all nursing students were invited to participate. As the study aimed to reach the entire student population, all nursing students were invited to participate. Although the minimum required sample size was calculated as 138 based on power analysis, a total of 608 students who met the inclusion criteria were included in the analysis. The statistical power of the study was above 0.99, indicating high reliability. This approach is widely accepted in cross-sectional descriptive studies and enhances both the generalizability and statistical reliability of the findings.[19] Moreover, recent studies on sample planning and power analysis in nursing research emphasize that expanding the sample through voluntary participation is methodologically appropriate and acceptable.[20–22] Although a small number of international students were enrolled in the program, they were not included in the study because they did not participate.

The inclusion criteria were being a nursing student and voluntarily agreeing to participate in the study. The exclusion criterion was incomplete or improperly completed questionnaires.

Data Collection Tools

The research data were collected using a questionnaire consisting of two sections: (1) a demographic information form developed by the researchers and (2) validated scales adapted from the literature. The first section included eight questions related to the students' descriptive characteristics: age, gender, grade level, cumulative grade point average (GPA), daily internet usage time (minutes), daily technology usage time (minutes), whether they had received education about AI, and whether they believed AI should be included in nursing education.

The second section included the following instruments: the Internet Addiction Scale (IAS), the Technology Addiction Scale (TAS), and the General Attitude Toward Artificial Intelligence Scale (GATAIS).

Internet Addiction Scale (IAS)

The scale, originally developed by Hahn and Jerusalem[23] and adapted into Turkish by Sahin and Korkmaz,[24] consists of 19 items. It includes three subdimensions: "loss of control," "desire to stay online longer," and "negativity in social relationships." The IAS is a five-point Likert-type scale, with the following response options: "Never (1)," "Rarely (2)," "Sometimes (3)," "Usually (4)," and "Always (5)." Loss of control refers to various problems caused by excessive internet use and the inability to stop using it. Desire to stay online longer indicates the amount of time spent online. Negativity in social relationships refers to interpersonal problems with other people resulting from excessive internet use. The total score obtainable from the scale ranges from 19 to 95. Higher scores indicate higher levels of internet addiction. The Cronbach's alpha (Crα) coefficient for the Turkish adaptation of the scale was reported as 0.85.24 In the present study, the Cronbach's alpha coefficient was 0.92.

Technology Addiction Scale (TAS)

The Technology Addiction Scale, developed based on Young's[25] Internet Addiction Test criteria and Griffiths'[26] study, was adapted into Turkish by Aydın.[27] The scale consists of 24 items and includes four subdimensions: Social Network Addiction (6 items), Instant Messaging Addiction (6 items), Online Game Addiction (6 items), and Website Addiction (6 items). The TAS is a five-point Likert-type scale. Each behavior is scored as follows: "1"=never, "2"=rarely, "3"=moderately often, "4"=very often, and "5"=always. For each subdimension, the minimum possible score is 6 and the maximum is 30. The total score for the entire scale ranges from 24 to 120. When interpreting total scores, the following categories are used:

- 24–48: Low level of addiction
- 49–72: Moderate level of addiction
- 73–96: High level of addiction
- 97–120: Very high level of addiction.

Scores below 24 were defined as "not addicted".[27] In the present study, the Cronbach's alpha coefficient was 0.93.

General Attitude Toward Artificial Intelligence Scale (GATAIS)

The GATAIS, developed by Schepman and Rodway[28] and adapted into Turkish by Kaya et al.,[29] consists of 20 items. The scale includes two subdimensions: positive attitudes toward AI (12 items) and negative attitudes toward AI (8 items). The GATAIS is a five-point Likert scale scored as follows: strongly agree (5), agree (4), undecided (3), disagree (2), and strongly disagree (1). Items 13–20, which measure negative attitudes, are reverse-coded during scoring. A minimum score of 12 and a maximum score of 60 can be obtained from the Positive Attitude Toward AI (Positive GAAI) subdimension. In contrast, the Negative Attitude Toward AI (Negative GAAI) subdimension yields scores ranging from 8 to 40. An increase in the Positive GAAI subdimension score indicates a more positive attitude toward AI. Higher scores on the Negative GAAI subdimension indicate lower levels of negative attitudes toward AI. In the original study, the Cronbach's alpha (Crα) coefficient was reported as 0.88 for the Positive GAAI and 0.83 for the Negative GAAI.28 In the Turkish adaptation, the Cronbach's alpha values were 0.82 for the Positive GAAI and 0.84 for the Negative GAAI.29 In the present study, the overall Cronbach's alpha coefficient for the scale was 0.83.

Dependent and Independent Variables of the Study

Students' descriptive characteristics were considered independent variables, whereas attitudes toward AI, technology addiction levels, and internet addiction levels were considered dependent variables.

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Data Collection

Data were collected face-to-face between February 15 and April 20, 2025. Prior to data collection, the researchers visited each class and informed the course instructors about the study. After explaining the purpose of the study, the data collection procedure, and the expected outcomes, written informed consent was obtained from the students who agreed to participate. The completion of the data collection instruments took approximately 10–15 minutes.

Data Analysis

The data were analyzed using IBM SPSS Statistics version 27.0 (IBM Corp., Armonk, NY, USA). Descriptive data were presented as numbers, percentages, minimum and maximum values, means, and standard deviations. The normality of the data distribution was assessed using the Kolmogorov-Smirnov test, as well as skewness and kurtosis coefficients. Since the variables did not demonstrate normal distribution, the Spearman correlation test was used to examine the relationships among variables. For intergroup comparisons, the nonparametric Mann-Whitney U test was used to evaluate differences between two groups, and the Kruskal-Wallis H test was used to compare three or more groups. Statistical significance was set at $p<0.05$.

Ethical Approval

Ethical approval was obtained from the Gazi University Ethics Committee (Approval Number: E-77082166-604.01-1130133, Date: 24.12.2024). Following ethical approval, written permission was obtained from the Faculty of Nursing of Gazi university. Written informed consent was obtained from the students after providing detailed information about the purpose, procedures, and expected outcomes of the study. Participation was voluntary, and no identifying information (such as names or student numbers) was collected. The researchers were not aware of which students participated. To minimize any perception of pressure, the questionnaires were collected by independent researchers rather than faculty members involved in the students' education. This procedure helped prevent any potential conflict of interest between the researchers and the student participants. The study commenced after all necessary approvals had been obtained. Permission to use the measurement scales was obtained via email from the original scale developers. The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. The authors did not use generative AI technologies (e.g., ChatGPT, large language models [LLMs], chatbots, or image generators) during the design, data analysis, or writing of the manuscript. A language editing tool (Grammarly) was used solely for grammar and language editing purposes.

Results

The mean age of the participants was 20.72±2.11 years, and 84.0% were female. Among the students, 28.9% were in the first year, and 37.6% reported a moderate academic GPA (2.50–3.00). The average daily internet usage was 281.92±122.70 minutes, while the average daily technology usage was 316.51±143.69 minutes. Additionally, 84.4% of students reported using AI, with 56.5% of those using it specifically for completing homework (Table 1).

Table 1. Distribution of students according to descriptive characteristics (n=608)

Characteristics	Min-Max	Mean±SD
Age	17–45	20.72±2.11
Daily internet use (minutes)	45–960	281.92±122.70
Daily technology use (minutes)	50–960	316.51±143.69
	n	**%**
Gender		
Female	511	84.0
Male	97	16.0
Academic year		
1st year	176	28.9
2nd year	149	24.5
3rd year	140	23.0
4th year	143	23.6
GPA		
<2.50 (low)	115	18.9
2.50–3.00 (moderate)	228	37.6
3.01–3.50 (good)	193	31.7
>3.50 (very good)	72	11.8
Received AI training		
Yes	18	3.0
No	590	97.0
Source of AI training (n=18)		
Online platforms	8	44.4
Undergraduate courses	7	38.9
Certified programs	3	16.7
AI usage status		
Uses AI	513	84.4
Does not use AI	95	15.6
Source of learning about AI (n=513)		
Social environment (friends)	182	35.4
Internet	186	36.3
Social media	124	24.2
Undergraduate courses	21	4.1
Purpose of AI use* (n=513)		
Doing homework	290	56.5
General curiosity/multiple topics	116	22.6
Academic research/accessing information	111	21.6
Entertainment	41	7.9
Learning English	7	1.3
Should AI be included in undergraduate education		
Yes	406	66.8
No	36	5.9
Undecided	166	27.3

*: Multiple responses were allowed. Min: Minimum, Max: Maximum, SD: Standard deviation.

The mean internet addiction score was 43.98±13.07, and the mean technology addiction score was 51.66±17.23. The mean total score for general attitude toward AI was 67.32±9.54. For the subdimensions, the mean positive attitude score was 42.60±7.47, while the mean negative attitude score was 24.72±5.76 (Table 2).

Table 3 presents the correlations between internet addiction, technology addiction, and general attitudes toward AI, including their subscales. A strong positive correlation was found between internet addiction and technology addiction ($r=0.773$; $p<0.01$). A low-level negative correlation was observed between negative attitudes toward AI and both internet addiction ($r=-0.206$; $p<0.01$) and technology addiction ($r=-0.191$; $p<0.01$). A low-level positive correlation was also found between positive attitudes toward AI and internet addiction ($r=0.142$; $p<0.01$) (Table 3).

The mean technology addiction score was significantly higher in male students ($\chi^2=58.09\pm20.38$) compared to female students ($\chi^2=50.44\pm16.30$) ($U=19441.0$, $p<0.01$). According to students' academic year, no significant differences were found in internet addiction ($H=5.9533$, $p=0.1139$) or technology addiction ($H=7.6486$, $p=0.0539$). However, a significant difference was found in attitudes toward AI by grade level ($H=40.6232$, $p<0.01$), with the highest attitude scores observed in 4th-year students ($\chi^2=70.72\pm9.82$) and the lowest in 1st-year students ($\chi^2=64.70\pm9.42$) (Table 4).

While it was found that participants' internet ($H=10.8538$, $p<0.05$) and technology ($H=19.1273$, $p<0.01$) addiction levels increased as their general academic GPA decreased, no significant difference was found in their attitude scores toward AI ($H=7.1302$, $p=0.0679$). In addition, in the analysis based on AI usage status, no significant difference was found in terms of internet addiction ($U=25800.5$, $p=0.3622$) or technology addiction ($U=25552.5$, $p=0.4512$). However, participants who used AI

Table 2. Mean scores of students' internet addiction, technology addiction, and attitudes toward AI (n=608)

Scale	Mean±SD	Min	Max
IAS			
Loss of control	18.63±5.42	7	35
Desire to stay online longer	8.17±2.81	3	15
Negativity in social relationships	17.17±6.82	8	43
Total	43.98±13.07	19	93
TAS			
Social network addiction	13.29±4.58	6	29
Instant messaging addiction	13.40±4.86	29	29
Online game addiction	11.30±5.84	6	30
Website addiction	13.65±5.40	6	30
Total	51.66±17.23	24	109
GATAIS			
Negative attitude toward AI	24.72±5.76	8	40
Positive attitude toward AI	42.60±7.47	12	104
Total	67.32±9.54	35	100

SD: Standard deviation, Min: Minimum, Max: Maximum, IAS: Internet Addiction Scale, TAS: Technology Addiction Scale, GATAIS: General Attitude Toward Artificial Intelligence Scale.

[χ^2=68.16±9.41] had significantly higher AI attitude scores than those who did not use AI [χ^2=62.74±8.97] (U=31609.0, p<0.01) (Table 4).

Discussion

The findings indicate that students reported active daily use of the internet and technology. Similarly, Guven Özdemir and Sönmez[2] found that nursing students make intensive use of online technologies. Although most nursing students in our study use AI technologies, it was concluded that only a small proportion had received training on this subject, which was generally obtained from online platforms or informal sources. This finding aligns with the results reported by Lukić et al.[10] and Akca Sumengen et al.[11] These results suggest that AI has not yet been sufficiently integrated into the nursing curriculum and that students' attitudes toward AI may be shaped more by limited knowledge and personal observation than by structured educational experiences. The finding that students primarily use AI for homework (56.5%) and general information (22.6%) indicates that this technology is not yet incorporated into health education in a structured and guided manner.[1] Unguided and unsupervised use of technology may lead students to accept AI-generated information without critically evaluating its accuracy, thereby increasing the risk of misinformation. This situation places important responsibility on educators to enhance digital literacy in nursing education and to develop structured teaching strategies that appropriately guide the use of AI.

In the present study, the level of internet addiction among nursing students was found to be moderate. When the subdimensions were examined, the higher scores for loss of control and negativity in social relationships, compared to the desire to stay online longer, may indicate that digital technologies exert more dominant effects on social functioning. Similarly, the mean total score for technology addiction was at a moderate level. The social network use and instant messaging subdimensions revealed that students primarily used technology for social interaction. These findings are consistent with the study by Göktaş and Öztürk's,[30] which demonstrated that increased technology use is largely concentrated on social media and instant communication platforms. Such patterns may negatively affect individuals' academic and social balance. Attitudes toward artificial intelligence were generally positive, with the overall attitude score predominantly reflecting the positive attitude toward AI subdimension. Dost et al.[31] and Farghaly Abdelaliem et al.[1] likewise reported that students demonstrated highly positive attitudes toward AI despite having limited direct experience. In addition, Gülırmak Güler and Şen Atasayar[13] found that nursing students' attitudes toward AI were significantly associated with creative personality traits, suggesting that individual characteristics may shape positive perceptions of AI beyond experiential factors. Similarly, El-Kader and Hanson[14] reported that most nursing students were moderate internet users, and 46.4% experienced occasional internet-related problems. Furthermore, 68.2% of students used the internet mainly for communication purposes, which confirms the prominence of digital media as a tool for social interaction.[14] Although these findings are not directly related to AI, they suggest that students' frequent and socially oriented use of the internet may increase their familiarity with technology, thereby indirectly contributing to the development of positive attitudes toward AI, even in the absence of in-depth experience. Although this study does not include a specific scale or comparative analysis examining cultural differences, the literature indicates that attitudes toward artificial intelligence can be influenced by cultural values, educational systems, and access to technological infrastructure.[32] In this context, the positive attitudes observed in the Turkish sample may be attributed to factors such as societal openness to digitalization, a high proportion of young people, and the level of technology integration in educational institutions. Furthermore, nursing students' positive attitudes toward AI are important for the adoption of AI-supported technologies in clinical practice. The literature emphasizes AI's potential to improve care quality and patient safety in nursing practice, particularly in areas such as clinical decision support systems, patient monitoring, early warning mechanisms, and data analytics.[33,34] However, potential risks, including the limitations of algorithms in ethical decision-making processes, concerns regarding data privacy, and the possible weakening of human-centered care, have also been discussed.[35] Therefore,

Table 3. Correlation between internet addiction, technology addiction, and general attitude toward AI

Scale and Subdimensions	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12
	r	r	r	r	r	r	r	r	r	r	r	r
Loss of control (D1)		0.675**	0.623**	0.888**	0.662**	0.559**	0.260**	0.602**	0.633**	-0.149**	0.188**	0.038
Desire to stay online longer (D2)	0.675**		0.544**	0.776**	0.543**	0.471**	0.233**	0.538**	0.540**	-0.110**	0.151**	0.049
Negativity in social relationships (D3)	0.623**	0.544**		0.881**	0.735**	0.616**	0.490**	0.670**	0.757**	-0.229**	0.065	-0.112**
Internet Addiction Scale (D4)	0.888**	0.776**	0.881**		0.770**	0.657**	0.418**	0.713**	0.773**	-0.206**	0.142**	-0.036
Social network addiction (D5)	0.662**	0.543**	0.735**	0.770**		0.673**	0.457**	0.703**	0.852**	-0.158**	0.078	-0.061
Instant messaging addiction (D6)	0.559**	0.471**	0.616**	0.657**	0.673**		0.428**	0.659**	0.831**	-0.163**	0.059	-0.067
Online game addiction (D7)	0.260**	0.233**	0.490**	0.418**	0.457**	0.428**		0.445**	0.697**	-0.139**	0.082*	-0.050
Website addiction (D8)	0.602**	0.538**	0.670**	0.713**	0.703**	0.659**	0.445**		0.862**	-0.171**	0.046	-0.089*
Technology Addiction Scale (D9)	0.633**	0.540**	0.757**	0.773**	0.852**	0.831**	0.697**	0.862**		-0.191**	0.079	-0.080*
Negative attitude toward AI (D10)	-0.149**	-0.110**	-0.229**	-0.206**	-0.158**	-0.163**	-0.139**	-0.171**	-0.191**		0.023	0.597**
Positive attitude toward AI (D11)	0.188**	0.151**	0.065	0.142**	0.078	0.059	0.082*	0.046	0.079	0.023		0.768**
General Attitude Toward AI Scale (D12)	0.038	0.049	-0.112**	-0.036	-0.061	-0.067	-0.050	-0.089*	-0.080*	0.597**	0.768**	

r: Spearman's correlation coefficient, *: p<0.05, **: p<0.01.

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Table 4. Relationship between demographic characteristics of nursing students and scale scores (n=608)

Demographic variable	n	Internet addiction scale Mean±SD	Technology addiction scale Mean±SD	General attitude toward AI scale Mean±SD
Gender				
Female	511	43.70±12.56	50.44±16.30	67.06±9.12
Male	97	45.46±15.47	58.09±20.38	68.67±11.45
U (p)		23436.0 (0.3956)	19441.0 (0.0008**)	23290.0 (0.3462)
Academic year				
1st year	176	42.91±12.74	52.91±17.27	64.70±9.42
2nd year	149	45.49±13.25	51.65±16.20	65.73±8.63
3rd year	140	45.18±13.04	52.57±16.19	68.83±9.09
4th year	143	42.55±13.17	49.25±19.06	70.72±9.82
H (p)		5.9533 (0.1139)	7.6486 (0.0539)	40.6232 (0.000*)
Overall GPA				
<2.50 (low)	115	46.26±13.53	57.23±18.99	65.36±10.40
2.50-3.00 (moderate)	228	44.98±13.48	52.60±17.73	67.50±9.91
3.01-3.50 (good)	193	42.63±12.57	48.90±15.42	67.93±8.72
>3.50 (very good)	72	40.81±11.45	47.19±14.71	68.20±8.78
H (p)		10.8538 (0.0125*)	19.1273 (0.0003**)	7.1302 (0.0679)
AI usage status				
Uses AI	513	44.17±13.07	51.84±17.21	68.16±9.41
Does not use AI	95	42.95±13.11	50.71±17.38	62.74±8.97
U (p)		25800.5 (0.3622)	25552.5 (0.4512)	31609.0 (0.000**)

*: p<0.05, **: p<0.01. SD: Standard deviation, U: Mann-Whitney U test, H: Kruskal-Wallis H test, GPA: Grade point average.

students' positive attitudes toward AI should be considered not only in terms of openness to technological innovation, but also in terms of their readiness to use these systems safely and ethically.

The strong correlations observed among the subdimensions of the internet and technology addiction scales indicates that these constructs can be evaluated both consistently and holistically, pointing to a multidimensional addiction profile. This finding is consistent with previous studies demonstrating that digital technologies are widely integrated into individuals' personal and academic lives.[6,30] Furthermore, earlier research suggests that high levels of digital addiction among nursing students may negatively affect academic and psychological well-being.[6,9] In particular, the significantly higher levels of technology addiction observed among male students support the influence of gender on digital habits.[5] Additionally, the significant increase in internet and technology addiction levels as GPA decreases suggests that these digital habits may be inversely related to academic achievement.[2]

However, it is noteworthy that the relationships between attitudes toward AI and digital addiction indicators (internet and technology addiction) were weak. This may be explained by the fact that AI technologies have not yet been sufficiently integrated into students' daily and academic lives. Studies indicate that individuals' attitudes toward a technology are closely related to the frequency and context of their exposure to it.[11,12,29] Students' knowledge and perceptions of AI appear to be largely based on indirect experiences; therefore, these attitudes may not be strongly associated with more established forms of digital behavior.[1,36,37] Consistent with this, a recent study reported that nursing students' attitudes toward AI were influenced by individual characteristics, such as creative personality traits, suggesting that factors beyond digital behaviors may shape perceptions of AI.[13] Based on these findings, AI-oriented applications, case studies, and clinical scenarios should be more systematically integrated into nursing education to foster stronger and more functional attitudes toward AI.

In this study, no significant differences were observed according to gender or AI use variables; however, grade level emerged as a significant determinant. The more positive attitudes toward AI observed among final-year students compared to first-year students suggest that the educational process enhances awareness and acceptance of this technology. This finding aligns with previous research indicating that positive attitudes toward AI develop through exposure to and meaningful experience with the technology.[11,36] Indeed, the significantly higher AI attitude scores among students who reported using AI indicate that usage influences attitude formation. Similarly, the literature shows that students who actively interact with AI tend to approach this technology more positively and demonstrate greater willingness to adopt it.[37] These findings suggest that expanding applied AI-related content within nursing education programs may play a critical role in fostering positive attitudes. Considering that the sample of this study consisted of nursing students, who will directly participate in patient care processes in their future professional practice, this finding is particularly significant. Therefore, although students' attitudes toward AI are positive, their largely superficial nature highlights the need to reinforce them through practice-based and experience-oriented education during training.

Overall, the findings indicate that nursing students are highly exposed to digital technologies; however, their direct experience with AI is limited. This suggests that while positive attitudes have formed, they are still superficial and are not grounded in practical use. Therefore, the integration of AI into the nursing curriculum should go beyond the awareness level and be supported by systematic, practice-based learning experiences.

Limitations

The generalizability of this study is limited, as the data were collected from nursing students within a specific timeframe. In addition, since AI use and attitudes were assessed through self-reported measures, response bias based on participants' subjective perceptions may have influenced the results. Furthermore, AI usage experience and frequency of use (factors that could affect attitudes toward AI) were not directly measured in this study. This should be considered an additional limitation when interpreting the findings.

Conclusion

The findings indicate that students' levels of internet and technology addiction are generally moderate. In addition, students' attitudes toward AI were found to be generally positive. However, these positive attitudes are primarily based on limited information, observation, and indirect learning sources rather than direct experience, despite participants' reports regarding their AI use and purposes.

This indicates that positive attitudes toward artificial intelligence have not yet translated into application-based competence.

Based on these findings, several strategic recommendations can be made regarding the integration of AI into nursing education within digital health systems. In particular, given the presence of positive yet experience-limited attitudes toward AI, it is necessary to incorporate AI into both theoretical coursework and practical training in a more systematic and structured manner to ensure that students' attitudes become sustained and functional. Accordingly, educational strategies should focus on enhancing students' technological competencies and supporting the effective and responsible use of AI.

In conclusion, although nursing students demonstrate high exposure to digital technologies, their direct experience with AI is limited. Nevertheless, they exhibit promising positive attitudes toward AI. Even when not fully experience-based, such positive attitudes are valuable in the context of rapidly digitalizing healthcare systems. The findings of this study contribute to the academic literature and hold strategic importance for shaping health policies, restructuring educational curricula, and developing professional competencies. Future research is recommended to comparatively examine nursing students' attitudes toward AI across different health disciplines and to provide more in-depth analyses using qualitative methodologies.

Ethics Committee Approval: The study was approved by the Gazi University Ethics Committee (Approval Number: E-77082166-604.01-1130133, Date: 24.12.2024).

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References

1. Farghaly Abdelaliem SM, Dator WLT, Sankarapandian C. The Relationship between Nursing Students' Smart Devices Addiction and Their Perception of Artificial Intelligence. Healthcare (Basel). 2022;11(1):110. [CrossRef]
2. Guven Ozdemir N, Sonmez M. The relationship between nursing students' technology addiction levels and attitudes toward e-learning during the COVID-19 pandemic: A cross-sectional study. Perspect Psychiatr Care. 2021;57(3):1442–1448. [CrossRef]
3. Sert H, Yilmaz FT, Kumsar AK, Aygin D. Effect of technology addiction on academic success and fatigue among Turkish university students. Fatigue: Biomedicine, Health & Behavior. 2019;7(1):41–51. [CrossRef]
4. Khalil AI, Alharbi NB, Alhawasawi HY, Albander AB. Prevalence of internet addiction among nursing students and the association with their academic performance and mental health. Athens J Health. 2016;3(43):291–306. [CrossRef]
5. Bayir B, Topbas T. The effect of technology addiction training given to nursing students on the perspectives and addiction levels of students. Arch Psychiatr Nurs. 2023;45:152–157. [CrossRef]
6. Cai H, Xi HT, An F, et al. The Association Between Internet Addiction and Anxiety in Nursing Students: A Network Analysis. Front Psychiatry. 2021;12:723355. [CrossRef]
7. Eiz-Elregal FA, Shaker MS, El Sayed HAE, Abd-El latif E. Internet addiction and its relationship with nursing students' health profile. Egypt J Health Care. 2018;9(4):368–381. [CrossRef]
8. Jiang Y, Shen Z, Zeng Y, et al. Social anxiety, loneliness, and mobile phone addiction among nursing students: latent profile and moderated mediation analyses. BMC Nurs. 2024;23(1):905. [CrossRef]
9. Celikkalp U, Bilgic S, Temel M, Varol G. The Smartphone Addiction Levels and the Association with Communication Skills in Nursing and Medical School Students. J Nurs Res. 2020;28(3):e93. [CrossRef]
10. Lukić A, Kudelić N, Antičević V, et al. First-year nursing students' attitudes towards artificial intelligence: Cross-sectional multi-center study. Nurse Educ Pract. 2023;71:103735. [CrossRef]
11. Akca Sumengen A, Ozcevik Subasi D, Cakir GN. Nursing students' attitudes and literacy toward artificial intelligence: A cross-sectional study. Teach Learn Nurs. 2025;20(1):e250–e257. [CrossRef]
12. Seo Y, Cho K. Influence of AI knowledge, perception, and acceptance attitude on nursing students' intention to use AI-based healthcare technologies. Korean Soc Nurs Res. 2022;6(3):81–90. [CrossRef]
13. Gülırmak Güler K, Şen Atasayar B. The relationship between nursing students' attitudes toward artificial intelligence and their creative personality traits. Int Nurs Rev. 2025;72(1):e70008. [CrossRef]
14. El-Kader RA, Hanson V. Internet usage and its addiction level among students in a selected college in Ras Al Khaimah Emirate: A cross-sectional study. Int J Stud Nurs. 2019;4(2):7–16. [CrossRef]
15. Sağlam RK, Kalanlar B. Living with and without AI: A mixed-methods study on AI usage, addiction, and 'Allessphobia' in nursing students. Nurse Educ Pract. 2025;88:104530. [CrossRef]
16. Arslan N, Esin K, Ayyıldız F. A validity and reliability study of the artificial intelligence attitude scale (AIAS-4) and its relationship with social media addiction and eating behaviors in Turkish adults. BMC Public Health. 2025;25(1):1244. [CrossRef]
17. Han S, Kang HS, Gimber P, Lim S. Nursing Students' Perceptions and Use of Generative Artificial Intelligence in Nursing Education. Nurs Rep. 2025;15(2):68. [CrossRef]
18. Ali LAEH, Ali MIEB, Ali SMA, Nashwan AJ. Smartphone dependency, digital amnesia, and somatic symptoms among nursing students: the challenge of artificial intelligence. BMC Nurs. 2025;24(1):599. [CrossRef]
19. Polit DF, Beck CT. Nursing research: Generating and assessing evidence for nursing practice. 11th ed. Philadelphia: Wolters Kluwer; 2021.
20. Althubaiti A. Sample size determination: A practical guide for health researchers. J Gen Fam Med. 2022;24(2):72–78. [CrossRef]
21. Buckley J. Conducting power analyses to determine sample sizes in quantitative research: a primer for technology education researchers using common statistical tests. J Technol Educ. 2024;35(2):81–109. [CrossRef]
22. Curtis AC, Keeler C. Sample Size Planning in Quantitative Nursing Research. Am J Nurs. 2023;123(11):42–46. [CrossRef]
23. Hahn A, Jerusalem M. Reliabilität und Validität in der Online-Forschung. In: Theobald A, Dreyer M, Starsetzki T, eds. Online-Marktforschung. Wiesbaden: Gabler Verlag; 2003:161–186. German. [CrossRef]
24. Sahin C, Korkmaz Ö. Adaptation of internet addiction scale into Turkish. Selçuk Univ Ahmet Keleşoğlu Educ Fac J. 2011;32:101–115. Turkish.
25. Young KS. Psychology of computer use: XL. Addictive use of the Internet: a case that breaks the stereotype. Psychol Rep. 1996;79(3 Pt 1):899–902. [CrossRef]
26. Griffiths M. A components model of addiction within a biopsychosocial framework. J Subst Use. 2005;10(4):191–197. [CrossRef]
27. Aydın F. Student views on the problems caused by technology addiction in the classroom environment. Master's Thesis. Ankara University Institute of Educational Sciences; 2017. Turkish.
28. Schepman A, Rodway P. Initial validation of the general attitudes towards Artificial Intelligence Scale. Comput Hum Behav Rep. 2020;1:100014. [CrossRef]
29. Kaya F, Aydin F, Schepman A, Rodway P, Yetişensoy O, Demir Kaya M. The roles of personality traits, AI anxiety, and demographic factors in attitudes towards artificial intelligence. Int J Hum Comput Interact. 2024;40(2):497–514. [CrossRef]
30. Göktaş P, Öztürk F. Examining the relationship between internet addiction and psychological well-being levels of university students. SDÜ Vizyoner Derg. 2022;13(36):1097–1116. Turkish. [CrossRef]
31. Dost A, Dogan AK, Huyar DA. Internet addiction in nursing students. Ordu Univ J Nurs Stud. 2021;4(3):393–401. Turkish. [CrossRef]
32. Barnes AJ, Zhang Y, Valenzuela A. AI and culture: Culturally dependent responses to AI systems. Curr Opin Psychol. 2024;58:101838. [CrossRef]
33. Chen Z, Liang N, Zhang H, et al. Harnessing the power of clinical decision support systems: challenges and opportunities. Open Heart. 2023;10(2):e002432. [CrossRef]
34. Wei Q, Pan S, Liu X, Hong M, Nong C, Zhang W. The integration of AI in nursing: addressing current applications, challenges, and future directions. Front Med (Lausanne). 2025;12:1545420. [CrossRef]
35. Elgin CY, Elgin C. Ethical implications of AI-driven clinical decision support systems on healthcare resource allocation: a qualitative study of healthcare professionals' perspectives. BMC Med Ethics. 2024;25(1):148. [CrossRef]
36. Khaled A, Elborai A. Knowledge and attitude of nursing students regarding artificial intelligence. Egypt J Health Care. 2024;15(3):510–523. [CrossRef]
37. Labrague LJ, Aguilar-Rosales R, Yboa BC, Sabio JB, de Los Santos JA. Student nurses' attitudes, perceived utilization, and intention to adopt artificial intelligence (AI) technology in nursing practice: A cross-sectional study. Nurse Educ Pract. 2023;73:103815. [CrossRef]

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Health and Social Care Professionals' Experiences of Community-Based Dementia Care: A Qualitative Study of Needs, Barriers, and Ethical Challenges

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Abstract

Background: As the number of people living with dementia (PwD) rises, community care is increasingly prioritized to support aging in place. However, dementia care at home presents complex challenges, including unmet medical needs, family caregiver burdens, and ethical concerns.

Aim: This study aimed to explore healthcare professionals' experiences and perceptions of community care for PwD, focusing on service delivery challenges, care needs, and ethical issues encountered in practice.

Methods: A qualitative descriptive design, following the Interpretive Phenomenological Approach, was used. Semi-structured interviews were conducted with 18 healthcare professionals providing community services, including doctors, nurses, and social workers. Data were analyzed thematically.

Results: Three main themes were identified: (1) Perceptions, differences, and gaps in service provision – professionals described varied understandings of dementia and highlighted inconsistencies in service coordination. Community care was often dependent on family initiative and limited by systemic barriers. (2) Dementia Patients' Needs and Challenges: Participants emphasized the physical and psychosocial needs of PwD, including hygiene, nutrition, and wound care. Many families lacked the knowledge or resources to provide adequate care. Financial strain, caregiver fatigue, and cases of neglect or abuse were common. (3) Ethical Issues in Community Care: Challenges included misuse of care pensions, unsafe living environments, and conflicts concerning autonomy and consent.

Conclusion: Community care for PwD is shaped by complex clinical, social, and ethical dynamics. Strengthening caregiver education, improving supervision, and establishing formal ethical support systems are essential.

Keywords: Dementia, ethics, professionals, qualitative research

Introduction

Dementia is a progressive neurological condition that impairs memory, cognition, behavior, and independent functioning. As the global population ages, its prevalence continues to rise, affecting more than 55 million people worldwide and is projected to reach 139 million by 2050.[1] According to national statistics for 2024, the proportion of adults aged 65 years and older has steadily increased over the past decade, exceeding 10% of the total population, and is expected to grow further.[2] Parallel to these demographic shifts, the number of people living with dementia is increasing, placing greater pressure on families and health and social care systems.[3]

Globally, nearly 60% of individuals newly diagnosed with dementia live in low- and middle-income countries, and approximately 71% of future cases are expected to occur in these settings.[4] In Türkiye, dementia represents a rapidly growing public health challenge: an estimated 800,000 people were living with dementia in 2019, and this number is projected to reach nearly 3 million by 2050, an increase of approximately 277%.[3]

In response to population ageing, home healthcare services in Türkiye have expanded through reforms promoting community-based care, including the Ministry of Health's Home Healthcare Services Regulation (2005) and the development of family physician–based models.[5] Although these services provide essential medical and rehabilitative support, dementia care remains complex due to limited specialization and fragmented coordination between medical and social services.[6–8] Dementia care in Türkiye is largely family-based, shaped by strong cultural expectations of familial responsibility and the limited availability of formal long-term care services. Because community-based services are accessible only to a limited number of people via municipal programs, state services, or private fee-based care, specialized services tailored to patients with dementia remain insufficient.[6–8]

Health and social care professionals providing community care to individuals with dementia face challenges that extend beyond clinical care. In this study, community care refers to health and social services provided to people with dementia in their homes and other non-institutional settings, including home healthcare services and municipality-based support programs. The intimate nature of community care creates complex situations, such as managing behavioral symptoms, ensuring safety in unsupervised environments, respecting autonomy amid cognitive decline, addressing consent issues, and balancing beneficence with limited resources.[9,10] Profes-

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sionals and caregivers often struggle to respect patients' preferences while ensuring their safety and well-being.[10] Disagreements between professionals and family caregivers may arise, particularly when patients are unable to express their wishes. Ethical conflicts frequently emerge around issues such as artificial feeding, involuntary treatments, and dignity at the end of life.[9,11] Poor communication between professionals and families can further intensify these dilemmas, while limited resources, training, and organizational support may hinder ethical decision-making in care.[9,11]

However, most existing evidence originates from high-income Western countries. Far less is known about how multidisciplinary healthcare professionals experience dementia care in community-based settings within middle-income or non-Western contexts, where family responsibility is central and formal support structures remain limited. In Türkiye, studies have reported difficulties in managing behavioral symptoms, communication barriers, and emotional strain in dementia care; however, ethical challenges in community-based care remain underexplored.[12,13] Research involving physicians indicates that their role in home health care is often limited to consultation, with minimal direct involvement in patient management.[14] Additionally, studies examining home healthcare services for people with Alzheimer's disease highlight gaps in coordination between professional teams and families, which adversely affect caregivers' well-being and the effectiveness of services.[15]

The absence of clear ethical guidance in community-based dementia care further intensifies these challenges.[16] In Türkiye, where dementia care is commonly perceived as a family responsibility, healthcare professionals frequently mediate between patients' needs and family expectations within under-resourced systems.[13,17] Understanding these culturally and systemically rooted dilemmas is essential for developing training, policies, and support systems that promote ethical, high-quality dementia care.

Therefore, this study aims to explore healthcare professionals' perceptions of dementia care, the practical and systemic challenges encountered during home-based service delivery, and the ethical dilemmas arising in everyday community-based practice. These dimensions are interconnected, as professionals' experiences are shaped by organizational constraints, family involvement, and ethical decision-making. By examining service delivery challenges, care needs, and ethical dilemmas in community settings, this study addresses a critical gap in the literature and provides contextually grounded insights from a middle-income, family-centered care system.

Study Questions

1. What are healthcare professionals' experiences and perceptions of community-based care for people living with dementia?
2. What challenges and gaps do healthcare professionals encounter in service delivery and coordination, and what dementia-related care needs are most difficult to meet in home/community settings?
3. What ethical issues and dilemmas arise in community-based dementia care, and how do healthcare professionals manage these issues in practice?

Materials and Methods

Study Design

This study employed a qualitative descriptive design informed by the Interpretive Phenomenological Approach(IPA).[18] It explored healthcare professionals' experiences and perceptions of community-based dementia care across disciplines, including doctors, nurses, and social workers. Focus group interviews were used to capture shared perspectives on professional roles, service challenges, and ethical concerns in community care. The study followed the Consolidated Criteria for Reporting Qualitative Research (COREQ) guidelines to ensure methodological rigor.[19] It was conducted within the framework of COST Action CA21137 (EDEM) as an initial phase of a cross-national analysis.

Participants and Setting

Participants were healthcare professionals recruited via purposive sampling from community care units of state hospitals, nursing homes, and municipal community care services. Data saturation was assessed during ongoing data collection and analysis, and was considered achieved when successive focus groups generated no new themes and repetitive patterns were observed by the third focus group. Most focus groups were conducted face-to-face in meeting rooms at participants' workplaces to ensure confidentiality and minimize disruption to routine duties, while one was conducted online via a secure videoconferencing platform.

Eligibility required at least six months' experience in community-based dementia care, including services provided through Alzheimer's Associations, and availability to participate in a focus group. Professionals without direct experience in community-based dementia care, those with less than six months of relevant experience, or those unable to attend a full focus group session were excluded.

Data Collection Tool

Data were collected through semi-structured interviews. An interview guide was developed covering topics such as perceived challenges, needs, ethical issues, and strategies in dementia care.[20]

Data Collection

Semi-structured focus group interviews were conducted between March and July 2024 to explore healthcare professionals' perspectives on community-based dementia care. Three focus groups (each with 5–8 participants) were held (two face-to-face and one online), each lasting 90–120 minutes. Interviews were conducted in Turkish, the native language of both participants and researchers. The use of both formats accommodated participants' clinical workload, geographical dispersion, and scheduling constraints. All sessions were audio-recorded with participants' consent and transcribed verbatim.

Data Analysis

Data were analyzed using an IPA-informed thematic analysis. Phenomenological concepts derived from IPA, such as attention to lived experience and interpretative meaning-making, informed the analytic stance, while the primary analytic goal was to identify recurring patterns and shared meanings across participants rather than to generate idiographic cases.[21] Audio recordings were transcribed verbatim in Turkish and analyzed in the original language to preserve meaning and contextual nuance. The analysis followed an iterative and inductive process. Transcripts were read repeatedly for familiarization, and initial notes capturing descriptive, linguistic, and conceptual observations were recorded in the margins. Codes were generated inductively, compared across transcripts, and then clustered into broader categories and themes. Themes were examined within and across focus groups and organized into superordinate themes and subthemes representing shared and divergent experiences. Illustrative quotations were selected to demonstrate how interpretations were grounded in the data. To enhance analytic rigor, preliminary codes and themes were discussed in analytic meetings within the research team. When differing interpretations emerged, researchers returned to the original transcripts and refined the themes through iterative discussion until consensus was reached. Reflexive memoing and peer debriefing were used to support transparency and credibility in the analytic process.

Rigor and Trustworthiness

To ensure rigor and trustworthiness, Lincoln and Guba's criteria[21] for credibility, dependability, confirmability, and transferability were applied. Credibility was supported through peer debriefing, reflexive memo writing, and an audit trail; member checking was not feasible due to participants' clinical workload. Transferability was addressed by providing detailed contextual descriptions of the setting and participants, enabling readers to assess applicability. Dependability was achieved by systematically documenting each research stage, including recruitment, data collection, and analysis, with coding decisions and theme development recorded in reflexive memos. Confirmability was strengthened through researcher reflexivity and by grounding interpretations in participants' narratives rather than in researchers' assumptions. Together, these measures ensured a transparent and methodologically robust analytic process.

Ethical Considerations

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Ethical approval was obtained from the Ethics Committee of Koç University (Approval Number: 2024.022.IRB3.005, Date: 25.01.2024). All participants provided written informed consent, and confidentiality was ensured through pseudonymization.

Results

Eighteen healthcare professionals participated in the study, including five physicians, eight nurses, and five social workers. Participants ranged in age from 27 to

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Table 1. Participant characteristics

Participant #	Gender	Age	Marital status	Education	Work experience (years)	Place of work	Type of service
Participant #1	W	28	Single	Medicine	4	State Home Care Unit	Public
Participant #2	M	51	Married	Medicine	26	Municipality Home Care	Public
Participant #3	W	51	Married	Medicine	26	Municipality Home Care	Public
Participant #4	M	40	Married	Medicine	14	Municipality Home Care	Public
Participant #5	M	59	Married	Medicine	32	Municipality Home Care	Public
Participant #6	W	45	Single	Nursing Vocational School	22	Municipality Home Care	Public
Participant #7	W	35	Married	Nursing High School	20	Municipality Home Care	Public
Participant #8	W	45	Married	Nursing - MSc	23	Municipality Home Care	Public
Participant #9	W	28	Married	Nursing - BSc	6	Municipality Home Care	Public
Participant #10	W	28	Single	Nursing - MSc	6	Municipality Home Care	Public
Participant #11	W	37	Single	Nursing - MSc	15	Municipality Home Care	Public
Participant #12	M	28	Single	Nursing - BSc	6	State Home Care	Public
Participant #13	M	27	Single	Nursing - BSc	5	State Home Care	Public
Participant #14	W	28	Married	Social Work - MSc	6	Nursing Home	Public
Participant #15	W	28	Married	Social Work - MSc	6	Municipality Social Service	Public
Participant #16	M	35	Married	Social Work - BSc	12	Nursing Home	Private
Participant #17	W	28	Married	Social Work - MSc	6	Municipality Social Service	Public
Participant #18	M	32	Married	Social Work - MSc	9	Municipality Social Service	Public

Table 2. Summary of findings

Theme	Subtheme	Key descriptive findings	Illustrative examples (profession)
Theme 1: Perception and Gaps in Service Provision	Perceptions of People with Dementia and Management of Care	People with dementia (PwD) are perceived as highly dependent; care is focused on safety, hygiene, and supervision; families experience long-term burden and exhaustion	"*They are like a baby; they need protection*." (Doctor)
	Service Delivery and Financial Barriers	Community care relies heavily on families; limited supplies are provided; families often purchase medical materials themselves; coordination occurs informally	"*The nurse goes first and sends photos of the wound*." (Doctor)
Theme 2: Needs and Care Challenges	Needs of People with Dementia	Basic care needs include hygiene, nutrition, mobility, and wound care; social support (cleaning, cooking) is also required	"*Our workers even go to clean and cook for her*." (Nurse)
	Care Challenges	Untrained family caregivers and paid foreign workers, language barriers, reuse of medical equipment, and delayed care due to poverty	"*They reuse catheters because they cannot buy new ones*." (Nurse)
	Involvement of Relatives in Care	Family caregivers should learn care tasks; training improves outcomes; emotional and financial support are needed	"*We taught them how to dress the wound, and it improved*." (Nurse)
Theme 3: Ethical Issues in Community Care	Failure to Fulfill Care Responsibility	Misuse of care pension; neglect and abuse; resistance to institutional care for financial reasons	"*They receive money but don't care for him*." (Social worker)
	Human Dignity in the Home Environment	PwD are kept in unsuitable rooms, unhygienic conditions, and isolation by family	"*They put him in a dark, dirty room*." (Doctor)
	Problems Caused by Cognitive Impairment	Difficulties with consent; conflicting wishes between patient and relatives; risk of false accusations	"*We decide instead of the patient*." (Doctor)
	Solution Finding for Ethical Problems	Team discussions, personal ethics, legal referral by social workers, and lack of formal ethics committees	"*We discuss it as a team*." (Nurse)

59 years, and six were single (Table 1). The analysis generated three overarching themes reflecting professionals' experiences of community-based dementia care: (1) perceptions of people with dementia and gaps in service provision; (2) the needs of people with dementia, care challenges, and family involvement; and(3)ethical issues and dilemmas in community care. These themes illustrate how healthcare professionals navigate clinical, social, and ethical complexities while providing care in home and community settings. A descriptive overview of findings across themes and professional groups is presented in Table 2, while the narrative below focuses on the interpretive analysis of participants' experiences.

Theme 1: Perceptions for People with Dementia and Gaps in Service Provision for People with Dementia

This theme explores healthcare professionals' understanding and interpretation of dementia, and how these perceptions shape the delivery of community-based care.

Sub-theme 1a: Perceptions Regarding People with Dementia and Management of Care

The participants view dementia as a progressive condition requiring intensive supervision and safety measures, frequently comparing patients' vulnerability to that

of children, and they perceive people with dementia as needing significant caregiver support and safety precautions. "…. *They are like a baby; they need protection in terms of security, and their doors are locked. … All of them need to be monitored. They cannot do it alone*." (Doctor)

The participants highlight the progressive nature of dementia care and the shifting responsibilities of families over time. The complexity of managing behavioral symptoms and safety concerns, such as preventing falls, ensuring medication adherence, and handling incontinence, further challenges family members as the disease progresses. "*Since patients with dementia cannot communicate their complaints, relatives and caregivers face a difficult situation. Relatives can become anxious and stressed while trying to solve the problems of their suffering patients. This makes caring for people with dementia more difficult for both relatives and healthcare professionals*." (Nurse)

This continuous pressure frequently results in caregiver burnout. Participants observed that some families reach a point of total exhaustion at which their inquiries about prognosis mask a deeper desire for the patient's suffering to end. "*Relatives of the patients also experience burnout. They take care of them for an extended period, and they become fatigued. The relatives ask us whether this disease will get better. What they really want to ask is when he will die. They appear to be waiting for death.*" (Doctor).

Sub-theme 1b: Service Delivery and Financial Barriers

Healthcare professionals play a crucial role in coordinating and delivering community care services for people with dementia, particularly those who are bedridden. Pressure ulcers and catheter use are common concerns for bedridden patients with advanced dementia and comorbidities. Multidisciplinary collaboration is facilitated through WhatsApp groups, allowing nurses to quickly refer patients to physiotherapists, psychologists, or other specialists. Home visits are more than just medical check-ups; they provide psychosocial support, especially for patients who live alone and may have limited social *interactions*.

Nurses are often the first to visit patients, assess their condition, and take photographs of wounds, which are then shared with physicians to guide treatment decisions. As one doctor explained: "Every *patient is visited as a team, but we doctors cannot keep up, so first the nurse goes and assesses the patient." If she takes photos of the wound and shares them with us, then the treatment process can begin*."

Social workers primarily provide referral-based support, guiding families to diagnostic clinics, disability benefits, and Alzheimer's associations for psychoeducational support and financial aid. As one social worker explained, "*As social workers, we cannot go to every home and communicate one-to-one with the family with Alzheimer's disease, but if there is a relative with Alzheimer's disease or suspicion of Alzheimer's disease in the family, we direct the elderly and the applicants accordingly to the service they need*."

Despite existing state and municipal support, significant service gaps remain. Professional feedback indicates that public provision of medical consumables, such as diapers, catheters, and wound dressings, is frequently insufficient. Consequently, family caregivers must cover these essential costs out-of-pocket, as the state's financial assistance fails to meet the daily demands of advanced dementia care.

Theme 2: Needs and Care Challenges

The complexities of the disease necessitate comprehensive care that spans physical, emotional, and social domains. This theme explores the multifaceted needs of individuals with dementia, the challenges associated with their care, and the critical role of family involvement in ensuring quality of life.

Sub-theme 2a: Needs of People with Dementia

People living with dementia require extensive and continuous support, as they often lose the ability to meet even their most basic needs. As dementia progresses, patients become increasingly dependent on others, often requiring help with every aspect of daily living. Doctors emphasize that many patients are immobile and vulnerable to additional illnesses such as pneumonia and cystitis. They highlight the critical need for full-time caregivers, holding that "These patients *forget many things". They cannot do it alone*." (Doctor)

In addition, dementia patients and their families require practical social support, including assistance with household tasks such as cleaning, cooking, and shopping. One healthcare worker described going beyond clinical care to meet patients' daily needs within their services.

"*Although her child lives across the street, our workers still go to her house to clean and cook for her, to meet her needs*." (Nurse)

While doctors and nurses are clearly aware of the comprehensive needs of patients with dementia, social workers may overlook basic care needs unless they have prior experience with or specific training in dementia care. This gap becomes evident in their limited involvement with families, as one social worker explained: "I mean, *at least when we go to the house for social inspection, we cannot go for social inspection very often." Suppose they approach us with an application or a denunciation. After conducting a social investigation, we go to supervise families once or twice a year at most, but that's it*." (Social workers)

Sub-theme 2b: Care Challenges

A common issue is reliance on untrained or inadequately prepared caregivers in home care.

"*The relatives say they are taking care of the wound, but they are not . It is important to ensure that they continue treatment to reduce the burden of care*." (Doctor)

Paid caregivers often fill community care gaps due to labor shortages and the demand for personalized, affordable care. Although institutional care is costlier than family care, families often share expenses to avoid institutionalization. However, many caregivers are informally employed and unlicensed, creating precarious, uncertain conditions: "*There are foreign caregivers in most homes. I ask the patient's relatives who they are, they say they are relatives, but these people have no knowledge of patient care*." (Doctor)

Financial limitations also exacerbate care deficiencies. In low-income households, caregivers may reuse medical equipment or delay treatments because of cost, which can lead to serious complications.

"*They use the tracheostomy catheter repeatedly because they cannot obtain it; consequently, infection develops.*" (Nurse) *"They don't do the dressing because they don't have money to buy wound dressing or they can't do it because of their workload in a crowded family*." (Nurse)

Doctors share these concerns that inadequate care at home may lead to deaths.

"*When these patients receive inadequate care, they may die from sepsis or other infections. One patient I visited at home had an odor of urine and a discharging wound. Care was inadequate. We attempted to care for him, but he died 5 days later*." (Doctor)

Another critical factor affecting the quality of community care is the limited availability of social workers to monitor care regularly. Follow-up visits are rare and often occur only in response to complaints: "*Let's say they come to us with an application or a denunciation*." *After conducting a social investigation, we go to supervise families once or twice a year at most, but that's it.*" (Social worker) This lack of regular supervision of the care provided at home makes it difficult to identify and intervene in cases of neglect or mistreatment, further complicating the care of patients with dementia.

Sub-theme 2c: Involvement of Relatives in Care

Family involvement is a cornerstone of effective dementia care, and participants widely agree that it can be enhanced through education, support, and empowerment. Teaching family members how to perform basic caregiving tasks not only lightens the burden on professionals but also contributes to improved patient outcomes.

"*Initially, the patient's relatives were unable to manage the wounds and bleeding. Over time, we taught them to provide wound care and assume that responsibility, and we subsequently observed improvement in the patient's wounds*." (Nurse)

Doctors emphasize hands-on instruction, demonstrating specific tasks and providing ongoing education for patients and their families. Similarly, social workers stress that patients should remain at home as long as possible to promote involvement and shared decision-making: "The best *option for family involvement is actually for patients to stay at home as long as they can." In this way, they can make relevant decisions more comfortably at home*." (Social workers).

However, family involvement requires more than technical training. Families must receive emotional and financial support for such training to be meaningful and sustainable. Raising awareness and building caregiving capacity are essential to fostering conscious, competent participation in the care process.

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Theme 3: Ethical Issues in Community Care

This theme explores the meanings attributed to ethical behavior, the ethical dilemmas that arise in community care settings, and the coping strategies professionals employ when navigating these difficult scenarios.

Sub-theme 3a: Failure to Fulfill the Care Responsibility

Sub-theme 3a (1): Misuse of Care Pension and Neglect

A significant ethical issue in community care is relatives' misuse of the care pension intended to support the patient. Nurses and social workers reported that financial aid is often redirected, leaving neglect unnoticed until situations become dire.

"*The people who care for the patient receive a care pension, but they do not use that money for him. They do not meet his needs*." (Nurse)

"*There are also families who keep him in a room and receive financial support. In fact, they do not provide him with any care*." (Social Workers)

Nurses frequently find family members failing to fulfill their responsibilities and witness signs of neglect or abuse. These incidents create ethical dilemmas, balancing family autonomy against the duty to safeguard vulnerable patients. Professional codes require action in cases of suspected abuse, despite potential conflicts. As one nurse recounted: "*On one of my visits, the patient's relative was beating the patient with dementia. I was threatened if I complain to the police*." Often, professionals cannot prove an act of neglect or abuse unless someone outside the family, such as a neighbor or another relative, files a formal complaint.

"*A patient being mistreated can sometimes say this. The patient sometimes reports that they are hungry. His relative says he fed him. The patient has experienced weight loss. In this case, we can do nothing; we cannot detect it*." (Doctor)

In such ethical dilemmas, professionals find themselves torn. They recognize the need for institutional care but face resistance from families who view the patient as a source of income.

"*He actually needs institutional care, but his relatives do not want to leave him because they see community care as a source of income. We cannot take him if the relatives refuse*." (Nurse)

Sub-theme 3a(2):Human Dignity in Home Environment

Another ethical concern involves patients living in inhumane or degrading conditions. Driven by shame or fatigue, some caregivers hide patients in unsuitable environments or provide inadequate care.

"*Relatives confine people with dementia to the worst part of the house – a dark, dirty, stuffy place where no one can see them*." (Doctor)

"*When we go home, the family caregiver takes the PwD upstairs; when we leave, the caregiver can bring him into the empty room downstairs*." (Social Worker)

Nurses shared similar observations regarding the impact of poor environments on health outcomes:

"*We cannot enter the home because there are many cats; the patient has a wound, and the environment is unclean.*" (Nurse) *"The patient lives in a house filled with garbage. A urine odor is present. The inability to change living conditions makes our job difficult*." (Nurse)

Healthcare workers face ethical challenges balancing their duty to provide care with personal safety. Professionals may refuse to provide risky treatments, such as IV antibiotics, in homes where patients are alone or where they (the patients) fear violence or legal accusations.

"*We do not administer medications, such as antibiotics, at home, because serious side effects, including anaphylactic reactions, can occur*." (Nurse)

Because many patients are unable to provide informed consent or to communicate effectively, professionals avoid being alone with them to reduce the risk of misunderstandings or legal risks. The presence of a third party ensures transparency and protects both parties.

"*The patient must be accompanied. If no one accompanies the patient, we cannot enter the home or provide the medication*." (Nurse)

"*We terminated services for the patient because he was mobile and lived alone. We need someone to accompany us*." (Doctor)

While justified as a safeguard, this requirement disproportionately disadvantages socially isolated individuals, raising concerns about neglect and the violation of the right to health. This reflects systemic inequities, as those with the fewest resources face the greatest barriers to essential care.

"*Agitated patients may attempt to remove NG catheters, PEG tubes, or other devices. If the patient's relatives do not help us, we close the patient's file. We try our best, but there is nothing we can do when we are attacked*." (Doctor)

Sub-theme 3b: Problems Caused by the Patient's Cognitive Impairment

Cognitive decline complicates the ethical landscape of community care, particularly regarding consent and decision-making. Dementia-related impairments limit a patient's ability to understand procedures or to express stable preferences, thereby shifting authority to family members or healthcare professionals. "*We cannot get consent from PwD. We have to make decisions on behalf of the patient... or on behalf of his/her relatives*." (Doctor)

Conflicts frequently arise when patients and families express opposing wishes, placing healthcare professionals in challenging positions. "*The patient does not want a catheter, but his relatives tell us to put one in... I told them to agree among themselves and I left*." (Doctor)

Such situations illustrate the ambiguity regarding whose wishes should prevail when patients resist care that others deem necessary for safety or hygiene. Social workers highlighted the difficulty of assessing a patient's reliability. "*Just because the person has cognitive impairment, what the person says may be ignored... but he may be telling the truth. A dilemma exists regarding this*." (Social Worker)

Nurses also described being vulnerable to accusations following interventions, especially when patients misunderstood the clinical process. "*You perform an interventional procedure and they are happy, but after you leave, they call the office and complain that the nurse mistreated me*." (Nurse)

These accounts demonstrate that cognitive impairment not only affects consent capacity but also exposes professionals to legal and moral risks. This reinforces the need for clear documentation and shared decision-making in community settings.

Sub-theme 3c: Solution Finding for Ethical Problems

In the absence of formal ethics committees, most ethical decisions are made collaboratively within care teams. Healthcare workers rely on team discussions, professional values, and personal conscience rather than standardized institutional guidance. Participants reported using collective reasoning and informal consultations as primary tools for resolving dilemmas.

Nurses emphasized that in-home care depends heavily on individual integrity: "*You are at home, there is no one supervising you, you do what you do according to your own values and you leave*." (Nurse) Team-based discussions are commonly used to evaluate complex cases and to distribute responsibility for difficult decisions. Social workers utilize social investigation reports and may involve judicial authorities in serious cases of ethical violations. This reflects an escalation pathway where informal professional judgment is supplemented by legal mechanisms when safety or dignity is threatened. "*We use social investigation reports when there is an ethical problem. If unresolved, we forward the final decision to the judicial authorities*." (Social Worker)

All groups expressed a strong desire for accessible ethical training, particularly online programs tailored to community care. Participants highlighted a clear need for formal ethics committees, clearer practice guidelines, and ethics education specifically designed for community-based dementia care.

Discussion

This study explored healthcare professionals' experiences of community-based dementia care, distinguishing findings that align with international literature from those that offer context-specific insights. Participants described dementia as a progressive and debilitating condition requiring intensive care, particularly in advanced stages. These perceptions are consistent with previous research indicating that dementia disrupts cognition, physical functioning, and social integration.[22]

Beyond confirming these patterns, participants, particularly nurses and physicians, highlighted the emotional toll on families, describing caregiver burnout and distress, which sometimes led to a silent wish for the patient's suffering to end. This moral ambivalence reflects the cumulative psychological strain of prolonged caregiving without adequate formal support. Such exhaustion underscores the need for accessible respite care services. A broader review similarly reports that respite services can help prevent negative outcomes such as caregiver burnout and declining well-being.[23] However, participants' accounts suggest that access to these services remains limited and inconsistently organized within community care settings.

Although multidisciplinary service models exist, participants reported inconsistencies in service delivery, including gaps between professional roles and disruptions in continuity of care. While home visits by nurses and physicians were valued for their responsiveness and coordination, resource limitations, understaffing, and bureaucratic barriers often hindered continuity of care. The absence of an integrated system linking municipal and state services further complicated service delivery. These findings align with the literature, which identifies fragmentation and underfunding as major weaknesses in community-based dementia care.[24,25]

Participants also emphasized the complex and holistic needs of people with dementia, identifying hygiene, nutrition, mobility, wound care, and emotional support as essential aspects of care. As dependency increases with disease progression, caregiver preparedness and professional support become increasingly important. Medical and social care needs were viewed as closely intertwined, with household assistance, financial aid, and psychosocial support considered as essential as clinical interventions. These findings support international calls for integrated care models that extend beyond a purely biomedical perspective.

Care challenges were particularly evident in families with limited resources or health literacy. Participants reported that some caregivers lacked training, and that foreign home-care workers were sometimes employed despite language barriers and minimal preparation for healthcare tasks. These conditions occasionally resulted in neglect, inappropriate reuse of medical equipment, and poor wound management, sometimes leading to serious outcomes such as infections or sepsis. These observations echo earlier findings that informal dementia caregiving remains undervalued and under-resourced.[26] Risks may be amplified in home settings where formal supervision mechanisms are limited. Importantly, the findings challenge the assumption that family involvement is inherently protective. Although education improved caregiving capacity in some cases, participants also described neglectful or abusive practices within families. These findings suggest that financial support alone is insufficient and that family caregiving requires structured supervision and professional guidance to ensure safe and dignified care.[27]

Ethical challenges in dementia care are widely documented, particularly regarding patient autonomy, decline in decision-making capacity, stigma, and the impact of caregiving on families.[28] Caring for people with dementia requires balancing respect for autonomy with the realities of progressive cognitive decline, while maintaining ethical principles such as beneficence, justice, and nonmaleficence. Recent international reviews also highlight a Global North–South divide in dementia care ethics, with countries in the Global South often relying heavily on family-based care due to limited institutional support and weaker legal frameworks.[29] This structural context helps explain the ethical uncertainty experienced by professionals in community settings when navigating autonomy, surrogate decision-making, and dignity.

Participants frequently described ethical dilemmas related to misuse of care pensions, neglect of patients, and difficulties in reporting or proving abuse. Without formal complaints or inspections, professionals often felt powerless. Similar concerns have been documented in studies examining elder abuse in domestic settings.[30] Poor living conditions or deliberate isolation sometimes compromised patients' dignity, creating tensions between maintaining family-based care and safeguarding that dignity. Healthcare professionals also faced physical and legal risks when entering unsafe home environments, occasionally leading them to withdraw from providing care. Such decisions shifted ethical responsibility from institutions to individual professionals. This situation reflects moral distress – knowing the ethically appropriate action but being constrained from acting – a phenomenon widely reported among healthcare providers.[31,32] Cognitive impairments further complicated the process of obtaining informed consent and increased professionals' vulnerability to misinterpretation or to accusations. International qualitative studies similarly identify ethical dilemmas in home-based end-stage dementia care, particularly in decisions between comfort-focused and life-prolonging treatments. Differences between professional and family perspectives are often ethically legitimate, but they may generate conflict in contexts characterized by limited resources and communication challenges.[11] Recent qualitative research from community care settings also documents moral distress among home-care nurses, particularly when working alone and confronting conflicts between professional values and organizational or financial constraints. These findings suggest that moral distress is primarily linked to structural limitations rather than individual shortcomings.[31]

Evidence from other resource-limited contexts further illustrates these structural challenges. A phenomenological study in Albania found that caregivers experienced significant moral tension when balancing autonomy, safety, and dignity in the absence of adequate support, highlighting systemic injustice rather than individual failure.[27] Similar tensions have been reported in North Macedonia, where healthcare professionals experienced ethical conflict when attempting to reduce family burden without adequate state-supported services.[33] In most cases, professionals addressed ethical dilemmas informally through personal judgment, peer consultation, or experience, rather than through structured ethical support.[34] While this approach allows flexibility, reliance on individual reasoning may create inconsistencies and emotional strain. Establishing multidisciplinary ethics committees and regular ethics discussions within community care services could support more consistent decision-making and reduce moral distress.

Limitations

Several limitations should be considered. While framed within Interpretative Phenomenological Analysis (IPA), the use of focus groups may have limited idiographic depth due to group dynamics. The heterogeneous sample provided broad perspectives but potentially reduced the individual depth typical of IPA. Additionally, mixing online and face-to-face data collection may have influenced participant interactions. The focus on a specific geographic and healthcare system context may also limit transferability.

Conclusion

This study highlights the complex realities of community-based dementia care. Effective care requires coordination across clinical, emotional, social, and ethical domains. Findings reveal under-resourced systems, inadequately supported caregivers, and significant ethical tensions regarding autonomy and justice. These challenges emphasize the need for enhanced professional education, transparent supervision of financial aid, and structured ethics consultation mechanisms. Strengthening integrated health and social care systems is essential to ensuring person-centered, safe, and dignified dementia care in both home and institutional settings.

Ethics Committee Approval: The study was approved by the Koç University Ethics Committee (Approval Number: 2024.022.IRB3.005, Date: 25.01.2024).

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References

1. World Health Organization. Dementia. Published September 2, 2021. Accessed April 3, 2026. https://www.who.int/news-room/fact-sheets/detail/dementia
2. Turkish Statistical Institute. Active Aging Index. Turkish. Accessed April 3, 2026. https://data.tuik.gov.tr/Bulten/Index?p=Aktif-Yaslanma-Endeksi-2024-57937
3. GBD 2019 Dementia Forecasting Collaborators. Estimation of the global prevalence of dementia in 2019 and forecasted prevalence in 2050: an analysis for the Global Burden of Disease Study 2019. Lancet Public Health. 2022;7(2):e105-e125.

4. Alzheimer's Disease International. Dementia statistics. Accessed April 3, 2026. https://www.alzint.org/about/dementia-facts-figures/dementia-statistics/
5. Republic of Turkey Ministry of Health, General Directorate of Health Services, Department of Research, Development and Health Technology Assessment. Integrated Home Healthcare and Care Services National Model Proposals. Publication No. 1294. Accessed April 3, 2026. https://ekutuphane.saglik.gov.tr/Ekutuphane/kitaplar/Ek_B%C3%BCt%C3%BCnle%C5%9Fik%20Evde%20Sa%C4%9Fl%C4%B1k%20ve%20Bak%C4%B1m%20Hizmetleri%20Ulusal%20Model%20%C3%96nerileri%20(66%20Sayfa).pdf
6. Turkish Health Institutes Directorate (TÜSEB), Institute of Public Health and Chronic Diseases; Istanbul Provincial Health Directorate, Public Hospitals Services Department-2. Home Healthcare Services Report. Accessed April 3, 2026. https://files.tuseb.gov.tr/tuhke/files/yayinlar/2024-11-29-14-51-41.pdf
7. Karan MA, Satman İ, Atlı T, et al. Healthcare problems and possible solutions in older adults in Turkey: geriatric syndromes and chronic diseases. Eur J Geriatr Gerontol. 2024;6(2):80–90. [CrossRef]
8. Republic of Türkiye Ministry of Family and Social Policies. Dementia Care Model Report for Türkiye. ASPB; 2016. Accessed April 3, 2026. https://aile.gov.tr/media/100413/annex-14-5-2-2-models-of-services-for-dementia-sh.pdf
9. Lundberg K. Dementia care work situated between professional and regulatory codes of ethics. Ethics Soc Welfare. 2017;12(2):133–146. [CrossRef]
10. Smebye KL, Kirkevold M, Engedal K. Ethical dilemmas concerning autonomy when persons with dementia wish to live at home: a qualitative, hermeneutic study. BMC Health Serv Res. 2016;16:21. [CrossRef]
11. Hochwald IH, Yakov G, Radomyslsky Z, Danon Y, Nissanholtz-Gannot R. Ethical challenges in end-stage dementia: Perspectives of professionals and family care-givers. Nurs Ethics. 2021;28(7-8):1228–1243. [CrossRef]
12. Çevik B, Kav S, Akgün Çıtak E, Akyüz E, Abbasoğlu A. Challenges of providing nursing care to patients with dementia: a qualitative study. Eur J Geriatr Gerontol. 2022;4(3):205–211. [CrossRef]
13. Lök N, Öncel S, Özer Z, Buldukoğlu K. Institutional services for dementia care in Turkey. Current Approaches in Psychiatry. 2017;9(4):464–473. [CrossRef]
14. İlhan B, Tufan A, Can B, Bahat G, Karan MA. What is the role of the geriatrician in home health care? An overview through an international survey. Eur J Geriatr Gerontol. 2020;2(3):83–86. [CrossRef]
15. Müderrisoğlu S, Çubukçu M. Evaluation of Quality of Life of Caregivers of Alzheimer's Patients Receiving Home Health Care. Turk J Fam Med Prim Care. 2022;16(1):48–56. Turkish. [CrossRef]
16. Porr C, Gaudine A, Smith-Young J. Ethical conflicts experienced by community nurses: A qualitative study. Nurs Ethics. 2024;31(4):541–552. [CrossRef]
17. Turkish Alzheimer Association. Turkey Report on Care and Treatment Conditions of Dementia Patients. Metron Analytics; 2023. Turkish. Accessed April 3, 2026. https://www.alzheimerdernegi.org.tr/2023-yili-alzheimer-hastalari-icin-bir-donum-noktasi/
18. Smith JA, Flowers P, Larkin M. Interpretative Phenomenological Analysis: Theory, Method and Research. 2nd ed. SAGE Publications; 2022.
19. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. Int J Qual Health Care. 2007;19(6):349–357. [CrossRef]
20. Kallio H, Pietilä AM, Johnson M, Kangasniemi M. Systematic methodological review: developing a framework for a qualitative semi-structured interview guide. J Adv Nurs. 2016;72(12):2954–2965. [CrossRef]
21. Lincoln YS, Guba EG. Naturalistic Inquiry. Thousand Oaks: SAGE Publications; 1986:289–331.
22. Brodaty H, Donkin M. Family caregivers of people with dementia. Dialogues Clin Neurosci. 2009;11(2):217–228. [CrossRef]
23. Lim Z, Lee JJM. Respite experiences and needs of caregivers of older adults in Singapore: a qualitative study. Health Soc Care Community. 2025;2025(1):8847165. [CrossRef]
24. Peel E. 'The living death of Alzheimer's' versus 'Take a walk to keep dementia at bay': representations of dementia in print media and carer discourse. Sociol Health Illn. 2014;36(6):885–901. [CrossRef]
25. World Health Organization. Global Status Report on the Public Health Response to Dementia. Published 2021. Accessed April 3, 2026. https://www.who.int/publications/i/item/9789240033245
26. Alzheimer's Disease International. World Alzheimer Report 2022: Life After Diagnosis – Navigating Treatment, Care and Support. Published 2022. Accessed April 3, 2026. https://www.alzint.org/u/World-Alzheimer-Report-2022.pdf
27. Gaxhja E, Toci I, Saja D, Sula E, Gugu M, Sperling D. Navigating Ethical Dilemmas: Experiences, Views and Attitudes of Informal Caregivers of Individuals With Dementia in Albania. J Geriatr Psychiatry Neurol. 2026;39(1):37–53. [CrossRef]
28. Chiong W, Tsou AY, Simmons Z, Bonnie RJ, Russell JA; Ethics, Law, and Humanities Committee (a joint committee of the American Academy of Neurology, American Neurological Association, and Child Neurology Society). Ethical Considerations in Dementia Diagnosis and Care: AAN Position Statement. Neurology. 2021;97(2):80–89. [CrossRef]
29. Al Mokdad Z, Msheik A, Tarabey L, Abou-Mrad F, Fadel P. Ethical dilemmas in the care of patients with Alzheimer's disease and related dementias unable to give informed consent: positioning Lebanon within the Global North-South context. BMC Med Ethics. 2025;26(1):152. [CrossRef]
30. Lachs MS, Pillemer KA. Elder Abuse. N Engl J Med. 2015;373(20):1947–1956. [CrossRef]
31. Petersen J, Rösler U, Meyer G, Luderer C. Understanding moral distress in home-care nursing: An interview study. Nurs Ethics. 2024;31(8):1568–1585. [CrossRef]
32. Lamiani G, Borghi L, Argentero P. When healthcare professionals cannot do the right thing: A systematic review of moral distress and its correlates. J Health Psychol. 2017;22(1):51–67. [CrossRef]
33. Dogan V, Taneska M, Novotni G, et al. On dementia, duties, and daughters. An ethical analysis of healthcare professionals being confronted with conflicts regarding filial duties in informal dementia care. Front Psychiatry. 2024;15:1421582. [CrossRef]
34. Vinckers F, Landeweer E. Moral distress among healthcare professionals in long-term care settings: a scoping review. Philos Ethics Humanit Med. 2025;20(1):8. [CrossRef]

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Nursing Students' 21st-Century Learner Skills and Their Attitudes Toward Artificial Intelligence

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Abstract

Background: Artificial intelligence (AI) has increasingly become integrated into education and healthcare, as it has in many areas of modern life. Contemporary learners are considered 21st-century learners, and AI is beginning to play a significant role in nursing education.

Aim: This study aimed to examine the relationship between nursing students' 21st-century learner skills and their attitudes toward artificial intelligence.

Methods: This correlational study included 354 nursing students. Data were collected using an Information Form, the 21st-Century Learner Skills Utilization Scale, and the General Attitude Toward Artificial Intelligence Scale. Data collection was conducted face-to-face by the researchers. The Kolmogorov–Smirnov test and Spearman's correlation analysis were used for data analysis. Statistical significance was set at $p<0.05$.

Results: Of the participants, 83.9% were female, and the mean age was 20.54±2.67 years. The mean score for the positive attitude subscale of the General Attitude Toward Artificial Intelligence Scale was 3.64±0.56, while the mean score for the negative attitude subscale was 3.01±0.69. Students' use of 21st-century learner skills was above the moderate level (3.68±0.44). A positive correlation was found between students' positive attitudes toward artificial intelligence and their use of 21st-century learner skills.

Conclusion: Integrating artificial intelligence into nursing education programs, in alignment with the structure of the discipline, may support the development of various 21st-century skills by leveraging the opportunities provided by AI.

Keywords: Artificial intelligence, learning, nursing students

Introduction

The 21st century is characterized by rapidly evolving information technologies and ongoing digital transformation, which are reshaping professions, educational processes, and expectations regarding professional competencies.[1,2] Within this context, 21st-century skills—such as critical thinking, problem-solving, creativity, collaboration, information literacy, digital competence, flexibility, and self-direction—are considered essential for success in both education settings and professional practice.[3,4] These competencies, emphasized by educational institutions and the modern workforce, are particularly crucial in the dynamic and continuously evolving field of healthcare. In this field, students are expected to adapt to emerging technologies, critically evaluate technology-driven information, and effectively integrate this knowledge into clinical decision-making.[2] Accordingly, it is imperative that nursing students not only acquire technical knowledge but also develop 21st-century competencies, including proficiency in digital tools, the ability to make critical judgments, and the capacity to adapt rapidly to changing practices.[3,5]

Technological advancements, particularly in computer science, data infrastructure, and artificial intelligence (AI), have increasingly influenced both healthcare delivery and the education of health professionals.[6–8] AI is now applied in a wide range of areas, including early and accurate diagnosis, clinical decision support systems, patient monitoring, risk prediction, data analytics, and personalized learning environments.[9–11] Furthermore, AI-enhanced simulations, virtual reality applications, and robotic assistants serve as valuable tools for improving clinical skill acquisition and supporting students' critical thinking and decision-making processes.[8,9,12] These technological developments are closely associated with 21st-century competencies: digital competence and information literacy facilitate the informed and responsible use of AI, while critical thinking and problem-solving skills enable accurate interpretation of AI outputs and their application in ethically sound practice.[13] Consequently, strengthening 21st-century skills in nursing education is considered essential for the effective integration and use of AI-based applications.[14]

Although the potential of AI in nursing practice continues to expand, existing research indicates that factors such as knowledge levels, attitudes, educational exposure, and AI-related anxiety significantly influence the adoption of AI technologies.[6,7] Therefore, assessing nursing students' knowledge, attitudes, and anxiety related to AI is essential for guiding the development and refinement of educational programs that aim to integrate both AI and 21st-century competencies into nursing curricula.[9,11]

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Identifying learner characteristics is crucial for keeping pace with changes in educational processes and enhancing the effectiveness of teaching. In this context, examining nursing students' general attitudes toward 21st-century learning skills and artificial intelligence, as well as the relationship between these variables, is expected to contribute to the sustainable development of 21st-century competencies and the design of educational programs that effectively integrate AI. Although previous studies have explored nursing students' general attitudes toward AI,[7,15,16] and 21st-century learner skills,[1,17–19] separately, no study has examined the relationship between these two constructs. This gap highlights not only a lack of evidence regarding the association between nursing students' modern learner skills and their perspectives on AI but also underscores the need to better understand this relationship to prepare a workforce capable of navigating and leading technology-driven transformations in healthcare. Accordingly, the aim of this study was to determine the relationship between nursing students' 21st-century learning skills and their attitudes toward artificial intelligence.

Study Question

The study sought to answer the following research question:

1. Is there a relationship between nursing students' 21st-century learner skills and their general attitudes toward AI?

Materials and Methods

Design

This study was designed as a correlational research model to examine the relationships among variables.

Population and Sample

The study population consisted of 1,448 nursing students enrolled at two universities: Konya Necmettin Erbakan (n=665) and Trakya University (n=783). The sample size was calculated using the formula for finite populations, based on a 95% confidence level (Z=1.96), a margin of error of 5% (d=0.05), and an assumed population proportion of p=0.50 (q=0.50):

$$N = [z^2 \cdot p (1-p) / e^2] / [1 + (z^2 \cdot p (1-p) / e^2 \cdot N)].$$

The required sample size was determined to be 305 students. To account for potential data loss, the target sample size was increased to 340 by incorporating a 10% attrition rate.[20] At the end of data collection, complete and analyzable data were obtained from 354 students, all of whom were included in the analyses.

To ensure that the sample adequately represented the population by class level, proportionate stratified sampling was employed. Students were first stratified by university and then by class level. The number of participants selected from each stratum was calculated using the formula $nh = N_h / N \times n$, based on the proportion of each stratum within the population. Consequently, the final sample consisted of 354 nursing students, including 160 from Konya Necmettin Erbakan University and 194 from Trakya University. The inclusion criteria were defined as being enrolled as a nursing student at Konya Necmettin Erbakan or Trakya University during the study period, being 18 years of age or older, and voluntarily agreeing to participate in the study. The exclusion criteria included not being a nursing student at these universities during the study period, being under 18 years of age, or declining to participate.

Data Collection Tools

Research data were collected using the Information Form, the 21st-Century Learner Skills Utilization Scale, and the General Attitude Toward Artificial Intelligence Scale.

Information Form: This form was developed by the researchers based on the relevant literature. It consists of eight questions designed to collect data on age, gender, university, class level, daily internet use, knowledge of the concept of AI, awareness of AI use in healthcare, and the use of AI-based applications.[7,9,15,16]

21st-Century Learner Skills Utilization Scale: Developed by Orhan Göksun and Kurt,[21] this scale consists of 31 items and four subscales: cognitive, autonomous, collaboration, and flexibility and innovation skills. There are no reverse-scored items. The total score is calculated by summing the responses to all items and dividing by the number of items. The scores for both the subscales and the overall scale range from 1 to 5. The original study reported an internal consistency coefficient of 0.87.[21] In the present study, Cronbach's alpha was 0.89.

General Attitude Toward Artificial Intelligence Scale: Developed by Schepman and Rodway[22] and adapted into Turkish by Kaya et al.,[23] this scale consists of two subscales measuring positive and negative attitudes toward artificial intelligence. The scale includes 20 items: 12 assessing positive attitudes and eight assessing negative attitudes. Items in the negative subscale are reverse-coded; thus, lower scores indicate stronger negative attitudes toward AI. Scores for the positive attitude subscale range from 12 to 60, while scores for the negative attitude subscale range from 8 to 40. In the Turkish adaptation, Cronbach's alpha values were 0.82 for the positive subscale and 0.84 for the negative subscale.[23] In the present study, Cronbach's alpha coefficients were 0.85 for the positive subscale and 0.81 for the negative subscale.

Procedures

Data were collected between October 2024 and November 2024 from nursing students who voluntarily agreed to participate in the study. To avoid potential instructor–student conflicts of interest, the researchers involved in data collection were not responsible for the participants' academic evaluation or grading. Data collection was conducted in classroom settings within the nursing departments of the participating universities, outside regular class hours, to minimize any perceived pressure or influence on participation. Written and verbal informed consent was obtained from all participants. Prior to data collection, participants were informed about the purpose of the study, the voluntary nature of participation, and their right to withdraw at any time without academic consequences. Student identities were kept confidential to prevent any potential impact on responses. No identifying information was collected, and all data were treated confidentially to ensure anonymity. Participants were instructed to complete the data collection forms accurately and fully. The researchers reviewed all forms during data collection to minimize missing data. There was no time limit for completing the forms; on average, completion took approximately 20 minutes.

Statistical Analysis

All statistical analyses were performed using IBM SPSS Statistics (Version 22.0; IBM Corp., Armonk, NY, USA). Descriptive statistics were presented as means, standard deviations, medians, minimum and maximum values for continuous variables, and as frequencies and percentages for categorical variables. The normality of data distributions was assessed using the Kolmogorov–Smirnov test, with $p<0.05$ indicating deviation from normality. However, because this test is sensitive to minor deviations, particularly in large samples,[24] normality was also evaluated using descriptive statistics. The results indicated that the data were not normally distributed. Therefore, nonparametric statistical methods were applied, and relationships between variables were examined using Spearman's rank-order correlation analysis. Statistical significance was set at $p<0.05$ for all analyses.

Ethical Considerations

Ethical approval was obtained from the Trakya University Social Sciences and Humanities Research Ethics Committee (Approval Number: 08/48, Date: 08.10.2024). Institutional permission and authorization for the use of data collection tools were also secured. The study was conducted in accordance with the principles of the Declaration of Helsinki, ensuring voluntary participation and informed consent. All participants provided both written and verbal consent prior to participation.

Results

A total of 354 nursing students participated in the study. Of these, 83.9% (n=297) were female, and the mean age was 20.54±2.67 years. Regarding academic year distribution, 23.7% (n=84) were first-year students, 26.3% (n=93) were second-year students, 27.1% (n=96) were third-year students, and 22.9% (n=81) were fourth-year students. The mean daily internet use duration was 5.38±2.44 hours.

As shown in Table 1, 61.6% of the nursing students reported having knowledge of the concept of AI, while 33.6% reported partial knowledge. Additionally, 45.5% indicated partial knowledge of AI use in healthcare. A majority of students (66.4%) reported using AI-based applications, whereas 20.9% reported that they did not use such applications.

As presented in Table 2, the mean score on the Positive Attitude subscale of the General Attitude Toward Artificial Intelligence Scale was 3.64±0.56, while the mean score on the Negative Attitude subscale was 3.01±0.69. The overall mean score on

Table 1. Nursing students' views on artificial intelligence (n=354)

		n	%
Knowledge of the concept of artificial intelligence	Yes	218	61.6
	No	17	4.8
	Partially	119	33.6
Knowledge of the use of artificial intelligence in healthcare	Yes	133	37.6
	No	60	16.9
	Partially	161	45.5
Use of artificial intelligence–based applications	Yes	235	66.4
	No	74	20.9
	Not sure	45	12.7

Table 2. Mean scores of the General Attitude Toward Artificial Intelligence Scale and the 21st-Century Learner Skills Utilization Scale (n=354)

	Subscale	Number of items	Mean±SD	Min–Max
GAAIS	Positive attitude	12	3.64±0.56	1.5–5
	Negative attitude	8	3.01±0.69	1.1–4.8
21st CLSUS	Cognitive skills	17	3.98±0.48	2.2–5
	Autonomous skills	6	3.37±0.57	1.6–5
	Collaboration and flexibility skills	6	3.15±0.69	1.1–5
	Innovation skills	2	3.66±0.80	1–5
	Total	31	3.68±0.44	2.2–4.9

SD: Standard deviation, Min: Minimum, Max: Maximum, GAAIS: General Attitude Toward Artificial Intelligence Scale, 21st CLSUS: 21st-Century Learner Skills Utilization Scale.

the 21st-Century Learner Skills Utilization Scale was 3.68±0.44. Examination of the subscales indicated that the highest mean score was observed in the Cognitive Skills subscale (3.98±0.48), whereas the lowest mean score was found in the Collaboration and Flexibility Skills subscale (3.15±0.69). The mean scores for the Autonomous Skills and Innovation Skills subscales were 3.37±0.57 and 3.66±0.80, respectively.

A weak but statistically significant positive correlation was found between the Positive Attitude subscale of the General Attitude Toward Artificial Intelligence Scale and the Cognitive Skills (r=0.327; p=0.000), Autonomous Skills (r=0.332; p=0.000), Collaboration and Flexibility Skills (r=0.221; p=0.000), Innovation Skills (r=0.365; p=0.000) subscales, as well as the total score (r=0.386; p=0.000) of the 21st-Century Learner Skills Utilization Scale (Table 3).

A very weak but statistically significant positive correlation was identified between the Negative Attitude subscale and the Innovation Skills (r=0.138; p=0.009). However, no statistically significant relationships were found between the Negative Attitude subscale and the Cognitive Skills (r=0.041; p=0.438), Autonomous Skills (r=0.059; p=0.268), Collaboration and Flexibility Skills (r=-0.088; p=0.099), or the total scale score (r=-0.008; p=0.878) of the 21st-Century Learner Skills Utilization Scale (Table 3).

Discussion

In this study, more than half of the nursing students reported being familiar with the concept of artificial intelligence, approximately half indicated partial knowledge regarding its use in healthcare, and the majority stated that they had used AI-based applications. These findings suggest that nursing students possess a generally moderate level of awareness and practical exposure to AI. However, given the rapidly expanding role of AI in healthcare and the varying levels of prior exposure reported, these results highlight the need to incorporate structured AI education into nursing curricula.

The scores obtained from the General Attitude Toward Artificial Intelligence Scale indicate that nursing students' attitudes toward artificial intelligence are generally at a moderate level. Consistent with this finding, studies by Lukić et al.[25] involving

Table 3. Correlation between the General Attitude Toward Artificial Intelligence Scale and the 21st-Century Learner Skills Utilization Scale (n=354)

		GAAIS	
Subscale		Positive attitude	Negative attitude
Cognitive skills	r	0.327*	0.041
	p	**0.000**	0.438
Autonomous skills	r	0.332*	-0.059
	p	**0.000**	0.268
Collaboration and flexibility skills	r	0.221*	-0.088
	p	**0.000**	0.099
Innovation skills	r	0.365*	0.138*
	p	**0.000**	**0.009**
21st CLSUS total	r	0.386**	-0.008
	p	**0.000**	0.878

*: Correlation is significant at the 0.01 level. r: Spearman's correlation coefficient. 21st CLSUS: 21st-Century Learner Skills Utilization Scale, GAAIS: General Attitude Toward Artificial Intelligence Scale.

first-year nursing students and by Cho and Seo[26] involving nurses also reported moderate levels of AI acceptance. In contrast, Wang et al.,[27] in a study of nurses in China, and Khaled and Elborai,[28] in a study of nursing students in Egypt, found that most participants held positive attitudes toward AI. Conversely, Sheela[29] reported that the majority of nursing students exhibited negative attitudes toward AI. In the present study, the coexistence of moderately positive and moderately negative attitudes may indicate that, while students are interested in technological innovations, they may also experience uncertainty or insecurity due to insufficient knowledge about AI. As AI becomes increasingly integrated into both healthcare and education, nursing students' attitudes are likely to play a critical role in their future professional practice after graduation.

In the present study, nursing students demonstrated above-moderate use of 21st-century learner skills, including cognitive, autonomous, collaboration and flexibility, and innovation skills. While Kaya et al.[1] and Ötün et al.[18] reported moderate levels of these skills among nursing students and nurses, respectively, Kocaağalar Akince et al.[19] found that Generation Z nursing students exhibited very high levels of these competencies. The above-moderate levels observed in the present study should be interpreted not only as an outcome of nursing education but also in light of the characteristics of the current student population, often described as digital natives with extensive exposure to technology. In this context, both educational experiences and generational characteristics may contribute to the development of 21st-century learner skills among nursing students. These findings suggest that nursing students demonstrate a relatively high level of competence in 21st-century learner skills, which may support their ability to cope with challenges in both personal and professional contexts and contribute to their overall professional development.

A positive relationship was identified between students' positive attitudes toward AI and their use of 21st-century learner skills. Specifically, students with more positive attitudes toward AI tended to demonstrate higher levels of cognitive, autonomous, collaboration and flexibility, and innovation skills. In contrast, higher levels of negative attitudes toward AI were associated with lower use of innovation skills. These findings indicate a meaningful association between attitudes toward artificial intelligence and the utilization of 21st-century skills. This relationship suggests that positive attitudes of nursing students toward AI may facilitate the development of various 21st-century competencies by enabling students to engage more effectively with the opportunities provided by AI technologies. Conversely, the finding that increased negative attitudes toward AI are associated with reduced use of innovation skills is particularly noteworthy and requires careful consideration. Negative perceptions of emerging technologies such as AI may hinder students' willingness to adopt these tools and limit their engagement in innovative practices. As a result, this may restrict their ability to keep pace with technological advancements in healthcare. Therefore, nursing education should incorporate strategies aimed at reducing negative attitudes toward technology.

Limitations

The generalizability of the findings is limited, as the study was conducted within a specific time frame, included undergraduate students from only two universities, and relied on self-reported data. The cross-sectional design of the study does not allow for the examination of changes in students' attitudes toward 21st-century learner skills and artificial intelligence over time. Furthermore, the results reflect only the relationships between variables and do not permit causal inferences.

Conclusion

The findings indicate that nursing students' familiarity with artificial intelligence and their use of 21st-century learner skills are generally at moderate to above-moderate levels. Enhancing students' positive attitudes toward AI may support the development of key 21st-century competencies, including cognitive, autonomous, collaboration and flexibility, and innovation skills. Conversely, reducing negative attitudes toward AI may help increase the use of innovation skills and contribute to overall professional competence.

The integration of AI into nursing education has the potential to enhance students' clinical skills, improve clinical decision-making, foster critical thinking, and increase effectiveness in patient care. The use of these technologies in nursing education may enable future nurses to deliver care more competently, efficiently, and effectively, while also strengthening their critical thinking abilities. In this context, AI can serve as an important tool in supporting the development of 21st-century skills. Overall, this study demonstrates that nursing students' attitudes toward AI play a significant role in their effective use of 21st-century learner skills. Negative attitudes, in particular, may hinder the development of innovation skills. Therefore, adopting educational strategies that promote positive attitudes toward technology is essential for facilitating skill development. Based on these findings, incorporating AI-related activities and exercises into nursing education programs may enhance students' cognitive, autonomous, collaboration and flexibility, and innovation skills. The structured integration of AI tools into course content can provide practical opportunities for students to develop these competencies in a targeted way.

Ethics Committee Approval: The study was approved by the Trakya University Social Sciences and Humanities Research Ethics Committee (Approval Number: 08/48, Date: 08.10.2024).

Informed Consent: Written informed consent was obtained from the nursing students.

Conflict of Interest: The authors have no conflicts of interest to declare.

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References

1. Kaya E, Karatana Ö, Yıldırım TÖ. The relationship between the online learning process, 21st century skills and work readiness in senior nursing students. Nurse Educ Pract. 2023;73:103801. [CrossRef]
2. Phoon GC, Idris MZ, Nugrahani R. Virtual reality (VR) in 21st century education: the opportunities and challenges of digital learning in classroom. Asian Pendidikan. 2021;1(2):105–110. [CrossRef]
3. González-Pérez LI, Ramirez-Montoya MS. Components of education 4.0 in 21st century skills frameworks: systematic review. Sustainability. 2022;14(3):1–31. [CrossRef]
4. Yıldırım Y, Altınpulluk H. Investigation of the relationship between 21st century learning skill levels of open and distance learners and their levels of engagement in open and distance learning environments. AKÜSB. 2022;24(4):1253–1273. [CrossRef]
5. Thornhill-Miller B, Camarda A, Mercier M, et al. Creativity, Critical Thinking, Communication, and Collaboration: Assessment, Certification, and Promotion of 21st Century Skills for the Future of Work and Education. J Intell. 2023;11(3):54. [CrossRef]
6. Bohr A, Memarzadeh K. The rise of artificial intelligence in healthcare applications. In: Bohr A, Memarzadeh K, eds. Artificial Intelligence in Healthcare. Academic Press; 2020:25–60. [CrossRef]
7. Salem GMM, El-Gazar HE, Mahdy AY, Alharbi TAF, Zoromba MA. Nursing Students' Personality Traits and Their Attitude toward Artificial Intelligence: A Multicenter Cross-Sectional Study. J Nurs Manag. 2024;2024:6992824. [CrossRef]
8. Buchanan C, Howitt ML, Wilson R, Booth RG, Risling T, Bamford M. Predicted Influences of Artificial Intelligence on Nursing Education: Scoping Review. JMIR Nurs. 2021;4(1):e23933. [CrossRef]
9. Robert N. How artificial intelligence is changing nursing. Nurs Manage. 2019;50(9):30–39. [CrossRef]
10. De Gagne JC. The State of Artificial Intelligence in Nursing Education: Past, Present, and Future Directions. Int J Environ Res Public Health. 2023;20(6):4884. [CrossRef]
11. Doğan P, Şendir M. Effect of different simulation methods in nursing education on critical thinking dispositions and self-efficacy levels of students. Think Skills Creat. 2022;45:101112. [CrossRef]
12. Glauberman G, Ito-Fujita A, Katz S, Callahan J. Artificial Intelligence in Nursing Education: Opportunities and Challenges. Hawaii J Health Soc Welf. 2023;82(12):302–305.
13. Sharma M, Sharma S. A holistic approach to remote patient monitoring, fueled by ChatGPT and Metaverse technology: The future of nursing education. Nurse Educ Today. 2023;131:105972. [CrossRef]
14. Çayır A. Importance and usage areas of artificial intelligence in nursing education intelligence. Balkan SBD. 2025;3(3):187–192.
15. Kandemir F, Azizoğlu F. Examining Nurses' General Attitudes Towards Artificial Intelligence. J Intensive Care Nurs. 2024;28(2):113–125. Turkish. [CrossRef]
16. Srinivasan M, Venugopal A, Venkatesan L, Kumar R. Navigating the Pedagogical Landscape: Exploring the Implications of AI and Chatbots in Nursing Education. JMIR Nurs. 2024;7:e52105. [CrossRef]
17. Karadaş A, Kaynak S, Ergün S, Palas Karaca P. Investigation of 21st century skills of nursing and midwifery students according to some variables. Ordu University J Nurs Stud. 2021;4(2):232–239. Turkish. [CrossRef]
18. Ötün T, Küçük Yüceyurt N, Şenyuva E. The relationship between nurses' 21st century skills and self-learning readiness. HUSBFD. 2022;9(3):716–737. [CrossRef]
19. Kocaağalar Akince E, Yüceler Kaçmaz H, Mucuk S. Examination of 21st century competencies in Z Generation nursing students. USBAD. 2024;6(15):165–181. [CrossRef]
20. Akbaş U, Tavşancıl E. Investigation of psychometric properties of scales with missing data techniques for different sample sizes and missing data patterns. J Meas Eval Educ Psy. 2015;6(1):38–57. Turkish.
21. Orhan Göksün D, Kurt AA. The relationship between pre-service teachers' use of 21st century learner skills and 21st century teacher skills. Educ Sci. 2017;42(190):107–130. [CrossRef]
22. Schepman A, Rodway P. The General Attitudes towards Artificial Intelligence Scale (GAAIS): Confirmatory validation and associations with personality, corporate distrust, and general trust. Int J Hum Comput Interact. 2023;39(13):2724–2741. [CrossRef]
23. Kaya F, Aydin F, Schepman A, Rodway P, Yetişensoy O, Demir Kaya M. The roles of personality traits, al anxiety, and demographic factors in attitudes toward artificial intelligence. Int J Hum Comput Interact. 2024;40(2):497–514. [CrossRef]
24. Field A. Discovering statistics using IBM SPSS statistics. 5th ed. Sage Publications; 2018.
25. Lukić A, Kudelić N, Antičević V, et al. First-year nursing students' attitudes towards artificial intelligence: Cross-sectional multi-center study. Nurse Educ Pract. 2023;71:103735. [CrossRef]
26. Cho KA, Seo YH. Dual mediating effects of anxiety to use and acceptance attitude of artificial intelligence technology on the relationship between nursing students' perception of and intention to use them: a descriptive study. BMC Nurs. 2024;23(1):212. [CrossRef]
27. Wang X, Fei F, Wei J, et al. Knowledge and attitudes toward artificial intelligence in nursing among various categories of professionals in China: a cross-sectional study. Front Public Health. 2024;12:1433252. [CrossRef]
28. Khaled AEM, Elborai ASA. Knowledge and attitude of nursing students regarding artificial intelligence. EJHS 2024;15(3):510–523. [CrossRef]
29. Sheela J. Attitude of nursing students towards artificial intelligence. IJSHR. 2022;7(2):344–347. [CrossRef]

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The Impact of Motivational Interviewing Guided by Watson's Theory of Human Caring on Adherence, Self-Efficacy, and Satisfaction in Patients with Diabetic Foot Ulcers: A Randomized Controlled Trial Protocol

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Abstract

Background: Diabetic foot ulcers (DFUs) are serious complications that diminish quality of life and increase healthcare costs. Effective management requires holistic, evidence-based approaches. Watson's Theory of Human Caring (THC) and motivational interviewing (MI) address both the physical and psychological dimensions of care.

Aim: This study examines the effects of motivational interviewing, guided by Watson's Theory of Human Caring, on treatment adherence, self-efficacy, and patient satisfaction among individuals with diabetic foot ulcers.

Methods: This single-blind randomized controlled trial included 76 participants with Wagner grade 1 DFUs. Participants were randomly assigned to either an experimental group receiving an eight-week motivational interviewing intervention based on Watson's THC or a control group receiving standard care. Data was collected at weeks 1, 8, and 12 using validated instruments: the Diabetic Foot Care Self-Efficacy Scale, the Medication Adherence Reporting Scale, and the Watson Caritas Patient Score. Data was analyzed using independent-samples t-tests, repeated-measures analyses, and chi-square tests.

Results: This study is expected to provide preliminary evidence regarding the effectiveness of motivational interviewing guided by Watson's Theory of Human Caring in individuals with diabetic foot ulcers. It is anticipated that participants in the intervention group may demonstrate improvements in treatment adherence, diabetic foot care self-efficacy, and patient satisfaction compared with those receiving standard care. Potential improvements in secondary clinical outcomes, including wound size and HbA1c levels, are also expected to be explored.

Conclusion: The study is expected to provide evidence supporting the integration of motivational interviewing and Watson's THC in DFU management. The findings may inform future research and clinical practice, supporting the delivery of more holistic care and improved outcomes for patients with DFUs.

Keywords: Diabetic foot, motivational interviewing, patient adherence, patient satisfaction, self-efficacy

Introduction

According to the International Diabetes Federation (IDF), approximately 537 million people worldwide are living with diabetes, including more than 61 million in Europe. Projections indicate that this number increased to 69 million by 2045. In Türkiye, where the adult population is estimated at 57 million, the prevalence of diabetes is 15.9%, with the total number of affected adults exceeding 9 million.[1] The rising prevalence of diabetes has led to a corresponding increase in its associated complications.[2] Diabetic foot ulcers (DFUs), among the most serious complications, not only compromise patients' overall health and social well-being but also place a substantial burden on healthcare systems and nursing practice.[3]

Diabetic foot ulcers, a common complication of diabetes, typically develop due to sensory loss associated with peripheral neuropathy, ischemia resulting from peripheral artery disease, infection, and inadequate foot care practices.[2,4] The prognosis for patients with diabetes, peripheral artery disease, and foot ulcers requiring amputation is poorer than that of many common cancers, with up to 50% of such patients surviving less than five years.[5] These findings highlight the need for interventions that promote positive health behaviors and improve the management of diabetes-related complications.[6]

Nursing theories have been developed to support professionalization and autonomy in the field, establish standards and a common language, and contribute to nursing research and education.[7,8] Among widely adopted nursing models, Jean Watson's Theory of Human Caring (THC), developed between 1975 and 1979, emphasizes the delivery of high-quality patient care alongside the cultivation of meaningful therapeutic relationships.[9] Addressing DFUs within the framework of THC aligns with the objectives of this study and introduces a novel perspective to nursing practice. This approach facilitates a comprehensive, holistic model of care for individuals with DFUs. Consequently, such care has the potential to prevent disease progression, reduce hospital admission rates and treatment costs, and promote sustainable healthcare outcomes.

Motivational interviewing (MI), originally introduced by clinical psychologists William R. Miller and Stephen Rollnick to address alcohol dependence, has evolved into a key strategy for facilitating behavioral change in chronic disease management. Extensive international literature demonstrates its effectiveness in improving

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clinical outcomes in conditions such as cardiovascular diseases, diabetes mellitus, and hypertension.[10,11] However, despite its established success in general diabetes care, there remains a notable lack of research examining its specific application to diabetic foot ulcers, a complication often associated with high levels of non-adherence and significant psychological burden.

Both national and international studies indicate that traditional patient education methods frequently fail to achieve sustained behavioral change in individuals with DFUs, resulting in recurrent ulcerations and increased rates of amputation.[2,4-6] While MI presents a promising alternative, its integration with nursing-specific theoretical frameworks remains insufficiently explored. This study addresses this gap by integrating MI with Watson's Theory of Human Caring, thereby offering a holistic approach that extends beyond conventional clinical instruction. Through this framework, the study aims to evaluate the impact of a structured, patient-centered intervention on treatment adherence, self-efficacy, and patient satisfaction. The findings are expected to provide a clinical framework for nurses, contributing to enhanced patient-centered care and a reduction in the global burden of DFU-related complications.

Materials and Methods

This study aims to evaluate the effects of motivational interviewing, grounded in Watson's THC, on treatment adherence, self-efficacy, and patient satisfaction among individuals with DFUs. The study was registered on April 12, 2023 in the ClinicalTrials.gov database (Identifier: NCT06023810).

Study Design

This study is designed as a single-blind randomized controlled trial. Participants were randomly assigned to either an experimental group, which received motivational interviewing sessions based on Watson's Theory of Human Caring, or a control group, which received standard care. The study protocol adheres to CONSORT (Consolidated Standards of Reporting Trials) guidelines.

Research Hypotheses

H1: Diabetic foot care self-efficacy differed between individuals with diabetic foot ulcers who receive motivational interviewing-based education grounded in Watson's Theory of Human Caring and those who receive conventional education.

H2: Individuals with diabetic foot ulcers who receive education through motivational interviewing aligned with Watson's Theory of Human Caring demonstrated more positive and consistent diabetic foot care behaviors than those receiving standard education.

H3: Individuals with diabetic foot ulcers who receive diabetic foot care education based on Watson's Theory of Human Caring through motivational interviewing exhibited higher levels of treatment adherence compared to those receiving traditional education methods.

H4: Individuals with diabetic foot ulcers who receive a motivational interviewing approach grounded in Watson's Theory of Human Caring reported higher satisfaction levels with diabetic foot care education compared to those receiving standard education.

Study Population

Participants are recruited from a tertiary healthcare institution and included adults aged 18 years or older with type 1 or type 2 diabetes who present with Wagner grade 1 diabetic foot ulcers and provide informed consent. Exclusion criteria include severe cognitive impairment, advanced musculoskeletal conditions, or other comorbidities that may limit participation. Participants are randomly assigned to one of two groups: the experimental group receives four weekly individual motivational interviewing sessions (45–60 minutes each) based on Watson's Theory of Human Caring, delivered by a trained nurse; the control group receives a single 30-minute session of conventional foot care education. The primary outcome of this study is diabetic foot care self-efficacy, measured at baseline and four weeks post-intervention. Secondary outcomes include foot care behaviors, treatment adherence, and patient satisfaction, all assessed using standardized questionnaires. The study is designed as a single-blind randomized controlled trial and adheres to the CONSORT guidelines to ensure reproducibility.

Randomization and Blinding

Participants were allocated to the experimental or control group using a computer-assisted simple randomization method to ensure equal group sizes. An independent researcher generated two sets of random numbers (ranging from 1 to 76) using the random.org platform. Group allocation was determined by a lottery system assigning each set of numbers to either the experimental or control group. The numbers were then placed on slips of paper, sealed in opaque envelopes, and prepared for allocation. Following eligibility assessment and informed consent, a hospital staff member independent of the study selected an envelope to determine each participant's group assignment.

The study is conducted in accordance with the CONSORT Checklist 2010[12] and the CONSORT eHealth Checklist 2011[13] to enhance clarity, integrity, and transparency.

Randomization procedures were performed by an independent researcher using random.org. The primary researcher remained blinded to group allocation until the intervention phase begins (i.e., when participants select the numbered envelopes). Data analysis was conducted by an independent statistician who was blinded to both group allocation and intervention conditions to minimize bias.[14]

Although double blinding is not feasible due to the nature of the intervention, blinding was implemented wherever possible. The researcher delivering the motivational interviewing did not have access to the randomization list and remained unaware of participants' group assignments prior to allocation. Randomization was conducted by an independent researcher who was not involved in recruitment, intervention delivery, or data collection. The hospital staff member responsible for distributing sealed envelopes was blinded to the study protocol and hypotheses. Due to the behavioral nature of the intervention, participant blinding was not feasible. However, outcome assessors and the statistician remained blinded to group allocation. This single-blind design was intended to minimize assessment and analysis bias.

Sample Size and Power Analysis

The sample size was determined using the G*Power statistical power analysis program (version 3.1; Heinrich-Heine-Universität Düsseldorf, Düsseldorf, Germany, released 2010). A dependent-samples t-test was planned to assess changes in self-efficacy within each group. The study followed a single-blind randomized controlled experimental design with experimental and control groups to examine the effects of motivational interviewing, grounded in Watson's Theory of Human Caring, on treatment adherence, self-efficacy, and satisfaction among individuals with diabetic foot ulcers.

In the absence of directly comparable studies, Cohen's standardized effect size was used.[15-17] The sample size calculation was based on a medium effect size (0.5),[18] an alpha level of 5%, and a statistical power of 80%, resulting in a minimum required sample of 34 participants per group.

To account for potential attrition and limit data loss to below 10–15%,[19-22] an additional 10% of participants were included. Accordingly, a total of 76 individuals were randomized, with 38 allocated to the experimental group and 38 to the control group (Fig. 1).

Outcome Measures

Primary Outcome Measures

The primary outcomes of this study are treatment adherence and diabetic foot care self-efficacy.

- **Diabetic foot care self-efficacy:** Assessed using the Turkish version of the Diabetic Foot Care Self-Efficacy Scale, which has demonstrated good reliability (Cronbach's α=0.86). Higher scores indicate greater self-efficacy.[23,24]
- **Medication adherence:** Measured using the Turkish version of the Medication Adherence Report Scale (MARS), which has been validated and shown to be reliable in the target population. Higher scores indicate better adherence.[25-27]

Secondary Outcome Measures

Secondary outcomes include patient satisfaction, foot care behaviors, wound size, and hemoglobin A1c (HbA1c) levels.

- **Patient satisfaction:** Evaluated using an instrument based on Watson's Theory of Human Caring, consisting of items rated on a 7-point Likert scale and an open-ended question capturing caring experiences.[28,29]

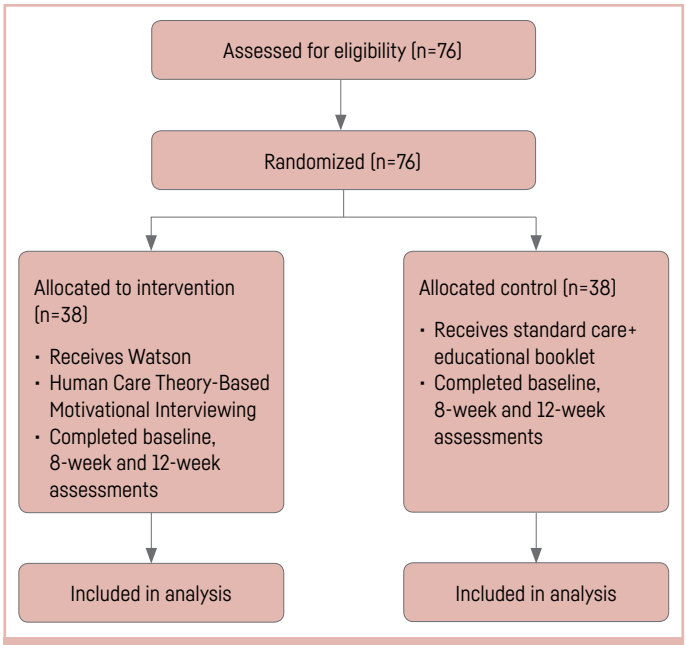

Figure 1. Planned participant flow diagram for the randomized controlled trial.

- **Foot care behaviors:** Assessed using the Turkish version of the Foot Care Behavior Scale (FCBS); higher scores indicate better adherence to American Diabetes Association (ADA) foot care recommendations.[30]
- **Wound size:** Measured using a standardized ruler, with area calculated as length × width (mm^2).
- **HbA1c levels:** Obtained from participants' recent clinical laboratory results and included as descriptive clinical data.

Intervention

Experimental Group

Participants in the experimental group received a motivational interviewing program grounded in Watson's Theory of Human Caring, delivered through weekly home visits over eight consecutive weeks. The first session lasted approximately 60 minutes, followed by seven sessions of approximately 30 minutes each.

Data were collected at three time points: baseline (week 1), post-intervention (week 8), and follow-up (week 12).

At baseline (week 1), data collection included the Patient Information Form, Diabetic Foot Assessment Form, Wagner Wound Assessment Form, Medication Adherence Report Scale, Foot Care Behavior Scale, wound size measurement, and the Diabetic Foot Care Self-Efficacy Scale.

At week 8 (post-intervention), the Diabetic Foot Assessment Form, Wagner Wound Assessment Form, Medication Adherence Report Scale, Foot Care Behavior Scale, wound size measurement, Diabetic Foot Care Self-Efficacy Scale, and the Watson Caritas Patient Score were administered.

At week 12 (follow-up), the Diabetic Foot Assessment Form, Wagner Wound Assessment Form, Medication Adherence Report Scale, Foot Care Behavior Scale, wound size measurement, HbA1c levels, and the Diabetic Foot Care Self-Efficacy Scale were collected.

A follow-up appointment was scheduled at the end of each visit.

The intervention was structured in accordance with the core principles of motivational interviewing, including open-ended questioning, reflective listening, affirmation, summarization, and elicitation of change talk, and was guided by Watson's Caritas Processes. Each session was designed to enhance patients' awareness, motivation, and sense of responsibility regarding foot care and treatment adherence.

The initial session focused on establishing a therapeutic relationship, assessing patients' beliefs and readiness for change, and introducing diabetic foot care within a caring-healing framework. Subsequent sessions aimed to strengthen self-efficacy, resolve ambivalence toward treatment adherence, reinforce positive foot care behaviors, and support emotional well-being through caring moments aligned with Watson's Theory of Human Caring.

All sessions were delivered by a nurse researcher trained in motivational interviewing and Watson's Theory of Human Caring, who had completed formal MI training and had prior clinical experience in diabetic foot care.

The detailed content of each session is summarized in Table 1. A comprehensive semi-structured intervention manual is provided as supplementary material.

Control Group

Participants in the control group receives standard care, defined as routine clinical follow-up, wound assessment, and treatment provided by healthcare professionals, without any additional structured intervention from the research team. To ensure ethical transparency and comparability between groups, all control participants received an educational booklet at the beginning of the study.

Data collection in the control group followed the same schedule as in the experimental group, with assessments conducted at baseline (week 1), week 8, and week 12.

At baseline (week 1), data was collected using the Patient Information Form, Diabetic Foot Assessment Form, Wagner Wound Assessment Form, Medication Adherence Report Scale, Foot Care Behavior Scale, wound size measurement, and the Diabetic Foot Care Self-Efficacy Scale.

Table 1. Structure of the motivational interviewing program based on Watson's Theory of Human Caring

Session	Core focus of the session	Motivational interviewing techniques	Watson's Caritas processes
1	Establishing rapport, assessing readiness for change	Open-ended questions, affirmations, reflective listening, summarizing	Humanistic–altruistic values, helping–trusting relationship, teaching–learning
2	Exploring illness experiences and emotional responses	Open-ended questions, reflective listening, affirmations	Sensitivity to self and others, expression of feelings
3	Addressing fears related to illness and treatment	Reflective listening, affirmations, summarizing	Expression of positive and negative feelings, existential openness
4	Discussing experiences and challenges related to diabetic foot care	Open-ended questions, reflective listening	Faith–hope, sensitivity to self and others
5	Enhancing treatment adherence and foot care behaviors	Eliciting change talk, decisional balance, affirmations	Teaching–learning, supportive caring relationship
6	Problem-solving and strengthening self-efficacy	Change talk, reflective listening, summarizing	Creative problem solving, helping–trusting relationship
7	Reinforcing progress and addressing remaining concerns	Open-ended questions, affirmations, change talk	Supportive and protective environment
8	Closure, future planning, and consolidation of gains	Reflection, summarizing, affirmations	Existential–phenomenological–spiritual care

Table 2. Timing and details of data collection

Measure	Experimental group			Control group		
	Week 1	Week 8	Week 12	Week 1	Week 8	Week 12
Information Form	+	-	-	+	-	-
Diabetic Foot Assessment Form	+	+	+	+	+	+
Wagner Wound Assessment Form	+	+	+	+	+	+
Medication Adherence Report Scale	+	+	+	+	+	+
Foot Care Behavior Scale	+	+	+	+	+	+
Diabetic Foot Care Self-Efficacy Scale	+	+	+	+	+	+
Wound Size Measurement	+	+	+	+	+	+
Watson Caritas Patient Score	-	+	-	-	-	-
HbA1c	+	-	+	+	-	+

At week 8, the Diabetic Foot Assessment Form, Wagner Wound Assessment Form, Medication Adherence Report Scale, Foot Care Behavior Scale, wound size measurement, and the Diabetic Foot Care Self-Efficacy Scale were administered.

At week 12, data collection included the Diabetic Foot Assessment Form, Wagner Wound Assessment Form, Medication Adherence Report Scale, Foot Care Behavior Scale, wound size measurement, HbA1c levels, and the Diabetic Foot Care Self-Efficacy Scale.

No motivational interviewing techniques or theory-based structured counseling was provided to the control group during the study period. At the conclusion of the study, motivational interviewing was offered to participants in the control group, ensuring equitable access to the intervention after all outcome measurements had been completed (Table 2).

Statistical Analysis

Data obtained from the study was entered into and analyzed using IBM SPSS Statistics version 25 (IBM Corp., Armonk, NY, USA; released 2012). The normality of the variables was assessed using skewness and kurtosis values. If the data were normally distributed, parametric tests were applied. Differences between groups were analyzed using the independent-samples t-test, while within-group comparisons were conducted using the paired-samples t-test. Repeated measures were evaluated using analysis of variance (ANOVA) with Bonferroni analysis. If the data were not normally distributed, nonparametric tests were used. Between-group comparisons were performed using the Mann–Whitney U test, within-group comparisons using the Wilcoxon signed-rank test, and repeated measures using the Friedman test with Dunn–Bonferroni analysis. Statistical significance was set at $p<0.05$.

Ethics Committee Approval

This study was conducted in accordance with the principles of Good Clinical Practices and the Declaration of Helsinki. Ethical approval was obtained from the Ethics Committee of İstanbul Okan University (Approval Number: 162, Date: 11.01.2023). The study was registered on April 12, 2023, in the ClinicalTrials.gov database (Identifier: NCT06023810). Institutional permission was obtained from the hospital where the study was conducted. All participants were informed about the study, and both written and verbal informed consent were obtained.

Discussion

Improving treatment adherence, self-efficacy, and patient satisfaction in individuals with diabetic foot ulcers is essential for reducing complications and improving clinical outcomes. This study evaluated the impact of integrating motivational interviewing with Watson's Theory of Human Caring within a holistic, patient-centered framework. By addressing both physical and emotional dimensions of care, the intervention aimed to support patients in managing their condition more effectively.

Motivational interviewing is a well-established strategy for enhancing self-care behaviors and treatment adherence in chronic disease populations. A systematic review by Miller and Rollnick demonstrated its effectiveness in improving medication adherence and glycemic control in individuals with diabetes.[11] Watson's Theory of Human Caring emphasizes therapeutic relationships and caring processes, which are associated with improved patient satisfaction and engagement in self-care.[31] By integrating these approaches, this study examined whether a structured intervention can positively influence adherence, self-efficacy, and satisfaction in diabetic foot ulcer care.

Diabetic foot ulcers present multifactorial challenges that require coordinated medical treatment, lifestyle modifications, and psychological support. Evidence suggests that addressing emotional and psychological factors alongside physical care improves healing outcomes and reduces recurrence.[32] This protocol incorporates motivational interviewing and Watson's Caritas Processes to evaluate whether such an integrated approach can enhance patient self-efficacy and adherence while supporting wound healing.

Holistic, patient-centered approaches grounded in Watson's Theory highlight the importance of caring moments and supportive therapeutic relationships. These principles align closely with motivational interviewing, which encourages patients to actively participate in their care.[33] Evaluating the feasibility and effectiveness of combining these approaches may provide valuable insights into strategies for improving adherence to foot care regimens and overall clinical outcomes.

Although both motivational interviewing and Watson's Theory have demonstrated individual benefits, research on their combined application in diabetic foot ulcer management is limited. This study aimed to address this gap and contribute to the growing body of evidence supporting holistic, patient-centered models in chronic disease care. By integrating physical and emotional care dimensions, the findings are expected to inform future research and the development of evidence-based clinical guidelines, particularly for populations with complex care needs.[34]

Limitations of the Study

This study has some limitations. First, due to the behavioral nature of the motivational interviewing intervention, blinding of the participants is not feasible, which may introduce performance bias. Second, the study is conducted in a single tertiary healthcare institution, which may limit the generalizability of the findings to different healthcare settings.

Conclusion

Based on the study hypotheses, integrating motivational interviewing within Watson's Theory of Human Caring is expected to positively influence treatment adherence, self-efficacy, and patient satisfaction among individuals with diabetic foot ulcers. The findings may provide practical insights into how nurses can incorporate evidence-based interventions into clinical practice. By adopting roles as educators and consultants, nurses may enhance holistic care delivery, improve treatment effectiveness, and contribute to better quality of life for patients managing chronic conditions such as diabetic foot ulcers.

Ethics Committee Approval: The study was approved by the İstanbul Okan University Ethics Committee (Approval Number: 162, Date: 11.01.2023).

Informed Consent: Written informed consent was obtained from the patients.

Conflict of Interest: The authors have no conflicts of interest to declare.

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References

1. International Diabetes Federation (IDF). Türkiye: Member information. IDF Europe. Accessed April 29, 2026.https://idf.org/europe/our-network/our-members/turkiye/
2. International Diabetes Federation (IDF). Diabetes Atlas. Accessed April 29, 2026. https://diabetesatlas.org/
3. Subrata SA, Phuphaibul R. A nursing metaparadigm perspective of diabetic foot ulcer care. Br J Nurs. 2019;28(6):S38–S50. [CrossRef]
4. American Diabetes Association. 10. Microvascular Complications and Foot Care: Standards of Medical Care in Diabetes-2018. Diabetes Care. 2018;41(Suppl 1):S105–S118. [CrossRef]
5. Schaper NC, van Netten JJ, Apelqvist J, Bus SA, Hinchliffe RJ, Lipsky BA; IWGDF Editorial Board. Practical Guidelines on the prevention and management of diabetic foot disease (IWGDF 2019 update). Diabetes Metab Res Rev. 2020;36 Suppl 1:e3266. [CrossRef]
6. Ekong G, Kavookjian J. Motivational interviewing and outcomes in adults with type 2 diabetes: A systematic review. Patient Educ Couns. 2016;99(6):944–952. [CrossRef]
7. Baykara ZG, Çalışkan N, Öztürk D, Karadağ A. The use of theory and models in nursing: A qualitative study. Çukurova Med J. 2019;44(Suppl 1):281–289. Turkish. [CrossRef]
8. Arslan Özkan İ, Okumuş H. A model where care and healing intersect: Watson's Theory of Human Caring. Turk J Res Dev Nurs. 2012;14(2):61–72. Turkish.
9. Erbay Ö, Yıldırım Y, Fadıloğlu Ç, Aykar FŞ. Nursing care applied to patients experiencing hypertensive attacks using Watson's Theory of Human Caring: A case report. Turk J Cardiovasc Nurs 2018;9(19):82–88. Turkish.
10. Rollnick S, Miller WR, Butler CC, Aloia MS. Motivational interviewing in health care: Helping patients change behavior. J Chronic Obstr Pulm Dis. 2008;5(3):203. [CrossRef]
11. Miller WR, Rollnick S. Motivational Interviewing: Helping People Change. New York: Guilford Press; 2023.
12. Schulz KF, Altman DG, Moher D; CONSORT Group. CONSORT 2010 Statement: updated guidelines for reporting parallel group randomised trials. Trials. 2010;11:32. [CrossRef]
13. Eysenbach G; CONSORT-EHEALTH Group. CONSORT-EHEALTH: improving and standardizing evaluation reports of Web-based and mobile health interventions. J Med Internet Res. 2011;13(4):e126. [CrossRef]
14. Fuller-Tyszkiewicz M, Richardson B, Little K, et al. Efficacy of a Smartphone App Intervention for Reducing Caregiver Stress: Randomized Controlled Trial. JMIR Ment Health. 2020;7(7):e17541. [CrossRef]
15. Cohen J. Statistical Power Analysis for the Behavioral Sciences. 2nd ed. Erlbaum; 1988.
16. Cohen J. Things I have learned (so far). Am Psychol. 1990;45(12):1304–1312. [CrossRef]
17. Lai MHC. Bootstrap Confidence Intervals for Multilevel Standardized Effect Size. Multivariate Behav Res. 2021;56(4):558–578. [CrossRef]
18. Brand C, O'Connell BH, Gallagher S. A randomised controlled trial of benefit finding in caregivers: The Building Resources in Caregivers Study Protocol. Health Psychol Open. 2015;2(2):2055102915595019. [CrossRef]
19. Montori VM, Guyatt GH. Intention-to-treat principle. CMAJ. 2001;165(10):1339–1341.
20. Silva Filho CR, Saconato H, Conterno LO, Marques I, Atallah AN. Assessment of clinical trial quality and its impact on meta-analyses. Rev Saude Publica. 2005;39(6):865–873. Portuguese. [CrossRef]
21. Ron K, Faltin F, Ruggeri F, eds. Statistical Methods in Healthcare. USA: Wiley; 2012. [CrossRef]
22. Akın B, Koçoğlu D. Randomized Controlled Trials. JOHUFON. 2017;4(1):73–92. Turkish.
23. Quarles BE. Educational methods increasing self-efficacy for the management of foot care in adults with diabetes and implementation of foot care behaviors. Dissertation. University of Kentuck; 2005.
24. Kır Biçer E, Enç N. Evaluation of foot care and self-efficacy in patients with diabetes in Turkey: an interventional study. Int J Diabetes Dev Ctries. 2016;36(3):334–344. [CrossRef]
25. Horne R, Weinman J. Self-regulation and self-management in asthma: exploring the role of illness perceptions and treatment beliefs in explaining non-adherence to preventer medication. Psychol Health 2002;17(1):17–32. [CrossRef]
26. Sandy R, Connor U. Variation in medication adherence across patient behavioral segments: A multi-country study in hypertension. Patient Prefer Adherence. 2015;9:1539–1548. [CrossRef]
27. Şen ET, Berk ÖS, Sındel D. Validity and reliability study of the Turkish adaptation of the Medication Adherence Reporting Scale. J Istanbul Fac Med. 2019;82(1):52–62.
28. Watson J, Woodward TK. Jean Watson's Theory of Human Caring. In: Parker ME, Smith MC, eds. Nursing Theories and Nursing Practice. 3rd ed. Philadelphia: FA Davis; 2010:351–369.
29. Watson Caritas Patient Score. Boulder (CO): Watson Caring Science Institute; c2010. Accessed April 29, 2026. http://www.watsoncaringscience.org/files/PDF/measurement/WCPS_v_1.1_01_2013.pdf
30. Borges WJ, Ostwald SK. Improving foot self-care behaviors with Pies Sanos. West J Nurs Res. 2008;30(3):325–341; discussion 342–349. [CrossRef]
31. Gunawan J, Aungsuroch Y, Watson J, Marzilli C. Nursing administration: Watson's theory of human caring. Nursing Science Quarterly. 2022;35(2):235–243. [CrossRef]
32. Pombeiro I, Moura J, Pereira MG, Carvalho E. Stress-reducing psychological interventions as adjuvant therapies for diabetic chronic wounds. Current Diabetes Reviews. 2022;18(3):66–76. [CrossRef]
33. Binning J, Woodburn J, Bus SA, Barn R. Motivational interviewing to improve adherence behaviours for the prevention of diabetic foot ulceration. Diabetes Metab Res Rev. 2019;35:e3105. [CrossRef]
34. International Diabetes Federation (IDF). Clinical Practice Recommendations for Managing Diabetic Foot Ulcers. Brussels: IDF; 2023. Accessed April 29, 2026. https://international-diabetes-federation.s3.eu-west-1.amazonaws.com/media/uploads/2023/05/attachments-61.pdf

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Knowledge and Attitudes of Nursing Students Regarding Postoperative Pain Management: A Cross-Sectional Study

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Abstract

Background: Nurses play a critical role in pain assessment and management; therefore, it is essential that nursing students possess adequate knowledge and appropriate attitudes toward this aspect of care. Previous research has consistently shown that nursing students have deficiencies in both knowledge and attitudes related to the effective management of postoperative pain.

Aim: This descriptive, cross-sectional study aimed to evaluate nursing students' knowledge and attitudes regarding pain management.

Methods: The study sample consisted of 306 second-, third-, and fourth-year nursing students who were 18 years of age or older, enrolled in a nursing faculty, and consented to participate. Data were collected between May 30, 2022 and June 3, 2022 using a Student Information Form and the Nurses' Knowledge and Attitudes Survey Regarding Pain (NKASRP), administered through structured face-to-face interviews. Data analysis included descriptive statistics, independent samples t-tests, and analysis of variance (ANOVA).

Results: Of the participants, 69.9% were female and 97.7% were single. The mean NKASRP score was 15.98±3.32, with a correct response rate of 38%, indicating a poor level of knowledge and attitudes. Notably, 92.2% of students correctly answered the question, "Who best expresses the severity of the patient's pain?", and 90.5% correctly identified that "After the recommended initial doses of opioid analgesics, additional doses should be adjusted according to the patient's individual response." A statistically significant difference was found in NKASRP scores based on whether students had received education on pain management ($p<0.05$).

Conclusion: The findings indicate that nursing students have insufficient knowledge regarding pain management. It is recommended that pharmacology and pain management content in nursing curricula be reviewed and strengthened to address these deficiencies.

Keywords: Attitude, nursing, pain management, postoperative pain, students

Introduction

Pain is a complex sensation that can impair an individual's quality of life, limit daily activities, and, in some cases, threaten life itself.[1] The International Association for the Study of Pain (IASP) defined pain in 1979 as "an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage." This definition, proposed by the Subcommittee on Taxonomy, was later adopted by the IASP Council.[2] Inadequate management of a patient's pain perception can negatively affect the individual physically, spiritually, and socially,[3] thereby diminishing overall quality of life.[4] Effective pain management is therefore a fundamental component of patient care, as untreated pain has significant adverse consequences.[5] Each year, millions of individuals worldwide undergo surgical procedures and experience pain during the postoperative period.[6] Postoperative pain is one of the most significant concerns for surgical patients.[7] It begins with the surgical procedure, and nurses play a vital role in decision-making regarding pain management during patients' clinical follow-up.[5] Nurses should deliver effective pain management to prevent unnecessary suffering during the postoperative period and to minimize potential complications. Pain management should focus on achieving optimal patient comfort through individualized care, including both pharmacological and non-pharmacological interventions.[8]

The knowledge, attitudes, and practices of nurses directly influence patients' ability to achieve adequate pain control.[3] Nursing students, as future healthcare professionals, must also be prepared to take an active role in pain management.[9] It is well established that healthcare professionals' knowledge, particularly that of nurses, is critical for accurate pain assessment and effective pain management. Consequently, undergraduate nursing education must be grounded in strong theoretical and clinical foundations to enhance students' competencies in this area. By the time they graduate, nursing students are expected to possess comprehensive knowledge of pain and its management.[10] A systematic review examining nursing students' knowledge and attitudes toward pain management over the past two decades reported insufficient levels of knowledge among students. This deficiency has been attributed to limitations in undergraduate curricula, particularly in translating theoretical knowledge into clinical practice.[2,11-14] In light of these concerns, this study aims to evaluate nursing students' knowledge and attitudes regarding postoperative pain and its management. Such evaluation represents an important initial step in developing educational strategies and interventions to improve nursing curricula and enhance the quality of patient care. This study is expected to contribute to the evaluation and improvement of students' competencies in pain management, thereby supporting better clinical outcomes.

This study is a master's thesis research. Thesis title: Evaluation of the Knowledge and Attitudes of a Nursing School Students on Pain Management in the Postoperative Period (2023). Demiroğlu Bilim University Health Sciences Institute. (Advisor: Asist. Prof. Dr. Gamze Oğuz).

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Table 1. Sociodemographic characteristics of nursing students (n=306)

Characteristics	n	%
Age (mean±SD: 22.30±2.15)		
≤22 years	184	60.1
>22 years	122	39.9
Gender		
Female	214	69.9
Male	92	30.1
Year of study		
Second year	99	32.4
Third year	108	35.3
Fourth year	99	32.3
Type of high school graduated		
Health vocational high school	79	25.8
General high school	28	9.2
Anatolian/Science high school	164	53.6
Other*	35	11.4
Academic achievement		
Poor	14	4.6
Moderate	122	39.9
Good	150	49.0
Very good	20	6.5
Previous bachelor's or associate degree		
No	233	76.1
Yes	73	23.9
Marital status		
Married	7	2.3
Single	299	97.7
Employment status		
Not employed	213	69.6
Employed	93	30.4
Current work unit		
Surgery	16	17.2
Intensive care	16	17.2
Operating room	10	10.8
Other**	51	54.8
Presence of health problems		
No	286	93.5
Yes	20	6.5

*: Other: Anatolian Imam Hatip High School, Vocational and Technical Anatolian High School,
**: Other: Service units. SD: Standard deviation.

Research Questions

1. What is the level of nursing students' knowledge regarding postoperative pain?
2. What are nursing students' attitudes toward postoperative pain?
3. Which factors influence nursing students' knowledge and attitudes regarding postoperative pain?

Materials and Methods

Study Design

This study employed a descriptive, cross-sectional design.

Study Population

The study population consisted of 353 nursing students enrolled in the nursing faculty of a foundation university in Istanbul, Türkiye, during the spring semester of the 2021–2022 academic year. Despite the absence of a dedicated course on pain in the nursing curriculum, several courses include relevant content. Specifically, four hours are allocated to "Pain and Nursing Care" in the Internal Medicine Nursing course, two hours to "Postoperative Pain and Management" in the Surgical Nursing course, two hours to "Pain Assessment" in the Health Assessment course, and two hours to "Pain and Symptom Management" in the elective Palliative Care course offered to third-year students. Although a two-hour pain management component was introduced into the Fundamentals of Nursing course during the spring semester of the first year, first-year students were excluded from the study because they had not yet received in-depth instruction on pain and were not involved in clinical practice. Data were collected between May 30, 2022 and June 3, 2022, during the final examination week, when all students were present on campus, to maximize participation. The study population consisted of 353 students enrolled in the second, third, and fourth years. The sample included 306 students aged 18 years or older who were present during the study period, voluntarily consented to participate, and completed the questionnaire in full. Twenty students submitted incomplete questionnaires, and 15 declined to participate. The final sample represented 86.7% of the total population, indicating a high participation rate.

Table 2. Learning and knowledge levels regarding pain among nursing students (n=306)

Characteristic	n	%
Training related to pain		
No	24	7.8
Yes	282	92.2
Follow-up of pain-related literature		
No	285	93.1
Yes	21	6.9
Self-reported knowledge of pain		
No knowledge	4	1.3
Insufficient	24	7.8
Moderate	256	83.7
Advanced	22	7.2

Data Collection Tools

Data were collected using the Student Information Form and the Nurses' Knowledge and Attitudes Survey Regarding Pain (NKASRP).

Student Information Form

The Student Information Form was developed by the researcher based on the literature.[3,5,9,10,15] It consisted of 20 items covering demographic and related characteristics, including age, gender, marital status, year of study, type of previously completed school, employment status (unit and duration), medication use, health status, personal pain experience, pain coping methods, and level of knowledge about pain.

Nurses' Knowledge and Attitudes Survey Regarding Pain

The Nurses' Knowledge and Attitudes Survey Regarding Pain is a 39-item instrument developed by Ferrell, McGuire, and Donovan in 1993 to assess nurses' knowledge and attitudes regarding pain and its management. The Turkish validity and reliability study was conducted by Yıldırım et al.15, with a reported Cronbach's α of 0.74. The instrument includes 22 true/false items and 13 multiple-choice questions, as well as two case scenarios requiring participants to assess patients. The correct response rate was calculated by dividing the number of correct answers by the total number of items. Each correct response was assigned 1 point, while incorrect or unanswered items received 0 points. The total score ranges from 0 to 39.15 When expressed as percentages, scores are categorized as poor (<50%), moderate (50–75%), or good (>75%). In the present study, the Cronbach's α coefficient was 0.54.

Data Collection

Data were collected through structured, face-to-face interviews conducted in classroom settings by trained research assistants. Participation was voluntary, and written informed consent was obtained from all participants prior to data collection. The average time required to complete the questionnaire was 15 minutes.

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Table 3. Comparison of Nurses' Knowledge and Attitudes Survey Regarding Pain scores according to students' sociodemographic characteristics (n=306)

Characteristic		Mean	SD	Min–Max	Test value	p
NKASRP	39-item scale	15.98	3.32	7–34		
Age	≤22 years	16.02	3.24		0.246**	0.806
	>22 years	15.93	3.45			
Gender	Female	16.40	3.27		3.383**	0.001°
	Male	15.02	3.24			
Marital status	Married	15.86	2.21		0.120**	0.919
	Single	15.99	3.33			
Year of study	Second year	15.60	3.39		2.353***	0.072
	Third year	15.65	3.01			
	Fourth year	16.74	3.54			
Type of high school graduated	Health vocational high school	15.96	3.21		0.150***	0.930
	General high school	15.68	2.87			
	Anatolian/Science high school	16.08	3.50			
	Other	15.83	3.12			
Academic achievement	Poor	15.64	3.91		0.544***	0.652
	Moderate	15.72	3.08			
	Good	16.19	3.52			
	Very good	16.25	2.75			
Previous bachelor's or associate degree	No	15.94	3.45		-0.371**	0.711
	Yes	16.11	2.86			
Employment status	Not employed	16.00	3.51		0.096**	0.923
	Employed	15.96	2.82			
Work unit	Surgery	16.75	2.72		2.539***	0.062
	Intensive care	17.37	2.55			
	Operating room	15.70	2.79			
	Other	15.36	2.83			
Health problems	No	15.90	3.30		-1.772**	0.077
	Yes	17.25	3.35			
Pain-related education	No	13.83	3.60		-3.364**	0.001°
	Yes	16.17	3.23			
Follow-up of pain-related literature	No	16.00	3.34		0.385**	0.700
	Yes	15.71	2.97			
Self-reported knowledge of pain	No knowledge	14.75	1.50		0.724***	0.538
	Insufficient	16.12	4.54			
	Moderate	16.06	3.26			
	Advanced	15.14	2.62			

°: p<0.05, **: Independent samples t-test, ***: One-way analysis of variance. Min–Max: Minimum-Maximum, SD: Standard deviation, NKASRP: Nurses' Knowledge and Attitudes Survey Regarding Pain.

Ethical Considerations

Ethical approval was obtained from Demiroğlu Science University Clinical Research Ethics Committee (Approval Number: 44140529/17680, Date: 24.05.2022). Additional written permission was obtained from the Directorate of the School of Nursing where the study was conducted. The study was carried out in accordance with the principles of the Declaration of Helsinki. Prior to data collection, participants were informed about the study and provided written informed consent. Permission to use the Nurses' Knowledge and Attitudes Survey Regarding Pain was obtained from the first author, who conducted the Turkish validity and reliability study of the scale.

Statistical Analysis

Data were analyzed using the SPSS Statistics software (Statistical Package for the Social Sciences), version 25.0 (IBM, Armonk, NY, USA). Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarize the data. For comparisons between two independent groups with normally distributed data, an independent samples t-test was applied. For comparisons among more than two groups, one-way analysis of variance was used. Statistical significance was set at $p<0.05$.

Results

Analysis of age distribution showed that 60.1% (n=184) of the students were 22 years of age or younger, while 39.9% (n=122) were older than 22 years. Of the participants, 69.9% (n=214) were female and 97.7% (n=299) were single. The sociodemographic characteristics of the participants are presented in Table 1. Regarding educational exposure, 92.2% (n=282) of the students reported having received education or coursework related to pain. However, 93.1% (n=285) indicated that they did not follow any publications related to pain. In terms of self-reported knowledge, 83.7% (n=256) of the students reported having a moderate level of knowledge about pain (Table 2).

Table 4. Percentage distribution of correct responses to the Nurses' Knowledge and Attitudes Survey Regarding Pain items (n=306)

Item no.	Item (Correct answer)	Correct responses	
		N	%
Items with <50% correct responses (poor)			
34	Percentage of patients who over-report pain (0)	0	0.0
35	Likelihood of opioid addiction when treating pain (<1–5%)	12	3.9
37	Appropriate action for inadequate pain relief (administer morphine 3 mg IV)	14	4.6
7	Effectiveness of non-drug interventions for severe pain	22	7.2
38	Appropriate action for inadequate pain relief (administer morphine 3 mg IV)	22	7.2
23	Recommended route of administration for prolonged cancer pain (oral)	23	7.5
28	Risk of respiratory depression with increasing opioid doses (<1%)	31	10.1
13	Patients with a history of substance abuse should not be given opioids for pain due to addiction risk	40	13.1
1	Reliance on vital signs to assess severe pain	52	17.0
22	Heat and cold should only be applied to the painful area	68	22.2
21	Use of placebo (sterile water) to assess pain validity	69	22.5
2	Because of underdeveloped neurological systems, children under two years of age have decreased pain sensitivity and limited memory of painful experiences	80	26.1
25	Drug of choice for moderate-to-severe cancer pain (morphine)	92	30.1
11	Duration of action of meperidine (Demerol) IM (4–5 hours)	100	32.7
26	IV morphine dose equivalent to oral morphine	101	33.0
20	Patients should be advised to use non-pharmacological techniques alone	112	36.6
16	Encouraging patients to tolerate pain before seeking relief	116	37.9
12	Research shows that promethazine (Phenergan) is a reliable potentiator of opioid analgesics	118	38.6
10	The World Health Organization (WHO) pain ladder recommends using a single analgesic rather than combining drug classes	123	40.2
17	For children under 11 years, nurses should rely on parents' assessment of pain intensity	124	40.5
3	If a patient can be distracted from their pain, this usually indicates that they do NOT have high pain intensity	127	41.5
39	Postoperative pain assessment (pain score of 8)	133	43.5
15	Elderly patients cannot tolerate opioids for pain relief	145	47.4
23	The recommended route of administration for opioid analgesics in patients with sudden-onset, severe pain is (intravenous)	146	47.7
Items with 50–74% correct responses			
6	Aspirin and other nonsteroidal anti-inflammatory drugs are NOT effective analgesics for bone pain caused by metastases	157	51.3
33	Which of the following best describes the appropriate approach to cultural considerations in caring for patients in pain?	173	56.5
9	Aspirin 650 mg PO is approximately equal in analgesic effect to meperidine (Demerol) 50 mg PO	176	57.5
30	Reason for requesting increased pain medication (the patient is experiencing increased pain)	179	58.5
4	Patients may sleep despite severe pain	183	59.8
8	Respiratory depression rarely occurs in patients receiving opioids over an extended period	193	63.1
5	Comparable stimuli produce the same intensity of pain in different individuals	200	65.4
30	Which of the following drugs are useful for the treatment of cancer pain?	201	65.7
36	A 25-year-old patient, Andrew, following abdominal surgery, reports a pain level of 8/10 despite normal vital signs and social interaction	201	65.7
14	Beyond a certain dose, increasing morphine does not improve pain relief	203	66.3
27	Analgesics for postoperative pain should initially be administered (around the clock on a fixed schedule)	212	69.3
29	Analgesia for chronic cancer pain should be administered (around the clock on a fixed schedule)	226	73.9
Items with ≥75% correct responses			
16	Based on religious beliefs, a patient may perceive pain and suffering as necessary	254	83.0
17	After the initial recommended dose of an opioid analgesic, subsequent doses should be adjusted according to the patient's individual response	277	90.5
31	The most accurate judge of the intensity of the patient's pain is (the patient)	282	92.2

The results of the NKASRP indicate that students' knowledge and attitudes regarding pain management are insufficient. The mean correct response rate for the overall scale was 38%, ranging from 20.51% to 82.05%. According to the evaluation criteria, 93.13% (284) of the students were classified as having poor knowledge, 6.9% (21) as moderate, and 0.03% (1) as good. The analysis showed that students performed at a poor level (<50%) on 24 items of the NKASRP, at a moderate level (50–75%) on 12 items, and at a good level (>75%) on three items.

Out of the 39 items assessing knowledge of pain, the mean number of correct responses was 15.98±3.32, with scores ranging from 7 to 34. Analysis of sociodemographic variables revealed that female students had higher NKASRP scores than male students (Table 3).

Students who had received education on pain-related topics during their studies demonstrated higher NKASRP scores compared to those who had not. However, no statistically significant difference was found between students' year of study and their NKASRP scores (Table 3).

Table 4 presents the percentage of correct responses for each item. The highest correct response rates were observed for the statements "The most accurate judge of the intensity of the patient's pain is (the patient)" (92.2%) and "After the initial recommended dose of opioid analgesics, subsequent doses should be adjusted according to the patient's individual response" (90.5%). The lowest correct response rate was observed for the question "What percentage of patients do you think over-report their pain?" (0%).

Discussion

Untreated pain is a global health problem that leads to preventable complications and increased healthcare costs. The knowledge, behaviors, and attitudes of healthcare professionals, particularly nurses, are critical in effective pain management. The foundational knowledge, skills, and attitudes that nursing students acquire during their education directly influence their future clinical practice. Therefore, it is essential that nursing students receive adequate education on pain management before entering professional practice.[16] The aim of this study was to evaluate nursing students' knowledge and attitudes regarding postoperative pain management to contribute to improving the quality of nursing education as a first step toward developing educational and strategic initiatives for optimal pain control.

The findings indicate that students' knowledge and attitudes toward pain management are inadequate. These results are consistent with previous studies.[10,17–19] However, studies reporting higher rates of correct responses among students have also been documented.[20,21] This variation may be attributed to differences in sample characteristics and curricular structures. Additionally, the continuation of education through distance learning during the coronavirus disease 2019 (COVID-19) pandemic may have contributed to the low levels of knowledge and attitudes observed, suggesting that remote education may negatively affect students' academic performance. Furthermore, insufficient emphasis on pain management in the curriculum, the absence of a dedicated course, and the limited integration of this topic within core courses, such as internal medicine nursing, surgical nursing, women's health nursing, health assessment, and palliative care, may also explain these deficiencies. Reorganizing the curriculum and incorporating diverse educational strategies could help improve students' knowledge and attitudes toward pain management. Supporting this, Evan and Mixon (2015) reported that students who received simulation-based training achieved higher NKASRP scores.[21]

The NKASRP items with the highest correct response rates indicate that most students identified the patient as "the most accurate judge of the intensity of pain." A large majority also correctly recognized that "after the initial recommended dose of an opioid analgesic, subsequent doses should be adjusted according to the patient's individual response." Additionally, most students acknowledged that "based on religious beliefs, a patient may perceive pain and suffering as necessary" and that "analgesia for chronic cancer pain should be administered." Similar findings have been reported in previous studies.[10,16,22] Given that pain is a subjective experience, patients' self-reports should be considered the most reliable indicator. Factors such as past experiences, age, and cultural and familial and cultural influences shape patients' perceptions of pain and their responses to pain management. Cultural background, in particular, may affect how patients express pain and their tolerance levels.[23] These findings suggest that students have a sound understanding of fundamental principles of pain assessment and management, consistent with the literature.

A statistically significant difference was found between gender and NKASRP scores, with female students scoring higher than male students. This finding is consistent with studies by Topal Hançer and Yılmaz[22] and Shdaifat et al.[24] and may be explained by higher levels of empathy among female students[25] and greater receptivity to pain management information. However, studies by Karaman et al.,[10] Al Khalaileh,[26] and Gadallah et al.[27] have reported that gender does not significantly influence nursing students' knowledge of pain management.

A statistically significant difference was found between students who had received education on pain-related topics and those who had not, with higher NKASRP scores among the former group. A similar relationship was reported by Al Khawaldeh et al.[18] This finding is expected and highlights the importance of incorporating pain management education into the nursing curriculum.

Although most students reported a moderate level of pain knowledge, no statistically significant relationship was found between self-reported knowledge and actual NKASRP scores. Karaman et al.[10] similarly reported inadequate knowledge and attitudes among nursing students. This discrepancy between perceived and actual knowledge has also been highlighted by Dalkılıç.[28]

The analysis showed that knowledge and attitude scores were not significantly associated with variables such as age, marital status, year of study, type of high school graduated, academic achievement, enrollment in a bachelor's or associate degree program, presence of a health condition, or following publications related to pain.

The overall low level of knowledge among nursing students about pain may be attributed to variations in curriculum content and teaching methods. Insufficient emphasis on pain assessment and management may result in inadequate patient care and continued suffering. Limited curriculum time devoted to pain management may also contribute to these deficiencies. Studies using the NKASRP have shown that students' knowledge does not significantly improve throughout their education, with topics such as addiction often remaining insufficiently addressed.[21]

The majority of surgical patients experience acute postoperative pain; however, evidence suggests that fewer than 50% achieve adequate pain relief. It is therefore essential that nurses possess comprehensive knowledge of postoperative pain assessment and effective management strategies.[29] Nursing education programs should prioritize this area, including robust pharmacology instruction, as the present study identified deficiencies in students' pharmacological knowledge. It is recommended that curricula be revised to include dedicated content on the pathophysiology, assessment, and management of pain, incorporating both pharmacological and non-pharmacological approaches. To enhance students' competencies, course content should be comprehensive and regularly updated.

Study Limitations

The descriptive cross-sectional study was conducted at a single center to examine factors associated with nursing students' inadequate knowledge, attitudes, and practices in postoperative pain management. The relatively low Cronbach's alpha coefficient and overall scores may be related to the timing of data collection, which occurred during the post-pandemic transition period, when students had just resumed in-person education after an extended period of distance learning. Additionally, limited exposure to structured pain management education may have contributed to the inadequate knowledge and attitudes observed among students.

Conclusion

Postoperative pain is an inevitable consequence of surgical procedures. Effective pain management is essential for promoting recovery and improving patient well-being, making it a fundamental responsibility of healthcare professionals. The findings of this study reveal significant deficiencies in nursing students' knowledge and attitudes regarding pain management in Türkiye, particularly in pharmacological aspects. These results highlight the need to revise undergraduate nursing curricula to include comprehensive pain management education. Nursing programs should strengthen both theoretical instruction and clinical training in this area. Addressing the identified gaps requires a holistic, evidence-based educational approach that also considers barriers to effective pain management. Further research is needed to identify these barriers among nurses in Türkiye and to evaluate the effectiveness of current pain management practices.

Ethics Committee Approval: The study was approved by the Demiroğlu Science University Clinical Research Ethics Committee (Approval Number: 44140529/17680, Date: 24.05.2022).

Informed Consent: Students who agreed to participate provided verbal consent and signed a written consent form.

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References

1. Aygin D, Var G. Pain Management in Trauma Patients and Nursing Approaches. Sakarya Med J. 2012;2(2):61-70. Turkish. [CrossRef]
2. Alavi CE, Biazar G, Maktabi N, et al. Evaluation of Nurse's Knowledge and Attitude about Post Surgery Pain Assessment and Management and its Relationship with Patient's Satisfaction. Int J Acad Med Pharm. 2023;5(1):83–88.
3. Akbaş M, Köse Tosunöz İ. Knowledge and approaches of nurses about pain related interventions. Cukurova Med J. 2019;44(1):136–143. Turkish. [CrossRef]
4. Tarakçıoğlu Çelik GH. Symptom Management in Oncology Nursing. GÜSBD. 2016;5(4):93–100. Turkish.
5. Samarkandi OA. Knowledge and attitudes of nurses toward pain management. Saudi J Anaesth. 2018;12(2):220–226. [CrossRef]
6. Büyükyılmaz F, Aştı T. Nursing Care of Postoperative Pain. J Anatolia Nurs Health Sci. 2009;12(2):84–93. Turkish.
7. Houmkoua A, Mbouemboue OP, Oumarou O, Essome H, Balep E. Knowledge of Nursing Staff on Postoperative Pain: The Case of the Laquintinie Hospital in Douala, Cameroon. J Biosci Med. 2021;9(5):120–131. [CrossRef]
8. Walters SR. Knowledge, Attitudes and Practices of Postoperative Pain Assessment and Management among Health Care Practitioners in Cape Coast Metropolis, Ghana. Texila Int J Nurs. 2015;6(1):1–11. [CrossRef]
9. Dirimeşe E, Kardaş Özdemir F, Akgün Şahin, Z. Nursıng Students' Knowledge Related to Pain Management, Cultural Awareness and Competence. GÜSBD. 2016;5(3):1–6. Turkish.
10. Karaman E, Doğru Vural B, Yildirim Y. Knowledge and attitudes of nursing students about pain management. Agri. 2019;31(2):70–78.
11. Feleke DG, Chanie ES, Tassaw SF, Dires T. Practice of non-pharmacological post-operative pain management and associated factors among Nurses working in public referral hospitals of Amhara regional state, Ethiopia, 2019. IJANS. 2024;20:100642. [CrossRef]
12. Teshome ZB, Aychew Y, Mitiku W, Guta B. Level of attitude, knowledge and practice of nurses toward postoperative pain management, cross-sectional study. Ann Med Surg (Lond). 2022;84:104902. [CrossRef]
13. Dessie M, Asichale A, Belayneh T, Enyew H, Hailekiros A. Knowledge and Attitudes of Ethiopian Nursing Staff Regarding Post-Operative Pain Management: A Cross-Sectional Multicenter Study. Patient Relat Outcome Meas. 2019;10:395–403. [CrossRef]
14. Cousins M, Lane-Krebs K, Matthews J, Johnston-Devin C. Student nurses' pain knowledge and attitudes towards pain management over the last 20 years: A systematic review. Nurse Educ Today. 2022;108:105169. [CrossRef]
15. Yildirim YK, Cicek F, Uyar M. Knowledge and attitudes of Turkish oncology nurses about cancer pain management. Pain Manag Nurs. 2008;9(1):17–25. [CrossRef]
16. Tosun N, Yesilyurt, T. The knowledge and attitudes of nursing students about pain management. FBU-JOHS. 2023;4(1):38–52. [CrossRef]
17. Hua Y, Zhang Q, Ting W, et al. Pediatric Nurse Practitioners' Knowledge and Attitudes Regarding Pain Management Study in Central China. J Contin Educ Nurs. 2019;50(6):275–281. [CrossRef]
18. Al-Khawaldeh OA, Al-Hussami M, Darawad M. Knowledge and attitudes regarding pain management among Jordanian nursing students. Nurse Educ Today. 2013;33(4):339–345. [CrossRef]
19. Dağ GS, Caglayan Payas S, Dürüst Sakallı G, Yıldız K. Evaluating the relationship between empathy, pain knowledge and attitudes among nursing students. Nurse Educ Today. 2022;111:105314. [CrossRef]
20. Hroch J, VanDenKerkhof EG, Sawhney M, Sears N, Gedcke-Kerr L. Knowledge and Attitudes about Pain Management among Canadian Nursing Students. Pain Manag Nurs. 2019;20(4):382–389. [CrossRef]
21. Evans CB, Mixon DK. The Evaluation of Undergraduate Nursing Students' Knowledge of Post-op Pain Management after Participation in Simulation. Pain Manag Nurs. 2015;16(6):930–937. [CrossRef]
22. Topal Hançer A, Yılmaz, M. Determination of knowledge and attitudes related to pain of nursing students in Turkey. Int J Caring Sci. 2020;13(1):716–724.
23. Ayaz NP, Sherman DW. Understanding Attitudes, Social Norms, and Behaviors of a Cohort of Post-Operative Nurses Related to Pain and Pain Management. Healthcare (Basel). 2022;10(5):844. [CrossRef]
24. Shdaifat E, Al-Shdayfat N, Sudqi A. Saudi nursing students' pain management knowledge and attitudes. Nurs Open. 2020;7(6):1833–1839. [CrossRef]
25. Ouzouni C, Nakakis K. An exploratory study of student nurses' empathy. Health Sci J. 2012;6(3):534–552.
26. Al Khalaileh M, Al Qadire M. Pain management in Jordan: nursing students' knowledge and attitude. Br J Nurs. 2013;22(21):1234–1240. [CrossRef]
27. Gadallah MA, Hassan AM, Shargawy SA. Undergraduate Nursing Students `Knowledge and attitude regarding pain management of children in upper Egypt. J Nurs Educ Prac. 2017;7(6):100–107. [CrossRef]
28. Dalkılıç N. Assessment of Student Nurses' Knowledge Levels Regarding Pain Management. Master Thesis. Istanbul Science University;2017.
29. binti Samad N, Ahmad A, Yusof P, Kunjukunju A. Knowledge, attitudes and practices on postoperative pain management among registered nurses in a private hospital in Selangor-Malaysia. Malahayati IJNHS. 2023;6(2):135–147. [CrossRef]

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Assessment of Intercultural Sensitivity Among Nursing Students

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Abstract

Background: When nurses fail to understand the cultural characteristics of the individuals in their care, communication breakdowns, prejudice, and intercultural conflicts may occur.

Aim: This study assesses the intercultural sensitivity levels of undergraduate nursing students.

Methods: This descriptive study was conducted with 1,106 nursing students enrolled at two universities in Ankara between December 15, 2023 and May 31, 2024. Data were collected through face-to-face surveys. The data collection tools included a questionnaire developed based on the relevant literature and the Intercultural Sensitivity Scale (ISS). Descriptive statistics, including percentages, frequencies, medians, and minimum and maximum values, were used to analyze the data.

Results: Among the participants, 86.1% were female and 80.2% were between 18 and 21 years of age. The median ISS score was 87.0 (min: 28, max: 120). Statistically significant differences were found between groups based on sociodemographic variables, including year of study, gender, proficiency in a language other than Turkish, interaction with individuals from different cultures, having friends from diverse cultural backgrounds, caring for patients from various cultures in clinical practice, receiving relevant education, and learning about cultural characteristics during treatment and care.

Conclusion: Nursing education should incorporate strategies that promote the development of intercultural sensitivity. Such efforts will better prepare nurses to provide high-quality care to patients from diverse cultural backgrounds.

Keywords: Culture, intercultural nursing, intercultural sensitivity, nursing students

Introduction

In recent years, globalization and increasing migration have led to the coexistence of multiple cultures within the same society. According to the 2024 report from the United Nations Department of Economic and Social Affairs (UNDESA), approximately 304 million international migrants (representing 3.7% of the global population) live outside their country of origin. The United States of America hosts the largest number of migrants (52.4 million), while Türkiye was estimated to host 7.1 million migrants as of mid-2024.[1] Additionally, data released from the United Nations High Commissioner for Refugees (UNHCR) indicate that Türkiye hosted the largest refugee population globally in mid-2023, with approximately 3.4 million refugees.[2]

As in many other countries, cultural diversity in Türkiye has increased significantly, transforming society into a multicultural structure. Migration occurs for various reasons, both positive and negative, including economic conditions, unemployment, war, oppressive governance, climate change, natural disasters such as earthquakes, as well as the pursuit of educational opportunities and professional development.[3,4]

When individuals from diverse cultural backgrounds leave their familiar environments and attempt to establish new lives in societies with different values and lifestyles, they may develop negative perceptions of their circumstances.[5,6] Cultural factors related to health, such as family roles, socioeconomic status, dietary habits, sexual behaviors, and marriage patterns, are inherent to each culture and can influence health outcomes, either positively or negatively. Individuals' perceptions of health and illness are closely linked to the cultural structures of their societies. Consequently, approaches to health promotion, disease prevention, and expectations of healthcare services may vary significantly across cultures.[7] This diversity within societies highlights the importance of tailoring services to individuals' cultural characteristics. Accordingly, intercultural sensitivity has become increasingly important, influencing the quality and delivery of services in fields such as education and healthcare.[8,9]

Intercultural care aims to assess individuals holistically by considering their cultural background and the environment in which they live, recognizing that perceptions of health vary across cultures, and providing care that aligns with their living conditions.[10]

To deliver culturally competent care, healthcare professionals must possess knowledge of cultural differences and demonstrate sensitivity to these variations. Intercultural sensitivity is defined as the ability to understand cultures different from one's own, as well as the thoughts and behaviors of individuals from those

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cultures, while demonstrating respectful, positive, and non-prejudicial attitudes.[11] When nurses fail to understand the cultural characteristics of the individuals in their care, communication breakdowns, prejudice, and intercultural conflicts may arise. This, in turn, can negatively affect the quality of healthcare services, leading to inequality, discrimination, and communication problems.[12,13] Given nurses' central role in healthcare delivery, it is essential to educate them to develop high levels of intercultural sensitivity and awareness in order to provide effective and high-quality care.[13,14] Previous studies have reported that nursing students generally demonstrate good levels of cultural sensitivity.[4,15,16] However, Kabu Hergül et al.[17] found that nursing students had moderate levels of intercultural sensitivity and that those with friends from different cultures exhibited higher sensitivity levels. In contrast, Yiğit et al.[18] reported that nursing students' intercultural sensitivity was below a moderate level and that they experienced related challenges in clinical practice.

Educational programs play a crucial role in preparing nursing students who are free from prejudice and capable of delivering culturally sensitive care to diverse communities. Examining nursing students' perspectives and approaches toward patients from different cultural backgrounds is essential for improving the quality of care. Determining students' intercultural sensitivity levels is also important for enhancing healthcare delivery and promoting public health. However, studies addressing this topic are limited in the literature. Therefore, assessing the intercultural sensitivity levels of nursing students, future members of the nursing profession, is vital for improving the quality of care and health outcomes at both individual and societal levels.

Research Questions

1. What are the intercultural sensitivity levels of nursing students?
2. Do nursing students' intercultural sensitivity levels vary according to their sociodemographic characteristics?

Materials and Methods

Aim

This study aimed to assess the intercultural sensitivity levels of undergraduate nursing students.

Research Design

This study was designed as a descriptive study.

Participants

The study population consisted of students enrolled in the nursing departments of two state universities in Ankara (n=1,608; University A: n=952; University B: n=656). These universities are among the largest in Türkiye, with students from diverse regions of the country. The required sample size was calculated using G*Power software, yielding a minimum of 176 participants based on a medium effect size (0.5), a power level of 0.95, and a significance level of 0.05, informed by a previous study.[19] All eligible students were invited to participate, and the study was completed with 1,106 nursing students. The inclusion criteria were being an undergraduate nursing student at one of the selected universities and consenting to participate. The exclusion criteria was being a foreign student.

Data Collection Tools

Data were collected using a questionnaire and the Intercultural Sensitivity Scale (ISS). The questionnaire was developed by the researchers based on a review of the literature. It included 13 items assessing students' sociodemographic characteristics and experiences, such as age, gender, year of study, ability to communicate in a language other than Turkish, interaction with individuals from different cultures, willingness to communicate with people from diverse cultures, having friends from different cultural backgrounds, caring for patients from diverse cultures during clinical practice, and receiving education on intercultural nursing. Additionally, the questionnaire included seven items assessing students' views on providing care to individuals from diverse cultural backgrounds.[15,17-21]

Intercultural Sensitivity Scale (ISS): The Intercultural Sensitivity Scale, developed by Chen and Starosta,[22] consists of 24 items and originally demonstrated a Cronbach's alpha coefficient of 0.86. The Turkish validity and reliability study conducted by Bulduk et al.[23] reported a Cronbach's alpha coefficient of 0.72. The scale uses a 5-point Likert format: (1) strongly disagree, (2) disagree, (3) undecided, (4) agree, and (5) strongly agree. The ISS comprises five subdimensions: interaction engagement (items 1, 11, 13, 22, 23, 24), respect for cultural differences (items 2, 7, 8, 16, 18, 20), interaction confidence (items 3, 4, 5, 6, 10), interaction enjoyment (items 9, 12, 15), and interaction attentiveness (items 14, 17, and 19). Items 2, 4, 7, 9, 12, 15, 18, 20, and 22 are reverse-coded. The minimum possible score on the scale is 24 and the maximum is 120, with higher scores indicating greater intercultural sensitivity.23 In the present study, the Cronbach's alpha coefficient for the ISS was 0.88.

Data Collection

Data were collected between December 2023 and May 2024 by the researchers. The data collection tools were administered to students during the first 5–10 minutes of class and during breaks, with permission from course instructors. Students were informed about the purpose of the study before the questionnaires were distributed, and they were asked to complete the forms voluntarily. Students who did not provide informed consent did not participate in the study. The researcher responsible for data collection was not involved in evaluating students' academic performance. Completing the data collection tools took approximately 15–20 minutes per class.

Data Analysis

The data were analyzed using SPSS version 27.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics, including percentages, frequencies, medians, and minimum and maximum values, were used to summarize the data. The Shapiro–Wilk test was used to assess data normality. The Mann–Whitney U test and Kruskal–Wallis H test with Bonferroni correction were applied for group comparisons. A significance level of 0.05 was set, and p-values <0.05 were considered statistically significant.

Ethical Considerations

Ethical approval was obtained from Ankara Yıldırım Beyazıt University Health Sciences Ethics Committee (Approval Number: 09-405, Date: 23.11.2023). Following ethical approval, institutional permissions were secured from the participating universities. The study was conducted in accordance with the Declaration of Helsinki. Written and verbal informed consent was obtained from all participants.

Results

Among the participants, 25.1% were first-year, 25.9% second-year, 25.6% third-year, and 23.4% fourth-year nursing students. Of the students, 86.1% were female, and 80.2% were aged between 18 and 21 years (Table 1). More than half of the students (54.6%) reported encountering patients from diverse cultural backgrounds during clinical practice, and 63.7% stated that they had provided care to such patients (Table 1). A large majority of students (88.1%) agreed that learning patients' cultural characteristics is essential for positively influencing health perceptions and care environments, while 85.4% emphasized the importance of assessing whether nursing practices align with patients' cultural characteristics prior to care delivery. Additionally, 63.5% reported concerns about encountering challenges with patients and their families from different cultures upon entering professional practice (Table 2).

The median ISS score was 87 (min: 28; max: 120) (Table 3). Second-year students had significantly higher median ISS scores than fourth-year students (p=0.00, b>d) (Table 1). Female students scored higher than male students (p=0.02) (Table 1). Students who were able to communicate in a language other than Turkish had higher intercultural sensitivity scores than those who were not (p=0.00, x>z) (Table 1). Similarly, students with friends from diverse cultural backgrounds had higher scores than those without such friendships (p=0.00) (Table 1). Interestingly, students who had provided care to patients from different cultures had lower median scores than those who had not (p=0.00) (Table 1). Students who reported experiencing challenges while caring for culturally diverse patients had higher sensitivity scores than those who did not (p=0.22) (Table 1). Students who had received intercultural nursing education had lower median scores than those who had not (p=0.01) (Table 1). Additionally, students who anticipated difficulties with culturally diverse patients and their families had lower sensitivity scores (p=0.00) (Table 1). Those who recognized the need to learn patients' cultural characteristics before providing care had higher intercultural sensitivity scores (p=0.01) (Table 1).

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Table 1. Comparison of students' sociodemographic characteristics and median Intercultural Sensitivity Scale scores (n=1.106)

Sociodemographic characteristics		Number	%	Median	Min	Max	Statistical values
Year of study	1st year[a]	278	25.1	89	46	116	KW=51.174, p=0.00*
	2nd year[b]**	286	25.9	90	47	120	
	3rd year[c]	283	25.6	84	47	120	
	4th year[d]**	259	23.4	84	38	120	
Age (years)	18–21	887	80.2	87	28	120	Z=-0.509, p=0.611
	≥22	219	19.8	86	38	120	
Gender	Female	952	86.1	88	47	120	Z=-2.294, p=0.02*
	Male	154	13.9	84	28	120	
Ability to communicate in a language other than Turkish	Yes[x]**	173	15.6	91	28	120	KW=40.374, p=0.00*
	Basic level[y]	550	49.7	88	38	120	
	No[z]**	383	34.6	84	52	115	
Interaction with individuals from different cultures	Yes	626	56.6	89	28	120	Z=4.019, p=0.00*
	No	480	43.4	86	63	120	
Willingness to communicate with individuals from different cultures	Yes	899	81.3	88	28	120	Z=6.304, p=0.00*
	No	207	18.7	82	52	112	
Having friends from different cultural backgrounds	Yes	899	53.3	88	28	120	Z=4.091, p=0.00*
	No	207	46.7	82	52	112	
Encountering culturally diverse patients in clinical practice	Yes	705	63.7	87	28	120	Z=-2.566, p=0.01*
	No	401	36.3	88	48	120	
Providing care to culturally diverse patients in clinical practice	Yes	604	54.6	86	28	120	Z=-4.018, p=0.00*
	No	502	45.4	88	46	120	
Experiencing problems while providing care to culturally diverse patients in clinical practice (n=604)***	Yes	593	98.2	86	28	120	Z=-1.218, p=0.22
	No	11	1.8	76	28	113	
Receipt of intercultural nursing training	Yes	144	13	84	64	107	Z=-2.526, p=0.01*
	No	962	87	88	28	120	
Interacting with patients from diverse cultural backgrounds is challenging	Yes	702	63.5	86	46	120	Z=-5.045, p=0.00*
	No	404	36.5	90	28	120	
Learning patients' cultural characteristics is important for providing care	Yes	974	88.1	88	28	120	Z=-2.478, p=0.01*
	No	132	11.9	85	46	111	

*: p<0.05, **: b>d, x>z, ***: The "n" s are various due to those who did not answer this question. KW: Kruskal–Wallis Test, Z: Mann–Whitney U Test, Min: Minimum, Max: Maximum.

Table 2. Students' views on caring for individuals from diverse cultural backgrounds (n=1.106)

Views	Yes		No	
	n	%	n	%
I believe that health is a concept that varies across cultures	718	64.9	388	35.1
As nurses, we recognize the importance of understanding the cultural characteristics of the patients we care for	869	78.6	237	21.4
When providing treatment and care to patients from different cultures, I believe that I need to learn their cultural characteristics to positively influence health perceptions and the care environment	974	88.1	132	11.9
I believe that standard care practices may not be appropriate for patients from different cultures	878	79.4	228	20.6
Before performing any nursing care practice, I consider it important to evaluate whether the practice is appropriate for the patient's cultural characteristics	944	85.4	165	14.6
I feel confident in caring for individuals, families, or communities from different cultures	307	27.8	799	72.2
I believe that I may experience difficulties with patients and their families from different cultures at the beginning of my professional career	702	63.5	404	36.5

n: Number.

Table 3. Distribution of Intercultural Sensitivity Scale (ISS) and subdimension scores (n=1.106)

Subdimensions	n	Median	Minimum	Maximum
Interaction engagement	1.106	26	7	35
Respect for cultural differences	1.106	23	6	30
Interaction confidence	1.106	16	5	25
Interaction enjoyment	1.106	11	3	15
Interaction attentiveness	1.106	11	3	15
ISS total score	1.106	87	28	120

Discussion

The findings of this study indicate that nursing students' intercultural sensitivity levels were above moderate, consistent with previous studies.[16–18,24–27] Other research has similarly reported moderate-to-high levels of intercultural sensitivity among nursing students.[19,28–31] However, Suk et al.[32] found that that school nurses in Korea had relatively low cultural sensitivity scores. The relatively high intercultural sensitivity observed in this study may be attributed to increasing globalization and migration, which have led to greater cultural diversity and may enhance students' ability to understand, respect, and tolerate individuals from different cultural backgrounds.

Intercultural sensitivity was also found to vary by year of study. Notably, second-year students demonstrated higher sensitivity than fourth-year students. Similar findings have been reported by Akça and Ayaz Alkaya,[29] who found that first-year students had higher sensitivity than fourth-year students, and by Kardaş and Yılmaz Şahin,[19] who reported higher sensitivity among second-year students compared to fourth-year students. Although intercultural sensitivity is generally expected to improve with increased education and clinical experience, the finding that second-year students scored higher than fourth-year students is noteworthy. This finding may suggest that fourth-year students encounter negative experiences during clinical practice with patients from diverse cultural backgrounds, which may contribute to decreased sensitivity levels. In contrast, second-year students, who may have had fewer clinical interactions, who typically have less clinical exposure, may maintain more positive perceptions and expectations regarding intercultural encounters. However, contrasting findings have been reported by Tosun and Sinan,[21] as well as Kuru Alici,[33] who found that intercultural sensitivity increases with years of education.

In the present study, intercultural sensitivity differed by gender, with female students demonstrating higher levels than male students. Similar findings were reported by Kardaş and Yılmaz Şahin,[19] Parlar Kılıç and Sevinç,[26] and Bilgiç and Şahin,[16] who also found that female nursing students had higher levels of cultural sensitivity than their male counterparts. However, contrasting results were reported by Şekerci Gümüş,[34] who found that male students demonstrated higher intercultural sensitivity than female students. A study conducted with Finnish students similarly indicated that female students exhibited more positive attitudes toward individuals from different cultures and higher levels of intercultural sensitivity compared to male students.[35] The higher intercultural sensitivity observed among female students in this study may be associated with women's generally stronger emotional and empathetic skills, which can enhance attentiveness and responsiveness to cultural differences. Conversely, findings from studies with higher proportions of male participants suggest that intercultural sensitivity may also be influenced by contextual factors, such as sample composition.

In this study, students who were able to communicate in a foreign language, even at a basic level, demonstrated higher intercultural sensitivity than those who could not communicate in another language. Similar findings were reported by Kardaş and Yılmaz Şahin,[19] Bulduk et al.,[36] and Ceylan and Çetinkaya,[37] who found that foreign language proficiency positively influences intercultural sensitivity. This finding is consistent with the present study and suggests that students who develop proficiency in a foreign language may feel more confident communicating with individuals from diverse cultural backgrounds, thereby fostering more positive attitudes and perspectives.

In this study, sensitivity also varied according to students' experiences interacting with individuals from different cultures (e.g., through education, travel, or living abroad). Additionally, willingness to communicate with people from diverse cultural backgrounds and having friends from different cultures were positively associated with higher intercultural sensitivity. Nursing students who engaged in culturally diverse social environments appeared to develop broader knowledge and experience, which contributed to increased sensitivity. In contrast, students whose exposure to cultural diversity was limited to clinical settings reported higher levels of anxiety and lower self-confidence, which may negatively affect intercultural sensitivity.[21] Supporting these findings, Bilgiç and Şahin[16] found that nursing students with friends from diverse cultures and a willingness to interact demonstrated significantly higher sensitivity. Similarly, Bulduk et al.[36] reported that interaction with individuals from different cultures positively influenced intercultural sensitivity. Kaya et al.[4] also found that nursing students with culturally diverse friendships exhibited higher sensitivity, consistent with the present study. A study conducted with newly graduated nursing students in Finland reported that increased interaction with different cultures, improved language skills, and participation in exchange programs were associated with higher cultural competence.[38] Likewise, a qualitative study examining the effect of nursing students' overseas study experiences found that participation in international experiences positively contributes to the development of cultural sensitivity.[39] Overall, these findings suggest that living and interacting within culturally diverse environments enhances students' awareness and intercultural sensitivity.

In the present study, students who reported experiencing difficulties while caring for patients from diverse cultural backgrounds, as well as those who had limited exposure to such patients, demonstrated higher intercultural sensitivity levels. In contrast, Karadağ Arli and Berivan Bakan[20] reported that nurses who did not experience such difficulties exhibited higher intercultural sensitivity levels. However, Dönmez et al.[14] found that nurses who provided care to culturally diverse patients demonstrated higher intercultural sensitivity. These mixed findings indicate that nursing students who provide care to patients from diverse cultural backgrounds may be at risk of developing biases, highlighting the need for targeted training in intercultural nursing to address and mitigate these biases.

According to the results of this study, nursing students' intercultural sensitivity varied based on their participation in intercultural nursing training. Notably, students who had not received such training demonstrated higher levels of intercultural sensitivity than those who had. Similarly, Meydanlıoğlu et al.[9] and Korkmaz Aslan et al.[12] reported that cultural training did not have a significant effect on improving intercultural sensitivity. However, these findings contrast with those of Yılmaz et al.,[40] who found that nurses who received intercultural training demonstrated higher levels of cultural sensitivity. A study conducted with newly graduated nursing students reported that most participants had received intercultural nursing education, yet their level of cultural competence was moderate.[38] The relatively high sensitivity observed among students who had not received formal training in the present study may suggest that the content or delivery of training programs was not sufficiently effective, and that social environments may play an important role in developing intercultural sensitivity.

In this study, nursing students who believed that interacting with patients from diverse cultural backgrounds would not be challenging demonstrated higher levels of intercultural sensitivity. This suggests that these students may feel more prepared and have developed greater confidence in intercultural interactions.

Furthermore, students who considered it important to learn patients' cultural characteristics in order to provide care demonstrated higher levels of intercultural sensitivity. In line with this finding, Larsen et al.[41] emphasized the importance of cultural knowledge for nurses, noting that it enhances communication with patients and supports the provision of equitable care. These findings suggest that students who actively seek to understand patients' cultural backgrounds not only demonstrate greater sensitivity but also show a commitment to developing competence in delivering effective, culturally appropriate care.

Limitations

This study included nursing students from only two universities; therefore, the findings cannot be generalized to all nursing students. Additionally, as the data were collected using self-reported measures, responses may be subject to bias.

Conclusion

This study demonstrated that nursing students' intercultural sensitivity levels were above moderate. Higher sensitivity levels were observed among female students, second-year students, and those who were willing to interact with individuals from different cultures or had friends from diverse cultural backgrounds. Students who did not provide care to patients from different cultures in clinical practice and those who had not received intercultural nursing training demonstrated lower levels of intercultural sensitivity. Based on these findings, it is recommended that intercultural sensitivity among nursing students be assessed regularly. Educational content and teaching strategies play a crucial role in enhancing intercultural sensitivity; therefore, diverse educational approaches and practical applications should be incorporated into nursing curricula. Furthermore, qualitative studies are recommended to explore the underlying factors influencing intercultural sensitivity in greater depth and to identify potential regional differences at the national level.

Ethics Committee Approval: The study was approved by the Ankara Yıldırım Beyazıt University Health Sciences Ethics Committee (Approval Number: 09-405, Date: 23.11.2023).

Informed Consent: Written informed consent was obtained from all participants.

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References

1. The Global Migration Data Portal, 2024. Accessed May 4, 2026. https://www.migrationdataportal.org/
2. United Nations High Commissioner for Refugees, 2023. Accessed May 4, 2026. https://www.unhcr.org/
3. Taşdelen Baş M, Molu B, Tuna Hİ, Baş İ. The effects of the socio-cultural and economic change of emigrant families on the lives of women and children. ITOBIAD. 2017;6(3):1680-1693. Turkish.
4. Kaya Y, Arslan S, Erbaş A, Yaşar BN, Küçükkelepçe GE. The effect of ethnocentrism and moral sensitivity on intercultural sensitivity in nursing students, descriptive cross-sectional research study. Nurse Educ Today. 2021;100:104867. [CrossRef]
5. Aktaş E, Gülçür İ. Suriyelilere Yönelik Toplumsal Kabulü Uyumu Etkileyen Sosyo Ekonomik Faktörler: Mersin İli Mezitli İlçesi Örneği. Paper presented at: 2nd International Congress of Applied Sciences: Migration, Poverty and Employment; September 23-25; 2016. Turkish. Accessed May 4, 2026. https://www.academia.edu/28909597/SUR%C4%B0YEL%C4%B0LERE_Y%C3%96NEL%C4%B0K_TOPLUMSAL_KABUL%C3%9C_UYUMU_ETK%C4%B0LEYEN_SOSYO_EKONOM%C4%B0K_FAKT%C3%96RLER_MERS%C4%B0N_%C4%B0L%C4%B0_MEZ%C4%B0TL%C4%B0_%C4%B0L%C3%87ES%C4%B0_%C3%96RNE%C4%9E%C4%B0
6. Topçu Ş, Beşer A. Migration and health. Cumhuriyet Nurs J. 2006;10(3):37-42. Turkish.
7. Öztürk E, Öztaş D. Transcultural nursing. BTUJLS. 2012;1(1):293-300. Turkish.
8. Kılınç M, Uludağ A. The relationship between aggressive behavior and empathic tendency levels of health workers. Gaziantep Univ J Soc Sci. 2017;16(3):809-825. Turkish. [CrossRef]
9. Meydanlioglu A, Arikan F, Gozum S. Cultural sensitivity levels of university students receiving education in health disciplines. Adv Health Sci Educ Theory Pract. 2015;20(5):1195-1204. [CrossRef]
10. Bekar M. Kültürlerarası (Transkültürel) hemşirelik. Toplum ve Hekim Derg. 2001;16(2):136-141. Turkish.
11. Tanrıverdi G. Approachs of nurses toward standards off practices for culturally competent care. EUHFD. 2015;31(3):37-52.
12. Korkmaz Aslan G, Kartal A, Turan T, Taşdemir-Yiğitoğlu G, Kayan S. Intercultural Sensitivity of University Students Studying At Health-Related Departments and Some Associated Factors. Florence Nightingale Hemsire Derg. 2019;27(2):188-200. Turkish. [CrossRef]
13. Kargın M, Çiftçi Çapar M. Determination of Intercultural Sensitivity of Clinical Nurses in a University Hospital. Turkiye Klinikleri J Nurs Sci. 2020;12(2):257-262. Turkish. [CrossRef]
14. Dönmez Ç, Aksoy Can A, Vefikuluçay-Yılmaz D. Determining the intercultural sensitivity of nurses: a descriptive and cross-sectional study. ASBTD. 2023;3(2):14-25. Turkish. [CrossRef]
15. Yurttaş A, Aras GN.The relationship between intercultural sensitivity levels and empathy levels of nursing students. JGEHES. 2020;2(3):117-125. Turkish. [CrossRef]
16. Bilgiç Ş, Şahin İ. Intercultural sensitivity and ethnocentrism levels of nursıng students. SDUJHS. 2019;10(3):230-236. Turkish.
17. Kabu Hergül F, Gök F, İpiçürük HG. Examination of intercultural sensitivity levels of nursing students. MAS JAS. 2022;7(11):228-240. Turkish. [CrossRef]
18. Yiğit Ü, Çoşkun S, Alpteker H. The levels of intercultural sensitivity of nursing students and the major problems they face. ASBTD. 2021;1(2):92-101. Turkish.
19. Kardas U, Yilmaz Sahin S. Investigation of the relationship between cultural sensitivity and effectiveness levels among nursing students. Nurse Educ Pract. 2023;72:103773. [CrossRef]
20. Karadağ Arlı Ş, Bakan AB. The factors affecting compassion and intercultural sensitivity among the surgical nurses. STED. 2018;27(4):277-283. Turkish.
21. Tosun B, Sinan Ö. Knowledge, attitudes and prejudices of nursing students about the provision of transcultural nursing care to refugees: A comparative descriptive study. Nurse Educ Today. 2020;85:104294. [CrossRef]
22. Chen GM, Starosta W. The development and validation of the intercultural sensitivity scale. Human Communication. 2000;3(1):2-14. [CrossRef]
23. Bulduk S, Tosun H, Ardıç E. Measurement Properties of Turkish Intercultural Sensitivity Scale Among Nursing Students. Turkiye Klinikleri J Med Ethics. 2011;19(1):25-31. Turkish.
24. Dur Ş, Göl İ, Erkin Ö. The effects of nursing students' conscientious intelligence on their cultural sensitivity levels. Perspect Psychiatr Care. 2022;58(2):795-803. [CrossRef]
25. Çiftçi B, Aras GN, Yıldız Ö. Examining the correlation between intercultural sensitivity and individualized care perception of nursing students. Nurse Educ Today. 2021;102:104937. [CrossRef]
26. Parlar Kılıç S, Sevinç S. The relationship between cultural sensitivity and assertiveness in nursing students from Turkey. J Transcult Nurs. 2018;29(4):379-386. [CrossRef]
27. Öner-Yalçın S, Öztürk Çeliktekin M. A descriptive study on intercultural sensitivity of health sciences students . Lokman Hekim J. 2022;12(3):658-665. Turkish. [CrossRef]
28. Açıl A, Gülseven Karabacak B. Determination of nursing students' levels of cultural awareness, intercultural sensitivity, and their perspectives on culturally sensitive nursing care. J Hum Sci. 2024;21(2):108-128. Turkish. [CrossRef]
29. Akca A, Ayaz Alkaya S. Determinants of attitudes towards refugees and intercultural sensitivity of nursing students: A descriptive and correlational study. Nurse Educ Today. 2023;124:105772. [CrossRef]
30. Beser A, Tekkas Kerman K, Ersin F, Arkan G. The effects of ethnocentrism and some features on intercultural sensitivity in nursing students: A comparative descriptive study. Nurse Educ Pract. 2020;1:103180. [CrossRef]
31. Budak F, Karasu F. Examination of the relationship between nursing students' intercultural sensitivity perceptions and clinical leadership characteristics. JOHMAL. 2020;1:15-27. Turkish.
32. Suk MH, Oh WO, Im YJ, Cho HH. Mediating Effect of School Nurses' Self Efficacy between Multicultural Attitude and Cultural Sensitivity in Korean Elementary Schools. Asian Nurs Res (Korean Soc Nurs Sci). 2015;9(3):194-199. [CrossRef]
33. Kuru Alici N. Cultural sensitivity and attitudes towards refugees of Turkish nursing students: A cross sectional descriptive study. IJIR. 2021;80:1-6. [CrossRef]
34. Şekerci Gümüş Y. Relationship between Cultural Sensitivity and Self-Determination (Assertiveness) in Nursing Students. J Educ Res Nurs. 2021;18(1):24-30. Turkish. [CrossRef]
35. Holm K, Nokelainen P, Tirri K. Relationship of gender and academic achievement to Finnish students' intercultural sensitivity. High Ability Studies. 2009;20(2):187-200. [CrossRef]
36. Bulduk S, Usta E, Dinçer Y. Determination of Intercultural Sensitivity and Influencing Factors: An Example of Vocational School of Health. J DU Health Sci Inst. 2017;7(2):73-77. Turkish.
37. Ceylan SS, Çetinkaya B. Experience and Cultural Sensitivity Levels of Nursing Students Who Providing Care to Immigrant Patients: A Mix Method Research. YBH Derg. 2022;3(2):1-20. Turkish. [CrossRef]
38. Repo H, Vahlberg T, Salminen L, Papadopoulos I, Leino-Kilpi H. The Cultural Competence of Graduating Nursing Students. J Transcult Nurs. 2017;28(1):98-107. [CrossRef]
39. Ruddock HC, Turner de S. Developing cultural sensitivity: nursing students' experiences of a study abroad programme. J Adv Nurs. 2007;59(4):361-369. [CrossRef]
40. Yilmaz M, Toksoy S, Direk ZD, Bezirgan S, Boylu M. Cultural Sensitivity Among Clinical Nurses: A Descriptive Study. J Nurs Scholarsh. 2017;49(2):153-161. [CrossRef]
41. Larsen R, Mangrio E, Persson K. Interpersonal Communication in Transcultural Nursing Care in India: A Descriptive Qualitative Study. J Transcult Nurs. 2021;32(4):310-317. [CrossRef]

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Systematic Review

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Symptom Prevalence in Older Adults Diagnosed with Cancer Receiving Palliative Care: A Systematic Review and Meta-Analysis

Abstract

Background: Older adults diagnosed with cancer often experience multiple concurrent symptoms, making effective symptom management crucial. Nurses play a key role in identifying and managing these symptoms in palliative care settings.

Aim: This study aimed to determine the prevalence of common symptoms among older adults (defined as individuals aged ≥65 years) with cancer receiving palliative care.

Methods: This systematic review and meta-analysis included studies retrieved from the Web of Science, PubMed, Google Scholar, EBSCO, Embase, and Cochrane Library databases between 2014 and 2024, using the keywords palliative, cancer, symptom, and age-related terms (*older, elderly*, and *aged*). The methodological quality of the included studies was assessed using the Joanna Briggs Institute critical appraisal checklists. Data were pooled and analyzed using meta-analysis techniques.

Results: Eighteen studies (nine cohort and nine cross-sectional) with a total sample size of 48,503 participants were included. The pooled prevalence estimates were as follows: pain, 48.6%; fatigue, 61.0%; dyspnea, 48.6%; lack of appetite, 56.7%; nausea, 27.0%; sleep problems, 52.9%; depression, 32.4%; drowsiness, 56.6%; poor well-being, 42.3%; and anxiety, 22.1%. This study identified the prevalence of major symptoms among older adults with cancer receiving palliative care. Further high-quality studies are needed to explore underlying mechanisms and mediators affecting symptom management.

Conclusion: The results highlight the importance of developing nursing-led symptom assessment and management strategies to improve the quality of palliative care for older adults.

Keywords: Cancer, elderly, meta-analysis, palliative, symptom

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Introduction

Cancer continues to be one of the most significant public health challenges worldwide, affecting populations in both developed and developing countries. According to recent global estimates, approximately 19.9 million new cancer cases and 9.7 million deaths occurred in 2022. Within five years of diagnosis, about 53.5 million individuals are still living with cancer.[1] It is projected that one in five people will be diagnosed with the disease during their lifetime, while one in nine men and one in twelve women will eventually die from it. With the steady aging of the global population, the number of older adults diagnosed with cancer is expected to rise dramatically in the coming decades. This growing burden highlights the increasing need for comprehensive chronic disease management and, in particular, for effective palliative care services.[2,3]

Aging itself brings about a range of physiological, psychological, and social changes that influence both health and illness trajectories. When combined with a diagnosis of cancer, these changes can lead to complex and multidimensional challenges. Reduced organ function, the presence of multiple comorbidities, and geriatric syndromes contribute to physical discomfort, emotional distress, cognitive decline, and financial strain.[4] Because cancer is closely associated with age, it has often been described as an "age-related disease." The global rise in cancer among older adults not only affects individual health outcomes but also places additional pressure on healthcare systems, underscoring the central role of palliative care in supporting this vulnerable population.[5]

The World Health Organization (WHO) defines palliative care as "an approach that improves the quality of life of patients and their families facing problems associated with life-threatening illness."[6] It focuses on the early recognition and management of pain and other distressing symptoms through accurate assessment and interdisciplinary collaboration.[7] Palliative care addresses not only the physical but also the psychological, social, and spiritual dimensions of illness. For patients with cancer–particularly older adults–these symptoms are often multiple, severe, and interrelated. Their cumulative impact increases the burden on families and the use of healthcare services.[8] Consequently, palliative care has become a cornerstone in ensuring comfort, dignity, and quality of life. Nurses, in particular, play an essential role in assessing, prioritizing, and managing these symptoms through patient-centered and evidence-based care.

Nevertheless, the types and severity of symptoms observed in older adults with cancer receiving palliative care vary according to disease characteristics, treatment phase, and individual factors.[9,10] Because of differences in study design, patient populations, and clinical settings, the literature on symptom prevalence remains highly heterogeneous. This inconsistency makes it difficult to establish a clear understanding of the overall

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symptom burden in this group. Meta-analysis, which allows researchers to combine data from multiple studies, provides an opportunity to generate more generalizable findings and strengthen evidence-based nursing and clinical practices.[11,12]

Therefore, the present study systematically reviewed the existing literature on symptom prevalence among older adults with cancer receiving palliative care and synthesized the data using meta-analytic methods. The goal was to identify the most commonly reported symptoms and to clarify their distribution in this population. The results are expected to guide nurses and other healthcare professionals in developing effective, evidence-informed strategies for symptom assessment and management, contributing to improved care quality for older adults living with cancer.

Research Questions

1. What are the most frequently reported symptoms among older adults with cancer receiving palliative care?
2. How does the prevalence of these symptoms differ across healthcare systems?
3. What is the methodological quality of existing studies, and what areas require improvement?

Materials and Methods

The study design was a systematic review and meta-analysis. This study was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement. The protocol was registered in the International Prospective Register of Systematic Reviews (PROSPERO; CRD42024614049). To minimize potential bias, the processes of literature searching, article selection, data extraction, and quality assessment were performed independently by two reviewers (R.B. and Y.K.). The results of their independent evaluations were compared and reconciled during discussion sessions chaired by the principal investigator (S.B.). Before data collection began, a meeting was carried out with the participation of all authors to ensure consistency in the review procedure.

Eligibility Criteria

The inclusion criteria were structured according to the Population–Exposure–Outcome–Study design (PEOS) framework: Population (P): older adults receiving palliative care; Exposure (E): cancer; Outcomes (O): symptoms (such as pain, fatigue, dyspnea, and loss of appetite); and Study design (S): studies published in English between 2014 and 2024 describing the symptoms of elderly patients with cancer receiving palliative care. The screening and inclusion processes were carried out in accordance with the PRISMA guidelines for systematic reviews and meta-analyses.

Searching Strategy

The literature search for this study was conducted between July 2024 and December 2024. The search strategy was developed based on the study objectives, relevant Medical Subject Headings (MeSH), and previously published systematic reviews in the field. The Web of Science, PubMed, Google Scholar, EBSCO, Embase, and Cochrane Library databases were used for the search. The keywords "palliative" AND "cancer" AND "symptom" AND ("older" OR "elderly" OR "aged") were combined using Boolean operators. In addition, the reference lists of the analyzed studies on this topic were checked to identify additional relevant articles.

Selection of Studies

Two researchers (R.B. and Y.K.) worked independently to identify and select studies for inclusion. At this stage, the inclusion criteria were applied. Duplicate articles were identified and removed using EndNote reference management software, followed by manual verification by two independent reviewers. Subsequently, the study titles, abstracts, and full texts were reviewed. Disagreements between the two researchers were discussed by all authors, and consensus was reached in the final stage.

Data Extraction

Research data were collected using a data extraction tool developed by the researchers. This tool included information on the year of publication, study design, study setting, patient characteristics (sample size, number of older adults, and mean age), measurement tools used, and reported symptoms. Data were independently identified, extracted, and cross-checked by two researchers in accordance with the eligibility criteria. The literature was first screened by reviewing titles and abstracts; after irrelevant studies were excluded, full texts were assessed for eligibility. The first author (S.B.) evaluated the year of publication, country of study, sample size, participant characteristics (age and gender), disease characteristics (symptoms, frequency, duration, and assessment), and study

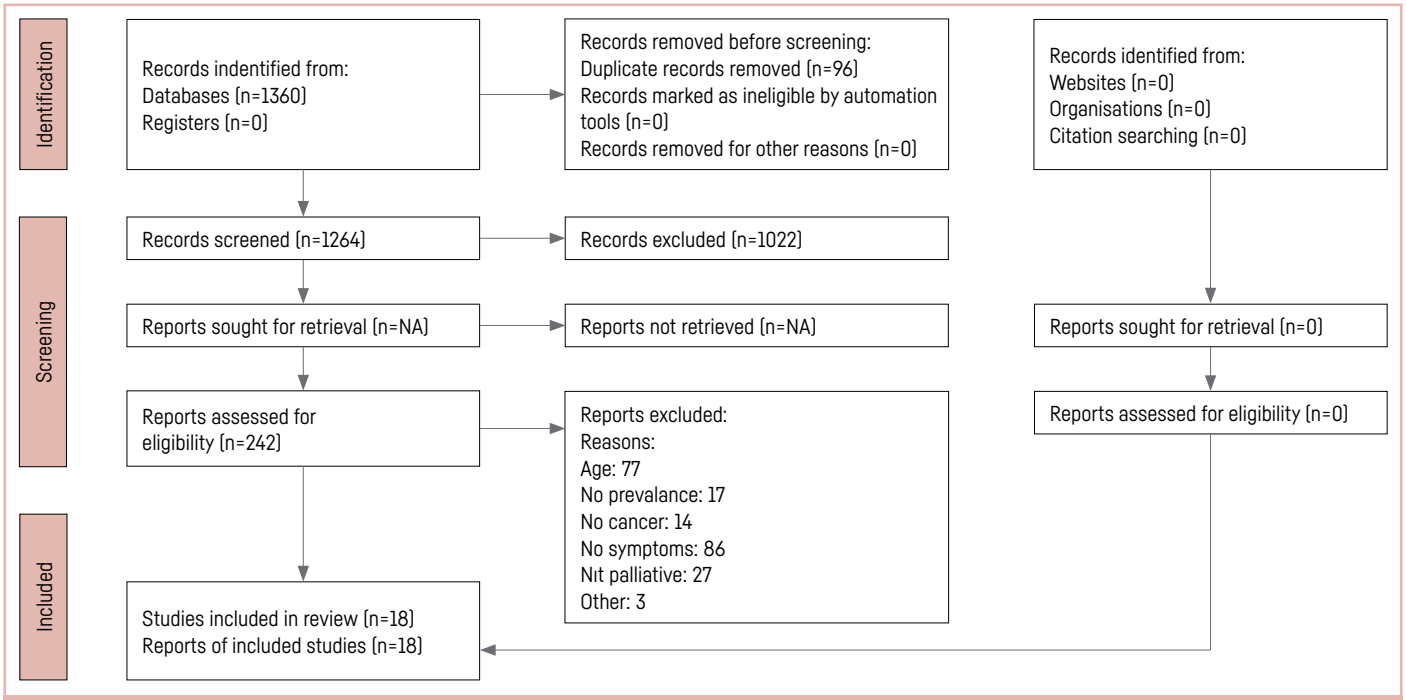

Figure 1. Flow diagram of the study selection process. The initial search identified 1,360 records. After removal of duplicates and screening of titles and abstracts, 37 full-text articles were assessed for eligibility. Following full-text evaluation, 18 studies met the inclusion criteria and were included in the meta-analysis.

results. In the final stage, two researchers (R.B. and Y.K.) reviewed and combined the extracted data. Any inconsistencies were discussed with the responsible researcher, and consensus was achieved.

Methodological Quality Evaluation of the Studies

The methodological quality of the included studies was independently assessed by two researchers (R.B. and Y.K.). Following these assessments, all authors discussed the findings and produced a single consolidated text. The Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Analytical Cross-Sectional Studies (8 items) and the JBI Critical Appraisal Checklist for Cohort Studies (11 items) were used to evaluate methodological quality of the studies.[13] The response options for each item were "yes," "no," "unclear," and "not applicable." Based on the appraisal results, studies were classified as having "moderate" quality when fewer than 50% of items were rated "yes," "average" quality when 51%-80% of items were rated "yes," and "good" quality when more than 80% of items were rated "yes."[13]

Data Synthesis

The data obtained in this study were synthesized using meta-analysis. Meta-analysis was conducted using the Comprehensive Meta-Analysis Version 3 (free trial) software (https://www.meta-analiz.com/pages/demo.php). Heterogeneity among studies was assessed using the Higgins I^2 test and forest plots. Heterogeneity was considered significant when the I^2 value exceeded 50%.[14] When the I^2 value was ≤50%, a fixed-effects model was applied; when it was >50%, a random-effects model was used.[14] For each outcome variable, a 95% confidence interval and estimated proportions were calculated. Publication bias was evaluated using Begg and Mazumdar's rank correlation test, Duval and Tweedie's trim-and-fill method, and funnel plots. According to the Begg and Mazumdar rank correlation test, a p value of <0.05 indicated the presence of publication bias. Duval and Tweedie's trim-and-fill method was used both to detect publication bias and to provide a solution for it. The funnel plot illustrates the missing studies identified using Duval and Tweedie's trim-and-fill method. All tests were conducted on a two-tailed basis, and a p value of ≤0.05 was considered statistically significant.

Ethical Considerations

Ethical approval was not required for this study, as it is a systematic review and meta-analysis based exclusively on previously published studies. The study was conducted in accordance with the PRISMA guidelines, and all original studies included in the review were appropriately cited. Research integrity and ethical standards were maintained throughout the review process.

Results

Search Results

The initial search yielded 1,360 records. After title and abstract screening, duplicate articles were removed, and 37 full-text articles were assessed for eligibility. Following full-text review, 18 studies met the inclusion criteria and were included in the analysis. A detailed overview of the study selection process is presented in Figure 1.

Characteristics of the Studies and Participants

This systematic review and meta-analysis included a total of 18 studies comprising 48,503 participants. All included articles were published in English; nine were cross-sectional and nine were cohort studies (five retrospective and four prospective). All participants were older adults with cancer receiving palliative care. Across the included studies, a total of 42 distinct symptoms were reported (Appendix 1).

Table 1. Critical appraisal checklist for analytical cross-sectional studies and cohort studies

Study	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Total (%)	Quality score
Kuang et al. (2024)[17]	+	+	+	+	+	+	+	+	100	Good
Miyashita et al. (2024)[18]	+	+	–	–	+	–	–	+	50	Moderate
Nakamura et al. (2023)[32]	+	+	+	+	+	+	+	+	100	Good
Pandya et al. (2019)[20]	+	+	+	+	+	–	+	–	75	Average
Turner et al. (2014)[24]	+	+	+	+	+	–	+	+	75	Average
Lancker et al. (2015)[25]	+	+	+	+	+	–	+	–	75	Average
Van Lancker et al. (2017)[26]	+	+	+	+	+	+	+	+	100	Good
Vettori et al. (2020)[29]	+	+	–	–	+	–	–	–	37.5	Moderate
Yoon et al. (2021)[27]	+	+	+	+	+	+	+	+	100	Good
Total (%)	100	100	77	77	100	44	77	66		

Study	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Total (%)	Quality score
Bruijnen et al. (2022)[15]	+	+	+	+	-	+	+	+	+	NA	-	72	Average
Goh et al. (2024)[16]	+	+	+	+	-	+	+	+	+	NA	+	81	Good
Gouraud et al. (2019)[31]	+	+	+	+	+	+	+	+	+	+	+	100	Good
Pang et al. (2019)[19]	+	+	+	+	-	+	+	+	+	NA	-	81	Good
Parthipan et al. (2024)[21]	+	+	+	+	-	+	+	+	+	NA	+	81	Good
Saphire et al. (2020)[22]	+	+	-	+	+	+	-	+	+	NA	+	72	Average
Tatokoro et al. (2022)[23]	+	+	-	+	-	+	-	+	+	NA	-	54	Average
Tillmann et al. (2023)[28]	+	+	+	+	-	+	+	+	+	NA	+	81	Good
Yan et al. (2023)[30]	+	+	+	+	+	+	+	+	+	NA	+	90	Good
Total (%)	100	100	77	100	33	100	77	100	100	11	66		

+: Yes, –: No, NA: Not applicable, Q: Question. Source: Adapted from the JBI Critical Appraisal Tools.[13]

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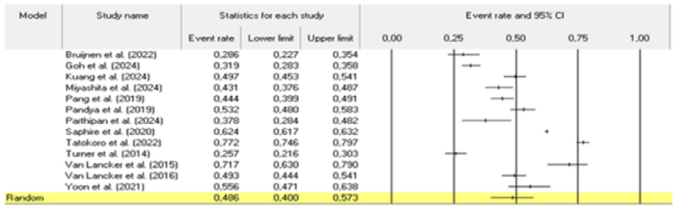
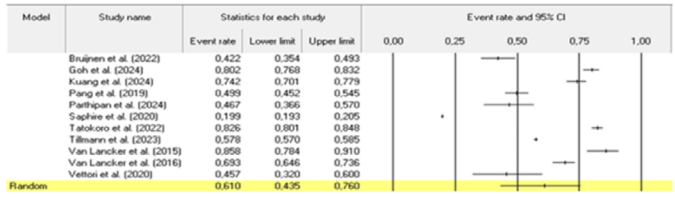
Table 2. Meta-analysis findings of included studies

Variables	Number of studies	Number of cases/total	Estimated proportion (95% CI)	Heterogeneity			Test for overall effect: Z/p
				Tau^2	Q-value/df/p	I^2	
Pain	13	12434/20779	0.486 (0.40–0.57)	0.397	711.06/12/0.000	98.31	6.67/0.000
Fatigue	11	15235/36204	0.610 (0.43–0.76)	1.404	5730.42/10/0.000	99.82	0.83/0.40
Dyspnea	10	20169/29718	0.486 (0.40–0.56)	0.277	1027.57/9/0.000	99.12	23.56/0.000
Lack of appetite	10	9118/19725	0.567 (0.44–0.68)	0.628	675.15/9/0.000	98.66	1.37/0.16
Nausea	8	4001/19220	0.270 (0.20–0.34)	0.220	241.22/7/0.000	97.09	-44.12/0.000
Sleep problems	8	1901/3119	0.529 (0.39–0.65)	0.582	327.38/7/0.000	97.86	6.27/0.000
Depression	7	853/3077	0.324 (0.25–0.40)	0.213	98.13/6/0.000	93.88	-15.62/0.000
Drowsiness	7	1172/2828	0.546 (0.32–0.75)	1.524	625.92/6/0.00	99.02	-0.80/0.41
Poor well–being	6	9094/17921	0.423 (0.31–0.53)	0.291	170.87/5/0.000	97.07	-4.65/0.000
Anxiety	6	488/2667	0.221 (0.09–0.42)	1.393	349.48/5/0.000	98.56	-20.64/0.000
Vomiting	4	287/1309	0.213 (0.14–0.30)	0.210	34.23/3/0.000	91.23	-18.10/0.000
Constipation	4	704/1856	0.400 (0.33–0.46)	0.066	20.97/3/0.000	85.69	-8.58/0.000
Dry mouth	4	814/1364	0.646 (0.47–0.78)	0.506	108.73/3/0.000	97.22	7.61/0.000
Diarrhea	3	176/826	0.240 (0.17–0.32)	0.116	12.39/2/0.002	83.86	-13.78/0.000
Numbness or tingling	3	352/1005	0.327 (0.25–0.41)	0.082	12.65/2/0.002	84.20	-9.62/0.000
Sputum production	3	624/1552	0.404 (0.33–0.48)	0.064	13.29/2/0.001	84.95	-6.99/0.000
Weight loss	3	3730/16766	0.435 (0.21–0.68)	0.848	200.33/2/0.000	99.00	-38.61/0.000
Psychological problems	3	8274/17087	0.359 (0.20–0.55)	0.465	148.52/2/0.000	98.65	-9.09/0.000
Cough	2	204/520	0.411 (0.32–0.50)	0.057	3.59/1/0.058	72.18	–
Urinary incontinence	2	129/520	0.235 (0.17–0.31)	0.055	2.63/1/0.104	62.06	–
Fecal incontinence	2	53/520	0.103 (0.07–0.13)	0.000	0.90/1/0.342	0.000	–
Changes in taste	2	212/520	0.470 (0.24–0.70)	0.708	22.96/1/0.000	95.64	–
Vertigo	2	158/520	0.304 (0.26–0.34)	0.000	0.12/1/0.728	0.000	–
Distress	2	430/844	0.509 (0.47–0.54)	0.000	0.29/1/0.587	0.000	–
Sadness	2	390/844	0.462 (0.42–0.49)	0.006	1.61/1/0.203	38.18	–
Memory problems	2	517/844	0.612 (0.57–0.64)	0.000	0.49/1/0.483	0.000	–
Concentration problems	2	203/520	0.413 (0.31–0.52)	0.081	4.65/1/0.031	78.52	–
Itching	2	98/520	0.224 (0.09–0.45)	0.745	20.27/1/0.000	95.06	–
Sore mouth	2	105/520	0.227 (0.12–0.37)	0.231	9.08/1/0.003	88.98	–
Tension	2	174/520	0.335 (0.29–0.37)	0.000	0.03/1/0.852	0.000	–
Brooding	2	285/520	0.579 (0.44–0.70)	0.127	6.46/1/0.011	84.52	–
Nervousness	2	220/520	0.456 (0.32–0.59)	0.147	7.66/1/0.006	86.96	–
Heartburn or belching	2	111/520	0.251 (0.11–0.47)	0.476	18.64/1/0.000	94.63	–
Fear	2	137/520	0.301 (0.15–0.49)	0.333	14.54/1/0.000	93.12	–
Anger	2	113/520	0.236 (0.15–0.34)	0.113	5.00/1/0.025	80.01	–
Loneliness	2	147/520	0.305 (0.21–0.42)	0.107	5.36/1/0.021	81.35	–
Confusion	2	47/520	0.166 (0.08–0.30)	0.306	9.66/1/0.002	89.65	–
Lack of willpower	1	118/400	0.295 (0.25–0.34)	–	–	–	–
Weakness	1	289/304	0.951 (0.92–0.97)	–	–	–	–
Edema	1	834/1032	0.808 (0.78–0.83)	–	–	–	–
Delirium	1	854/1032	0.828 (0.80–0.84)	–	–	–	–
Dysuria	1	176/1032	0.171 (0.14–0.19)	–	–	–	–

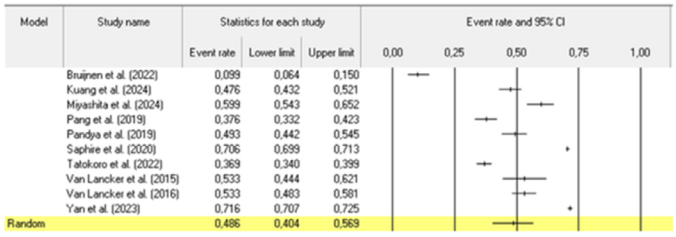
Meta-analysis results were calculated using a random-effects model. Analyses were performed using Comprehensive Meta-Analysis software.[14]



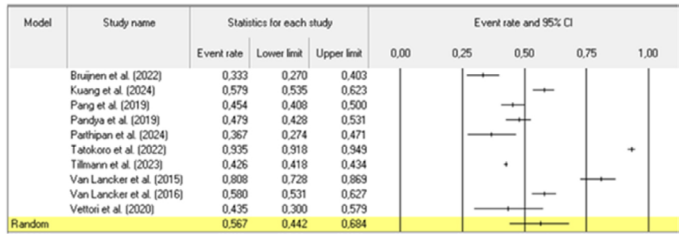
(a) Pain



(b) Fatigue



(c) Dyspnea



(d) Lack of appetite

Figure 2. (a–d) Forest plots of symptom prevalence: pain **(a)**, fatigue **(b)**, dyspnea **(c)**, and lack of appetite **(d)**.

Quality Assessment Results of the Studies

Of the nine cross-sectional studies included, three were rated as adequate, two as average, and four as good quality. Three studies met 100% of the checklist criteria with "yes" responses, three met 77%, one met 66%, and one met 44% of the criteria (Table 1). In addition, of the nine cohort studies, three were rated as average quality and six as good quality. Within the checklist, "yes" responses were given to 100% of items in six studies, 77% in two studies, 66% in one study, 33% in one study, and 11% in one study (Table 1).

Symptom Prevalence

Across the 18 included studies, 42 distinct symptoms were identified. Meta-analyses were conducted for 37 symptoms that were reported in at least two studies. Pain, fatigue, dyspnea, lack of appetite, nausea, sleep problems, depression, drowsiness, poor well-being, and anxiety were each reported in at least six studies (Table 2).[15–32]

Pain was reported in 13 studies, with an estimated prevalence of 48.6%. Fatigue was documented in 11 studies, with a prevalence of 61.0%. Dyspnea and loss of appetite were each reported in 10 studies, with estimated prevalence of 48.6% and 56.7%, respectively. Nausea and sleep disturbances were observed in eight studies, with estimated prevalence of 27.0% and 52.9%, respectively. Depression and drowsiness were reported in seven studies, with prevalence rates of 32.4% and 54.6%, respectively. Poor general well-being and anxiety were each noted in six studies, with estimated prevalence of 42.3% and 22.1%, respectively. Vomiting, constipation, and dry mouth were reported in four studies, with prevalence rates of 21.3%, 40.0%, and 64.6%, respectively. Diarrhea, numbness or tingling, sputum production, weight loss, and psychological problems were observed in three studies, with estimated prevalence of 24.0%, 32.7%, 40.4%, 43.5%, and 35.9%, respectively (Table 2).

Cough, urinary incontinence, fecal incontinence, altered taste, vertigo, distress, sadness, memory problems, concentration difficulties, itching, sore mouth, tension, brooding, nervousness, heartburn or belching, fear, anger, loneliness, and confusion were each reported in two studies. The estimated prevalence was 41.1% for cough, 23.5% for urinary incontinence, 10.3% for fecal incontinence, 47.0% for altered taste, 30.4% for vertigo, 50.9% for distress, 46.2% for sadness, 61.2% for memory problems, 41.3% for concentration difficulties, 22.4% for itching, 22.7% for sore mouth, 33.5% for tension, 57.9% for brooding, 45.6% for nervousness, 25.1% for heartburn or belching, 30.1% for fear, 23.6% for anger, 30.5% for loneliness, and 16.6% for confusion (Table 2).

Lack of willpower, weakness, edema, delirium, and dysuria were each reported in a single study. The estimated prevalence was 29.5% for lack of willpower, 95.1% for weakness, 80.8% for edema, 82.8% for delirium, and 17.1% for dysuria (Table 2).

Results on Heterogeneity Between Studies

The I^2 statistic and forest plot methods were used to evaluate heterogeneity among reported symptoms. I^2 values were calculated for a total of 37 symptoms, and 31 of these values exceeded 50% (Figs. 2, 3), indicating a high level of heterogeneity. Forest plots were generated for symptoms reported in at least 10 studies (Fig. 2), which also demonstrated high heterogeneity.

Results on Publication Bias

Begg and Mazumdar's rank correlation test, Duval and Tweedie's trim-and-fill method, and funnel plot analyses were applied to symptoms reported in at least six studies to assess publication bias. According to Begg and Mazumdar's rank correlation test, all p-values were greater than 0.05 for the examined symptoms, including pain (p=0.90), fatigue (p=0.10), dyspnea (p=0.55), lack of appetite (p=0.78), nausea (p=1.00), sleep problems (p=0.45), depression (p=0.65), drowsiness (p=0.65), poor well-being (p=0.85), and anxiety (p=0.34). These results indicate no significant publication bias based on this test.

According to Duval and Tweedie's trim-and-fill method, three missing studies were identified for dyspnea, two for nausea, and two for poor well-being. For all other symptoms (pain, fatigue, lack of appetite, sleep problems, depression, drowsiness, and anxiety), no missing studies were imputed, suggesting stable and symmetric distributions. The funnel plots illustrating symptoms with missing studies are presented in Figure 3.

Discussion

This systematic review and meta-analysis provides a comprehensive overview of the symptom burden experienced by older adults with cancer receiving palliative care. The findings highlight the wide range and clinical relevance of symptoms that require careful consideration in patient management. Common problems such as pain, fatigue, dyspnea, lack of appetite, nausea, and sleep problems were particularly prominent. In particular, the high prevalence of pain and fatigue represents important findings that should be carefully considered in treatment planning for this population.

There are significant differences between the findings of the systematic review and meta-analysis conducted by Van Lancker et al.[33] and those of the present study in terms of symptom prevalence, measurement methods, and clinical settings. Van Lancker et al.[33] identified weight loss, pain, anorexia, and dyspnea as the most common symptoms, whereas in our study, pain, fatigue, dyspnea, lack of appetite, nausea, and sleep problems were most prevalent. Similarly, the study by Henson et al.[34] on symptom burden in patients with cancer receiving palliative care reported that pain, dyspnea, nausea, vomiting, and fatigue were among the most common symptoms. Battat et al.[35] found that 61.6% of cancer patients receiving palliative care experienced drowsiness, 54.6% pain, 40.2% nausea, 55.0% lack of appetite, 28.4% dyspnea, 40.6% depression, and 47.2% anxiety. In a study by Vogt et al.[36] examining

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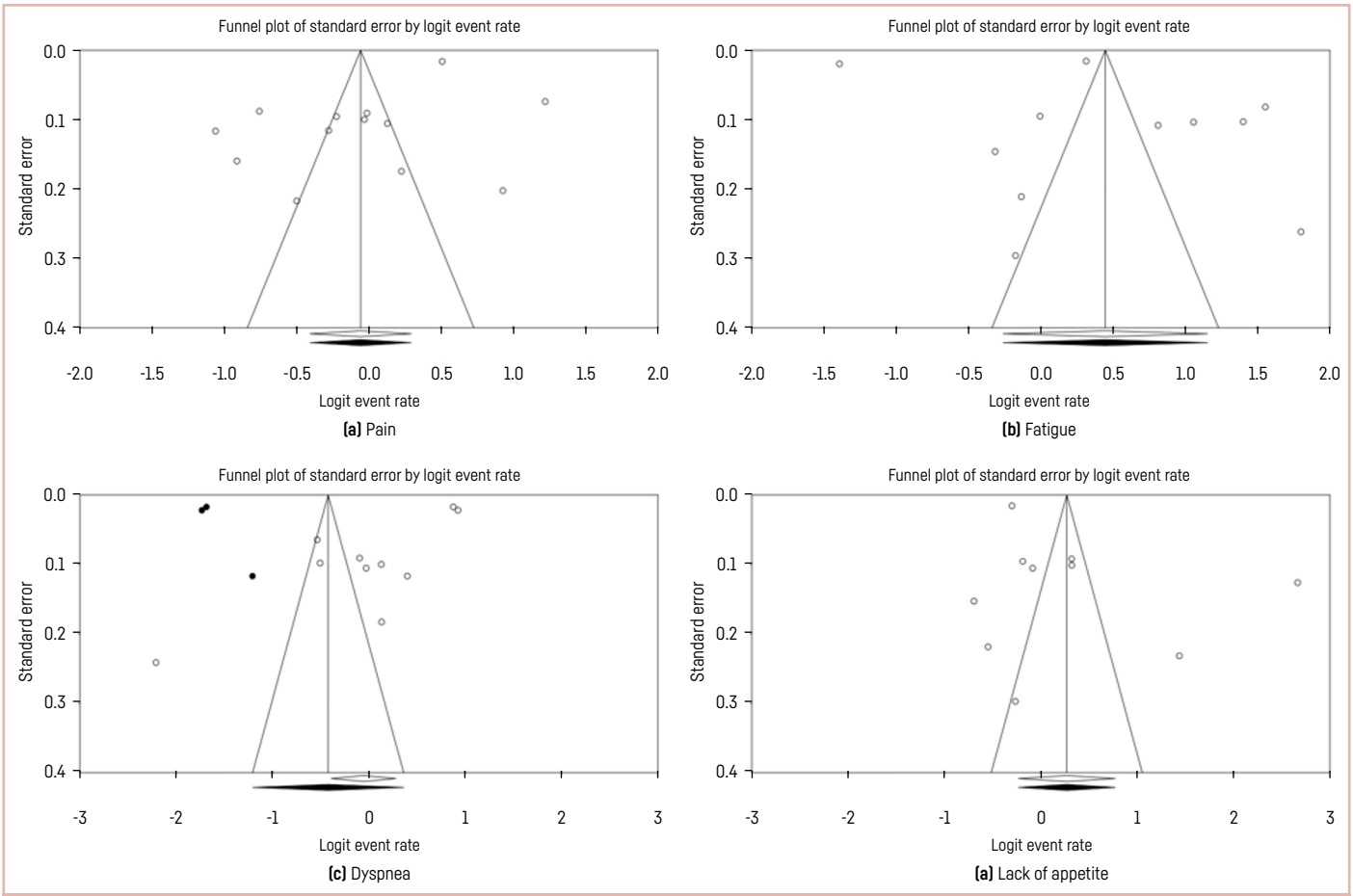

Figure 3. (a–d) Funnel plots assessing publication bias for pain **(a)**, fatigue **(b)**, dyspnea **(c)**, and lack of appetite **(d)**.

the palliative care needs of individuals with metastatic cancer across 20 centers in Germany, 64.0% of participants reported distress, 53.0% apathy, 46.0% depressive symptoms, and 36% loneliness. Across these studies, symptoms prevalence varied considerably.[35,36] These differences are likely attributable to variations in study methodologies and factors such as cancer type, diagnostic and treatment approaches, and changes in living standards over time. The high heterogeneity observed across the pooled estimates is therefore not unexpected and can be explained by clinical and methodological differences among the included studies, including cancer types, disease stages, care settings, and symptom assessment tools. This variability should be interpreted as reflecting real-world palliative care practice rather than as a methodological limitation, and the findings should be interpreted with appropriate caution.

While only two (11.8%) of the 17 studies included in the review by Van Lancker et al.[33] employed valid and reliable measurement tools, a substantially higher proportion (66.7%) was observed in our study. Significant differences were also noted in terms of clinical settings. The lack of standardization in measurement methods is considered an important factor contributing to variations in reported symptom prevalence across studies. In a systematic review on prognosis and symptom management in patients with cancer, Hui et al.[37] emphasized that increased use of valid measurement tools is critical for accurate symptom evaluation. Nevertheless, it has been reported that a lack of standardization in measurement methods contributes to heterogeneity in symptom prevalence and complicates clinical decision-making processes.[38]

National and international guidelines recommend the early integration of palliative care into the treatment of patients with advanced cancer and emphasize its positive effects.[39–42] Comprehensive cancer palliative care centers are increasingly highlighted as essential components of cancer care for managing symptoms and related problems using up-to-date knowledge and high-quality standards.[43,44] Berendt et al.[45] examined differences in symptom burden between comprehensive cancer center palliative care and other hospital-based palliative care services among 10,447 older adults requiring palliative care in Germany. In this study, pain, vomiting, constipation, depression, anxiety, and distress were found to be less prevalent in palliative care centers compared to other hospital settings. Temel et al.,[46] in a study examining palliative care services, emphasized that the care environments has a direct effect on the nature of symptoms experienced by patients. Changes in care and treatment settings over time may influence patient characteristics and symptom prevalence, thereby directly shaping study outcomes. Zhang et al.[47] reported that palliative care significantly improved depressive symptoms and alleviated both physical and psychological symptoms in patients with end-stage cancer compared to traditional oncology care. The differences observed in our study underscore the influence of methodological and contextual variations across studies on the results and highlight the need for more standardized approaches to symptom management in patients with cancer.[45,47]

From a nursing care perspective, the findings of this review suggest that symptoms such as pain, fatigue, dyspnea, lack of appetite, and sleep problems should be prioritized in routine palliative care assessments. These symptoms were consistently reported with high prevalence across studies and have a direct impact on functional status, comfort, and quality of life. Early identification and systematic monitoring of these symptoms by nurses may facilitate timely interventions and improve symptom control in older adults receiving palliative care.

For palliative care to be implemented effectively, the manner and duration of care are of critical importance. Adopting a multidisciplinary approach can improve the quality of life of patients and their families by addressing psychosocial, spiritual, and cultural needs in addition to managing physical symptoms.[35,47] Early initiation of palliative care facilitates symptom management, enhances patients' ability to cope with disease, and leads to measurable improvements in quality of life.[46] Further-

more, establishing standards and individualizing care processes may help reduce heterogeneity and ensure that patient needs are met more effectively.[37] While effective pain control supports individuals' ability to maintain social and emotional functioning, alleviation of symptoms such as dyspnea provides both physical and psychological comfort. In addition, spiritual support and efforts to reduce the psychosocial burden on families may enhance resilience during the grief process and mitigate the effects of trauma. Palliative care supports patients' physical and emotional health in a holistic manner, and social and psychological support systems should also be established for families.[48–50]

Strengths and Limitations of the Study

The main strengths of this study include the generally high methodological quality of the included studies, a low risk of publication bias, and the fact that all included studies collected data from hospital-based records. The main limitations are the lack of standardization in measurement instruments and the geographical variability of the included studies, both of which may have contributed to the observed heterogeneity in symptom prevalence.

Conclusion

Palliative care represents a fundamental model of care that enhances the quality of life of patients and their families by addressing physical, psychological, and emotional needs in advanced chronic diseases such as cancer. As essential members of the multidisciplinary team, nurses have a key responsibility to deliver high-quality, evidence-based, and compassionate care tailored to individual needs. This study not only raises awareness of the symptom burden experienced by older adults receiving palliative care but also identifies ongoing gaps in the literature. Such research is vital for strengthening nursing practice and ensuring that both patients and their families receive adequate support throughout the palliative care journey. Future research should prioritize prospective studies using standardized and validated assessment tools to better understand symptom prevalence and to inform individualized nursing interventions. Expanding the evidence base will contribute to the standardization of palliative care services across diverse care settings, patient populations, and cultural contexts.

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References

1. Güçlüel YÖ, Birbudak S. Healthcare staff' views on oral health in palliative care patients: a qualitative study. J Educ Res Nurs. 2024;21(4):273–280. [CrossRef]
2. Pilleron S, Gnangnon F, Noronha V, Soto-Perez-de-Celis E. Cancer incidence estimates in adults aged 60 years and older living in low-and-middle-income countries for the years 2020 and 2040. Ecancermedicalscience. 2023;17:1594. [CrossRef]
3. World Health Organization. Global Cancer Observatory. Accessed February 11, 2026. https://gco.iarc.who.int/media/globocan/factsheets/populations/900-world-fact-sheet.pdf
4. Sedrak MS, Cohen HJ. The Aging-Cancer Cycle: Mechanisms and Opportunities for Intervention. J Gerontol A Biol Sci Med Sci. 2023;78(7):1234–1238. [CrossRef]
5. Mudoti D, Addis G. Barriers experienced by community nurses in delivering pain management to end-of-life adult cancer patients. J Educ Res Nurs. 2025;22(1):32–38. [CrossRef]
6. World Health Organization. Palliative care. Accessed February 11, 2026. https://www.who.int/news-room/fact-sheets/detail/palliative-care
7. Radbruch L, De Lima L, Knaul F, et al. Redefining Palliative Care-A New Consensus-Based Definition. J Pain Symptom Manage. 2020;60(4):754–764. [CrossRef]
8. Kumari K, Kalyani CV, Gupta S, et al. Meta-analysis on Effectiveness of Palliative Care versus Conventional Care amongst Advanced Gynaecological Patients with Cancer and Caregivers. Indian J Palliat Care. 2024;30(4):289–295. [CrossRef]
9. Nipp RD, Subbiah IM, Loscalzo M. Convergence of Geriatrics and Palliative Care to Deliver Personalized Supportive Care for Older Adults with Cancer. J Clin Oncol. 2021;39(19):2185–2194. [CrossRef]
10. van der Vlies E, Kurk SA, Roodhart JML, et al. The relevance of geriatric assessment for older patients receiving palliative chemotherapy. J Geriatr Oncol. 2020;11(3):482–487. [CrossRef]
11. Al Maqbali M, Al Sinani M, Al Naamani Z, Al Badi K, Tanash MI. Prevalence of Fatigue in Patients with Cancer: A Systematic Review and Meta-Analysis. J Pain Symptom Manage. 2021;61(1):167–189.e14. [CrossRef]
12. Bjerkeset E, Röhrl K, Schou-Bredal I. Symptom cluster of pain, fatigue, and psychological distress in breast cancer survivors: prevalence and characteristics. Breast Cancer Res Treat. 2020;180(1):63–71. [CrossRef]
13. Joanna Briggs Institute. Critical Appraisal Tools. Accessed February 11, 2026. https://jbi.global/critical-appraisal-tools
14. Cleophas JT, Zwinderman HA. Modern meta-analysis: Review and update of methodologies. Switzerland: Springer International Publishing; 2017. [CrossRef]
15. Bruijnen CP, Laeven CE, Koldenhof JJ, et al. Symptom burden of older patients with cancer during systemic therapy and its relationship with frailty: A prospective observational study. In: Bruijnen CP, ed. Shared-decision making in older patients with cancer the added value of frailty screening. Rotterdam: Gildeprint Enschede; 2022:120–138.
16. Goh WY, Hum AYM. Symptom severity reported by older adults with cancer and its impact on survival prognostication. J Geriatr Oncol. 2024;15(8):102073. [CrossRef]
17. Kuang Y, Jing F, Sun Y, Zhu Z, Xing W. Symptom networks in older adults with cancer: A network analysis. J Geriatr Oncol. 2024;15(3):101718. [CrossRef]
18. Miyashita M, Evans CJ, Yi D, Gomes B, Gao W. Symptom burden, service use and care dissatisfaction among older adults with cancer, cardiovascular disease, respiratory disease, dementia and neurological disease during the last 3 months before death: A pooled analysis of mortality follow-back surveys. Palliat Med. 2024;38(5):582–592. [CrossRef]
19. Pang L, de la Cruz M, Wu J, Liu D, Naqvi M, Bruera E. Symptom frequency and change of oldest old cancer patients. Support Care Cancer. 2019;27(11):4165–4170. [CrossRef]
20. Pandya C, Magnuson A, Flannery M, et al. Association Between Symptom Burden and Physical Function in Older Patients with Cancer. J Am Geriatr Soc. 2019;67(5):998–1004. [CrossRef]
21. Parthipan M, Feng G, Breunis H, et al. Understanding the incidence, duration, and severity of symptoms through daily symptom monitoring among frail and non-frail older patients receiving metastatic prostate cancer treatments. J Geriatr Oncol. 2024;15(3):101720. [CrossRef]
22. Saphire ML, Prsic EH, Canavan ME, Wang SJ, Presley CJ, Davidoff AJ. Patterns of Symptom Management Medication Receipt at End-of-Life Among Medicare Beneficiaries with Lung Cancer. J Pain Symptom Manage. 2020;59(4):767–777.e1. [CrossRef]
23. Tatokoro M, Matsuo N. The Impact of Aging on Symptom Prevalence and Management in Terminally ill Patients with Cancer. J Pain Symptom Manage. 2022;63(2):251–259. [CrossRef]
24. Turner JP, Shakib S, Singhal N, et al. Statin use and pain in older people with cancer: a cross-sectional study. J Am Geriatr Soc. 2014;62(10):1900–1905. [CrossRef]
25. Lancker A, Cypers S, Vanwynsberghe E, Verhaeghe S, Hecke A, Beeckman D. Symptom assessment in hospitalized older palliative patients with cancer: agreement among patients, nurses, and proxies. Oncol Nurs Forum. 2015;42(2):E73–E90. [CrossRef]
26. Van Lancker A, Beeckman D, Van Den Noortgate N, Verhaeghe S, Van Hecke A. Frequency and intensity of symptoms and treatment interventions in hospitalized older palliative cancer patients: a multicentre cross-sectional study. J Adv Nurs. 2017;73(6):1455–1466. [CrossRef]
27. Yoon SL, Scarton L, Duckworth L, et al. Pain, symptom distress, and pain barriers by age among patients with cancer receiving hospice care: Comparison of baseline data. J Geriatr Oncol. 2021;12(7):1068–1075. [CrossRef]
28. Tillmann BW, Hallet J, Sutradhar R, et al.; members of the REcovery after Surgical Therapy for Older adults REsearch –Cancer (RESTORE-C) group. The impact of unexpected intensive care unit admission after cancer surgery on long-term symptom burden among older adults: a population-based longitudinal analysis. Crit Care. 2023;27(1):162. [CrossRef]
29. Vettori JC, da Silva LG, Pfrimer K, et al. Older Adult Cancer Patients Under Palliative Care with a Prognosis of 30 Days or More: Clinical and Nutritional Changes. J Am Coll Nutr. 2021;40(2):148–154. [CrossRef]
30. Yan M, Tjong M, Chan WC, et al. Dyspnea in patients with stage IV non-small cell lung cancer: a population-based analysis of disease burden and patterns of care. J Thorac Dis. 2023;15(2):494–506. [CrossRef]
31. Gouraud C, Paillaud E, Martinez-Tapia C, et al.; ELCAPA Study Group. Depressive Symptom Profiles and Survival in Older Patients with Cancer: Latent Class Analysis of the ELCAPA Cohort Study. Oncologist. 2019;24(7):e458–e466. [CrossRef]
32. Nakamura ZM, Small BJ, Zhai W, et al. Depressive symptom trajectories in older breast cancer survivors: the Thinking and Living with Cancer Study. J Cancer Surviv. 2025;19:568–597. [CrossRef]
33. Van Lancker A, Velghe A, Van Hecke A, et al. Prevalence of symptoms in older cancer patients receiving palliative care: a systematic review and meta-analysis. J Pain Symptom Manage. 2014;47(1):90–104. [CrossRef]
34. Henson LA, Maddocks M, Evans C, Davidson M, Hicks S, Higginson IJ. Palliative Care and the Management of Common Distressing Symptoms in Advanced Cancer: Pain, Breathlessness, Nausea and Vomiting, and Fatigue. J Clin Oncol. 2020;38(9):905–914. [CrossRef]
35. Battat M, Omair N, WildAli MA, et al. Factors associated with palliative care symptoms in cancer patients in Palestine. Sci Rep. 2023;13(1):16190. [CrossRef]

36. Vogt J, Beyer F, Sistermanns J, et al.; Arbeitsgemeinschaft Palliativmedizin (APM) of the German Cancer Society (DKG). Symptom Burden and Palliative Care Needs of Patients with Incurable Cancer at Diagnosis and During the Disease Course. Oncologist. 2021;26(6):e1058–e1065. [CrossRef]
37. Hui D, dos Santos R, Chisholm GB, Bruera E. Symptom Expression in the Last Seven Days of Life Among Cancer Patients Admitted to Acute Palliative Care Units. J Pain Symptom Manage. 2015;50(4):488–494. [CrossRef]
38. Passik SD, Weinreb HJ. Managing chronic nonmalignant pain: overcoming obstacles to the use of opioids. Adv Ther. 2000;17(2):70–83. [CrossRef]
39. Bakitas MA, Tosteson TD, Li Z, et al. Early Versus Delayed Initiation of Concurrent Palliative Oncology Care: Patient Outcomes in the ENABLE III Randomized Controlled Trial. J Clin Oncol. 2015;33(13):1438–1445. [CrossRef]
40. Bauman JR, Temel JS. The integration of early palliative care with oncology care: the time has come for a new tradition. J Natl Compr Canc Netw. 2014;12(12):1763–1771; quiz 1771. [CrossRef]
41. Davis MP, Temel JS, Balboni T, Glare P. A review of the trials which examine early integration of outpatient and home palliative care for patients with serious illnesses. Ann Palliat Med. 2015;4(3):99–121.
42. Haun MW, Estel S, Rücker G, et al. Early palliative care for adults with advanced cancer. Cochrane Database Syst Rev. 2017;6(6):CD011129. [CrossRef]
43. Berendt J, Stiel S, Nauck F, Ostgathe C. Early palliative care: current status of integration within German comprehensive cancer centers. Support Care Cancer. 2017;25(8):2577–2580. [CrossRef]
44. Lödel S, Ostgathe C, Heckel M, Oechsle K, Gahr S. Standard Operating Procedures (SOPs) for Palliative Care in German Comprehensive Cancer Centers - an evaluation of the implementation status. BMC Palliat Care. 2020;19(1):62. [CrossRef]
45. Berendt J, Brunner S, Heckel M, Tewes M, Ostgathe C, Gahr S. Symptom burden and relief in palliative care units of German Comprehensive Cancer Center and other hospitals. J Cancer Res Clin Oncol. 2024;150(3):160. [CrossRef]
46. Temel JS, Greer JA, Muzikansky A, et al. Early palliative care for patients with metastatic non-small-cell lung cancer. N Engl J Med. 2010;363(8):733–742. [CrossRef]
47. Zhang J, Fang H, Sun Y, Wang W, Yuan Y, Zheng K. Meta-analysis of Palliative Care on End-stage Quality of Life in Cancer Patients. Altern Ther Health Med. 2024:AT10548. 2024 May 17. [Epub ahead of print].
48. Abbasnezhad M, Rahmani A, Ghahramanian A, et al. Cancer Care Burden among Primary Family Caregivers of Iranian Hematologic Cancer Patients. Asian Pac J Cancer Prev. 2015;16(13):5499–5505. [CrossRef]
49. Kiyancicek Z, Caydam DO. Spiritual needs and practices among family caregivers of patients with cancer. Acta Paul Enferm. 2017;30(6):628–634. [CrossRef]
50. Penman J, Ellis B. Palliative care clients' and caregivers' notion of fear and their strategies for overcoming it. Palliat Support Care. 2015;13(3):777–785. [CrossRef]

Appendix 1. Characteristics and main results of studies included in the systematic review

Study	Study design and setting	Patients characteristics	Measurement instrument	Symptom prevalence
Bruijnen et al. (2022)[15]	Prospective cohort/Department of Medical Oncology	Sample size: 192 Number of older adults: 192 Age: All patients ≥70 years Median age 74 years	Utrecht Symptom Diary	Fatigue (42.1%) Poor well-being (40.6%) Sleep problems (33.8%) Lack of appetite (33.3%) Pain (28.6%) Anxiety (23.9%) Depression (18.7%) Dyspnea (9.8%) Nausea (7.8%)
Goh et al. (2024)[16]	Prospective cohort/Palliative Care Service	Sample size: 840 Number of older adults: 592 Age: older adult group ≥65 years	Edmonton Symptom Assessment System	Fatigue (80.2%) Pain (31.9%) Poor well-being (23.9%) Anxiety (5.2%)
Gouraud et al. (2019) [31]	Prospective cohort/Geriatric Oncology Clinics	Sample size: 847 Number of older adults: 847 Age: All patients ≥70 years Median age 79 years	Mini Geriatric Depression Scale	Depression (31.7%)
Kuang et al. (2024) [17]	Cross-sectional/Shanghai Cancer Survivor (SCANS) Report	Sample size: 485 Number of older adults: 485 Age: Median age 72 years	MD Anderson Symptom Inventory	Fatigue (74.2%) Sleep problems (68.7%) Memory problems (62.3%) Lack of appetite (57.9%) Distress (51.8%) Drowsiness (50.5%) Pain (49.7%) Dyspnea (47.6%) Dry mouth (46.2%) Sadness (44.3%) Numbness or tingling (40.0%) Nausea (32.2%) Vomiting (28.5%)
Miyashita et al. (2024)[18]	Cross-sectional/Hospice and Home Care	Sample size: 304 Number of older adults: 304 Age: All patients ≥75 years	Unknown	Weakness (95.0%) Drowsiness (80.9%) Dyspnea (59.8%) Constipation (49.0%) Depression (45.0%) Pain (43.0%) Anxiety (42.1%) Nausea (39.1%) Diarrhea (25.9%) Vomiting (24.0%)
Nakamura et al. (2023) [32]	Cross-sectional/Cancer Center	Sample size: 272 Number of older adults: 272 Age: All patients ≥60 years	Center for Epidemiological Studies Depression Scale	Depression (15.6%)
Pang et al. (2019)[19]	Retrospective cohort/Cancer Center	Sample size: 441 Number of older adults: 241 Age: Older adult group ≥65 years	Edmonton Symptom Assessment System	Fatigue (49.8%) Poor well-being (49.8%) Sleep problems (47.8%) Lack of appetite (45.3%) Pain (44.4%) Drowsiness (39.9%) Anxiety (39.4%) Dyspnea (37.6%) Depression (33.3%) Nausea (26.5%) Psychological problems (17.2%)
Pandya et al. (2019)[20]	Cross-sectional/Geriatric Oncology Clinics	Sample size: 359 Number of older adults: 359 Age: All patients ≥65 years Median age 81 years	Clinical Symptom Inventory	Sleep problems (63.7%) Memory problems (62.1%) Pain (55.5%) Dry mouth (54.3%) Distress (52.6%) Dyspnea (52.0%) Sadness (50.8%) Lack of appetite (49.8%)

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Appendix 1. Cont.

Study	Study design and setting	Patients characteristics	Measurement instrument	Symptom prevalence
Parthipan et al. [2024][21]	Prospective cohort/Cancer Center	Sample size: 90 Number of older adults: 90 Age: All patients ≥65 years	Edmonton Symptom Assessment System	Fatigue [46.8%] Sleep problems [42.9%] Poor well-being [41.2%] Pain [37.5%] Lack of appetite [37.1%]
Saphire et al. [2020][22]	Retrospective cohort/Medicare Database	Sample size: 16,246 Number of older adults: 16,246 Age: All patients ≥67 years	Unknown	Dyspnea [70.7%] Pain [62.5%] Psychological problems [49.4%] Weight loss [21.4%] Fatigue [19.9%] Nausea [19.2%]
Tatokoro et al. [2022][23]	Retrospective cohort/Palliative Care Unit	Sample size: 1,032 Number of older adults: 1,032 Age: All patients ≥60 years Median age 79 years	Unknown	Lack of appetite [93.6%] Delirium [82.8%] Fatigue [82.6%] Edema [80.8%] Sleep problems [79.4%] Pain [77.2%] Sputum production [42.1%] Dyspnea [37.0%] Constipation [34.5%] Nausea [30.0%] Dysuria [17.1%] Drowsiness [11.4%] Anxiety [7.3%]
Tillmann et al. [2023][28]	Retrospective cohort/Regional Cancer Centers	Sample size: 16,560 Number of older adults: 16,560 Age: All patients ≥70 years	Edmonton Symptom Assessment System	Fatigue [57.7%] Poor well-being [51.8%] Lack of appetite [42.5%]
Turner et al. [2014][24]	Cross-sectional/Medical Oncology Outpatient Clinic	Sample size: 385 Number of older adults: 385 Age: All patients ≥70 years	Visual Analogue Scale	Pain [25.7%]
Lancker et al. [2015][25]	Cross-sectional/General Hospitals	Sample size: 120 Number of older adults: 120 Age: All patients ≥65 years	Symptom Instrument For Elderly Patients Diagnosed With Cancer Receiving Palliative Care	Fatigue [85.8%] Drowsiness [84.1%] Lack of appetite [80.8%] Dry mouth [79.1%] Pain [71.6%] Weight loss [71.6%] Brooding [65.0%] Changes in taste [60.0%] Depression [55.0%] Dyspnea [53.3%] Nervousness [53.3%] Sputum production [48.3%] Concentration problems [47.5%] Cough [46.6%] Nausea [45.0%] Sleep problems [41.6%] Fear [40.0%] Constipation [40.0%] Loneliness [36.6%] Heartburn or belching [35.8%] Tension [34.1%] Itching [33.3%] Vertigo [31.6%] Diarrhea 30.8%] Sore mouth [30.0%] Anger [29.1%] Numbness or tingling [24.1%] Vomiting [23.3%] Confusion [23.3%] Urinary incontinence [19.1%] Fecal incontinence [12.5%]

Appendix 1. Cont.

Study	Study design and setting	Patients characteristics	Measurement instrument	Symptom prevalence
Van Lancker et al. (2017)[26]	Cross-sectional/Acute Care Hospitals	Sample size: 400 Number of older adults: 400 Age: All patients ≥65 years	Assessment Symptoms Palliative Elderly	Fatigue (69.3%) Drowsiness (65.8%) Lack of appetite (58.0%) Dyspnea (53.3%) Brooding (51.8%) Pain (49.3%) Psychological problems (46.0%) Nervousness (39.0%) Depression (36.3%) Tension (33.3%) Lack of willpower (29.5%) Dry mouth (77.0%) Weight loss (41.3%) Sleep problems (40.8%) Constipation (37.8%) Cough (37.0%) Concentration problems (36.5%) Changes in taste (35.0%) Sputum production (33.0%) Numbness or tingling (32.3%) Vertigo (30.0%) Urinary incontinence (26.5%) Nausea (26.3%) Loneliness - 103 (25.8%) Fear - 89 (22.3%) Anger - 78 (19.5%) Diarrhea (17.5%) Sore mouth (17.3%) Heartburn or belching (17.0%) Itching (14.5%) Vomiting (12.0%) Confusion (11.8%) Fecal incontinence (9.5%)
Vettori et al. (2020)[29]	Cross-sectional/University Hospital	Sample size: 46 Number of older adults: 46 Age: Unknown Median age 66 years	Unknown	Anxiety (50.0%) Poor well-being (50.0%) Drowsiness (45.6%) Fatigue (45.6%) Lack of appetite (43.4%)
Yan et al. (2023)[30]	Retrospective cohort/Sciences Database	Sample size: 13,159 Number of older adults: 10,139 Age: Older adult group ≥60 years	Edmonton Symptom Assessment System	Dyspnea (71.6%)
Yoon et al. (2021)[27]	Cross-sectional/Hospice	Sample size: 230 Number of older adults: 133 Age: Older adult group ≥65 years	McGill Pain Questionnaire	Pain (55.6%)

Source: Summary of characteristics and main findings of included studies (Refs. 15–32). Table created by the authors based on the original publications.

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Review

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Storytelling for Cyberbullying Prevention in Adolescents: A Literature Review

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Abstract

With the rapid advancement of digitalization, adolescents' social interactions have increasingly shifted to online environments. Adolescence is a developmental period characterized by intensified peer influence, identity formation, and high levels of social media engagement, all of which may increase vulnerability to involvement in cyberbullying. In this context, cyberbullying is widely recognized as a significant public health concern. Research indicates that low levels of empathy constitute one of the key psychological factors contributing to cyberbullying behaviors. Accordingly, interventions aimed at enhancing empathy have emerged as prominent preventive strategies. Storytelling is an effective method for fostering empathy, as it enables individuals to experience the events from diverse perspectives and assume different roles. In recent years, school-based interventions incorporating storytelling have been shown to reduce cyberbullying behaviors and enhance empathy levels. In this regard, school health nurses—beyond their role in individual counseling—are well positioned to implement story-based interventions through group education programs and the development of school policies. Accordingly, this review summarizes the literature and provides recommendations tailored to adolescents and school settings, with particular emphasis on the role of school nurses in coordinating storytelling-based prevention strategies.

Keywords: Adolescents, cyberbullying, empathy, school health nursing, storytelling

Introduction

The rapid development and widespread use of digital technologies have significantly shifted adolescents' social relationships into online environments.[1] During adolescence, peer relationships, identity development, and the need for social approval become central, and online interactions shape daily social experiences.[2,3] Therefore, adolescents represent a particularly vulnerable group for involvement in cyberbullying within the school context.[2-4] This transformation has created a foundation for the proliferation of cyberbullying, which has emerged as a negative consequence of online interactions. Cyberbullying is defined as the intentional, repetitive, and harmful use of digital tools to engage in aggressive behaviors. Due to its increasing prevalence and adverse effects, it is now recognized as a significant public health concern.[2] In a systematic review examining the global epidemiology of cyberbullying among adolescents, the prevalence of cyberbullying perpetration ranged from 6% to 46.3%, while cybervictimization ranged from 13.99% to 57.5%; verbal aggression was identified as the most common form of cyberbullying.[5]

Cyberbullying is shaped by multilevel determinants, including peer norms and bystander dynamics, the school environment and reporting mechanisms, and digital affordances such as perceived anonymity.[1,3,4] It can affect adolescents' mental health and functioning in multidimensional ways, being associated with increased depressive and anxiety symptoms, as well as adverse psychosocial outcomes such as loneliness, social isolation, and low self-esteem.[1,3] Within the school context, cyberbullying has been linked to absenteeism, school avoidance, reduced school connectedness, and poorer academic achievement. It has also been identified as a risk factor for sleep disturbances, psychosomatic complaints, and self-harm tendencies.[1,3] Cyberbullying possesses distinctive characteristics that differentiate it from traditional bullying. Its potential for anonymity, lack of physical contact, and continuous presence within online environments make it a more complex and covert phenomenon.[1] Moreover, cyberbullying is a multidimensional issue that encompasses not only behavioral aspects but also cognitive and emotional processes.[3]

A critical psychological variable shaping behaviors in cyberbullying contexts is empathy, which includes both cognitive and affective components.[2] Empathy refers to the capacity to understand and emotionally share another person's feelings, thoughts, and experiences. The literature indicates that adolescents with higher levels of empathy exhibit a lower tendency to engage in cyberbullying behaviors.[2,4,6,7] Moreover, structured interventions aimed at enhancing empathy have been shown to be effective in preventing and reducing cyberbullying.[2] In particular, fostering skills such as emotional awareness, empathy, and adherence to social norms reduces individuals' propensity to engage in bullying and strengthens prosocial behaviors.[7] In this context, storytelling—an approach that enables individuals to emotionally connect with others' lived experiences—emerges as an effective method for supporting empathy development.[8]

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Storytelling can be readily planned and implemented in both individual and group-based school interventions by practitioners such as teachers and school nurses. School health nurses, in particular, occupy a pivotal role in the storytelling process, serving not only as health counselors but also as educators who promote social and emotional learning.[9] By integrating storytelling into their practice, nurses can enhance adolescents' empathic awareness, support the development of effective coping strategies against bullying, and create safe learning environments that foster psychosocial resilience.[10]

Cyberbullying prevention requires multilevel action across the school community and should be embedded within a whole-school approach to student health and well-being.[11] Consistent with global guidance, school health services provide an evidence-based platform for delivering preventive, promotive, and referral-oriented support to students within school settings.[12] In line with contemporary school nursing standards, school health nurses contribute through population-based assessments, health education, early identification and referral, coordination of multidisciplinary responses, and advocacy for safe school policies and reporting mechanisms.[9] Furthermore, the National Association of School Nurses[10] explicitly identifies school nurses as key professionals in the prevention and intervention of bullying and cyberbullying through education, case identification, referral coordination, and policy-level action. Accordingly, this review conceptualizes storytelling not only as an educational technique, but as a nurse-coordinated prevention strategy that can be integrated into school health services and whole-school prevention frameworks.

This review synthesizes current empirical and theoretical findings regarding the use of storytelling in addressing cyberbullying and provides a scientific foundation for the development of interdisciplinary, evidence-based, and innovative intervention strategies, particularly within the context of school health nursing. The aim of this review is to examine the potential of storytelling as a method for addressing cyberbullying among adolescents, with specific attention to its implications for school health nursing practice.

Search Strategy of This Literature Review

This review synthesizes empirical evidence on storytelling as an approach to cyberbullying prevention among adolescents, with particular attention to implications for school nursing practice. A literature search was conducted for publications published between January 2015 and December 2025 in PubMed/MEDLINE, Scopus, and Web of Science Core Collection. The search strategy combined three conceptual blocks: (1) cyberbullying or bullying; (2) storytelling or story-based educational approaches (including digital and technology-mediated formats); and (3) adolescent populations or school settings, including school health and school nursing. Reference lists of included studies and relevant review articles were screened to identify additional eligible records. To support the public health and school systems framework, targeted web searches were also conducted to identify guidance documents from the World Health Organization, the Centers for Disease Control and Prevention, and the National Association of School Nurses.

Records were considered eligible if they addressed bullying or cyberbullying in adolescent or school-aged populations and were substantively related to storytelling or story-based educational approaches, including digital and technology-mediated formats. Evidence was also included when it provided guidance relevant to school health services or school nursing practice in areas such as prevention, early identification, referral pathways, or coordinated school responses. Records were excluded if they were unrelated to bullying or cyberbullying, lacked substantive relevance to story-based approaches or school health nursing implications, or if the full text was inaccessible.

Discussion

This review is organized into four sections: (1) Definition of Storytelling and Educational Functions; (2) Design Principles for Storytelling-Based Interventions; (3) Applying Storytelling to Cyberbullying Prevention; and (4) Integrating Storytelling into School Nursing Practice.

Definition of Storytelling and Educational Functions

Storytelling is a long-standing communication method through which individuals convey experiences, emotions, and ideas within a meaningful structure using oral, written, or digital formats.[13] As one of the oldest forms of learning in human history, storytelling not only facilitates knowledge transmission but also communicates values, enables emotional sharing, and supports the internalization of social norms.[13] Through stories, individuals can make sense of complex events, engage with diverse perspectives, and develop a sense of belonging.[14] In this regard, storytelling is considered a multifaceted pedagogical approach that serves both cognitive and affective learning objectives.[15]

Storytelling is widely used to capture adolescents' attention, enhance memory retention, and foster empathy and critical thinking skills.[16-21] This approach is particularly effective during adolescence, as it promotes emotional and social learning.[22] By engaging both cognitive and emotional domains simultaneously, stories support the internalization of knowledge and facilitate attitude change.[23,24] Storytelling contributes not only to academic learning objectives but also to moral development, values education, and the strengthening of social skills.[25] Therefore, it is frequently employed in programs aimed at bullying prevention and empathy training.[26,27] During adolescence, storytelling may be especially relevant because stories can explicitly address peer norms, reputational concerns, and digital citizenship, factors that frequently shape online aggression and bystander behavior.[3]

Principles and Recommendations for Storytelling-Based Interventions

Storytelling is a powerful pedagogical tool that holistically engages cognitive, emotional, and social processes. However, for this method to function as an effective intervention strategy, it must be carefully structured.[13,28]

Stories designed to foster empathy, perspective-taking, and moral reasoning in adolescents should incorporate elements of conflict, resolution, and character development. Such narratives promote identification with characters and stimulate mental state modeling in the listener.[29,30] The narrative structure of stories should be clear and coherent. A well-defined beginning–middle–end sequence, along with clearly presented characters, conflicts, and resolutions, enables listeners to construct a mental story map that highlights causal relationships. Consequently, compelling narratives can become powerful tools for learning and behavior change.[30]

Active participation should be a core component of storytelling-based interventions. Adolescents may write their own stories, dramatize them, reconstruct them in digital formats, or modify existing stories. Such participatory approaches facilitate deeper cognitive restructuring and promote empathy development.[22] Additionally, elements such as story pacing, tone of voice, impactful messages, and eye contact are crucial. Multimedia-supported storytelling—incorporating video, audio, and text—may further enhance effectiveness, inclusivity, and engagement. Visual, auditory, and kinesthetic techniques that address different learning styles can increase participation and strengthen emotional connection.[31,32]

In storytelling practices that address sensitive themes—such as cyberbullying, social exclusion, or traumatic experiences—it is essential to create learning environments in which participants feel safe and protected from emotional distress.[33] Educators should not only provide opportunities for individuals to share stories but also cultivate a respectful, empathetic, and supportive classroom climate in which emotions can be expressed openly.[34] For storytelling-based interventions to be effective, content selection, narrative structure, participation methods, instructional strategies, and ethical considerations must be planned in an integrated manner. This holistic approach transforms storytelling from a mere vehicle for information delivery into a pedagogical tool that fosters empathy, reinforces values, and facilitates inner transformation.

In school-based bullying prevention programs, classroom sessions typically align with standard lesson periods (approximately 30–45 minutes).[35,36] However, systematic reviews of cyberbullying interventions indicate substantial heterogeneity in both session length and overall program duration. Accordingly, these reviews recommend tailoring the number and duration of sessions to the school's available resources and to the developmental characteristics of the target population.[37] To promote safe and effective implementation and support standardization, it is recommended that the school health nurse delivering the sessions complete an initial orientation and brief pre-implementation training. Given the dynamic nature of school environments, ongoing coaching and periodic refresher training should also be available, supported by a structured supervision and monitoring system to maintain quality over time.[12]

The Use of Storytelling in Combating Cyberbullying

Storytelling is a promising approach to addressing cyberbullying, as it enables individuals to engage with others' experiences at both emotional and cognitive levels. However, direct storytelling interventions specifically targeting cyberbullying remain scarce in the literature. Recent reviews indicate that technology-based interventions—such as gamified interactive e-books and scenario- or story-based learning models—can be effective; nevertheless, most studies incorporate storytelling as one component of a broader intervention rather than evaluating it as a standalone protocol.[37-39] For example, Khan et al.[40] demonstrated that storytelling practices significantly improved empathy, self-awareness, and social communication skills among primary school students. In a study conducted in China, Shao et al.[39] reported that a gamified digital storybook application enhanced students' knowledge of cyberbullying, as well as their problem-solving and self-regulation skills. Similarly, Yang and Lu[38] found that a multi-role scenario-based learning model, allowing students to experience the roles of bully, victim, and bystander, fostered empathy and conflict resolution skills. These findings clearly underscore the effectiveness of multifaceted storytelling approaches in fostering empathic experiences. Similarly, a systematic review and meta-analysis examining interactive story-based digital games reported reductions in bullying behaviors and increases in social-emotional awareness.[41]

Through storytelling, individuals can develop awareness not only of the challenges faced by victims but also of the underlying factors influencing the behaviors of those who engage in bullying. This multidimensional perspective shift may promote a conscious effort to transform both victimization and aggressive behaviors.[42] In this regard, storytelling is considered a powerful pedagogical tool in combating cyberbullying, particularly in relation to communication strategies, values-based transformation, social-emotional development, and empathy education.

School Nursing and Storytelling in Combating Cyberbullying

Cyberbullying is a prevalent and complex form of digital violence that particularly affects adolescents. Developing effective and sustainable intervention strategies requires interdisciplinary collaboration, with school health nurses playing a pivotal role.[43] School health nursing is a public health practice area that encompasses not only the monitoring of students' physical health but also the protection and promotion of their mental, social, and digital well-being.[12] In this context, storytelling emerges as a valuable empathy-based intervention tool that school nurses can implement at the individual, group, and community levels.[10,44] Encouraging adolescents to create stories based on their own experiences or to engage with real-life stories that allow them to emotionally explore both victim and bully roles may facilitate cognitive-behavioral restructuring.[38] Such structured storytelling activities can be integrated into nurse-led group sessions, classroom-based programs, or individual counseling. Evidence syntheses suggest that story-based approaches can support the development of social-emotional competencies and related psychosocial outcomes in adolescents, underscoring their relevance to school health nursing practice.[44]

Storytelling-based programs may also be designed by school health nurses as multilevel interventions targeting not only adolescents but also teachers and parents. For example, in digital content–based intervention programs such as Cyberprogram 2.0 or No-Trap, nurses can assume an active facilitative role by delivering psychoeducational modules, guiding adolescents' emotional responses, and fostering a supportive classroom climate.[39,41] Digital storybooks, interactive scenarios, and gamified stories incorporated into such programs may capture adolescents' attention and enhance engagement in the learning process.[45]

When working with adolescents who have experienced bullying, social exclusion, or digital violence, nurses hold fundamental ethical responsibilities, including creating a safe learning environment, respecting adolescents' emotional boundaries, and providing referrals when necessary.[34] School health nurses possess the knowledge, skills, and ethical competence to design storytelling-based interventions holistically in areas such as empathy development, anti-bullying strategies, and digital safety. Therefore, integrating creative, child-centered, and emotion-focused approaches, such as storytelling, into nursing education programs emerges as a strategic necessity for both safeguarding student health and strengthening professional capacity. These responsibilities call for a structured framework to incorporate storytelling into routine school health services. In this regard, the Public Health Intervention Wheel offers a practical model to guide feasible, multilevel school nursing actions for storytelling-based cyberbullying prevention.

Storytelling-based cyberbullying prevention can be conceptualized within the Public Health Intervention Wheel framework. The Intervention Wheel defines population-based public health nursing practice across individual/family, community, and systems levels and organizes practice according to intervention types rather than service settings.[46] Within this framework, school health nurses may use school-level monitoring and early identification strategies to inform the development of cyberbullying-related scenarios and to iteratively refine session content. Structured storytelling sessions can be implemented within the health teaching intervention domain. When recurrent patterns or high-risk situations are identified, referral and follow-up, case management, and safety planning may be employed to provide individualized support.[46] Concurrently, system- and community-level interventions, including consultation, collaboration, advocacy, and policy development and enforcement, can strengthen consistent reporting and response mechanisms across the school community.

Conclusion and Recommendations

This review synthesizes current evidence on storytelling as a strategy for cyberbullying prevention and situates this approach within the scope of school nursing practice. By enabling individuals to engage with the emotional and cognitive perspectives of different roles (bully, victim, and bystander), storytelling is recognized as a powerful tool for fostering empathy, facilitating values-based transformation, empowering adolescents emotionally, and promoting adherence to social norms. To enhance nursing-specific applicability, storytelling-based cyberbullying prevention was mapped onto population-based public health nursing practice using the Public Health Intervention Wheel and established school nursing standards. This mapping delineates actionable steps across key domains, including assessment and monitoring, health teaching, counseling and follow-up, referral coordination, and school-wide strategies such as consultation, collaboration, advocacy, and policy development.

In conclusion, storytelling-based cyberbullying prevention represents a feasible and scalable approach that can be integrated into routine school health services under the leadership of school nurses. When implemented across individual-level support, classroom-based education, and school-wide systems, it has the potential to foster empathic responses, reduce the normalization of online aggression, and strengthen bystander intervention and help-seeking behaviors. Future experimental studies should evaluate nurse-led, storytelling-based cyberbullying prevention programs integrated into routine school health services, including follow-up assessments to examine the durability of their effects.

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References

1. Li C, Wang P, Martin-Moratinos M, Bella-Fernández M, Blasco-Fontecilla H. Traditional bullying and cyberbullying in the digital age and its associated mental health problems in children and adolescents: a meta-analysis. Eur Child Adolesc Psychiatry. 2024;33(9):2895–2909. [CrossRef]
2. Mateus Francisco S, Costa Ferreira P, Veiga Simão AM, Salgado Pereira N. Moral disengagement and empathy in cyberbullying: how they are related in reflection activities about a serious game. BMC Psychol. 2024;12(1):168. [CrossRef]
3. Chan TKH, Cheung CMK, Lee ZWY. Cyberbullying on social networking sites: a literature review and future research directions. Inf Manag. 2021;58(2):103411. [CrossRef]
4. Zych I, Baldry AC, Farrington DP, Llorent VJ. Are children involved in cyberbullying low on empathy? A systematic review and meta-analysis of research on empathy versus different cyberbullying roles. Aggress Violent Behav. 2019;45:83–97. [CrossRef]
5. Zhu C, Huang S, Evans R, Zhang W. Cyberbullying Among Adolescents and Children: A Comprehensive Review of the Global Situation, Risk Factors, and Preventive Measures. Front Public Health. 2021;9:634909. [CrossRef]
6. Fang J, Wang X, Yuan KH, Wen Z, Yu X, Zhang G. Callous-unemotional traits and cyberbullying perpetration: the mediating role of moral disengagement and the moderating role of empathy. Pers Individ Dif. 2020;157:109829. [CrossRef]
7. Shannen T, Kim SJ, Lee J. Empathy, cyberbullying, and cybervictimization among Filipino adolescents. Child Health Nurs Res. 2021;27(1):65–74. [CrossRef]
8. Andreeva I, Green M. Testing the role of narrative modeling on self-compassion. J Media Psychol. 2025;37(1):1–11. [CrossRef]

9. National Association of School Nurses (NASN). School Nursing: Scope and Standards of Practice. 4th ed. National Association of School Nurses; 2022.
10. National Association of School Nurses. National Association of School Nurses Position Statement: Prevention and Intervention of Bullying and Cyberbullying in Schools. J Sch Nurs. 2025;41(3):409–411. [CrossRef]
11. Centers for Disease Control and Prevention. Strategies for using the Whole School, Whole Community, Whole Child (WSCC) framework. Accessed March 17, 2026. https://www.cdc.gov/whole-school-community-child/strategies/index.html
12. World Health Organization. Implementation guidance for school health services. Accessed March 17, 2026. https://cdn.who.int/media/docs/default-source/mca-documents/adolescents/shs_draft_1_for-public-consultation_18.11.2024.pdf
13. Dudley MZ, Squires GK, Petroske TM, Dawson S, Brewer J. The Use of Narrative in Science and Health Communication: A Scoping Review. Patient Educ Couns. 2023;112:107752. [CrossRef]
14. Frolli A, Cerciello F, Ciotola S, Ricci MC, Esposito C, Sica LS. Narrative Approach and Mentalization. Behav Sci (Basel). 2023;13(12):994. [CrossRef]
15. Landrum R, Brakke K, McCarthy M. The pedagogical power of storytelling. Scholarsh Teach Learn Psychol. 2019;5(3):247–253. [CrossRef]
16. Bagley L, Wilson J, Kime A. The story so far: current opinion in the use and applications of interactive storytelling in physiology and clinical education. Curr Res Physiol. 2025;100142. [CrossRef]
17. Barchas-Lichtenstein J, Sherman M, Voiklis J, Clapman L. Science through storytelling or storytelling about science? Identifying cognitive task demands and expert strategies in cross-curricular STEM education. Front Educ. 2023;8:1279861. [CrossRef]
18. Bilen K, Hoştut M, Büyükcengiz M. The effect of digital storytelling method in science education on academic achievement, attitudes, and motivations of secondary school students. Pedagogical Res. 2019;4(3):em0034. [CrossRef]
19. Dima A, Kaiafa E, Tsiaras A. Drama education through storytelling strategy develops students' critical thinking skills. Paper presented at: 3rd International Conference on Advanced Research in Education; March 11-14, 2021; Oxford, United Kingdom. Accessed March 17, 2026. https://www.dpublication.com/wp-content/uploads/2021/03/93-192.pdf
20. Ghafar Z. Storytelling as an educational tool to improve language acquisition: a review of the literature. J Digit Learn Distance Educ. 2024;2(10):781–790. [CrossRef]
21. Walan S, Enochsson AB. The potential of using a combination of storytelling and drama when teaching young children science. Eur Early Child Educ Res J. 2019;27(6):821–836. [CrossRef]
22. Pulimeno M, Piscitelli P, Colazzo S. Children's literature to promote students' global development and wellbeing. Health Promot Perspect. 2020;10(1):13–23. [CrossRef]
23. Breiner H, Ford M, Gadsden VL. Parenting knowledge, attitudes, and practices. In: Breiner H, Ford M, Gadsden VL, eds. Parenting Matters: Supporting Parents of Children Ages 0-8. Washington, DC: National Academies Press; 2016.
24. Rutledge P. Everything is story: Telling stories and positive psychology. In: Wright JD, ed. Exploring Positive Psychology: The Science of Happiness and Well-Being. USA: ABC-Clio; 2016.
25. Benabbes S, AbdulHaleem Abu Taleb H. The effect of storytelling on the development of language and social skills in French as a foreign language classrooms. Heliyon. 2024;10(8):e29178. [CrossRef]
26. Odumegwu J, Scheidt L, McMahon J. Fostering empathy in children through storytelling: a protocol for scoping review. Published Online May 2022. doi:10.21203/rs.3.rs-1665413/v2
27. Fokides E. Using digital storytelling to inform students about bullying: results of a pilot program. In: Khosrow-Pour M, ed. Research Anthology on School Shootings, Peer Victimization, and Solutions for Building Safer Educational Institutions. Information Science Reference/IGI Global; 2021:514–526. [CrossRef]
28. Mojtahedzadeh R, Mohammadi A, Hossein Emami A, Zarei A. How Digital Storytelling Applied in Health Profession Education: A Systematized Review. J Adv Med Educ Prof. 2021;9(2):63–78.
29. Herman D. Storytelling and the Sciences of Mind. MIT Press; 2017.
30. Storr W. The Science of Storytelling: Why Stories Make Us Human and How to Tell Them Better. Abrams Press; 2020.
31. Boris V. What Makes Storytelling So Effective For Learning? Harvard Business Impact. Accessed March 17, 2026. https://www.harvardbusiness.org/insight/what-makes-storytelling-so-effective-for-learning/
32. Gallo C. Storytelling to Inspire, Educate, and Engage. Am J Health Promot. 2019;33(3):469–472. [CrossRef]
33. Vegt N, Visch V, Spooren W, van Rossum EFC, Evers AWM, van Boeijen A. Erasing stigmas through storytelling: why interactive storytelling environments could reduce health-related stigmas. Design Health (Abingdon). 2024;8(1):46–77. [CrossRef]
34. Karousiou C, Vrikki M, Evagorou M. Teachers' perceptions on introducing sensitive and controversial issues in the classroom. Front Educ. 2025;10:1481173. [CrossRef]
35. Olweus Bullying Prevention Program. Accessed March 17, 2026. https://clemsonolweus.org/
36. KiVa Antibullying Program. Accessed March 17, 2026. https://www.kivaprogram.net/
37. Kamaruddin IK, Ma'rof AM, Mohd Nazan AIN, Ab Jalil H. A systematic review and meta-analysis of interventions to decrease cyberbullying perpetration and victimization: An in-depth analysis within the Asia Pacific region. Front Psychiatry. 2023;14:1014258. Erratum in: Front Psychiatry. 2023;14:1226698. [CrossRef]
38. Yang KH, Lu Y. Combating school bullying through multi-role experience-based virtual scenario learning model: Assessing empathy, problem-solving, and self-efficacy from a multi-stakeholder perspective. Heliyon. 2024;10(10):e31044. [CrossRef]
39. Shao J, Abdul Rabu SN, Chen C. Gamified interactive e-books for bullying prevention: enhancing knowledge and motivation in Chinese primary schools. Front Psychol. 2025;16:1509549. [CrossRef]
40. Khan S, Poletti G, Khan F, Hussain S. Digital storytelling: a pedagogical approach to enhance young learners' social-emotional skills. Rev Educ Adm Law. 2025;8(2):219–228. [CrossRef]
41. Gómez-León MI. Serious games to support emotional regulation strategies in educational intervention programs with children and adolescents. Systematic review and meta-analysis. Heliyon. 2025;11(4):e42712. [CrossRef]
42. Thompson S. Everybody's got a story: Examining the building of empathy and understanding for the bully, the bullied, and the bystander through digital storytelling. Dissertation. University of Ontario Institute of Technology; 2018.
43. Yosep I, Mardhiyah A, Suryani S, Hikmat R, Kurniawan K, Purnama H. Experiences of mental health nurses who give nursing intervention among child and adolescent with cyberbullying: a qualitative study. BMC Nurs. 2025;24(1):527. [CrossRef]
44. Ramamurthy C, Zuo P, Armstrong G, Andriessen K. The impact of storytelling on building resilience in children: A systematic review. J Psychiatr Ment Health Nurs. 2024;31(4):525–542. [CrossRef]
45. Konstantopoulou A, Nikolaou E, Fesakis G, Volika S, Markogiannakis G. Designing interactive digital storytelling as a strategy of raising children's awareness of bullying in preschool education: implications for bullying prevention. International Digital Storytelling Conference; September 21-23; 2018; Zante, Greece. Accessed March 17, 2026. https://www.researchgate.net/publication/327915611_DESIGNING_INTERACTIVE_DIGITAL_STORYTELLING_AS_A_STRATEGY_OF_RAISING_CHILDREN'S_AWARENESS_OF_BULLYING_IN_PRESCHOOL_EDUCATION_IMPLICATIONS_FOR_BULLYING_PREVENTION
46. Minnesota Department of Health. Public health interventions: applications for public health nursing practice. 2nd ed. Published 2019. Accessed March 17, 2026. https://www.health.state.mn.us/communities/practice/research/phncouncil/wheel.html