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# JERN

## Journal of Education and Research in Nursing

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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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**Open Access Statement**



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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.

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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, 8$^{th}$ 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.

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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

Journal of Education and Research in Nursing requires and encourages the authors and the individuals involved in the evaluation process of submitted manuscripts to disclose any existing or potential conflicts of interests, including financial, consultant, and institutional, that might lead to potential bias or a conflict of interest. Any financial grants or other support received for a submitted study from individuals or institutions should be disclosed to the Editorial Board. To disclose a potential conflict of interest, the ICMJE Potential Conflict of Interest Disclosure Form should be filled in and submitted by all contributing authors. The journal's Editorial Board resolves cases of a potential conflict of interest of the editors, authors, or reviewers within the scope of COPE and ICMJE guidelines.

## 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 11$^{th}$ 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 present the 2025 Issue 2 (Volume 22, Issue 2, June 2025) of the Journal of Education and Research in Nursing.

The 2025 Nursing Week was commemorated globally, including in Türkiye, under the theme "Our Nurses. Our Future. Caring for nurses strengthens economies", as designated by the International Council of Nurses (ICN). This year's theme underscores the critical role of nurses not only as foundational components of health care systems but also as key contributors to the social and economic development of societies. The campaign emphasized the urgent need to develop evidence-based and actionable solutions to address the multifaceted challenges nurses face—spanning physical, mental, emotional, and ethical dimensions of their professional lives. In alignment with this theme, the ICN's 2025 International Nurses Day (IND) report presented a comprehensive set of scientifically grounded strategies aimed at enhancing nurses' health and wellbeing. The report recognizes that fostering the wellbeing of the nursing workforce is essential not only for individual health outcomes but also for the creation of resilient health systems and the advancement of economic sustainability. Proposed interventions include support for mental health, promotion of physical wellness, assurance of occupational safety, and cultivation of positive and inclusive workplace cultures. These measures aim to ensure that nurses operate in environments that are both safe and supportive, enabling them to deliver higher-quality patient care and to contribute more effectively and sustainably to health systems over the long term. As articulated in ICN's Charter for Change, the protection, respect, and strategic investment in nurses by governments and health institutions are imperative for the sustainability of the nursing profession and the broader health care sector. Prioritizing the health and wellbeing of nurses is not only a professional obligation but also a public health imperative and a societal necessity.

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), Elecronic Journal library (2024), 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, our readers, editors, managing director and advisory board members are.

As for our June 2025 issue, a total of 11 studies, including 9 valuable original studies, one is review and one case report is presented in this issue. The titles of the articles are as follows:

The original articles are titled "Effect of moral sensitivity on empathy levels of nursing students", "Earthquake preparedness recommendations from frontline nurses and rescuers in the 2023 Türkiye-Syria earthquake: A grounded theory", "Assessing Intern Students' Professional Commitment and Perspectives on Graduate Education", "The Relationship Between Patients' Perceptions of Illness and Their Satisfaction with Nursing Care",

"Relationship between teachers' attitudes and knowledge toward epilepsy and their health literacy and health anxiety", "Comparison of Psychosocial and Economic Problems and Quality of Life in Patients Following Heart Transplantation or Left Ventricular Assist Device Implantation", "Obsession with Healthy Eating in Pregnancy Scale: Instrument Development and Cross-sectional Validation Study", "Osteoarthritis and its management, impact of wearable technologies: A systematic review" and "Validity and reliability of the Turkish version of the gender equality scale in nursing education".

The review article is titled "Positive work environment in nursing: Components and strategies".

The case report article is titled "Serotonin syndrome in an adolescent: Early nursing interventions and care strategies in the emergency department using the components of life model".

I would like to express my endless thanks to our authors who have contributed to present the 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 has contributed to the publication of our journal, and to the members of the advisory board who has carefully evaluated each article.

***"Science is the great antidote to the poison of enthusiasm and superstition."***
***Adam Smith***

**Kind regards,**

**Prof. Sevilay Şenol Çelik, PhD, RN**

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Original Article

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# Effect of Moral Sensitivity on Empathy Levels of Nursing Students

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## Abstract

**Background:** Empathy skills are essential components of nursing care plans for nursing students to provide high-quality care to patients and are closely associated with moral sensitivity.

**Aim:** This study aims to explore the relationship between nursing students' empathy skills, moral sensitivity, and other related variables.

**Methods:** This research was designed as a cross-sectional study. The study was conducted at a state university offering a four-year nursing program, with a sample size of 353 students. Data were collected via an online survey in March 2022. Students who agreed to participate voluntarily were included in the study. Data analysis was performed using Pearson correlation and multiple linear regression methods.

**Results:** A total of 353 students participated in the study, with a mean age of 21.83±1.39 years. The mean empathy score was 162.03±25.40, and the mean moral sensitivity score was 97.63±30.21, indicating moderate levels for both. The Holistic Approach sub-dimension of moral sensitivity (r=-0.309, p=0.021) and the Interpersonal Orientation sub-dimension (-0.260, p=0.001) were associated with empathy skills and positively influenced their development. Additionally, the Execution sub-dimension of the moral sensitivity questionnaire was identified as a predictor of empathy skills (B=-1.27, p=0.002).

**Conclusion:** Moral sensitivity is an important factor in the development of empathy skills among nursing students. However, the empathy skills of nursing students were found to be below the desired level. To enhance the empathy skills of nursing students, theoretical course content should be enriched, and their empathy levels should be assessed through bedside observations during clinical practice.

*Keywords: Clinical practice, empathy skills, ethics, nursing students, moral sensitivity*

## Introduction

In the nursing profession, developing, synchronizing, sharing clinical and theoretical information, and adhering to ethical principles are fundamental components for ensuring safe and effective patient care.[1] The concept of morality was first explored by Lawrence Kohlberg, and building on this foundation, James Rest introduced the term moral sensitivity as one of the key components of moral action.[2,3] In the context of ethical conflicts, a high level of moral sensitivity is required to accurately identify the problem and make appropriate decisions. Moral sensitivity enables nurses to correctly perceive ethical issues and understand patient needs.[4,5] Nursing students must develop moral sensitivity to enhance their nursing practice, as acquiring this skill early leads to better quality patient care.[6]

Travelbee,[7] a prominent nursing theorist, described empathy in her Human-to-Human Relationship Model as "basically an intellectual process combined with an effort to understand someone else, trying to understand how a person feels, even though I can't feel what they feel." The social environment and family are two important factors influencing the development of empathy. Additionally, teamwork skills, subjective well-being, age, and gender also emerge as significant factors in fostering empathy among nursing students in patient care.[8] While higher levels of empathy in nurses are associated with more positive attitudes toward patients, studies report that empathy levels tend to decrease as burnout levels increase.[9,10]

While empathy supports better analysis and interpretation of the moral problems experienced, it also plays a role in recognizing moral problems in others. Fostering empathy among students has become essential for developing moral sensitivity.[11] In their study, Nesime and Belgin[12] found that patient advocacy education included in undergraduate programs positively contributed to the moral sensitivity of nursing students. Another study identified factors affecting the development of empathy, including innate characteristics, physiological and mental states, professional identity, work environment, life experience, and situational stressors.[13] Technological advancements in the healthcare field and the recent Coronavirus Disease 2019 (COVID-19) pandemic have introduced numerous ethical challenges.[14,15] Consequently, ethical dilemmas in the nursing profession have become inevitable.

In addition to the theoretical and clinical education of nursing students, fostering moral sensitivity and empathy skills is crucial to improving the quality of patient care. This article aims to evaluate nursing students' empathy skills and the factors influencing them.

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## Research Questions

1. Are nursing students' empathy skills related to moral sensitivity?
2. Does moral sensitivity affect the development of empathy skills in nursing students?
3. What other variables are related to nursing students' empathy skills?

# Materials and Methods

## Research Design

This research is designed as a cross-sectional study.

## Participants and Research Context

The study population consisted of 600 second-, third-, and fourthyear nursing students enrolled at a state university in western Türkiye. At this university, clinical practice internships are conducted in the second and third years, lasting 28 weeks per academic year, with 16 hours of practice each week. In the fourth grade, nursing students work as interns, participating in 24 hours of clinical practice per week over 28 weeks. First-year students were excluded from the study as clinical practice internships are not part of their curriculum. The aim was to reach the entire study population. A total of 353 students voluntarily completed the questionnaire, achieving a participation rate of 58.83%.

## Data Collection Tools

### Introductory Information Form

This form was prepared by the researchers following a comprehensive literature review.[5,6,8,10,12,15] It consists of two sections. The first section collects demographic information about the students, while the second section includes questions about whether they have received empathy or ethics training and whether they have encountered ethical dilemmas. Students' academic success was evaluated using their cumulative grade point average.

### Empathy Skill Scale

The Empathy Skill Scale (ESS) was developed by Dökmen in 1988,[16] based on Kohlberg's moral development theory. The scale comprises six scenarios depicting daily life problems involving friends or family, with 12 potential empathetic responses for each scenario. Participants were instructed to select four out of 12 empathetic responses, with each response scored between 0 and 10 points. Accordingly, the total possible score on the ESS ranges from a minimum of 62 to a maximum of 219. Additionally, one of the responses was intentionally designed to be irrelevant to the constructed problem, and surveys in which participants selected this response were deemed invalid. In this study, the reliability coefficient of the scale was calculated to be 0.82.

### Moral Sensitivity Questionnaire

This scale, developed by Lützén et al.[17] to assess the ethical sensitivity of healthcare professionals during the ethical decision-making process, was adapted to Turkish culture by Tosun.[18] It consists of six sub-dimensions–autonomy, benevolence, holistic approach, conflict, execution, and interpersonal orientation–and includes a total of 30 questions. Scores on the scale range from a minimum of 30 to a maximum of 210. A lower score indicates higher ethical sensitivity, while a larger score reflects lower sensitivity. In this study, the reliability coefficient of the scale was calculated as 0.92.

## Data Collection

Questionnaires were created using Google Forms to collect data from students. An explanatory description of the study was shared on an online communication platform used by students for education and training-related discussions. The link to the online questionnaire was also provided. Completing the entire set of questionnaires took approximately 20 minutes. Data collection occurred in March 2022, after obtaining approval from the Ethics Committee and institutional permissions. A total of 353 students who met the inclusion criteria (enrolled at the relevant university, having internet access, and volunteering to participate in the study) provided valid responses.

## Data Analysis

Data were analyzed using the IBM SPSS Statistics 23 software package (Armonk, NY: IBM Corp.). Normality of the data distribution was assessed using kurtosis and skewness values. Continuous variables were presented as mean±standard deviation, and categorical variables were expressed as numbers and percentages. In examining the relationships between numerical data, Pearson correlation analyses were conducted, and factors influencing empathy ability were analyzed using multiple linear regression. Results were evaluated within a 95% confidence interval, with statistical significance set at $p<0.05$.

## Ethical Considerations

Ethical approval for this study was obtained from the Non-interventional Clinical Research Ethics Committee of Pamukkale University (Approval Number: E-60116787-020-161649, Date: 25.01.2022). Permission to use the Turkish versions of the scales was obtained from the authors who conducted their validity and reliability studies. Prior to completing the surveys, students were fully informed about the study. In the online survey, they were explicitly asked, "Do you agree to participate in the research voluntarily?", and all participants provided affirmative responses. Thus, informed consent was obtained from all volunteers. The study was conducted in accordance with the principles outlined in the Declaration of Helsinki.

# Results

The majority of the participants were female (83.9%, n=296), while 16.1% (n=57) were male. The distribution of students across grades was as follows: 100 second-grade students (28.2%), 137 third-grade students (38.8%), and 116 fourth-grade students (33%). The age range of the participants was 19 to 36 years, with an average age of 28.83±1.39.

It was concluded that male students had a lower mean ESS total score than female students ($p=0.006$, $t=2.847$). Additionally, the mean ESS total score was higher among nursing students compared to those who had not received training or courses on empathy and ethics. A statistically significant difference was found between these groups ($p=0.001$, $t=3.427$; $p<0.001$, $t=4.111$) (Table 1).

**Table 1.** Variables related to nursing students and differences between groups

| | ESS Mean±SD[a] (Median,IQR)[b] | p value | test |
|---|---|---|---|
| Gender | | | |
| Female (n=296) | 163.69±25.21 | **0.006** | 2.847[a] |
| Male (n=57) | 153.43±24.83 | | |
| Did you receive training/courses on empathy? | | | |
| Yes (n=158) | 167.10±23.41 | **0.001** | 3.427[a] |
| No (n= 195) | 157.92±26.25 | | |
| Did you receive training/courses on ethics? | | | |
| Yes (n=166) | 167.78±24.08 | **<0.001** | 4.111[a] |
| No (n=187) | 156.93±25.51 | | |
| Did you experienced ethical dilemmas in your social life? | | | |
| Yes (n=43) | 162.51 (166.0, 42.0) | 0.990 | 6657.5[b] |
| No (n=310) | 161.97 (163.00,38.0) | | |
| Did you experience ethical dilemmas in your clinical practice? | | | |
| Yes (n=27) | 162.92 (163.00, 45.00) | 0.985 | 4391.5[b] |
| No (n= 326) | 161.96 (163.50,38.00) | | |

ESS: Empathy skill scale, [a]independet t-test, [b]Mann–Whitney U test.

**Table 2.** Correlation of the empathy skill scale with age, academic success, and sub-dimensions of the moral sensitivity questionnaire

| | X±SD (Min-Max) | ESS | |
|---|---|---|---|
| | | r | p |
| Age, years | 21.83±1.39 (19-36) | -0.058 | 0.137 |
| Academic success* | 3.13±0.26 (2.09-3.81) | **0.303** | **<0.001** |
| ESS | 162.03±25.40 (92-211) | - | - |
| MSQ | 97.63±30.21 (30-210) | -0.14 | 0.393 |
| Sub-dimensions of MSQ | | | |
| Autonomy | 22.14±8.46 (7-49) | 0.012 | 0.413 |
| Benevolence | 13.11±4.49 (4-28) | -0.021 | 0.344 |
| Holistic approach | 14.16±7.28 (5-35) | **-0.309** | **0.021** |
| Conflict | 11.54±3.37 (3-21) | -0.029 | 0.291 |
| Execution | 14.23±4.65 (4-28) | 0.085 | 0.056 |
| Interpersonal orientation | 10.60±6.55 (4-28) | **-0.260** | **0.001** |

*Academic success scale score in the university; Min: 1.75, Max: 4.00 (a positive correlation indicates a higher academic success score). ESS: Empathy skill scale, MSQ: Moral sensitivity questionnaire, r: Pearson correlation coefficient.

The mean total score on the Empathy Skill Scale was 162.03±25.40, while the mean total score on the Moral Sensitivity Questionnaire (MSQ) was 97.63±30.21. A weak, statistically significant negative correlation was found between the ESS total score and academic achievement, the holistic approach sub-dimension of the MSQ, and the interpersonal orientation sub-dimension (Table 2).

Multiple linear regression analysis revealed that the sub-dimensions of the Moral Sensitivity Scale had a low but significant effect on empathy ability (R=0.317, $R^2$=0.187, p=0.008). This indicates that the sub-dimensions of moral sensitivity explain 18% of the variance in empathy skills. The study found that only the execution sub-dimension of the Moral Sensitivity Questionnaire serves as a predictor of empathy ability (Table 3).

## Discussion

This study explored the empathy skills of students who are future health professionals, examined their relationship with moral sensitivity, and analyzed the influencing factors. One of the primary goals of the nursing profession is to deliver the highest quality care to patients. High levels of empathy among health professionals are an essential requirement for providing better quality patient care.[19]

When the results are examined, it is evident that gender differences among students influence their empathy skills. Studies on the subject indicate that female nursing students tend to have higher empathy skills compared to their male counterparts.[8,20,21] In most cultures, gender norms and traditional caregiving roles, often assigned to women from an early age, are frequently cited as factors contributing to the relationship between empathy and gender. In a study by Yang et al.,[22] it was found that structured empathy training for nursing students enhanced their empathy skills. Similarly, nursing students who took communication courses during their undergraduate education or participated in simulation training in digital environments also showed improvements in empathy skills.[20,23,24] This study likewise found that students who received training in empathy and ethics demonstrated better empathy skills. These findings suggest that a supportive learning environment, appropriate educational materials, diverse teaching methods, and fostering sensitivity toward empathy throughout the educational process play a crucial role in developing students' empathy skills. It was observed that ethical dilemmas encountered by students were not related to their empathy skills. However, previous research has shown that oncology patients and end-of-life care, which are often associated with ethical dilemmas in patient-nurse communication, are linked to higher empathy skills.[25,26] The ethical dilemmas observed in this study may be related to the significance of the dilemmas experienced, which might explain why they do not appear to impact the students' empathy skills.

In the current literature, some studies have found that the empathy skills of students in different classes or age groups are similar, while others have identified a negative relationship between empathy skills and age.[8,20,27] In this study, the lack of a relationship between age and empathy skills may be attributed to the students' engagement in clinical internships throughout their education, which helps keep their empathy skills and sensitivities dynamic. Additionally, studies have shown a relationship between empathy levels and academic success. For instance, a study by Iqbal et al.[28] with medical students and another by Ertuğ[29] with nursing students both found that empathy levels increased with higher academic achievement. The positive correlation identified in this study aligns with the findings in the literature.

In recent years, studies conducted with clinical nurses have reported a positive relationship between moral sensitivity and empathy.[30,31] Technological advancements in patient care practices are continually evolving and progressing. These developments introduce new ethical dilemmas, particularly in the care of critically ill patients, such as those in intensive care or oncology. Consequently, ethics remains an important and ongoing concern in nursing care as technology advances. In this context, the lack of a relationship between the mean scores of nursing students on the ESS and MSQ emerges as an important finding. The lack of a

**Table 3.** Predictors of empathy skill scale scores: Multiple linear regression analysis

| | Unstandardized coefficients | | Standardized xoefficients | | |
|---|---|---|---|---|---|
| | B | SE | β | t | p |
| Constant | - | 5.777 | - | 27.609 | 0.000 |
| Autonomy | -0.228 | 0.322 | -0.076 | -0.708 | 0.479 |
| Benevolence | 0.487 | 0.416 | 0.086 | 1.169 | 0.243 |
| Holistic approach | -0.088 | 0.432 | -0.025 | -0.205 | 0.838 |
| Conflict | -0.685 | 0.438 | -0.091 | -1.566 | 0.118 |
| Execution | -1.277 | 0.402 | 0.234 | 3.179 | **0.002** |
| Interpersonal orientation | -0.736 | 0.462 | -0.190 | -1.593 | 0.112 |

Model summary: R=0.317; $R^2$ (% explained variance) = 0.187 (18.7%); Adjusted $R^2$=0.244; F=2.932; p=0.008.

relationship between empathy skills and moral sensitivity is likely due to students' limited exposure to ethical dilemmas in patient care during their clinical internships, which may hinder the development of their moral reasoning abilities. Empathy, on the other hand, is constantly developing under the influence of the social environment and may evolve independently of moral sensitivity. As a result, the relationship between empathy and moral sensitivity in students may be insignificant. In contrast, clinical nurses, due to their extended interactions with patients, may develop greater sensitivity, leading to a stronger relationship between empathy and moral sensitivity. When examining the average total scores of the ESS and MSQ, it is evident that students scored at an intermediate level on both scales. Studies in the literature align with this finding.[32,33] However, another study involving a sample group of nursing students found a decline in empathy levels after the third year.[34] To address this issue, theoretical courses on empathy should be maintained alongside clinical internships to ensure the continuous development of students' empathy skills. As sensitivity related to the holistic approach and interpersonal orientation sub-dimensions of the MSQ increases, empathy skills also improve. The holistic approach emphasizes nursepatient interactions that address psychological well-being in addition to physical care. Students who engage in holistic care are more likely to actively listen to patients and incorporate their experiences into nursing care. Consequently, the application of holistic care by students may play a crucial role in developing their empathy skills. The interpersonal orientation sub-dimension of the MSQ reflects students' decisions regarding actions that impact nurse-patient relationships. During the decision-making process, as students strive to make choices that best serve their patients, their empathy skills are likely to play a role and improve over time.

When examining the predictive factors of empathy ability, only the execution sub-dimension of the MSQ appears to be effective. This sub-dimension focuses on questions related to providing care or treatment while considering the ethical aspects of the situation. Greater sensitivity in this area can lead to enhanced empathy skills. Conversely, the other five sub-dimensions of the MSQ do not seem to influence the development of empathy skills.

## Limitations and Strengths

This study aimed to reach the entire population; however, nearly half of the students did not complete the questionnaire. The study was conducted during the academic semester, coinciding with a period of intensive theoretical and practical coursework, which likely restricted students' availability for participation. Nevertheless, as the study was limited to nursing students from a single university, its findings cannot be generalized to the broader nursing student population, representing a key limitation of this research. Since this study was conducted on nursing students from a single university, the results cannot be generalized to all nursing students. This is another limitation of the research.

## Conclusion

Empathy skills and moral sensitivity are two indispensable concepts for providing high-quality patient care. This study identified a relationship between empathy skills and moral sensitivity, highlighting the roles of gender, courses related to empathy/ethics, and academic success in the development of emphasis should be placed on fostering the development of empathy in male students, and all students should have opportunities to visit clinics where ethical dilemmas are frequently encountered. Additionally, students' empathy skills should be assessed during their transition to each higher academic level, and changes should be monitored over the years to track their progress.

**Ethics Committee Approval:** The study was approved by the Non-interventional Clinical Research Ethics Committee of Pamukkale University (Approval Number: E-60116787-020-161649, Date: 25.01.2022).

**Informed Consent:** Written consent was obtained from the volunteers.

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

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**Authorship Contributions:** Concept – B.B., B.Ç.; Design – B.B., B.Ç.; Supervision – B.Ç.; Funding – B.B.; Materials – B.B., B.Ç.; Data collection and/or processing – B.B.; Data analysis and/or interpretation – B.B., B.Ç.; Literature search – B.B.; Writing – B.B., B.Ç.; Critical review – B.B., B.Ç.

**Peer-review:** Externally peer-reviewed.

## References

1. Peirce AG, Elie S, George A, Gold M, O'Hara K, Rose-Facey W. Knowledge development, technology and questions of nursing ethics. Nurs Ethics. 2020;27(1):77–87. [CrossRef]
2. Kohlberg L. Education, moral development and faith. J Moral Educ.1974;4(1):5–16. [CrossRef]
3. Rest JR. Research on moral development: implications for training counseling psychologists. Couns Psychol. 1984;12(3):19–29. [CrossRef]
4. Mert S, Sayilan AA, Karatoprak AP, Baydemir C. The effect of COVID-19 on ethical sensitivity. Nurs Ethics. 2021;28(7–8):1124–1136. [CrossRef]
5. Palazoğlu CA, Koç Z. Ethical sensitivity, burnout, and job satisfaction in emergency nurses. Nurs Ethics. 2019;26(3):809–822. [CrossRef]
6. Lee HL, Huang SH, Huang CM. Evaluating the effect of three teaching strategies on student nurses' moral sensitivity. Nurs Ethics. 2017;24(6):732–743. [CrossRef]
7. Travelbee J. What do we mean by rapport? Am J Nurs. 1963;63:70–72. [CrossRef]
8. Berduzco-Torres N, Medina P, San-Martín M, Delgado Bolton RC, Vivanco L. Non-academic factors influencing the development of empathy in undergraduate nursing students: a cross-sectional study. BMC Nurs. 2021;20(1):245. [CrossRef]
9. Román-Sánchez D, Paramio-Cuevas JC, Paloma-Castro O, et al. Empathy, burnout, and attitudes towards mental illness among Spanish mental health nurses. Int J Environ Res Public Health. 2022;19(2):692. [CrossRef]
10. Yuguero O, Forné C, Esquerda M, Pifarré J, Abadías MJ, Viñas J. Empathy and burnout of emergency professionals of a health region: a cross-sectional study. Med (Baltim). 2017;96(37):e8030. [CrossRef]
11. Maxwell B, Racine E. Should empathic development be a priority in biomedical ethics teaching? A critical perspective. Camb Q Healthc Ethics. 2010;19(4):433–445. [CrossRef]
12. Nesime D, Belgin A. Impact of Education on student nurses' advocacy and ethical sensitivity. Nurs Ethics. 2022;29(4):899–914. [CrossRef]
13. Yu CC, Tan L, LE MK, et al. The development of empathy in the healthcare setting: a qualitative approach. BMC Med Educ. 2022;22(1):245. [CrossRef]
14. Korhonen ES, Nordman T, Eriksson K. Technology and its ethics in nursing and caring journals: an integrative literature review. Nurs Ethics. 2015;22(5):561–576. [CrossRef]
15. Seo H, Kim K. Factors influencing public health nurses' ethical sensitivity during the pandemic. Nurs Ethics. 2022;29(4):858–871. [CrossRef]
16. Dökmen Ü. Measuring empathy based on a model and improving it by psychodrama. JFES. 1988;21(1):155–190.
17. Lützén K, Evertzon M, Nordin C. Moral sensitivity in psychiatric practice. Nurs Ethics. 1997;4(6):472–482. [CrossRef]
18. Tosun H. Moral Sensitivity Questionnaire (MSQ): Turkish adaptation of the validity and reliability. J Contemp Med. 2018;8(4):316–321.
19. Bilgiç Ş. Does the compassion level of nursing students affect their ethical sensitivity? Nurse Educ Today. 2022;109:105228. [CrossRef]
20. Öztürk A, Kaçan H. Compassionate communication levels of nursing students: predictive role of empathic skills and nursing communication course. Perspect Psychiatr Care. 2022;58(1):248–255. [CrossRef]
21. Korkmaz Doğdu A, Aktaş K, Dursun Ergezen F, Bozkurt SA, Ergezen Y, Kol E. The empathy level and caring behaviors perceptions of nursing students: a cross-sectional and correlational study. Perspect Psychiatr Care. 2022;58(4):2653–2663. [CrossRef]
22. Yang C, Zhu YL, Xia BY, Li YW, Zhang J. The effect of structured empathy education on empathy competency of undergraduate nursing interns: a quasi-experimental study. Nurse Educ Today. 2020;85:104296. [CrossRef]
23. Yu J, Parsons GS, Lancastle D, Tonkin ET, Ganesh S. "Walking in Their Shoes": the effects of an immersive digital story intervention on empathy in nursing students. Nurs Open. 2021;8(5):2813–2823. [CrossRef]
24. Ma Z, Huang KT, Yao L. Feasibility of a computer role-playing game to promote empathy in nursing students: the role of immersiveness and perspective. Cyberpsychol Behav Soc Netw. 2021;24(11):750–755. [CrossRef]
25. Arda Sürücü H, Anuş Topdemir E, Baksi A, Büyükkaya Besen D. Empathic approach to reducing the negative attitudes of nursing undergraduate students towards cancer. Nurse Educ Today. 2021;105:105039. [CrossRef]
26. Zhang J, Fu Y, Zhang H, Tang T, Yin M, Shi L. Analysis of factors influencing the attitudes towards the elderly of nursing students based on empathy and end-of-life care: a cross-sectional study. Nurs Open. 2022;9(5):2348–2355. [CrossRef]
27. 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]
28. Iqbal MZ, AlBuraikan AR, AlQarni AA, AlQahtani HA, AlOhail AM, AlMusaileem MM. Measuring empathy in medical students: a cross-sectional study. J Pak Med Assoc. 2022;72(6):1101–1105. [CrossRef]
29. Ertuğ N. The investigation of levels of empathy in nurse candidates. Bezmialem Sci. 2018;6:37–42. [CrossRef]

30. Rezapour-Mirsaleh Y, Aghabagheri M, Choobforoushzadeh A, Mohammadpanah Ardakan AA. Mindfulness, empathy and moral sensitivity in nurses: a structural equation modeling analysis. BMC Nurs. 2022;21(1):132. [CrossRef]
31. Jo H, Kim S. Moral sensitivity, empathy and perceived ethical climate of psychiatric nurses working in the national mental hospitals. J Korean Acad Psychiatr Ment Health Nurs. 2017;26(2):204–215. [CrossRef]
32. Jiménez-Herrera MF, Font-Jimenez I, Bazo-Hernández L, Roldán-Merino J, Biurrun-Garrido A, Hurtado-Pardos B. Moral sensitivity of nursing students. Adaptation and validation of the moral sensitivity questionnaire in Spain. PLoS One. 2022;17(6):e0270049. [CrossRef]
33. Jeon J, Choi S. Factors influencing patient-centeredness among Korean nursing students: empathy and communication self-efficacy. Healthcare (Basel). 2021;9(6):727. [CrossRef]
34. Sobczak K, Zdun-Ryżewska A, Rudnik A. Intensity, dynamics and deficiencies of empathy in medical and non-medical students. BMC Med Educ. 2021;21(1):487. [CrossRef]

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# Earthquake Preparedness Recommendations from Frontline Nurses and Rescuers in the 2023 Türkiye Earthquake: A Grounded Theory Study

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## Abstract

**Background:** Two powerful earthquakes, measuring 7.8 and 7.6 in magnitude, struck Türkiye on February 6, 2023, causing widespread devastation and significant loss of life across 11 provinces. In the aftermath of such disasters, a well-coordinated, rapid, and accessible emergency response is critical. However, the well-being of rescuers, an essential factor that significantly impacts their performance, is often overlooked, despite its crucial role in disaster search and rescue operations. Addressing these challenges is vital for enhancing the effectiveness of disaster management and saving more lives.

**Aim:** This study aims to identify the problems faced during rescue operations in order to improve disaster response and prevention efforts in Türkiye, a country prone to earthquakes. It also seeks to enhance healthcare services, nursing care, and disaster preparedness among healthcare workers, nurses, and the broader society.

**Methods:** A cross-sectional study design was employed, using Grounded Theory methodology. The sample consisted of 19 participants selected from among healthcare workers and search-and-rescue teams. Data were collected through online meetings conducted via Google Meet. Participants responded to a semi-structured questionnaire comprising 16 open-ended questions related to their personal backgrounds and earthquake experiences. Data were analyzed using content analysis with the support of the MAXQDA software.

**Results:** A total of 19 individuals, twelve females and seven males, participated in the study. Four main themes and ten associated codes were identified. The main themes were: (i) *Scale of the Disaster*, (ii) *Challenges During the Disaster Response*, (iii) *Life After Returning from the Disaster Area*, and (iv) *Preparedness for Future Disasters*. Through interviews conducted using the Grounded Theory method, a conceptual framework titled "*Frontline Rescuer's Resilience Against Disasters*" was developed based on participants' responses. This framework synthesizes elements from various theories, including Post-Traumatic Growth, Maslow's Hierarchy of Needs, and stress response theory.

**Conclusion:** Search and rescue training should be provided to healthcare workers, nurses, and the general public, with a particular emphasis on building resilience in the face of disasters. Additionally, small, localized teams should be formed to plan and prepare for future disasters at the regional level. Policymakers should develop and enforce targeted legislative actions aimed at implementing preventive policies.

***Keywords:*** *Disaster, disaster management and organization, disaster resilience, earthquake, Grounded Theory, search-and-rescue*

## Introduction

Türkiye is situated in a seismically active region characterized by intense fault lines. The Great Anatolian Fault, which separates the Anatolian and Eurasian tectonic plates, is considered one of the most active fault lines in the world.[1–3] Prior to 2023, the most devastating earthquake generated by this fault line occurred on August 17, 1999, in Düzce, located along the Black Sea coast. This 7.4-magnitude earthquake, measured on the Richter scale,[I] resulted in the deaths of approximately 20,000 people.[4,5] On February 6, 2023, at 04:17 a.m., another powerful earthquake, measuring 7.8 in magnitude on the Richter scale, caused significant damage and loss of life across 11 provinces in Türkiye. This earthquake, which caused the most significant damage in Türkiye since 1999 Düzce earthquake, was followed by another tremor measuring 7.6 in magnitude in the same region just nine hours later.[5] As of February 21, 2023, according to a statement from AFAD (the Turkish Disaster and Emergency Management Presidency), a total of 42,310 people had lost their lives in the affected regions, most of which consist of residential areas, while 448,018 individuals had to be rapidly evacuated. Following national and international calls for aid, a total of 14,740 search-and-rescue personnel were deployed to the region, including healthcare workers, volunteer doctors and nurses, as well as personnel from the Police, Army, UMKE (the Turkish National Medical Rescue Team), local security forces, and various non-governmental organizations. The total number of individuals actively serving in the region was reported to be 242,392.[6,7] Due to the large-scale nature of the disaster, in addition to immediate emergency and search-and-rescue operations, those affected required urgent access to food, shelter, clean water, medicine, and adequate security.[7] The most critical needs in the first few hours following a disaster are immediate emergency assistance, search-and-rescue operations, and accessible healthcare services.[8] Regardless of the scale of the disaster, the potential loss of life can be significantly

[I] An internationally recognized scale used in seismology to measure the magnitude of an earthquake.

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reduced through the rapid delivery of humanitarian aid and the timely deployment of healthcare workers, rescue teams, and essential equipment to the affected region.[5,9] However, research indicates that critical gaps remain in disaster preparedness in Türkiye, particularly in the areas of disaster management and readiness. Among the most significant shortcomings are the absence of a comprehensive disaster preparedness plan and the lack of holistic training for rescuers, healthcare professionals, and nurses—training that would also encompass psychosocial support.[10]

Mass casualty disasters, such as earthquakes, are an unavoidable reality for societies. Therefore, in addition to the structural integrity of settlements, disaster preparedness and effective disaster management are of vital importance for surviving such events or minimizing the loss of life.[11] However, the recent earthquake in Türkiye has clearly demonstrated that the preparations of both authorized institutions and individuals is inadequate.[11,12] These shortcomings were evident in various issues, including failures in the chain of command, the inability of teams to operate effectively and in coordination, particularly due to communication breakdowns, and a general lack of resources.[13,14] Unfortunately, these deficiencies observed in the post-earthquake response process provide concrete evidence of a broader lack of disaster preparedness.[12]

Following a disaster, physical, emotional, and social needs are greatly intensified.[12,15] In addition to search and rescue personnel, nurses assume critical roles and responsibilities that extend beyond clinical care, particularly in the context of crisis management.[16,17] Through critical thinking and multitasking skills, nurses are able to provide high-quality care before, during, and after a crisis, contributing to a reduction in mortality rates by 50–70%. However, studies emphasize that these skills must be supported not only through disaster management training but also through psychological resilience and wellness programs, which are essential for sustaining effective search and rescue efforts.[12,15,18] It has been observed that disasters not only result in the loss of life and property but also have a profound impact on the personal health, psychological well-being, and quality of life of rescuers.[19] The critical role of nurses during and after disasters is gaining increasing recognition. Their responsibilities extend beyond critical care and hospital-based decision-making to include coordination, leadership, and providing emotional support to disaster victims and their families.[12,19] Although international studies highlight the importance of psychological resilience and comprehensive disaster management training,[15,17] there remains a gap in understanding the unique, region-specific challenges faced by healthcare professionals in Türkiye. Addressing these challenges requires tailored strategies and interventions to enhance both preparedness and resilience among healthcare professionals. In this context, studies emphasize the importance of continuing education programs for health professionals and nurses working on the front lines, equipping them with the necessary skills to respond effectively to disaster scenarios in a multifaceted manner.[13,17,20]

Disasters are traumatic events that can cause profound psychological shock, not only to the victims but also to the rescuers. Individuals who struggle to return to their daily routines are at increased risk of developing vicarious trauma and secondary traumatic stress due to their caregiving roles in supporting trauma victims.[19,21] Sato et al.[22] found that nurses are at a higher risk of experiencing psychological distress compared to other professional groups. This psychological burden among nurses and emergency responders negatively affects the efficiency and outcomes of rescue operations, underscoring the urgent need for targeted psychological empowerment programs.[12] Nurses and rescuers who themselves become disaster victims may experience a range of emotional challenges, including fear, helplessness, guilt, anger, sleep disturbances, and fear of death. Additionally, they may exhibit symptoms of post-traumatic stress disorder (PTSD), such as intrusive images and flashbacks of the traumatic event.[23] For example, Ünsal et al.[10] reported that nurses often struggle with feelings of helplessness and guilt while trying to fulfill their professional responsibilities, highlighting the need for a targeted support system. In another qualitative study involving nurses, Yanik and Ediz[19] found that nurses faced emotional difficulties such as guilt, anger, helplessness, nightmares, grief, and depression. These challenges not only impact the mental health and well-being of rescuers but also significantly impair the overall effectiveness of rescue teams, potentially jeopardizing disaster response efforts.[19,24]

Failure to address these challenges and the lack of psychosocial support can significantly impair nurses' functioning by reducing their coping abilities, communication skills, self-esteem, and self-awareness. This decline in the functioning of nurses and rescuers may also hinder their capacity to provide empathetic care, which is a fundamental principle of the profession.[19,25] Major disasters underscore the critical importance of having effective disaster response plans in place. However, the consequences of failing to implement such plans extend beyond measurable losses. The personal experiences, observations, and proposed solutions of first responders, particularly nurses and other healthcare professionals, are invaluable in shaping future disaster preparedness and management strategies. Unfortunately, the existing literature includes a limited number of studies using Grounded Theory and in-depth interviews to explore the challenges faced by search-and-rescue teams, including nurses, in disaster management. The primary objective of this study is to identify the problems encountered in order to improve rescue operations and disaster prevention in Türkiye, a country prone to earthquakes. Additionally, it seeks to enhance healthcare services, nursing care, and disaster preparedness among healthcare workers, nurses, and society at large. The study also aims to develop a new theoretical framework to strengthen resilience. The results derived from the Grounded Theory approach will serve as a solid foundation for designing effective disaster preparedness and training programs.

### Research Questions

1. What were the main challenges encountered by frontline nurses and search-and-rescue teams during the response to the 2023 Türkiye earthquake?
2. How did the absence of basic necessities, such as food, water, shelter, and medical supplies, affect the effectiveness and well-being of rescuers and healthcare workers in the disaster area?
3. What emotional and psychological challenges did frontline responders face during and after their disaster response efforts, and how did these challenges impact their ability to work?
4. What coping strategies did rescuers and healthcare workers use to manage post-disaster trauma, and how did these experiences contribute to their personal and professional resilience?
5. What key recommendations can be made to improve disaster preparedness for healthcare workers, search-and-rescue teams, and the general public, based on the experiences and insights of frontline responders?

## Materials and Methods

### Study Design

This study was conducted to explore the feelings and perspectives of healthcare workers and search-and-rescue team members who were actively involved with earthquake survivors from the earliest days following the disaster. The study design is descriptive, qualitative, and cross-sectional, utilizing a Grounded Theory approach. In accordance with the Grounded Theory methodology[26] employed in this study, data collection and analysis were carried out simultaneously.[26,27] The data were analyzed through repeated reviews, with particular attention given to identifying the boundaries of each concept and the relationships between them. A conceptual framework was developed at the end of the study, based on the evaluation and conceptualization of the data. This framework offers a theoretical explanation of the problems and solutions related to disaster response.[28,29] The study followed the COREQ (Consolidated Criteria for Reporting Qualitative Research) checklist developed by Tong et al.[30] in 2007.

### Sampling Strategy and Eligibility of the Participants

The target population of the study consisted of nurses and search-and-rescue team members who provided care to earthquake victims during the post-disaster period. Participants were primarily selected from the Yeditepe University Natural Disasters Search-and-Rescue Club (abbreviated as "YÜDAK" in Turkish), a university-supported volunteer social service organization. A snowball sampling method was used to recruit participants. In this approach, the sample grows as new participants are contacted and interviewed based on referrals from the initial individuals involved in the study area.[29] As a result, the study sample included volunteer undergraduate rescue team members and nurses who were identified through this strategy. The final sample consisted of 19 participants drawn from healthcare workers and search-and-rescue teams. Among them, 31.5% were students, 42.1% were nurses, 10.5% were anesthesia technicians, and 15.7% were

volunteers from outside the healthcare field. The eligibility criteria included having worked with earthquake victims in the disaster area within the first seven days following the February 6, 2023 earthquake, providing assistance to earthquake victims for at least one week, and being either a healthcare worker or a member of a search-and-rescue team.

## Location and Time of Study

The study was conducted between March 20, 2023 and May 20, 2023. Interviews were conducted online with the search-and-rescue team members and nurses participating in the study to facilitate access, as they were located in various regions of Türkiye. Most of the participants who were closest to the earthquake zone were geographically distant from the researchers.

## Data Collection Tools

### Semi-Structured Interview Form

The interview guide was developed by the researchers based on a review of the literature.[31,32] The form included 14 open-ended questions and one introductory question related to participants' personal information. The questions were not administered in the exact same order for every participant. In accordance with the principle of data saturation, which is central to Grounded Theory, additional in-depth questions were asked during the interviews to gain a comprehensive understanding of the core issues experienced by participants. After conducting interviews with the first five participants, the semi-structured interview questions were revised by the researchers based on participants' responses and feedback. Specifically, the question "*Did you receive professional support for your psychological health?*" was merged with "*Have there been any changes in your physical and mental health?*" based on participants' responses and feedback. Additionally, two new questions were added to the semi-structured interview form: "*If you think you were not affected, which of your personal characteristics do you believe contributed to that?*" and "*When did you arrive at the disaster area, and how long did you work there (considering shelter, food, and security problems)?*" These revisions were implemented after the first interview, conducted on March 20, 2023, and the interviews with the remaining participants were completed by May 20, 2023.

## Data Collection

The data collection process was carried out through online meetings using the Google Meet platform. This method provided greater flexibility for both researchers and participants. Google Meet provided a reliable and accessible platform for conducting online interviews, allowing researchers and participants to connect regardless of time or location. Its ease of use facilitated the effective execution of the data collection process. Additionally, conducting interviews via Google Meet allowed participants to join from the comfort of their home environments, which likely contributed to a more relaxed atmosphere and encouraged more open and sincere responses. However, reliance on online meetings also presented limitations. The quality of participants' internet connections occasionally affected the interviews, with poor connectivity causing audio and video disruptions that impacted the flow of discussions. Initially, the researchers contacted members of a university-affiliated voluntary social assistance club through the club president. After explaining the purpose and scope of the study, individuals who expressed interest in participating were assessed for eligibility using Google Forms, based on the study's inclusion and exclusion criteria. The study group was then determined accordingly. Google Forms offered a fast and organized method for collecting participant information, allowing for the automatic aggregation and structuring of data for analysis. Its cloud-based infrastructure enhanced data security and enabled real-time collaboration among researchers. However, a notable limitation of this approach was the potential difficulty faced by individuals without internet access or familiarity with digital tools in accessing and using the platform. The participants' contact information was initially obtained through the club president, and those who volunteered and met the eligibility criteria were contacted via mobile phone. Upon scheduling an appointment and receiving the signed consent form, online meetings were arranged and conducted. During the interviews, participants were asked to provide contact information for colleagues they had worked with during earthquake-related activities. Subsequent interviews were then conducted with those referred by the initial participants, in accordance with the snowball sampling method. At the beginning of each online meeting, the informed voluntary consent form was explained again. After participants agreed to have the conversations recorded, the interviews proceeded. Each researcher was responsible for transcribing the interviews they personally conducted. When interviews had been conducted with a total of 19 participants and similar responses were consistently received from both search-and-rescue workers and healthcare professionals, the researchers made a joint decision to conclude the data collection process. The duration of the interviews ranged from 30 to 90 minutes. All files were anonymized before being uploaded to the software and Google Drive, and each was identified using case numbers.

## Data Analysis

The data were evaluated using content analysis. Each researcher independently reviewed all interviews and generated potential codes for analysis. The analysis phase spanned two months, during which the research team held eight meetings to discuss the data analysis process. In the first four meetings, the team clarified the codes to be used and grouped them into specific themes by identifying relationships among them. All documents were processed using the MAXQDA software (free trial version, VERBI Software, Berlin, Germany), and participants' comments were assigned to relevant codes. In the final meeting, the researchers reached a consensus on which comments to include in the report from the 450 individual statements made. This collaborative process marked the completion of the data analysis and the reporting of findings. The researcher with the most experience in conducting qualitative studies independently reviewed all the data and compared the audio recordings with the corresponding transcripts. The coding process and the relevance of the identified themes were also reassessed by the same researcher. After these revisions, and once the researchers reached a final consensus on the codes and themes, the data analysis was concluded.

## Techniques to Enhance Trustworthiness

The researcher, who had extensive experience in psychiatric nursing and qualitative research, independently examined all the data and compared the audio recordings with the corresponding transcripts. Any discrepancies identified between the recordings and transcripts were corrected prior to the analysis phase. The same researcher reassessed the coding and the appropriateness of the themes. Any disagreements regarding coding or thematic categorization that arose during the study were carefully reviewed by the same researcher. In-depth discussions were conducted with the other researchers to resolve these differences. These discussions were guided by the theoretical framework of the study and supported by direct examples from the data to ensure alignment. Discussions continued until full consensus was achieved among the research team. Following these revisions, the data analysis process was finalized.

## Researcher Characteristics and Reflexivity

The researchers who conducted this study are full-time faculty members at an accredited university. None of the researchers were personally affected by the disaster in a way that could have biased the data collection process. As a result, the interviews were conducted with complete impartiality. All researchers hold at least a Master's degree in psychiatric nursing and have prior experience in conducting qualitative research. The researchers had no prior relationship or communication with the participants. All authors conducted interviews, with each completing five interviews, except for the last author, who conducted four. At the time of the study, all researchers held at least a Master's degree, and two held PhDs. Three of the researchers were female, and one was male.

## Ethical Approval

In addition to adhering to the principles of scientific ethics, universal ethical standards were also upheld throughout the study. Ethical approval was obtained from the Yeditepe University Rectorate Non-interventional Clinical Research Ethics Committee (Approval Number: E.83321821-805.02.03-165, Date: 10.03.2023), in compliance with institutional review board (IRB) requirements. In addition, institutional permission was obtained from the Social Support and Solidarity Club of Yeditepe University. Participation in the study was voluntary, and informed consent was obtained from all participants prior to recording their interviews. Participants were informed that they could withdraw from the study at any time. All recordings were stored on an encrypted computer accessible only to the research team and will be retained for five years. The study was conducted in accordance with the principles outlined in the Declaration of Helsinki.

**Table 1.** Sociodemographic characteristics of participants

| | n | % |
|---|---|---|
| Age, years (mean±SD) | 27.3±4.6 | |
| Gender | | |
| Female | 7 | 36.8 |
| Male | 12 | 63.2 |
| Volunteer's professional field | | |
| Nurse | 8 | 42.1 |
| Anesthesia technician | 2 | 10.5 |
| Student | 6 | 31.6 |
| Volunteer search-and-rescue personnel | 3 | 15.8 |
| Experience working in disasters | | |
| Had experience | 6 | 31.5 |
| No experience | 13 | 68.4 |

SD: Standard deviation.

## Result

The participants had an average age of 27.31 years (SD = 4.63), with the majority being male (63.15%). In terms of professional background, 42.1% were nurses, 31.6% were students, 10.5% were anesthesia technicians, and 15.8% were volunteer search-and-rescue personnel. Additionally, 31.57% of participants had previous disaster response experience, while 68.43% were participating in such efforts for the first time. The detailed sociodemographic characteristics of the participants are presented in Table 1. In the study, five main themes and nine subthemes were identified: (1) Scale of the Disaster (Subthemes: *Emotional Impact, Perceived Magnitude*), (2) Challenges During Disaster Response (Subthemes: *Management and Communication Issues, Basic Needs and Resource Limitations, Emotional Struggles*), (3) Factors Affecting Participants' Work (Subthemes: *Workload, Team Coordination*), (4) Experiences After Returning from the Disaster Area (Subthemes: *Emotional Problems, Coping Mechanisms, Post-Traumatic Growth*) and (5) Preparedness for Future Disasters (Subthemes: *Public-Level Recommendations, Training and Readiness for Rescuers and Healthcare Professionals*).

### Themes and Subthemes

#### Theme 1: Scale of the Disaster

The majority of participants reported that they departed for the disaster area as soon as they learned about the earthquake. Several stated that they arrived without having time to make any preparations. They described their initial impressions upon arrival. Some participants described the scene they witnessed using phrases such as "the apocalypse," "the end of the world," "the smell of death," "great destruction," "a great disaster," "the end of everything," and "a war zone."

Participants noted that the sounds of military helicopters, police sirens, and ambulance sirens contributed to the overwhelming sense of chaos in the disaster area. The smell of decomposing bodies also had a profound impact on the participants. As the number of recovered bodies increased, they were initially placed outside tents and later stacked in the back of trucks, an image many described as the most distressing. Additionally, some participants expressed fear of aftershocks and the risk of further injury.

> "*On the one hand, people were constantly arriving to search for their loved ones... There wasn't even a body bag; most of the bodies were wrapped in blankets... People were crying, uncovering the blankets, looking at the faces of those who had died one by one, and then covering them again. And you were seeing all of that there. Those memories will never be erased from my mind.*" (Participant 14, age 26, Female, Health Worker)

> "*Nobody wants to see human bodies stacked on top of each other in the back of a pickup truck.*" (Participant 16, age 21, Female, Search-and-Rescue Worker)

#### Theme 2: Challenges During the Disaster Response

*Subtheme 1: Management, organization, and communication*

Poor management and organizational inefficiencies significantly hindered the efforts of search-and-rescue teams and healthcare professionals in the disaster area. Many participants reported feeling isolated due to a lack of coordination and organization, which contributed to a sense of chaos. A major issue cited was the inconsistent functioning of the Global System for Mobile Communications (GSM) operators. Communication networks were operational for only one out of seven days during the search-and-rescue efforts, making it difficult to reach certain individuals.

> "*Even on the fifth day after the earthquake, we were looking for rubble to work on by walking around street by street. During this time, we went down streets where no rescue teams had been yet.*" (Participant 2, age 24, Male, Search-and-Rescue Worker)

> "*The most important problem was communication—as with the GSM operators. Because without communication, you can't manage this situation.*" (Participant 13, age 33, Male, Health Worker)

*Subtheme 2: Basic living requirements*

The lack of basic necessities significantly impacted on participants' ability to carry out their duties, with 67% expressing this concern. Many worked for long hours with minimal food, sometimes only a single piece of a cookie for the entire day and had no access to drinking water. Water shortages disrupted both medical treatments and efforts to maintain hygiene. Seasonal weather conditions created challenges related to heating, shelter, and personal security, each of which is essential for meeting basic daily needs.

> "*We got dinner on the third day... When we were working on the debris, our only meal for the whole day was a cookie cut in half.*" (Participant 16, age 21, Female, Search-and-Rescue Worker).

> "*For example, when we first arrived, the people rescued from the rubble had fractures. Those who had been pulled from the debris had broken arms and legs and needed casts... It was raining, meaning you had to use the water on the ground because there was no [other] water.*" (Participant 10, age 27, Male, Health Worker)

*Subtheme 3: Emotional responses*

Participants reported significant emotional distress in the aftermath of the earthquake, largely due to inadequate equipment, which led to feelings of helplessness and frustration. Inexperienced rescuers experienced greater emotional difficulties. The condition of children was reported as the most emotionally distressing aspect of disaster triage for many participants.

> "*Desperation. I guess the only emotion was desperation, not even anger... Sounds were coming from hundreds of buildings, and from thousands of people under the rubble, but there were only a few crews. On the second or third day, when the despair turned into anger, I started to get angry.*" (Participant 7, age 23, Male, Search-and-Rescue Worker)

> "*When we pulled the children out from under the rubble, as a father, I remembered my own child, and the only thing I could think of was why these children had to go through something like this.*" (Participant 1, age 37, Male, Search-and-Rescue Worker)

#### Theme 3: Life After Returning from the Disaster Area

*Subtheme 1: Emotional problems*

Participants reported experiencing a range of emotional difficulties upon returning from the earthquake zone. These included anger, insomnia, irritability, frequent crying, fear of another earthquake, and heightened sensitivity to everyday triggers. Below are some representative statements:

> "*Insomnia, for example: I can't sleep at night. I can't sleep until 4:30 and 5:00 a.m. every day. Whether I go to bed early or late, I can't sleep because I'm thinking.*" (Participant 11, age 28, Male, Search-and-Rescue Worker)

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> "*One day after I came back, I saw two children holding their mother's hand as I was getting off the bus, a girl and a boy, the same age as some of the children we pulled out of the wreckage. I froze when I saw them the week after the event. I didn't talk to anyone much; I cut off communication a bit. Seeing those kids affected me deeply*." (Participant 7, age 23, Male, Search-and-Rescue Worker)

*Subtheme 2: Coping methods*

Our study found that participants employed various positive coping strategies, including spending time with friends, discussing earthquake preparedness, and focusing on positive aspects of their experiences. Negative coping behaviors included avoidance, and one participant reported an increase in smoking. Additionally, some participants experienced ongoing fear triggered by frequent aftershocks.

> "*Especially when someone is sitting next to me and swinging their leg, it really bothers me. You know: 'Don't shake me!' I try to avoid getting on anything that sways, as much as possible*." (Participant 16, age 21, Female, Search-and-Rescue Worker)

> "*When I first came back, I had trouble staying indoors. Then I couldn't sit in a restaurant for long. I realized I couldn't even be alone in my own home*." (Participant 19, age 28, Female, Health Worker)

*Subtheme 3: Post-traumatic growth*

Participants in our study reported experiencing positive changes in their lives following this difficult experience. They described becoming calmer, more composed, and more solution-oriented in their approach to problems. Many stopped postponing things they wanted to do, grew spiritually stronger, gained a deeper appreciation for their health, became less materialistic, and found joy in the small things in life.

> "*In particular, they pulled a couple out from under the rubble, or a whole family, and everyone was dead. After witnessing these things, thoughts like 'Life is very short. It's not worth getting upset or treating someone badly when everything could end so suddenly,' became deeply ingrained in me. It's not worth being upset, getting angry, or holding grudges. Buildings can collapse on us in the middle of the night*." (Participant 17, age 33, Male, Health Worker)

> "After this experience, I've come to realize that working just to buy a house or a car, or trying to live in comfort... it's not really about that. I now understand much better how important it is to live in the moment. Life is truly too short." (Participant 15, age 25, Woman, Health Worker)

### Theme 4: Preparedness for Future Disasters

*Subtheme 1: Recommendations at the public level*

Based on their experiences in the earthquake-affected region, participants recommended enhancing disaster preparedness at the public level. This included educating communities, improving planning, ensuring the availability of necessary equipment, organizing response teams, informing citizens, and strengthening infrastructure. They particularly emphasized the urgent need to increase preparedness in Istanbul, given the high risk of a potential earthquake.

> "*Let's say there was an earthquake in Istanbul: the houses here are very close to each other. The roads will be blocked when buildings collapse. It will not be possible to reach some of the debris. Helicopter use should be planned in advance. Or boats could be used for sea transport*." (Participant 3, age 25, Female, Search-and-Rescue Worker)

> "*Disaster shipping containers are very important. They should be placed in every neighborhood and every region for use in emergency response during a disaster*." (Participant 11, age 27, Male, Health Worker)

*Subtheme 2: Recommendations for search-and-rescue workers*

Participants suggested that search-and-rescue teams should be equipped with the necessary tools and be effectively organized to respond to future earthquakes. They recommended conducting frequent training sessions in smaller groups, incorporating a variety of disaster scenarios. The formation of motorized units was also proposed to help overcome transportation and communication problems. Additionally, participants emphasized the importance of providing communication training and enhancing the psychological resilience of search-and-rescue teams.

> "*I thought about developing a protocol for a motorized team... giving a seismic acoustic listening device to someone on the motorized team and sending them around the city. They could go directly to the people coordinating at buildings they are really certain about, and this could be a faster way to proceed*." (Participant 5, age 26, Female, Search-and-Rescue Worker)

> "*There is a bit of a lack of psychological training. Because you encounter bodies or people with severed limbs there... I think it requires people who can psychologically cope with these situations, and for that, there should be mental preparation to endure them*." (Participant 12, age 25, Male, Search-and-Rescue Worker)

*Subtheme 3: Recommendations for health professionals*

Participants recommended training healthcare professionals to become members of UMKE and encouraging student nurses to join search-and-rescue clubs. They emphasized the importance of strengthening psychological resilience, improving readiness for challenging conditions, providing communication training, and implementing comprehensive pre-deployment planning. Additionally, they advocated for greater emphasis on nursing practices and practical, disaster-related training within undergraduate education programs.

> "*I also support my own teammates. Join UMKE, take responsibility there, you feel more prepared*." (Participant 14, age 26, Female, Health Worker)

> "*The topic of 'communication' is included in our training, but it is very limited. What approach should we take to understand another person's psychology? What mindset should other workers have? Before deployment, training should recreate those moments. Demonstrations and simulations should be used, like 'Look, you are getting this reaction for this reason; here's how you can respond differently,' In my opinion, that would help a lot*." (Participant 15, age 25, Female, Health Worker)

## Discussion

Losing loved ones, homes, belongings, and livelihoods, as well as witnessing collapsed buildings, injured individuals, deceased bodies, or those dying, and the ongoing search for missing persons under the rubble, can cause significant trauma not only for survivors but also for rescuers.[19,33] Participants in this study were deeply affected by the earthquake and described witnessing unforgettable and distressing scenes. To ensure the effectiveness and safety of search-and-rescue operations, the essential needs of volunteers must be met.[34] It is critically important that basic necessities such as food, water, shelter, personal security, and hygiene are provided during disaster response efforts. The most significant and unavoidable challenge encountered during disasters is the lack of resources.[35–37] Maslow's Hierarchy of Needs outlines the fundamental requirements for human survival, beginning with physiological and safety needs; higher-level needs cannot be fulfilled until these basic needs are met.[38] This study found that participants were often required to work without having their basic needs met, which negatively impacted their performance. Access to essential resources such as food, water, and hygiene facilities would have improved their ability to carry out their duties effectively. This issue is commonly reported among healthcare providers and search-and-rescue teams responding to disasters.[32,39] The location of disaster can hinder intervention efforts due to factors such as ground conditions, damaged roads, traffic congestion, and adverse weather. Improved disaster policies and planning are essential to addressing these issues.[19,32,39] For instance, the delivery of relief supplies to rescuers was delayed due to heavy rainfall following both the Kahramanmaraş earthquakes and the 2015 Nepal earthquake. In the latter case, relief supplies waiting at Kathmandu Airport c were unable to reach the affected areas until the third day after the earthquake.[40] Although the lack of basic resources was not the primary issue reported by participants in this study, when combined with the emotional burden of the disaster, it significantly disrupted search-and-rescue operations.[32,41] Consistent with our findings,

participants in other studies have also reported challenges related not only to the lack of basic necessities but also to emotional distress.[19,32,37,42] Using a qualitative research method similar to our own, Yanik and Ediz19 investigated the experiences of nurses who volunteered as rescuers during the same disaster. They found that participants were most likely to struggle with emotional difficulties after returning from the disaster zone. Nurses in the study by Farokhzadian et al.[43] also described emotional and psychological difficulties similar to those identified in our research, particularly highlighting the emotional strain of communicating with the families of disaster victims. In our study, individuals who had not previously experienced a disaster or witnessed traumatic loss, especially the death of children, were significantly affected by what they encountered. This finding aligns with the experiences reported by participants in the present study and underscores the critical connection between unmet needs among rescuers and emotional distress. Addressing this dual challenge is essential and should be prioritized by policymakers.

Given the relatively young average age of participants in our study, this is an additional concern for authorities to consider. In a study conducted by Yang et al.,[37] one participant described witnessing the death of a young girl while holding her hand after she was pulled from the rubble. The participant reported that this, along with similar traumatic experiences, led to ongoing sleep disturbances during and after the relief efforts.[37] Similarly, in the study by Harmanci Seren and Dikeç,[23] experiences similar to those reported in our research underscore the importance of incorporating psychological preparation and support components into disaster preparedness programs. For example, practical training aimed at developing skills to manage trauma and grief during disasters is considered an effective strategy for enhancing individual resilience and improving teams performance.[12] In 2014, Lu and Xu42 noted that psychological needs were largely overlooked during the 2008 Sichuan earthquake. However, by the time of the 2013 Lushan earthquake, psychiatric support teams were deployed to the field within a few days alongside medical teams, marking a significant improvement in disaster response efforts. Based on both our study findings and the supporting literature, integrating rapid psychological support response systems and peer counseling programs into disaster response plans are vital strategies for addressing the emotional and psychological needs of search-and-rescue workers, nurses, and physicians working in the field. These strategies have the potential to improve not only the well-being of frontline workers but also the overall effectiveness and coordination of disaster management operations.

Effective disaster response requires proper organization of teams and equipment, as well as timely transportation to the affected area. During the 2017 Sichuan earthquake, a well-coordinated response successfully transported 1,108 soldiers, 396 rescue vehicles, 30 search-and-rescue dogs, 24 electric generators, and other essential necessities to the region within just three hours.[44] According to AFAD's report, 14,740 search-and-rescue personnel and 242,392 field personnel were deployed, along with 116 helicopters and 78 aircraft, to the 11 provinces affected by the earthquake.[6] This response more extensive compared to that of the Marmara earthquake.[45] However, consistent with findings in the literature,[10,12,19,46] participants in our study perceived the response as inefficient, possibly due to the unprecedented magnitude and scope of the disaster. Effective crisis management also depends heavily on reliable communication. Participants in recent studies noted communication difficulties during crises, particularly due to disruptions in GSM operator services. For instance, telephone communication was virtually impossible during the 1999 Marmara Earthquake.[45] In the 21st century, individuals are able to contact their relatives not only through GSM operators but also via internet-based platforms and social media accounts.[47] During disasters, communication is just as critical as search-and-rescue operations. AFAD in Türkiye has recognized this and incorporated communication strategies into its emergency action plan. AFAD has also developed a mobile application to support communication during crises.[48] One of the key themes identified in the qualitative study conducted by Farokhzadian et al.[43] in 2024 in Iran was the use of inappropriate interactive platforms during disaster response efforts. This suggests that communication issues during emergencies are not unique to Türkiye. Furthermore, the nurses who participated in that study emphasized deficiencies in effective communication, leadership, and team management.[43]

Participants in our study reported experiencing emotional issues following post-disaster relief efforts, including anger, insomnia, and fear of future earthquakes. The literature also indicates that rescue workers and healthcare professionals are at risk of developing PTSD,[12,49,50] psychological distress,[51] depression,[52] and anxiety disorders.[53] The behaviors observed in our participants, such as insomnia, nightmares, and avoidance, are indicative of symptoms commonly associated with PTSD. According to Horowitz's Stress-Response Theory, traumatic events create stress that disrupts the processing of new information and disturbs internal schemas. Incompatibilities with internal schemas during information processing can trigger a post-traumatic stress response. Experiencing PTSD can also affect an individual's ability to respond to future disasters. Brown et al.[54] in 2018 conducted a study in which individuals who had previously experienced a disaster were followed over time and evaluated for suicidal thoughts or behaviors after encountering another disaster. The study found that participants with a history of PTSD were more likely to experience suicidal ideation or engage in suicidal behaviors following the subsequent traumatic event. In a meta-analysis of studies investigating the prevalence of PTSD in search-and-rescue workers, it was found that factors contributing to the development of PTSD included the decision to participate in rescue operations, the preparations required before deployment, and the specific tasks performed in the field.[53] It is important to assess the mental health of disaster response workers and encourage them to seek help when needed to maintain their well-being and effectiveness. Coping strategies after a traumatic event are crucial for effective problem-solving. Ehring et al.[52] in 2011 found that the coping methods used by search-and-rescue workers following an earthquake influenced their emotional outcomes. Our study similarly found that participants employed both positive and negative coping mechanisms, with some relying on avoidance behaviors. Despite these negative experiences, most participants reported gaining a new perspective on life and no longer being upset by everyday problems. Janoff-Bulman's[55] theory of Post-Traumatic Growth explains how some individuals find satisfaction in their survival after a traumatic event and come to cherish what they value most in life, such as family, friendships, or spirituality. In a study conducted by Carlile et al.[56] in 2014, a team of volunteers was formed, provided with long-term training, and later participated in the rescue efforts following the 2010 Haiti earthquake. After the earthquake, a Grounded Theory study found that the psychological resilience and social bonds of the participants had strengthened. Search-and-rescue workers and nurses reported feeling calmer and adopting a more solution-focused approach. They also began to prioritize what truly mattered, felt spiritually stronger, placed greater importance on health, became less materialistic, and found happiness in small, everyday things.

In our study, healthcare and search-and-rescue workers similarly emphasized the critical need for public-level disaster preparedness. Şahin and Üçgül[57] in 2019 evaluated the Türkiye Disaster Response Plan and noted that a 7.5 magnitude earthquake would likely cause significant damage to nearly all buildings in Hatay. One participant in our study pointed out that while knowing what to do during an earthquake is important, it is not sufficient on its own. Altınsoy and Aksakal[20] in 2020 reported a rescue rate of 28.1% during the Van earthquake search-and-rescue operations. Although the response was well-coordinated, only about a quarter of those trapped were rescued. This finding highlights the importance of prioritizing sturdy building construction and preventive measures, rather than focusing solely on improving rescue operations. Similarly, Şahin and Üçgül[57] in 2019 emphasized the need for a paradigm shift in Türkiye's Disaster Plan, advocating for improved coordination and resource preparedness. They highlighted the importance of focusing on risk management and pre-disaster preparedness, rather than relying solely on post-disaster response efforts.

Healthcare and search-and-rescue workers in our study reported that many of their colleagues were affected by trauma while working in the disaster area. Psychological preparation and mental resilience training were frequently emphasized as essential. Aker[58] in 2006 found that medical personnel, firefighters, and search-and-rescue teams involved in the 1999 Marmara earthquake experienced high rates of major depression and PTSD. Traumatic events encountered during recovery operations had long-lasting psychological effects. To address these risks, psychological preparation and well-being assessments should be provided to all personnel involved in disaster response. Additionally, even experienced personnel should be regularly re-evaluated before participating in future operations.[59] Supporting this perspective, Mao et al.[60] in 2019 found that healthcare professionals who had received training in disaster response, psychological first aid, and stress management prior to deployment in earthquake-affected areas demonstrated greater resilience and experienced more positive outcomes after the disaster. Similarly, a study by Kaya and Erdoğan[46] in 2024 indicated that nurses' competency levels were positively correlated with disaster preparedness, which directly influenced their roles and responsibilities during disaster response efforts. The study also emphasized that partial knowledge of disaster preparedness does not equate to true competency. In line with these findings,

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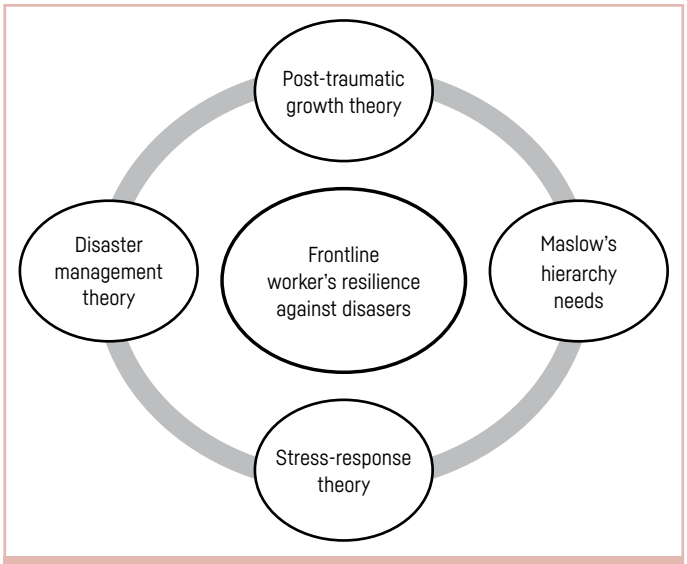


**Figure 1.** Frontline worker's resilince against disasters.

the authors stressed the need for additional training for frontline nurses and rescue teams to enhance their resilience in the face of future disasters and highlighted the importance of widespread dissemination of such training programs.

## Limitations

Several limitations were encountered during the course of this research. The first was that all interviews were conducted online, which may have made it more difficult to capture participants' emotional expressions and nonverbal cues compared to face-to-face interactions. Although online platforms such as Google Meet and Google Forms allowed participants to take part in the study from the comfort of their homes, limited internet access and technical difficulties may have excluded some individuals from participating. Additionally, as this study employed a qualitative methodology, it was conducted with a limited sample size. While this may affect the generalizability of the findings, it allowed for in-depth exploration of participants' personal experiences, an essential strength of qualitative research. Moreover, the use of snowball sampling may have impacted the homogeneity of the sample and c led to the overrepresentation of certain groups. This sampling method may also limit the ability to generalize the results to the wider population. Nonetheless, the conclusions drawn from these individual experiences provide a rich and meaningful understanding of the research topic.

## Conclusion

Large-scale disasters have a profound impact on entire societies. This study, conducted using the Grounded Theory approach, identified key themes and patterns that contribute to understanding the resilience of frontline rescuers in disaster situations. Based on participants' responses and supported by existing literature, including concepts such as Post-Traumatic Growth Theory, Maslow's Hierarchy of Needs, Stress-Response Theory, and various disaster management frameworks, a conceptual framework has been proposed to explain the factors influencing frontline rescuers' resilience (Figure 1). This framework provides a foundation for future research and contributes to the ongoing theoretical discourse in disaster response and resilience.

The development of this theory began with the identification of recurring themes in participants' responses using a method known as open coding. These themes were then compared with existing theoretical frameworks, resulting in the creation of a coherent model of resilience. The iterative nature of the Grounded Theory method allowed for the continuous alignment of emerging concepts with both the collected data and the relevant literature. Within the framework of this theory, the concept map presented in Figure 1 was developed to strengthen the resilience of frontline rescue workers, nurses, and other healthcare providers. Problems encountered during search-and-rescue and recovery operations emerged as the most critical factors affecting the ultimate success of disaster response efforts. In addition to the provision, or lack, of basic necessities, essential resources such as management, organization, and communication were found to directly impact the overall effectiveness of disaster response operations. It was also concluded that psychological support mechanisms, including post-trauma counseling and peer support systems, should be integrated into disaster response plans. Rescuers need training not only on what to do during a disaster, but also on how to adapt to life afterward. Incorporating psychological support services, such as post-trauma counseling and peer support programs, into disaster preparedness planning is essential. This integration will help field workers better cope with the emotional and psychological challenges they may face following traumatic events. Rescuers frequently experience significant emotional and psychological difficulties both during and after disasters, which can negatively affect their well-being and performance. Therefore, ensuring access to mental health services and trauma recovery programs is critical to promoting long-term resilience. In-service training for relevant groups of workers should be conducted periodically, and the necessary resources must be allocated to promote disaster awareness among the general population. To provide clear guidance, model training programs and policy frameworks should be developed and piloted, offering scalable solutions for broader implementation. Regional disaster planning should involve small, well-coordinated groups, and policymakers must develop and enforce preventive strategies through specific legal regulations.

**Ethics Committee Approval:** The study was approved by the Yeditepe University Rectorate Non-interventional Clinical Research Ethics Committee (Approval Number: E.83321821-805.02.03-165, Date: 10.03.2023).

**Informed Consent:** Informed consent was obtained from all participants prior to recording their interviews.

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## References

1. Achour N, Pascale F, Price AD, et al. Learning lessons from the 2011 Van Earthquake to enhance healthcare surge capacity in Turkey. Environ Hazards. 2016;15(1):74–94. [CrossRef]
2. Ersoy Ş, Koçak A. Disasters and earthquake preparedness of children and schools in Istanbul, Turkey. Geomatics Nat Hazards Risk. 2016;7(4):1307–1336. [CrossRef]
3. American Museum of Natural History. Anatolian Fault, Turkey. Accessed April 8, 2025. https://www.amnh.org/exhibitions/permanent/planet-earth/why-are-there-ocean-basins-continents-and-mountains/plate-tectonics/when-plates-move-past-each-other/anatolian-fault-turkey
4. Parsons T, Toda S, Stein RS, Barka A, Dieterich JH. Heightened odds of large earthquakes near Istanbul: An interaction-based probability calculation. Science. 2000;288(5466):661–665. [CrossRef]
5. Tekeli-Yeşil S, Dedeoğlu N, Braun-Fahrlaender C, Tanner M. Factors motivating individuals to take precautionary action for an expected earthquake in Istanbul. Risk Anal. 2010;30(8):1181–1195. [CrossRef]
6. Afet ve Acil Durum Yönetimi Başkanlığı. Kahramanmaraş'ta Meydana Gelen Depremler Hk. - 34. Accessed April 8, 2025. https://www.afad.gov.tr/kahramanmarasta-meydana-gelen-depremler-hk-34
7. OCHA. Türkiye: 2023 Earthquakes Situation Report No. 1, As of 16 February 2023. Accessed April 8, 2025. https://reliefweb.int/report/turkiye/turkiye-2023-earthquakes-situation-report-no-1-16-february-2023
8. Acar M, Kaya O. A healthcare network design model with mobile hospitals for disaster preparedness: A case study for Istanbul earthquake. Transp Res Part E Logist Transp Rev. 2019;130:273–292. [CrossRef]
9. Dedeoğlu N, editor. Knowledge, attitude and practice of residents of Antalya, Turkey about earthquake preparedness. In: International Disaster Reduction Conference; 2006; Davos, Switzerland.
10. Ünsal B, Özbudak Arıca E, Höbek Akarsu RH. Ethical issues after the earthquake in Turkey: A qualitative study on nurses' perspectives. Int Nurs Rev. 2024;1–13. [CrossRef]
11. Kalanlar B. A PRISMA-driven systematic review for determination of earthquake and nursing studies. Int Emerg Nurs. 2021;59:101095. [CrossRef]
12. Mercan Annak İ, Erdoğan B, Yıldız Emre N. Experiences of Turkish nurses volunteering in the disaster zone following the 2023 Türkiye-Syria earthquake. Int Nurs Rev. 2024;1–11. [CrossRef]

13. Uran BNÖ, Yıldırım B. Büyük felaket: Afet hemşireliği ve afet farkındalığı. İzmir Katip Çelebi Univ Sağlık Bil Fak Derg. 2023;8(2):749–754.
14. Türk Tabipleri Birliği. 3. Ay Deprem Raporu: Birinci basamak sağlık hizmetlerine erişim ve sağlık çalışanlarının sağlığı. Accessed April 8, 2025. https://www.ttb.org.tr/userfiles/files/3ayraporu.pdf.
15. Moradi K, Abdi A, Valiee S, Rezaei SA. Nurses' experience of providing ethical care following an earthquake: A phenomenological study. Nurs Ethics. 2020;27(4):911–923. [CrossRef]
16. Firouzkouhi M, Kako M, Abdollahimohammad A, Balouchi A, Farzi J. Nurses' roles in nursing disaster model: A systematic scoping review. Iran J Public Health. 2021;50(5):879. [CrossRef]
17. Nakayama Y, Kato I, Ohkawa T. Sustaining power of nurses in a damaged hospital during the Great East Japan earthquake. J Nurs Scholarsh. 2019;51(3):271–280. [CrossRef]
18. Li YH, Li SJ, Chen SH, et al. Disaster nursing experiences of Chinese nurses responding to the Sichuan Ya'an earthquake. Int Nurs Rev. 2017;64(2):309–317. [CrossRef]
19. Yanik D, Ediz Ç. Experiences and psychosocial challenges of volunteer nurses in Turkey devastating earthquake zones: Lessons to be learnt for prevention of health system problems in disasters: A qualitative study. Public Health Nurs. 2024;41(3):503–513. [CrossRef]
20. Altınsoy U, Aksakal E. Türkiye'de meydana gelebilecek depremlere karşı afet yönetim sistemi performansının veri zarflama analizi ile değerlendirilmesi. Dicle Univ J Eng. 2020;11(1):341–352. [CrossRef]
21. Özyer Y, Dinçer S. Afetlerde hemşirelerin psikolojik ilk yardım rolleri. IBAD Sosyal Bilimler Derg. 2020;(7):198–206. [CrossRef]
22. Sato H, Techasrivichien T, Omori A, Ono-Kihara M, Kihara M. Psychosocial consequences among nurses in the affected area of the Great East Japan Earthquake of 2011 and the Fukushima Complex disaster: A qualitative study. Disaster Med Public Health Prep. 2019;13(3):519–526. [CrossRef]
23. Harmanci Seren AK, Dikeç G. The earthquakes in Turkey and their effects on nursing and community health. Int Nurs Rev. 2023;70(3):262–265. [CrossRef]
24. McCann CM, Beddoe E, McCormick K, et al. Resilience in the health professions:A review of recent literature. Int J Wellbeing. 2013;3(1):60–81. [CrossRef]
25. Pratiwi A, Hamid AYS, Fadhillah H. Effectiveness of Psychological Adaptation Model of Mental Health Nursing for nurse survivors experiencing post-earthquake disaster post-traumatic stress syndrome. Enferm Clin. 2018;28:289–294. [CrossRef]
26. Chamberlain-Salaun J, Mills J, Usher K. Linking symbolic interactionism and grounded theory methods in a research design: From Corbin and Strauss' assumptions to action. Sage Open. 2013;3(3):2158244013505757. [CrossRef]
27. Chun Tie Y, Birks M, Francis K. Grounded theory research: A design framework for novice researchers. SAGE Open Med. 2019;7:2050312118822927. [CrossRef]
28. Bulduklu Y. Eleştirel çalışmalarda nitel araştırma yöntemi olarak gömülü teori. Kritik İletişim Çalışmaları Derg. 2019;1(1):1–14.
29. Kümbetoğlu B. Qualitative methods and research in sociology and anthropology. Bağlam Yayıncılık; 2005.
30. 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]
31. Torpuş K, Bostan S. Sel afetlerinde acil sağlık hizmetlerinin organizasyonu ve yaşanan sorunlar: Hopa örneği. Doğ Afet Çev Derg. 2022;8(2):396–407. [CrossRef]
32. Wenji Z, Turale S, Stone TE, Petrini MA. Chinese nurses' relief experiences following two earthquakes: Implications for disaster education and policy development. Nurse Educ Pract. 2015;15(1):75–81. [CrossRef]
33. Arnaouti MKC, Cahill G, Baird MD, et al. Medical disaster response: A critical analysis of the 2010 Haiti earthquake. Front Public Health. 2022;10:995595. [CrossRef]
34. Salam MA, Khan SA. Lessons from the humanitarian disaster logistics management: A case study of the earthquake in Haiti. Benchmarking Int J. 2020;27(4):1455–1473. [CrossRef]
35. Ivanov D, Dolgui A, Sokolov B, Ivanova M. Literature review on disruption recovery in the supply chain. Int J Prod Res. 2017;55(20):6158–6174. [CrossRef]
36. Reyes MM. Making millennials the heroes of the earthquake. Voices Mex. 2018;105:18–21.
37. Yang YN, Xiao LD, Cheng HY, Zhu JC, Arbon P. Chinese nurses' experience in the Wenchuan earthquake relief. Int Nurs Rev. 2010;57(2):217–223. [CrossRef]
38. Maslow AH. A theory of human motivation. Psychol Rev. 1943;50:370–396. [CrossRef]
39. Altay N, Gunasekaran A, Dubey R, Childe SJ. Agility and resilience as antecedents of supply chain performance under moderating effects of organizational culture within the humanitarian setting: A dynamic capability view. Prod Plan Control. 2018;29(14):1158–1174. [CrossRef]
40. Sharma DC. Nepal earthquake exposes gaps in disaster preparedness. Lancet. 2015;385(9980):1819–1820. [CrossRef]
41. Owens PJ, Forgione A Jr, Briggs S. Challenges of international disaster relief: Use of a deployable rapid assembly shelter and surgical hospital. Disaster Manag Response. 2005;3(1):11–16. [CrossRef]
42. Lu Y, Xu J. The progress of emergency response and rescue in China: A comparative analysis of Wenchuan and Lushan earthquakes. Nat Hazards. 2014;74:421–444. [CrossRef]
43. Farokhzadian J, Mangolian Shahrbabaki P, Farahmandnia H, Taskiran Eskici G, Soltani Goki F. Nurses' challenges for disaster response: A qualitative study. BMC Emerg Med. 2024;24(1):1. [CrossRef]
44. Wang W, Chen H, Xu A, Qu M. Analysis of the disaster characteristics and emergency response of the Jiuzhaigou earthquake. Nat Hazards Earth Syst Sci. 2018;18(6):1771–1783. [CrossRef]
45. Genç FN. Crisis communication: Marmara earthquake case study. Selçuk İletişim. 2008;5(3):161–175.
46. Şermet Kaya Ş, Erdoğan EG. Disaster management competence, disaster preparedness belief, and disaster preparedness relationship: Nurses after the 2023 Turkey earthquake. Int Nurs Rev. 2025;72(1):e13020. [CrossRef]
47. Usta E, Yükseler M. Afetlerde sosyal medya kullanımı ve etik ikilemler: İzmir Seferihisar depremi örneği. Afet ve Risk Derg. 2021;4(2):249–269. [CrossRef]
48. Yıldırım A. Afetlerde dijital iletişim ve acil çağrı uygulamalarının kullanılabilirliği üzerine bir inceleme: AFAD Acil Çağrı. TRT Akademi. 2023;8(18):552–573. [CrossRef]
49. Chang CM, Lee LC, Connor KM, Davidson JR, Jeffries K, Lai TJ. Posttraumatic distress and coping strategies among rescue workers after an earthquake. J Nerv Ment Dis. 2003;191(6):391–398. [CrossRef]
50. Guo YJ, Chen CH, Lu ML, Tan HKL, Lee HW, Wang TN. Posttraumatic stress disorder among professional and non-professional rescuers involved in an earthquake in Taiwan. Psychiatry Res. 2004;127(1-2):35–41. [CrossRef]
51. Alvarez J, Hunt M. Risk and resilience in canine search and rescue handlers after 9/11. J Trauma Stress. 2005;18(5):497–505. [CrossRef]
52. Ehring T, Razik S, Emmelkamp PM. Prevalence and predictors of posttraumatic stress disorder, anxiety, depression, and burnout in Pakistani earthquake recovery workers. Psychiatry Res. 2011;185(1-2):161–166. [CrossRef]
53. Mao X, Fung OWM, Hu X, Loke AY. Psychological impacts of disaster on rescue workers: A review of the literature. Int J Disaster Risk Reduct. 2018;27:602–617. [CrossRef]
54. Brown LA, Fernandez CA, Kohn R, Saldivia S, Vicente B. Pre-disaster PTSD as a moderator of the relationship between natural disaster and suicidal ideation over time. J Affect Disord. 2018;230:7–14. [CrossRef]
55. Janoff-Bulman R. Posttraumatic growth: Three explanatory models. Psychol Inq. 2004;15(1):30–34.
56. Carlile JA, Mauseth K, Clark NE, Cruz JL, Thoburn JW. Local volunteerism and resilience following large-scale disaster: Outcomes for health support team volunteers in Haiti. Int J Disaster Risk Sci. 2014;5:206–213. [CrossRef]
57. Şahin Ş, Üçgül İ. Türkiye'de afet yönetimi ve iş sağlığı güvenliği. Afet ve Risk Derg. 2019;2(1):43–63. [CrossRef]
58. Aker AT. 1999 Marmara earthquakes: A review on epidemiologic findings and community mental health policies. Turk Psikiyatri Derg. 2006;17(3):204.
59. Brewer CA, Hutton A, Hammad KS, Geale SK. A feasibility study on disaster preparedness in regional and rural emergency departments in New South Wales: Nurses self-assessment of knowledge, skills and preparation for disaster management. Australas Emerg Care. 2020;23(1):29–36. [CrossRef]
60. Mao X, Loke AY, Fung OWM, Hu X. What it takes to be resilient: The views of disaster healthcare rescuers. Int J Disaster Risk Reduct. 2019;36:101112. [CrossRef]

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# Assessing Intern Students' Professional Commitment and Perspectives on Graduate Education

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## Abstract

**Background:** Professional commitment is a concept that influences one's interest in continuing a profession and engaging in professional development after graduation. Postgraduate education plays a key role in supporting such development by offering valuable opportunities for individuals to enhance their knowledge and skills.

**Aim:** This study aimed to determine the level of professional commitment among intern students and their views on pursuing postgraduate education.

**Methods:** This descriptive study was conducted among intern students (n=315) at a Faculty of Nursing between May and June 2017. The research sample consisted of 251 intern students who voluntarily agreed to participate, without any sampling method being applied. Data were collected using the Nursing Professional Commitment Scale and an introductory form that included items on opinions about postgraduate education. Data analysis included frequency, mean, percentage distribution, Pearson correlation, t-test, and Kruskal-Wallis (KW) tests.

**Results:** The students' average score on the Nursing Professional Commitment Scale was 78.25±13.27. Subdimensions scores were as follows: "Willingness to Exert Effort" – 39.88±7.97, "Maintaining Professional Membership" – 23.29±6.33, and "Devotion to Goals and Values" – 15.08±2.92. The mean scores for total professional commitment, "Willingness to Exert Effort," and "Maintaining Professional Membership" were significantly higher among students who had voluntarily chosen the nursing profession ($p<0.01$). It was found that 63.3% of the students were considering postgraduate education, 38.6% aimed to pursue an academic career, and 77.7% believed that postgraduate education contributes to the professional identity of nursing.

**Conclusion:** Intern students who willingly chose the nursing profession demonstrated a higher level of professional commitment. Additionally, the majority of students were considering postgraduate education and viewed it as a key factor in enhancing the professionalism of the nursing field.

*Keywords: Intern nurse, nursing student, postgraduate education, professional commitment*

## Introduction

A profession consists of a group of activities in which an individual specializes through a rigorous training process to sustain their livelihood. According to the definition by Lee,[1] a profession is "*the work of individuals over a certain period to sustain their vital activities and earn financial income*."[1] Professional commitment can be defined as "*the development of one's professional skills, abilities and attitudes, gaining expertise in one's profession, and then placing value on one's profession by placing it at the centre of one's life*."[2] To be successful in their profession, individuals must possess a deep sense of commitment that goes beyond the desire to earn money. Commitment is defined as "*the force that drives an individual to act towards a particular goal*." A nurse's professional commitment enables them to remain in their role for many years, embrace their work, view it as a career opportunity, and make future plans accordingly.[1] Individuals with a career-oriented mindset often make various investments to support their personal and professional development. They also formulate long-term goals and plans to enhance themselves and advance in their careers. Postgraduate education in nursing is a significant educational investment that fosters both personal and professional growth. In our country, postgraduate nursing education began in 1968.[3] Gardner[4] in 1992 highlighted the connection between professional commitment in nursing and the choice of the nursing profession and career paths. He defined a nurse's professional commitment as the intention to pursue a lifelong career in nursing.[4] Professional commitment is shaped by four key factors: the willingness to put in effort; knowledge of and identification with the profession (including its maintenance and protection); belief in the goals and values of nursing; and the opportunity for career continuity.[5–7] Similarly, Tsai et al.[8] reported that most nurses with higher levels of professional commitment also exhibited greater career self-efficacy. Therefore, to enhance nurses' positive perceptions of their careers, their professional commitment should be strengthened. Commitment to the profession is a vital component of the working lives of both nurses and nursing students. A nurse must believe in and embrace professional values, strive to uphold them, seek continuous improvement in the professional field, and be determined to remain in the profession.[1,8,9]

Nurses' commitment to their profession and their attitudes toward it play a crucial role in achieving professional status, delivering quality care to society, and building professional strength. Strengthening professional commitment and fostering a strong professional identity among nurses will lead to improvements in

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both the quality of healthcare services and the profession's status. Furthermore, professional commitment contributes to nurses' professional development and promotes stability in their careers.[10] In nursing, professional commitment begins to develop during the early stages of education. To sustain this commitment, it is recommended that, alongside the acquisition of core professional values during training, other human values, such as flexibility, sacrifice, honesty, kindness, and patience, be integrated into the curriculum.[10]

Postgraduate education offers in-depth and comprehensive learning in a chosen field. It also fosters positive attitudes, values, and habits of analytical thinking. One of its key aims is to highlight the importance of research in nursing practice and promote the use of evidence-based data in academic and clinical work. Postgraduate education enables the application of appropriate scientific principles to solve nursing-related problems and supports the development of new hypotheses.[10,11] In nursing, postgraduate education contributes to both the personal development of individuals and the advancement of the profession.[3] Therefore, evaluating the perspectives of nursing graduates on postgraduate education and their commitment to the profession is important.

A review of the literature reveals that there are studies in our country exploring students' views on postgraduate education.[12–15] However, no studies have examined both nursing students' professional commitment and their views on postgraduate education. This study was conducted to evaluate the professional commitment of intern nursing students and their opinions about postgraduate education. It aims to contribute to the nursing literature by identifying the level of commitment among intern nurses, the factors influencing this commitment, and their perspectives on postgraduate education.

### Research Questions

- What is the level of professional commitment among intern nurses?
- What are the views of intern nurses regarding postgraduate education?
- Does professional commitment influence views on postgraduate education?

## Materials and Methods

### Design

This research is descriptive in nature.

### Sample of the Study

The study population consisted of 315 senior intern students from Atatürk University Faculty of Nursing. The study was completed with 251 (79.6%) intern students who volunteered to participate and were actively continuing their education between May 15 and June 15, 2017. No sampling method was used. A post hoc (experimental) power analysis was conducted to assess the adequacy of the sample size. In the power analysis, the statistical power of the study was calculated to be 0.99 at a significance level of 0.05 and a 95% confidence interval (based on a t-test comparison between two groups). The group statistics were as follows: $\bar{x}_1$=82.48±12.73, $\bar{x}_2$=71.41±13.21, with $n_1$=155 and $n_2$=96.

### Data Collection Tools

Data were collected using an Introductory Form (which included questions to determine the students' demographic characteristics and their views on postgraduate education) and the Professional Commitment Scale.

### Introductory Form

This form contains a total of 13 questions. Six questions assess students' demographic characteristics, including age, gender, parents' education level, family's economic status, motivation for choosing the nursing profession, and preferred position after graduation. The remaining seven questions explore students' views on postgraduate education. The section on postgraduate education was based on a review of the relevant literature.[14,15]

### Nursing Professional Commitment Scale

The Nursing Professional Commitment Scale (NPCS) was developed by Lu et al.[5] in 2000 and adapted into Turkish by Çetinkaya et al.[16] It is used to assess nurses' levels of professional commitment. The scale consists of 26 items and is structured as a four-point Likert-type scale. It includes three sub-dimensions: "Willingness to Exert Effort," "Maintaining Professional Membership," and "Devotion to Goals and Values." Items 14, 15, 16, 17, 18, 19, 20, 21, and 25 are reverse-coded. The total score ranges from 26 to 104. The sub-dimension score ranges are as follows: "Willingness to Exert Effort" – 13–52; "Maintaining Professional Membership" – 8–32; and "Devotion to Goals and Values" – 5–20. Higher scores indicate a greater level of professional commitment. In the original study, the internal consistency was reported as 0.94 for the overall scale, 0.88 for "Willingness to Exert Effort," 0.77 for "Maintaining Professional Membership," and 0.67 for "Devotion to Goals and Values."[16] In the present study, the Cronbach's alpha values were 0.90 for the overall scale, and 0.91, 0.88, and 0.66 for the respective sub-dimensions.

### Data Collection

Research data were collected in the Faculty of Nursing classrooms between May 15 and June 15, 2017. The data collection took place before or after the students' Internship I and II theoretical classes. The researcher explained the purpose and methodology of the study and invited students to participate. Participation in the study was entirely voluntary. Students who agreed to participate were given a survey form and asked to complete it. Completing the survey took approximately 10–15 minutes.

### Data Analysis

Data were analyzed using the SPSS 21 (Statistical Package for the Social Sciences, IBM Corp., Armonk, NY, USA; Released 2012). Descriptive statistics such as numbers, means, and percentage distributions were calculated. The Pearson correlation test, t-test, and Kruskal-Wallis (KW) test were used for analysis. The internal consistency of the scale was evaluated using Cronbach's alpha. Statistical significance was considered at $p<0.05$ and $p<0.01$.

### Ethical Considerations

To conduct the study, official written approval was obtained from the Ethics Committee of Atatürk University Faculty of Nursing (Approval Number: 2017-4/11, Date: 08.05.2017) and the Dean's Office of the Faculty of Nursing. Participation in the study was voluntary, and both written and verbal informed consent were obtained from all participants.

## Results

When the students' introductory characteristics were examined, the average age was found to be 22.47±1.13 years. Of the participants, 78.1% were female, 55.8% reported that their mothers were primary school graduates, and 42.6% stated the same for their fathers. Additionally, 76.1% of students described their family's economic status as "moderate," and 61.8% indicated that they chose the nursing profession willingly. Regarding the positions students aspired to after graduation, 45.4% wished to work as nurses, 42.6% as educators, and 7.6% as managers (Table 1).

The mean scores from the scale measuring students' commitment to the profession, the total mean score was 78.25±13.27 (3.00±0.51). The subdimension scores were as follows: *Willingness to Exert Effort*: 39.88±7.97 (3.07±0.61); *Maintaining Professional Membership*: 23.29±6.33 (2.91±0.79); *Devotion to Goals and Values*: 15.08±2.92 (3.01±0.58) (Table 2).

It was found that female students had higher mean scores on the professional commitment scale compared to male students. However, this difference was statistically significant only in the subdimension of *Maintaining Professional Membership* ($p<0.05$) (Table 3).

The mean commitment scale scores of students who had willingly chosen the nursing profession were higher than those of students who had not, and this difference was statistically significant ($p<0.05$) (Table 3).

Although the mean commitment scores of students considering postgraduate education were higher than those of students not considering it, a statistically significant difference was found only in the *Devotion to Goals and Values* subdimension ($p<0.05$) (Table 3).

It was found that 63.4% of the students were considering postgraduate education. Among them, 22.7% preferred postgraduate education in psychiatric nursing, 38.6% aimed for an academic career, and 12.7% reported that they did not want to pursue postgraduate education due to a lack of foreign language skills. Additionally, 46.6% of the students were aware of the application requirements

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**Table 1.** Descriptive characteristics of the students

| Descriptive characteristics (n=251) | n | % | Descriptive characteristics (n=251) | n | % |
|---|---|---|---|---|---|
| Age group (21–30 years) (mean±SD) | 22.47±1.13 | | Father's level of education | | |
| Gender | | | High school graduate | 66 | 26.3 |
| Female | 196 | 78.1 | University graduate | 26 | 10.4 |
| Male | 55 | 21.9 | Family economic status | | |
| Mother's level of education | | | Good | 58 | 23.1 |
| Illiterate | 42 | 16.7 | Moderate | 191 | 76.1 |
| Literate | 13 | 5.1 | Poor | 2 | 0.8 |
| Primary school graduate | 140 | 55.8 | Nursing profession selection status | | |
| Secondary school graduate | 27 | 10.8 | Chose willingly | 155 | 61.8 |
| High school graduate | 25 | 10.0 | Did not choose willingly | 96 | 38.2 |
| University graduate | 4 | 1.6 | Preferred career path after graduation | | |
| Father's level of education | | | To be a nurse | 114 | 45.4 |
| Illiterate | 4 | 1.6 | To be an educator | 107 | 42.6 |
| Literate | 3 | 1.2 | To be a manager | 19 | 7.6 |
| Primary school graduate | 107 | 42.6 | All of the above | 4 | 1.6 |
| Secondary school graduate | 45 | 17.9 | Other | 7 | 2.8 |

n: Number, SD: Standard deviation.

**Table 2.** Students' professional commitment score averages

| Scale | Min-max | Average score (item score average) |
|---|---|---|
| Willingness to exert effort | 13–52 | 39.88±7.97 (3.07±0.61) |
| Maintaining professional membership | 8–32 | 23.29±6.33 (2.91±0.79) |
| Devotion to goals and values | 5–20 | 15.08±2.92 (3.01±0.58) |
| Total score | 26–104 | 78.25±13.27 (3.00±0.51) |

for postgraduate programs, 45.4% had not attended any information sessions on postgraduate education, and 77.6% believed that postgraduate education contributed to establishing a professional identity in nursing (Table 4).

## Discussion

Professional commitment is defined as "*highlighting professional identity, making an effort for the profession one belongs to, and being committed to professional goals, values, norms and ethical principles*."[17] When the students' average scores for professional commitment were examined, it was found that the total mean score was above average. This finding is similar to the results of previous studies.[10,16–18] One possible explanation for this result is the high percentage of students in this study who reported choosing the nursing profession willingly. Cihangiroğlu et al.[19] noted that healthcare professionals tend to have higher levels of professional commitment compared to other occupational groups.[17] Similarly, Ayaz-Alkaya et al.[20] found that internship programs positively influenced students' commitment to the profession and significantly increased their desire to work as nurses. The findings of earlier research support the results of this study.[18,20] These results of the study are are significant, as they suggest the presence of future nurses who are committed to practicing their profession willingly, are compassionate toward patients, provide high-quality nursing care, and have the potential to succeed in academic and managerial roles within the healthcare system.

As a result, it was determined that the students' average scores in the subdimensions of the Professional Commitment Scale (*Willingness to Exert Effort, Maintaining Professional Membership, and Devotion to Goals and Values*) were above average. *Willingness to Exert Effort* refers to students' readiness to make significant efforts on behalf of the profession. *Devotion to Goals and Values* measures students' belief in and alignment with the core goals and values of the nursing profession. These findings are consistent with the results of previous studies.[10,16,17,18,21] Ayaz-Alkaya et al.[20] found that internship programs positively influenced students' professional commitment and significantly increased their desire to work as nurses. Additionally,

**Table 3.** Comparison of students' professional commitment scores by selected characteristics

| | Willingness to exert effort | Maintaining professional membership | Devotion to goals and values | Total score |
|---|---|---|---|---|
| Age | r=0.001 | r=0.022 | r=0.063 | r=0.024 |
| | p=0.982 | p=0.728 | p=0.320 | p=0.711 |
| Gender | | | | |
| Female | 39.99±8.10 | 23.84±6.26 | 15.11±2.99 | 78.94±13.48 |
| | (3.08±0.62) | (2.98±0.78) | (3.02±0.60) | (3.03±0.52) |
| Male | 39.47±7.53 | 21.35±6.27 | 14.96±2.67 | 75.78±12.32 |
| | (3.04±0.58) | (2.67±0.78) | (2.99±0.53) | (2.91±0.47) |
| | t=0.447 | t=2.606 | t=0.343 | t=1.644 |
| | p=0.656 | p=0.011* | p=0.733 | p=0.103 |
| Nursing profession selection status | | | | |
| Chose willingly | 42.16±7.42 | 25.01±6.09 | 15.31±2.94 | 82.48±12.73 |
| | (3.24±0.57) | (3.12±0.76) | (3.06±0.59) | (3.17±0.49) |
| Did not choose willingly | 36.20±7.45 | 20.51±5.73 | 14.70±2.85 | 71.41±11.15 |
| | (2.78±0.57) | (2.56±0.72) | (2.94±0.57) | (2.74±0.43) |
| | t=6.172 | t=5.907 | t=1.633 | t=7.241 |
| | p<0.001** | p<0.001** | p=0.104 | p<0.001** |
| Interest in pursuing postgraduate education | | | | |
| Yes | 40.74±7.94 | 23.66±6.19 | 15.47±1.97 | 79.63±13.12 |
| No | 39.09±8.07 | 22.62±6.45 | 14.11±2.75 | 75.82±13.21 |
| Undecided | 37.74±7.64 | 22.68±6.74 | 15.23±3.14 | 75.89±13.47 |
| | F=2.871 | F=0.738 | F=3.173 | F=2.377 |
| | p=0.059 | p=0.479 | p=0.044* | p=0.095 |

*: p<0.05, **: p<0.001. r: Correlation, t: t-test, F: Analysis of variance.

Chang et al.[9] reported that components of professional commitment were negatively affected by burnout. The fact that the sample in this study consisted of intern students who had not yet taken on professional job responsibilities (and were therefore less likely to experience burnout) may have contributed to these positive

**Table 4.** Students' views on postgraduate education (n=251)

| | n | % |
|---|---|---|
| Interest in pursuing postgraduate education | | |
| Yes | 159 | 63.4 |
| No | 45 | 17.9 |
| Undecided | 47 | 18.7 |
| Desired field of postgraduate education* | | |
| Fundamentals of nursing | 27 | 10.7 |
| Internal medicine nursing | 32 | 12.7 |
| Surgical nursing | 33 | 13.1 |
| Women's health and diseases nursing | 20 | 7.9 |
| Child health and diseases nursing | 24 | 9.5 |
| Psychiatric nursing | 57 | 22.7 |
| Public health nursing | 38 | 15.1 |
| Nursing management | 6 | 2.4 |
| Unanswered | 67 | 26.7 |
| Reasons for choosing postgraduate education* | | |
| To determine my area of expertise | 49 | 19.5 |
| To pursue an academic career | 97 | 38.6 |
| To contribute to the profession | 40 | 15.9 |
| To provide higher-quality care | 22 | 8.7 |
| To become a manager | 12 | 4.7 |
| Unanswered | 61 | 24.3 |
| Reasons for not pursuing postgraduate education* | | |
| The available departments are not of interest | 31 | 5.9 |
| Low undergraduate GPA**** | 29 | 11.5 |
| Insufficient financial resources | 10 | 3.9 |
| Inadequate performance on the ALES*** exam | 11 | 4.3 |
| Lack of foreign language proficiency | 32 | 12.7 |
| Other | 13 | 5.1 |
| Awareness of postgraduate education application requirements | | |
| Fully aware | 117 | 46.6 |
| Not aware | 54 | 21.5 |
| Partially aware | 65 | 25.9 |
| Unanswered | 15 | 6.0 |
| Participation in postgraduate education-related events** | | |
| Yes | 79 | 31.5 |
| No | 114 | 45.4 |
| I researched it independently | 43 | 17.1 |
| Unanswered | 15 | 6.0 |
| Perceptions of postgraduate education's contribution to the nursing profession | | |
| It provides a professional identity to the nursing profession | 195 | 77.6 |
| It does not contribute to professional identity | 10 | 4.0 |
| It partially contributes to professional identity | 28 | 11.2 |
| I don't know | 3 | 1.2 |
| Unanswered | 15 | 6.0 |

*: Students could select more than one option, **: Includes participation in information sessions, seminars, congresses, etc., ***: ALES (Academic Personnel and Graduate Education Exam) is a standardized test used in Türkiye to select and place students into postgraduate programs at Turkish universities after they have completed a bachelor's degree, ****: GPA (Grade Points Average) is a parameter used to select and place students in graduate programs in Türkiye.

results. In addition, the fact that most of the students who participated in the study chose the nursing profession willingly, that many were considering postgraduate education, and that the majority aspired to become nurses or educators after graduation may have influenced these results.

This study also found that the average professional commitment scores of female students were higher than those of male students. A statistically significant difference was observed in the *Maintaining Professional Membership* subdimension. These findings are consistent with those of previous studies.[17,18,22–26] According to Tak et al.,[27] women are believed to have a higher normative commitment to their organization because they are more likely to be affected by the perceived cost of leaving their jobs compared to men. Several studies suggest that women tend to have higher professional commitment than men due to the belief that women make relatively greater sacrifices to achieve a certain professional status.[18,27] In this study, it was also determined that students' age did not have a significant effect on their level of professional commitment. In their studies, Sarı[18] and Derin et al.[24] reported differences between nurses' age groups and their levels of professional commitment; however, these differences were not statistically significant. In contrast, studies conducted by Hsu et al.,[21] Cihangiroğlu et al.,[19] and Demirci[17] found that professional commitment increased significantly with age. Similarly, Dönmez and Karakuş,[10] in their study with newly graduated nurses, found that young nurses had lower levels of professional commitment. In the present study, the fact that the students were of similar age and generally belonged to a younger age group may have contributed to the results observed.

The total professional commitment scores, as well as the scores in the subdimensions of *Willingness to Exert Effort and Maintaining Professional Membership*, were significantly higher among students who willingly chose the nursing profession compared to those who did not. In the results of studies by Sarı,[18] Demirci,[17] and Şimşek and Aslan,[28] it was found that nurses who voluntarily chose the profession had higher professional commitment scores compared to those who entered the profession unwillingly. Similarly, a study by Dönmez and Karakuş[10] involving newly graduated nurses reported that those who chose the profession willingly demonstrated a higher level of professional commitment. In line with these findings, it is expected that individuals who do not willingly choose nursing, a self-sacrificing and demanding profession, would show lower levels of commitment. The literature also suggests that practicing a profession aligned with an individual's interests can positively influence both professional satisfaction and commitment.[24]

In this study, the mean scores of students who were considering postgraduate education were higher in the *Devotion to Goals and Values* subdimension, and the difference was statistically significant. In the studies by Hsu et al.,[21] Sarı,[18] Ayaz-Alkaya et al.,[20] and Bulut and Çevik,[29] the mean scores for the *Devotion to Goals and Values* subdimension were found to be similar to the results of this research. Derin et al.[24] reported that negative perceptions about the profession may hinder mechanisms that support professional commitment, particularly when individuals question whether they truly desire to be in the profession. The high scores in the *Devotion to Goals and Values* subdimension in this study may be explained by the fact that more than half of the participating students chose the nursing profession willingly. Additionally, most students believed that postgraduate education contributes to establishing a professional identity for the nursing profession.

In this study, when students' views on postgraduate education were examined, it was found that more than half expressed a desire to pursue postgraduate education. Similarly, Karadaş et al.[30] found that 45.9% of nursing students wanted to pursue postgraduate education; in the study by Satır and Murat,[31] this rate was 92.8%; Şen et al.[32] reported 51%; Kavurmacı et al.[33] found 77.1%; Bozkurt et al.[34] reported 77.4%. The positive attitudes of student nurses toward pursuing postgraduate education are critical for gaining in-depth and comprehensive knowledge in their field of study, as well as for developing positive values, attitudes, and analytical thinking skills.[33] The importance of postgraduate education in training qualified human resources and fostering innovation in science and technology is widely recognized both in our country and around the world.[35]

As a result of this study, it was found that most students believed postgraduate education would contribute to the professional identity of nursing, and some expressed a desire to become academicians. Many also reported being aware of the application requirements for postgraduate education. Similarly, in a study conducted by Kavurmacı et al.,[33] 45.3% of students stated their purpose for pursuing postgraduate education was to become academicians, and 52.7% were aware of the application requirements for postgraduate education. In another study by Erenoğlu,[36] 48.6% of students reported that their motivation for pursuing postgraduate education was to become academicians. In previous studies on career planning, it has been reported that becoming aware of career paths during student years,

and having the intention to pursue them, is important for developing professional competencies and facilitating the transition to professional life after graduation.[37–39]

In this study, approximately one-fourth of the students expressed a desire to pursue postgraduate education in psychiatric nursing. In earlier studies, students reported wanting to pursue postgraduate education in various departments such as surgical nursing, internal medicine nursing, nursing management and principles, and women's health and diseases nursing, often because they found these areas enjoyable, easier, or intriguing.[31,34,40] One limitation of this study is that students were not asked why they wanted to pursue postgraduate education in psychiatric nursing, which restricts the ability to interpret this result. It is possible that many students who showed interest in psychiatric nursing were influenced by their positive experiences with a faculty member teaching the course or with the clinical setting where they completed their practice. According to previous studies, many factors influence individuals' decisions to pursue graduate education. These factors include program management, accessibility to academic staff, quality of education, course content, institutional reputation, and physical facilities. It has also been noted that students' preferences are influenced by the guidance they receive from faculty members during their undergraduate education.[41]

This study also explored reasons for not choosing postgraduate education. One in ten students reported that their foreign language skills were insufficient. It is recommended that foreign language education and international opportunities be expanded as part of university career development programs, and that students' awareness of these opportunities be increased to help them take full advantage of them. It was also found that only one-third of the students had participated in an information session on postgraduate education. In today's rapidly evolving world of technology and knowledge, scientific competence is increasingly being attained through master's and doctoral programs. Postgraduate education not only allows individuals to advance academically but also provides opportunities for personal and scientific development.[42] In this context, raising students' awareness of the value and possibilities of postgraduate education is important.

## Limitations of the Study

The study was limited to a single center and relied on self-reported data. Therefore, the results can be generalized only to this specific group.

## Conclusion

The results of this study showed that students' overall commitment to the nursing profession was above average. Students who voluntarily chose the nursing profession and those considering postgraduate education had higher levels of professional commitment. Female students scored higher than male students in the subdimension of *Maintaining Professional Membership*. Additionally, the majority of students expressed interest in pursuing postgraduate education. To enhance professional commitment, it is important to assess nursing students' commitment levels at the beginning of their education and in the subsequent years. Supporting students in developing a positive perception of the profession from the first year onward may positively influence their long-term professional commitment. Moreover, future research should consider evaluating individual characteristics and other factors that affect commitment. Providing regular guidance and counseling services, along with seminars, could help reduce students' concerns regarding postgraduate education and foreign language proficiency. It is recommended that congresses be organized on topics such as professional commitment and postgraduate education, with active student participation encouraged. Career counseling centers within universities should implement educational programs focused on foreign languages, studying abroad, postgraduate opportunities, and self-awareness. These centers should establish consistent communication with students starting from their first year.

**Ethics Committee Approval:** The study was approved by the Atatürk University Faculty of Nursing Ethics Committee (Approval Number: 2017-4/11, Date: 08.05.2017).

**Informed Consent:** Both written and verbal informed consent were obtained from all participants.

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

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## References

1. Lee K, Carswell JJ, Allen NJ. A meta-analytic review of occupational commitment: Relations with person- and work-related variables. J Appl Psychol. 2000;85(5):799–811. [CrossRef]
2. Benligiray S, Sönmez YDDH. Hemşirelerin mesleki bağlılıkları ile diğer bağlılık formları arasındaki ilişki: Örgüte bağlılık, işe bağlılık ve aileye bağlılık. Hacettepe Univ Hemş Fak Derg. 2011;18(1):28–40.
3. Erol Ö. Hemşirelik alanında lisansüstü eğitim alan öğrencilerin akademik başarı durumları ve etkileyen faktörler. Yükseköğretim ve Bilim Derg. 2020;10(3):608–614.
4. Gardner DL. Career commitment in nursing. J Prof Nurs. 1992;8(3):155–160. [CrossRef]
5. Lu KY, Chiou SL, Chang YY. A study of the professional commitment changes from nursing students to registered nurses. Kaohsiung J Med Sci. 2000;16(1):39–46.
6. Lu KY, Lin PL, Wu CM, Hsieh YL, Chang YY. The relationships among turnover intentions, professional commitment, and job satisfaction of hospital nurses. J Prof Nurs. 2002;18(4):214–219. [CrossRef]
7. Teng CI, Lotus Shyu YI, Chang HY. Moderating effects of professional commitment on hospital nurses in Taiwan. J Prof Nurs. 2007;23(1):47–54. [CrossRef]
8. Tsai CW, Tsai SH, Chen YY, Lee WL. A study of nursing competency, career self-efficacy and professional commitment among nurses in Taiwan. Contemp Nurse. 2014;49:96–102. [CrossRef]
9. Chang HY, Shyu YL, Wong MK, Chu TL, Lo YY, Teng CI. How does burnout impact the three components of nursing professional commitment? Scand J Caring Sci. 2017;31(4):1003–1011. [CrossRef]
10. Dönmez S, Karakuş E. Yeni mezun olan hemşirelerin mesleğe bağlılıklarının incelenmesi. Kocaeli Tıp Derg. 2019;8(1):146–152. [CrossRef]
11. García-Moyano L, Altisent R, Pellicer-García B, Guerrero-Portillo S, Arrazola-Alberdi O, Delgado-Marroquín MT. A concept analysis of professional commitment in nursing. Nurs Ethics. 2019;26(3):778–797. [CrossRef]
12. Atalay M. Lisans iyileştirme çalışmaları raporu. İzmir: Dokuz Eylül Üniversitesi; 1996.
13. Kocaman G. Türkiye'de hemşirelik eğitim sorunları ve çözüm arayışları. In: 12 Mayıs Dünya Hemşireler Günü Özel Baskı. Ankara; 2005:123–153.
14. Numminen O, Ruoppa E, Leino-Kilpi H, Isoaho H, Hupli M, Meretoja R. Practice environment and its association with professional competence and work-related factors: Perception of newly graduated nurses. J Nurs Manag. 2016;24(1):E1-E11. [CrossRef]
15. Kuzu N, Bayramova N, Korkmaz G, Taşdemir G. Sağlık yüksekokulu hemşirelik ve sağlık memurluğu öğrencilerinin eğitimlerine ve geleceklerine ilişkin düşünceleri. I Hemşirelik Forumu. 2003;6(5):40–44.
16. Çetinkaya A, Özmen D, Temel AB. Hemşirelikte Mesleğe Bağlılık Ölçeği'nin geçerlik ve güvenirlik çalışması. Dokuz Eylul Univ Hems Fak Elektron Derg. 2015;8(2):54–60.
17. Demirci B. Hemşirelerin sosyodemografik ve mesleki özellikleri ile iş doyumlarının mesleki bağlılıkları üzerine etkisi. Master's Thesis. Koç Üniversitesi; 2018.
18. Sarı M. Hemşirelerin mesleğine yönelik imaj ve mesleğe bağlılık algısı. Master's Thesis. Marmara University; 2019.
19. Cihangiroğlu N, Teke A, Özata M, Çelen Ö. Mesleki bağlılık ile örgütsel bağlılık arasındaki ilişkinin analizi. Gülhane Tıp Derg. 2015;57(4):367–372.
20. Ayaz-Alkaya S, Yaman-Sözbir Ş, Bayrak-Kahraman B. The effect of nursing internship program on burnout and professional commitment. Nurse Educ Today. 2018;68:19–22. [CrossRef]
21. Hsu HC, Wang PY, Lin LH, Shih WM, Lin MH. Exploring the relationship between professional commitment and job satisfaction among nurses. Workplace Health Saf. 2015;63(9):392–398. [CrossRef]
22. Dixon MA, Cunningham GB, Sagas M, Turner BA, Kent A. Challenge is key: An investigation of affective organizational commitment in undergraduate interns. J Educ Bus. 2005;80(3):172–180. [CrossRef]
23. Karrasch BV. Antecedents and consequences of organisational commitment. Mil Psychol. 2003;15:225–236. [CrossRef]
24. Derin N, Ilkım NŞ, Yayan H. Hemşirelerde mesleki bağlılığın mesleki prestijle açıklanması. Hacettepe Univ Hems Fak Derg. 2017;4(3):24–37.
25. Nesje K. Nursing students' prosocial motivation: Does it predict professional commitment and involvement in the job? J Adv Nurs. 2015;71(1):115–125. [CrossRef]
26. Özmen ÖT, Özer PS, Saatçioğlu ÖY. Akademisyenlerde örgütsel ve mesleki bağlılığın incelenmesine ilişkin bir örnek araştırma. Dokuz Eylul Univ Isletme Fak Derg. 2005;6(2):1–14.
27. Tak B, Çiftçioğlu BA, Özçakır A, Divleli A. Mesleki bağlılığın bireylerin mesleklerine ve çalıştıkları örgüte ilişkin tutumlarını nasıl etkilediğini anlamaya yönelik bir alan araştırması. ISGUC J Ind Relat Hum Resour. 2009;11(4):89–102.
28. Şimşek MŞ, Aslan Ş. Meslekî ve örgütsel bağlılığın, örgütsel davranışa ilişkin sonuçlarla ilişkileri. Sosyo Ekon Arast Derg. 2012;12(23):414–454.
29. Bulut A, Çevik K. Hemşirelerin mesleğe bağlılık ile bağlamsal performansları arasındaki ilişki. Hacettepe Univ Hems Fak Derg. 2021;8(3):321–327. [CrossRef]

30. Karadaş A, Duran S, Kaynak S. Hemşirelik öğrencilerinin kariyer planlamaya yönelik görüşlerinin belirlenmesi. Suleyman Demirel Univ Saglik Bilim Derg. 2017;8(1):1–8. [CrossRef]
31. Satır G, Murat M. Hemşirelik öğrencilerinin lisansüstü eğitime yönelik tutumlarının belirlenmesi: Vakıf üniversitesi örneği. Ege Univ Hems Fak Derg. 2021;37(1):59–67.
32. Şen S, Özdilek S, Öz EN. Hemşirelik öğrencilerinde kariyer geleceği ile hemşirelik mesleğine yönelik imaj algısı arasındaki ilişkinin belirlenmesi. Saglik Hemşirelik Yonetim Derg. 2021;8(1):21–30.
33. Kavurmacı M, Tan M, Arıkan D, Yıldız İ. Hemşirelik öğrencilerinin lisansüstü eğitime ve kariyer planlamaya yönelik görüşlerinin belirlenmesi. Anadolu Hemsirelik Saglik Bilim Derg. 2021;24(2):192–201. [CrossRef]
34. Bozkurt ÖD, Kazankaya F, Demirkol A, Karakaş G, Pekşen H. Hemşirelik öğrencilerinin lisansüstü eğitime yönelik düşünce ve tutumları. Kadin Sagligi Hemsireligi Derg. 2022;8(2):72–82.
35. Bozan M. Lisansüstü eğitimde nitelik arayışları. Sosyal Beseri Bilimler Derg. 2012;4(2):177–187.
36. Erenoğlu R. Hemşirelik öğrencilerinin mesleğe yönelik tutumlarının kariyer iyimserliği ve uyumluluğu üzerine etkisi. JAREN. 2022;8(3):156–165.
37. Karadağlı F. Hemşirelik öğrencilerinin profesyonel değer algıları ve etkileyen faktörler. Mersin Univ Saglik Bilim Derg. 2016;9(2):81–91.
38. Kozak MA, Dalkıranoğlu T. Mezun öğrencilerin kariyer algılamaları: Anadolu Üniversitesi örneği. Anadolu Univ J Soc Sci. 2013;13(1):41–52.
39. Kim JH, Shin HS. Effects of self-reflection-focused career course on career search efficacy, career maturity, and career adaptability in nursing students: A mixed methods study. J Prof Nurs. 2020;36(5):395–403. [CrossRef]
40. Altunkürek ŞZ, Gençbaş D, Çiçek H, Bebiş H, Özdemir S. Hemşirelik öğrencilerinin mesleği tercih etme durumları ile mesleki kariyer planları arasındaki ilişkisinin belirlenmesi. Cumhuriyet Hemsirelik Derg. 2018;6(2):74–82.
41. Nas S, Peyman D, Arat ÖG. Bireylerin yüksek lisans yapma nedenleri üzerine bir araştırma. Dokuz Eylul Univ Sos Bilim Enst Derg. 2016;18(4):571–599. [CrossRef]
42. Ardahan M, Özsoy S. Türkiye'de hemşirelik araştırmalarındaki eğilimler: Yüksek lisans ve doktora tezleri üzerine bir çalışma. Gümüşhane Univ Saglik Bilim Derg. 2015;4(4):516–534.

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# The Relationship Between Patients' Perceptions of Illness and Their Satisfaction with Nursing Care

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## Abstract

**Background:** Patients' perceptions of illness and their satisfaction with nursing care significantly impact the overall quality of healthcare.

**Aim:** This study aimed to examine the relationship between hospitalized patients' perceptions of illness and their satisfaction with nursing care.

**Methods:** This descriptive and correlational study included a sample of hospitalized 255 patients. Data were collected using the Patient Identification Form, the Illness Perception Questionnaire, and the Newcastle Satisfaction with Nursing Care Scale. Data collection was conducted through face-to-face surveys between July 2022 and July 2023. Descriptive statistics, t-test, one-way analysis of variance (ANOVA), and Pearson correlation analysis were used to analyze the data. Statistical significance was set at $p<0.05$.

**Results:** The mean age of the patients was 49.29±15.93 years, with an average hospital stay of 3.24±1.58 days and a mean number of hospitalizations of 2.07 ± 0.86. Among the participants, 59.6% were female, 75.3% were married, and 53.3% reported a middle income level. Pain (90.2%) and fatigue (63.5%) were the most frequently reported symptoms since the onset of illness. The mean total score of the "Opinions About the Illness" subscale was 117.53±10.41, while the mean score for the "Illness Causal Subscale" was 35.24±10.31. The mean total score on the Newcastle Satisfaction with Nursing Care Scale was 63.81±12.18. A statistically significant, weak positive correlation was found between patients' total scores on the Newcastle Satisfaction with Nursing Care Scale and the Illness Identity Subscale, specifically, the item "*I have experienced this symptom since the beginning of my illness*" (r=0.244; p=0.000) and the item "*This symptom is related to my disease*" (r=0.253; p=0.000).

**Conclusion:** This study revealed that patients receiving inpatient care and treatment in internal medicine and surgical wards had below-average perceptions of their illness and moderate levels of satisfaction with nursing care. Based on these findings, it is recommended that educational programs be implemented to improve patients' illness perceptions, along with initiatives aimed at enhancing the quality of nursing care.

*Keywords: Care satisfaction, illness perception, nurse, patient*

## Introduction

Hospitalized patients receive healthcare services from healthcare professionals for various reasons, including surgical interventions, general care, diagnosis, and treatment. Having a chronic illness, undergoing surgery, or experiencing hospitalization places a significant burden on individuals and can negatively affect their quality of life.[1,2] During hospitalization and after discharge, individuals must cope with symptoms and problems related to their condition.[3] This process can influence each patient's perception of their illness in unique ways. The perception of illness, which encompasses both subjective and objective aspects, can vary from person to person.[1,4]

Illness perception is defined as the combination of cognitive and emotional responses to a current disease state.[4,5] Many individuals experience illness at some point in their lives and may react to it in different ways. These reactions reflect their methods of managing the illness and the meaning they attribute to it. Illness perception encompasses how patients interpret and evaluate their symptoms and overall health condition. It may influence their treatment adherence, psychological well-being, and overall quality of life.[1,4–6] According to the literature, illness perception can be shaped by various factors, including individuals' past hospital experiences, personal beliefs and values, environmental influences, and it may evolve over time.[1–3] For patients, understanding their perception of illness and the factors that influence it is important for providing effective and individualized care. Coping with the physical, emotional, and psychological challenges caused by illness, along with the level of adaptation demonstrated, are key determinants of a patient's quality of life.[1–3]

Satisfaction with nursing care among hospitalized patients is one of the primary indicators of the healthcare quality.[7,8] Patient satisfaction encompasses expectations and evaluations throughout the entire care process, beginning with hospitalization, continuing during treatment or care, and concluding with discharge.[8,9] Nursing care plays a central role in patient satisfaction, as patients typically have more frequent and direct contact with nurses than with other healthcare professionals. Additionally, the provision of individualized nursing care further strengthens this relationship.[7,8,10,11] It is believed that improving satisfaction with nursing care can help reduce patients' stress and anxiety levels, foster a sense of safety, support adher-

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ence to treatment, shorten hospital stays, enhance communication and feedback, and promote the visibility, continuity, and effectiveness of nursing services.[9–11]

The level of satisfaction of hospitalized patients with nursing care may be influenced by various factors, including the hospital environment, environmental conditions, disease status, patients' perceptions and experiences of their illness, and their communication with healthcare professionals.[8,9,11] Identifying these factors, understanding how patients perceive their illness, and planning appropriate feedback and improvements are believed to impact patients' satisfaction with nursing care. A review of the literature revealed that studies evaluating both the illness perception of hospitalized patients and their satisfaction with nursing care are limited,[2,6,9,11] and no studies were found that directly examined the relationship between the two.

### Aim of the Study

The aim of this study is to examine the relationship between hospitalized patients' illness perceptions and their satisfaction with nursing care.

### Research Questions

1. What is the level of illness perception among hospitalized patients?
2. What is the level of satisfaction with nursing care among hospitalized patients?
3. What is the relationship between hospitalized patients' illness perception and their satisfaction with nursing care?
4. Do illness perception and satisfaction with nursing care differ according to the sociodemographic characteristics of hospitalized patients?

## Materials and Methods

### Study Design

This research is descriptive and correlational in design.

### Setting

The study population consisted of patients hospitalized in inpatient clinics of a state hospital located in the Black Sea Region, who were receiving treatment and care services. The internal medicine clinics in the study were Cardiology, Internal Medicine, Infectious Diseases, Neurology, Oncology, Hematology, Chest Diseases, and Dermatology. The surgical clinics included Neurosurgery, Urology and Thoracic Surgery, General Surgery, Orthopedics, Ear, Nose, and Throat, Ophthalmology, and Cardiovascular Surgery.

The sample size was based on the 62.3% satisfaction level reported by Kayrakcı and Özşaker[11] in 2014 in their study evaluating surgical patients' satisfaction with nursing care. Based on this rate, a sample size calculation using the G*Power program determined that 255 participants would be sufficient to achieve 90% statistical power. The study was completed with a total of 255 patients. Inclusion criteria were: being 18 years of age or older, having the cognitive ability to understand and respond to the survey questions, being hospitalized for at least 48 hours, and voluntarily agreeing to participate in the study.

### Data Collection Tools

Data were collected using the Patient Identification Form, the Illness Perception Questionnaire (IPQ), and the Newcastle Satisfaction with Nursing Scale (NSNS).

### Patient Identification Form

A diagnostic form developed by the researchers based on the relevant literature was used.[1–5,6,12] This form consists of 13 questions. It includes items regarding the patients' age, gender, marital status, length of hospitalization, the number of previous hospitalizations (including the current one), whether they have previously received treatment or care in the same hospital, income level, education level, employment status, presence of health insurance, the department in which they are hospitalized, whether they observed any improvements in nursing services during prior hospitalizations, and whether they are currently using any medications.

### The Illness Perception Questionnaire

The Illness Perception Questionnaire was originally developed by Weinman et al. in 1996, revised by Moss-Morris et al. in 2002, and adapted into Turkish by Kocaman et al.[5] in 2007. The IPQ consists of three subscales: the Illness Identity Subscale, Opinions About Illness Subscale, and the Illness Causal Subscale. The Illness Identity Subscale includes 14 illness-related symptoms: pain, sore throat, nausea, breathlessness, weight loss, fatigue, stiff joints, sore eyes, wheeziness, headaches, upset stomach, sleep difficulties, dizziness, and loss of strength. The Opinions About Illness includes seven dimensions: timeline (acute/chronic), consequences, personal control, treatment control, illness coherence, timeline (cyclical), and emotional representations. The Illness Causal Subscale consists of 18 items and is related to the patients' beliefs about the possible causes of their illness. In the study of Kocaman et al.[5] in 2007, the Cronbach's alpha coefficients for the subscales of the IPQ were reported as follows: 0.89 for the Illness Identity Subscale, 0.69–0.77 for the Opinions About Illness Subscale, and 0.25–0.72 for the Illness Causal Subscale. In the present study, the Cronbach's alpha values were as follows: Illness Identity Subscale – 0.877, Opinions About Illness Subscale – 0.674, and Illness Causal Subscale – 0.817.

### Newcastle Satisfaction with Nursing Scale

The Newcastle Satisfaction with Nursing Scale was developed by Thomas et al. in 1995 to evaluate and compare the effectiveness of nursing care, clinical practices, and patient experience and satisfaction. The scale was adapted into Turkish by Uzun in 2003 and by Akın and Erdoğan in 2007.[12] The NSNS consists of a single dimension with 19 items rated on a five-point Likert scale. Scores range from a minimum of 19 to a maximum of 95 points. The total score is obtained by summing all item scores and converting the result to a scale of 0–100. The scale does not have a cut-off point; a higher total score indicates higher patient satisfaction. In the Turkish validity study conducted by Akın et al.[12] in 2007, the Cronbach's alpha coefficient was found to be 0.96. In the present study, the Cronbach's alpha coefficient for the Newcastle Satisfaction with Nursing Scale was 0.93.

### Data Collection

After identifying participants who met the inclusion criteria, the purpose and importance of the study were explained to them. Informed consent was then obtained, including a statement assuring that personal information would remain confidential and would not be shared with anyone. The questionnaires were administered by the researcher through face-to-face interviews, during which questions were read aloud and answered by the participants. Data were collected by the researcher using the face-to-face interview method, with all measurement tools completed during a single session in the patient's room. Interviews were conducted at times when patients were rested, pain-free, and not undergoing care or treatment. The research data were collected between July 2022 and July 2023 using face-to-face surveys. Each data collection session took approximately 10–15 minutes.

### Data Analysis

Quantitative data obtained from the study were analyzed using the Statistical Package for the Social Sciences version 22.0 (IBM, New York, USA). Statistical methods including numbers, percentage, minimum and maximum values, mean, and standard deviation were used to summarize the data. The normality of data distribution was assessed using the Kolmogorov-Smirnov test and by examining skewness and kurtosis coefficients. For comparisons between independent groups, parametric tests including the t-test and one-way analysis of variance (ANOVA) were used. To evaluate the relationship between continuous variables, Pearson correlation analysis was used, as the data met the assumptions of normal distribution. Statistical significance was set at $p<0.05$.

### Ethical Considerations

Ethical approval for the study was obtained from the Clinical Research Ethics Committee of Ordu University (Approval Number: 165, Date: 01.07.2022), and written institutional permission was granted by the Provincial Directorate of Health. Additionally, patients were provided with detailed information about the study, and written informed consent was obtained from each participant. The study was conducted in accordance with the principles outlined in the Declaration of Helsinki. Permission to use the data collection scales was obtained from the original authors via email.

## Results

The mean age of the patients was 49.29±15.93 years, the average length of hospital stay was 3.24±1.58 days, and the mean number of hospitalizations was 2.07±0.86 times. In this study, 59.6% of the participants were female, 75.3% were married, and 53.3% reported a middle income level. Additionally, 40% of the patients were high school graduates, 20.4% were not working due to illness, and 94.5% had health insurance. Among the patients included in the study, 57.6% were hospitalized in inter-

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**Table 1.** Sociodemographic characteristics of patients (n=255)

| Sociodemographic characteristics | Min-max | Mean±SD |
|---|---|---|
| Age (years) | 18–90 | 49.29±15.93 |
| Length of hospital stay (days) | 1–15 | 3.24±1.58 |
| Number of hospitalizations (mean) | 1–6 | 2.07±0.86 |
| | **n** | **%** |
| Gender | | |
| Female | 152 | 59.6 |
| Male | 103 | 40.4 |
| Marital status | | |
| Married | 192 | 75.3 |
| Single | 63 | 24.7 |
| Income level | | |
| Low | 13 | 5.1 |
| Middle | 136 | 53.3 |
| High | 87 | 34.1 |
| Very high | 19 | 7.5 |
| Education level | | |
| Literate | 39 | 15.3 |
| Primary-secondary education | 64 | 25.1 |
| Education level | | |
| High school | 102 | 40.0 |
| Undergraduate/graduate | 50 | 19.6 |
| Working status | | |
| Not working due to illness | 52 | 20.4 |
| Not working (other reasons) | 148 | 58.0 |
| Working | 55 | 21.6 |
| Health Insurance | | |
| Yes | 141 | 94.5 |
| No | 14 | 5.5 |
| Clinic type | | |
| Internal medicine clinic | 147 | 57.6 |
| Surgical clinic | 108 | 42.4 |
| Previous hospitalization at this hospital | | |
| Yes | 85 | 33.3 |
| No | 170 | 66.7 |
| Medication use | | |
| Using | 173 | 67.8 |
| Not using | 82 | 32.2 |

Min: Minimum, Max: Maximum, SD: Standard deviation.

**Table 2.** Distribution of patients' illness perception questionnaire (IPQ) subscale disease type scores

| IPQ subscale symptom | I have experienced this symptom since the beginning of my illness | | | | This symptom is related to my disease | | | |
|---|---|---|---|---|---|---|---|---|
| | Yes | | No | | Yes | | No | |
| | n | % | n | % | n | % | n | % |
| Pain | 230 | 90.2 | 25 | 9.8 | 239 | 93.7 | 16 | 6.3 |
| Sore throat | 17 | 6.7 | 238 | 93.3 | 30 | 11.8 | 225 | 88.2 |
| Nausea | 61 | 23.9 | 194 | 76.1 | 80 | 31.4 | 175 | 68.6 |
| Breathlessness | 35 | 13.7 | 220 | 86.3 | 47 | 18.4 | 208 | 81.6 |
| Weight loss | 111 | 43.5 | 144 | 56.5 | 124 | 48.6 | 131 | 51.4 |
| Fatigue | 162 | 63.5 | 93 | 36.5 | 157 | 61.6 | 98 | 38.4 |
| Stiff joints | 55 | 21.6 | 200 | 78.4 | 77 | 30.2 | 178 | 69.8 |
| Sore eyes | 15 | 5.9 | 240 | 94.1 | 39 | 15.3 | 216 | 84.7 |
| Wheeziness | 17 | 6.7 | 238 | 93.3 | 41 | 16.1 | 214 | 83.9 |
| Headaches | 68 | 26.7 | 187 | 73.3 | 93 | 36.5 | 162 | 63.5 |
| Upset stomach | 69 | 27.1 | 186 | 72.9 | 89 | 34.9 | 166 | 65.1 |
| Sleep difficulties | 103 | 40.4 | 152 | 59.6 | 121 | 47.5 | 134 | 52.5 |
| Dizziness | 53 | 20.8 | 202 | 79.2 | 98 | 38.4 | 157 | 61.6 |
| Loss of strength | 114 | 44.7 | 141 | 55.3 | 151 | 59.2 | 104 | 40.8 |

| | Min-max | Mean±SD | Min-max | Mean±SD | Cronbach's Alpha |
|---|---|---|---|---|---|
| Illness identity subscale | 16–28 | 23.64±2.56 | 13–25 | 20.68±3.28 | 0.877 |

Min: Minimum, Max: Maximum, SD: Standard deviation.

nal medicine clinics and 42.4% in surgical clinics. It was also found that 33.3% of the patients had not been previously hospitalized in the hospital where the study was conducted, and 67.8% of the patients were using medication (Table 1).

In this study, it was found that patients most frequently experienced the symptoms of pain (90.2%) and fatigue (63.5%), according to the IPQ. Additionally, patients most commonly believed that the symptoms of pain (93.7%), fatigue (61.6%), and loss of strength (59.2%) were related to their illness. The total mean score for the item "*I have experienced this symptom since the beginning of my illness*" on the Illness Identity Subscale was 23.64±2.56, while the total mean score for the item "*This symptom is related to my disease*" on the Illness Identity Subscale was 20.68±3.28 (Table 2).

**Table 3.** Distribution of patients' scores on the opinions about illness subscale, illness causal subscale, and newcastle satisfaction with nursing scale (NSNS)

| Illness causal subscale | Min-max | Mean±SD | Cronbach's Alpha |
|---|---|---|---|
| Timeline (acute/chronic) | 6–28 | 17.15±4.43 | 0.738 |
| Consequences | 6–28 | 17.07±3.72 | 0.684 |
| Personal control | 13–30 | 20.23±3.11 | 0.535 |
| Treatment control | 11–25 | 16.92±2.76 | 0.455 |
| Illness coherence | 9–25 | 17.17±3.30 | 0.728 |
| Timeline/cyclical | 4–20 | 11.64±2.89 | 0.725 |
| Emotional representations | 6–26 | 17.32±3.47 | 0.679 |
| Total – opinions about illness subscale | 92–157 | 117.53±10.41 | 0.674 |
| Psychological attributions | 6–27 | 11.80±3.93 | 0.597 |
| Risk factors | 8–35 | 16.17±5.09 | 0.635 |
| Immunity | 2–10 | 4.07±1.99 | 0.352 |
| Accident or chance | 2–9 | 2.85±1.39 | 0.654 |
| Total – illness causal subscale | 19–72 | 35.24±10.31 | 0.817 |
| Total – newcastle satisfaction with nursing care scale (NSNS) | 28–95 | 63.81±12.18 | 0.933 |

Min: Minimum, Max: Maximum, SD: Standard deviation.

In terms of the Opinions About Illness Subscale, the total mean score was 117.53±10.41. Subscale averages were as follows: 17.15±4.43 for Timeline Acute/Chronic, 17.07±3.72 for Consequences, 20.23±3.11 for Personal Control, 16.92±2.76 for Treatment Control, and 17.17±3.30 for Illness Coherence. Additionally, the average score was 11.64±2.89 for Timeline/Cyclical and 17.32±3.47 for Emotional Representations (Table 3). The total mean score for the Illness Causal Subscale was 35.24±10.31. Subscale averages were as follows: 11.80±3.93 for Psychological Attributions, 16.17±5.09 for Risk Factors, 4.07±1.99 for Immunity, and 2.85±1.39 for Accident or Chance. The total mean score for the NSNS was 63.81±12.18 (Table 3).

When examining difference in Opinions About Illness Subscale scores based on patients' personal characteristics, statistically significant differences were found according to marital status (p=0.009), education level (p=0.000), employment status (p=0.019), and availability of health insurance (p=0.027) (p<0.05). Similarly, when analyzing Illness Causal Subscale scores based on personal characteristics, statistically significant differences were observed between according to income level (p=0.000), education level (p=0.063), and the type of clinic where the patient was hospitalized (p=0.014) (p<0.05). In this study, when the differences in NSNS scores were examined according to patients' personal characteristics, no statistically significant differences were found (Table 4).

A weak but statistically significant positive correlation was found between patients' NSNS total scores and their scores on the Illness Identity Subscale, specifically for the items "*I have experienced this symptom since the beginning of my illness*" (r=0.244; p=0.000) and "*This symptom is related to my disease*" (r=0.253; p=0.000) (Table 5).

## Discussion

Illness perception influences not only the health problems individuals face but also their experiences during illness and their coping mechanisms. In this study, the total IPQ scores of patients in surgical and internal medicine clinics were found to be below average. Based on this result, it can be inferred that patients are aware of their health conditions, experience notable symptoms, and make moderate efforts toward recovery. It was also observed that patients most frequently experienced pain and fatigue, and they associated pain, fatigue, and loss of strength with their illness. In a study by Shakya et al.[13] in 2020 conducted at a tertiary hospital in Nepal, patients frequently reported symptoms such as headaches, fatigue, and dizziness. Similarly, in a study by Karabulutlu and Karaman[14] in 2015 on cancer patients, fatigue was reported as the most common symptom. In the study conducted by Yorulmaz et al.[15] in 2013 with patients diagnosed with diabetes, it was found that the most commonly experienced symptoms were fatigue, weakness, and weight loss. In line with these results, the present study also identified fatigue as the most frequently experienced symptom, with other symptoms aligning closely with findings from similar studies in the literature.

In this study, participants scored lowest on the Timeline/Cyclical subscale and highest on the Personal Control subscale of the IPQ – Opinions About Illness. Similar results were reported by Karabulutlu and Karaman[14] in 2015 in their study on cancer patients. These findings suggest that patients in internal medicine and surgical clinics tend to have positive attitudes and beliefs regarding their ability to control and monitor their illness, as well as the course of treatment and care. However, differing results are also reported in the literature.[13,16,17] For example, in the study by Shakya et al.[13] in 2020 conducted in Nepal, patients scored lowest on the Timeline/Cyclical dimension but highest on the Timeline (Acute/Chronic) dimension. In their study with hemodialysis patients, Özer et al.[16] in 2022 found that participants scored lowest in the Personal Control dimension and highest in the Consequences dimension. Similarly, in a study by Thomson et al.[17] in 2020 conducted in Scotland with individuals diagnosed with coronary artery disease, it was found that patients also had the lowest scores in the Personal Control dimension and the highest in the Consequences dimension. These findings suggest that the variations observed across studies may be attributed to differences in the disease characteristics of the patient populations.

In the present study, patients from internal medicine and surgical clinics who participated in the research had the lowest scores on the Illness Causal Subscale of the IPQ and the highest scores in the Risk Factors dimension. Similar findings were reported in the studies by Shakya et al.[13] in 2020 and Karabulutlu and Karaman[14] in 2015. In contrast, the study by Menekli et al.[18] in 2020 involving cancer patients showed that participants scored lowest in the Accident or Chance dimension and highest in the Psychological Attributions dimension. These results suggest that the patients in the current study believed risk factors played a significant role in the development of their illness, while the accident or chance factor was perceived to have little influence.

Patient satisfaction with nursing care in the current study was found to be at a moderate level. Similar results were reported in various studies. For example, Hajy et al.[19] in 2024 investigated patient satisfaction with nursing care in Iraq; Arli[20] in 2023 examined the relationship between surgical patients' awareness of individualized care and their satisfaction with nursing care in Türkiye; and Dinsa et al.[21] in 2022 found that patient satisfaction levels in Ethiopia were at a moderate level. Although some studies in the literature support the findings of this study, others have reported differing results. For instance, Tomaszewska et al.[22] in 2023 conducted a study in Poland evaluating nursing care satisfaction among patients hospitalized in a cardiology ward, and Rodríguez-Herrera et al.[23] in 2021 found high levels of nursing care satisfaction among cancer patients in Mexico. In the study by Özşaker et al.[24] in 2021, which examined the perception of nursing care and satisfaction among surgical patients, and in the study by Bahçecioğlu et al.[25] in 2021, which assessed nursing care satisfaction and readiness for discharge among patients hospitalized in internal medicine clinics, patient satisfaction levels were found to be high. The literature suggests that differences in findings

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**Table 4.** Distribution of patients' scores on the illness perception questionnaire (IPQ) and newcastle satisfaction with nursing scale (NSNS) by sociodemographic characteristics (n=255)

| Sociodemographic characteristics | IPQ – opinions about illness subscale Mean±SD | IPQ – illness causal subscale Mean±SD | Newcastle satisfaction with nursing scale (NSNS) Mean±SD |
|---|---|---|---|
| Gender | | | |
| Female | 118.48±10.56 | 33.86±9.55 | 63.20±11.84 |
| Male | 116.12±10.07 | 37.11±11.07 | 64.71±12.67 |
| Statistical analysis | t=1.783 | t=-2.163 | t=-0.970 |
| | p=0.610 | p=0.152 | p=0.249 |
| Marital status | | | |
| Married | 118.60±9.55 | 35.36±9.91 | 63.24±12.46 |
| Single | 114.25±12.20 | 34.90±11.50 | 65.52±11.18 |
| Statistical analysis | t=2.921 | t=0.304 | t=-1.289 |
| | **p=0.009** | p=0.516 | p=0.155 |
| Income level | | | |
| Low | 121.84±19.72 | 47.30±17.76[a] | 67.92±11.55 |
| Middle | 117.68±9.70 | 34.53±9.84[b] | 63.89±12.17 |
| High | 117.68±9.90 | 34.95±8.89[b] | 63.69±12.31 |
| Very High | 112.78±7.71 | 33.42±8.44[b] | 60.89±12.10 |
| Statistical analysis | F=2.098 | F=6.803 | F=0.860 |
| | p=0.101 | **p=0.000** | p=0.462 |
| Education level | | | |
| Literate | 123.76±13.26[a] | 36.69±11.31 | 62.10±12.41 |
| Primary-secondary education | 118.98±9.14[ab] | 37.53±9.44 | 64.92±13.80 |
| High school | 116.53±8.97[bc] | 34.48±10.92 | 63.70±11.14 |
| Undergraduate/graduate | 112.84±9.72[c] | 32.80±8.66 | 63.94±11.98 |
| Statistical analysis | F=9.657 | F=2.462 | F=0.435 |
| | **p=0.000** | **p=0.063** | p=0.738 |
| Working status | | | |
| Not working due to illness | 116.98±10.09[a] | 35.13±13.83 | 63.96±12.68 |
| Not working (other reasons) | 118.91±10.52[ab] | 35.70±9.62 | 63.20±12.45 |
| Working | 114.34±9.85[a] | 34.12±9.49 | 65.31±10.93 |
| Statistical analysis | F=4.038 | F=0.472 | F=0.594 |
| | **p=0.019** | p=0.624 | p=0.553 |
| Health insurance | | | |
| Yes | 117.20±9.94 | 35.11±10.07 | 63.44±12.15 |
| No | 123.14±16.06 | 37.57±14.04 | 70.07±11.32 |
| Statistical analysis | t=-2.086 | t=-0.867 | t=-1.990 |
| | **p=0.027** | p=0.084 | p=0.527 |
| Clinic type | | | |
| Internal medicine clinic | 118.61±10.82 | 36.75±11.03 | 62.27±12.50 |
| Surgical clinic | 116.05±6.69 | 33.21±8.89 | 65.92±11.44 |
| Statistical analysis | t=1.952 | t=2.740 | t=-2.382 |
| | p=0.096 | **p=0.014** | p=0.410 |
| Previous hospitalization at this hospital | | | |
| Yes | 119.87±10.91 | 34.12±9.42 | 64.01±12.28 |
| No | 116.36±9.99 | 36.25±10.95 | 61.75±11.54 |
| Statistical analysis | t=2.560 | t=-1.197 | t=1.021 |
| | p=0.301 | p=0.173 | p=0.921 |
| Medication use | | | |
| Using | 118.89±10.60 | 35.45±10.72 | 64.08±11.54 |
| Not using | 114.67±9.45 | 34.81±9.43 | 63.24±13.47 |
| Statistical Analysis | t=3.070 | t=0.459 | t=0.512 |
| | p=0.331 | p=0.152 | p=0.111 |

[a-c]: No difference between groups with the same letter. SD: Standard deviation, t: Student's t-test, F: One-way analysis of variance (ANOVA).

**Table 5.** Correlation between illness perception questionnaire (IPQ) subscales and newcastle satisfaction with nursing scale (NSNS) scores

| | Illness identity subscale (I have experienced this symptom since the beginning of my illness) | Illness identity subscale (This symptom is related to my disease) | Opinions about illness subscale | Illness causal subscale |
|---|---|---|---|---|
| Newcastle satisfaction with nursing scale (NSNS) total score | | | | |
| r | 0.244 | 0.253 | -0.021 | -0.119 |
| p | 0.000* | 0.000* | 0.737 | 0.060 |

*: p<0.05. r: Pearson correlation coefficient.

across studies may be influenced by variations in patient populations and cultural contexts, as well as by the multidimensional nature of patient satisfaction.

In the present study, it was determined that the mean score of the Opinions About Illness subscale of the IPQ varied depending on the marital status of patients receiving care in internal medicine and surgical services. It was found that Opinions About Illness subscale scores were higher among patients who were married. However, similar studies in the literature have reported different results. In the study by Okur et al.[26] in 2023 involving elderly individuals with chronic diseases, no significant difference was found between IPQ scores and marital status. In the study by Karabulutlu and Karaman[14] in 2015 conducted with cancer patients, a significant difference was observed only in the Consequences dimension of the Opinions About Illness subscale. It has been suggested that differences in study results on this subject may be due to the fact that individuals' perceptions of illness can be influenced by a variety of factors.

In the present study, Opinions About Illness subscale scores differed significantly by education level, with higher scores among literate patients. Similarly, Karagülle and Çiçek[27] in 2020 found a significant relationship between education level and IPQ scores in patients with chronic obstructive pulmonary disease (COPD), whereas Kahyaoğlu Süt[28] in 2017 found no such association. Education level, shaped by social and cultural factors, may influence illness perception, although it is likely only one of several contributing factors. Additionally, the subscale scores were significantly higher among patients who were not working for reasons unrelated to illness and those without health insurance. It is possible that limited access to reliable health information may lead uninsured individuals to develop misconceptions about their illness.

In this study, the mean score of the IPQ Illness Causal Subscale differed significantly by income level, with higher scores observed among patients with lower income. Similarly, Karagülle and Çiçek[27] in 2020 found that income level influenced illness perception in patients with COPD. Limited access to healthcare services and greater exposure to risk factors may lead low-income individuals to be more aware of their symptoms and to perceive their illness more intensely. Additionally, Illness Causal Subscale scores were significantly higher among patients with primary or secondary education. In line with this, Boonsatean et al.[29] in 2016 found that education level impacted illness perception, with higher-educated patients demonstrating a better understanding of their condition. Individuals with lower levels of education may develop inaccurate beliefs about their illness, potentially leading to unnecessary anxiety.

The current study also found that the average score on the Illness Causal Subscale was significantly higher among patients hospitalized in internal medicine wards. This result may be attributed to the fact that patients in internal medicine units typically have chronic or more severe illnesses and tend to experience longer hospital stays. Additionally, their higher illness causation scores may be explained by more frequent encounters with disease complications, greater health awareness and knowledge, and a heightened ability to recognize and interpret their symptoms.

In the present study, no significant differences were found in NSNS scores based on the personal characteristics of the patients. However, the literature reports varying results on this subject. For example, in 2024, Hajy et al.[19] in Iraq identified a significant relationship with marital status; Alhowaymel et al.[30] in 2022 in Saudi Arabia and Tomaszewska et al.[22] in 2023 in Poland found significant differences based on educational status; and Karaca and Durna[9] in 2017 reported significant relationships with both marital status and education level. In Cerit's[7] in 2016 study, a significant difference was observed based on educational level, while no significant relationships were observed between patient satisfaction and gender, clinic type, or age. It is suggested that patient satisfaction may be influenced not only by personal characteristics but also by factors such as the quality of healthcare services, previous hospital experiences, nurses' communication skills, and patient expectations.

In the present study, a weak, positive, and statistically significant relationship was found between patients' satisfaction with nursing care and their Illness Identity perception (specifically "*I have experienced this symptom since the beginning of my illness*", and "*This symptom is related to my disease*"). As illness perception increased, so did satisfaction with nursing care. In contrast, Al-Zaru and Al-Dwairi[31] in 2023 found a negative relationship between satisfaction and illness perception in patients with coronary heart disease in Northern Jordan. Meanwhile, Iskandarsyah et al.[32] in 2013 in Indonesia reported that information satisfaction among breast cancer patients was associated with more positive illness perceptions. Although limited studies exist, illness perception appears to be one of many factors influencing patient satisfaction. Other important factors include communication, quality of service, waiting times, physical conditions, patient rights, access to care, staff professionalism, and technological infrastructure.[33] Since these variables were not assessed in the present study, future research should consider them to provide a more comprehensive understanding of patient satisfaction.

## Limitation

This study has two principal limitations. Firstly, the findings cannot be generalized to the entire patient population, as they are limited to individuals receiving inpatient care in the internal medicine and surgical departments of the hospital where the research was conducted. Secondly, several factors known to influence patients' perceptions of illness—such as communication processes, quality of services, waiting times, physical environment, patient rights, accessibility of care, staff professionalism, and technological infrastructure—were not assessed within the scope of this study.

## Conclusion

This study found that the illness perceptions of patients receiving inpatient care in internal medicine and surgical units were below average, and their satisfaction with nursing care was at a moderate level. A weak but positive relationship was observed between illness type and nursing care satisfaction. Additionally, the study concluded that personal characteristics did not affect nursing care satisfaction. Based on these findings, it is recommended to conduct studies aimed at enhancing patients' knowledge about their symptoms and treatment options, as well as to develop communication strategies that facilitate regular feedback to better understand patients' concerns and needs. Further research on this topic by healthcare professionals is also encouraged. Identifying patients' perceptions of illness can help healthcare professionals provide more effective care, improve communication, increase patient satisfaction, and enhance treatment outcomes. It can also help patients feel understood and supported, prompt treatment adherence, and lead to greater satisfaction with their overall healthcare experience. Assessing satisfaction with nursing care is equally important, as it reflects patients' trust in the healthcare institution and can positively influence the motivation of healthcare staff. Therefore, identifying and evaluating patient feedback is essential for the continuous improvement of healthcare services.

**Ethics Committee Approval:** The study was approved by the Ordu University Clinical Research Ethics Committee (Approval Number: 165, Date: 01.07.2022).

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

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## References

1. Dempster M, Howell D, McCorry NK. Illness perceptions and coping in physical health conditions: A meta-analysis. J Psychosom Res. 2015;79(6):506–513. [CrossRef]
2. Schüz B, Wolff JK, Warner LM, Ziegelmann JP, Wurm S. Multiple illness perceptions in older adults: Effects on physical functioning and medication adherence. Psychol Health. 2014;29(4):442–457. [CrossRef]
3. Foxwell R, Morley C, Frizelle D. Illness perceptions, mood and quality of life: A systematic review of coronary heart disease patients. J Psychosom Res. 2013;75(3):211–222. [CrossRef]
4. Armay Z, Özkan M, Kocaman N, Özkan S. Hastalık Algısı Ölçeği'nin kanser hastalarında Türkçe geçerlik ve güvenirlik çalışması. Klin Psikiyatri. 2007;10:192–200.
5. Kocaman N, Özkan M, Armay Z, Özkan S. Hastalık Algısı Ölçeği'nin Türkçe uyarlamasının geçerlilik ve güvenilirlik çalışması. Anadolu Psikiyatri Derg. 2007;8:271–280.
6. Demir Akça AS, Saraçli Ö, Emre U, Atasoy N, Güdül S, Özen Barut B, et al. Relationship of cognitive functions with daily living activities, depression, anxiety and clinical variables in hospitalized elderly patients. Noro Psikiyatr Ars. 2014;51(3):267–274. [CrossRef]
7. Cerit B. Hastaların hemşirelik bakımından memnuniyet düzeyi. J Hacettepe Univ Fac Nurs. 2016;3(1):27–36.
8. Mulugeta H, Wagnew F, Dessie G, Biresaw H, Habtewold TD. Patient satisfaction with nursing care in Ethiopia: A systematic review and meta-analysis. BMC Nurs. 2019;18:27. [CrossRef]
9. Karaca A, Durna Z. Patient satisfaction with the quality of nursing care. Nurs Open. 2019;6(2):535–545. [CrossRef]
10. Alan H. Bir üniversite hastanesinde yatan hastaların hemşirelik hizmetlerinden memnuniyet düzeyleri. Hemşirelikte Eğit Araştırma Derg. 2018;15(2):81–87.
11. Kayrakçı F, Özşaker E. Cerrahi hastalarının hemşirelik bakımından memnuniyet düzeylerinin belirlenmesi. Flor Nightingale Hemşirelik Derg. 2014;22(2):105–113. [CrossRef]
12. Akin S, Erdogan S. The Turkish version of the Newcastle Satisfaction with Nursing Care Scale used on medical and surgical patients. J Clin Nurs. 2007;16(4):646–653. [CrossRef]
13. Shakya R, Shrestha S, Gautam R, Rai L, Maharjan S, Satyal GK, et al. Perceived illness and treatment adherence to hypertension among patients attending a tertiary hospital in Kathmandu, Nepal. Patient Prefer Adherence. 2020;14:2287–2300. [CrossRef]
14. Karabulutlu EY, Karaman S. Kanser hastalarında hastalık algısının değerlendirilmesi. Sağlık Bilimleri ve Meslekleri Derg. 2015;2(3):271–284. [CrossRef]
15. Yorulmaz H, Tatar A, Saltukoğlu G, Soylu G. Diyabetli hastalarda hastalık algısını etkileyen faktörlerin incelenmesi. FSM İlmî Araştırmalar İnsan Toplum Bilimleri Derg. 2013;(2):367–387.
16. Özer Z, Turan GB, Öztürk D. Hemodiyaliz hastalarında sağlıkta kadercilik anlayışı ile hastalık algısı arasındaki ilişki: Karşılaştırmalı bir çalışma. Balıkesir Sağlık Bilimleri Derg. 2022;11(1):10–17.
17. Thomson P, Rushworth GF, Andreis F, Angus NJ, Mohan AR, Leslie SJ. Longitudinal study of the relationship between patients' medication adherence and quality of life outcomes and illness perceptions and beliefs about cardiac rehabilitation. BMC Cardiovasc Disord. 2020;20(1):71. [CrossRef]
18. Menekli T, Doğan F, Elkıran ET. Kanserli hastalarda hastalık algısı ve yaşam kalitesi. Harran Üniv Tıp Fak Derg. 2020;17(3):467–474. [CrossRef]
19. Hajy MA, Ahmed KM, Ahmed NS, Ahmed HM. Patient satisfaction with nursing care based on Newcastle Satisfaction with Nursing Scale in Erbil/Iraq. Continuity. 2024;13:1320–1325. [CrossRef]
20. Arli SK. Surgical patients' awareness of individualized care and their satisfaction with nursing care. Int J Caring Sci. 2023;16(3):1271.
21. Dinsa K, Deressa BG, Salgedo WB. Comparison of patients satisfaction levels toward nursing care in public and private hospitals, Jimma, Ethiopia. Nurs Res Rev. 2022;177–189. [CrossRef]
22. Tomaszewska K, Majchrowicz B, Serwin A. Assessment of patient satisfaction with nursing care with the Newcastle scale. Nurs 21st Century. 2023;22:8–13. [CrossRef]
23. Rodríguez-Herrera C, López-Jiménez JJ, Del Toro-Valero A, Torres-Carrillo NM, Torres-Carrillo N, Godínez-Peña CA, et al. The Newcastle satisfaction with nursing scales in a Mexican Oncology Hospital. Afr Health Sci. 2021;21(1):60–66. [CrossRef]
24. Özşaker E, Sevilmiş H, Özcan Y, Samast M. Cerrahi hastalarının hemşirelik bakımını algılayışı ve memnuniyet düzeyleri. J Contemp Med. 2021;11(1):110–117. [CrossRef]
25. Bahçecioğlu Turan G, Özer Z, Atan G. Nursing care satisfaction and readiness for hospital discharge states of patients hospitalized in internal medicine clinics: Descriptive cross-sectional research example. Turkiye Klinikleri J Nurs Sci. 2021;13(4):947–957. [CrossRef]
26. Okur E, Karaçal R, Sarı C. Kronik hastalığı olan yaşlı bireylerde hastalık algısı. Muş Alparslan Univ Sağlık Bilim Derg. 2023;3(1):45–52.
27. Karagülle Ç, Çiçek SC. Kronik obstrüktif akciğer hastalığı olan bireylerin hastalık algısının yaşam kalitesine etkisi. Turk J Sci Health. 2020;1(2):36–49.
28. Kahyaoğlu Süt H. Jinekolojik cerrahi operasyon öncesi hastaların hastalık algıları üzerine etkili faktörler. Med J Bakirkoy. 2017;13(2):83–90. [CrossRef]
29. Boonsatean W, Dychawy Rosner I, Carlsson A, Östman M. The influences of income and education on the illness perception and self-management of Thai adults with type 2 diabetes. J Diabetes Metab Disord. 2016;3(2):017.[CrossRef]
30. Alhowaymel F, Abaoud A, Alhuwaimel A, Alenezi A, Alsayed N. COVID-19 patients' satisfaction levels with nursing care: A cross-sectional study. SAGE Open Nurs. 2022;8:23779608221078163. [CrossRef]
31. Al-Zaru IM, Al-Dwairi HR. Relationship between illness perception and perceived social support and satisfaction with nursing care quality among patients with coronary heart disease in Jordan. Open Nurs J. 2023;17(1):e18744346269665. [CrossRef]
32. Iskandarsyah A, de Klerk C, Suardi DR, Soemitro MP, Sadarjoen SS, Passchier J. Satisfaction with information and its association with illness perception and quality of life in Indonesian breast cancer patients. Support Care Cancer. 2013;21(11):2999–3007. [CrossRef]
33. Kamra V, Singh H, Kumar De K. Factors affecting patient satisfaction: An exploratory study for quality management in the health-care sector. Total Qual Manag Bus Excell. 2016;27(9-10):1013–1027. [CrossRef]

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# Relationship Between Teachers' Attitudes and Knowledge About Epilepsy and Their Health Literacy and Health Anxiety

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## Abstract

**Background:** Epilepsy is a common neurological condition that can affect students in educational settings. Teachers' knowledge and attitudes toward epilepsy play a vital role in ensuring student safety and educational continuity.

**Aim:** This study aimed to examine the relationship between teachers' health literacy, health anxiety, and their knowledge and attitudes toward epilepsy.

**Methods:** A cross-sectional descriptive study was conducted among primary, middle, and high school teachers in Ankara, Türkiye. A total of 205 teachers were selected through simple random sampling. Data were collected using a sociodemographic questionnaire, Epilepsy Knowledge and Attitude Inventories, Short Health Anxiety Inventory, and Turkey Health Literacy Scale-32. Descriptive statistics, Pearson correlation, Student's t-test, and Chi-square tests were used for data analysis.

**Results:** Participants had a mean age of 46.16±8.33 years and an average of 21.79±8.46 years of teaching experience; 75.6% were female. The mean scores on the epilepsy attitude and knowledge inventories were 41.32±5.32 and 8.26±2.95, respectively. Teachers with personal experiences, such as witnessing a seizure or having a family member with epilepsy, scored higher on epilepsy knowledge. Knowledge of epilepsy was negatively associated with the "negative consequences" subdimension of health anxiety and overall health literacy. Positive correlations were found between epilepsy attitudes and health literacy, while attitudes were negatively correlated with health anxiety.

**Conclusion:** Training programs should be implemented to improve teachers' knowledge of epilepsy and their first aid skills, especially for those without prior experience. These programs should address practical aspects of epilepsy, including symptoms, seizure types, and appropriate interventions. Additionally, they should offer stress management strategies to enhance teachers' confidence and preparedness.

*Keywords: Attitude, epilepsy, health anxiety, health knowledge, health literacy, nursing, teachers*

## Introduction

Epilepsy is a neurological condition characterized by abnormal electrical discharges in the brain, affecting approximately 0.5–1% of children worldwide.[1–3] In Türkiye, prevalence rates vary, with 0.8% reported in the 7–17 age group[4] and 0.86% in the 6–14 age group.[5] Despite these differences, the overall prevalence among school-aged children remains high. School is a critical period for children's development, and those with epilepsy face increased risks of academic failure, learning difficulties, and behavioral disorders compared to peers with other chronic conditions.[6–9] Epilepsy also has emotional consequences, with many children experiencing stigma that negatively impacts their social lives.[10–12] Teachers who are knowledgeable about epilepsy and maintain a positive attitude can improve the peer relationships and academic success of students with epilepsy.[10]

Studies examining teachers' knowledge levels about epilepsy have generally found them to be low.[13–15] However, despite limited knowledge, teachers often demonstrate a positive attitude toward the condition. It is essential for teachers to have sufficient knowledge about their student's health conditions in order to understand and manage them effectively.[16]

Health literacy equips teachers with the foundational knowledge to understand general health issues and provide appropriate support for students' specific health needs.[17] Studies have shown that many teachers lack sufficient knowledge regarding emergency interventions during seizures and how to create a safe physical environment.[13,18–20] Teachers' knowledge levels play a crucial role in their ability to support students effectively. Factors such as anxiety levels and socioeconomic background can influence how teachers respond to health-related situations. Therefore, enhancing teachers' understanding of conditions like epilepsy and promoting their health literacy is essential.[21] Maintaining a calm and systematic approach is particularly important during emergencies.[22] However, teachers may experience fear or anxiety when witnessing epilepsy symptoms in their students.[23] Individuals with health anxiety are more likely to interpret physical symptoms in an excessively negative manner.[24] While research on health anxiety in teachers is limited, with most studies focusing on the general population,[25–27] the presence of health anxiety among teachers could impair their ability to manage emergencies effectively. A basic understanding of epilepsy, combined with the

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ability to respond calmly and supportively in unfamiliar or high-stress situations, can help teachers manage potential emergencies and adapt to evolving circumstances with greater confidence.

Health literacy refers to an individual's ability to access, understand, evaluate, and use health-related information. People with low health literacy may struggle to obtain accurate and reliable information about illnesses, which can lead to misconceptions and the formation of attitudes based on inadequate understanding. In contrast, individuals with high health literacy are better able to evaluate health information, develop healthier attitudes based on accurate knowledge, and more effectively apply that information. Health literacy can also shape individuals' attitudes toward epilepsy; as knowledge increases, negative biases may diminish, fostering greater empathy and support. When these factors align, health literacy can significantly influence epilepsy-related knowledge and attitudes, promoting more informed and supportive perspectives, reducing misinformation-based prejudices, and enhancing the ability to provide effective assistance. Although the importance of teachers' health literacy for school health has long been recognized,[28] no specific studies have focused on epilepsy in this context.

This study was conducted to address a critical gap in teachers' knowledge and attitudes regarding epilepsy, a condition that significantly affects the academic success and social integration of students. Although the importance of health literacy in managing health-related issues in schools is widely recognized, no specific study has comprehensively examined its relationship with teachers' knowledge and attitudes about epilepsy. This research aimed to fill that gap by exploring how health literacy influences teachers' ability to support students with epilepsy and effectively manage related emergencies.

### Research Questions

1. How do teachers' knowledge levels about epilepsy vary according to their personal experiences?
2. How do health anxiety and health literacy influence teachers' knowledge and attitudes toward epilepsy?

## Materials and Methods

### Study Design

This cross-sectional descriptive study was conducted using a structured online survey administered between April 1 and August 15, 2023. The study followed the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) checklist for cross-sectional studies.

### Sample Size

The study population consisted of teachers working at the primary, lower secondary, and upper secondary education levels in the Çankaya district of Ankara, Türkiye. According to records from the Ministry of National Education, there are a total of 14,939 teachers in the Çankaya district.[29] In this study, the sample size was calculated as 205 participants using G*Power version 3.1.9.7, based on a confidence level of 85% and a sampling error of 5% for a known population. The survey was closed once the target sample size of 205 participants was reached. Simple random sampling, a type of cluster sampling method, was used to select participants. Teachers from primary, middle, and high schools were included. Eligibility criteria required participants to have no prior formal training on epilepsy and to provide informed consent. Those with insufficient knowledge of epilepsy or who were unable to complete the survey were excluded from the study.

### Data Collection Instruments

Data were collected using the Epilepsy Attitude Inventory (EAI), Epilepsy Knowledge Inventory (EKI), Short Health Anxiety Inventory (SHAI), and the Turkey Health Literacy Scale-32 (THLS-32). The dependent variable in this study was teachers' knowledge and attitudes toward epilepsy, while the independent variables were sociodemographic characteristics, health anxiety, and health literacy levels.

### Sociodemographic Information Form

This form consists of 10 open-ended or multiple-choice questions developed by the researchers based on a review of the literature. It aims to gather information on characteristics that may influence teachers' knowledge and attitudes toward epilepsy.[13,16]

### Epilepsy Attitude Inventory

Developed by Aydemir in 2008 to assess knowledge and attitudes about epilepsy in the Turkish population,[30] this scale originally included 15 items but was finalized with 14 items. Cronbach's α was calculated as α=0.85. The items are scored on a 5-point Likert scale to evaluate general attitudes (both positive and negative) toward epilepsy and individuals with epilepsy. The total score ranges from 14 to 70, with higher scores indicating a more positive attitude toward epilepsy and those affected by it.[20] The Cronbach's alpha value obtained in this study was 0.72.

### Epilepsy Knowledge Inventory

This inventory was developed by Aydemir (2008) to assess the level of knowledge about epilepsy within the Turkish community.[30] The items in the scale cover topics such as the causes of epilepsy, treatment methods, seizure triggers, social limitations associated with epilepsy, and appropriate responses during seizures. Cronbach's α was calculated as α=0.67.[30] The knowledge scale consists of 16 items, with a total score ranging from 0 to 16. Higher scores indicate greater knowledge about epilepsy. Response options are categorized as "correct," "incorrect," and "I don't know." The Cronbach's alpha value found in this study was 0.69.

### Short Health Anxiety Inventory

This is an 18-item self-report scale developed by Salkovskis et al. in 2002,[31] and its Turkish validity and reliability study was conducted by Aydemir et al. in 2013.[32] Each item is scored from 0 to 3, with higher scores indicating higher levels of health anxiety. The SHAI consists of two factors. The first factor includes the first 14 items of the scale, representing the bodily dimension, which reflects excessive sensitivity to bodily symptoms and related anxiety. The second factor comprises the last 4 items, referred to as the negative consequences subscale, which is associated with perceived adverse outcomes of the condition. The original Cronbach's alpha internal consistency coefficient for the scale was 0.91. In this study, Cronbach's alpha value was found to be 0.87.

### Turkey Health Literacy Scale-32

This scale was developed by Okyay et al. in 2016,[33] based on the conceptual framework of the European Health Literacy Consortium, to assess health literacy among literate individuals aged 15 and older. The scale includes two main dimensions: treatment and health services, and disease prevention and health promotion, and covers four key processes: accessing health information, understanding it, interpreting/evaluating it, and using it for health-related decision-making. The Cronbach's alpha values were 0.93 for the entire scale, 0.88 for the treatment and health services subscale, and 0.86 for the disease prevention and health promotion subscale. The scale comprises 32 items, each evaluated using a 5-point Likert-type response format. Positive statements were re-coded as 1–4, while negative statements were coded as 4–1 during score calculation. The final score was standardized into an index ranging from 0 to 50 for each participant, using the formula:

Index = (Mean – 1) x [50 / 3]

Health literacy levels were categorized based on the index score as follows: 0–25 points indicate inadequate literacy; 25–33 points indicate problematic/limited literacy; 33–42 points indicate sufficient literacy; and 42–50 points indicate excellent health literacy.[33] The Cronbach's alpha value for this study was found to be 0.96.

### Data Collection

The online survey (Google Forms) link was distributed via an instant messaging application (WhatsApp) used by school principals in the Çankaya district, ensuring that it reached teachers through each school's dedicated messaging platform. To serve as reminders, the survey link was reposted at two-week intervals until the desired number of responses was obtained. Once the target number was reached, the survey was closed to further responses. Teachers who voluntarily participated and completed the online forms in full comprised the study sample. Completion of the survey took approximately 20 minutes.

### Statistical Analysis

Data were analyzed using SPSS Statistics for Windows, Version 23.0 (IBM Corp., Armonk, NY). Statistical significance was set at $p<0.05$. Descriptive analyses were used to present data in terms of frequency, percentage, mean, and standard deviation. To assess the normality assumption, kurtosis and skewness coefficients (±1.5)

**Table 1.** Characteristics of teachers (n=205)

| | Mean±SD | Min-max |
|---|---|---|
| Age (years) | 46.16±8.33 | 27–65 |
| Years of professional experience | 21.79±8.46 | 1–40 |
| **Characteristics** | **n** | **%** |
| Gender | | |
| Female | 155 | 75.6 |
| Male | 50 | 24.4 |
| Marital status | | |
| Married | 161 | 78.5 |
| Single | 44 | 21.5 |
| School level taught | | |
| Primary | 20 | 9.8 |
| Lower secondary | 58 | 28.2 |
| Upper secondary | 127 | 62.0 |
| First aid education | | |
| Received at least one training | 140 | 68.3 |
| Never received training | 65 | 31.7 |
| A family member with epilepsy | | |
| Yes | 25 | 12.2 |
| No | 180 | 87.8 |
| Witnessed a child having a seizure | | |
| Yes | 109 | 53.2 |
| No | 96 | 46.8 |
| Intervened for a child with a seizure | | |
| Yes | 45 | 22.0 |
| No | 160 | 78.0 |
| Currently teaching a child with epilepsy | | |
| Yes | 28 | 13.7 |
| No | 177 | 86.3 |

SD: Standard deviation

were examined. The Student's t-test (a) was used to compare the means of two independent groups when the normality assumption was met, whereas the Mann-Whitney U test (b) was employed when this assumption was violated. For comparisons involving three or more groups, the Kruskal-Wallis H test (c) was applied. The Chi-square test was used to analyze differences in categorical variables. Pearson correlation analysis was conducted to examine the relationships between scale scores.

## Ethics Approval

Ethical approval for the study was obtained from the Ethics Committee of Selçuk University (Approval Number: 2023/127, Date: 02.03.2023), and the study was conducted in accordance with the principles of the Declaration of Helsinki. Participants were informed about the purpose and nature of the study via an online consent form. The form provided detailed information regarding the study's objectives, procedures, potential risks, and the voluntary nature of participation. Prior to participation, informed consent was obtained from all participants by confirming their agreement through the consent form. To ensure participants' privacy, all collected data were securely stored, and no personally identifiable information was included in the dataset. Confidentiality was maintained throughout the study, and the data were used exclusively for research purposes. Permissions to use the scales were obtained from the respective authors, and proper citations were provided for all instruments used in the study.

## Results

The participants' average age was 46.16±8.33 years, with an average teaching experience of 21.79±8.46 years. Among the participants, 75.6% were female, 78.5% were married, and 62% worked at the high school level. Additionally, 68.3% had previously received first aid training. At the time of the study, 12.2% reported having a family member or relative with epilepsy, and 13.7% had a student diagnosed with epilepsy. Furthermore, 22% of the participants had previously intervened in a seizure episode involving a child (Table 1).

**Table 2.** Mean scores for teachers' epilepsy knowledge, attitudes, health literacy, and health anxiety

| Variables | Mean±SD | Min-max |
|---|---|---|
| Epilepsy Attitude Inventory (EAI) | 41.32±5.32 | 18–56 |
| Epilepsy Knowledge Inventory (EKI) | 8.26±2.95 | 0–13 |
| Short Health Anxiety Inventory (SHAI) State | 11.83±5.89 | 2–37 |
| Negative Consequences | 2.56±2.07 | 0–9 |
| Turkey Health Literacy Scale-32 (THLS-32) | 17.57±9.47 | 2.38–66.67 |

The mean score on the Epilepsy Attitude Inventory was 41.32±5.32; the Epilepsy Knowledge Inventory mean was 8.26±2.95. The Health Anxiety Scale - State subscale had a mean of 11.83±5.89, and the Negative Consequences subscale had a mean of 2.56±2.07. The mean score for Health Literacy was 17.57±9.47 (Table 2).

Participants' scores on the Epilepsy Knowledge Scale were significantly higher among those who had a family member with epilepsy, had a student diagnosed with epilepsy in their class, or had witnessed an epileptic seizure ($p<0.05$). However, no significant relationship was found between age, gender, school level taught, years of teaching experience, prior first aid training, experience intervening during a child's seizure, and scores on the Epilepsy Knowledge Scale. Similarly, no significant relationship was found between participants' scores on the Epilepsy Attitude Scale and any of the examined characteristics ($p>0.05$) (Table 3).

There was no correlation between participants' epilepsy knowledge and the state subscale of health anxiety ($r=0.094$, $p=0.179$). However, a significant negative correlation was observed between epilepsy knowledge and both the negative consequences subscale of health anxiety ($r=-0.202$, $p=0.004$) and health literacy ($r=-0.198$, $p=0.004$). Correlation analysis exploring the relationship between epilepsy attitudes and health anxiety revealed a negative relationship with both health anxiety subscales: the state subscale ($r=-0.383$, $p=0.000$) and the negative consequences subscale ($r=0.575$, $p=0.000$). In contrast, a positive correlation was found between teachers' epilepsy attitudes and health literacy ($r=0.309$, $p=0.000$) (Table 4).

## Discussion

The results of this study may represent an important step toward increasing awareness of epilepsy within educational institutions and addressing existing gaps in this field. As such, the findings are expected to provide a valuable roadmap for identifying key focus areas in teacher training and awareness programs.

Numerous studies conducted worldwide have shown that teachers often lack sufficient knowledge and appropriate attitudes regarding epilepsy.[13–16] While some research indicates that teachers may generally have positive attitudes toward individuals with epilepsy, significant gaps remain in their understanding of the condition, particularly regarding its impact in educational settings and the appropriate management of epilepsy and seizures in the classroom.[34] A systematic review of 54 studies from 27 countries found that, globally, teachers tend to hold negative knowledge and attitudes toward epilepsy.[16] The findings of our study align with these results. Analysis of the scale scores revealed that teachers' average scores on the Epilepsy Attitude Inventory indicate suboptimal levels of both knowledge and attitudes toward epilepsy.

In the present study, it was particularly observed that teachers who have a family member with epilepsy, a student diagnosed with epilepsy, or who have witnessed a seizure tend to score significantly higher on the Epilepsy Knowledge Inventory. This suggests that personal experiences may positively influence teachers' knowledge levels about epilepsy. Supporting this, studies conducted in Greece[35] and Italy[36] have shown that teachers often acquire information about epilepsy through personal experiences. These findings underscore the influential role that encounters can play in the process of knowledge acquisition. However, a study assessing attitudes toward epilepsy found that having a family member with epilepsy or encountering epilepsy-related situations did not influence primary school teachers'

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**Table 3.** Comparison of teachers' epilepsy knowledge, attitudes, health literacy, and health anxiety scores by selected variables

| Variables | Categories | EAI | | EKI | | SHAI state | | SHAI negative consequences | | THLS-32 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Mean±SD | p | Mean±SD | p | Mean±SD | p | Mean±SD | p | Mean±SD | p |
| Gender | Female | 41.67±4.96 | 0.321 | 7.64±3.44 | 0.068 | 11.79±5.82 | 0.684 | **2.49±1.94** | **0.017** | 17.68±9.87 | 0.203 |
| | Male | 40.42±6.22 | | 8.46±2.76 | | 11.98±6.16 | | **2.76±2.46** | | 17.23±8.18 | |
| Marital status | Married | 41.34±5.27 | 0.975 | 8.29±3.02 | 0.255 | 11.95±5.86 | 0.603 | 2.56±2.08 | 0.941 | 9.34±0.73 | 0.475 |
| | Single | 41.25±5.56 | | 8.15±2.75 | | 11.4±6.05 | | 2.54±2.07 | | 8.07±1.21 | |
| School level taught | Primary | 41.05±8.95 | 0.933 | 8.05±3.45 | 0.942 | 11.1±6.35 | 0.774 | 2.9±2.19 | 0.197 | **20.52±10.43** | **0.004** |
| | Lower secondary | 41.51±4.61 | | 8.31±2.91 | | 11.65±5.11 | | 2.15±1.84 | | **15.96±8.87** | |
| | Upper secondary | 41.27±4.9 | | 8.27±2.91 | | 12.03±6.18 | | 2.69±2.14 | | **17.71±8.93** | |
| First aid education | Received at least one training | 41.42±5.49 | 0.361 | 8.68±2.84 | 0.641 | 11.61±6.05 | 0.376 | 2.57±2.16 | 0.198 | 17.13±9.31 | 0.938 |
| | Never received training | 41.1±4.94 | | 7.35±3.01 | | 12.32±5.56 | | 2.52±1.89 | | 18.26±8.67 | |
| A family member with epilepsy | Yes | 39.88±5.33 | 0.767 | **9.92±5.51** | **0.021** | 11.36±5.16 | 0.866 | 2.6±2.14 | 0.771 | 17.72±9.36 | 0.665 |
| | No | 41.52±5.3 | | **8.1±2.98** | | 11.9±6 | | 2.55±2.07 | | 17.45±9.1 | |
| Witnessed a child having a seizure | Yes | 41.37±5.01 | 0.25 | **9.03±2.45** | **0.006** | 12±6.19 | 0.235 | 2.46±2.11 | 0.798 | 16.93±8.7 | 0.514 |
| | No | 41.26±5.67 | | **7.38±3.2** | | 11.64±5.56 | | 2.63±2.04 | | 18.12±9.56 | |
| Intervened for a child with a seizure | Yes | 40.84±563 | 0.931 | 9.15±2.42 | 0.203 | 11.28±5.86 | 0.802 | 2.4±2.16 | 0.663 | 16.79±9.88 | 0.442 |
| | No | 41.45±5.23 | | 8.01±0.05 | | 11.99±5.91 | | 2.6±2.05 | | 17.68±8.9 | |
| Currently teaching a child with epilepsy | Yes | 41.03±5.6 | 0.654 | **9.81±2.78** | **0.03** | 11.35±6.42 | 0.565 | 2.25±2.27 | 0.887 | 16.88±7.98 | 0.317 |
| | No | 41.36±5.28 | | **8.01±2.96** | | 11.91±5.82 | | 2.61±2.04 | | 17.58±9.29 | |
| | | r | p | r | p | r | p | r | p | r | p |
| Age (years) | | 0.23 | 0.746 | -0.001 | 0.984 | 0.071 | 0.309 | -0.081 | 0.246 | 0.065 | 0.363 |
| Years of professional experience | | 0.1 | 0.889 | 0.5 | 0.473 | -0.078 | 0.266 | -0.058 | 0.407 | 0.6 | 0.396 |

EAI: Epilepsy attitude inventory, EKI: Epilepsy knowledge inventory, SHAI: Short Health Anxiety Inventory, THLS-32: Turkey Health Literacy Scale-32, SD: Standard deviation

**Table 4.** Correlations between teachers' epilepsy knowledge and attitude, and their health literacy and health anxiety levels

| | EKI | | EAI | |
|---|---|---|---|---|
| | r | p | r | p |
| Short Health Anxiety Inventory (SHAI) - State | -0.094 | 0.179 | **-0.383** | **0.000** |
| Short Health Anxiety Inventory (SHAI) - Negative Consequences | **-0.202** | **0.004** | **-0.575** | **0.000** |
| Turkey Health Literacy Scale-32 (THLS-32) | **-0.198** | **0.004** | **0.309** | **0.000** |

EAI: Epilepsy attitude inventory, EKI: Epilepsy knowledge inventory

social attitudes toward the condition.[14] Such findings highlight the importance of exploring a broader range of factors that influence both knowledge and attitudes toward epilepsy. Understanding the factors that shape teachers' knowledge and attitudes toward epilepsy could contribute to the development of more effective education and awareness programs for teachers.

The study reveals that as teachers' level of knowledge about epilepsy increases, their anxiety regarding the potential negative consequences of epilepsy decreases. In other words, better-informed teachers may feel more confident and less anxious when faced with epilepsy-related situations, which may be associated with higher levels of knowledge and a greater sense of perceived control. Research specifically focusing on teachers' health anxiety is limited in the literature, with most studies addressing professional groups within broader investigations of the general population.[26,27,37] The negative consequences subscale of health anxiety measures individuals' negative expectations related to illnesses.[32] In this study, it was observed that lower levels of knowledge among teachers about epilepsy were associated with increased negative expectations regarding illness. This suggests that a lack of information may contribute to the development of overly negative perceptions about the condition. In this context, interventions aimed at improving teachers' knowledge about epilepsy may help reduce negative illness-related expectations. Lowering health anxiety may also play a role in reducing panic responses during emergencies.

The study found a negative relationship between teachers' attitudes toward epilepsy and their health anxiety. This indicates that teachers who hold more positive attitudes tend to experience less anxiety when facing epilepsy-related situations. Adopting a more open and supportive approach to epilepsy may help teachers feel more competent and calm in managing such events. One study found that three key dimensions of health anxiety (the tendency to exaggerate the likelihood of illness, perceived seriousness of illness, and response to disgusting stimuli) were positively and significantly associated with the development of health anxiety.[25] These tendencies are shaped by systematic education, popular media, and environmental influences.[38] Providing accurate information and addressing misconceptions can help teachers develop more positive attitudes. Additionally, educational sessions that promote empathy and understanding may contribute to fostering positive attitudes toward individuals with epilepsy among teachers. Creating a supportive and inclusive school environment can further enhance these positive attitudes. As previously mentioned, reducing health anxiety is also essential, as it can improve teachers' ability to manage emergency situations effectively.

Karabulut and Abi's in 2022[14] study found no relationship between primary school teachers' sociodemographic characteristics, previous experiences with epilepsy, and their health literacy scores. In contrast, Yılmazel's in 2023[39] study identified both negative attitudes toward epilepsy and limited health literacy among teachers. Previous research generally suggests that teachers possess limited health literacy, with no clear link to their personal or professional experiences.[14] However, in the present study, a positive relationship was identified between teachers' attitudes toward epilepsy and their health, a finding not previously reported in the literature. These findings suggest that teachers generally exhibit acceptable attitudes toward epilepsy and demonstrate proficiency in interpreting health-related information. While various policies are being implemented to improve health literacy across different communities, the number of studies specifically addressing this area is limited. Existing research primarily emphasizes the effectiveness of educational interventions in enhancing health literacy.[40]

For example, an intervention study conducted in India used an interactive workshop format for teachers, incorporating active participation methods such as lectures and role-playing activities. This approach resulted in increased knowledge about epilepsy among teachers and fostered positive attitudes toward the condition.[41] Similarly, in Nigeria, an educational program for teachers focusing on epilepsy and first aid, delivered through a discussion-based format, led to significant improvements in both knowledge and attitudes toward epilepsy among teachers.[42] In Türkiye, a study implementing an educational intervention on epilepsy and seizure management for teachers also showed a notable increase in knowledge scores following the intervention.[43] These findings collectively demonstrate that educational programs for teachers, particularly those using interactive and discussion-based approaches, can significantly enhance both their understanding of epilepsy and their attitudes toward individuals living with the condition. The positive outcomes observed across different countries underscore the importance of such initiatives in enhancing teachers' preparedness to support students with epilepsy.

## Limitations

Since the study was conducted solely in the city of Ankara, the results may not be generalizable to teachers across all of Türkiye. Teachers' health literacy, health anxiety, and attitudes toward epilepsy may vary across different geographical regions, as well as cultural and educational contexts. Therefore, the findings of this study may primarily apply to teachers in Ankara, and similar research conducted in other provinces may yield different results. This limitation is an important factor that narrows the scope of the study's findings.

## Conclusion

The findings of this study indicate that teachers' knowledge and attitudes toward epilepsy may vary depending on personal experiences. In particular, personal experiences were found to positively influence knowledge levels, emphasizing the need for further investigation into the factors that shape teachers' understanding and attitudes regarding epilepsy. Additionally, a negative relationship was identified between health anxiety and epilepsy-related knowledge. Increased health anxiety may reinforce negative attitudes, while accurate information has the potential to improve them. Educational programs that promote empathy and foster inclusive school environments can further support the development of positive attitudes. Additionally, a positive correlation was found between attitudes toward epilepsy and health literacy, suggesting that teachers are generally capable of interpreting health-related information and tend to hold acceptable attitudes toward epilepsy. Therefore, policies aimed at improving health literacy among educators should be prioritized.

In conclusion, teachers should receive practical training in first aid for managing epileptic seizures. Community support initiatives also play a crucial role in raising epilepsy awareness. Organizing epilepsy aware-ness days, distributing informative materials, and developing individualized support plans can help foster lasting awareness. Such sustainable interventions can reduce stigma and promote a more inclusive educational environment.

**Ethics Committee Approval:** The study was approved by the Selçuk University Ethics Committee (Approval Number: 2023/127, Date: 02.03.2023).

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

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## References


1. Auer T, Schreppel P, Erker T, Schwarzer C. Impaired chloride homeostasis in epilepsy: Molecular basis, impact on treatment, and current treatment approaches. Pharmacol Ther. 2020;205:107422. [CrossRef]
2. Bastos F, Cross JH. Epilepsy. Handb Clin Neurol. 2020;174:137–158. [CrossRef]
3. Rubenstein S, Levy A. Seizures in childhood: Aetiology, diagnosis, treatment, and what the future may hold. Neurology. 2019;7:62–70. [CrossRef]
4. Canpolat M, Kumandas S, Poyrazoglu HG, Gumus H, Elmali F, Per H. Prevalence and risk factors of epilepsy among school children in Kayseri City Center, an urban area in Central Anatolia, Turkey. Seizure. 2014;23(9):708–716. [CrossRef]
5. Huseyinoglu N, Ozben S, Arhan E, Palanci Y, Gunes N. Prevalence and risk factors of epilepsy among school children in eastern Turkey. Pediatr Neurol. 2012;47(1):13–18. [CrossRef]
6. Aydin A, Ergor A, Ergor G, Dirik E. The prevalence of epilepsy amongst school children in Izmir, Turkey. Seizure. 2002;11(6):392–396. [CrossRef]
7. Beghi E. Addressing the burden of epilepsy: Many unmet needs. Pharmacol Res. 2016;107:79–84. [CrossRef]
8. Davies S, Heyman I, Goodman R. A population survey of mental health problems in children with epilepsy. Dev Med Child Neurol. 2003;45(5):292–295. [CrossRef]
9. Wu YP, Follansbee-Junger K, Rausch J, Modi A. Parent and family stress factors predict health-related quality in pediatric patients with new-onset epilepsy. Epilepsia. 2014;55(6):866–877. [CrossRef]
10. Elhassan MA, Alemairy AA, Amara ZM, Hamadelneel AA, Mohamed AH, Elaimeri AA. Epilepsy: Knowledge, attitude, and practice among secondary school teachers in khartoum state. Neurol Ther. 2017;6(2):225–235. [CrossRef]
11. Kotsaki K. A historical review on stigma of epilepsy and its interactive factors. Glob J Intellect Dev Disabil. 2022;8(3):2575–8586.
12. Ustuner Top F, Cam HH, Bora Güneş N. Perceptions of stigma of children with epilepsy and their parents and its effects on social life. Curr Psychol. 2024;43(1):62–71. [CrossRef]
13. Assadeck H, Toudou Daouda M, Moussa Konate M, Mamadou Z, Douma Maiga D, Sanoussi S. Knowledge, attitudes, and practices with respect to epilepsy among primary and secondary school teachers in the city of Niamey, Niger. Brain Behav. 2020;10(3):e01539. [CrossRef]
14. Karabulut N, Abi Ö. Primary school teachers' health literacy levels, knowledge, and attitudes toward childhood epilepsy. Epilepsy Behav. 2022;127:108511. [CrossRef]
15. Sansa E, Fray S, Jamoussi H, Chebbi S, Ben Mahmoud M, Ben Ali N, et al. Knowledge and attitudes toward epilepsy among teachers in Tunisia. Epilepsy Behav. 2021;123:108260. [CrossRef]
16. Jones C, Atkinson P, Helen Cross J, Reilly C. Knowledge of and attitudes towards epilepsy among teachers: A systematic review. Epilepsy Behav. 2018;87:59–68. [CrossRef]
17. Liu C, Wang D, Liu C, Jiang J, Wang X, Chen H, et al. What is the meaning of health literacy? A systematic review and qualitative synthesis. Fam Med Community Health. 2020;8(2):e000351. [CrossRef]
18. Aleid DK, Alanazi AA, Kokandi AA, Aljahany MS. Epilepsy and seizures: Knowledge, attitudes and first aid practice among school teachers in Saudi Arabia. Epilepsy Seizure. 2020;12(1):28–39. [CrossRef]
19. Alharthi WM, Almalki SR, Alkhaldi AA, Althobati NM, Alomairi NE, Atalah AA, et al. Knowledge, attitude and practice about epilepsy among elementary school teachers in Taif city, Saudi Arabia. World Fam Med J. 2019;99(6515):1–9.
20. Alkhotani AM, Almalki WM, Alkhotani AM, Turkistani MA. Makkah female teachers' knowledge of seizure first aid. Epilepsy Behav. 2019;98:10–13. [CrossRef]
21. Liu R, Yu M, Zhao Q, Wang J, Bai Y, Chen H, et al. Are personal health literacy and school health literacy environment important to schoolteachers' health outcomes? medRxiv. 2024. Preprint. [CrossRef]
22. Chatzipanagiotou P, Katsarou E. Crisis management, school leadership in disruptive times and the recovery of schools in the post COVID-19 era: A systematic literature review. Educ Sci. 2023;13(2):118. [CrossRef]
23. Yang L, Lu Q, Tang W, Ji J, Tang P, Jiang Y, et al. Teachers' experiences of managing children with epilepsy in school: A qualitative study. Epilepsy Behav. 2021;121:108039. [CrossRef]
24. Abramowitz JS, Olatunji BO, Deacon BJ. Health anxiety, hypochondriasis, and the anxiety disorders. Behav Ther. 2007;38(1):86–94. [CrossRef]
25. Asmundson GJ, Abramowitz JS, Richter AA, Whedon M. Health anxiety: Current perspectives and future directions. Curr Psychiatry Rep. 2010;12(4):306–312. [CrossRef]
26. Barrett LC. Teaching teachers about school health emergencies. J Sch Nurs. 2001;17(6):316–322. [CrossRef]
27. Özdin S, Bayrak Özdin Ş. Levels and predictors of anxiety, depression and health anxiety during COVID-19 pandemic in Turkish society: The importance of gender. Int J Soc Psychiatry. 2020;66(5):504–511. [CrossRef]
28. Okan O, Paakkari L, Dadaczynski K. Health literacy in schools: State of the art. Schools for Health in Europe. 2020.
29. Ankara Çankaya Milli Eğitim Müdürlüğü. Accessed April 15, 2025. https://cankaya.meb.gov.tr/
30. Aydemir N. Developing two different measures for assessing knowledge of and attitudes toward epilepsy for the Turkish population. Epilepsy Behav. 2008;12(1):84–89. [CrossRef]
31. Salkovskis PM, Rimes KA, Warwick HM, Clark DM. The Health Anxiety Inventory: Development and validation of scales for the measurement of health anxiety and hypochondriasis. Psychol Med. 2002;32(5):843–853. [CrossRef]
32. Aydemir Ö, Kirpinar I, Sati T, Uykur B, Cengisiz C. Sağlık Anksiyetesi Ölçeği'nin Türkçe için güvenilirlik ve geçerlilik çalışması. Arch Neuropsychiatr. 2013;50(4):325–331. [CrossRef]
33. Okyay P, Abacıgil F, Harlak H. Türkiye Sağlık Okuryazarlığı Ölçeği-32 (TSOY-32). In: Türkiye sağlık okuryazarlığı ölçekleri güvenilirlik ve geçerlilik çalışması. 2016;43–61.
34. Bishop M, Boag EM. Teachers' knowledge about epilepsy and attitudes toward students with epilepsy: Results of a national survey. Epilepsy Behav. 2006;8(2):397–405. [CrossRef]
35. Kampra M, Tzerakis NG, Losidis S, Katsarou E, Voudris K, Mastroyianni S, et al. Teachers' knowledge about epilepsy in Greece: Information sources and attitudes towards children with epilepsy during school time. Epilepsy Behav. 2016;60:218–224. [CrossRef]
36. Iannone LF, Roberti R, Arena G, Mammone S, Pulitano P, De Sarro G, et al. Assessing knowledge and attitudes toward epilepsy among schoolteachers and students: Implications for inclusion and safety in the educational system. PLoS One. 2021;16(4):e0249681. [CrossRef]
37. Asmundson GJG, Taylor S. How health anxiety influences responses to viral outbreaks like COVID-19: What all decision-makers, health authorities, and health care professionals need to know. J Anxiety Disord. 2020;71:102211. [CrossRef]
38. Du X, Witthöft M, Zhang T, Shi C, Ren Z. Interpretation bias in health anxiety: A systematic review and meta-analysis. Psychol Med. 2023;53(1):34–45. [CrossRef]
39. Yılmazel G. Teachers' negative attitudes and limited health literacy levels as risks for low awareness of epilepsy in Turkey. J Prev Med Public Health. 2023;56(6):573–582. [CrossRef]
40. Nutbeam D, McGill B, Premkumar P. Improving health literacy in community populations: A review of progress. Health Promot Int. 2018;33(5):901–911. [CrossRef]
41. Sulena S, Singh G, Tyagi D, Bansal N, Padda P, Garg R, et al. Epilepsy smart schools: Educational intervention improves knowledge, attitude, and practices regarding epilepsy among school teachers. Epilepsy Behav. 2023;141:109138. [CrossRef]
42. Eze CN, Ebuehi OM, Brigo F, Otte WM, Igwe SC. Effect of health education on trainee teachers' knowledge, attitudes, and first aid management of epilepsy: An interventional study. Seizure. 2015;33:46–53. [CrossRef]
43. Kartal M, Karakaş N, Tuz P, Kapıkıran G. The evaluation of the training, "The approach to epilepsy and epileptic seizure," which was given to teachers in Türkiye. Brain Behav. 2024;14(5):e3538. [CrossRef]

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# Comparison of Psychosocial and Economic Problems and Quality of Life in Patients Following Heart Transplantation or Left Ventricular Assist Device Implantation

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## Abstract

**Background:** The use of left ventricular assist devices (LVADs) has become increasingly common as a treatment to extend lifespan and improve the quality of life (QOL) for patients awaiting heart transplantation (HT) or those ineligible for HT. However, patients with an LVAD often experience various challenges.

**Aim:** This study aimed to compare the QOL of patients following LVAD implantation and HT, and to identify the problems experienced by LVAD patients.

**Methods:** This descriptive study was conducted through face-to-face interviews with 66 patients (LVAD = 21; HT = 45) having had undergone surgery in the adult cardiovascular surgery clinic of a university hospital and later visited the cardiology outpatient clinic for a follow-up. Data were collected using a "Determination Form for Sociodemographic Characteristics and Problems Associated with LVAD and HT" and the "Short Form-36 (SF-36) Quality of Life Scale". Data analysis included t-tests, analysis of variance (ANOVA), and multiple regression analysis.

**Results:** The mean age of the participants was 39.3 ± 15.7 years. The majority of patients in both groups were male and single. The survival time of patients who underwent HT was longer than that of patients who received a LVAD implantation. Among heart transplant patients, issues such as depression, anger, personality and attitude changes, and anxiety were identified. Patients with LVAD implants primarily experienced depression, fear, and anxiety about the future. Complications such as infection, thrombosis, and bleeding were more common in LVAD patients, while heart transplant patients experienced complications including tremors, diabetes mellitus, osteoporosis, hypertension, and infections. Most patients in both groups reported being unemployed and facing economic difficulties.

**Conclusion:** Although the clinical QOL improves following LVAD implantation, better outcomes are generally achieved after HT. Social, psychological, and sexual challenges significantly impact patients' overall well-being. It is believed that preparing patients for the postoperative period may help identify potential problems early and support their adaptation to the recovery process.

*Keywords: Heart transplantation, heart-assist devices, nursing, quality of life*

## Introduction

Heart failure is a major public health concern. As of 2017, an estimated 6.5 million adults in the United States (U.S.) were living with heart failure. Although advances in heart failure treatment can reverse myocardial damage and improve survival rates, many patients continue to experience persistent symptoms, contributing to increased morbidity and mortality. Heart transplantation (HT) is one of the most effective treatments for patients with severe heart failure symptoms.[1] However, when a suitable donor organ is unavailable, ventricular assist devices (VADs) offer a promising alternative by providing mechanical support to the ventricles. These devices have emerged as a promising alternative treatment to HT for patients with advanced-stage heart failure, serving as an effective mechanical circulatory support strategy to improve survival. As a result, left ventricular assist devices (LVADs) have become both an alternative to HT and a form of "permanent treatment" for patients who are not eligible for HT.[2,3] LVADs are highly effective in improving cardiac output and maintaining adequate hemodynamics over the long term.[3] The average one-year survival rate with an LVAD is approximately 80%.[4] Nevertheless, after implantation, patients must adapt to various lifestyle changes, and they often face physical, psychological, and social challenges.[5] These challenges may include limitations in daily activities such as bathing and swimming, travel difficulties, disruptions in interpersonal relationships, the need to modify their home environment and manage family dynamics. Additionally, patients are at risk for serious medical complications such as thrombosis, bleeding, infection, right heart failure, and device malfunction, some of which can be fatal.[6]

Some physical, psychological, and social problems emerge in the early period after HT and often persist over time.[7] Side effects of immunosuppressive drugs and metabolic changes introduce new stressors and contribute to increased mortality, morbidity, and various psychosocial and psychological challenges for patients.[8] Although there are a limited number of studies[9] in the literature focusing on the problems experienced by patients following HT, no comprehensive study has been found that addresses the problems experienced by patients with an LVAD. This study aims to identify the psychosocial and financial challenges faced by pa-

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tients who have undergone LVAD implantation or HT and to compare the two groups in terms of their quality of life (QOL). Understanding the problems experienced by these patients can support the delivery of effective and holistic nursing care. Additionally, this information can help both patients and caregivers adapt to life with an LVAD or after HT, while also supporting the nurses in managing complications and facilitating lifestyle adjustments associated with these treatments.

### Study Questions

- What are the postoperative problems experienced by LVAD patients?
- What are the postoperative problems experienced by patients after undergoing HT?
- How does LVAD implantation affect patients' QOL in the postoperative period?
- How does HT affect patients' QOL in the postoperative period?

## Materials and Methods

### Study Design and Samples

This descriptive study aimed to compare the psychosocial and economic problems, as well as the QOL, experienced by patients who underwent LVAD implantation or HT. The study aimed to include the entire population without performing a sample size calculation. Based on hospital records, a total of 60 patients had undergone LVAD implantation and 120 had undergone HT between 2000 and 2017. Since many of these patients had passed away, the study sample was limited to those who were alive and visited the hospital for follow-up between January and May 2018, when the study was conducted. As a result, 22 patients with LVAD implantation and 49 patients with HT were included in the study. One LVAD patient was excluded due to deterioration in health status, and four HT patients declined to participate. Therefore, the study was completed with a total of 66 patients (21 with LVAD implantation and 45 with HT). Pediatric patients, those with cognitive impairments, orientation or confusion issues, or hemodynamic instability were excluded from the study.

### Data Collection Tools

#### Sociodemographic and Psychosocial Measurements

A data collection form, prepared based on a literature review, was used to identify the sociodemographic characteristics of the patients and the problems associated with LVAD implantation and HT.[10–15] The form consisted of two sections. The first section included seven questions aimed at identifying patients' sociodemographic characteristics, such as age, gender, marital status, income level, and place of residence. The second section contained 21 questions focused on identifying complications experienced after LVAD implantation and HT, as well as psychosocial and financial problems.

#### Short Form-36 (SF-36) Quality of Life Scale (QOL Measures)

The SF-36 Quality of Life Scale was developed by Ware and Sherbourne[16] in 1992. It was translated into Turkish by Koçyiğit et al.[17] in 1999, and its validity and reliability were also established. The Cronbach's alpha value for the scale ranged between 0.7324 and 0.7612. The SF-36 Quality of Life Scale consists of 36 items and includes eight health domains: physical functioning (10 items), role limitations due to physical problems (four items), pain (two items), general health perception (five items), vitality/energy (four items), social functioning (two items), role limitations due to emotional problems (three items), and mental health (five items). High scores on the scale indicate better health status, while lower scores reflect poorer health.[11] In our study, the Cronbach's alpha values for the scale ranged from 0.784 to 0.986.

### Data Collection

Data were collected through face-to-face interviews conducted in the cardiovascular surgery department and cardiology outpatient clinic with patients who consented to participate in the study and had undergone either LVAD implantation or HT. Each interview took approximately 20 minutes to complete the data collection forms.

### Ethical Approval

This study was approved by the Non-interventional Research Ethics Committee of Başkent University (Approval Number: KA17/299), and the the necessary institutional permissions were obtained (Decision dated 12/20/2017, No: 888225990-044/45767). All participants were informed about the study, and written consent was obtained from each patient. Permission to use the scale was also secured. All procedures were carried out in accordance with the principles outlined in the Declaration of Helsinki.

### Statistical Analysis

Statistical analyses were performed using the Statistical Package for the Social Sciences version 25.0 (SPSS, IBM Corporation, NY, USA). Descriptive statistics were expressed as numbers and percentages, and as mean ± standard deviation for numerical data. The chi-square test was used for comparing rates between groups, while the t-test and analysis of variance (ANOVA) were used to analyze quantitative variables in independent groups. Additionally, multiple regression analysis was conducted using the backward elimination method. The data analyses were performed at a 0.05 significance level with a 95% confidence interval. A p value of <0.05 was considered statistically significant.

## Results

### Characteristics of the Patients

The mean age of the patients was 39.3±15.7 years (LVAD: 48.9±14.1 years; HT: 34.8±14.4 years). The majority of patients in both groups were male (LVAD: 90.5%; HT: 60.0%) and single (LVAD: 81.0%; HT: 57.8%). Among those with LVAD implantation, 47.6% were primary school graduates, while 48.9% of the HT group were high school graduates. Most patients in both groups were unemployed (LVAD: 61.9%; HT: 51.1%) and reported that their income was equal to their expenses (LVAD: 42.2%; HT: 38.1%). Diabetes mellitus was more common among patients with LVAD implantation (23.8%), whereas hypertension (31.1%) was more frequently observed in patients who underwent HT (Table 1).

### Mean QOL Scale Scores Based on Sociodemographic Characteristics in Patients with LVAD Implantation and HT

An examination of the SF-36 QOL scale mean scores revealed that patients who underwent HT had higher mean scores in the subdimensions of physical functioning ($\bar{X}$=87.44±14.60) and energy/vitality ($\bar{X}$=74.22±19.51). In comparison, patients with LVAD implantation also had relatively high mean scores in the same subdimensions: physical functioning ($\bar{X}$=67.14±28.92) and energy/vitality ($\bar{X}$=59.52±25.34) (p<0.05) (Table 1).

When comparing marital status, married patients had higher mean scores in the physical functioning subdimension ($\bar{X}$=88.69±14.63) compared to single patients ($\bar{X}$=76.86±24.49) (p<0.05). Regarding employment status, working patients had higher mean scores in several subdimensions: physical functioning ($\bar{X}$=88.16±14.35), emotional role difficulty ($\bar{X}$=92.22±24.26), pain ($\bar{X}$=90.00±15.32), and general health perception ($\bar{X}$=69.00±22.33) compared to non-working patients (p<0.05). Patients aged 54–74 years had lower mean scores in the physical functioning subdimension ($\bar{X}$=65.31±30.41) compared to other age groups (p<0.05) (Table 1).

### Patient Features Based on Disease Type and Treatment Pathway

An examination of the reason for hospital visits in the postoperative period revealed that eight LVAD patients visited the hospital for routine checkups, while 13 visited due to complications. Among HT patients, 31 out of 45 visited the hospital for checkups, and 14 visited due to complications (p<0.05). It was found that 19 LVAD patients were within five years post-operation, and only two had survived for more than five years. In contrast, 24 HT patients were within five years post-operation, while 21 had survived for more than five years (p<0.05) (Table 2).

HT patients most frequently experienced tremors (52.8%), diabetes mellitus (hyperglycemia) (48.9%), osteoporosis (40.0%), hypertension (31.1%), rounded face (22.2%), and infections (15.6%). In contrast, LVAD patients predominantly experienced complications such as infections (52.4%), thrombosis (33.3%), bleeding (33.3%), and lifestyle changes associated with these complications (33.3%).

### Factors Affecting the QOL Scale Subdimensions of Patients with LVAD Implantation and HT

The overall mean QOL score for LVAD patients was 68.67±24.33, while the mean score for HT patients was 79.09±17.61. Based on the regression analysis of factors affecting QOL in both patient groups, those who visited the hospital due to complications within the first year had lower scores in several sub-dimensions compared to those who visited for routine checkups: general health perception (15.24 points lower), pain (16.27 points lower), physical role difficulty (24 points lower), and physical functioning (10.53 points lower) (p<0.05).

**Table 1.** Mean scores of the short form-36 (SF-36) quality of life scale by sociodemographic characteristics in patients with left ventricular assist device (LVAD) implantation and heart transplantation (HT) (n=66)

| | | SF-36 quality of life subscale | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Sociodemographic characteristics** | **n** | **Physical functioning X̄±SD** | **Role limitations due to physical health X̄±SD** | **Role limitations due to emotional problems X̄±SD** | **Energy/ vitality X̄±SD** | **Mental health X̄±SD** | **Social functioning X̄±SD** | **Pain X̄±SD** | **General health perception X̄±SD** |
| Group | | | | | | | | | |
| LVAD implantation | 21 | 67.14±28.92 | 65.48±46.42 | 77.78±41.28 | 59.52±25.34 | 76.38±21.20 | 70.83±30.96 | 77.50±29.68 | 54.76±27.91 |
| HT | 45 | 87.44±14.60 | 86.67±34.38 | 85.19±35.22 | 74.22±19.51 | 75.20±18.56 | 74.72±30.68 | 84.00±23.16 | 65.33±21.54 |
| Statistical evaluation[a] | | t=-3.041 | t=-1.867 | t=-0.753 | t=-2.586 | t=0.230 | t=-0.478 | t=-0.969 | t=-1.536 |
| | | p=0.005 | p=0.072 | p=0.454 | p=0.012 | p=0.819 | p=0.634 | p=0.336 | p=0.135 |
| Marital status | | | | | | | | | |
| Single | 43 | 76.86±24.49 | 76.16±41.88 | 80.62±38.64 | 68.83±23.92 | 77.48±20.00 | 71.51±30.65 | 80.87±26.80 | 59.06±24.40 |
| Married | 23 | 88.69±14.63 | 86.95±34.43 | 86.95±34.43 | 70.86±19.75 | 72.00±17.72 | 77.17±30.76 | 83.91±22.84 | 67.39±22.90 |
| Statistical evaluation[a] | | t=-2.454 | t=-1.123 | t=-0.658 | t=-0.348 | t=1.104 | t=-0.714 | t=-0.46 | t=-1.348 |
| | | p=0.017 | p=0.266 | p=0.513 | p=0.729 | p=0.274 | p=0.478 | p=0.646 | p=0.182 |
| Employment status | | | | | | | | | |
| Employed | 30 | 88.16±14.35 | 90.00±30.51 | 92.22±24.26 | 74.66±22.81 | 77.60±18.89 | 81.25±27.99 | 90.00±15.320 | 69.00±22.33 |
| Unemployed | 36 | 75.00±25.74 | 71.52±44.38 | 75.00±43.91 | 65.27±21.47 | 73.88±19.70 | 67.01±31.50 | 75.20±29.96 | 56.11±24.14 |
| Statistical Evaluation[a] | | t=2.619 | t=1.995 | t=2.013 | t=1.719 | t=0.776 | t=1.922 | t=2.584 | t=2.233 |
| | | p=0.011 | p=0.050 | p=0.049 | p=0.090 | p=0.440 | p=0.059 | p=0.012 | p=0.029 |
| Age group (years) | | | | | | | | | |
| 11–22 | 14 | 92.14±9.138 | 92.85±26.72 | 85.71±36.31 | 67.50±18.88 | 69.71±17.45 | 77.67±30.68 | 86.96±20.19 | 64.28±22.68 |
| 23–41 | 17 | 83.82±21.25 | 76.47±43.72 | 94.11±24.25 | 78.23±23.58 | 82.82±15.85 | 81.61±28.33 | 81.17±24.15 | 70.58±22.97 |
| 42–53 | 19 | 83.42±14.72 | 85.52±34.67 | 87.71±29.83 | 70.52±21.07 | 74.73±19.46 | 73.02±27.40 | 86.18±21.94 | 60.78±21.42 |
| 54–74 | 16 | 65.31±30.41 | 65.62±47.32 | 62.50±50.00 | 60.93±23.95 | 74.00±23.00 | 61.71±35.19 | 73.28±33.26 | 52.18±27.44 |
| Statistical evaluation[b] | | F=4.692 | F=1.393 | F=2.413 | F=1.746 | F=1.297 | F=1.297 | F=0.987 | F=1.724 |
| | | p=0.005 | p=0.253 | p=0.075 | p=0.167 | p=0.283 | p=0.283 | p=0.405 | p=0.171 |

[a]: t-Test, [b]: Analysis of variance (ANOVA) Test. X̄±SD: Mean±standard deviation, t: t-value (used to test if the coefficient is significantly different from zero), t: independent samples t test, F: F-statistic (used to test whether the overall regression model is significant), F: Analysis of variance

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**Table 2.** Patient characteristics based on disease type and treatment process

| Disease and treatment variables | LVAD implantation (n=21) | | HT (n=45) | | Statistical analysis |
|---|---|---|---|---|---|
| | n | % | n | % | p* |
| Frequency of hospital admission | | | | | 0.297 |
| 1–4 times | 9 | 43.0 | 28 | 62.0 | $X^2$=2.427 |
| 5–8 times | 6 | 29.0 | 7 | 16.0 | |
| 9 or more times | 6 | 29.0 | 10 | 22.0 | |
| Reason for hospital admission | | | | | **0.018** |
| Routine control | 8 | 38.0 | 31 | 69.0 | $X^2$=5.617 |
| Complication | 13 | 62.0 | 14 | 31.0 | |
| Postoperative survival duration | | | | | **0.003** |
| ≤5 years | 19 | 90.0 | 24 | 53.0 | $X^2$=8.700 |
| >5 years | 2 | 10.0 | 21 | 47.0 | |

*: Pearson's chi-square $X^2$ test. LVAD: Left ventricular assist device, HT: Heart transplantation.

**Table 3.** Factors influencing short form-36 (SF-36) quality of life subscale scores in patients with left ventricular assist device (LVAD) implantation and heart transplantation

| Factors affecting subdimensions of the SF-36 quality of life scale | B | SD | Beta | t | p | Statistical analysis |
|---|---|---|---|---|---|---|
| Factors affecting the general health perception subscale | | | | | | |
| Constant | 83.45 | 8.60 | 0.00 | 9.706 | 0.001 | $R^2$=0.099 F=7.000 p=0.010 |
| Reason for hospital admission within one year | -15.24 | 5.76 | -0.31 | -2.646 | 0.010 | |
| Factors affecting the pain subscale | | | | | | |
| Constant | 104.86 | 9.05 | | 11.582 | 0.001 | $R^2$=0.101 F=7.196 p=0.009 |
| Reason for hospital admission within one year | -16.27 | 6.07 | -0.32 | -2.683 | 0.009 | |
| Factors affecting the energy/vitality subscale | | | | | | |
| Constant | 29.30 | 13.08 | | 2.241 | 0.029 | $R^2$=0.138 F=5.046 p=0.009 |
| Patient group (LVAD implantation vs. HT) | 10.97 | 5.97 | 0.23 | 1.838 | 0.071 | |
| Postoperative survival time | 9.40 | 5.28 | 0.22 | 1.782 | 0.080 | |
| Factors affecting the role limitations due to physical health subscale | | | | | | |
| Constant | 113.75 | 14.19 | | 8.015 | 0.000 | $R^2$=0.091 F=6.371 p=0.014 |
| Reason for hospital admission within one year | -24.00 | 9.51 | -0.30 | -2.524 | 0.014 | |
| Factors affecting the physical functioning subscale | | | | | | |
| Constant | 50.68 | 15.56 | | 3.256 | 0.002 | $R^2$=0.290 F=8.453 p<0.001 |
| Patient group (LVAD Implantation vs. HT) | 13.10 | 5.59 | 0.28 | 2.344 | 0.022 | |
| Postoperative survival time | 9.97 | 4.78 | 0.24 | 2.084 | 0.041 | |
| Reason for hospital admission within one year | -10.53 | 5.02 | -0.24 | -2.098 | 0.040 | |

*: Regression analysis. B: Unstandardized regression coefficient (shows how much the outcome changes when the predictor increases by one unit), SD: Standard deviation, t: t-value (used to test if the coefficient is significantly different from zero), t: independent samples t test, $R^2$: Coefficient of determination (shows how much of the outcome is explained by the predictors), F: F-statistic (used to test whether the overall regression model is significant), F: Analysis of variance.

Patients who had undergone surgery more than five years ago had significantly higher scores in some sub-dimensions: physical functioning scores were 9.97 points higher, and the energy/vitality scores were 9.40 points higher, compared to those who had surgery within the past five years. Additionally, HT patients had higher mean scores than LVAD patients in the energy/vitality sub-dimension (10.97 points higher) and in physical functioning (13.10 points higher) (Table 3).

## Problems Experienced by LVAD and HT Patients

Most patients (LVAD: 71.4%; HT: 84.1%) reported no problems in their social relationships. However, among those who did report issues, 28.5% of LVAD patients and 13.6% of HT patients stated that their communication with friends deteriorated during the postoperative period. Psychological problems reported by LVAD patients included depression (42.9%), fear (particularly fear of death) (42.9%), anxiety (28.6%),

**Table 4.** Problems experienced by patients undergoing left ventricular assist device (lvad) implantation and heart transplantation

| Problems experienced by patients undergoing LVAD implantation and heart transplantation | LVAD implantation (n=21) | | Heart transplantation (n=44) | |
|---|---|---|---|---|
| | n* | %** | n* | %** |
| Social relationship challenges | | | | |
| Impaired communication with friends | 6 | 28.5 | 6 | 13.6 |
| Impaired communication with colleagues | 3 | 14.3 | 2 | 4.6 |
| Impaired family relationships | 2 | 9.5 | 5 | 11.4 |
| No issues reported | 15 | 71.4 | 37 | 84.1 |
| Psychological problems | | | | |
| Depression | 9 | 42.9 | 15 | 34.1 |
| Fear (including fear of death) | 9 | 42.9 | 8 | 18.2 |
| Anxiety | 6 | 28.6 | 10 | 22.7 |
| Uncertainty about the future | 5 | 23.8 | 7 | 15.9 |
| Anger | 3 | 14.3 | 13 | 29.5 |
| Difficulty adapting | 2 | 9.5 | 4 | 9.1 |
| Social isolation | 2 | 9.5 | 6 | 13.6 |
| Personality and behavioral changes | 1 | 4.8 | 12 | 27.3 |
| No issues reported | 8 | 38.1 | 18 | 40.9 |
| Economic difficulties | | | | |
| High transportation costs | 9 | 42.9 | 29 | 67.4 |
| Examination and treatment expenses | 6 | 28.6 | 20 | 46.5 |
| Early retirement due to health | 6 | 28.6 | 9 | 20.9 |
| Job loss | 4 | 19.0 | 4 | 9.3 |
| Inability to obtain a work permit | 2 | 9.5 | 1 | 2.3 |
| Reduced physical activity | 2 | 9.5 | 5 | 11.6 |
| Decreased productivity | 0 | 0 | 6 | 14.0 |
| Difficulty finding employment related to health condition | 0 | 0 | 3 | 7.0 |
| No issues reported | 7 | 33.3 | 9 | 20.9 |
| Sexual health problems | | | | |
| Decreased sexual desire | 7 | 36.8 | 6 | 14.0 |
| Erectile dysfunction | 7 | 36.8 | 3 | 7.0 |
| Reduced frequency of sexual intercourse | 4 | 21.1 | 5 | 11.6 |
| Fear of engaging in sexual activity | 4 | 21.1 | 1 | 2.3 |
| Position-related difficulties during intercourse | 3 | 15.8 | 0 | 0 |
| Lack of pleasure during sexual activity | 1 | 5.3 | 3 | 7.0 |
| Partner-related concerns | 1 | 5.3 | 2 | 4.7 |
| Menstrual irregularities | 0 | 0 | 6 | 14.0 |
| No issues reported | 6 | 31.6 | 30 | 69.8 |
| Additional problems reported by LVAD patients only | | | | |
| Inability to bathe or swim (e.g., in sea/pool) | 15 | 71.4 | – | |
| Weight of the LVAD bag | 13 | 61.9 | – | |
| Being subject to curious or intrusive questions | 13 | 61.9 | – | |
| Difficulty carrying the device bag | 12 | 57.1 | – | |
| Fear of bag theft (snatching) | 12 | 57.1 | – | |
| Feelings of embarrassment due to visible equipment | 9 | 42.9 | – | |
| Need to plan for batteries and electrical components on long trips | 5 | 23.8 | – | |
| Obligation to carry spare batteries | 5 | 23.8 | – | |
| Sleep disturbances | 5 | 23.8 | – | |
| Problems using public transportation | 2 | 9.5 | – | |
| Total | 21.00 | | – | |

*: Patients could select more than one response, **: Results are presented as n (%). LVAD: Left ventricular assist device, HT: Heart transplantation

and worry about the future (23.8%). In contrast, HT patients reported depression (34.1%), anger (29.5%), changes in personality and behavior (27.3%), and anxiety (22.7%). Additionally, economic difficulties were experienced by 66.7% of LVAD patients and 79.1% of HT patients (Table 4).

These problems primarily included transportation costs (LVAD: 42.9%; HT: 67.4%), examination and treatment expenses (LVAD: 28.6%; HT: 46.5%), and financial difficulties related to early retirement (LVAD: 28.6%; HT: 20.9%). Additionally, 61.9% of LVAD patients and 60% of HT patients reported that they stopped working after the operation (Table 4).

Postoperative sexual problems among LVAD patients included a decrease in sexual desire (36.8%), erectile dysfunction (36.8%), a reduction in the frequency of sexual intercourse (21.1%), and fear of engaging in sexual activity (21.1%). HT patients reported fewer sexual issues than LVAD patients, with the most common being a decrease in the frequency of sexual intercourse (11.6%) and reduced sexual desire (14.0%). Among female HT patients, the most frequently reported sexual issue was menstrual irregularity (14.0%) (Table 4).

Although not shown in the table, 66.7% of HT patients reported making lifestyle changes, 73.3% stated that they did not experience changes in their roles and responsibilities, and 60% stopped working. In comparison, 71.4% of LVAD patients indicated making lifestyle changes, 76.2% experienced changes in roles and responsibilities, and 61.9% stopped working (Table 4).

Furthermore, most LVAD patients (71.4%) reported difficulties with bathing and stated they were unable to go to the sea or pool (61.9%). Many also experienced being subjected to curious questions (61.9%), felt the battery bag was heavy and difficult to carry (57.1%), and expressed fear of the LVAD bag being stolen or snatched (57.1%) (Table 4).

## Discussion

According to the International Society for Heart and Lung Transplantation (ISHLT) guidelines, HT is generally recommended for patients under 70 years of age due to the increased risk of comorbidities and complications related to immunosuppression in older individuals. Data from the United Network for Organ Sharing (UNOS) show that the median age of HT recipients is 56 years (interquartile range [IQR]: 46–63 years).[18] In our study, most HT patients were in the 42–53 age group, while the majority of LVAD patients were in the 54–74 age group, supporting the finding that HT is typically preferred for younger patients. It was also observed that nearly all LVAD patients were single. This may be attributed to the frequent hospitalizations, the high caregiving burden associated with the condition, and the lack of an active sexual life following the operation.

Our study observed that the sociodemographic characteristics of patients in both groups influenced different subdimensions of the QOL scale. The mean scores in the physical functioning subdimension were higher among married patients compared to single patients. This finding may be attributed to the emotional and practical support provided by spouses. In a study conducted by Vader et al.[19] involving LVAD patients, it was reported that married patients had lower mortality rates. Similarly, Kelty et al.[2] found that the five-year survival rate was higher among married HT patients.

In our study, working patients had higher mean scores in the physical functioning, emotional role difficulty, pain, and general health perception subdimensions compared to non-working patients. Another study on LVAD patients found that being unemployed was associated with removal from the transplant waiting list, increased mortality,[19] and poorer overall QOL outcomes within the first two years after implantation.[20] In our study, it was found that the mean physical functioning scores in the 54–74 age group were lower than those of the younger age group. Some studies, however, have reported contrary findings, showing that older HT patients had lower anxiety levels, fewer psychological problems, and better quality of life compared to younger HT patients.[21] This difference may be attributed to variations in countries' levels of development, with more developed countries experiencing fewer psychosocial issues and older individuals possibly having better coping mechanisms due to greater life experience.

It was also observed in our study that the mean scores in the physical functioning and energy/vitality subdimensions were significantly higher in HT patients compared to LVAD patients. This finding is consistent with previous research.[3] It is likely due to the fact that LVAD patients must carry a device weighing approximately 2 kg in their daily lives, which imposes physical limitations and reduces their overall vitality and physical fitness.

Similar to the findings of the present study, it has been observed that the survival rates of both LVAD and HT patients tend to decrease over time following the operation. Complications are among the key factors affecting the survival rates of patients with an LVAD.[22] In our study, a range of complications was observed following LVAD implantation, including driveline infection, surgical site infection, pump thrombosis, gastrointestinal bleeding, cerebrovascular accidents, arrhythmia, renal failure, and device failure.[23,24] For HT patients, neurological and dermatological issues such as tremors, fatigue, and forgetfulness have been reported more frequently.[25] The most common causes of death in this group are cardiac allograft vasculopathy, acute rejection, infection, and malignancy.[26] The results of our study are consistent with these findings.[25,26] In the present study, LVAD patients visited the hospital more frequently than HT patients, primarily due to complications. This result is also supported by the findings of Jakovljevic et al.[3]

For both patient groups, the mean scores in the physical role difficulty and physical functioning subdimensions were lower among those who visited the hospital due to complications compared to those who visited for routine checkup. In the postoperative period, patients were prescribed multiple medications with various side effects. These treatments, combined with complications, difficulties in daily activities, and increased dependency on others, contribute to a decline in patients' quality of life. As the frequency of hospital visits due to complications increased, both overall health perception and pain sub-dimension mean scores showed a noticeable decrease. In a study by Dew et al.,[27] it was found that LVAD patients (n=42) experienced fear of infection (52.0%), fear of device malfunction (40.0%), sleep disturbances due to driveline position (40.0%), and discomfort caused by device noise (32.0%). The study emphasized that anxiety levels increased alongside physical limitations and psychological distress, ultimately leading to a decline in QOL.

Social support is one of the key factors associated with QOL for both LVAD and HT patients.[28,29] Patients often experience changes in their relationships with family, friends, and neighbors in the postoperative period and must cope with these adjustments.[9,30] In our study, we found that both LVAD and HT patients experienced deteriorated communication with friends, strained family relationships, and difficulties with colleagues after surgery. Additionally, LVAD patients often faced social isolation after implantation (due to efforts to protect themselves from infection), relocated their homes, adjusted their roles and responsibilities, and were unable to continue working due to decreased independence, ultimately leading to early retirement.

Regarding psychological issues, LVAD patients most commonly reported depression, fear (particularly fear of death), anxiety, and concerns about the future. HT patients, on the other hand, described experiencing depression, anger, changes in personality and attitude, and anxiety. Studies have indicated that both LVAD and HT patients experience symptoms of depression and anxiety, although these symptoms tend to decrease over time during the postoperative period.[3–9,14] In another study, patients with an LVAD were reported to have lower QOL and reduced psychological functioning compared to HT patients.[31] Furthermore, LVAD patients have been shown to face issues requiring psychiatric intervention, including family stress, major depression, organic mental syndromes, and severe adjustment disorder.[32] Based on our observations, it became evident that both patient groups needed to establish new balances within the family after the operation. Among LVAD patients in particular, the adaptation and acceptance process regarding the device had a negative impact on both the patient and their family.

In a study by Weerahandi et al.,[33] LVAD patients were also reported to experience financial difficulties. Similarly, a study by Sadala et al.[34] found that HT patients faced increased familial and financial problems following transplantation. Consistent with these findings, our study also revealed that most patients in both groups experienced financial problems.

LVAD patients experienced specific issues related to sexual function, including erectile dysfunction or vaginal dryness, problems related to cables or batteries, difficulties achieving orgasm, fear of injury, partner-related problems, negative self-image, pain, and depression.[35,36] On the other hand, some studies have shown that sexual function in certain LVAD patients improved or was maintained after implantation. In these cases, patient-partner harmony was achieved despite the presence of the device, and some couples experienced increased non-sexual intimacy.[36] These findings regarding sexual issues in LVAD patients are consistent with the results of our study.

In terms of social life, LVAD patients also reported challenges such as the inability to bathe or swim in the sea/pool, being subjected to curious or intrusive questions, the heaviness of the device bag, and difficulty carrying the bag. In some studies, the problems experienced after LVAD implantation included changes in body image, challenges with battery and device management, bathing and swimming limitations, driving restrictions, deterioration in interpersonal relationships, and resulting stress.[35,37] Patients reported that while they were able to overcome physical, psychological, and environmental concerns through early adaptation, they often took longer to accept the LVAD as an integral part of their body.[37]

## Limitations

The limitations of this study include its single-center design, the smaller sample size of patients with LVAD implantation compared to those who underwent HT, and the predominance of male patients in the LVAD group.

## Conclusion

LVAD implantation is expected to continue playing an increasingly important role in the treatment of heart failure. Therefore, it is essential to identify the psychosocial problems experienced by LVAD patients, assess changes in their quality of life, and understand the factors that influence these changes. While HT patients generally report better QOL compared to those with LVADs, demographic characteristics and post-treatment complications can lead to both positive or negative variations in QOL. Patients in both groups faced financial problems of varying degrees. In general, the economic problems experienced by these patients were primarily related to transportation costs, examination and treatment expenses, and early retirement. For LVAD patients, additional financial support is often required due to ongoing care needs, follow-up and treatment processes, and maintenance of the device. For HT patients, difficulty finding employment and reduced productivity after transplantation contribute to their economic burdens. Therefore, future studies should aim to identify risk factors and track changes in the psychosocial, financial, and quality of life outcomes of these patients using larger sample sizes.

**Ethics Committee Approval:** The study was approved by the Başkent University Non-interventional Research Ethics Committee (Approval Number: KA17/299, Date: 20.12.2017).

**Informed Consent:** All participants were informed about the study, and written consent was obtained from each patient.

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## References

1. Kelty CE, Dickinson MG, Fogarty KJ. The effects of demographic, psychosocial, and socioeconomic characteristics on access to heart transplantation and left ventricular assist device. Am Heart J Plus. 2022;17:100172. [CrossRef]
2. Kelty CE, Dickinson MG, Lyerla R, Chillag K, Fogarty KJ. Non-medical characteristics affect referral for advanced heart failure services: A retrospective review. J Racial Ethn Health Disparities. 2025;12(1):374–383. [CrossRef]
3. Jakovljevic DG, McDiarmid A, Hallsworth K, et al. Effect of left ventricular assist device implantation and heart transplantation on habitual physical activity and quality of life. Am J Cardiol. 2014;114(1):88–93. [CrossRef]
4. Lee CS, Gelow JM, Chien CV, et al. Implant strategy-specific changes in symptoms in response to left ventricular assist devices. J Cardiovasc Nurs. 2018;33(2):144–151. [CrossRef]
5. Jezovnik MK, Gregoric ID, Poredos P. Medical complications in patients with LVAD devices. Eur Soc Cardiol. 2017;14:37.
6. Sandau KE, Hoglund BA, Weaver CE, Boisjolie C, Feldman D. A conceptual definition of quality of life with a left ventricular assist device: Results from a qualitative study. Heart Lung. 2014;43(1):32–40. [CrossRef]
7. Schulz KH, Kroencke S. Psychosocial challenges before and after organ transplantation. Transplant Res Risk Manag. 2015:45–58. [CrossRef]
8 Kim IC, Youn JC, Kobashigawa JA. The past, present and future of heart transplantation. Korean Circ J. 2018;48(7):565–590. [CrossRef]
9. Almgren M, Lundqvist P, Lennerling A, Forsberg A. Self-efficacy, recovery and psychological wellbeing one to five years after heart transplantation: A Swedish cross-sectional study. Eur J Cardiovasc Nurs. 2021;20(1):34–39. [CrossRef]
10. Chair SY, Doris SF, Ng MT, et al. Evolvement of left ventricular assist device: The implications on heart failure management. J Geriatr Cardiol. 2016;13(5):425–430.
11. Monemian S, Abedi H, Naji SA. Life experiences in heart transplant recipients. J Educ Health Promot. 2015;4:18. [CrossRef]
12. Pollock-BarZiv SM, Anthony SJ, Niedra R, Dipchand AI, West LJ. Quality of life and function following cardiac transplantation in adolescents. Transplant Proc. 2003;35(7):2468–2470. [CrossRef]
13. Aleksova N, Chih S. The role of durable left ventricular assist devices in advanced heart failure: Would my patient benefit? Can J Cardiol. 2017;33(4):540–543. [CrossRef]
14. Abshire M, Prichard R, Cajita M, DiGiacomo M, Himmelfarb CD. Adaptation and coping in patients living with an LVAD: A metasynthesis. Heart Lung. 2016;45(5):397–405. [CrossRef]
15. Brouwers C, Denollet J, Caliskan K, et al. Psychological distress in patients with a left ventricular assist device and their partners: An exploratory study. Eur J Cardiovasc Nurs. 2015;14(1):53–62. [CrossRef]
16. Ware JE Jr, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. Med Care. 1992;30(6):473–483. [CrossRef]
17. Koçyiğit H, Aydemir Ö, Fişek G, Ölmez N, Memiş AK. Form-36 (KF-36)'nın Türkçe versiyonunun güvenilirliği ve geçerliliği. Ilaç Tedavi Derg. 1999;12(2):102–106.
18. Jawitz OK, Raman V, Klapper J, Hartwig M, Patel CB, Milano C. Donor and recipient age matching in heart transplantation: Analysis of the UNOS Registry. Transpl Int. 2019;32(11):1194–1202. [CrossRef]
19. Vader JM, LaRue S, Ewald G, Silvestry S, Prasad S, Joseph S. Unmarried left ventricular assist device (LVAD) recipients are more likely to experience adverse events. J Heart Lung Transplant. 2013;32(4):287. [CrossRef]
20. Miller L, Birks E, Guglin M, Lamba H, Frazier OH. Use of ventricular assist devices and heart transplantation for advanced heart failure. Circ Res. 2019;124(11):1658–1678. [CrossRef]
21. Grady KL, Fazeli PL, White-Williams C, et al. Implant strategy is related to health-related quality of life at 2 years after LVAD implantation: An INTERMACS analysis. J Heart Lung Transplant. 2016;35(4):S343–S344. [CrossRef]
22. Hanke JS, Rojas SV, Mahr C, et al. Five-year results of patients supported by HeartMate II: Outcomes and adverse events. Eur J Cardiothorac Surg. 2018;53(2):422–427. [CrossRef]
23. Arnold SV, Jones PG, Allen LA, et al. Frequency of poor outcome (death or poor quality of life) after left ventricular assist device for destination therapy: Results from the INTERMACS registry. Circ Heart Fail. 2016;9(8):10. [CrossRef]
24. Kilic A, Acker MA, Atluri P. Dealing with surgical left ventricular assist device complications. J Thorac Dis. 2015;7(12):2158–2164.
25. Yurttaş A, Öztürk Ö, Kavuran E. Sol ventrikül destek cihazı (LVAD) uygulanan hastaların retrospektif analizi. J Cardiovasc Nurs. 2017;8(15):14–19. [CrossRef]
26. Ahmed RR, Pizanis N, Koch A, et al. Survival analysis and postoperative complications after ventricular assist device implantation: Prognostic value of INTERMACS scale. Ann Cardiovasc Thorac Surg. 2018;1(1):15–23. [CrossRef]
27. Dew MA, Kormos RL, Winowich S, et al. Human factors issues in ventricular assist device recipients and their family caregivers. ASAIO J. 2000;46(3):367–373. [CrossRef]
28. Fraund S, Pethig K, Franke U, et al. Ten year survival after heart transplantation: Palliative procedure or successful long term treatment? Heart. 1999;82(1):47–51. [CrossRef]
29. Carvalho WDN, Maria GDSA, Gonçalves KC, Miranda AL, Moreira MDCV. Comparison of quality of life between patients with advanced heart failure and heart transplant recipients. Braz J Cardiovasc Surg. 2021;36(5):623–628. [CrossRef]
30. Brouwers C, de Jonge N, Caliskan K, et al. Predictors of changes in health status between and within patients 12 months post left ventricular assist device implantation. Eur J Heart Fail. 2014;16(5):566–573. [CrossRef]
31. Bunzel B, Wollenek G, Grundböck A. Psychosocial problems of donor heart recipients adversely affecting quality of life. Qual Life Res. 1992;1(5):307–313. [CrossRef]
32. Grady KL, Meyer PM, Dressler D, et al. Change in quality of life from after left ventricular assist device implantation to after heart transplantation. J Heart Lung Transplant. 2003;22(11):1254–1267. [CrossRef]
33. Weerahandi H, Goldstein N, Gelfman LP, et al. The relationship between psychological symptoms and ventricular assist device implantation. J Pain Symptom Manage. 2017;54(6):870–876.e1. [CrossRef]
34. Sadala ML, Stolf NG, Bocchi EA, Bicudo MA. Caring for heart transplant recipients: The lived experience of primary caregivers. Heart Lung. 2013;42(2):120–125. [CrossRef]
35. Hasin T, Jaarsma T, Murninkas D, et al. Sexual function in patients supported with left ventricular assist device and with heart transplant. ESC Heart Fail. 2014;1(2):103–109. [CrossRef]
36. Marcuccilli L, Casida JJ, Peters RM, Wright S. Sex and intimacy among patients with implantable left-ventricular assist devices. J Cardiovasc Nurs. 2011;26(6):504–511. [CrossRef]
37. Marcuccilli L, Casida JJ. Overcoming alterations in body image imposed by the left ventricular assist device: A case report. Prog Transplant. 2012;22(2):212–216. [CrossRef]

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# Obsession with Healthy Eating in Pregnancy Scale: Instrument Development and Cross-sectional Validation Study

## Abstract

**Background:** Orthorexia nervosa (ON) during pregnancy is an important yet often overlooked issue that requires attention. Screening pregnant women who exhibit an obsession with healthy eating is crucial for identifying risk factors and ensuring a qualified nursing process. However, there is currently no valid and reliable ON scale specifically designed for pregnant women.

**Aim:** This study aimed to develop a measurement tool to assess the obsession with healthy eating during pregnancy and to evaluate its psychometric properties.

**Methods:** A scale development and cross-sectional validation study was conducted with 539 pregnant women at the obstetrics and gynecology clinic of a university hospital in Türkiye. Preliminary scale items were generated through a comprehensive literature review. A total of 31 preliminary items underwent item-total correlation analyses. Factor analyses and reliability assessments were then performed.

**Results:** Factor analysis revealed a 12-item scale with a four-factor structure: concern for the baby's health, healthy orthorexia, orthorexia nervosa, and restricted eating motivation. The scale demonstrated acceptable construct validity, discriminant validity, internal consistency (α=0.83), and test-retest reliability (intraclass correlation coefficient = 0.918).

**Conclusion:** The results suggest that the scale is a valid and reliable tool for assessing symptoms of an obsession with healthy eating during pregnancy, in both research and clinical practice settings. The scale is potentially valuable, as it facilitates the identification of such obsessions and supports improvements in the quality of perinatal care.

*Keywords: Healthy eating, instrument development, obsession, pregnancy, validation study*

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## Introduction

Orthorexia nervosa (ON) is a pathological obsession with avoiding unhealthy foods.[1] Although it is not yet an officially recognized diagnosis, ON is believed to differ from pre-existing eating disorders (EDs) and obsessive-compulsive disorders.[2] Proposed diagnostic criteria for ON include: (1) an obsessive concern with healthy eating; (2) avoidance of foods perceived as unhealthy or contaminated, with strict adherence to a self-defined healthy diet; (3) emotional distress, such as guilt, shame, or anxiety, triggered by minor dietary violations, often leading to even stricter dietary restrictions; (4) impairment in social, occupational, or academic functioning; and (5) the development of physical health issues due to nutritional deficiencies.[3]

Focusing on healthy eating is not a disorder in itself. The trend toward ON may reflect a healthier, non-pathological diet and can even be health-promoting, especially in its early stages.[4] Bratman (2017)[5] identified two phases in the development of ON: *healthy orthorexia*, characterized by a non-pathological interest in healthy eating, and *pathological orthorexia*, marked by an obsessive focus on dietary purity.[5] Thus, ON can be both health-enhancing, and, in more extreme forms, potentially life-threatening.[6]

Pregnancy is a critical period in a woman's life, where maintaining health is essential for both mother and fetus. During this time, many women are motivated to improve their diets as part of broader behavioral changes related to gestation.[7] However, this motivation, combined with changes in body shape and dissatisfaction with appearance, can increase vulnerability to EDs.[8] Emotional distress during pregnancy may also lead to anxiety and the emergence of obsessive-compulsive symptoms.[9] Therefore, pregnancy is recognized as a high-risk period for the onset, recurrence, or worsening of EDs.[10] Given the high prevalence of EDs among women of reproductive age, these conditions increase both fetal and maternal morbidity and mortality.[6] Additionally, experiences during pregnancy that deviate from societal expectations have been associated with feelings of fear, shame, and loneliness. These factors may cause pregnant women with mental health concerns to fear being perceived as a "bad mother," leading them to hide their symptoms and avoid seeking help. As a result, the actual prevalence of ON during pregnancy is likely underestimated.[11]

In the limited number of studies available, the prevalence of ON during pregnancy has been reported to range from 21.4% to 26.6%.[12,13] However, evidence on ON in pregnancy is insufficient. Despite being a significant concern, ON during pregnancy is often overlooked and requires greater attention.[14]

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A study that conducted thematic analysis of original tweets on social media identified several perceptions of ON: (1) ON is viewed as a medical issue and a personal responsibility; (2) ON is seen as a cultural phenomenon, shaped by sociocultural influences; and (3) discursive tension arises when ON is interpreted as healthy eating rather than a pathological eating behavior.[15]

Unfortunately, due to varying definitions of ON in the literature, there is no unified understanding of the phenomenon.[16] Although numerous tools have been developed to assess ON risk in different populations, such as the Bratman Orthorexia Test,[17] Orthorexia Nervosa Inventory,[18] ORTO-15,[19] Duesseldorf Orthorexia Scale,[20] Eating Habits Questionnaire,[21] and Teruel Orthorexia Scale,[22] no standardized diagnostic criteria exist.[23] This lack of consensus hinders accurate prevalence estimation.[24] When the target population is pregnant women, the issue becomes even more complex, as, based on current literature, there is no valid and reliable ON scale specifically designed for use during pregnancy. For these reasons, existing measurement tools are insufficient to accurately capture ON symptoms during sensitive periods such as pregnancy, when nutritional changes occur, and may yield questionable results.[15] Therefore, it is crucial to screen pregnant women who exhibit an obsession with healthy eating and to identify associated risk factors to support a qualified nursing process. This study aimed to develop a pregnancy-specific scale to measure obsession with healthy eating and to evaluate its psychometric properties.

In line with this aim, the research questions were:

1. Is the Obsession with Healthy Eating in Pregnancy Scale (OHEPS) valid?
2. Is the OHEPS reliable?

## Materials and Methods

### Design

Two types of studies were conducted: (1) a methodological study for instrument development and (2) a cross-sectional study for scale validation.

### Study Sample

Pregnant women undergoing non-stress testing (monitoring of fetal heart rate and uterine contractions using a cardiotocograph) were recruited from the Gynecology and Obstetrics Clinic of Afyonkarahisar University of Health Sciences Hospital in Türkiye. Inclusion criteria were: being in the last trimester of pregnancy (week 30 or later), aged over 18 years, having no pregnancy-related risk factors, having no history of eating disorders, and volunteering to participate in the study. Those who did not meet these criteria were excluded.

To determine the sample size for exploratory factor analysis (EFA), a 25% dropout rate was added to the standard calculation of five times the number of items in the draft scale.[25] This yielded a required sample size of 194. McNeish (2016)[26] reported that a sample size of 200 is sufficient for EFA. Accordingly, 200 pregnant women were recruited via convenience sampling between October 2021 and January 2022 (Data Set A).

For confirmatory factor analysis (CFA), the required minimum sample size was calculated as 328, based on $\alpha$=0.05, power=0.80, and degree of freedom=30.[27] A total of 339 pregnant women were recruited between May 2022 and September 2022. However, due to violations of normality in the CFA dataset, outliers were removed, and CFA was conducted with data from 330 participants (Data Set B).

### Data Collection

Data were collected using a survey form. The form included 12 questions assessing the demographic and obstetric characteristics of the pregnant women, such as age, educational status, gestational age, as well as the OHEPS.

The OHEPS was developed as part of this study. Items are rated on a scale from 1 (strongly disagree) to 5 (strongly agree). The scale has no cut-off point; higher scores indicate a greater level of obsession with healthy eating.

### Data Analysis

Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS, IBM SPSS Statistics, Chicago, IL, USA) version 25 and Analysis of Moment Structures (AMOS, IBM, Armonk, NY, US) version 24. The procedures for instrument development and psychometric testing are detailed below:

### Instrument Development

#### Item Generation

Preliminary items were developed based on a literature review aimed at exploring the concept of nutritional obsession during pregnancy. The literature review was conducted using Google Scholar, PubMed, EBSCOhost, Web of Science, and Scopus databases with the keywords "pregnancy," "orthorexia nervosa," "healthy eating," and "obsession". Studies published in Turkish or English between 2000 and 2021 were included. No articles were excluded.

#### Content Validity

Content validity was assessed using the item and scale content validity indices (I-CVI and S-CVI), calculated based on expert evaluations following the Davis method (1992).[28] The expert panel included five psychiatric nurses with doctoral degrees and experience in scale development, three obstetrics and gynecology nurses, one public health nurse, three nutrition and dietetics experts, one Turkish language expert, and one assessment and evaluation specialist. Experts rated each item in terms of intelligibility, clarity, and relevance using the following scale: A = "appropriate," B = "needs some revision," C = "needs serious revision," and D = "not appropriate." The I-CVI was calculated by dividing the number of experts who rated the item ss A or B by the total number of experts. Based on expert feedback, draft items were revised, combined, or removed.

#### Face Validity

Five pregnant women evaluated each item on a 4-point Likert-type scale ranging from "very difficult" to "very easy," assessing clarity, comprehensibility, and appropriateness. The time required to complete the scale was also recorded.

### Psychometric Tests

#### Item Analysis

Corrected item-total correlations were used to analyze the items. Items with correlations below 0.3 or above 0.8 were removed.[29]

#### Construct Validity

First, the theoretical structure of the scale was identified using EFA on Data Set A, followed by CFA to validate this structure using a new sample (Data Set B).[30] Principal component analysis with varimax rotation was applied in the EFA. Kaiser-Meyer-Olkin (KMO) statistics and Bartlett's test were used to assess sampling adequacy. In the EFA, the following criteria were used to determine the number of items and factors: anti-image correlations >0.50, communalities >0.30, total variance explained >50%, eigenvalues, and item factor loadings >0.40.29 Items were removed step by step, and EFA was repeated iteratively.

CFA was conducted to confirm the theoretical structure derived from the EFA. Maximum likelihood and bootstrap estimation methods were used in CFA. Multicollinearity among variables was assessed using variance inflation factors (VIF), and normality was assessed through skewness and kurtosis coefficients (<3).[31] Fit indices used in CFA to assess the goodness of fit of the default model included the chi-square to degrees of freedom ratio ($x^2$/df), goodness-of-fit index (GFI), Tucker-Lewis Index (TLI), comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). Values of 0.90 and above for GFI, TLI, and CFI; 0.08 and below for RMSEA and SRMR; and $x^2$/df values of 3 or less[32] were considered indicators of good model fit.

#### Convergent Validity

Convergent validity was assessed using the following criteria: composite reliability (CR) >0.7, standardized regression weight (SRW) >0.5, and average variance extracted (AVE) >0.5.[33]

#### Discriminant Validity

$R^2$ values (the square of the estimated correlation between factors) that were smaller than the AVE values indicated discriminant validity.[29]

#### Internal Consistency Reliability

Internal consistency reliability was evaluated using coefficient a.

#### Test Reliability

Test reliability was assessed using the standard error of measurement (SEm), calculated with the formula: SEm=sd $\sqrt{1-a}$.[34]

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### Test-retest Reliability

To assess test-retest reliability, the scale was re-administered two weeks after the initial data collection (Time I) to a randomly selected subgroup of 50 participants (Time II).[35] If the intraclass correlation coefficient (ICC) between TI and TII is close to one, it indicates a strong correlation between the two measurements.[36]

## Ethics Approval

Ethical approval was obtained from the Afyonkarahisar University of Health Sciences Clinical Research Ethics Committee (Approval Number: 2021-410, Date: 06.08.2021). The study was conducted in accordance with the principles of the Declaration of Helsinki. Written informed consent was obtained from all participants.

# Results

## Participant Characteristics

The sociodemographic and obstetric characteristics of the pregnant women are presented in Table 1. The mean age was 27.88±5.06 years, the mean gestational week was 34.76±2.45, and the average number of pregnancies was 2.28±1.31. It was found that 54% of the participants had a high school or university-level education, 12.4% were employed, 96.1% reported having a medium to good income, and 84% had social security coverage. Additionally, 56.2% of the pregnant women had not received any prior training on nutrition during pregnancy. According to their pre-pregnancy Body Mass Index (BMI), 49.7% of the women were classified as overweight or obese. The average weight gain during pregnancy was 9.75±6.01 kg. Furthermore, 31.1% of participants exhibited symptoms associated with an obsession with healthy eating.

## Instrument Development

### Item Generation

During the creation of the item pool, care was taken to ensure that each item was simple, clear, and did not contain more than one idea or judgment. Following the literature review, 31 draft items were developed.

### Content Validity

Based on expert feedback, terms that were difficult to understand were revised, similar items were combined, and some items were removed. The I-CVI scores for the 23 items ranged from 0.76 to 1.00, and the S-CVI score was 0.91. According to Davis (1992),[28] an S-CVI value of at least 0.80 is acceptable. Ayre and Scally (2014)[37] also state that the minimum Content Validity Ratio (CVR) for 14 experts should be 0.57. Since the condition of S-CVI > CVR was met, the content validity of the 23-item draft scale was deemed sufficient.

### Face Validity

The scale items received an average score of three out of four from pregnant participants in terms of clarity, appropriate item length, and readability. This suggests that the scale is easy to understand and has adequate readability.

## Psychometric Tests

### Item Analysis

Three items (Item 17=0.16; Item 18=0.23; Item 23=0.23) were removed from the scale because their corrected item-total correlation coefficients were below 0.30. The remaining items had corrected item-total correlation values ranging from 0.33 to 0.63.

### Construct Validity

Exploratory factor analysis (EFA) was conducted with the remaining 20 items after item analysis. In the initial EFA, the KMO value was 0.84, and Bartlett's test of sphericity was $x^2$=1724.03 (df=190, p<0.001), indicating that the data were suitable for factor analysis. When eigenvalues were examined, six factors emerged, explaining 66.14% of the total variance. Three items were found to load simultaneously on more than one factor. Therefore, Item 2 (Factor 3 [F3]=0.52 and F5=0.50), Item 12 (F5=0.46 and F6=0.49), and Item 16 (F1=0.36, F5=0.42, and F6=-0.34) were removed from the scale. In the second EFA, two items with communality values below 0.30 (Item 3=0.20 and Item 13=0.15) were also removed. As a result of the third EFA, the remaining 15 items met the acceptable criteria for factor analysis (KMO=0.82; Bartlett's test $x^2$=1427.73, df=105, p<0.001; anti-image correlations >0.77; communality >0.34). The total variance explained by the 15-item scale with a four-factor structure was 66.70%. Factor loadings ranged from 0.51 to 0.90 (Table 2).

**Table 1.** Sociodemographic and obstetric characteristics of pregnant women (n=539)

| Characteristic | n | % | Mean±SD |
|---|---|---|---|
| Age | | | 27.88±5.06 |
| Education level | | | |
| Primary education | 62 | 11.5 | |
| Secondary education | 348 | 64.6 | |
| University education | 129 | 23.9 | |
| Employment status | | | |
| Employed | 67 | 12.4 | |
| Unemployed | 472 | 87.6 | |
| Income status | | | |
| Good | 142 | 26.3 | |
| Moderate | 376 | 69.8 | |
| Poor | 21 | 3.9 | |
| Duration of marriage | | | 5.96±4.64 |
| Number of pregnancies | | | 2.28±1.31 |
| Number of children | | | 1.6±0.73 |
| Pregnancy weeks | | | 34.76±2.45 |
| Nutrition education during pregnancy | | | |
| Did not receive | 303 | 56.2 | |
| Received | 236 | 43.8 | |
| Pre-pregnancy body mass index | | | |
| <18.5 (Underweight) | 33 | 6.1 | |
| 18.5–24.9 (Normal) | 236 | 43.8 | |
| 25–29.9 (Overweight) | 159 | 29.5 | |
| 30–40 (Obese) | 111 | 20.6 | |
| Weight gained during pregnancy | | | 9.75±6.01 |
| Healthy eating obsession symptoms | 161 | 31.1* | |
| Total | 539 | 100 | |

*: Upper 25th percentile. SD: Standard deviation.

**Table 2.** Results of exploratory factor analysis using data set A (n=200)

| Item | Factor | | | | Communality |
|---|---|---|---|---|---|
| | F1 | F2 | F3 | F4 | |
| 4 | | | | 0.698 | 0.569 |
| 5 | | | | 0.744 | 0.618 |
| 6 | | | | 0.769 | 0.665 |
| 1 | | | 0.798 | | 0.670 |
| 7 | | | 0.629 | | 0.653 |
| 14 | | | 0.661 | | 0.482 |
| 15 | | | 0.575 | | 0.606 |
| 9 | | 0.780 | | | 0.732 |
| 10 | | 0.881 | | | 0.825 |
| 11 | | 0.902 | | | 0.873 |
| 8 | 0.507 | | | | 0.348 |
| 19 | 0.878 | | | | 0.789 |
| 20 | 0.846 | | | | 0.758 |
| 21 | 0.782 | | | | 0.627 |
| 22 | 0.871 | | | | 0.791 |
| Eigenvalue | 5.154 | 2.387 | 1.272 | 1.193 | |
| % of Variance | 34.357 | 15.914 | 8.482 | 7.955 | |
| Cumulative % | 34.357 | 50.271 | 58.753 | 66.708 | |

F: Factor.

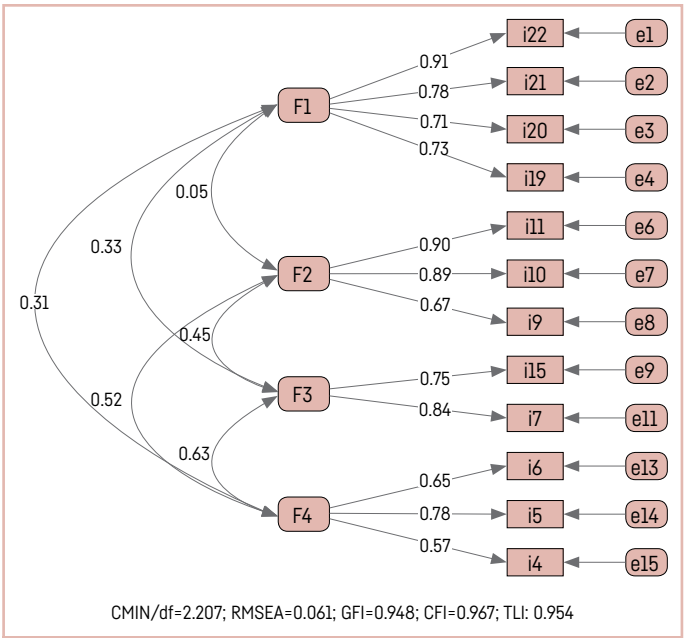


**Figure 1.** The confirmatory factor analysis results.

CMIN: Chi square, df: Degrees of freedom, RMSEA: Root mean square error of approximation, GFI: Goodness-of-fit index, CFI: Comparative fit index, TLI: Tucker-lewis index.

Using the 15-item, four-factor model, CFA was performed with Data Set B (n=330) to cross-validate the fit of the data to the factor structure. Prior to CFA, skewness and kurtosis values for the variables were found to range from 0.368 to 1.345 and from 1.302 to 2.217 respectively. The VIF was below 10 (range: 1.27–3.35), indicating that multicollinearity among the measured variables was not a concern.[38] Although the model's goodness-of-fit indices were acceptable ($x^2$/df=2.806, GFI=0.912, CFI=0.923, TLI=0.904, RMSEA=0.074, SRMR=0.077), three items were removed sequentially due to low standardized regression weights (SRW < 0.50): Item 8 (0.301), Item 14 (0.432), and Item 1 (0.481). CFA was repeated after each item removal. The goodness-of-fit indices for the final 12-item model were found to be acceptable ($x^2$/df=2.207, GFI=0.948, CFI=0.967, TLI=0.954, RMSEA=0.061, SRMR=0.046) (Fig. 1, Appendix 1).

### Convergent Validity

The SRW of the items ranged from 0.574 to 0.913, all statistically significant (p>0.001). The AVE values ranged from 0.455 to 0.621, and the CR values ranged from 0.711 to 0.866. The AVE for Factor 4 was below the recommended threshold (0.455) (Table 3).

### Discriminant Validity

Discriminant validity was confirmed, as the $R^2$ values (the squared estimated correlations between factors) ranged from 0.00 to 0.39, and were lower than the corresponding AVE values.[33]

### Internal Consistency Reliability

The a coefficient for the scale was 0.83. The alpha values for individual factors ranged from 0.69 to 0.87 (Table 4).

### Test Reliability

The SEm for the total OHEPS score was 0.142. SEm values for individual factors ranged from 0.232 to 0.408 (Table 4).

### Test-retest Reliability

The ICC value was 0.918 (p<0.001).

## Discussion

The OHEPS is a self-report tool developed to assess the obsessive and pathological preoccupations of pregnant women with healthy eating, as well as the emotional consequences of failing to adhere to self-imposed dietary rules. The findings indicate that the final 12-item, four-factor version of the scale meets established validity and reliability criteria and is appropriate for use with pregnant women. Although there is ongoing debate about whether ON should be classified a disorder or simply a new lifestyle trend,[1,38] research demonstrates that ON is associated with physical, psychological, and social consequences, aligning it with existing definitions of mental disorders.[39-41] Given that pregnancy is a critical period for the development of EDs, health professionals should also address obsessions with healthy eating as part of perinatal care.[10]

**Table 3.** Confirmatory factor analysis results using data set B (n=330)

| Item | | F | Estimate | SRW | SE | Critical ratio | p | AVE | CR |
|---|---|---|---|---|---|---|---|---|---|
| 22 | ← | 1 | 1 | 0.913 | | | | 0.621 | 0.866 |
| 21 | ← | | 1.068 | 0.778 | 0.064 | 16.687 | *** | | |
| 20 | ← | | 0.84 | 0.711 | 0.057 | 14.705 | *** | | |
| 19 | ← | | 1.039 | 0.734 | 0.068 | 15.37 | *** | | |
| 11 | ← | 2 | 1 | 0.902 | | | | 0.686 | 0.866 |
| 10 | ← | | 0.996 | 0.894 | 0.052 | 19.143 | *** | | |
| 9 | ← | | 0.733 | 0.668 | 0.054 | 13.609 | *** | | |
| 15 | ← | 3 | 1 | 0.752 | | | | 0.632 | 0.774 |
| 7 | ← | | 1.191 | 0.836 | 0.116 | 10.228 | *** | | |
| 6 | ← | 4 | 1 | 0.653 | | | | 0.455 | 0.711 |
| 5 | ← | | 1.168 | 0.78 | 0.121 | 9.665 | *** | | |
| 4 | ← | | 0.758 | 0.574 | 0.092 | 8.249 | *** | | |

***: p<0.001. F: Factor, SRW: Standardized regression weight, SE: Standard error, AVE: Average variance extracted estimate, CR: Composite reliability.

Content validity was assessed based on expert evaluations to determine the extent to which the OHEPS and each of its items effectively measure the obsession with healthy eating during pregnancy. The literature suggests that a CVI of at least 0.80 is required for acceptable content validity.28 In our study, the CVI was found to be high (0.91), indicating strong content validity.

To evaluate construct validity, the KMO coefficient and Bartlett's test of sphericity were used. A KMO value above 0.60 and approaching 1 indicates that the data are suitable for factor analysis and that the sample size is adequate. A significant result from Bartlett's test suggests that the item correlation matrix is appropriate for factor analysis.[29] In our study, the KMO value was 0.82, and Bartlett's test was significant. These findings indicate that the sample was adequate for factor analysis. EFA revealed a four-factor structure. A validation study using Data Set B was then conducted to test this theoretical structure, and the goodness-of-fit indices for the resulting 12-item, four-factor model were found to be within acceptable limits.[32]

In naming the factors, the factor structure of other scales used to evaluate ON, as well as the suggested diagnostic criteria, were taken into consideration. Factor 1 was named "*Concern for the baby's health*" because concerns about the baby's food safety tend to increase during pregnancy.[9] This factor may indicate that the pregnant woman restricts her food choices out of concern for fetal health, potentially using it as a coping mechanism to justify obsessive thoughts about healthy eating.[42] Factor 2 was named "*Healthy orthorexia*", reflecting the commonly observed increase in interest in diet and nutrition during pregnancy.[43,44] Pregnant women who score high on this factor tend to be highly engaged in healthy eating and devote considerable time and financial resources to purchasing, planning, and preparing healthy meals. This interest aligns with their self-concept, as they often view their dietary behavior as a lifestyle choice.[22,45] However, some cross-sectional studies have shown a relationship between an obsession with healthy eating and pathological eating behaviors.[22,46] Since thoughts about healthy eating can sometimes reflect a pathological preoccupation,22 Factor 3 was named "*Orthorexia nervosa*." Individuals who score high on this factor tend to experience extreme anxiety and are overwhelmed by negative consequences such as self-punishment, social isolation, and guilt. This factor indicates that pregnant women obsessively focus on dietary practices through healthy eating, leading to impaired functioning.[47] Factor 4 was named "*Restricted eating motivation*" because the concept of healthy eating ap-

**Table 4.** Reliability statistics using data sets A and B (n=530)

| Factor | Item | Mean±SD | Corrected Item-total correlation | Squared multiple correlation | Cronbach's alpha if item deleted | Cronbach's Alpha | Standard error of measurement |
|---|---|---|---|---|---|---|---|
| 1 | 22 | 1.78±0.63 | 0.46 | 0.62 | 0.82 | 0.87 | 0.85 |
| | 21 | 1.94±0.79 | 0.42 | 0.52 | 0.82 | | |
| | 20 | 1.80±0.65 | 0.38 | 0.49 | 0.83 | | |
| | 19 | 1.89±0.81 | 0.38 | 0.48 | 0.83 | | |
| | Total | 7.36±2.37 | | | | | |
| 2 | 11 | 3.28±1.13 | 0.56 | 0.71 | 0.81 | 0.87 | 1.07 |
| | 10 | 3.19±1.13 | 0.57 | 0.69 | 0.81 | | |
| | 9 | 3.22±1.12 | 0.55 | 0.47 | 0.81 | | |
| | Total | 9.67±2.99 | | | | | |
| 3 | 15 | 3.52±0.94 | 0.54 | 0.42 | 0.82 | 0.75 | 0.90 |
| | 7 | 3.21±1.07 | 0.54 | 0.43 | 0.81 | | |
| | Total | 6.70±1.79 | | | | | |
| 4 | 6 | 2.78±1.02 | 0.51 | 0.33 | 0.82 | 0.69 | 1.25 |
| | 5 | 2.98±0.97 | 0.51 | 0.36 | 0.82 | | |
| | 4 | 2.27±0.88 | 0.46 | 0.29 | 0.82 | | |
| | Total | 8.02±2.24 | | | | | |
| Total | | 31.77±6.60 | | | | 0.83 | 2.72 |

SD: Standard deviation.

pears to increase pregnant women's tendency to control their food intake. Although ON is generally not associated with weight control, several studies suggest that it is primarily motivated by a desire to be healthy.[13,22,40]

A comparison of the reliability results of the OHEPS with those reported in the literature supports the scale's use. The Cronbach's α reliability coefficient for the overall scale was found to be 0.83, while the coefficients for the individual factors ranged from 0.69 to 0.87. In comparison, Cronbach's alpha values reported for previous ON scales were 0.60–0.67 for the Bratman Orthorexia Test, 0.14–0.83 for the ORTO-15, 0.81–0.92 for the Eating Habits Questionnaire, and 0.80–0.88 for the Duesseldorf Orthorexia Scale.[17,19-21] The literature suggest that a scale is considered reliable when the alpha coefficient is between 0.60 and 0.80, and highly reliable when it is 0.80 or above.[29] Therefore, the internal consistency and reliability of the OHEPS can be considered high.

Another reliability test is the test-retest method, which examines the correlation between measurements obtained from the same group at two different time points. This method helps determine the stability of the test over time.[29] A high correlation indicates the stability of test scores and minimal variation between measurements over time. In our study, the correlation coefficient between the test and retest scores of the scale was found to be 0.91, demonstrating that the scale is a consistent measurement tool over time. Previous studies have reported that orthorexic tendencies tend to increase alongside the prevalence of EDs.[4,21,22]

## Limitations

The most significant limitation of this study is that participants were recruited from a single center. Therefore, more comprehensive studies with larger samples are needed to explore the obsession with healthy eating during pregnancy across different cultures and contexts. Additional limitations include the reliance on self-reported data, the inclusion of only third-trimester pregnant women, and the absence of clinical confirmation of ED symptomatology.

## Conclusion

The Obsession with Healthy Eating in Pregnancy Scale is a measurement tool designed to assess pregnant women's obsessive and pathological preoccupations with healthy eating, as well as the emotional consequences of not adhering to self-imposed dietary guidelines. Our findings demonstrate that the 12-item, four-factor scale developed for use in pregnant women meets established criteria for validity and reliability. Given that pregnancy is a critical period for the onset or exacerbation of EDs, it is essential for healthcare professionals to also evaluate symptoms of healthy eating obsession, such as inadequate weight gain during pregnancy, persistent hyperemesis gravidarum beyond the 20th week, a history of pre-pregnancy EDs, adherence to restrictive diets, and negative attitudes toward food.

The OHEPS provides healthcare professionals with a valuable tool for identifying symptoms of obsession with healthy eating during pregnancy and for evaluating the effectiveness of nutritional interventions in high-risk pregnancies. The results of this study may support mental health professionals in improving the quality of perinatal care. The scale has potential utility for enhancing pregnancy monitoring, as it allows for the assessment of obsessive symptoms related to healthy eating during pregnancy in both research and clinical prasctice settings.

**Ethics Committee Approval:** The study was approved by the Afyonkarahisar University of Health Sciences Clinical Research Ethics Committee (Approval Number: 2021-410, Date: 06/08/2021).

**Informed Consent:** Informed consent was obtained from all participants.

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## References

1. Bratman S. Health food junkie. Yoga J. 1997;8:42–50. [CrossRef]
2. Zagaria A, Vacca M, Cerolini S, Ballesio A, Lombardo C. Associations between orthorexia, disordered eating, and obsessive-compulsive symptoms: A systematic review and meta-analysis. Int J Eat Disord. 2022;55:295–312. [CrossRef]
3. Dunn TM, Bratman S. On orthorexia nervosa: A review of the literature and proposed diagnostic criteria. Eat Behav. 2016;21:11–17. [CrossRef]
4. Varga M, Dukay-Szabó S, Túry F, van Furth EF. Evidence and gaps in the literature on orthorexia nervosa. Eat Weight Disord. 2013;18(2):103–111. Erratum in: Eat Weight Disord. 2013;18(2):113. [CrossRef]
5. Bratman S. Orthorexia vs. theories of healthy eating. Eat Weight Disord. 2017 Sep;22(3):381–385. [CrossRef]
6. Pieczykolan A, Flis E, Bień A. Eating disorders during pregnancy. Pielegniarstwo Zdrowie Publiczne Nurs Public Health. 2017;7(3):223–226. [CrossRef]
7. Van den Bergh B, Simons A. A review of scales to measure the mother-foetus relationship. J Reprod Infant Psychol. 2009;27(2):114–126. [CrossRef]

8. Sebastiani G, Andreu-Fernández V, Herranz Barbero A, Aldecoa-Bilbao V, Miracle X, Meler Barrabes E, et al. Eating disorders during gestation: Implications for mother's health, fetal outcomes, and epigenetic changes. Front Pediatr. 2020;8:587. [CrossRef]
9. Abramowitz JS, Nelson CA, Rygwall R, Khandker M. The cognitive mediation of obsessive-compulsive symptoms: A longitudinal study. J Anxiety Disord. 2007;21(1):91–104. [CrossRef]
10. Watson HJ, Von Holle A, Hamer RM, Knoph Berg C, Torgersen L, Magnus P, et al. Remission, continuation and incidence of eating disorders during early pregnancy: A validation study in a population-based birth cohort. Psychol Med. 2013;43(8):1723–1734. [CrossRef]
11. Law S, Ormel I, Babinski S, Plett D, Dionne E, Schwartz H, et al. Dread and solace: Talking about perinatal mental health. Int J Ment Health Nurs. 2021;30 Suppl 1(Suppl 1):1376–1385. [CrossRef]
12. İpkirmaz İB, Saka M. The evaluation of healthy nutrition obsession (orthorexia nervosa) and eating attitudes of pregnant women. Baskent Univ Fac Heal Sci J. 2020;5:17–30.
13. Taştekin Ouyaba A, Çiçekoğlu Öztürk P. The effect of the information-motivation-behavioral skills (IMB) model variables on orthorexia nervosa behaviors of pregnant women. Eat Weight Disord. 2022;27(1):361–372. [CrossRef]
14. Kadioğlu M, Oskay Ü. The effects of eating disorders on pregnancy and postpartum period. J Womens Health Nurs. 2017;3:40–53.
15. Valente M, Cesuroglu T, Labrie N, Syurina EV. "When are we going to hold orthorexia to the same standard as anorexia and bulimia?" Exploring the medicalization process of orthorexia nervosa on Twitter. Health Commun. 2022;37(7):872–879. [CrossRef]
16. Cena H, Barthels F, Cuzzolaro M, Bratman S, Brytek-Matera A, Dunn T, et al. Definition and diagnostic criteria for orthorexia nervosa: A narrative review of the literature. Eat Weight Disord. 2019;24(2):209–246. [CrossRef]
17. Bratman S, Knight D. Health food junkies: Overcoming the obsession with healthful eating. Broadway Books; 2000.
18. Oberle CD, Watkins RS, Burkot AJ. Orthorexic eating behaviors related to exercise addiction and internal motivations in a sample of university students. Eat Weight Disord. 2018;23(1):67–74. [CrossRef]
19. Donini LM, Marsili D, Graziani MP, Imbriale M, Cannella C. Orthorexia nervosa: Validation of a diagnosis questionnaire. Eat Weight Disord. 2005;10(2):e28–32. [CrossRef]
20. Barthels F, Meyer F, Pietrowsky R. Duesseldorf Orthorexia Scale: Construction and evaluation of a questionnaire measuring orthorexic eating behavior. Z Klin Psychol Psychother. 2015;44(2):97–105. [CrossRef]
21. Ambwani S. Measuring "orthorexia": Development of the Eating Habits Questionnaire. Int J. 2013;12(2):1–18.
22. Barrada JR, Roncero M. Bidimensional structure of the orthorexia:Development and initial validation of a new instrument. An Psicol. 2018;34(2):282–290. [CrossRef]
23. Niedzielski A, Kaźmierczak-Wojtaś N. Prevalence of orthorexia nervosa and its diagnostic tools-A literature review. Int J Environ Res Public Health. 2021;18(10):5488. [CrossRef]
24. Valente M, Syurina EV, Donini LM. Shedding light upon various tools to assess orthorexia nervosa: A critical literature review with a systematic search. Eat Weight Disord. 2019;24(4):671–682. [CrossRef]
25. Cheon H, Song JA, Kim J, Jung S. The Competence Scale in Managing Behavioral and Psychological Symptoms of Dementia (CS-MBPSD) for family caregivers: Instrument development and cross-sectional validation study. Int J Nurs Stud. 2022;129:104205. [CrossRef]
26. McNeish D. Exploratory factor analysis with small samples and missing data. J Pers Assess. 2017;99(6):637–652. [CrossRef]
27. Gnambs T. Required sample size and power for SEM. Accessed May 20, 2025. https://timo.gnambs.at/index.php/research/power-for-sem
28. Davis LL. Instrument review: Getting the most from a panel of experts. Appl Nurs Res. 1992;5:194–197. [CrossRef]
29. Özdamar K. Biostatistics with SPSS. 10th ed. Nisan Kitabevi; 2015.
30. Orçan F. Açımlayıcı ve doğrulayıcı faktör analizi: İlk hangisi kullanılmalı. Egit Psikol Olcme Degerlendirme Derg. 2018;9(4):413–421.
31. Kline RB. Principles and practice of structural equation modeling. The Guilford Press; 2011.
32. Gürbüz S. AMOS ile yapısal eşitlik modellemesi: Temel ilkeler ve uygulamalı analizler. Seçkin Publishing; 2019.
33. Bae BR. Structural equation modeling with Amos 19: Principles and practice. Seoul: Chungram Books; 2011.
34. Reigeluth CM, Kim M. Instructional theory. In: The SAGE encyclopedia of educational research, measurement, and evaluation. Sage Publications; 2018:835–838.
35. Alpar R. Applied multivariate statistical methods. 4th ed. Ankara: Detay Press; 2013.
36. Katzmarzyk PT, Denstel KD, Martin CK, Newton RL Jr, Apolzan JW, Mire EF, et al; PROPEL Research Group. Intraclass correlation coefficients for weight loss cluster randomized trials in primary care: The PROPEL trial. Clin Obes. 2022;12(4):e12524. [CrossRef]
37. Ayre C, Scally AJ. Critical values for Lawshe's content validity ratio: Revisiting the original methods of calculation. Meas Eval Couns Dev. 2014;47(1):79–86. [CrossRef]
38. Pietrowsky R, Barthels F. Orthorexia nervosa-Lebensstil oder gesellschaftlich relevantes Krankheitsbild? Public Health Forum. 2016;24(3):189–190. [CrossRef]
39. Nevin SM, Vartanian LR. The stigma of clean dieting and orthorexia nervosa. J Eat Disord. 2017;5:37. [CrossRef]
40. Strahler J, Hermann A, Walter B, Stark R. Orthorexia nervosa: A behavioral complex or a psychological condition? J Behav Addict. 2018;7(4):1143–1156. [CrossRef]
41. Moroze RM, Dunn TM, Holland JC, Yager J, Weintraub P. Microthinking about micronutrients: A case of transition from obsessions about healthy eating to near-fatal "orthorexia nervosa" and proposed diagnostic criteria. Psychosomatics. 2015;56(4):397–403. [CrossRef]
42. Fogarty S, Elmir R, Hay P, Schmied V. The experience of women with an eating disorder in the perinatal period: A meta-ethnographic study. BMC Pregnancy Childbirth. 2018;18(1):121. [CrossRef]
43. Depa J, Barrada JR, Roncero M. Are the motives for food choices different in orthorexia nervosa and healthy orthorexia? Nutrients. 2019;11(3):697. [CrossRef]
44. Roncero M, Barrada JR, García-Soriano G, Guillén V. Personality profile in orthorexia nervosa and healthy orthorexia. Front Psychol 2021;12:710604. [CrossRef]
45. Barthels F, Barrada JR, Roncero M. Orthorexia nervosa and healthy orthorexia as new eating styles. PLoS One. 2019;14(7):e0219609. [CrossRef]
46. Arusoğlu G, Kabakçi E, Köksal G, Merdol TK. Ortoreksiya nervoza ve Orto-11'in türkçeye uyarlama çalışması. Turk Psikiyatri Derg. 2008;19(3):283–291.
47. Mohamadirizi S, Kordi M, Shakeri MT, Modares-Gharavi M. The relationship between eating disorder symptoms and obsessive compulsive disorder in primigravida women. Iran J Nurs Midwifery Res. 2015;20(6):642–646. [CrossRef]

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**Appendix 1.** Final version of the obsession with healthy eating in pregnancy scale

| Factor | Item no.* | | Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
|---|---|---|---|---|---|---|---|
| 1 Concern for baby's health | 1 | I think I need to pay attention to my diet to bring a healthy baby into the world.<br>*Dünyaya sağlıklı bir bebek getirebilmem için beslenmeme dikkat etmem gerektiğini düşünürüm.* | 5 | 4 | 3 | 2 | 1 |
| | 2 | I believe that if I eat unhealthy, pregnancy-related problems will arise.<br>*Sağlıksız beslenirsem gebelikle ilgili sorunların ortaya çıkacağına inanırım.* | 5 | 4 | 3 | 2 | 1 |
| | 3 | During my pregnancy, I give importance to healthy eating more for the health of my baby than for myself.<br>*Gebeliğimde sağlıklı beslenmeye kendimden çok bebeğimin sağlığı için önem veririm.* | 5 | 4 | 3 | 2 | 1 |
| | 4 | When I consume unhealthy food during my pregnancy, I worry about my baby's health.<br>*Gebeliğimde sağlıksız bir besin tükettiğimde bebeğimin sağlığı için endişelenirim.* | 5 | 4 | 3 | 2 | 1 |
| 2 Healthy orthorexia | 5 | I spend a lot of time searching for healthy food during my pregnancy.<br>*Gebeliğimde sağlıklı besin bulmak için oldukça fazla zaman harcarım.* | 5 | 4 | 3 | 2 | 1 |
| | 6 | I allocate more budget to access healthy foods during my pregnancy.<br>*Gebeliğimde sağlıklı besinlere ulaşmak için daha fazla bütçe ayırırım.* | 5 | 4 | 3 | 2 | 1 |
| | 7 | I spend most of my time preparing healthy foods during my pregnancy.<br>*Gebeliğimde vaktimin çoğu sağlıklı besinleri hazırlamakla geçer.* | 5 | 4 | 3 | 2 | 1 |
| 3 Orthorexia nervosa | 8 | Planning a healthy diet during my pregnancy keeps my mind very busy.<br>*Gebeliğimde sağlıklı beslenmeyi planlamak zihnimi çok meşgul eder.* | 5 | 4 | 3 | 2 | 1 |
| | 9 | I find myself constantly dealing with the issue of healthy eating during my pregnancy.<br>*Gebeliğimde kendimi sürekli sağlıklı beslenme konusuyla ilgilenirken bulurum.* | 5 | 4 | 3 | 2 | 1 |
| 4 Restricted eating motivation | 10 | I do not consume foods that I consider unhealthy during pregnancy.<br>*Gebeliğimde sağlıksız olduğunu düşündüğüm gıdaları tüketmem.* | 5 | 4 | 3 | 2 | 1 |
| | 11 | I enjoy eating only healthy food during my pregnancy.<br>*Gebeliğimde yalnızca sağlıklı olan yemekleri yemekten zevk alırım.* | 5 | 4 | 3 | 2 | 1 |
| | 12 | I prefer the foods I eat during my pregnancy to be healthy rather than delicious.<br>*Gebeliğim boyunca yediğim besinlerin lezzetli olmasından çok sağlıklı olmasını tercih ederim.* | 5 | 4 | 3 | 2 | 1 |

*: The Turkish version of each item is italicized.

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# Validity and Reliability of the Turkish Version of the Gender Equality Scale in Nursing Education

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## Abstract

**Background:** Equality has become an increasingly prominent issue across various sectors of society, with gender inequality emerging as a key topic of discussion in nursing education. A comprehensive evaluation is essential to advancing gender parity in this field.

**Aim:** This study aimed to assess the validity of the Turkish version of the *Gender Equality Scale in Nursing Education* (GES-NE).

**Methods:** This methodological, descriptive, and correlational study was conducted between February 10 and April 30 with 408 senior nursing students aged 18 to 36. Data were collected via an online questionnaire, which included a *Socio-Demographic Data Collection Form* and the GES-NE scale. Prior to implementation, the scale underwent language adaptation, expert review, and a pilot study. The primary sample was subsequently assessed using item-total score analysis, Cronbach's alpha, and both confirmatory and exploratory factor analyses.

**Results:** The scale consisted of four subdimensions and 23 items, accounting for 50% of the total variance. Both confirmatory and exploratory factor analyses showed that all factor loadings were above 0.30. Confirmatory factor analysis revealed that all fit indices exceeded the acceptable threshold of 0.80, with a Root Mean Square Error of Approximation (RMSEA) value of 0.080. The overall Cronbach's alpha coefficient was 0.93, with each subdimension exceeding 0.60.

**Conclusion:** The Turkish version of the GES-NE scale is a valid and reliable instrument for measuring gender equality in nursing education among Turkish students.

***Keywords:** Gender discrimination, gender equality, gender role, nursing education, reliability, validity*

## Introduction

Diversity encompasses a broad range of personal, demographic, and societal characteristics, including, but not limited to, race, ethnicity, gender, sex, age, and gender identity. In contemporary societies, it is imperative to ensure equitable treatment for all individuals and to dismantle artificial barriers, preconceived notions, and biases. In educational environments that value diversity and inclusivity, students, faculty, and administrators increasingly recognize the importance of diversity in achieving success in teaching, learning, research, and practice.[1]

The American Association of Colleges of Nursing (AACN) highlights the importance of diversity, inclusion, and equity in nursing education and the development of a strong nursing workforce capable of delivering high-quality healthcare services.[2] Historically, nursing has been perceived as a profession primarily suited for women, based on the belief that nursing is inherently feminine and therefore inappropriate for men.[3] As a result, research on gender inequality in nursing has largely focused on the experiences of male nurses and nursing students, rather than measuring gender-based disparities or examining the biases and challenges they face.

The literature indicates that gender biases and stereotypes hinder the advancement and inclusivity of the nursing profession. For example, Madlala et al.[4] in 2021 found that male students experienced gender discrimination during midwifery education in clinical practice. They suggest that policy revisions or curriculum enhancements in nursing education could serve as effective strategies to address gender inequality.[4] Similarly, Petges and Sabio[5] im 2020 emphasize that promoting gender equality in nursing education requires the inclusion of diverse genders in mentoring programs, with faculty members playing a key role in supporting this process. Recognizing the importance of gender parity in nursing promotes inclusivity in curricula by encouraging students from diverse ethnic and cultural backgrounds to participate in and successfully complete nursing education programs. Additionally, Green1 suggests that nursing schools should publicly demonstrate their commitment to equity in nursing education while also complying with accreditation renewal requirements.[1] Several studies have also focused on reducing barriers for men entering nursing education and promoting greater male inclusion within the profession.[3,6]

Nevertheless, gender parity concerns in nursing extend beyond issues affecting men. According to the Global Health Workforce Network, established by the World Health Organization and the Center for Gender Equality, significant gender inequality persists within the healthcare industry.[7] The report highlights that gender stereotypes not only discourage men from pursuing nursing as a profession but also limit women's access

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to leadership and senior roles in the field. Brandford and Brandford-Stevenson[8] in 2021 note that while women comprise 70% of the global health workforce, they hold only 25% of senior positions, reflecting a stark disparity. Therefore, a comprehensive examination of gender equality in nursing education is crucial to identifying and addressing the challenges faced by women in the profession.

Previous research has primarily focused on assessing the gender-based disparities experienced by male nursing students. For instance, O'Lynn in 2004 developed the *Inventory of Men's Friendship in Nursing Programs* (IMFNP) to measure the gender-related challenges perceived by male nursing students during their educational journey.[3] However, a more holistic understanding is necessary to develop effective strategies for promoting gender equality in nursing education. Accordingly, this study aimed to translate and adapt Cho et al.'s[9] in 2022 *Gender Equality Scale in Nursing Education* (GES-NE) from English to Turkish.

### Research Questions of the Study

1. Is the *Gender Equality Scale in Nursing Education* a valid measurement tool?
2. Is the *Gender Equality Scale in Nursing Education* a reliable measurement tool?

## Materials and Methods

### Study Design

A methodological-descriptive-correlational design was employed in this study.

### Universe and Sampling

This study utilized a methodological approach to evaluate the validity and reliability of the *Gender Equality Scale in Nursing Education*, adapted for use in Turkish. The target population included senior nursing students aged 18 and older in Türkiye. Convenience sampling was used to recruit participants from this population. A total of 710 senior nursing students who met the inclusion criteria were invited to participate and were encouraged to share the link with their peers.

According to the literature, sample size adequacy is classified as inadequate for values up to 200, fair for up to 300, good for up to 500, very good for up to 700, and excellent for values exceeding 1000.[10–12] The study sample consisted of 408 senior nursing students who voluntarily consented to participate between February 10 and April 30, 2023. A pilot study was conducted with a group of 20 senior nursing students. For the pilot application, data were collected from the first 20 volunteer students who accessed the study link shared via social media. These participants were excluded from the main sample to avoid any potential influence on the scale outcomes. Thus, the final sample included 408 senior nursing students. Sampling criteria required participants to be senior nursing students aged 18 or older, in good physical and mental health, and to have voluntarily agreed to participate. The participation rate was recorded at 57.4%.

### Data Collection Tools

Data were collected using the Socio-Demographic Data Collection Form and the Gender Equality in Nursing Education Scale (GES-NE).

### Socio-Demographic Data Collection Form

The form, developed by the researchers based on a review of the relevant literature, includes seven questions related to student's age, gender, education level, and employment status.[9]

### Gender Equality in Nursing Education

The five-point Likert-type GES-NE scale, consisting of 23 items across four sub-dimensions, was developed by Cho et al.[9] The scale provides five response options, ranging from "1=strongly agree" to "5=strongly disagree." Item factor loadings range from 0.30 to 0.87. The four sub-dimensions: *gender personal experience of inequality, gender role perception, gender discrimination*, and *gender biases*, together account for 50% of the total variance.

The first sub-dimension, *gender personal experience of inequality*, consists of eight items (16, 15, 22, 17, 18, 26, 20, 14). The second sub-dimension, *gender role perception*, includes five items (3, 4, 5, 1, 2). The third sub-dimension, *gender discrimination*, comprises seven items (12, 8, 13, 24, 25, 9, 23). The fourth sub-dimension, *gender biases*, contains three items (7, 6, 19). The sub-dimensions and items in the Turkish version are consistent with those of the original scale.

Cronbach's alpha was used to assess the reliability of the scale. The overall Cronbach's α value was 0.93, with sub-dimension values ranging from 0.73 to 0.90.

### Data Collection

Data were collected online due to the nationwide shift to distance education following the significant earthquake in Şanlıurfa on February 6, 2023. The researchers disseminated a link containing details about the study via social media platforms such as Instagram, WhatsApp, and Facebook.

### Procedure

The Turkish version of the scale was developed in accordance with the guidelines of the International Test Commission (ITC).[13] Written permission was obtained from the scale's original developer to conduct the research. The adaptation process involved both back-translation and group translation methods. Five translators, proficient in both languages, translated the scale from English to Turkish after receiving the necessary approval from the scale's developer. The draft Turkish version, reflecting the most accurate Turkish equivalents, was then back-translated into English by three professionals (two academic nurses and one linguist), who had no prior exposure to the original scale. Following the back-translation, the researchers made the necessary revisions, and the final Turkish version of the scale was prepared. The scale was then submitted to experts for evaluation in terms of language, cultural equivalence, and content validity.[10,14]

According to the literature, consultation with at least three experts is recommended for such evaluations.[14] In this study, expert opinions were obtained from 11 faculty members from different universities, all specializing in gender equality research within the public health nursing departments of three higher education institutions.

The experts were provided with both the English and Turkish versions of the scale and were asked to assess the appropriateness of each item. The evaluators were provided with both the source (English) and target (Turkish) versions of the scale and were asked to rate the appropriateness of each item using a 4-point scale: 1 = minimal adjustments needed, 2 = some adjustments needed, 3 = appropriate, and 4 = highly appropriate. The ratings were analyzed using the Davis Content Validity Index (CVI), and both the item-level CVI (I-CVI) and the scale-level CVI (S-CVI) were calculated. For the overall scale, the I-CVI ranged from 0.99 to 1.00, while the S-CVI was 0.99. I-CVI and S-CVI values above 0.80 are considered sufficient to establish content validity. Following expert approval of both the Turkish and English versions, a preliminary study was conducted with 20 senior nursing students. The pilot results indicated that the questions were clear and no negative feedback was received. Data were collected via an online survey distributed through Google Forms. Based on the pilot findings, no changes were made to the Turkish version of the scale, and the researchers proceeded to administer it to the main sample. The 20 who participated in the pilot study were excluded from the main sample to prevent any potential influence on the results. No personal data or email addresses were collected from participants during the online survey administration.

### Invariance of the Scale Over Time

The stability of the scale over time was assessed using the test-retest reliability method. Nursing students completed the GES-NE scale twice, with a two-week interval between administrations. The test-retest reliability coefficient was determined to be 0.94.

### Data Analysis

Data analysis was conducted using the Statistical Package for the Social Sciences version 24.0 (IBM SPSS Corp., Armonk, NY, USA) and Analysis of Moment Structures version 25 (Amos Development Corporation, Chicago, IL, USA).[15] Descriptive statistics, including percentages, means, standard deviations, and frequencies, were used to summarize the data. Normality was assessed using skewness and kurtosis values, along with normality tests. For language adaptation, the translation and back-translation method was employed. Validity analysis included content validity, surface validity, and construct validity. For content validity, both the Content Validity Index and Content Validity Ratio were calculated using the Davis

**Table 1.** Descriptive characteristics of nursing students (n=408)

| Characteristic | n | % | M (SD) |
|---|---|---|---|
| Gender | | | |
| Male | 176 | 43.1 | |
| Female | 232 | 56.9 | |
| Marital status | | | |
| Single | 352 | 86.3 | |
| Married | 56 | 13.7 | |
| Presence of male faculty members | | | |
| Yes | 400 | 98.0 | |
| No | 8 | 2.0 | |
| Views opposite sex as brother/sister | | | |
| Yes | 264 | 64.7 | |
| No | 144 | 35.3 | |
| Received instruction from male instructors | | | |
| Yes | 374 | 94.1 | |
| No | 24 | 5.9 | |
| Proportion of male students in class | | | |
| <10% | 88 | 21.6 | |
| >10%–20% | 252 | 61.8 | |
| >20%–30% | 60 | 14.7 | |
| >30% | 8 | 2.0 | |
| Satisfaction with nursing (VAS 1–10) | | | 5.68±3.16 |
| Determination to become a nurse (VAS 1–10) | | | 5.96±2.98 |
| Total scale score | | | 81.05±17.24 |

n: Number, %: Percentage, M: Mean, SD: Standard deviation, VAS: Visual analogue scale.

technique. Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were used to assess construct validity. For reliability analysis, item-total correlations, Cronbach's alpha, and split-half methods were employed. A p-value of <0.05 was considered the threshold for statistical significance.

## Ethics Committee Approval

Written permission to translate the GES-NE scale into Turkish was obtained via email from the scale's original author. The study received ethical approval from Hakkari University Rectorate Scientific Research and Publication Ethics Committee (Date: 23.01.2023, Number: 2023/14-1).

The study's objective was explained to nursing students through a consent form accessible via a Google Form link. The study included senior nursing students who voluntarily provided informed consent to participate. The research was conducted in accordance with the principles of the Declaration of Helsinki.

# Results

Among the nursing students, 56.9%, were identified as female, while a significant majority, 86.3%, reported being single. Additionally, 61.8% indicated that the percentage of male students enrolled in their nursing programs ranged from 10% to 20%. A smaller proportion, 5.9%, reported that their schools had no male faculty members. The data show that the majority of nursing students, specifically 98%, acknowledged the presence of male faculty members at their institutions. Additionally, 64.7% of the students reported perceiving individuals of the opposite sex as siblings. The average total score on the scale was found to be 81.05±17.24 (Table 1).

## Validity Analysis of the Scale

### Content Validity

Content validity was assessed based on responses from 11 experts who were provided with the form developed for the study. The Content Validity Index was calculated using the Davis technique.[16] In this study, the item-level Content Validity Index ranged from 0.99 to 1.00, while the scale-level Content Validity Index was 0.99.

### Construct Validity

The construct validity of the scale was evaluated using both Exploratory Factor Analysis and Confirmatory Factor Analysis. Following the EFA, the promax rotation method and principal axis factoring were applied to determine the construct validity of the scale, as the data were normally distributed. Bartlett's test yielded a $\chi^2$ value of 13,651.996, the Kaiser-Meyer-Olkin coefficient was 0.857, and p<0.01. The analysis revealed that the scale consists of four sub-dimensions. These four dimensions collectively explained 58.13% of the total variance:

The first sub-dimension item factor loads varied from 0.73 to 0.80. The items in the second sub-dimension had factor loads ranging from 0.56 to 0.79. The third sub-dimension item factor loads varied from 0.51 to 0.73. The fourth sub-dimension item factor loads range from 0.50 to 0.67 (Table 2).

In the four-factor model, items 1 through 9 loaded most heavily onto the first factor.

The four sub-dimensions identified through the Exploratory Factor Analysis were further evaluated using CFA. Goodness-of-fit indices used in the CFA included the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Chi-square/degrees of freedom ratio (CMIN/DF), Incremental Fit Index (IFI), and the Root Mean Square Error of Approximation (RMSEA). The fit indices from the CFA were as follows: $\chi^2$=472.864, df=224, $\chi^2$/df=2.111, RMSEA=0.055, CFI=0.90, and IFI=0.91 (Table 3). In the first sub-dimension, which measures *personal experience of gender inequality*, the factor loadings ranged from 0.70 to 0.91. In the second sub-dimension, which measures *perception of gender roles*, factor loadings ranged from 0.58 to 0.88. In the third sub-dimension, which measures *gender discrimination*, factor loadings ranged from 0.64 to 0.98. Finally, in the fourth sub-dimension, which measures *gender biases*, factor loadings ranged from 0.84 to 0.91 (Figure 1).

## Results of the Scale's Reliability Analysis

The Cronbach's coefficients for the overall scale and each sub-dimension were as follows:

Overall scale 0.96, personal experience of gender inequality 0.94, perception of gender roles 0.83, gender discrimination 0.95, and gender biases 0.91.

Cronbach alpha values for the first and second halves of the split-half analysis were determined to be 0.93 and 0.94, respectively. The Spearman-Brown coefficient was found to be .90, the Guttman split-half coefficient to be .89, and the two halves' correlation coefficient to be 802. The analysis yielded the following results for Hotelling: T2=479.44, F=20.66, and p=0.000. The inter-item correlation ranged from 0.09 to 0.69 (Table 4).

The study found a range of correlations between the scale items and the scale total score, with values ranging from 0.48 to 0.83. Table 5 presents the correlation coefficients between the total score of each subdimension and its corresponding subdimension. Table 5 displays the correlation coefficients for each subdimension. The first subdimension has a range of 0.71–0.96, the second subdimension has a range of 0.74–0.89, the third subdimension has a range of 0.87–0.96, and the fourth subdimension has a range of 0.87–0.90.

## Lower and Upper Group Item Analysis

In scale development studies, lower and upper-group item analysis is used to determine the discriminatory power of items.[10,12] To evaluate item distinctiveness in the GES-NE scale, the scores of 408 nursing students were ranked from highest to lowest. The mean total scores of the upper and lower 27% groups (n=204 each) were compared using an independent sample t-test. The t-test revealed that the difference between the upper and lower group scores was statistically significant (p<0.05). Based on this test, all 23 items on the scale were found to be distinctive. These results indicate that the scale has strong discriminatory power, effectively measures the intended construct, and can clearly differentiate the upper and lower 27% of respondents (Table 6).

# Discussion

A minimum CVI of 0.80 is required to establish content validity.[17] In this study, the scale-level Content Validity Index was 0.99, while the item-level Content Validity Index ranged from 0.99 to 1.00. These values exceed the threshold of 0.80. The high I-CVI and S-CVI values in the current study indicate that content validity was achieved, expert

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**Table 2.** Factor loadings for the four-factor structure of the Turkish version of the gender equality scale in nursing education (n=408)

| Items | Factor loadings | | | |
|---|---|---|---|---|
| | Personal experience of gender inequality | Perception of gender roles | Gender discrimination | Gender prejudices/ bias in the classroom |
| I1 | 0.806 | | | |
| I2 | 0.804 | | | |
| I3 | 0.802 | | | |
| I4 | 0.790 | | | |
| I5 | 0.769 | | | |
| I6 | 0.761 | | | |
| I7 | 0.753 | | | |
| I8 | 0.737 | | | |
| I9 | | 0.792 | | |
| I10 | | 0.657 | | |
| I11 | | 0.566 | | |
| I12 | | 0.645 | | |
| I13 | | 0.593 | | |
| I14 | | | 0.552 | |
| I15 | | | 0.512 | |
| I16 | | | 0.645 | |
| I17 | | | 0.593 | |
| I18 | | | 0.650 | |
| I19 | | | 0.739 | |
| I20 | | | 0.727 | |
| I21 | | | | 0.673 |
| I22 | | | | 0.645 |
| I23 | | | | 0.508 |
| Explained variance (%) | 37.45 | 8.41 | 7.42 | 4.85 |
| Total explained variance (%) | 58.13 | | | |
| Eigenvalue | 13.37 | 1.94 | 1.71 | 1.12 |
| Kaiser-Meyer-Olkin | 857 | | | |
| Barlett's Test ($\chi^2$) | 13,651.996 | | | |
| p | 0.000 | | | |

**Table 3.** Model fit indices of the gender equality scale in nursing education

| Model | $\chi^2$ | CFA[a] | $\chi^2$/DF | RMSEA[b] | GFI[c] | CFI[d] | IFI[e] |
|---|---|---|---|---|---|---|---|
| Four-factor structure | 472.864 | 224 | 2.111 | 0.055 | 0.95 | 0.90 | 0.91 |

[a]: Confirmatory factor analysis, [b]: Root mean square error of approximation, [c]: Goodness of fit index, [d]: Comparative fit index; [e]: Incremental fit index. DF: Degree of freedom.

consensus was reached, and the scale effectively measured the intended construct. The content validity results were consistent with those reported in the original study.[9]

There are several techniques for assessing construct validity, with factor analysis being the most commonly used method.[11,14,17] Factor analysis can be conducted using two approaches: Exploratory Factor Analysis and Confirmatory Factor Analysis. To conduct factor analysis effectively, the sample size should be sufficiently large, ideally five to ten times the number of items on the scale.[17,18] Initially, sample adequacy should be assessed using the Kaiser-Meyer-Olkin (KMO) test, followed by Bartlett's test to evaluate the suitability of the data for factor analysis. The KMO test determines whether the sample is adequate, while Bartlett's test assesses the appropriateness of the data structure for factor analysis.[10,14] KMO values are interpreted as follows: Below 0.50=Poor, 0.50–0.59=Fair, 0.60–0.69=Good, 0.70–0.79= Very good and 0.80–1.00 = Excellent.[17,18]

If the KMO value is close to 1 and greater than 0.60, the data are considered suitable for factor analysis.[19] In this study, the EFA results indicated a Kaiser-Meyer-Olkin coefficient of 0.857 and a Bartlett's test $\chi^2$ value of 13,651.996 ($p<0.01$), confirming that the sample size and data were appropriate for factor analysis.[20] The sample size and dataset used in this study were similar to those of the original research.[9] Additionally, the scale consists of four factors, with items numbered 1 to 9 showing the strongest association with the the first factor.

Variance rates between 40% and 60% are generally considered acceptable when determining the number of components.[17] In this study, the four-factor structure explained 50% of the total variance. In comparison, the initial study reported that the scale accounted for 60.7% of the variance.[9]

According to the EFA results, the factor loadings of the scale items were ≥0.30.18 The factor loadings for the four sub-dimensions ranged from 0.30 to 0.87 based on the results of the EFA. According to the literature, items with factor loadings below 0.30 should be excluded from the scale. The minimum acceptable factor loading for determining an item's inclusion in a factor is 0.30 or higher.[17,10,12] In their study, Cho et al.[9] in 2022 reported factor loadings for the four subscales ranging from 0.58 to 0.85. The similarity between the current findings and those of the original study supports the scale's robust factor structure.

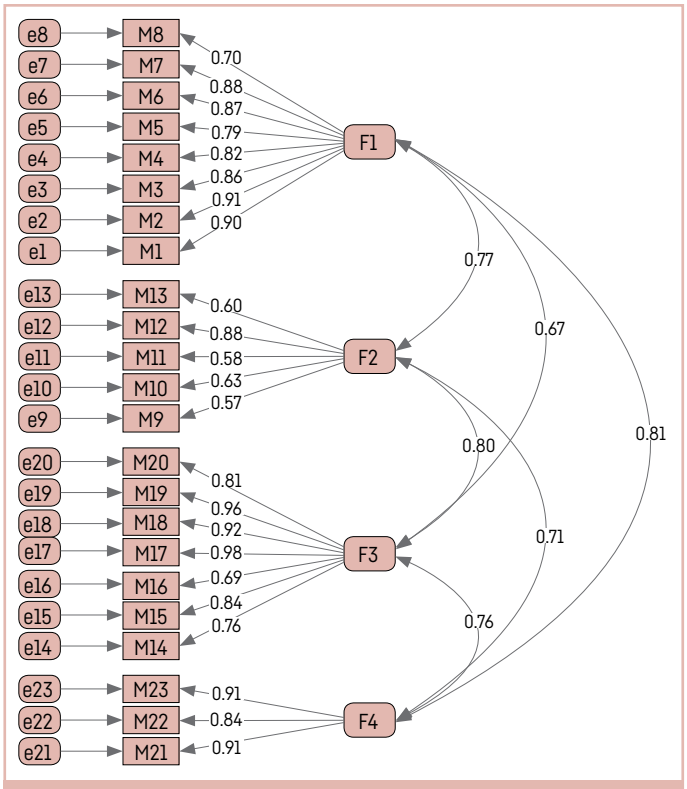


**Figure 1.** Confirmatory factor analysis (CFA) results of the Gender Equality Scale in Nursing Education (n=408).

CFA is another technique used in scale adaptation research to ascertain the structure of the measure.[10,14] The goodness-of-fit indices in CFA indicate how well the proposed structure represents the observed data. These indices partially determine whether the model is acceptable or should be rejected. The most commonly used goodness-of-fit indices include CMIN/DF, Goodness-of-Fit Index (GFI), CFI, Normed Fit Index (NFI), IFI, and RMSEA.[14] It is generally expected that the CMIN/DF value should be less than 5, the CFI value greater than 0.85, and the GFI, NFI, and TLI values greater than 0.80.[10] The interpretation of Root Mean Square Error of Approximation values is as follows: ≤0.05 indicates a good fit; 0.05–0.08 indicates an adequate fit; 0.08–0.10 indicates an acceptable fit; and >0.10 indicates a poor fit.[21,22] In this study, the CFA results were: CFI=0.91, RMSEA=0.055, GFI=0.95, CFI=0.90, and IFI=0.91. The $\chi^2$/df ratio was found to be 2.111, and RMSEA <0.85. According to the literature, a $\chi^2$/df value less than 5 and an RMSEA value below 0.08 are considered indicators of good model fit.[11,14,19] The CFA results in this study meet these criteria. Cho et al.[9] in 2022 confirmed that the final model in their study demonstrated satisfactory goodness of fit. The findings of the present investigation are consistent with those of the original study.

There are several methods to assess the reliability of a measurement tool.[23] In this study, reliability was evaluated using internal consistency coefficient, split-half, and item-total score correlation analyses.[18] The internal consistency coefficient, known as Cronbach's α, measures the degree of internal consistency and is used to assess reliability. Higher values indicate stronger coherence among items. The scale is considered reliable when Cronbach's alpha falls within the range of 0.80 to 1.00.[18,23] In this study, the overall Cronbach's α for the scale was 0.963, and all sub-dimensions had values above 0.80. These results demonstrated the high reliability of the measure, with a reliability value that exceeded that of the initial study (0.824).[9]

To verify the explanatory power of individual items in relation to the overall score, item analysis should be conducted as part of the reliability assessment process.[11,12] Correlation coefficients between the items and the total score should exceed 0.20.[11,23] In this study, the adjusted item-total correlation coefficients ranged from 0.48 to 0.83, all of which were above 0.20 and met the necessary criteria. Item-total correlation data were not available in the original study, so a direct comparison could not be made.[9]

Split-half analysis is a technique used to assess reliability. According to the literature, Guttman and Spearman-Brown split-half coefficients should exceed 0.80.[18] In this study, both the Spearman-Brown and Guttman split-half coefficients were greater than 0.80, demonstrating the strong reliability of the scale's items and overall structure. Our results could not be compared to the findings of the original study, as split-half analysis was not performed in that research.[9] The results of this study demonstrate that the scale is reliable and that the items are consistent with the theoretical framework.

One of the recommended methods for assessing the reliability and validity of scales is the 27% upper-lower group comparison.[10,12,14] In this study, a statistically significant difference was found between the average scores of nursing students in the upper 27% group and those in the lower 27% group. These results indicate that the scale has strong discriminating power, adequately measures the intended construct, and can effectively distinguish between the upper and lower 27% performance groups. Overall, the findings demonstrate that this scale is both valid and reliable and can be used to assess gender equality in nursing education.

## Limitations

The study has several limitations despite its many strengths. First, the use of a convenience sampling method may affect the generalizability of the findings. The data were collected based on self-reports from nursing students, and it is possible that some students provided inaccurate responses, which may have introduced response bias. This could have impacted the reliability of the results. Additionally, collecting data through an online platform may be considered another limitation of the study.

## Conclusion

Gender equality is one of the least explored domains in nursing, despite being one of the essential components of modern nursing education. There exists scant empirical literature on the evaluation of gender equity within nursing education in Türkiye, and even on a global scale, there are only a few studies that apply 'scale' criteria to assess inequality in nursing education. With this gap in mind, we sought to validate and assess reliability for the Gender Equality Scale for Nursing Education (GES-NE) adapted to Turkish. The results supported that the Turkish version of GES-NE has satisfactory levels of internal consistency and structural validity with four sub-dimensions and 23 items. These four sub-dimensions explained 58.3% of the overall

**Table 4.** Reliability analysis results of the gender equality scale in nursing education (n=408)

| Dimension | Cronbach's α | Split-half analysis | | | | |
|---|---|---|---|---|---|---|
| | | First half Cronbach's α | Second half Cronbach's α | Spearman-brown coefficient | Guttman split-half coefficient | Correlation between halves |
| Total scale | 0.96 | 0.93 | 0.94 | 0.90 | 0.89 | 0.80 |
| Personal experience of gender inequality | 0.94 | | | | | |
| Perception of gender roles | 0.83 | | | | | |
| Gender discrimination | 0.95 | | | | | |
| Gender biases | 0.91 | | | | | |

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**Table 5.** Item-total score and sub-dimension score correlations

| Item | Corrected item-subdimension total score correlations | | | | |
|---|---|---|---|---|---|
| | Personal experience of gender inequality | Perception of gender roles | Gender discrimination | Gender prejudices/ bias in the classroom | Corrected item-total correlation |
| I1 | 0.937 | | | | 0.806 |
| I2 | 0.960 | | | | 0.810 |
| I3 | 0.947 | | | | 0.781 |
| I4 | 0.936 | | | | 0.724 |
| I5 | 0.925 | | | | 0.742 |
| I6 | 0.959 | | | | 0.803 |
| I7 | 0.923 | | | | 0.820 |
| I8 | 0.711 | | | | 0.691 |
| I9 | | 0.749 | | | 0.506 |
| I10 | | 0.780 | | | 0.556 |
| I11 | | 0.750 | | | 0.489 |
| I12 | | 0.895 | | | 0.819 |
| I13 | | 0.783 | | | 0.503 |
| I14 | | | 0.914 | | 0.788 |
| I15 | | | 0.888 | | 0.837 |
| I16 | | | 0.911 | | 0.771 |
| I17 | | | 0.962 | | 0.782 |
| I18 | | | 0.942 | | 0.707 |
| I19 | | | 0.944 | | 0.760 |
| I20 | | | 0.870 | | 0.751 |
| I21 | | | | 0.858 | 0.770 |
| I22 | | | | 0.871 | 0.740 |
| I23 | | | | 0.905 | 0.776 |

**Table 6.** t-test of upper and lower group means for the overall scale (n=408)

| | Item | Upper 27% (n=204) | | Lower 27% (n=204) | | Test | |
|---|---|---|---|---|---|---|---|
| | | Mean | SD | Mean | SD | t | p |
| Personal experience of gender inequality | I1 | 3.8 | 1.01 | 1 | 0.00 | 29.168 | 0.000 |
| | I2 | 3.73 | 1.16 | 1.22 | 0.78 | 18.856 | 0.000 |
| | I3 | 3.15 | 1.47 | 1.07 | 0.26 | 14.656 | 0.000 |
| | I4 | 4.09 | 1.09 | 1.89 | 1.38 | 13.162 | 0.000 |
| | I5 | 3.87 | 1.05 | 1.75 | 1.36 | 13.025 | 0.000 |
| | I6 | 3.15 | 1.47 | 1.27 | 0.59 | 12.491 | 0.000 |
| | I7 | 3.74 | 1.2 | 1.38 | 1 | 15.796 | 0.000 |
| | I8 | 3.31 | 1.27 | 1.56 | 1.06 | 11.055 | 0.000 |
| Perception of gender roles | I9 | 3.3 | 1.39 | 1.89 | 1.38 | 7.55 | 0.000 |
| | I10 | 3.66 | 1.23 | 2.02 | 1.69 | 8.258 | 0.000 |
| | I11 | 3.37 | 1.6 | 2.98 | 1.53 | 1.845 | 0.066 |
| | I12 | 3.15 | 1.06 | 1.07 | 0.26 | 19.932 | 0.000 |
| | I13 | 3.73 | 1.58 | 2.05 | 1.4 | 8.328 | 0.000 |
| Gender discrimination | I14 | 3.09 | 1.44 | 1.07 | 0.26 | 14.49 | 0.000 |
| | I15 | 2.95 | 1.44 | 1.29 | 0.81 | 10.539 | 0.000 |
| | I16 | 3.09 | 1.44 | 1.22 | 0.78 | 12.011 | 0.000 |
| | I17 | 2.59 | 1.5 | 1 | 0 | 11.054 | 0.000 |
| | I18 | 2.51 | 1.6 | 1 | 0 | 9.919 | 0.000 |
| | I19 | 2.51 | 1.41 | 1.07 | 0.26 | 10.562 | 0.000 |
| | I20 | 2.8 | 1.43 | 1.18 | 0.51 | 11.225 | 0.000 |
| Gender prejudices/bias in the classroom | I21 | 3.31 | 1.27 | 1.42 | 0.73 | 13.509 | 0.000 |
| | I22 | 3.09 | 1.39 | 1.42 | 0.91 | 10.585 | 0.000 |
| | I23 | 3.16 | 1.4 | 1.31 | 0.83 | 11.917 | 0.000 |

SD: Standard deviation.

variance, fulfilling the vital psychometric standards. Therefore, the conclusions of this research proved that the Turkish GES-NE is a valid and reliable tool for evaluating gender equity in nursing education in Türkiye. Moreover, this tool will guide efforts aimed at evaluating organizational and educational initiatives undertaken to promote gender equality in nursing education.

Taking these considerations into account, we recommend that the nursing education programs in Türkiye incorporate the GES-NE into their assessment practices for systematic evaluation at all levels. This would facilitate efforts to achieve gender equality at the institutional level within nursing programs. Moreover, other longitudinal studies employing the GES-NE over extended periods would provide greater clarity and focus on the assessment of gender-equality initiatives over time. Lastly, cross-case studies among varying levels of education in Türkiye may further illuminate the context factors that determine gender equality and strengthen educational opportunities and policies using gender lenses.

**Ethics Committee Approval:** The study was approved by the Hakkari University Rectorate Scientific Research and Publication Ethics Committee (Approval Number: 2023/14–1, Date: 23.01.2023).

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

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**Peer-review:** Externally peer-reviewed.

## References

1. Green C. Equity and diversity in nursing education. Teach Learn Nurs. 2020;15(4):280–283. [CrossRef]
2. American Association of Colleges of Nursing. Diversity, equity, and inclusion in academic nursing. Accessed April 14, 2025. https://www.aacnnursing.org/News-Information/Position-Statements-White-Papers/Diversity
3. Teresa-Morales C, Rodríguez-Pérez M, Araujo-Hernández M, Feria-Ramírez C. Current stereotypes associated with nursing and nursing professionals: An integrative review. Int J Environ Res Public Health. 2022;19(13):7640. [CrossRef]
4. Madlala ST, Ngxongo TS, Sibiya MN. Perceptions of student accoucheurs regarding gender inequality in midwifery training at Free State maternal healthcare institutions. Curationis. 2021;44(1):e1-e8. [CrossRef]
5. Petges N, Sabio C. Perceptions of male students in a baccalaureate nursing program: A qualitative study. Nurse Educ Pract. 2020;48:102872. [CrossRef]
6. Pai HC, Liu NY, Hsu WY, Hung CA, Wu PL. Testing and validation of the gender-friendliness barriers in nursing programs questionnaire: A confirmatory factor analysis. 2019. Accessed April 14, 2025. https://www.sigmarepository.org/cgi/viewcontent.cgi?article=6116&context=inrc
7. Boniol M, McIsaac M, Xu L, et al. Gender equity in the health workforce: Analysis of 104 countries. Geneva: World Health Organization. 2019. Accessed April 14, 2025. https://iris.who.int/handle/10665/311314
8. Brandford A, Brandford-Stevenson A. Going up!: Exploring the phenomenon of the glass escalator in nursing. Nurs Adm Q. 2021;45(4):295–301. [CrossRef]
9. Cho S, Kwon SH, Jang SJ. Validity and reliability of the gender equity scale in nursing education. Nurs Health Sci. 2022;24(2):447–457. [CrossRef]
10. Kartal M, Bardakçı S. SPSS ve AMOS uygulamalı örneklerle güvenirlik ve geçerlik analizleri. Ankara: Akademisyen Kitabevi. 2018;1–192. [CrossRef]
11. Özdamar K. Eğitim, sağlık ve davranış bilimlerinde ölçek ve test geliştirme yapısal eşitlik modellemesi. Eskişehir: Nisan Yayınevi. 2016;6–286.
12. Seçer İ. Psikolojik test geliştirme ve uyarlama süreci: SPSS ve LISREL uygulamaları. Ankara: Anı Yayıncılık. 2018;10–168.
13. Gregoire J. ITC guidelines for translating and adapting tests. Int J Testing. 2018;18(2):101–134. [CrossRef]
14. Karagöz Y. SPSS 23 ve AMOS 23 uygulamalı istatistiksel analizler. Ankara, Turkey: Nobel Akademik Yayıncılık. 2016;878–940.
15. IBM Corp. IBM SPSS Statistics for Windows, version 24.0. Armonk, NY: IBM Corp. 2016. [CrossRef]
16. Davis LL. Instrument review: Getting the most from a panel of experts. Appl Nurs Res. 1992;5(4):194–197. [CrossRef]
17. DeVellis RF, Thorpe CT. Scale development: Theory and applications. Thousand Oaks, CA: Sage Publications. 2021;31–59.
18. Tabachnick BG, Fidell LS. Çok değişkenli istatistiklerin kullanımı. Baloğlu M, translator. Ankara: Nobel Academic Publishing. 2015;612–760.
19. Johnson BR, Christensen L. Educational research: Quantitative, qualitative, and mixed approaches. 3rd ed. Thousand Oaks, CA: SAGE Publication. 2014;190–222.
20. Çokluk Ö, Şekercioğlu G, Büyüköztürk Ş. Sosyal bilimler için çok değişkenli istatistik: SPSS ve LISREL uygulamaları. Ankara: Pegem Akademi. 2010.
21. Kline RB. Principles and practice of structural equation modeling. 3rd ed. New York, NY: Guilford. 2011;7–342.
22. MacCallum RC, Browne MW, Sugawara HM. Power analysis and determination of sample size for covariance structure modeling. Psychol Methods. 1996;1(2):130–149. [CrossRef]
23. Polit DF, Beck CT, Owen SV. Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. Res Nurs Health. 2007;30(4):459–467. [CrossRef]

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# Osteoarthritis and Its Management: Impact of Wearable Technologies – A Systematic Review

## Abstract

**Background:** Wearable technology plays a significant role in disease management for individuals diagnosed with osteoarthritis.

**Aim:** This review aims to assess the impact of wearable technologies on disease management in patients with osteoarthritis.

**Methods:** The researchers searched relevant databases between March 4 and April 4, 2024. Randomized and quasi-experimental studies published in Turkish or English between 2000 and 2024 were included, provided they had full text availability and involved the use of wearable technology in individuals aged 18 years and older diagnosed with osteoarthritis. A total of 472 studies were reviewed, and five articles met the inclusion criteria. The Cochrane Risk of Bias tool was used to evaluate the quality of the included studies.

**Results:** Wearable technologies were found to help manage physiological symptoms and increase physical activity. However, the optimal duration and specific techniques of wearable technology interventions for osteoarthritis management are unclear.

**Conclusion:** Wearable technology interventions have been shown to improve disease control and increase physical activity. Therefore, these products can be recommended for inclusion in healthcare plans to support both disease management and the promotion of physical activity.

*Keywords: Disease management, nursing care, osteoarthritis, wearable technology*

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## Introduction

Osteoarthritis (OA) is one of the most common rheumatic diseases, characterized by the progressive and irreversible loss of joint cartilage, accompanied by synovial inflammation, pain, and dysfunction in weight-bearing joints such as hands, knees, hips, feet, and vertebrae. This condition often leads to significant disability, particularly among the elderly.[1,2] Although the incidence of OA increases with age, it is most prevalent in women over the age of 60. The prevalence rate is 42.1% in women and 31.2% in men.[3] According to 2019 data from the Turkish Statistical Institute, the prevalence of OA in the Turkish population was estimated at 11.2%.[4] In the United States (USA), the prevalence of radiographic hand OA is 27.2%, knee OA is 19.2%, and hip OA is 27%.[5] Risk factors for OA include age, genetic predisposition,[6] gender, occupational and sports activities,[7] obesity, nutrition,[8,9] joint disorders and trauma,[10] osteoporosis, and smoking.[11] The most typical symptom experienced by OA patients is pain, often described as aching and gradually worsening. It is frequently one of the primary reasons for seeking medical attention. Other common symptoms include morning stiffness, limited joint movement, crepitus, swelling, redness, and other related issues. These symptoms lead to disability, reduced physical capacity, and a diminished quality of life.[11] As with all rheumatic diseases, integrative management approaches, such as patient education and exercise, are recommended for OA.[2] Due to their symptoms, OA patients are particularly prone to physical inactivity. However, physical activity offers numerous benefits and is one of the most critical components of symptom management. Wearable technologies (WATs) can assist in managing symptoms such as pain and stiffness, while also promoting increased physical activity.[12–15]

Wearable technology, also referred to as "wearable devices" or simply "wearables," includes technological devices that can be worn, attached, or carried on the body. These devices perform many of the same functions as computers and smartphones.[16] To be classified as a wearable device, the product typically includes smart sensors and the ability to transmit data to a computer or smartphone.[17] The use of WATs has grown rapidly in recent years and is increasingly popular due to their blend of fashion and functionality.[16] They provide users with mobile access to real-time information, eliminating the need to remain in a fixed location. WAT products come in various forms, including smartwatches, smart clothing, and smart glasses.[18] Wearable technology used in healthcare helps individuals lead healthier lifestyles by continuously recording physiological parameters and monitoring metabolic status, providing a steady stream of health data for disease diagnosis and treatment. These devices allow healthcare professionals to remotely access patients' health data, enabling the planning of health-related behaviors, such as medication, exercise, and diet programs, even before the individual visits a healthcare facility. With WAT devices, various types of health data can be

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accessed, including habits, sleep duration, medical history, diagnostic test results, daily step count, heart rate, blood pressure, blood glucose levels, and blood oxygen concentration.[19] Physical activity and maintaining a healthy body weight are crucial for controlling the progression of OA.[20] Physical activity enables patients to carry out their daily activities and reduces the risk of symptom progression. Therefore, increasing physical activity through the use of wearable devices is essential for OA patients. Given these benefits, the use of wearable devices is recommended for individuals with OA.[19] The role of WAT in healthcare is becoming increasingly prominent. With advances in wearable health technologies, individuals are now more empowered to take an active role in managing their own health. These devices offer continuous access to personal health data anytime and anywhere, and enable the monitoring of physical activity levels. The data collected by wearable devices not only provide individuals with insights into their health but also hold significant potential in clinical settings, particularly in diagnosis and treatment processes. It is promising that wearable technologies, now a part of everyday life, are increasingly gaining attention and making life easier, while also offering potential benefits for human health.[18–20] In light of this, the present study was conducted to highlight the effect of wearable technologies on disease management in individuals diagnosed with osteoarthritis, particularly as they age. The aim of this systematic review was to determine the impact of WAT on symptom control and physical activity in OA patients experiencing symptoms such as pain, stiffness, and rigidity.

### Research Questions

- Is WAT effective in the symptom management of individuals diagnosed with OA?
- Is WAT effective in increasing the physical activity of individuals diagnosed with OA?
- What types of WAT products are used by individuals diagnosed with OA?
- Which WAT interventions are recognized for managing the physiological symptoms of OA?
- Which WAT interventions are used to increase physical activity in individuals with OA?

## Materials and Methods

This study was designed as a systematic review. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA-P) guideline was followed[20] to ensure accurate and comprehensive conduct and reporting of the review.

### Search Strategy

Articles published between 2000 and 2024 in the following databases were searched between March 4 and April 4, 2024: DergiPark, Cochrane Central Register of Controlled Trials, PubMed, ScienceDirect, Web of Science Core Collection, and Google Scholar. 'Medical Subject Headings (MeSH)' were used for English keywords and 'Turkish Science Terms (TST)' for Turkish keywords. A detailed search strategy was developed using these terms (Table 1).

### Inclusion and Exclusion Criteria

Inclusion and exclusion criteria were determined based on the PICOS framework (Population, Intervention, Comparison, Outcome, Study Design).[21] This systematic review included only randomized controlled trials published in peer-reviewed international scientific journals between 2000 and 2024. Eligible studies investigated the effects of WAT applications on symptom management and physical activity in patients aged 18 years and older diagnosed with OA. Studies were excluded if they did not meet the inclusion criteria, were written in languages other than Turkish or English, or lacked full-text availability.

### Selection of Literature Included in the Review

The literature review was conducted by the researchers. To document the number of articles retrieved from the selected databases, a PRISMA-P flowchart was created (Fig. 1). A total of 472 studies were initially identified and imported into the Mendeley Library for categorization and selection of relevant manuscripts for the review. Duplicates (n=47) were identified by importing references from the Mendeley Library into the Rayyan Intelligent Systematic Review program.[22] After excluding studies based on inappropriate subject matter, study type, or lack of access to the full manuscript, five randomized controlled trials were included in the review (Fig. 1). No quasi-experimental studies meeting the inclusion criteria were found during the search.

### Study Selection and Data Extraction

The researchers (FA, TE, GBA) were involved at every stage of the review process. The search strategy, search dates for each database, search terms used, and the number of articles retrieved were all documented. A PRISMA-P flowchart was created to record journal selection and to document the total number of articles considered. All retrieved articles were imported from the Mendeley Library into the Rayyan database, where duplicates were identified and removed. One researcher (FA) initially screened article titles and abstracts to apply the inclusion and exclusion criteria. A second researcher (TE) reviewed the titles and abstracts categorized under the exclusion criteria for accuracy. Full texts of potentially eligible studies were independently assessed for adequacy by all three researchers (FA, TE, GBA). Reasons for excluding studies were detailed in the PRISMA-P flowchart. One researcher (FA) summarized the data from the included articles and finalized the literature review. The other researchers (TE, GBA) reviewed the extracted data and independently verified the accuracy and consistency of the database.

### Evaluation of Methodological Quality of Included Studies

The methodological quality of the included studies (n=5) was assessed by the researchers using a checklist developed by the Joanna Briggs Institute (JBI) (Table 2). The JBI checklist includes 13 questions that evaluate selection bias, performance bias, reporting bias, and neglect bias. Each question is scored as "Yes=1," "No=0," "Unclear=0," or "Not Applicable=0." For randomized controlled experimental trials, the maximum score is 13. A higher total score indicates a higher methodological quality (Table 3).[23]

### Evaluation of Risk of Bias

The quality of the studies was also assessed using the Cochrane Risk of Bias tool (RoB 2), which evaluates six categories of potential bias. Based on these criteria, studies were classified as having a "high risk of bias," "suspected risk of bias," or "low risk of bias" (Table 4).[24]

### Ethical Considerations

Since the findings of this study were derived from previously published articles retrieved from databases, ethics committee approval was not required. All studies included in the review have been properly cited and referenced. This review has been registered with the PROSPERO (International Prospective Register of Systematic Reviews) database, which provides a platform for registering systematic and meta-analysis reviews, under registration number CRD42024522145.

## Results

Five randomized controlled trials published between 2000 and 2024 were included in the review (Fig. 1).

**Table 1.** Keywords

| | |
|---|---|
| Keywords | English: Osteoarthritis, Wearable Technology, Wearable Electronic Device, Symptom, Symptom Management<br>Turkish: Osteoartrit, Giyilebilir Teknoloji, Giyilebilir Elektronik Cihazlar, Semptom, Semptom Yönetimi |
| Search strategy using english keywords | [(Osteoarthritis[Title]) AND (Wearable Technology[Title]) OR (Wearable Electronic Device[Title]) AND ((Symptom[Title/Abstract]) OR (Symptom Management[Title/Abstract]))] |
| Search strategy using turkish keywords | [(Osteoartrit[Title]) AND (Giyilebilir Teknoloji[Title]) OR (Giyilebilir Elektronik Cihazlar[Title]) AND ((Semptom[Title/Abstract]) OR (Semptom yönetimi[Title/Abstract]))] |

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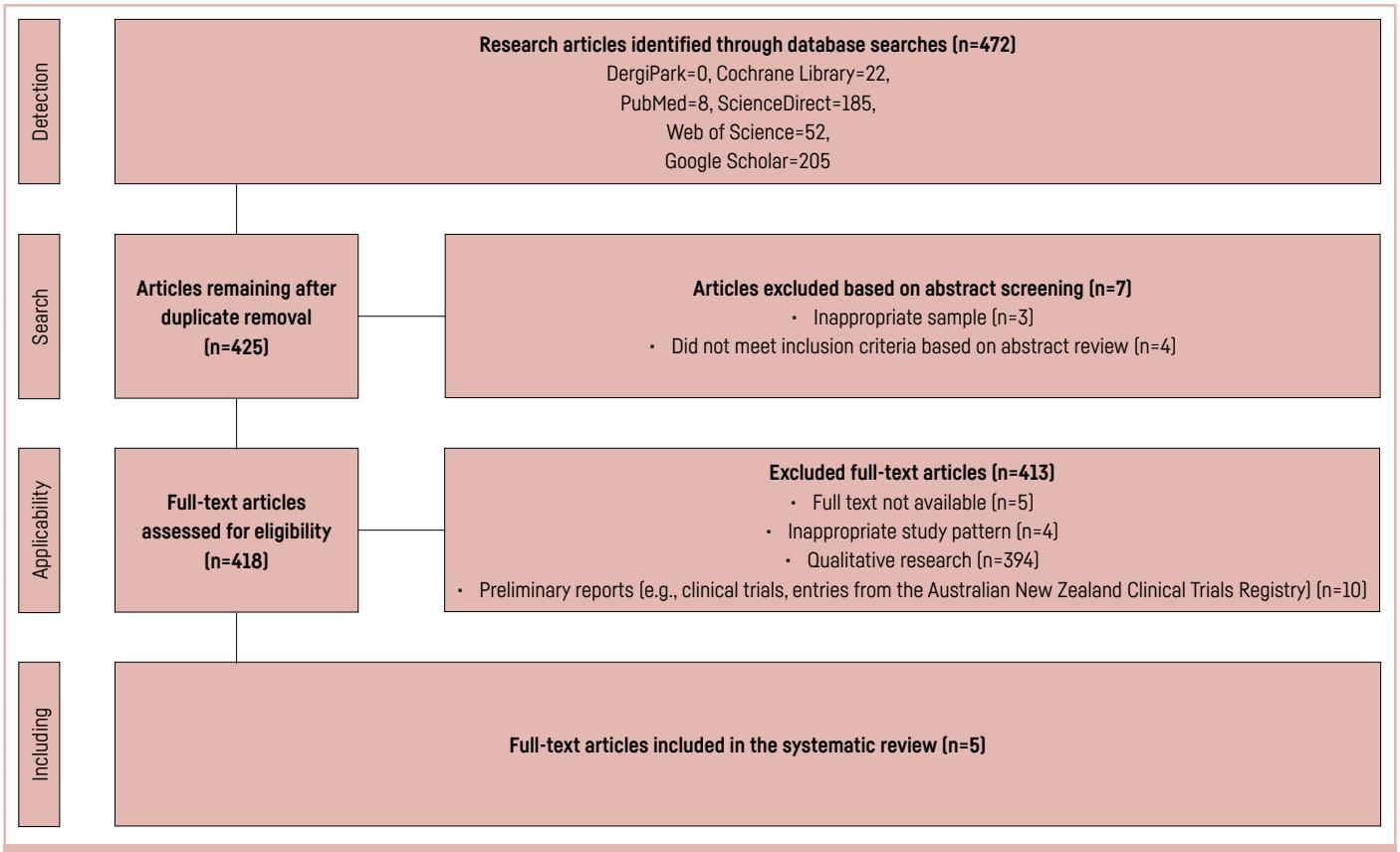


**Figure 1.** PRISMA-P (preferred reporting items for systematic review and meta-analysis protocols) flowchart of the study selection process.

**Table 2.** Methodological quality assessment of included studies

| Study | Criteria 1 | Criteria 2 | Criteria 3 | Criteria 4 | Criteria 5 | Criteria 6 | Criteria 7 | Criteria 8 | Criteria 9 | Criteria 10 | Criteria 11 | Criteria 12 | Criteria 13 | n | % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Menz et al.,[25] 2014 | + | ? | + | + | ? | ? | + | + | + | + | + | + | + | 10/13 | 76.9 |
| Skrepnik et al.,[26] 2017 | + | + | + | + | - | ? | + | + | + | + | + | + | + | 11/13 | 84.61 |
| Li et al.,[27] 2020 | + | - | + | - | - | - | + | + | + | + | + | + | + | 9/13 | 69.2 |
| Östlind et al.,[28] 2022 | + | ? | + | - | - | - | + | + | + | + | + | + | + | 9/13 | 69.2 |
| Hsu et al.,[29] 2022 | + | - | + | - | - | ? | + | + | + | + | + | + | + | 9/13 | 69.2 |

+: Yes, -: No, ?: Uncertain/not applicable, Criteria 1-13: Criteria from the Joanna Briggs Institute (JBI) systematic review checklist for randomized controlled trials, n: Number, %: Percentage.

**Table 3.** Risk of bias assessment of randomized controlled trials included in the review based on the cochrane risk of bias tool, version 2 (ROB-2)

| Risk of bias criteria | Studies included in the review | | | | |
|---|---|---|---|---|---|
| | Menz et al.,[25] 2014 | Skrepnik et al.,[26] 2017 | Li et al.,[27] 2020 | Östlind et al.,[28] 2022 | Hsu et al.,[29] 2022 |
| Risk of bias due to randomization process | + | + | + | + | + |
| Risk of bias due to deviations from intended interventions (effect of assignment to intervention) | ? | + | ? | ? | ? |
| Risk of bias due to deviations from intended interventions (effect of adherence to intervention) | ? | ? | − | + | + |
| Risk of bias due to missing outcome data | + | + | + | ? | + |
| Risk of bias in measurement of the outcome | + | + | + | + | ? |
| Risk of bias in selection of the reported result | + | + | ? | + | + |

+ : Low risk of bias, ? : Some concerns, − : High risk of bias

**Table 4.** Randomized controlled trials on wearable assistive technology (WAT) interventions for disease management in patients with osteoarthritis

| Author, year (Country) | Study design | Department | Sample size | Participant characteristics | Symptoms/ outcomes assessed | Assessment tools | Intervention | Follow-up period | WAT product |
|---|---|---|---|---|---|---|---|---|---|
| Menz et al.,[25] 2014 (Australia) | RCT | University of Sydney | n=80 | OA patients | Pain, stiffness, foot health, physical activity | Visual analog scale (VAS), foot health status questionnaire (FHSQ), planned activity questionnaire | Participants were fitted with custom prefabricated foot orthoses designed to reduce pain associated with first metatarsophalangeal joint osteoarthritis (OA). Outcomes were evaluated using a wireless wearable motion analysis system and an in-shoe plantar pressure system. | Baseline, weeks 4, 8, 12 | Personalized footwear, wireless wearable motion system, and in-shoe plantar pressure system |
| Skrepnik et al.,[26] 2017 (USA) | RCT | Multicenter | n=318 | Knee OA patients | Pain, mobility | 6-minute walk test | Participants wore a wearable activity monitor/pedometer continuously for 90 days. | Baseline, day 90 | Wearable activity monitor/ pedometer |
| Li et al.,[27] 2020 (Canada) | RCT | University of British Columbia | n=51 | Knee OA patients | Physical activity, time spent in physical activity, pain, quality of life | Knee Injury and osteoarthritisoutcome score (KOOS), Step count per day | Participants received 30 minutes of face-to-face training on the use of a wristband, along with physical activity counseling. Their activity data were recorded using FitViz, a Fitbit-compatible web-based platform. | Baseline, weeks 13, 26, 39 | Smart wristband |
| Östlind et al.,[28] 2022 (Sweden) | RCT | 28 health centers in Southern Sweden | n=160 | Hip and knee OA patients | Physical activity, work efficiency, work ability | Work ability index (WAI), International physical activity questionnaire, activity impairment scale | Participants engaged in an osteoarthritis self-management program supported by technology. Data collected by the device were transmitted via Bluetooth to smartphones, tablets, or computers and could be accessed through a dedicated application in real time. | Baseline, Months 3, 6, 12 | Smart wristband |
| Hsu et al.,[29] 2022 (Taiwan) | RCT | Asian University Hospital | n=27 | Knee OA patients | Pain, stiffness, physical function, plantar pressure | VAS, western ontario and McMaster Universities osteoarthritis index (WOMAC), plantar-pressure test | Using a foot evaluation system, thermoplastic polyurethane insoles customized for foot compatibility were placed in the participants' shoes. They were instructed to wear them for at least four hours per day. | Baseline, Week 20 | Wearable sensor insole |

RCT: Randomized controlled trial.

## Methodological Quality and Risk of Bias Assessment

The average methodological quality score of the included articles was 9.6, with scores ranging from a minimum of 9 to a maximum of 11 (Table 2). Risk of bias assessments for each study are presented in Table 3.

## Characteristics of Included Studies and Participants

The five randomized controlled trials were conducted between 2000 and 2024. The studies took place in Australia,[25] the USA,[26] Canada,[27] Sweden,[28] and Taiwan,[29] primarily in departments and institutions such as university clinics and health centers. The included articles involved a total of 636 participants, all diagnosed with OA, including knee OA, hip OA, or generalized OA. Participants were aged 18 years and older (Table 4).

## Intervention Method and Scope

The included studies used various wearable technology interventions for patients diagnosed with osteoarthritis, including knee and hip osteoarthritis. The technologies used were: personalized footwear, a wireless wearable motion system, and an in-shoe plantar pressure system,[25] wearable activity monitors or pedometers,[26] smart wristbands,[27,28] and wearable sensing insole technology.[29] Most devices were worn on the wrist or foot. The duration of interventions ranged from a minimum of three months[25] to a maximum of 12 months.[28] The studies reviewed primarily analyzed physiological parameters and physical activity levels. Secondary outcomes included foot health,[25] mobility,[26] time spent in physical activity, quality of life,[27] work productivity, work ability,[28] physical function, and plantar pressure[29] (Table 4).

## Effects of WAT Interventions on Disease Management

The included studies assessed the effectiveness of WAT interventions in managing OA and evaluated their impact following the intervention period (Table 4). In conclusion, outcomes such as work efficiency, plantar pressure, and quality of life were also evaluated following interventions using wearable technology products. In the studies included in this systematic review, WAT products were generally found to reduce physiological symptoms[25–29] and increase physical activity.[25,27] However, one study reported no effect of wrist-worn WAT devices on physical activity, work efficiency, or work ability[28] (Table 5).

## Discussion

While conducting this systematic review, we observed that WAT interventions are most commonly applied in populations such as individuals who are overweight or obese,[30] those with type II diabetes mellitus,[31] stroke,[32] dementia,[33] or cardiovascular conditions.[34] However, there is limited literature, both nationally and internationally, focusing on the use of wearable technologies in individuals with rheumatological conditions. With advancing technology, WATs are emerging as a new approach to improving disease management in individuals diagnosed with OA, and they have the potential to be integrated into nursing care. This review discusses the findings of five articles analyzing the impact of WAT on disease management in individuals with OA.

Among the interventions included in the review, WAT products were specifically developed and tested for the management of pain symptoms in individuals diagnosed with osteoarthritis. To address pain, patients were treated using devices such as an ankle-worn smart wristband,[27,28] a wearable sensing insole,[29] a wearable activity monitor,[26] a wireless wearable mo-

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**Table 5.** Effects of wearable assistive technology (WAT) interventions on disease management outcomes in included studies

| Study | Physical activity | Work efficiency | Work ability | Pain | Stiffness | Physical function | Plantar pressure | Quality of life | Mobility (steps/day) |
|---|---|---|---|---|---|---|---|---|---|
| Menz et al.,[25] 2014 | ↑ | | | ↓ | ↓ | | ↓ | | |
| Skrepnik et al.,[26] 2017 | | | | ↓ | | | | | ↑ |
| Li et al.,[27] 2020 | ↑ | | | ↓ | | | | ↑ | |
| Östlind et al.,[28] 2022 | ↔ | ↔ | ↔ | ↓ | | | | | |
| Hsu et al.,[29] 2022 | | | | ↓ | ↓ | ↑ | ↓ | | |

tion system, and an in-shoe plantar pressure system.[25] Each of these studies found WAT products to be effective in managing pain symptoms.[25–29] In the broader literature, a study that designed a wearable therapeutic ultrasound device for individuals with chronic myofascial pain reported reduced use of painkillers and improved pain management.[35] Similarly, another study on patients with chronic knee pain found that a wearable transcutaneous electrical nerve stimulation device was effective in reducing pain.[36] These findings suggest that WAT is effective in managing pain not only in OA patients but also in individuals with other conditions, and that a variety of devices can be developed depending on the location of the pain. However, when examining the characteristics of the studies, it is unclear how frequently wearable devices should be used for effective pain management.

In the interventions included in the review, WAT products were developed to address stiffness symptoms, and their effectiveness in symptom management was tested. A wireless wearable motion system and an in-shoe plantar pressure system were used to manage stiffness.[25] Additionally, to address stiffness, insoles made of thermoplastic polyurethane were placed in patients' shoes, and participants received a wearable sensing insole.[29] These wearable technology products were found to be effective in managing stiffness symptoms. In the broader literature, a study reported that a wearable device applied to shoulder stiffness reduced symptoms of stiffness.[37] However, the literature review reveals a lack of sufficient studies focused specifically on managing stiffness symptoms. While all three studies in this review indicate that wearable technologies can be effective for stiffness management, the limited number of studies prevents a conclusive evaluation of their overall effectiveness.

The importance of lifestyle changes is often emphasized by health professionals following a diagnosis of osteoarthritis. Among these, individuals with obesity are commonly advised to lose weight, increase their physical activity, and follow a healthy diet. Studies have shown that disease management is more effective in patients who follow these recommendations.[13] In the studies included in our review, wearable activity monitors were used to track daily step counts.[26] It was found that these WAT products increased the number of steps taken by individuals with OA. In the literature, a study that tested the step count levels of a wearable activity monitor on young adults over a two-week period found that the device visibly increased step count.[38] Similarly, a meta-analysis involving individuals with overweight and obesity found that wearable technology products contributed to a reduction in body mass index, an increase in step count, and a decrease in waist circumference. In addition, it was noted that such devices allow users to access numerical feedback, which can help motivate individuals to reach their goals when they observe they have taken fewer steps.[30]

Another study reported that, over a three-month period, breast cancer survivors who used wearable technology products increased their physical activity and reduced sedentary behavior.[39] In the studies included in our review, wearable technology interventions promoting physical activity were generally conducted over periods ranging from 2 to 10 months. As a result, increased physical activity levels were observed.[25,27] However, the variation in the WAT products used across studies prevented direct comparisons in terms of the duration or frequency of application. It is unclear which specific WAT interventions should be applied, and for which symptoms in individuals diagnosed with OA.

The wearable sensing insole used to improve physical function was found to be effective in enhancing physical function in OA patients.[29] When examining the research outcomes, WAT methods generally appear to increase physical activity in individuals with OA.[25,27] Only one study reported no effect on physical activity.[28] Analyzing the included studies individually, WAT products were found to be effective in treating OA-related symptoms. However, it is still unclear which product is more effective for which specific symptom, or which products should be used in combination. There is considerable heterogeneity among the studies reviewed, and notably, similar symptoms are not evaluated using consistent criteria. This makes it difficult to accurately assess the true impact of WAT products. However, overall, the studies suggest that WAT offers individuals the ability to monitor themselves objectively. In this way, individuals can make the necessary lifestyle changes to support activity motivation and disease management.

One study included in the review found that wearable sensing insoles improved the quality of life in individuals with osteoarthritis.[29] Another study, which examined the impact of pain on the quality of life in fibromyalgia patients, concluded that a wearable device (a millimeter wave-emitting wristband) improved quality of life by reducing pain.[40] These findings highlight the importance of managing physiological symptoms. When such symptoms are effectively controlled, an indirect improvement in patients' quality of life is often observed.

## Limitations of the Research

This study has several limitations. First, only six databases were searched, and gray literature was not included. The review was limited to studies conducted between 2000 and 2024, published in English or Turkish, and with accessible full texts. No Turkish studies were identified among the reviewed articles. Another limitation is that while the review intended to include both randomized controlled and quasi-experimental studies, only randomized controlled trials were ultimately included.

## Conclusion

In conclusion, interventions using WAT products were found to be effective strategies for reducing physiological symptoms and increasing physical activity levels in individuals diagnosed with OA. Although WAT products appear to be effective in symptom management, most studies had small sample sizes. Therefore, future research should include larger sample groups to strengthen the evidence base. Currently, no WAT interventions specific to OA patients are being applied in our country. In this systematic review, we emphasize that individuals diagnosed with OA can manage their condition using emerging technology products. We believe that further research should be conducted to raise awareness of such technologies in our country. It is unclear which WAT products are most suitable for specific symptoms and the optimal duration of their use in symptom management for individuals with OA. Therefore, more randomized controlled trials are needed to address these gaps. Finally, WAT products are known to be costly. We believe that these interventions should undergo cost analysis and be used effectively in the disease management of individuals through state-supported healthcare programs.

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## References


1. Özdemir L. Kas-iskelet sistemi hastalıkları ve hemşirelik bakımı. In: Bedük T, edt. İç Hastalıkları Hemşireliği Akıl Notları. Ankara:Güneş Tıp Kitabevi;2019:S299–311.
2. Parlar Kılıç S. Eklem ve bağ dokusu hastalıkları. In: Ovayolu N, Ovayolu Ö, eds. Temel İç Hastalıkları Hemşireliği ve Farklı Boyutlarıyla Kronik Hastalıklar. Ankara:Nobel Tıp Kitabevi;2016:S425–431.
3. Karataş T, Yılmaz E, Polat Ü. Osteoartrit yönetimi, yaşam kalitesi ve hemşirenin destekleyici rolü. Med J SDU. 2022;29(2):265–271. [CrossRef]
4. Türkiye İstatistik Kurumu. Türkiye sağlık araştırması, 2019. Accessed May 13, 2025. https://data.tuik.gov.tr/Bulten/Index?p=Turkiye-Saglik-Arastirmasi-2019–33661
5. Babadağ Savaş B. Osteoartrit ve bakım. In: Oksel E, Balcı Alparslan G, ed. Romatoloji hemşireliği hastalıklar ve bakım. Ankara:Nobel Tıp Kitabevi;2019:S1–9.
6. Palazzo C, Nguyen C, Lefevre-Colau MM, Rannou F, Poiraudeau S. Risk factors and burden of osteoarthritis. Ann Phys Rehabil Med. 2016;59(3):134–138. [CrossRef]
7. Allen KD, Golightly YM. State of the evidence. Curr Opin Rheumatol. 2015;27:276–283. [CrossRef]
8. Yılmaz Demiriz S, Sarıkaya S. Diz osteoartriti hastalarında tanı ve kılavuzlar ışığında güncel tedavi. Med J West Black Sea. 2021;5(2):115–124. [CrossRef]
9. Bortoluzzi A, Furini F, Scirè CA. Osteoarthritis and its management-epidemiology, nutritional aspects and environmental factors. Autoimmun Rev. 2018;17(11):1097–1104. [CrossRef]
10. Vina ER, Kwoh CK. Epidemiology of osteoarthritis: Literature update. Curr Opin Rheumatol. 2018;30(2):160–167. [CrossRef]
11. Bilge A, Ulusoy RG, Üstebay S, Öztürk Ö. Osteoartrit. Kafkas J Med Sci. 2018;8(1):133–142. [CrossRef]
12. Wang Y, Liu X, Wang W, Shi Y, Ji X, Hu L, et al. Adherence, efficacy, and safety of wearable technology-assisted combined home-based exercise in Chinese patients with ankylosing spondylitis: Randomized pilot controlled clinical trial. J Med Internet Res 2022;24(1):e29703. [CrossRef]
13. Li LC, Feehan LM, Xie H, Lu N, Shaw CD, Gromala D, et al. Effects of a 12-week multifaceted wearable-based program for people with knee osteoarthritis: Randomized controlled trial. JMIR Mhealth Uhealth. 2020;8(7):e19116. [CrossRef]
14. Labat G, Hayotte M, Bailly L, Fabre R, Brocq O, Gerus P, et al. Impact of a wearable activity tracker on disease flares in spondyloarthritis: A randomized controlled trial. J Rheumatol. 2022;49(10):1109–1116. [CrossRef]
15. Östlind E, Eek F, Stigmar K, Sant'Anna A, Hansson EE. Promoting work ability with a wearable activity tracker in working age individuals with hip and/or knee osteoarthritis: A randomized controlled trial. BMC Musculoskelet Disord. 2022;23(1):112. [CrossRef]
16. Demirci Ş. Giyilebilir teknolojilerin sağlık hizmetlerine ve sağlık hizmet kullanıcılarına etkileri. Anemon Mus Alparslan Univ J Soc Sci. 2018;6(6):985–992.
17. Dursun N, Yılmaz E. Cerrahi hemşireliği alanında giyilebilir teknoloji kullanımı. Istanbul Gelisim Univ J Health Sci. 2021;15:646–656. [CrossRef]
18. Thierer A. The internet of things and wearable technology: Addressing privacy and security concerns without derailing innovation. Richmond J Law Technol. 2015;21(2):1–118. [CrossRef]
19. U.S. Food&Drug Administration. Vital Connect HealthPatch MD Biosensor Receives FDA. [Internet]. Accessed May 16, 2025. https://www.accessdata.fda.gov/cdrh_docs/pdf19/K192757.pdf
20. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. BMJ. 2021;372:n71. [CrossRef]
21. Amir-Behghadami M, Janati A. Population, Intervention, Comparison, Outcomes and Study (PICOS) design as a framework to formulate eligibility criteria in systematic reviews. Emerg Med J. 2020;37:387. [CrossRef]
22. Ouzzani M, Hammady H, Fedorowicz Z, Elmagarmid A. Rayyan-a web and mobile app for systematic reviews. Syst Rev. 2016;5:1–10. [CrossRef]
23. Hür G, Zengin H, Suzan ÖK, Kolukısa T, Eroğlu A, Çınar N. Joanna Briggs Enstitüsü (JBI) randomize kontrollü çalışmalar için kalite değerlendirme aracı'nın Türkçe'ye uyarlaması. Sağlık Bilimlerinde İleri Araştırmalar Derg. 2021;5(2):112–117. [CrossRef]
24. Higgins JP, Thompson SG, Deeks JJ, Altman DG. Measuring inconsistency in meta-analyses. BMJ. 2003;327(7414):557–560. [CrossRef]
25. Menz HB, Levinger P, Tan JM, Auhl M, Roddy E, Munteanu SE. Rocker-sole footwear versus prefabricated foot orthoses for the treatment of pain associated with first metatarsophalangeal joint osteoarthritis: Study protocol for a randomised trial. BMC Musculoskelet Disord. 2014;15:1–13. [CrossRef]
26. Skrepnik N, Spitzer A, Altman R, Hoekstra J, Stewart J, Toselli R. Assessing the impact of a novel smartphone application compared with standard follow-up on mobility of patients with knee osteoarthritis following treatment with Hylan GF 20: A randomized controlled trial. JMIR mHealth uHealth. 2017;5(5):e7179. [CrossRef]
27. Li LC, Feehan LM, Xie H, Lu N, Shaw CD, Gromala D, et al. Effects of a 12-week multifaceted wearable-based program for people with knee osteoarthritis: Randomized controlled trial. JMIR Mhealth Uhealth. 2020;8(7):e19116. [CrossRef]
28. Östlind E, Eek F, Stigmar K, Sant'Anna A, Hansson EE. Promoting work ability with a wearable activity tracker in working age individuals with hip and/or knee osteoarthritis: A randomized controlled trial. BMC Musculoskelet Disord. 2022;23(1):112. [CrossRef]
29. Hsu WC, Chou LW, Chiu HY, Hsieh CW, Hu WP. A study on the effects of lateral-wedge insoles on plantar-pressure pattern for medial knee osteoarthritis using the wearable sensing insole. Sensors. 2022;23(1):84. [CrossRef]
30. Wong SH, Tan ZYA, Cheng LJ, Lau ST. Wearable technology-delivered lifestyle intervention amongst adults with overweight and obese: A systematic review and meta-regression. Int J Nurs Stud. 2022;127:104163. [CrossRef]
31. Chua REC, Lau Y, Ang WW, Boey AAYF, Lau ST. Effectiveness of wearable technology-based physical activity interventions for adults with type 2 diabetes mellitus: A systematic review and meta-regression. J Diabetes. 2024;16(10):e70002. [CrossRef]
32. Parker J, Powell L, Mawson S. Effectiveness of upper limb wearable technology for improving activity and participation in adult stroke survivors: Systematic review. J Med Internet Res. 2020;22(1):e15981. [CrossRef]
33. Weizman Y, Tirosh O, Beh J, Fuss FK, Pedell S. Gait assessment using wearable sensor-based devices in people living with dementia: A systematic review. Int J Environ Res Public Health. 2021;18(23):12735. [CrossRef]
34. Prasitlumkum N, Cheungpasitporn W, Chokesuwattanaskul A, Thangjui S, Thongprayoon C, Bathini T, et al. Diagnostic accuracy of smart gadgets/wearable devices in detecting atrial fibrillation: A systematic review and meta-analysis. Arch Cardiovasc Dis. 2021;114(1):4–16. [CrossRef]
35. Lewis GK Jr, Langer MD, Henderson CR Jr, Ortiz R. Design and evaluation of a wearable self-applied therapeutic ultrasound device for chronic myofascial pain. Ultrasound Med Biol. 2013;39(8):1429–1439. [CrossRef]
36. Yamada K, Shimizu H, Doi N, Harada K, Ishizuka-Inoue M, Yamashita R, et al. Usefulness and safety of a wearable transcutaneous electrical nerve stimulation device for promoting exercise therapy in patients with chronic knee pain: A randomized controlled trial. Arch Phys Med Rehabil. 2025;106(2):167–176. [CrossRef]
37. Sawada T, Okawara H, Nakashima D, Iwabuchi S, Matsumoto M, Nakamura M, et al. Effects of alternating heat and cold stimulation using a wearable thermo-device on subjective and objective shoulder stiffness. J Physiol Anthropol. 2022;41:1–10. [CrossRef]
38. Tayler WB, LeCheminant JD, Price J, Tadje CP. The effect of wearable activity monitor presence on step counts. Am J Health Behav. 2022;46(4):347–357. [CrossRef]
39. Lynch BM, Nguyen NH, Moore MM, Reeves MM, Rosenberg DE, Boyle T, et al. A randomized controlled trial of a wearable technology-based intervention for increasing moderate to vigorous physical activity and reducing sedentary behavior in breast cancer survivors: The ACTIVATE Trial. Cancer. 2019;125(16):2846–2855. [CrossRef]
40. Maindet C, Minier L, Chipon E, Véloso M, Dumolard A, Barmaki M, et al. Millimetre wave-based neuromodulation combined with coaching improves quality of life in fibromyalgia patients: A 9-month prospective, multicenter, open, randomized, controlled trial. Medicine. 2025;104(10):e41706. [CrossRef]

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# Positive Work Environment in Nursing: Components and Strategies

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## Abstract

While sufficient infrastructure, materials, and resources are necessary for the provision of sustainable healthcare, the key factor in delivering these services is people. The most important resource for meeting human needs in healthcare is the workforce. To enhance the productivity of nurses, who represent the largest segment of the hospital healthcare workforce, it is essential to improve their work environment. The inadequacy of the nursing work environment is a global issue and poses a significant challenge to the delivery of quality healthcare services. The fact that quality care and positive patient outcomes are largely dependent on effective nursing highlights the importance of improving nurses' work environments. Particularly during the pandemic, the need for a positive work environment in nursing has become a timely and critical issue for healthcare quality, safety, and institutional success. This review offers recommendations for nurse leaders and institutions to support the development of a positive work environment.

*Keywords: Components, nursing, positive work environment, strategies*

## Introduction

During the Coronavirus Disease 2019 (COVID-19) pandemic, which had a global impact, there was a notable increase in nurse recruitment. However, this was accompanied by a significant rise in nurses leaving the profession and the migration of experienced nurses from their home countries.[1] The World Health Organization (WHO) estimates a global shortage of 13 million nurses and warns that this situation may worsen due to the aging population.[2] A report from the United Kingdom revealed that the National Health Service had approximately 40,000 vacant nursing positions, and 36% of the current workforce was considering leaving their jobs in 2021.[3] Issues such as healthcare workforce shortages, high staff turnover rates, increased nurse migration, and departures from the profession are considered indicators of inadequate work environments in healthcare services.[4] A study evaluating nursing work environments[5] found that negative mental health outcomes, such as post-traumatic stress disorder, anxiety, depression, and high emotional exhaustion, were more prevalent in nursing settings. In contrast, organizational support, preparedness, workplace safety, and access to supplies and resources were reported at lower levels. These findings have brought existing problems in nurses' work environments into sharper focus.

Nursing work environments encompass organizational features that support professional nursing practice. These include nurses' relationships with management and other professionals, their involvement in institutional decision-making, their participation in quality improvement, as well as staffing levels and the availability of patient care resources.[6] A meta-analysis highlighting the importance of the work environment for nurses' well-being found that nurses working in better environments were 28–32% less likely to experience job dissatisfaction, burnout, or intentions to leave their positions.[6] Nurses, as the backbone of the healthcare system, require supportive, safe, and positive work environments. According to the International Council of Nurses (ICN), a positive work environment is defined as "settings that specifically ensure the health, safety, and personal well-being of staff, support high-quality patient care, and enhance the motivation, productivity, and performance of both individuals and organizations."[1] Research shows that positive work environments reduce hospital-acquired infection rates,[7] hospital mortality,[8] readmissions,[9] missed nursing care,[10] and adverse events.[11] A systematic review examining nurse retention strategies[12] revealed that nurses are most influenced by workplace characteristics. Specifically, creating a positive work environment, characterized by collaboration, teamwork, work-life balance, fairness, flexibility, support, and opportunities for professional development, has been identified as an effective strategy for retaining nurses. Furthermore, having nurse managers who embody and lead with these qualities helps nurses feel secure and supported.[13]

The development and maintenance of strategies by nurse leaders to create a positive work environment is a multifaceted process. These strategies are implemented across various levels of the healthcare system and involve a wide range of stakeholders, including government bodies, institutions, organizations, and nursing services management. The role modeling demonstrated by nurse leaders is essential in promoting, sustaining, and encouraging participation in positive work environments.[14] By adopting flexible and supportive leadership qualities, nurse leaders can implement strategies to enhance teamwork, establish shared visions and goals, organize training sessions to empower themselves and their teams, and support various nursing roles. Additionally, organizing educational activities to define the components of a positive work environment and raising awareness among all staff members are crucial steps.[15] Ensuring the participation of nurses in hospital management and policy-making

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processes, contributing to research that emphasizes the importance of positive work environments, and sharing research findings with hospital administrators can further strengthen the impact of these strategies. Moreover, hospital management can support the sustainability of these efforts by implementing practices that recognize and reward employees who contribute to a positive work environment and achieve favorable outcomes.[16] In this context, delivering high-quality healthcare and achieving positive nursing outcomes require both a supportive work environment and leaders who actively foster such conditions. This review aims to contribute to the national literature and promote the development of positive work environments in nursing.

## The Concept of a Positive Work Environment

The literature on nursing work environments has expanded in recent years, underscoring the growing importance of the concept of a "Positive Work Environment." This concept is broadly defined as a setting that is "safe, empowering, and satisfying."[17] According to Pereira et al.,[14] a positive work environment is "a setting conducive to high-quality care, one that supports professionals, involves them in decision-making processes, promotes collaboration and effective communication, supports autonomy and professional development, and is grounded in the core principles of nursing and the best available evidence." Similarly, the Registered Nurses' Association of Ontario[18] describes it as "a practice setting that maximizes the health and well-being of professional nurses, enhances patient outcomes and satisfaction, improves institutional performance, and positively impacts societal outcomes." A positive work environment encompasses key elements such as a patient-centered culture, strong leadership, autonomy, supportive managers and colleagues, teamwork, and both structural and psychological empowerment.[4] Achieving this type of environment requires dynamic collaboration among healthcare professionals, shared governance, and active participation in decision-making processes that promote safe and high-quality care.[15] Positive work environments support employee well-being, foster excellence at both individual and organizational levels, and promote decent working conditions.[19] They also safeguard employee health and safety, enhance the quality of patient care, and improve overall satisfaction and productivity for both individuals and organizations.[12] A study conducted among nurses found a positive relationship between satisfaction with work environment factors, such as benefits, support, respect, and safety, and healthy lifestyle behaviors and overall well-being.[20]

A positive work environment yields significant benefits not only for nurses but also for patients and healthcare institutions. In a systematic review conducted by Paguio et al.,[21] the impact of an improved work environment was evaluated across three dimensions: nurses, patients, and hospitals. The study found that positive work environments were significantly associated with better nurse outcomes, including increased job satisfaction, reduced burnout, decreased intent to leave, enhanced autonomy, and stronger leadership. For patients, improvements were linked to higher satisfaction levels, fewer medical errors, and reduced fall rates. At the institutional level, positive environments were correlated with reduced workload, lower nurse turnover rates, and improved quality of care. Another study[22] reported that patients receiving care in positive work environments experienced lower rates of mortality and morbidity, fewer unexpected hospital events, better information and education at discharge, reduced readmissions due to complications, and higher satisfaction with the overall quality of care. Nurses working in such environments reported higher job satisfaction, reduced incidences of nursing missed care, lower levels of burnout and compassion fatigue, longer tenure in their positions, and decreased nurse turnover rates. Furthermore, hospitals that foster positive work environments demonstrate improvements in performance indicators and quality measures, along with high levels of nurse and patient satisfaction and increased institutional preference.[22] In this context, it is essential to create a supportive and positive work environment that acknowledges and respects the rights, responsibilities, and needs of all stakeholders, including healthcare institutions, patients and their families, nurses, and other healthcare professionals.

A study conducted in Portugal[14] identified several key conditions necessary for establishing a positive work environment in nursing. These include professionalism, clinical expertise, effective leadership, inclusive teamwork, adequate equipment and staffing, sufficient physical infrastructure, a culture of safety, a human-centered organizational culture, occupational health and safety policies, continuous quality improvement strategies, innovation and research policies, professional competency frameworks, work-life balance initiatives, talent management strategies, nursing standards and protocols, strategic nursing planning, and clinical supervision models. Additionally, the study highlighted specific components that shape a positive work environment, such as collaborative practice, professional autonomy, patient-centered care, evidence-based practice, effective communication, foundational nursing principles, meaningful recognition, active involvement and shared decision-making, opportunities for professional development, and strong managerial support. In South Korea, nurses defined the key components of a positive work environment as "effective managerial leadership," "adequate nurse staffing," "professional autonomy," "access to education and support for professional development," and "strong interpersonal relationships." The study also revealed that 31.1% of nurses did not have a meal break, and 54.4% lacked rest breaks, reporting working conditions that negatively affected their physical health. Such negative working conditions lead nurses to leave their work environments, which, in turn, exacerbates the nursing workforce shortage and further deteriorates the quality of the work environment. To ensure that nurses benefit from a positive work environment, several key elements are required: physical satisfaction, psychological stability, autonomous competence, collaborative relationships, structural support, and attention to the clinical adaptation of newly graduated nurses.[16] In the United States, incivility and bullying in nursing work environments are on the rise, posing harmful effects on nurses' health, well-being, and job satisfaction. Uncivil behaviors in the workplace negatively impacts nurse retention. For example, early-career nurses are particularly vulnerable to verbal abuse, which often leads them to leave their first jobs within six months or to exit the profession entirely.[23] It is especially critical for newly graduated nurses to experience a supportive environment during their first six months and to perceive the workplace positively, as these factors significantly influence their professional integration.[24] In this context, the challenges faced by nurses in both developed and developing countries underscore the necessity of creating and sustaining positive work environments.

## The Components of a Positive Work Environment

Positive work environments are characterized by a high level of trust between leaders and employees, respectful behavior among colleagues, effective communication, an organizational culture that supports collaboration, and a climate in which employees feel both physically and mentally safe.[25] Several key components have been identified as essential for developing such a culture and climate. In healthcare, institutions that have led the way in fostering positive work environments include Magnet hospitals. These hospitals are recognized for creating supportive environments for nurses and ensuring high-quality patient care. The Magnet hospital concept was developed to acknowledge hospitals that promote excellence in patient care and support professional nursing practices. The Magnet model is built around 14 "Forces of Magnetism." These forces include quality of nursing leadership, organizational structure, management style, personnel policies and programs, professional models of care, quality of care, quality improvement, consultation and resources, autonomy, community and the healthcare organization, nurse educators, nursing image, interdisciplinary relationships, and professional development. Nurses working in Magnet hospital environments have been found to experience lower levels of psychological burnout, higher job satisfaction, and improved patient outcomes.[26] Innovative policies focused on recruitment and retention, strategies aimed at continued education and self-renewal, fair recognition of employees' efforts, awareness programs, a safe working environment, and the provision of adequate equipment and supplies are among the key characteristics of a positive work environment as defined by the ICN.[1] These characteristics closely align with the components found in Magnet hospitals.

In the United States, the Texas Health Education Center Program has developed 12 Nurse-Friendly Hospital Criteria, which outline the fundamental elements needed to create a positive work environment for nurses. The Nurse-Friendly Hospital Project was initiated to address the growing nursing shortage and to promote retention by improving workplace conditions. The 12 criteria are as follows:[27]

1. **Control of Nursing Practices:** Ensuring the maintenance of nursing care standards and the application of evidence-based practices.
2. **Workplace Safety:** Protecting the health and safety of nurses in their work environment.
3. **Multidisciplinary Approach to Patient Care:** Encouraging collaboration with other healthcare professionals to enhance patient care.
4. **Nurse Orientation:** Providing competency-based orientation tailored to the nurses' education, experience, strengths, and areas for improvement.
5. **Nurse Leadership Competency:** Ensuring nurse leaders are supported by hospital administration, actively involved in management organizations, and hold a master's degree.

6. **Professional Development:** Offering opportunities to fulfill continuing education needs and to further develop professional expertise.
7. **Competitive Compensation:** Structuring pay to reflect employee performance in a competitive and market-aligned way.
8. **Recognition of Nurses:** Valuing achievements through awards, formal recognition, and expressions of gratitude.
9. **Balanced Lifestyle:** Promoting work-life balance through flexible scheduling practices.
10. **Zero Tolerance Policy for Nurse Abuse**
11. **Responsibility of Managers:** Holding managers accountable for maintaining leadership competencies in areas such as team building, collaboration, and analytical thinking.
12. **Quality Initiative:** Demonstrating a commitment to evidence-based practices through the collection, analysis, and application of institutional data.

Until the COVID-19 pandemic, published components aimed at fostering positive work environments did not explicitly include concepts such as nurses' involvement in decision-making, generational differences, technology and innovation, professional recognition, or diverse cultural characteristics. The pandemic underscored the critical importance of enhancing nursing work environments through more comprehensive and concrete interventions, highlighting the urgent need for up-to-date and inclusive components and strategies to define a positive work environment. Furthermore, it has become increasingly evident that there is a need to develop assessment tools capable of evaluating current work environments and incorporating the full scope of positive work environment components.[28] In this context, Maassen et al.[4] identified 36 components for developing a positive work environment in nursing through the Delphi technique. These components are as follows: autonomy, career development, professional development, engaging and enjoyable work, recognizing employees as valuable partners, control over practices, feeling valued, motivation and job satisfaction, leadership, multidisciplinary collaboration, open communication, a patient-centered culture, staff development, physical comfort, professionalism and competence, a relational atmosphere (team spirit), a safety climate, teamwork, working conditions, supportive management, collegial and organizational atmosphere, knowledge sharing, preparedness for innovation and change, role sharing, organizational learning, self-care, alignment with the mission and vision, staffing adequacy and workload, work schedule (work-life balance), conflict management, availability of structural resources and tools, effective recruitment and retention strategies, event reporting and error handling, performance evaluation, justice, participation in policy-making, and the use of professional standards and guidelines. These components are critically important for conducting an in-depth analysis of nursing work environments in the post-pandemic era, ensuring that such environments are both current and comprehensive.

The American Association of Critical-Care Nurses (AACN) outlines six key components of positive work environments, providing evidence-based guidelines for success. These components are: skilled communication, true collaboration, effective decision-making, appropriate staffing, meaningful recognition, and authentic leadership. Together, they offer organizations a framework grounded in evidence to create work environments that empower nurses and healthcare professionals to perform at their highest potential, ultimately leading to optimal patient outcomes and greater professional satisfaction. The six AACN components are as follows:[28]

1. **Skilled Communication:** Nurses must be as proficient in communication as they are in clinical practice.
2. **True Collaboration:** Nurses should be relentless in pursuing and promoting genuine collaboration across teams.
3. **Effective Decision-making:** Nurses must serve as valued and committed partners in policy-making, actively contributing to the guidance, evaluation, and improvement of clinical care, as well as the leadership of institutional operations.
4. **Appropriate Staffing:** Staffing strategies must ensure an optimal match between patient care needs and the competencies of the nursing force.
5. **Meaningful Recognition:** Nurses should receive acknowledgment for their contributions, and all team members should recognize and value the contributions of their colleagues to the organization's mission.
6. **Authentic Leadership:** Nurse leaders must fully embrace and model the principles of a positive work environment, fostering a culture of engagement and shared responsibility.

In Türkiye, the working environment is addressed under the title of "Healthy Work Life" in the Ministry of Health's "*Quality Standards in Healthcare – Hospital Version 5*." However, the 12 standards presented in this document are designed for all healthcare professionals and do not offer a nursing-specific framework for improving the work environment.[29] In contrast, the Nurse Managers Association has taken a more focused approach through the project titled "*Development of Healthy Work Environment Standards for Nurses in Türkiye*." This initiative established nursing-specific standards for positive work environments, consisting of six main standards and 35 substandards aimed at enhancing the nursing work environment. These standards include: nurse workload, development and career planning, social rights, occupational health and safety, suitable physical conditions and adequate tools and equipment, teamwork, communication, appreciation and recognition, and effective management and leadership.[30]

Positive work environments benefit not only nurses but all healthcare professionals, supporting excellence in care delivery. At the same time, positive work environments contribute to improved institutional performance and better patient outcomes.[14] Therefore, the focus of positive work environment initiatives should extend beyond nurses alone. Nurses, patients, and healthcare institutions should be recognized as the three central pillars in this context, and both the antecedents and outcomes of positive work environments should be evaluated with this comprehensive perspective. It is essential to establish nationwide, evidence-based policies that address the working conditions of nurses and all healthcare professionals. These policies can provide a foundation for the development of organizational or institutional guidelines that promote positive work environments. For instance, in the United Kingdom, the Department of Health has implemented the "*Improving Working Lives Standard*," which outlines clear criteria for all national healthcare service providers to follow. Additionally, national nursing organizations play a vital role in advocating for policy changes that emphasize the importance of healthy work environments. These professional associations are also instrumental in developing nationwide standards and strategic frameworks that foster and sustain positive and supportive workplaces for healthcare professionals.[1]

## Strategies for Developing a Positive Work Environment

Creating a positive work environment for professional practice is a critical responsibility for nurse leaders. When identifying strategies to improve the work environment, it is essential to conduct a thorough analysis of current working conditions. Nurses should be actively involved in the development and implementation of these strategies. When nurses understand the potential impact of their contributions, they are more likely to demonstrate greater effort and motivation to work toward shared goals.[31] Although many nurse leaders recognize the importance of a positive work environment, they are also aware of the challenges involved in initiating change, uniting their teams, and bringing their vision to life. Creating and sustaining a positive work environment requires intentional effort and actionable steps. It is a long-term journey that demands cultural transformation at all levels of the organization. Common barriers nurse leaders face in this process include:[32]

- Uncertainty about where or how to begin,
- Lack of clarity on who to approach or where to seek support,
- Lack of access to critical resources, such as time and funding,
- Difficulty translating evidence and theory into everyday practice,
- Insufficient support from all levels of the organization to initiate and maintain a positive work environment.

A review of the literature highlights '*providing adequate staffing and resources*' as one of the most critical strategies. During the COVID-19 pandemic, nurses were among the highest-risk groups for exposure and mortality, largely due to working conditions such as inadequate staffing and shortages of personal protective equipment.[5] When organizations lose qualified nurses, they are required to restart the recruitment and orientation process. This results in significant losses in terms of quality, cost, and time within healthcare services. To prevent such outcomes, institutions and nurse leaders must engage in efforts that strengthen organizational commitment, such as improving nurses' social rights and providing psychosocial support.[24] Recruiting and retaining newly graduated nurses, in particular, is both costly and time-consuming for healthcare institutions. This process is often stressful and challenging for nurses entering the workforce for the first time. A vital part of recruitment is assessing whether the candidate possesses the appropriate attitude, skills, and knowledge, and determining if they are a good fit for the organization. To

ensure a smooth transition, newly hired nurses must be supported through comprehensive orientation programs. Research has shown that when newly graduated nurses engage in communication with experienced senior nurses, their job-related stress decreases, and their adaptation process is accelerated.[33] Senior nurses must also be aware of the challenges faced by newly graduated nurses. Each nurse has unique individual circumstances and needs. Strategies to address these needs include implementing mentorship programs for new nurses,[24] ensuring easy access to the necessary equipment, materials, and resources required to perform their duties,[30] providing opportunities for socialization and work-life balance,[34] and supporting fair and decent work conditions.[19] These strategies help foster a work environment that effectively supports nurses. Adequate staffing and the provision of essential resources enhance job satisfaction and performance among nurses, which in turn leads to better outcomes for both patients and healthcare staff.[14]

Among the various strategies, '*providing teamwork and multidisciplinary collaboration*' stands out as particularly impactful. Teamwork facilitates the equitable sharing of power, allowing each team member, regardless of their educational or professional background, to contribute meaningfully to safe and effective patient care. In healthcare institutions, teamwork is a collaborative process involving the interactions and relationships among healthcare professionals, and it plays a crucial role in establishing and maintaining a positive work environment.[15] Facilitating such collaboration involves several key factors, including: providing team training to address negative behaviors,[35] promoting effective physician-nurse collaboration,[36] establishing an environment that supports clear and open communication,[37] encouraging active information sharing within teams,[38] and enhancing nurse autonomy and fostering self-awareness.[39] At the same time, nurse leaders play a critical role in fostering supportive work environments by creating opportunities for effective dialogue and open communication among team members.[23] Teamwork and collaboration help nurses feel heard and respected.[40] A study by Poghosyan et al.[41] found that positive work environments and strong collegial relationships contribute to improved management of chronic diseases, while also reducing emergency department visits and hospitalizations related to complications.

To improve and sustain a healthy nursing work environment, it is essential to support nurse leaders at all organizational levels. Creating such environments through evidence-based transformational leadership is a key leadership strategy rooted in relationships built on trust and respect.[40] In this context, the strategy of *'transformational and supportive leadership*' can be implemented through several actions, including: organizing mentorship training for nurse leaders,[42] encouraging participation in leadership training programs,[16] supporting the creation of unit-specific visions and values,[43] promoting nurse involvement in decision-making,[14] facilitating nurses' career development,[44] and fostering innovation and positive outcomes among nursing staff.[45]

To foster a positive work environment, the next strategy focuses on *'enhancing job satisfaction*.' Key actions for achieving this goal include: establishing reward programs and recognition programs,[15] scheduling meal and rest breaks in alignment with working conditions,[46] organizing enjoyable social activities,[34] addressing generational differences and preventing peer bullying,[33] implementing a fair wage system,[47] ensuring flexibility in work schedules,[34] maintaining a healthy physical work environment,[5] and fostering a peaceful, conflict-free workplace. Employees both desire and deserve a work environment where they are valued as assets and consistently recognized for their individual and collective contributions to the institution's success. Highly desirable work environments promote employee satisfaction and encourage the open expression of diverse perspectives.[23]

An empowering work environment is defined by 'access to information, support, resources, and opportunities for learning and development.'[40] In this context, *'enhancing structural and psychological empowerment*' emerges as a key strategy for fostering a positive work environment. Structurally empowered environments are supported by several factors, including: organizing training sessions and regular meetings to enhance nurses' professional knowledge and skills,[47] providing regular feedback from nurse leaders,[13] offering opportunities for promotion within the organization,[44] ensuring nurses are informed about organizational policies and strategic decisions, and maintaining a clear focus on institutional goals and objectives.[15] In addition, psychological empowerment is nurtured within positive work environments. Work settings that emphasize psychological empowerment are associated with nurses who feel autonomous in most job-related decisions,[48] possess strong self-efficacy,[49] experience alignment between job expectations and personal values, and perceive themselves as empowered individuals.[50] A positive and empowering work environment that offers professional development, recognition, and growth opportunities motivates nurses to contribute more meaningfully and supports long-term retention within the organization.[14]

However, negative conditions in current work environments, such as limited resources, understaffing, and inadequate managerial support, present significant challenges to implementing effective strategies and cultivating positive settings. In particular, the absence of support and accessibility from nurse leaders contributes to employee dissatisfaction.[40] In this context, placing the right leaders, those with the appropriate qualifications, experience, and training, in key positions is essential. Effective leadership is critical to shaping a healthy work environment. Leaders play a central role in fostering professional engagement, defining nursing values and ethical standards, and promoting multidisciplinary collaboration, trust, and unity. Workplace leaders should model behaviors that reflect self-awareness, visibility, accessibility, open and transparent communication, professional recognition, and the encouragement of active participation and individual growth.[32] To implement these strategies successfully, it is vital to recognize the value of nurses, secure strong management support, and ensure the active involvement of nurses in decision-making processes. Institutions bear a significant responsibility in this effort, including the provision of adequate financial resources and equipment, ensuring employee safety and well-being, and cultivating an organizational culture that supports continuous professional development. Additionally, the use of standardized language, digital communication tools, training healthcare professionals to use existing resources effectively, and ensuring proper physical infrastructure for employees are further elements that contribute to the development of a positive work environment. A work environment characterized by adequate supplies and technological resources, manageable workloads, supportive management, and appreciation from colleagues and the multidisciplinary team enhances nurses' empowerment, satisfaction, and motivation, while reducing their intention to leave the profession.[40] Opportunities for professional development and a supportive organizational climate are critically important for nurse retention and are strongly associated with professional empowerment.[28] Empowering nurses can lead to increased productivity, stronger organizational commitment, and greater participation in decision-making processes.[14] At the same time, a positive work environment promotes professional safety by reducing all forms of discrimination, harassment, and the physical and psychological challenges faced by staff.[5] Institutions that foster such environments clearly define nurses' roles and enhance the visibility of the nursing profession.[47] These strategies are essential for motivating nurses to remain in their positions and within the profession long-term.

A central focus of these strategies is the patient. Factors such as a culture of safety and effective communication, both of which are crucial for patient safety, help reduce errors and adverse events. Effective communication not only improves safety-related outcomes but also strengthens patient and family engagement, thereby increasing satisfaction with the care provided.[21] In positive work environments, the design and delivery of nursing care are grounded in core nursing principles and the best available scientific evidence. High-quality care, interdisciplinary collaboration, autonomous nursing practice, and empowered staff work collectively to achieve optimal patient outcomes and high levels of patient satisfaction.[15]

## Conclusion

A positive work environment is closely linked to improved patient outcomes, enhanced nurse well-being, and higher employee retention within healthcare institutions. Strong nursing leadership plays a critical role in establishing conditions that support safe, high-quality patient care. The responsibility for fostering such an environment lies largely with nurse leaders. To begin this process, nurse leaders must identify the underlying risks contributing to nursing shortages in current work environments, examine the existing components of positive work environments as outlined in the literature, and collaborate with relevant stakeholders to develop comprehensive strategies for improvement. Importantly, nurses should be actively involved in both the formulation and implementation of these strategies. Additionally, it is essential for nurses to evaluate their current work environments using positive work environment measurement tools. These tools offer valuable insight and serve as a foundation for monitoring the effectiveness of implemented strategies within the organization. In this context, nurse leaders and healthcare institutions share a critical responsibility: to implement strategies that cultivate a positive work environment, to address challenges that arise during implementation, and to evaluate their overall impact.

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## References

1. International Council of Nurses. Positive practice environments: Quality workplaces, quality patient care: Information and action tool kit. Accessed May 12, 2025. https://www.hrhresourcecenter.org/node/1645.html
2. World Health Organization. State of the world's nursing 2020: Investing in education, jobs and leadership. Accessed May 12, 2025. https://iris.who.int/bitstream/handle/10665/331677/9789240003279-eng.pdf?sequence=1&isAllowed=y
3. Nursing in Practice. COVID-19 responsible for a third of nurse absences in April. Accessed May 12, 2025. https://www.nursinginpractice.com/latest-news/covid-19-responsible-for-a-third-of-nurse-absences-in-april/
4. Maassen SM, van Oostveen C, Vermeulen H, Weggelaar AM. Defining a positive work environment for hospital healthcare professionals: A Delphi study. PLoS One. 2021;16(2):e0247530. [CrossRef]
5. Havaei F, Ma A, Staempfli S, MacPhee M. Nurses' workplace conditions impacting their mental health during COVID-19: A cross-sectional survey study. Healthcare (Basel). 2021;9(1):84. [CrossRef]
6. Lake ET, Sanders J, Duan R, Riman KA, Schoenauer KM, Chen Y. A meta-analysis of the associations between the nurse work environment in hospitals and 4 sets of outcomes. Med Care. 2019;57(5):353–361. [CrossRef]
7. Lee YSH, Stone PW, Pogorzelska-Maziarz M, Nembhard IM. Differences in work environment for staff as an explanation for variation in central line bundle compliance in intensive care units. Health Care Manage Rev. 2018;43(2):138–147. [CrossRef]
8. Curry LA, Brault MA, Linnander EL, et al. Influencing organisational culture to improve hospital performance in care of patients with acute myocardial infarction: A mixed-methods intervention study. BMJ Qual Saf. 2018;27(3):207–217. [CrossRef]
9. Lasater KB, Mchugh MD. Nurse staffing and the work environment linked to readmissions among older adults following elective total hip and knee replacement. Int J Qual Health Care. 2016;28(2):253–258. [CrossRef]
10. Aiken LH, Fagin CM. Evidence-based nurse staffing: ICN's new position statement. Int Nurs Rev. 2018;65(4):469–471. [CrossRef]
11. Braithwaite J, Herkes J, Ludlow K, Testa L, Lamprell G. Association between organisational and workplace cultures, and patient outcomes: Systematic review. BMJ Open. 2017;7(11):e017708. [CrossRef]
12. McClain AR, Palokas M, Christian R, Arnold A. Retention strategies and barriers for millennial nurses: A scoping review. JBI Evid Synth. 2022;20(1):121–157. [CrossRef]
13. Lake ET, Gil J, Moronski L, McHugh MD, Aiken LH, Lasater KB. Validation of a short form of the practice environment scale of the nursing work index: The PES-5. Res Nurs Health. 2024;47(4):450–459. [CrossRef]
14. Pereira S, Ribeiro M, Mendes M, et al. Positive nursing practice environment: A concept analysis. Nurs Rep. 2024;14(4):3052–3068. [CrossRef]
15. Williams KM, Campbell CM, House S, et al. Healthy work environment: A systematic review informing a nursing professional practice model in the US Military Health System. J Adv Nurs. 2024;80(9):3565–3576. [CrossRef]
16. Shin SH, Lee EH. Development and validation of a quality of healthy work environment instrument for shift nurses. BMC Nurs. 2024;23(1):37. [CrossRef]
17. Aiken LH, Clarke SP, Sloane DM, Sochalski J, Silber JH. Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction. JAMA. 2002;288(16):1987–1993. [CrossRef]
18. Registered Nurses' Association of Ontario. The healthy work environments: Quick reference guide for nurse managers. Accessed February 03, 2025. https://rnao.ca/bpg/guidelines?f%5B0%5D=bpg_categories%3A1897
19. Sönmez B, Yıldız Keskin A, İspir Demir Ö, Emiralioğlu R, Güngör S. Decent work in nursing: Relationship between nursing work environment, job satisfaction, and physical and mental health. Int Nurs Rev. 2023;70(1):78–88. [CrossRef]
20. Chung HC, Chen YC, Chang SC, Hsu WL, Hsieh TC. Nurses' well-being, health-promoting lifestyle and work environment satisfaction correlation: A psychometric study for development of nursing health and job satisfaction model and scale. Int J Environ Res Public Health. 2020;17(10):3582. [CrossRef]
21. Paguio JT, Yu DSF, Su JJ. Systematic review of interventions to improve nurses' work environments. J Adv Nurs. 2020;76(10):2471–2493. [CrossRef]
22. Kitayama M, Unoki T, Matsuda Y, et al. Development and initial validation of the Japanese healthy work environment assessment tool for critical care settings. PLoS One. 2022;17(5):e0268124. [CrossRef]
23. Clark CM, Sattler VP, Barbosa-Leiker C. Development and testing of the healthy work environment inventory: A reliable tool for assessing work environment health and satisfaction. J Nurs Educ. 2016;55(10):555–562. [CrossRef]
24. Kester KM, Lindsay M, Granger B. Development and evaluation of a prospective staffing model to improve retention. J Nurs Manag. 2020;28(2):425–432. [CrossRef]
25. Kol E, İlaslan E, Turkay M. The effectiveness of strategies similar to the Magnet model to create positive work environments on nurse satisfaction. Int J Nurs Pract. 2017;23(4):e12557. [CrossRef]
26. Smith SA. Magnet hospitals: Higher rates of patient satisfaction. Policy Polit Nurs Pract. 2014;15(1–2):30–41. [CrossRef]
27. Meraviglia M, Grobe SJ, Tabone S, et al. Creating a positive work environment: Implementation of the nurse-friendly hospital criteria. J Nurs Adm. 2009;39(2):64–70. [CrossRef]
28. Ulrich B, Cassidy L, Barden C, Varn-Davis N, Delgado SA. National nurse work environments - October 2021: A status report. Crit Care Nurse. 2022;42(5):58–70. [CrossRef]
29. T.C. Sağlık Bakanlığı. Sağlıkta kalite standartları hastane. Accessed May 12, 2025. https://dosyamerkez.saglik.gov.tr/Eklenti/3460/0/skshastanesetiv5r1pdf.pdf
30. Kocaman G, Yürümezoğlu HA, Uncu S, Türkmen E, Göktepe N, İntepeler ŞS. Türkiye'de hemşireler için sağlıklı çalışma ortamı standartlarının geliştirmesi. Hemşirelikte Eğitim Araştırma Derg. 2018;15(1):30–38.
31. Stewart C. Understanding new nurses' learning experiences in intensive care. Intensive Crit Care Nurs. 2021;67:103094. [CrossRef]
32. Raso R, Fitzpatrick JJ, Masick K. Clinical nurses' perceptions of authentic nurse leadership and healthy work environment. J Nurs Adm. 2020;50(9):489–494. [CrossRef]
33. Dombaycı A, Kıvanç MM. Hemşirelik hizmetlerinde Y kuşağını işe alma ve işte tutma stratejileri. Sağlık Hemşirelik Yönetimi Derg. 2020;7(1):160–168.
34. Reinhardt AC, León TG, Amatya A. Why nurses stay: Analysis of the registered nurse workforce and the relationship to work environments. Appl Nurs Res. 2020;55:151316. [CrossRef]
35. Ahlstedt C, Eriksson Lindvall C, Holmström IK, Muntlin Athlin Å. What makes registered nurses remain in work? An ethnographic study. Int J Nurs Stud. 2019;89:32–38. [CrossRef]
36. Perry SJ, Richter JP, Beauvais B. The effects of nursing satisfaction and turnover cognitions on patient attitudes and outcomes: A three-level multisource study. Health Serv Res. 2018;53(6):4943–4969. [CrossRef]
37. Swiger PA, Loan LA, Raju D, Breckenridge-Sproat ST, Miltner RS, Patrician PA. Relationships between Army nursing practice environments and patient outcomes. Res Nurs Health. 2018;41(2):131–144. [CrossRef]
38. Karlsson AC, Gunningberg L, Bäckström J, Pöder U. Registered nurses' perspectives of work satisfaction, patient safety and intention to stay - A double-edged sword. J Nurs Manag. 2019;27(7):1359–1365. [CrossRef]
39. Oneal G, Graves JM, Diede T, Postma J, Barbosa-Leiker C, Butterfield P. Balance, health, and workplace safety: Experiences of new nurses in the context of total worker health. Workplace Health Saf. 2019;67(10):520–528. [CrossRef]
40. Mabona JF, van Rooyen D, Ten Ham-Baloyi W. Best practice recommendations for healthy work environments for nurses: An integrative literature review. Health SA. 2022;27:1788. [CrossRef]
41. Poghosyan L, Liu J, Perloff J, et al. Primary care nurse practitioner work environments and hospitalizations and ED use among chronically ill medicare beneficiaries. Med Care. 2022;60(7):496–503. [CrossRef]
42. Olender L, Capitulo K, Nelson J. The impact of interprofessional shared governance and a caring professional practice model on staff's self-report of caring, workplace engagement, and workplace empowerment over time. J Nurs Adm. 2020;50(1):52–58. Erratum in: J Nurs Adm. 2020;50(4):237. [CrossRef]
43. Monroe M, Morse E, Price JM. The relationship between critical care work environment and professional quality of life. Am J Crit Care. 2020;29(2):145–149. [CrossRef]
44. Sönmez B, Gül D, İspir Demir Ö, Emiralioğlu R, Erkmen T, Yıldırım A. Antecedents and outcomes of nurses' subjective career success: A path analysis. J Nurs Scholarsh. 2021;53(5):604–614. [CrossRef]
45. Emiralioğlu R, Sönmez B. The relationship of nursing work environment and innovation support with nurses' innovative behaviours and outputs. J Nurs Manag. 2021;29(7):2132–2141. [CrossRef]
46. Campbell CM, Patrician PA. Generational preferences in the nursing work environment: A dimensional concept analysis. J Nurs Manag. 2020;28(4):927–937. [CrossRef]
47. Johansen ML, de Cordova PB, Weaver SH. Exploration of the meaning of healthy work environment for nurses. Nurse Leader. 2021;19(4):383–389. [CrossRef]
48. Boamah S, Laschinger H. Engaging new nurses: The role of psychological capital and workplace empowerment. J Res Nurs. 2015;20(4):265–277. [CrossRef]
49. Purdy N, Spence Laschinger HK, Finegan J, Kerr M, Olivera F. Effects of work environments on nurse and patient outcomes. J Nurs Manag. 2010;18(8):901–913. [CrossRef]
50. Cicolini G, Comparcini D, Simonetti V. Workplace empowerment and nurses' job satisfaction: A systematic literature review. J Nurs Manag. 2014;22(7):855–871. [CrossRef]

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Case Report

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# Serotonin Syndrome in an Adolescent: Early Nursing Interventions and Care Strategies in the Emergency Department Using the Components of Life Model

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## Abstract

This case report discusses a 16-year-old female patient who presented to the emergency department following a suicide attempt involving an overdose of lamotrigine and sertraline tablets, resulting in symptoms consistent with serotonin syndrome. The patient's presentation highlights the complexities of managing neuropsychiatric conditions associated with suicide attempts in adolescents, particularly given the rarity of serotonin syndrome in this age group. Upon admission, the patient exhibited acute serotonin syndrome symptoms including tachycardia, sweating, delirium, and neuromuscular disturbances, which led to the diagnosis of serotonin syndrome. Early intervention involved close monitoring of vital signs, administration of oxygen and fluid therapy, and treatment with the serotonin antagonist cyproheptadine alongside benzodiazepines. This comprehensive approach, supported by multidisciplinary collaboration, enabled the patient to be safely stabilized. In conclusion, this case emphasizes the importance of early recognition and prompt treatment of serotonin syndrome in adolescents, as well as the vital role of a multidisciplinary team in managing such cases. It also offers valuable insight into the emergency management of suicide attempts. Furthermore, the application of Jones' Life Components Model in nursing care within the emergency department proved instrumental in enhancing patient outcomes through improved collaboration and a patient-centered approach.

***Keywords:** Adolescent, case study, Jones Dependency Tool, Life Components Model, nursing care, serotonin syndrome, suicidal behavior*

## Introduction

Adolescence is a distinct phase of human development occurring between the ages of 10 and 19, bridging the gap between childhood and adulthood. During this period, individuals undergo rapid physical, cognitive, and psychosocial growth, which influences how they feel, think, make decisions, and interact with the world. Although often considered a generally healthy stage of life, adolescence is also marked by increased risks of death, illness, injury, and suicide.[1] Globally, it is estimated that 1 in 7 individuals aged 10 to 19 (14%) experience mental health issues, yet many of these conditions remain unrecognized and untreated.[2] According to the World Health Organization (WHO), approximately 720,000 people die by suicide each year, making it the third leading cause of death among individuals aged 15 to 29.[3]

Mental health issues during adolescence can significantly impact an individual's quality of life. Without appropriate interventions, these issues may escalate to suicide attempts. The rapid cognitive and emotional changes that occur during adolescence increase vulnerability to mental health disorders, thereby heightening the risk of suicide at this developmental stage.[4] In particular, medications used in suicide attempts can lead to both physiological and psychological complications.[5] In this context, intentional overdose can result in life-threatening conditions such as serotonin syndrome.

Serotonin syndrome, also known as serotonin toxicity, is a potentially life-threatening condition caused by increased serotonergic activity in the central nervous system. It typically arises from therapeutic drug use, drug interactions, or overdoses, especially in the context of suicide attempts.[6] Clinically, serotonin syndrome is characterized by a triad of symptoms: altered mental status, autonomic hyperactivity, and neuromuscular abnormalities. However, it can present with a broad spectrum of severity, ranging from mild symptoms to fatal outcomes.[7]

In serotonin syndrome, changes in mental status may include anxiety, restlessness, disorientation, agitation, and delirium. Patients often exhibit signs of hyperexcitability. Autonomic symptoms can include sweating, tachycardia, fever, hypertension, vomiting, and diarrhea.[8] Neuromuscular hyperactivity is characterized by tremors, myoclonus, hyperreflexia, and a positive Babinski sign. Hyperreflexia and clonus, particularly in the lower extremities, are commonly observed. Diagnosis is based on clinical findings; therefore, a detailed history and thorough physical and neurological examination are essential.[9]

Symptoms of serotonin syndrome in the pediatric population generally mirror those seen in adults. Most cases of serotonin syndrome develop within 24 hours of a medication dosage change or the introduction

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of a new drug, often within the first six hours. Toxicity tends to be more severe in cases of intentional ingestion, making it crucial to assess the patient's intent.[10] However, information provided by patients who have overdosed is often unreliable, requiring further verification. The patient's history should also be obtained from family members, friends, emergency medical services personnel, and law enforcement.

In mild cases, supportive care and the use of benzodiazepines for sedation are typically sufficient, while moderate to severe cases require more aggressive treatment. Cardiac monitoring is essential in all cases.8 The appropriate dose of cyproheptadine in children varies by age, with a recommended maximum daily dose ranging from 0.25 mg/kg to 16 mg.[11,12]

Emergency nursing care plays a critical role in ensuring patient safety, preventing complications, and achieving rapid stabilization. In life-threatening conditions such as serotonin syndrome, nurses promptly implement interventions including monitoring vital signs, ensuring adequate oxygenation, administering intravenous therapy, and managing medications. Safety measures are prioritized for high-risk patients, and holistic care is delivered through collaboration with multidisciplinary teams. A model-based approach supports systematic, consistent, and patient-centered care, ultimately streamlining emergency responses and improving patient outcomes.[13]

Emergency nursing interventions require a contextualized framework tailored to the specific role of the emergency nurse. To address this need, Jones developed the practice-based "Life Components Framework" for emergency nursing.[13–15]

## The Components of Life Model

Jones in 1990 developed the Components of Life Model to provide a practical framework aimed at maintaining individuals' health and quality of life. While many models are developed from a theoretical perspective, Jones based this model on observations conducted in the emergency departments of two hospitals, establishing a philosophy grounded in human needs.[16]

The model proposes that individuals possess seven components of life encompassing physical, behavioral, and social dimensions. Maintaining a balance among these components is essential for preserving both health and quality of life. Disruptive events such as illness or injury can disturb this balance. In this context, emergency care personnel are viewed as key resources in helping to restore equilibrium and support the individual's independence, as well as their physical, emotional, and social well-being. The model, and the dependency tool derived from it, has since been revised and updated to include six components of life (Figure 1).[16,17]

The model has four primary objectives:

1. Establishing collaboration with patients and their families.
2. Promoting an appropriate level of independence based on the nature of the illness or injury.
3. Supporting individuals in preventing illness or injury through self-care, health education, and environmental safety.
4. Facilitating the most effective implementation of nursing and medical treatments.

The Dependency Tool was developed using the same core principles as the Components of Life Model. It serves as the foundation for the development of a dependency tool, which assigns a dependency score to each patient upon arrival and is updated regularly throughout their stay.[14,15,17,18]

The Jones Dependency Tool (JDT) supports nurses in accurately planning patient care by considering not only the urgency of the patient's condition but also their specific nursing needs. The tool incorporates six components of the model: Communication; Airway/Breathing/Circulation; Mobility; Eating/Drinking/Elimination and Personal Care; Environmental Safety; and Health and Social Needs, along with Triage.[14]

Each component is rated on a three-level scale, with the total dependency score ranging from 3 to 18:

6–7 points: Low dependency (Score: 0)

8–12 points: Moderate dependency (Score: 1)

13–15 points: High dependency (Score: 2)

16–18 points: Full dependency (Score: 3).

The Turkish validity and reliability study of the Jones Dependency Tool was conducted by Arslan and Dağ[19] in 2023 for use in adult populations. The model also includes a dependency tool designed for younger children; however, the author (Jones) stated that the tool can be applied to individuals as young as 16 years old.

## Case Presentation

A 16-year-old female patient presented to the emergency department following the ingestion of a high dose of medication with suicidal intent. She had taken 1200 mg of lamotrigine and 600 mg of sertraline. Upon admission, she exhibited symptoms of acute altered mental status, tachycardia, and diaphoresis. Her medical history revealed that she had been on Lamotrigine and Sertraline for 12 years and was under psychiatric care for Attention Deficit Hyperactivity Disorder (ADHD). The patient had no prior hospital admissions. Physical examination showed ocular clonus, mydriasis, hyperreflexia, and altered consciousness–neurological and physical signs consistent with serotonin syndrome. Laboratory tests revealed the following blood gas results: pH 7.25, $pCO_2$ 46.5 mmHg, $HCO_3$ 2.3 mEq/L, and lactate 2.3 mmol/L. Hemogram results indicated acetaminophen levels of <5 and creatine kinase (CK) levels of 6900. Informed written consent was obtained from the patient's parent (father). This case report was prepared in accordance with the CARE (Case Report) Checklist guidelines to ensure transparency and comprehensive reporting.

## Care Strategies

In the management of serotonin syndrome, Jones's Components of Life Model provides a robust framework for organizing nursing care in emergency settings. The model's six core components including communication, airway/breathing/circulation, mobility, eating/drinking/elimination, and personal care, environmental safety and social needs, and triage serve as a guide for systematically delivering patient care. These strategies are detailed in Table 1. As outlined in Table 1, the *triage component* involved a comprehensive patient assessment and the preparation of resuscitation equipment and medications to prevent potential deterioration. The patient was positioned strategically for continuous monitoring, with oxygen saturation recorded at 100%, and hourly electrocardiograms (ECGs) confirming normal sinus rhythm. The *ABC component* emphasized maintaining airway, respiratory, and circulatory stability. Vital signs were monitored every 30 minutes, and arterial blood gases were analyzed regularly to prevent hypoxia. Due to the risk of autonomic dysfunction, hemodynamic parameters were closely observed. Intravenous midazolam and oral cyproheptadine hydrochloride were administered as part of the treatment protocol (Tables 1, 2). *The Communication component* (Table 1) prioritized continuous observation and psychological support, with strict suicide risk precautions, including the removal of

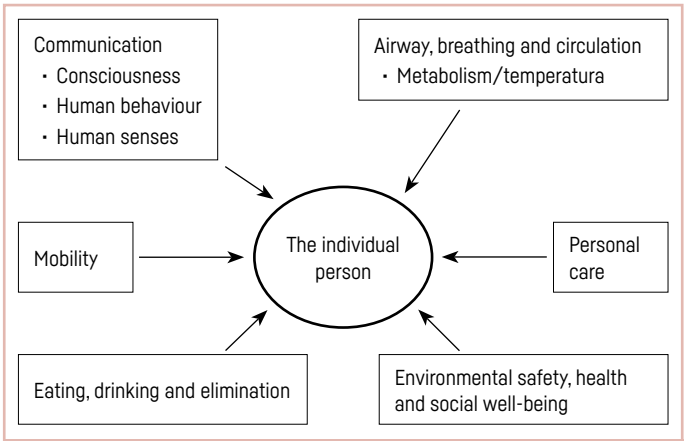


**Figure 1.** The components of life framework.[16]

**Table 1.** Emergency department interventions based on the components of life model

| Component | Indicators | Dependency score | Nursing interventions |
|---|---|---|---|
| Triage | Red/Orange | 3 points | • General Condition Assessment: The patient's overall condition was evaluated.<br>• Preparation for Potential Deterioration: Age-appropriate resuscitation materials, medications, and equipment were prepared in the resuscitation room.<br>• Bag-Valve Mask Readiness: A bag-valve mask was kept at the bedside in case of deterioration.<br>• Initial Assessment: Upon presentation to the emergency department, oxygen saturation was 100%.<br>• Hourly Electrocardiogram (ECG) Monitoring: Continuous ECG recordings were conducted (ECG findings: normal sinus rhythm).<br>• Placement in the Emergency Department: The patient was placed in a location within the emergency department that allowed for continuous observation. |
| Airway, Breathing, Circulation (ABC) | - Risk of deterioration in airway, breathing, or circulation leading to shock | 2 points | • Vital Signs Monitoring: Conducted every 30 minutes (Table 2).<br>• Airway and Breathing Monitoring: Airway and respiratory indicators were closely monitored to prevent hypoxia.<br>• Arterial Blood Gas Monitoring: Arterial blood gases were regularly assessed.<br>• Cardiac Observation: The patient was closely monitored for any cardiac anomalies.<br>• Location Adjustment: The patient was relocated to an area with enhanced visibility for continuous observation by medical staff.<br>• ECG Observation: ECG findings were regularly recorded and evaluated.<br>• Hemodynamic Monitoring: Due to the effects of delirium, the risk of autonomic dysfunction was considered, and the patient's hemodynamic status was closely monitored.<br>• Required Intravenous (IV) Treatment: IV midazolam and oral cyproheptadine were administered. |
| Communication | - Presence of behavioral disturbances due to psychological issues or medications<br>- The patient is unresponsive | 3 points | • Accessibility of Healthcare Professionals: Medical staff remained readily available in a clearly designated area for immediate access.<br>• Continuous Observation: The patient was continuously monitored due to behavioral disturbances and the need for psychological support.<br>• Parental Supervision: The accompanying parent was instructed to closely supervise the patient and avoid leaving them unattended for extended periods.<br>• Suicide Risk Precautions: Staff were informed of the patient's suicide risk. All potentially harmful items (e.g., glass objects, scissors, syringes, needle tips, cannulas) were removed from the bedside to ensure safety. |
| Mobility | - The patient requires a stretcher or wheelchair for movement | 2 points | • Fall Risk Assessment Score: The patient had a fall risk score of 11 (high fall risk). Contributing factors included: age (12–18 years - 1 point), medication (2 points), presence of medical equipment (2 points), mental status (3 points), and vital signs (3 points).<br>• Fall Risk Precautions: Bed rails were raised, and the patient was safely positioned in bed to reduce the risk of fall.<br>• Delirium Monitoring: The patient's extremities were restrained to ensure safety while monitoring for signs of delirium.<br>• Family Presence and Support: A family member remained with the patient to provide emotional support and received guidance on safe monitoring practices.<br>• Positioning Adjustments: The patient's positioning and mobility were regularly adjusted based on clinical condition and comfort. |
| Eating, drinking, elimination, and personal care | - Partial loss of bowel/bladder function and/or vomiting<br>- Requires assistance with personal care | 3 points | • Inability to Eat Orally Due to Altered Consciousness: Non-oral feeding was initiated as the patient was unable to eat orally.<br>• Nasogastric (NG) Tube Insertion: An NG tube was inserted.<br>• Fluid Therapy: To maintain fluid and electrolyte balance, fluid therapy was initiated using 5% Dextrose + 0.9% NaCl (1900 cc/24 hours).<br>• Hourly Blood Glucose Monitoring: Blood glucose levels were checked every hour. |
| Environmental safety, health, and social needs | - Risk of harm to self or others<br>- Requires extensive social support | 2 points | • Frequent Monitoring: The patient was closely monitored due to behavioral disturbances and the presence of delirium.<br>• Enhanced Observation Location: The patient was moved to an area where medical staff could observe them more easily.<br>• Written Physician Order: A written order was obtained from the physician prior to applying physical restraints.<br>• Use of Physical Restraints: Physical restraints were applied to prevent agitation, delirium-related behavior, and self-harm.<br>• Documentation: All observations regarding the patient's condition and the use of restraints were recorded in the nursing observation form.<br>• Restraint Evaluation: The need for physical restraints was reassessed hourly by the physician.<br>• Necessary arrangements for the patient's transfer to the intensive care unit were made in coordination with the attending physician.<br>• The patient's family was informed and updated regularly. |

Jones Dependency Score. 15 points (High Dependency Level): According to the Component of Life Model, a score of 15 indicates that a high level of nursing intervention is required. However, it does not meet the threshold for complete dependence, which applies to fully dependent patients.[19]

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**Table 2.** Vital signs monitoring

| Time | Blood pressure (mmHg) | Heart rate (bpm) | Body temperature (°C) | Oxygen saturation (%) | Blood glucose (mg/dL) | Arterial blood gas | Acute interventions |
|---|---|---|---|---|---|---|---|
| 11:25 | 120/89 | 122 | 36.5 | 100 | 87 | | |
| 12:30 | 98/53 | 111 | 36.7 | 100 | 91 | | 0.1 mg/kg of midazolam administered |
| 13:30 | 96/54 | 117 | 36.8 | 99 | 85 | pH: 7.25<br>$pCO_2$: 46.5 mmHg<br>$HCO_3$: 2.3 mEq/L<br>Lactate: 2.3 mmol/L | 0.01 mg/kg midazolam administered again |
| 14:00 | 105/55 | 117 | 36.8 | 97 | | | |
| 14:30 | 122/69 | 111 | 36.9 | 100 | 87 | | 10 mg of cyproheptadine administered; plan: 2 mg every two hours |
| 15:00 | 110/69 | 110 | 36.7 | 98 | | | |
| 15:30 | 120/58 | 101 | 36.5 | 100 | 96 | | |
| 16:00 | 105/65 | 101 | 36.7 | 97 | | | The patient was transferred to the pediatric intensive care unit for close monitoring |

pH: Power of hydrogen, $pCO_2$: Partial carbon dioxide pressure, $HCO_3$: Bicarbonate

hazardous objects. The accompanying parent was instructed to remain with the patient to ensure safety and provide emotional stability. The *Mobility component* (Table 1) included a fall risk assessment, with a score of 11 indicating high risk due to the patient's age, medication effects, and altered mental status. Fall prevention strategies included raised side rails and the use of extremity restraints to reduce agitation related to delirium. Family members were educated on safe monitoring practices. The *Nutrition, Hydration, Elimination, and Personal Care component* (Table 1) addressed the patient's altered consciousness through the use of nasogastric feeding, with fluid and electrolyte balance was maintained via intravenous 5% Dextrose + 0.9% NaCl (1900 cc/24 hours). Hourly blood glucose monitoring was conducted to ensure metabolic stability. The *Environmental Safety and Social Needs component* (Table 1) focused on self-harm prevention and delirium management. Physician-authorized physical restraints were used and reassessed hourly. Preparations were made for a potential intensive care unit (ICU) transfer, and the patient's family received regular updates. All interventions were thoroughly documented to ensure a coordinated, interdisciplinary approach. The Jones Dependency Score was calculated as 15 points, indicating a high level of dependency that required extensive nursing interventions. While this score reflects significant reliance on nursing care, the patient did not meet the criteria for full dependency. Continuous, comprehensive nursing interventions were essential to maintain the patient's physical stability, psychological well-being, and overall safety.

## Discussion

The complexity of serotonin syndrome necessitates a thorough understanding of its symptoms, potential complications, and appropriate interventions, particularly in the pediatric population. The presence of symptoms such as altered mental status, tachycardia, and neuromuscular disturbances underscores the importance of timely diagnosis and intervention to prevent life-threatening outcomes.[20,21]

Current research indicates that although the suicide rate is higher among males, the incidence of suicide attempts is greater among females. Suicide is the third leading cause of death among individuals aged 15 to 29.[3,22] According to 2023 data from the Turkish Statistical Institute (TÜİK), the crude suicide rate in Türkiye is 0.476%.[23] Upon admission to the emergency department, our patient presented with altered consciousness, sweating, and tachycardia. A 2021 study reported only 10 documented cases of serotonin syndrome in individuals under the age of 18 between 1965 and 2020.[21] Our patient also had a history of ADHD, and similar cases have been reported by Gill et al.[11] in 1999 and Godinho et al.[24] in 2002, involving one female and one male patient with ADHD.[11,24] Individuals with ADHD are more prone to major depression, suicidal tendencies, and other psychiatric comorbidities. Furthermore, long-term use of serotonergic medications can disrupt serotonin balance in the brain, thereby increasing the risk of serotonin syndrome. The neuropsychiatric effects of ADHD, along with its pharmacological treatment, may have played a significant role in the development of this condition.[25,26]

Symptoms in our case shared several characteristic features, including sweating, tremors, and fluctuations in consciousness.[21,27] In pediatric cases, serotonin syndrome symptoms typically appear within 24 hours following an increase in medication dosage or an overdose.[28,29] In our patient, symptoms were observed approximately 24 hours after ingesting an excessive dose of medication with suicidal intent. The management strategies employed in this case, such as continuous monitoring of vital signs, administration of oxygen and fluids, and pharmacological intervention with serotonin antagonists, are consistent with current best practices for the treatment of serotonin syndrome.

In this case, the integration of the Life Components Model provided a structured and evidence-based framework for the comprehensive nursing management of serotonin syndrome. The model effectively guided assessment and intervention across six primary components, prioritizing both physiological stability and psychological well-being. Upon admission, the patient exhibited altered consciousness, tachycardia, and sweating—symptoms characteristic of serotonin syndrome. Nursing interventions, guided by the model, included continuous monitoring of vital signs, administration of oxygen and intravenous fluids, and pharmacological treatment with serotonin antagonists such as cyproheptadine. These measures were effective in alleviating symptoms and maintaining physiological stability. Additionally, communication strategies were implemented to address behavioral disturbances, including continuous observation and the removal of potentially hazardous objects to ensure patient safety. Mobility-related interventions focused on reducing fall risk by securing the patient in bed with raised side rails and providing education to family members on safe observation techniques. Environmental safety measures, including the use of physical restraints under strict medical supervision, were implemented to prevent self-harm while adhering to ethical and clinical guidelines.[30]

The application of the Life Components Model also facilitated systematic monitoring of the patient's condition, enabling early detection of clinical deterioration and timely adjustments to the care plan. For instance, the onset of symptoms approximately 24 hours after the overdose aligns with findings in the existing literature, emphasizing the importance of regular assessment and prompt phar-

macological intervention. By integrating theoretical approaches, nursing care in this case was not only scientifically grounded but also tailored to the complex and unique needs of a pediatric patient.[31,32]

This rare condition provides valuable insights into nursing practice by highlighting the challenges of managing uncommon clinical presentations. The implementation of the Life Components nursing model, a distinctive and relatively underutilized approach, enhances the precision and efficiency of real-time assessments and targeted interventions in complex cases.[33]

The integration of evidence-based practices, such as the use of serotonin antagonists and continuous monitoring, ensures that clinical interventions are grounded in scientific principles, while also emphasizing the importance of interdisciplinary collaboration.[34] However, the report also highlights several limitations. The urgency of interventions in the emergency department often prevents nurses from fully addressing the psychological aspects of care. Although multidisciplinary teams are in place, maintaining continuity of care in the emergency setting presents a significant challenge. Additionally, the patient's transfer to intensive care limited the availability of long-term outcome data, making it difficult to assess recovery rates or any residual effects of serotonin syndrome. Consequently, this limitation hinders a comprehensive understanding of the long-term efficacy of the interventions.

## Conclusion

This case report highlights the management of an adolescent patient diagnosed with serotonin syndrome in the emergency department. Early intervention and effective nursing strategies were critical to ensuring patient safety and promoting recovery. The patient received continuous monitoring, fall risk prevention measures, and regular assessments of vital signs, along with careful management of fluid and electrolyte balance. Psychosocial support was provided by creating a calming environment and offering appropriate information to the patient's family. This holistic approach, supported by targeted nursing interventions and multidisciplinary collaboration, facilitated the patient's safe stabilization and recovery. Jones's Components of Life Model served as a vital framework for structuring care processes by holistically addressing patient needs in the management of complex conditions. Its application enables nurses to assess the patient's condition accurately and plan care strategies efficiently, thereby enhancing patient safety and supporting recovery.

To further enhance outcomes in similar cases, several key recommendations can be made:

1. Comprehensive information should be provided to the families of pediatric and adolescent patients to promote treatment adherence and support effective monitoring for potential complications.
2. Family education programs should be widely implemented to help caregivers better understand the psychosocial changes that occur during adolescence and to recognize suicide risk factors.
3. Mental health screenings for adolescents should be prioritized to enable early detection and appropriate treatment of psychiatric conditions such as depression and anxiety, thereby reducing the risk of suicide.

In conclusion, the utilization of the Life Components Model and contextual care strategies empowers nurses and healthcare professionals to deliver rapid and effective interventions in acute situations such as serotonin syndrome. By addressing physiological, psychological, and social needs in an integrated manner, this approach not only supports patient recovery but also enhances the quality of nursing practice in complex clinical scenarios.

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## References

1. World Health Organization. Adolescent health. Accessed April 7, 2025. https://www.who.int/health-topics/adolescent-health
2. World Health Organization. Mental health of adolescents. Accessed April 7, 2025. https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health
3. World Health Organization. Suicide. Accessed April 7, 2025. https://www.who.int/news-room/fact-sheets/detail/suicide
4. Hua LL, Lee J, Rahmandar MH, Sigel EJ. Suicide and suicide risk in adolescents. Pediatrics. 2024;153(1):e2023064800. [CrossRef]
5. Dávila Cervantes CA, Luna Contreras M. Suicide attempt in teenagers: Associated factors. Rev Chil Pediatr. 2019;90(6):606–616. [CrossRef]
6. Boyer EW. Serotonin syndrome (serotonin toxicity). UpToDate. Accessed April 7, 2025. https://www.uptodate.com/contents/serotonin-syndrome-serotonin-toxicity
7. Sampson E, Warner JP. Serotonin syndrome: Potentially fatal but difficult to recognize. Br J Gen Pract. 1999;49(448):867–868.
8. Boyer EW, Shannon M. The serotonin syndrome. N Engl J Med. 2005;352(11):1112-1120. Erratum in: N Engl J Med. 2007;356(23):2437. Erratum in: N Engl J Med. 2009;361(17):1714. [CrossRef]
9. Dunkley EJ, Isbister GK, Sibbritt D, Dawson AH, Whyte IM. The Hunter Serotonin Toxicity Criteria: Simple and accurate diagnostic decision rules for serotonin toxicity. QJM. 2003 Sep;96(9):635–642. [CrossRef]
10. Mason PJ, Morris VA, Balcezak TJ. Serotonin syndrome. Presentation of 2 cases and review of the literature. Medicine (Baltimore). 2000;79(4):201–209. [CrossRef]
11. Gill M, LoVecchio F, Selden B. Serotonin syndrome in a child after a single dose of fluvoxamine. Ann Emerg Med. 1999;33(4):457–459. [CrossRef]
12. Birmes P, Coppin D, Schmitt L, Lauque D. Serotonin syndrome: A brief review. CMAJ. 2003;168(11):1439–1442.
13. Curtis K, Murphy M, Hoy S, Lewis MJ. The emergency nursing assessment process-A structured framework for a systematic approach. Australas Emerg Nurs J. 2009;12(4):130–136. [CrossRef]
14. Jones G. Measuring patient dependency in the emergency department. Nurs Stand. 2015;30(2):38–43. [CrossRef]
15. National Emergency Medicine Programme. A framework to support the delivery and recording of nursing care in emergency care networks in Ireland. Accessed April 7, 2025. https://www.hse.ie/eng/about/who/cspd/ncps/emp/resources/framework-to-support-the-delivery-recording-of-nursing-care-in-ecns.pdf
16. Jones G, Endacott R, Crouch R. Emergency nursing care: Principles and practice. Cambridge University Press; 2002.
17. Jones G. Frameworks for emergency nursing assessment and management: The components of Life Model and the Jones Dependency Tool. Nurs Standard. 2022;35(10):36–39.
18. Jones G. Accident and emergency nursing. A&E nursing: Today and the future. Nurs Stand. 1990;4(27):51–52. [CrossRef]
19. Arslan MÖ, Dağ GS. Acil serviste hasta bağımlılığı: Jones Bağımlılık Aracının Türkçe geçerliği ve güvenirliği: Metodolojik çalışma. Turkiye Klinikleri J Nurs Sci. 2023;15(4):931–940. [CrossRef]
20. Ganetsky M, Brush DE. Serotonin syndrome-What have we learned? Clin Pediatr Emerg Med. 2005;6(2):103–108. [CrossRef]
21. Xuev S, Ickowicz A. Serotonin syndrome in children and adolescents exposed to selective serotonin reuptake inhibitors-A review of literature. J Can Acad Child Adolesc Psychiatry. 2021;30(3):156.
22. Freeman A, Mergl R, Kohls E, et al. A cross-national study on gender differences in suicide intent. BMC Psychiatry. 2017;17:1–11. [CrossRef]
23. Türkiye İstatistik Kurumu. TÜİK Veri Portalı. Accessed April 7, 2025. https://data.tuik.gov.tr/Kategori/GetKategori?p=nufus-ve-demografi-109&dil=1
24. Godinho EM, Thompson AE, Bramble DJ. Neuroleptic withdrawal versus serotonergic syndrome in an 8-year-old child. J Child Adolesc Psychopharmacol. 2002;12(3):265–270. [CrossRef]
25. Chang Z, D'Onofrio BM, Quinn PD, Lichtenstein P, Larsson H. Medication for attention-deficit/hyperactivity disorder and risk for depression: A nationwide longitudinal cohort study. Biol Psychiatry. 2016;80(12):916–922. [CrossRef]
26. Taipale H, Bergström J, Gèmes K, et al. Attention-deficit/hyperactivity disorder medications and work disability and mental health outcomes. JAMA Netw Open. 2024;7(3):e242859. [CrossRef]
27. Sternbach H. The serotonin syndrome. Am J Psychiatry. 1991;148(6):705–713. [CrossRef]
28. Ener RA, Meglathery SB, Decker WAV, Gallagher RM. Serotonin syndrome and other serotonergic disorders. Pain Med. 2003;4(1):63–74. [CrossRef]
29. Volpi-Abadie J, Kaye AM, Kaye AD. Serotonin syndrome. Ochsner J. 2013;13(4):533–540.

30. T.C. Sağlık Bakanlığı. Sağlıkta Kalite, Akreditasyon ve Çalışan Hakları Daire Başkanlığı. İlgili kaynaklar. Accessed April 7, 2025. https://shgmkalitedb.saglik.gov.tr/TR-105669/ilgili-kaynaklar.html
31. Torres C, Mendes F, Duarte AM, Vilaça S, Barbieri-Figueiredo MC. Implementation of evidence-based practice in paediatric nursing care: Facilitators and barriers. Collegian. 2024;31(5):342–347. [CrossRef]
32. Sheehan R, Brenner M, Ryder M. Quality care for children and young people with complex and integrated care needs: A discussion on nursing-sensitive indicators. Int J Nurs Stud Adv. 2024;8:100275. [CrossRef]
33. Prakash S, Rathore C, Rana K, Prakash A. Fatal serotonin syndrome: A systematic review of 56 cases in the literature. Clin Toxicol. 2021;59(2):89–100. [CrossRef]
34. Zwarenstein M, Goldman J, Reeves S. Interprofessional collaboration: Effects of practice-based interventions on professional practice and healthcare outcomes. Cochrane Database Syst Rev. 2009;3:CD000072. [CrossRef]