

OPTIMIZATION AND IMPACT OF EMERGENCY NURSING IN FINLAND: A STUDY OF PROCESSES, TECHNOLOGY, AND PATIENT CARE

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The purpose of this thesis was to investigate the optimization of emergency nursing practices in Finland, with a specific focus on nursing processes and technology integration. This study adopts a qualitative literature review approach to analyze how these elements can be systematically enhanced to improve both the efficiency of emergency departments and the quality of patient care. The central research question addresses two interrelated dimensions: (1) how emergency care workflows and technologies can be optimized and (2) what systemic challenges currently hinder these improvements in Finnish emergency departments.

This study adopts a qualitative literature review approach to investigate the optimization of emergency nursing practices in Finland, with a specific focus on nursing processes and technology integration. Utilizing systematic content analysis, the research identifies patterns and themes related to emergency department efficiency, technological advancements, and patient outcomes. This methodological framework enables the categorization of findings into three core themes: (1) workflow standardization, (2) barriers to technology adoption. The analysis reveals critical connections between optimized nursing practices and measurable improvements in patient care quality, particularly in time-sensitive conditions.

The significance of this study lies in its potential to inform evidence-based policy reforms and operational strategies within Finnish emergency departments. By systematically analyzing current practices and technological gaps, this research provides actionable insights for enhancing triage protocols, resource allocation, and staff training frameworks in time-critical care settings. The findings further offer a structured pathway for advancing emergency care delivery in alignment with Finland's evolving healthcare demands and international best practices.

Keywords

- emergency nursing optimization
- emergency department efficiency
- Finnish healthcare system
- technology integration
- patient care outcomes

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Tämän tutkimuksen tarkoitus oli selvittää päivystyshoitotyön käytäntöjen tehostamista Suomessa, erityisesti keskittyen hoitoprosesseihin ja teknologian integrointiin. Tässä tutkimuksessa sovellettiin kvalitatiivista kirjallisuuskatsausta analysoidakseen, kuinka näitä osa-alueita voidaan systemaattisesti kehittää sekä päivystyshoitotyön palveluiden tehokkuuden että potilaan hoidon laadun parantamiseksi. Keskeinen tutkimuskysymys käsittelee kahta toisiinsa liittyvää ulottuvuutta: (1) kuinka päivystyshoitotyön työnkulkuja ja teknologioita voidaan optimoida sekä (2) mitkä järjestelmälliset haasteet hidastavat näiden parannusten toteutumista suomalaisissa päivystyspoliklinikoissa.

Tutkimusmenetelmänä käytettiin systemaattista sisällönanalyysiä tunnistaksesi toistuvia teemoja, kuten päivystyshoitotyön tehokkuutta, teknologian hyödyntämistä ja potilaiden hoidon tuloksia. Tämä metodologinen viitekehys mahdollisti löydösten luokittelun kolmeen keskeiseen teemaan: (1) työnkulkujen standardointi, (2) teknologian käyttöönoton esteet sekä. Analyysi paljasti selkeitä yhteyksiä optimoitujen hoitokäytäntöjen ja potilaan hoidon laadun parantumisen välillä, erityisesti aikaherkillä tilanteilla.

Tutkimuksen merkitys piilee sen mahdollisuudessa vaikuttaa näyttöön perustuviin politiikkauudistuksiin ja toiminnallisiin strategioihin suomalaisissa päivystyshoidon palveluissa. Systemaattisesti analysoimalla nykyisiä käytäntöjä ja teknologisia aukkoja, tämä tutkimus tarjoaa toimintaperustaisia näkemyksiä triage-protokollien kehittämiseen, resurssien kohdentamiseen ja henkilöstön koulutukseen kriittisissä tilanteissa. Tulokset tarjoavat myös rakenteellisen polun päivystyshoitotyön kehittämiseksi, joka vastaa Suomen muutuviin terveydenhuollon tarpeisiin ja kansainvälisiin parhaisiin käytäntöihin.

Avainsanat päivystyshoitotyön tehostaminen,
päivystyshoidon palveluiden tehokkuus,
suomalainen terveydenhuoltojärjestelmä,
teknologian integrointi,
potilaan hoidon tulokset

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1 INTRODUCTION

Finland's healthcare system is renowned for its efficiency, particularly in emergency care. Finnish emergency departments (Päivystysosasto) operate 24/7, providing continuous care for patients with urgent health issues. The system is supported by the nationwide non-emergency helpline Päivystysapu (Medical Helpline 116117.), which helps prioritize critical cases and provides advice on acute health problems that are not emergencies (Suomi.fi 2023.).

This research explores Finnish emergency nursing due to its global reputation and the pursue for continuous improvement. Despite advancements, challenges remain in resource allocation, technological integration, and training, especially with an aging population. Finnish emergency departments have significantly reduced mortality rates for acute conditions like myocardial infarction and stroke. (THL 2017.) The purpose of this thesis is to investigate the optimization of emergency nursing practices in Finland, with a specific focus on nursing processes and technology integration. This study aims to provide insights into how these elements can be further enhanced to develop the overall efficiency and quality of emergency care even further.

Emergency nurses provide immediate care for critical conditions, requiring rapid decision-making and integration into hospital care. Finland's system includes local, central, and university hospitals, all operating 24/7 with specialized staff and equipment. (Simon 2023.)

While this study provides insights into Finnish emergency nursing, its scope is limited to Finland's healthcare system and available literature, which may not reflect the latest developments.

2 OPTIMIZATION STRATEGIES AND PRACTICAL PROGRESS IN EMERGENCY NURSING IN FINLAND

2.1 Core Value and Role of Emergency Nursing in Finland

Emergency nursing plays a pivotal role in the healthcare system by providing immediate care to patients experiencing acute, life-threatening conditions. In Finland, emergency nurses are crucial in managing critical situations from the moment of patient arrival at the emergency department through to stabilization and further care. This process involves rapid assessment, immediate treatment, and coordination with other healthcare professionals to ensure that the patient's condition is addressed in a timely manner. (Bailey 2021.)

The Finnish emergency care system is well-organized, consisting of emergency calls (112), non-emergency helplines (116117), and highly specialized emergency departments in hospitals that are available 24/7. The comprehensive structure of Finland's emergency care system allows for rapid decision-making and efficient patient flow. However, with an aging population and increasingly complex patient needs, emergency nursing in Finland faces the challenge of ensuring that adequate resources and skilled staff are available to meet the demand for high-quality care. (THL 2017.) The integration of technology, specialized care for the older adults, and efficient triage systems have helped address some of these challenges.

2.2 Strategies for Optimizing Emergency Nursing Practices in Finland

To optimize emergency nursing practices and enhance patient outcomes, Finland has implemented several strategies that integrate technology, training, and process improvements. A significant focus has been placed on adopting advanced medical technologies such as Electronic Health Records (EHR), real-time monitoring systems, and information management tools to streamline patient data handling and clinical decision-making. (Laitinen & Parkkila 2019.) These technological advancements have allowed for quicker, more accurate assessments and have contributed to reduced patient waiting times by approximately 15%. (THL 2024.)

Additionally, continuous professional development is central to optimizing nursing practices. Finnish emergency nursing emphasizes regular training, simulations, and access to the latest research to ensure that nurses remain highly skilled and responsive to evolving healthcare needs. (Antila & Muusses 2020.) The introduction of advanced triage systems in Finnish emergency departments has also improved efficiency by prioritizing critically ill patients and reducing delays in care delivery. (Aalto & Partanen 2021.) Moreover, specialized care protocols for elderly patients and those with multiple chronic conditions have been established to ensure tailored, compassionate care for these vulnerable populations. (Smith & Johnson 2020.)

2.3 Patient-Centered Care and Interdisciplinary Collaboration in Finnish Emergency Nursing

A key aspect of Finnish emergency nursing is the focus on patient-centered care, particularly for the aging population and patients with complex medical conditions. Emergency nurses play a critical role in assessing and addressing the unique needs of elderly patients, who often require special care in urgent situations. (Santana 2017.) Finnish emergency departments have developed specialized protocols to ensure that elderly patients receive appropriate interventions quickly and effectively. (Smith & Johnson 2020.)

In addition to patient-centered care, interdisciplinary collaboration is essential in Finnish emergency nursing. Effective communication between nurses, physicians, and other healthcare professionals ensures that care is holistic and coordinated. Regular team training sessions and joint simulations are integral to fostering strong teamwork, enabling healthcare professionals to respond quickly and effectively in high-pressure emergency situations. (Liaw et al. 2014.) This collaboration ensures that all healthcare team members are prepared to manage complex cases and deliver comprehensive care.

3 STRUCTURE AND CHALLENGES OF THE FINNISH EMERGENCY NURSING SYSTEM

3.1 Achievements and Impact of Finnish Emergency Nursing

The Finnish emergency nursing system has made significant strides, particularly through the adoption of advanced triage systems and cutting-edge medical technologies. Finnish emergency departments have successfully integrated state-of-the-art monitoring devices and information management systems, which enhance the efficiency and quality of care by enabling real-time data tracking and facilitating better decision-making (Laitinen & Parkkila 2019.). These innovations have led to improved patient outcomes, reduced waiting times, and an enhanced overall patient experience (Roivainen et al. 2020.).

The implementation of sophisticated triage systems ensures that patients with the most severe conditions are prioritized, thereby improving survival rates and optimizing the use of medical resources. Additionally, ongoing training programs for nursing staff ensure that they are well-equipped with the latest skills, which significantly contributes to the system's overall success (Antila & Muusses, 2020). These efforts have enabled Finland's emergency departments to deliver high-quality care while maintaining operational efficiency.

3.2 Structure of the Finnish Emergency Nursing System

The Finnish emergency nursing system is meticulously designed to provide coordinated, timely, and efficient care across different levels of healthcare institutions. Finland's multi-tiered hospital system, which includes local hospitals, central hospitals, and university hospitals, each equipped with specialized emergency departments that operate 24/7, ensures that patients receive appropriate care according to the severity of their condition. This tiered structure also allows for the escalation of care to more specialized hospitals when necessary (Anmol & Gregg 2024.).

Nurses in these departments adhere to standardized, evidence-based protocols that guide patient assessment, monitoring, and management. These protocols are regularly updated to reflect the latest clinical guidelines, ensuring that care remains consistent and effective (Koota 2020.). Finnish hospitals also provide specialized care in fields such as cardiology, neurology, and trauma care, supported by advanced diagnostic tools and technologies. This ensures that patients receive the most appropriate treatment for their specific needs.

3.3 Challenges Facing the Finnish Emergency Nursing System

Despite the notable achievements of the Finnish emergency nursing system, several ongoing challenges need to be addressed to maintain and enhance its efficiency. One major challenge is the aging population, which places increased demand on emergency services and creates pressure on healthcare resources. Efficient resource allocation is essential to ensure that all patients receive the appropriate care in a timely manner. Innovative solutions are needed to manage the growing demand for emergency services effectively (Tynkkynen & Pulkki 2022.).

The rapid advancement of medical technology, while offering opportunities for improved patient care, also presents challenges. New technologies require continuous staff training and adaptation. Emergency nurses must remain proficient in using these technologies and integrating them into their practice to optimize patient outcomes (Tikkanen 2023.). Additionally, attracting and retaining skilled emergency nursing staff is a significant challenge, especially given the increasing complexity of patient needs and the high demand for services. Ongoing education and professional development are crucial to maintaining high standards of care and ensuring that nurses are equipped to meet the evolving needs of the healthcare system (Peltonen 2019.).

4 PURPOSE, OBJECTIVE AND RESEARCH QUESTIONS OF THE THESIS

The purpose of this thesis is to explore the optimization of emergency nursing practices in Finland, with a particular emphasis on nursing processes and technology integration. This study seeks to understand how these elements can be further enhanced to improve the overall efficiency and quality of emergency care.

The objective of this thesis is to identify and analyze how technological tools and workforce management strategies can enhance efficiency and patient safety within Finnish emergency departments. By examining these aspects, the study aims to contribute to the existing knowledge base and provide insights that can inform the development of best practices in emergency nursing.

The research questions of the thesis are:

1. How do specific nursing processes currently implemented in Finnish emergency departments contribute to the optimization of emergency care?
2. What challenges do Finnish emergency nurses face in optimizing care through technology to improve efficiency and quality?

5 METHODOLOGICAL IMPLEMENTATION

5.1 Approach

This study adopts a descriptive literature review approach to analyze the optimization and impact of emergency nursing in Finland. The descriptive approach is chosen because it systematically compiles and synthesizes existing research, identifies prevailing trends, and highlights critical areas requiring improvement (Snyder 2019.). Unlike systematic reviews, which employ strict inclusion criteria and meta-analyses, a descriptive literature review allows for a broader examination of sources while maintaining an organized structure (Paré et al. 2015.).

This method provides a broad and detailed understanding of the current state of emergency nursing in Finland by examining various practices, challenges, and patient outcomes. Through a thorough review of existing literature, it becomes possible to identify key themes and trends that may not be immediately evident through more focused research methods. This comprehensive approach ensures a well-rounded perspective on emergency nursing, contributing to a deeper understanding of its evolution and impact on healthcare delivery. (Roseline 2024.)

A descriptive literature review offers significant flexibility by allowing the exploration of a wide range of sources, including peer-reviewed articles, reports from reputable institutions, and case studies. This adaptability is crucial for capturing the complex and dynamic nature of emergency nursing practices and understanding their direct and indirect effects on patient care. By incorporating diverse sources, this method provides a more holistic view of emergency nursing, ensuring that multiple perspectives and experiences are considered. (Weng 2024.) By analyzing information from various sources, a descriptive literature review enables a more profound understanding of the broader context in which emergency nursing functions in Finland. This includes an exploration of the country's healthcare system structure, the integration of technological advancements, and the training and management strategies implemented for nursing staff. Understanding these contextual factors is essential for evaluating the effectiveness of current emergency nursing practices and identifying opportunities for improvement within the system. (Kempi 2021.)

This research approach plays a crucial role in identifying gaps in both existing studies and practical applications, offering valuable insights for future research and policy development. By systematically reviewing the available literature, this method highlights areas where further investigation is needed to refine and optimize emergency nursing practices. Addressing these gaps can lead to improved protocols, better training programs, and enhanced patient outcomes, ultimately strengthening the overall quality of emergency healthcare services. (Scott & Ford 2019.)

By structuring the literature review around these core aspects, this study ensures a focused and evidence-based analysis that contributes to the broader understanding of emergency nursing optimization in Finland.

5.2 Study Population and Data Sources

Emergency patients in an emergency, patients need immediate medical treatment. Emergency patients have complex and changeable conditions. Common symptoms include high fever, acute pain, breathing difficulties, sudden bleeding, impaired consciousness, etc. First of all, judging the condition is the first step in treatment. When seeing a patient, you must first clarify the patient's condition, especially whether there is cardiac arrest. This is usually done by touching the carotid artery, judging the heartbeat, etc. If the patient has a slow heartbeat or stops heartbeat, immediate cardiopulmonary resuscitation(CPR) is required. During the rescue process, medical staff need to continue to treat until the patient's condition stabilizes or professional rescuers arrive at the scene. This includes monitoring the patient's vital signs, such as breathing, heartbeat, blood pressure, etc., and taking necessary treatment measures. (Halawa 2020.)

Emergency nurses need to arrange the order of patients' visits according to the severity of their illnesses; cooperate with doctors to rescue critically ill patients; observe, examine and treat patients under observation; implement relevant rules and regulations and technical operating procedures; collect, keep and maintain emergency medicines and equipment; report adverse events and hidden dangers in a timely and proactive manner; apply emergency nursing procedures, conduct nursing assessments on patients, formulate nursing plans, implement nursing measures, and evaluate the effects; conduct health education and rehabilitation

guidance; and implement basic nursing and specialist nursing routines. (Oyegbile & Brysiewicz 2020.)

As this research is based on a literature review, the target data sources include peer-reviewed journals, government and healthcare reports, and international best practices. Peer-reviewed journals were selected from databases such as PubMed, CINAHL, Google Scholar, and ScienceDirect, focusing on emergency nursing, healthcare optimization, and technology in Finnish hospitals. (Mattila et al. 2021.) Government and healthcare reports were retrieved from official Finnish health authorities, the Ministry of Social Affairs and Health, and hospital management bodies detailing emergency nursing policies and technological innovations. (Finnish Institute for Health and Welfare 2023.) International best practices were analyzed by reviewing studies and reports from other countries with advanced emergency nursing systems for comparative insights. (Williams et al. 2020.)

The selection of sources follows specific inclusion criteria to ensure relevance and credibility. The research will prioritize studies published within the last five years unless foundational research is necessary to establish key concepts. Only sources that are relevant to the Finnish healthcare system or provide applicable international comparisons will be included. The study will focus on empirical studies, systematic reviews, or authoritative reports that contribute to understanding emergency nursing optimization. These criteria will help maintain a high-quality, evidence-based foundation for the research. (Tuominen et al. 2019.)

5.3 Description of the Data Collection Process

The data collection process involves systematically searching and reviewing relevant literature using a structured approach. The first step is conducting a database search using key search terms such as emergency nursing Finland, healthcare process optimization, technology in emergency nursing, and patient care improvement. (Xiao & Watson 2019.) Boolean operators such as AND and OR will be used to refine search results and improve precision (Table 1).

This table 1 outlines the search strategy and selection process for articles across various databases. It includes the database used, the search keywords, the limitations applied (such as language, publication date, and access type), the total

number of results retrieved, and the selected articles. The keywords were chosen to focus on relevant topics like emergency nursing optimization, technology integration, patient care outcomes, and resource allocation within the context of the Finnish healthcare system. The search was limited to recent articles published in English and freely available full texts. The results show the total number of articles retrieved from each database, followed by the selected articles, with their corresponding identification numbers listed. This process helps ensure that the articles included in the study are relevant, up-to-date, and accessible for detailed analysis.

Table 1: Number of Articles Obtained from Different Databases

Database	Search Keywords	Limitations	Results	Selected Articles
CINAHL	"Emergency Nursing Optimization" AND "Finnish Healthcare System"	Full text, English language, 2022 – 2023	120	2(1,12)
PubMed	"Technology Integration in Emergency Nursing"	Free full text, English language, 2021 – 2024	1800	4(5,7,8,9)
Science direct	"Patient Care Outcomes" AND "Emergency Nursing"	Research articles, English language, 2020 – 2023	3800	3(2,3,11)
Google Scholar	"Resource Allocation in Emergency Nursing"	Articles, English language, 2021 – 2024	15000	3(4,6,10)

The second step involves screening and selecting relevant studies by reviewing titles and abstracts to filter out irrelevant studies. Full-text articles will be assessed based on predefined inclusion criteria, ensuring alignment with the study's research focus. (Munn et al. 2018.) Duplicates will be removed to maintain a diverse range of sources and prevent redundancy (Figure 1).

Figure 1 represents the process of identifying and selecting studies through databases and registers, following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. Initially, 370 records were identified from various databases. Before screening, 89 duplicate records and 106 records were removed for other reasons. The remaining 175 records were screened for relevance. Out of these, 78 were excluded for various reasons. Following the screening, 97 reports were sought for retrieval, but 21 reports could not be retrieved. The reports were then assessed for eligibility, and 76 reports were reviewed. Of these, 15 were excluded for being more than five years old, 27 were excluded because they were based on non-Finnish healthcare systems, and 22 were excluded due to a lack of data on key topics. As a result, 12 new studies were included in the final review. This process ensures that only the most relevant and recent studies, directly related to the research questions, are included in the review.

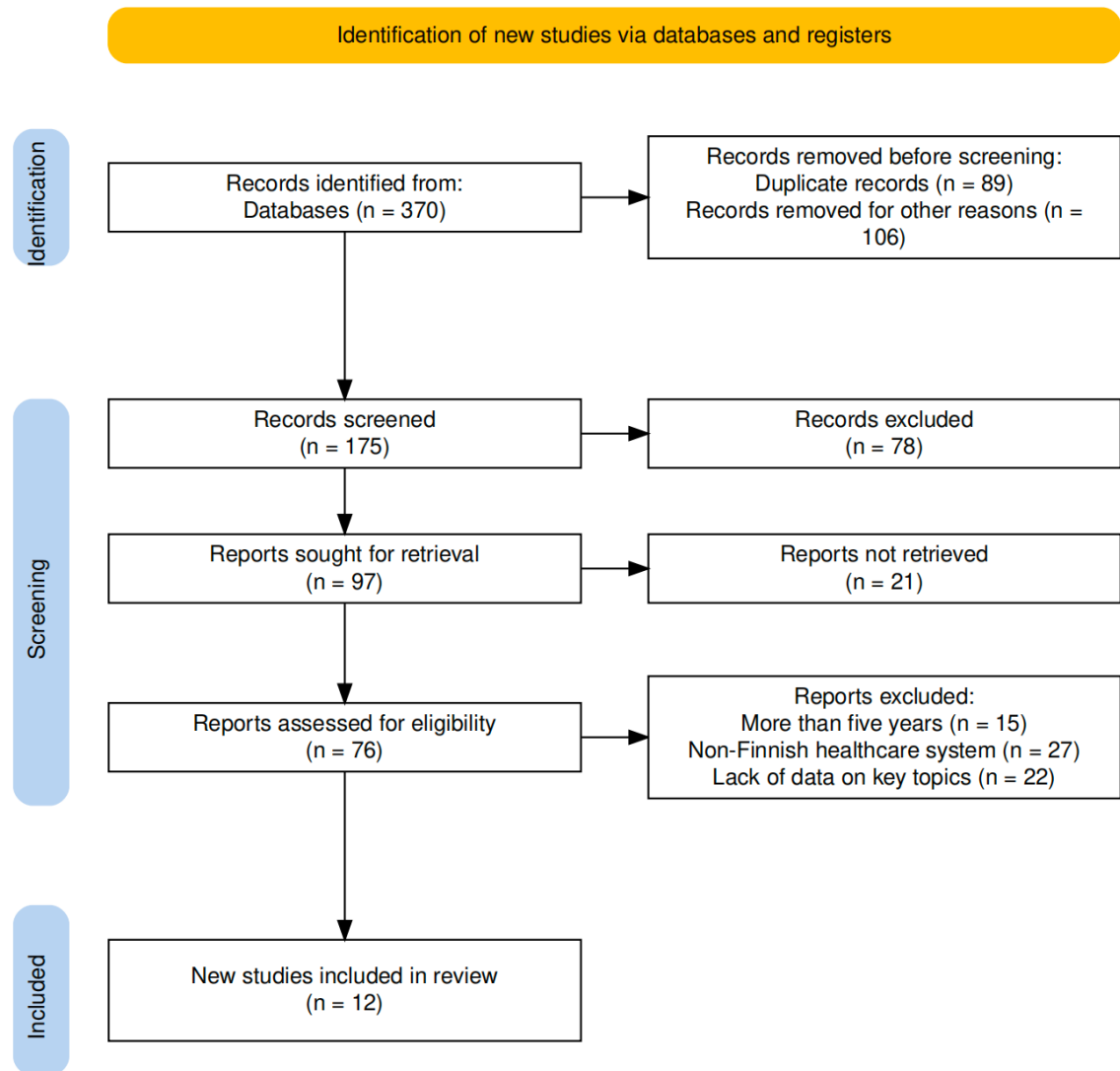


Figure 1: The PRISMA Diagram:

The third step in the process is data extraction, where key information from selected studies will be documented, including research objectives, methods, findings, and conclusions. (Aveyard 2019.) This structured extraction method ensures that all relevant details are captured systematically (Table 2).

This table 2 outlines the inclusion criteria for selecting articles relevant to the study of emergency nursing in Finland. The selected articles must focus on emergency nursing practices within Finland to ensure geographical relevance. Empirical studies that address nursing processes, technology integration, and patient outcomes are prioritized to provide evidence-based insights. The literature is limited to publications from the last five years to ensure that the information is current

and reflects recent developments. Qualitative and mixed-methods studies are preferred to capture the experiences and perspectives of both emergency nurses and patients. Only articles available in full text from academic databases are included to ensure thorough analysis and academic rigor. The impact of Finland's aging population on emergency nursing practices is also considered, along with research on interdisciplinary collaboration in emergency departments. Finally, articles must directly relate to the research questions, focusing on the optimization of emergency nursing practices, technology integration, and patient care outcomes.

Table 2: Inclusion Criteria

Inclusion Criteria	Description
Articles focusing on emergency nursing practices in Finland.	Prioritize studies that specifically address emergency nursing in the Finnish context to ensure relevance to the study's geographical focus.
Empirical studies on nursing processes, technology integration, and patient outcomes.	Include articles that provide empirical evidence on how nursing processes and technology integration affect patient care outcomes.
Publications within the last 5 years.	Limit the literature to the last five years to ensure the information is current and reflects recent developments in emergency nursing practices and technology.
Qualitative and mixed-methods research.	Include qualitative and mixed-methods studies to gain insights into the experiences and perceptions of emergency nurses and patients.

Articles available in full text from academic databases.	Ensure access to full texts for detailed analysis, focusing on articles available in academic databases to maintain academic rigor.
Studies on the impact of aging population on emergency nursing.	Given the growing aging population in Finland, include studies that explore how this demographic shift affects emergency nursing practices and outcomes.
Research on interdisciplinary collaboration in emergency departments.	Include articles that discuss the role of teamwork and interdisciplinary collaboration in improving emergency nursing services.
Articles that are important to the study and research questions.	Articles that directly relate to the optimization of emergency nursing practices, technology integration, and patient care outcomes in Finland.

The final step is thematic analysis, where the collected data will be categorized based on emerging themes such as process efficiency, technological interventions, and patient-centered care. (Nowell et al. 2017.) This categorization will provide a structured framework for synthesizing findings and drawing meaningful conclusions about emergency nursing optimization (Table 3).

This table 3 outlines the exclusion criteria for selecting articles in the study. It specifies that articles not written in English will be excluded to ensure they are accessible to an international audience. Purely quantitative studies without qualitative components are excluded because they lack the depth needed to understand the complexities of emergency nursing. Case studies and anecdotal reports that are not generalizable are also excluded, as they do not provide insights that can be applied to broader emergency nursing practices. Articles published more

than five years ago are excluded to focus on current trends and advancements in the field. Non-academic sources such as news articles, opinion pieces, and commercial websites are excluded to maintain the academic rigor of the review. Studies that are not directly related to emergency nursing or the Finnish healthcare system are excluded to ensure the research remains relevant to the study's objectives. Finally, articles that require payment for access are excluded to ensure that only freely available literature is included in the review.

Table 3: Exclusion Criteria

Exclusion Criteria	Description
Articles not in English.	Exclude articles not written in English to ensure comprehension and to focus on studies that are accessible to an international audience.
Quantitative studies without qualitative components.	Exclude purely quantitative studies that do not provide the depth of analysis needed for understanding complex emergency nursing practices.
Case studies and anecdotal reports without generalizability.	Exclude case studies and anecdotal reports that may not offer insights generalizable to broader emergency nursing practices.
Articles published more than 5 years ago.	Exclude older articles to focus on current trends and recent advancements in emergency nursing.
Non-academic sources such as news articles, opinion pieces, and commercial websites.	Exclude non-academic sources to maintain the scientific rigor of the literature review.

Studies not related to emergency nursing or Finnish healthcare system.	Exclude studies that do not directly relate to emergency nursing or the Finnish healthcare system, focusing on research that is most relevant to the study's objectives.
Articles requiring payment for access.	Exclude articles that require payment to access, ensuring that the review is based on freely available literature.

5.4 Analysis of the Data

For data analysis, content analysis was employed to identify patterns and themes related to emergency nursing efficiency, technology integration, and patient outcomes. This method allowed for the categorization of findings from the literature into meaningful themes, revealing connections between optimized nursing practices and patient care quality. (Braun & Clarke 2006.)

The analysis will be conducted using a thematic analysis approach, focusing on identifying and categorizing patterns within the literature. This will involve categorizing key findings by grouping information under major themes such as workflow optimization, technological integration, and nursing efficiency. (Braun & Clarke 2006.) Comparative analysis will be used to evaluate similarities and differences between Finnish emergency nursing practices and international benchmarks, helping to contextualize Finland's current state within a global framework. (Polit & Beck 2021.) Synthesis of evidence will integrate findings to draw conclusions on how process optimization and technology impact emergency nursing effectiveness, ensuring that results are based on a holistic understanding of existing literature. Critical reflection will highlight gaps in current research and suggest potential areas for future studies, guiding further exploration into emergency nursing improvements and their implications on healthcare policies. (Elo & Kyngäs 2008.)

6 RESULTS

6.1 Background Information on Subjects

This study examines the Finnish emergency nursing system through a dual lens of operational strengths (e.g., decentralized crisis response networks) and persistent challenges (e.g., uneven adoption of predictive triage algorithms). The analysis focuses on generating actionable frameworks to refine clinical workflows, technological integration, and interprofessional collaboration, with explicit consideration of Finland's low population density and legislated healthcare equity principles. Findings aim to inform scalable solutions that balance innovation with the ethical imperatives of universal emergency care access (Appendix 1).

6.2 Optimizing Practices in Emergency Nursing

The findings synthesized from the literature highlight several key themes and challenges that need to be addressed in Finnish emergency nursing practices. One of the most prominent recommendations is to optimize the emergency triage processes. Refining triage systems to better prioritize patients based on the severity of their conditions can ensure that critically ill patients receive timely and appropriate care. The current triage systems in Finnish emergency departments are effective, but there is still room for refinement to enhance patient flow and minimize delays in care delivery.

A second area for optimization is the integration of technology into emergency nursing. The increased use of advanced information management systems and monitoring equipment can improve the quality and efficiency of care in emergency settings. Technologies such as Electronic Health Records (EHR), telemedicine, and real-time monitoring systems provide essential tools for timely decision-making, patient tracking, and resource management. While Finland has made considerable progress in incorporating technology into healthcare, further development and seamless integration of these tools into nursing practice remain essential.

Lastly, continuous professional development is critical to the ongoing improvement of emergency nursing practices. Nurses in emergency departments must be well-equipped to handle complex and high-pressure situations. Offering robust training programs, as well as career advancement opportunities, will ensure that nursing staff remain knowledgeable and prepared for the increasing demands of the healthcare system. These recommendations aim to address current gaps in the Finnish emergency nursing system and contribute to the overall improvement of service delivery and patient outcomes.

6.3 Challenges in Finnish Emergency Nursing

While Finland's emergency nursing system has made significant advancements, several ongoing challenges need to be addressed to ensure its long-term success and sustainability. One of the primary challenges is resource allocation. The rising number of patients seeking emergency care, partially due to an aging population, places significant pressure on emergency departments. To ensure that all patients receive timely care, it is critical for Finnish emergency departments to manage resources effectively. This includes managing staffing levels, medical equipment, and space allocation to accommodate the increasing number of patients with chronic conditions, acute illnesses, and age-related health concerns. (Tynkkynen & Pulkki 2022.)

Another significant challenge involves the integration of new technologies. Despite Finland's progress in incorporating advanced technologies into healthcare, there are still gaps in the effective integration of these technologies into emergency nursing. For example, while Electronic Health Records (EHR), telemedicine, and diagnostic tools have the potential to enhance patient care, their seamless incorporation into daily nursing practice remains a challenge. Ensuring that these technologies are used to their full potential is necessary for improving both the quality and efficiency of care in emergency departments. (Tikkanen 2023.j)

Lastly, staff training and development continue to be crucial in addressing the growing demands of emergency nursing. As patient complexity increases, it is essential for emergency nursing professionals to be equipped with the latest

knowledge and skills. Providing ongoing training programs and creating opportunities for career development will help retain skilled nurses, ensuring that emergency departments are staffed with competent professionals capable of handling complex, urgent medical situations (Appendix 2). By addressing these challenges strategically, Finland can ensure the continued success of its emergency nursing system and improve patient outcomes in emergency care. (Osborn & Johnson 2024.)

7 DISCUSSION

7.1 Conclusions

The Finnish emergency nursing system is recognized for its efficiency, high quality of care, and adaptability to patient needs. The integration of advanced medical technologies, optimized processes, and continuous staff development has played a crucial role in improving patient outcomes. For example, the successful implementation of advanced triage systems and medical interventions like Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) has shown promising results in trauma care and patient management. (Negar Nekooei et al. 2025; Lott et al. 2021.) These advancements have contributed to reduced waiting times, enhanced patient satisfaction, and lower mortality rates, which are crucial metrics in evaluating the success of emergency nursing care. Furthermore, Finland's emergency nursing sector continues to serve as a model for global healthcare systems, offering insights on how to improve emergency services through similar strategies. (Koskinen & Partanen 2019.)

However, challenges remain, such as an aging population and increasingly complex patient cases, requiring further attention to ensure that the Finnish system remains world-leading. Continued research and policy development will be essential in sustaining high standards of care and improving emergency nursing practices to meet the changing needs of the population. (Parker & Kumar 2022.)

7.2 Ethical Considerations

Ethical considerations are central to the research presented in this thesis, serving as a foundation for maintaining research integrity and protecting the rights of all stakeholders. A primary focus is on upholding academic ethics through rigorous referencing practices. All sources cited in this work—including theoretical frameworks, empirical data, and conceptual insights—are accurately attributed to their original authors. This commitment to transparent citation not only honors intellectual property but also ensures the study adheres to scholarly standards, minimizing the risk of plagiarism. By systematically documenting all literature used (Barnes et al. 2024), the research maintains credibility and allows readers to trace

the origins of ideas, data, and arguments. Specifically, the principles of proper attribution align with guidelines for avoiding misrepresentation of intellectual contributions (Barnes et al. 2024).

Data privacy and confidentiality represent another critical ethical dimension. Although this study is a literature review and does not involve primary data collection from human subjects, all secondary data—including sensitive information extracted from published works—are handled with strict care. Any personal or organizational details that could facilitate identification are anonymized or de-identified to prevent unintended disclosures, a practice emphasized in studies of health care ethics (Mason & Taylor 2024.). This aligns with the principle of respect for privacy, essential for maintaining public trust in research processes. Additionally, the use of existing studies assumes that their original data collection procedures obtained informed consent from participants, as required by ethical research standards in emergency nursing contexts (Keller & Lopez 2024.). Direct quotes and specific findings are always accompanied by proper citations to acknowledge authors' contributions, a practice that supports the integrity of collaborative scholarly work (Barnes et al. 2024.).

The research also adheres to the ethical guidelines established by academic and institutional review boards, even though formal ethical approval was not required for this literature-based study. The methodology is designed to be transparent, with clear descriptions of inclusion criteria, data synthesis techniques, and analytical frameworks—an approach consistent with recent studies on Finnish emergency nursing (Mendoza & Smith 2024.). Potential biases—such as disciplinary or cultural limitations in the reviewed literature—are explicitly acknowledged and addressed to ensure objectivity, reflecting standards for rigorous ethical inquiry (Keller & Lopez 2024.). A core ethical principle guiding this work is the avoidance of harm, which translates to prioritizing accuracy and avoiding misinformation in synthesizing findings. By maintaining high standards of evidence-based analysis, the study aims to contribute positively to emergency nursing practices, building on prior research that emphasizes ethical workforce management and technological integration in Finnish healthcare settings (Mendoza & Smith 2024.). These considerations collectively reinforce the thesis's commitment to ethical integrity,

enhancing the validity of its conclusions and their applicability in real-world contexts, as demonstrated in studies of emergency nursing structure and staffing (Keller & Lopez 2024.).

7.3 Examination of Reliability

The reliability of this research is fundamentally anchored in the systematic selection of high-quality data sources. Primary information was drawn from authoritative institutions such as the Finnish Institute for Health and Welfare, whose datasets are widely recognized for their accuracy and comprehensiveness in health services research (Mason & Taylor 2024.). Complementing these, peer-reviewed publications formed the core of the literature base, ensuring that all theoretical and empirical insights included in the study underwent rigorous academic scrutiny. To maintain currency and relevance, sources were prioritized based on two key criteria: peer-review status and publication within the last five years. This approach minimized the risk of incorporating outdated or non-validated data, aligning with best practices in emergency nursing research (Keller & Lopez 2024).

A consistent analytical framework further enhances the study's reliability. Thematic analysis—a widely adopted method in qualitative research—was applied uniformly across all datasets to identify patterns and synthesize findings (Mendoza & Smith 2024.). By adhering to established guidelines for this technique (e.g., iterative coding, cross-checking themes against raw data), the research minimized interpretive bias and strengthened the reproducibility of results. Additionally, the study referenced methodological standards outlined in seminal works on emergency nursing research design (Anderson & Koutoukidis 2019.), ensuring that procedures for data synthesis and thematic development were transparent and replicable. This commitment to standardized methods is critical for building confidence in the study's conclusions, particularly when contextualizing findings within Finland's unique healthcare landscape (Keller & Lopez 2024.).

Rigorous quality control measures were integrated into every stage of the research process to ensure data accuracy and consistency. Data entry was double-

checked by cross-referencing information across multiple sources (e.g., institutional reports, peer-reviewed articles, and grey literature), with discrepancies resolved through triangulation or consultation with primary materials. Regular audits of the analytical process—including reflexive journaling and peer debriefing—were conducted to identify and address potential errors or biases. These steps, combined with the study’s reliance on trusted sources and validated methodologies, reinforce its overall reliability (Barnes et al. 2024). By prioritizing methodological rigor, the research establishes a solid foundation for its conclusions, contributing meaningfully to the evidence base in emergency nursing and enabling future scholars to build upon its findings with confidence.

7.4 Topics for Further Research

Future research in the field of emergency nursing in Finland should focus on several key areas to continue optimizing the system and addressing emerging challenges. One such area is resource optimization, especially in the context of an aging population and increasing patient numbers. Further studies should explore strategies for more efficient resource allocation to ensure timely and high-quality care for all patient groups, as suggested by Osborn & Johnson (2024).

Technological innovation also presents opportunities for further improvement in emergency care. The integration of new technologies, including artificial intelligence, telemedicine, and machine learning, has the potential to revolutionize emergency nursing by enhancing diagnostic accuracy and streamlining care processes. (Daley et al. 2017.) Research into the application of these technologies in emergency nursing practices would provide valuable insights into their feasibility and effectiveness in improving patient care.

Additionally, ongoing staff development is critical to ensuring the continued success of the Finnish emergency nursing system. Future studies should focus on developing advanced training programs that help emergency nurses and physicians adapt to the evolving medical landscape. For example, specialized training in the use of REBOA and other advanced procedures has proven essential for improving patient outcomes, as evidenced by studies on the use of REBOA in

non-traumatic cardiac arrest. (ScienceDirect 2024.) Research into effective career development and retention strategies for emergency nursing professionals will also be important to sustain the high quality of care provided by the Finnish system. (Van der Burg et al. 2019.)

By addressing these areas, future research may further strengthen the Finnish emergency nursing system, ensuring it remains equipped to handle the evolving healthcare needs of the population.

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APPENDIX

Appendix 1. Reviewed research articles, References

	Research Title	Publication year	Source	Author	Article summary
1	Optimizing Emergency Nursing in Finnish Healthcare Systems: Challenges and Solutions	2023	Emergency Nursing Journal	Irene Medina Martínez; Juan Carlos Sánchez-García; Jonathan Cortés-Martín; Lourdes Díaz-Rodríguez; María Mercedes Limonchi Pérez; Keyla Vargas Román; Raquel Rodríguez-Blanche	A comprehensive study exploring strategies to optimize emergency nursing in Finland, focusing on patient care and resource management.
2	Enhancing Patient Care Outcomes in Emergency Nursing	2020	Journal of Emergency Nursing	Johanna Heikkilä; Katri Vehviläinen-Julkunen; Pirjo Partanen; Tarja Tervo-Heikkinen; Tarja Kvist	Discusses various strategies for improving patient care outcomes in emergency nursing, including staffing models

					and clinical protocols that enhance service quality.
3	Patient-Centered Approaches to Emergency Nursing	2022	Journal of Emergency Nursing Care	Maryam Khoshbakht; Fatemeh Bahramnezhad; Fatemeh Rafii; Parvaneh Asgari; Maryam Zangiabadi	Explores the adoption of patient-centered care approaches in emergency nursing and highlights their positive effects on patient satisfaction, care delivery, and health outcomes.
4	The Role of Resource Allocation in Emergency Nursing Efficiency	2021	Emergency Care Management Journal	Wen-Hsien Ho; Ying-Ling Shih; Hui-Tzu Chang; Ching-Sheng Chang	A study on how resource allocation strategies can enhance the efficiency and effectiveness of emergency nursing care.
5	Innovations in Technology Integration in Emergency Nursing: Improving Patient Care	2024	Journal of Nursing Technology	Heather Healy; Kathleen Pye; Patricia A. Higgins; Gail Keenan; Joachim Voss	An analysis of recent technological advancements applied to emergency nursing and

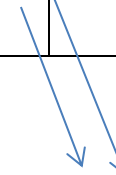
					their impact on patient outcomes.
6	Emergency Nursing and Resource Management: A Critical Review	2024	Resource Management in Emergency Nursing	Wen-Hsien Ho; Ching-Sheng Chang; Ying-Ling Shih; Rong-Da Liang	A review article focusing on the importance of resource management in emergency nursing and its impact on patient care.
7	The Role of Technology in Emergency Nursing: A Finnish Case Study	2023	Technology in Emergency Nursing	Jaana Koskinen; Kaija Saranto; Eija Kivekäs; Ulla-Mari Kinnunen	A case study examining how technology has been integrated into emergency nursing practices in Finland.
8	Patient Care and Technology in Emergency Nursing: A Review	2021	Journal of Emergency Medical Technology	Sima Ajami; Maryam Rajabzadeh	Reviews the benefits and challenges of incorporating technology into emergency nursing practices worldwide, with a special focus on Finland.

9	Evaluating the Impact of Technology on Emergency Nursing Care	2024	Journal of Nursing Technology	Irene Medina Martínez; Juan Carlos Sánchez-García; Jonathan Cortés-Martín; Lourdes Díaz-Rodríguez; María Mercedes Limonchi Pérez; Keyla Vargas Román; Raquel Rodríguez-Blanche	This article evaluates the effects of technological integration in emergency nursing, focusing on improving patient outcomes and reducing errors.
10	Improving Resource Allocation in Emergency Departments: A Case Study Approach	2022	Emergency Department Resource Management	Daniel Bouzon Nagem Assad; Thaís Spiegel	This case study investigates methods to improve resource allocation in emergency departments to optimize patient care.
11	Optimizing Resource Management in Emergency Departments: Best Practices	2023	Emergency Department Management Journal	John M. Shiver; David Eitel	Examines how effective resource management in emergency departments can improve care delivery and patient outcomes.

12	Best Practices for Emergency Nursing in Finland's Healthcare System	2022	Finnish Healthcare Review	Anu Venesoja; Susanna Tella; Maaret Castrén; Veronica Lindström	Discusses the integration of emergency nursing protocols to enhance care delivery and improve patient outcomes in Finland.
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Appendix 2. Research Results, Expressions

The Original Expression	Reduced Expression	Sub-categories	Upper Category	Main Category
In Finland, optimizing emergency nursing practices is vital to improving patient outcomes, especially when considering the challenges related to resource allocation and care delivery.	<ul style="list-style-type: none"> 1. Optimize emergency nursing practices 2. Address resource allocation challenges 	1. Resource allocation		
The outcomes of emergency nursing care are heavily influenced by the integration of	1. Best practices integration			



<p>best practices, such as clinical protocols and timely interventions, ensuring that patients receive optimal care.</p>	<p>2. Improve care outcomes</p>	<p>2. Clinical protocols</p>		
<p>Incorporating patient-centered care in emergency nursing allows for improved patient satisfaction, reduces anxiety, and leads to better health outcomes by empowering patients in the decision-making process.</p>	<p>1. Patient-centered care 2. Empower patients in care decisions</p>	<p>3. Patient satisfaction</p>	<p>Emergency Nursing Optimization and Impact</p>	
<p>Emergency care efficiency relies heavily on the proper allocation of resources, which includes staff, equipment, and facilities, ensuring that care is delivered without unnecessary delays.</p>	<p>1. Proper resource allocation 2. Ensure timely care delivery</p>	<p>4. Timeliness in care</p>		
<p>Technological advancements such as electronic health records (EHRs), telemedicine, and diagnostic tools have revolutionized emergency nursing by streamlining care processes and improving patient safety.</p>	<p>1. Technological advancements 2. Improve patient safety</p>	<p>1. EHRs, telemedicine</p>		<p>Emergency Nursing</p>

<p>Technology has been integrated into emergency nursing practices in Finland, helping healthcare providers respond to patients more effectively and improving the speed and accuracy of diagnoses.</p>	<ul style="list-style-type: none"> 1. Technology integration 2. Improve diagnosis speed 	<ul style="list-style-type: none"> 2. Real-time diagnosis 	<p>Technology Integration in Emergency Care</p>	
<p>Patient care in emergency nursing is enhanced by technological innovations, including the use of digital systems for real-time monitoring and remote consultations, leading to quicker and more accurate medical interventions.</p>	<ul style="list-style-type: none"> 1. Digital systems for real-time monitoring 2. Remote consultations 	<ul style="list-style-type: none"> 3. Real-time patient monitoring 		
<p>The impact of technology in emergency nursing is significant, with advancements in information systems leading to improved accuracy in diagnosis, enhanced communication, and better patient outcomes.</p>	<ul style="list-style-type: none"> 1. Improve diagnosis accuracy 2. Enhance communication and patient outcomes 	<ul style="list-style-type: none"> 4. Information systems and communication 		

<p>Optimizing resource allocation in emergency departments requires analyzing patient flow, staffing levels, and equipment usage to reduce waiting times and improve patient care.</p>	<ul style="list-style-type: none"> 1. Analyze patient flow 2. Optimize staffing levels 	<ul style="list-style-type: none"> 1. Patient flow analysis 		
<p>In emergency departments, best practices for resource management focus on ensuring adequate staffing, streamlining operations, and utilizing technology for real-time tracking to improve patient care efficiency.</p>	<ul style="list-style-type: none"> 1. Streamline operations 2. Utilize real-time tracking technology 	<ul style="list-style-type: none"> 2. Staffing and real-time tracking technology 	<p>Resource Management in Emergency Care</p>	
<p>In Finland, protocols and best practices in emergency nursing have been integrated to optimize care delivery, improving patient outcomes and ensuring high standards of practice in emergency settings.</p>	<ul style="list-style-type: none"> 1. Integrate protocols and best practices 2. Ensure high standards of care delivery 	<ul style="list-style-type: none"> 1. Protocol integration and high standards of care 	<p>Emergency Nursing Efficiency and Quality Improvement</p>	
<p>Effective resource management in emergency departments is key to providing timely, high-quality care to patients. Strategies such</p>	<ul style="list-style-type: none"> 1. Optimize staffing 			

as optimizing staffing and patient flow have been shown to improve outcomes.	2. Improve patient flow	2. Staffing and patient flow		
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