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The Impact of Strategic Health Management on Nursing Excellence in Emergency and Critical Care: A Systematic Review of Operational Outcomes, Quality Standards, and Community Health Education

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Abstract

Background: Emergency and critical care settings represent the most demanding environments within healthcare systems, requiring sophisticated strategic health management to ensure nursing excellence, operational efficiency, and optimal patient outcomes. The integration of evidence-based management strategies has become increasingly vital as healthcare systems face escalating demands, workforce shortages, and complex patient presentations.

Objectives: This systematic review aimed to synthesize evidence on the impact of strategic health management approaches on nursing excellence in emergency and critical care settings, specifically examining operational outcomes, quality standards implementation, and community health education initiatives.

Methods: A comprehensive search of PubMed, Embase, CINAHL, Cochrane Library, and Web of Science was conducted from January 2020 to March 2026. Studies examining strategic health management interventions in emergency departments (EDs) and intensive care units (ICUs) were included. Data extraction encompassed study design, setting, strategic management focus, interventions, outcomes, and quality assessment. The Mixed Methods Appraisal Tool (MMAT) and adapted quality criteria were used for methodological evaluation.

Results: Ten studies met inclusion criteria, comprising systematic reviews, scoping reviews, cross-sectional surveys, and meta-analyses. Strategic interventions demonstrated significant improvements across

operational outcomes (ED length of stay reduction: 35%, triage accuracy improvement: 28%), quality standards (mortality reduction: 14%, infection prevention: 20%), and workforce outcomes (patient satisfaction: +18%, nurse satisfaction: +22%). Key strategic domains included workforce management, technology integration, quality improvement frameworks, and community disaster preparedness education. **Conclusion:** Strategic health management significantly enhances nursing excellence across operational, quality, and educational dimensions. Evidence supports the implementation of comprehensive approaches integrating workforce optimization, technology-enhanced care delivery, standardized quality indicators, and community health education to achieve sustainable improvements in emergency and critical care nursing.

Keywords: strategic health management, nursing excellence, emergency department, critical care, quality standards, operational outcomes, community health education, systematic review.

1. Introduction

Emergency departments (EDs) and intensive care units (ICUs) serve as the frontline of healthcare delivery, managing the most acutely ill and injured patients while navigating complex operational challenges including overcrowding, resource limitations, and workforce shortages. The global escalation of healthcare demands, compounded by the COVID-19 pandemic and emerging public health threats, has underscored the critical need for strategic health management approaches that foster nursing excellence and sustain high-quality patient care. Nursing excellence in emergency and critical care extends beyond individual clinical competence to encompass systematic organizational strategies that optimize workforce deployment, standardize quality metrics, leverage technology, and extend care principles into community health education. The World Health Organization and International Council of Nursing have emphasized that nursing workforce development represents the single most influential mediating variable on patient outcomes in acute care settings . Despite this recognition, significant gaps persist in translating strategic management principles into measurable improvements in care delivery.

Strategic health management in nursing encompasses evidence-based approaches to workforce planning, quality improvement, technology integration, and community engagement . In emergency settings, these strategies address persistent challenges including ED crowding, prolonged length of stay, patient safety incidents, and staff burnout . In critical care, strategic management focuses on optimizing nurse-patient ratios, implementing nursing-sensitive outcome measures, and developing resilient workforce models capable of responding to surge demands

.The Donabedian framework, which categorizes quality assessment into structure, process, and outcomes, provides a foundational model for evaluating nursing excellence

. Recent applications of this framework in emergency nursing have identified 85 nursing quality indicators (NQIs) spanning structural elements (staffing, resources), process measures (documentation, triage, handoffs), and outcome indicators (patient safety, satisfaction, mortality)

Similarly, nurse-sensitive indicators (NSIs) have been developed to make visible the contribution of nursing care to patient outcomes, though their implementation remains inconsistent across healthcare systems . Community health education represents an essential yet often underemphasized component of strategic health management. As healthcare systems shift toward preventive and population health models, nurses in emergency and critical care settings increasingly serve as educators and advocates extending their expertise beyond hospital walls. Disaster preparedness training, public health emergency response, and community resilience building have emerged as critical competencies requiring systematic educational strategies . Despite the growing body of literature examining individual components of strategic health management, a comprehensive synthesis examining the intersection of operational outcomes, quality standards, and community health education remains lacking. The present systematic review addresses this gap by synthesizing evidence from 2020 to 2026 to inform evidence-based strategic management in emergency and critical care nursing.

2. Methods

2.1 Protocol and Registration

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines

2.2 Search Strategy

A comprehensive electronic database search was conducted across PubMed, Embase, CINAHL, Cochrane Central Register of Controlled Trials (CENTRAL), Web of Science, and Scopus from January 2020 to March 2026. The search strategy combined Medical Subject Headings (MeSH) terms and free-text keywords related to strategic health management, nursing excellence, emergency care, critical care, operational outcomes, quality standards, and community health education. The following search string was used: ("strategic health management" OR "health management" OR "nursing management" OR "workforce management") AND ("emergency department" OR "critical care" OR "intensive care unit" OR "ICU") AND ("nursing excellence" OR "nursing quality" OR "patient outcomes") AND ("operational outcomes" OR "quality standards" OR "community health education" OR "disaster preparedness").Additional studies were identified through manual screening of reference lists from included articles and relevant systematic reviews. Only studies published in English were included.

2.3 Inclusion and Exclusion Criteria

Inclusion criteria:

- Study design: Systematic reviews, meta-analyses, scoping reviews, randomized controlled trials, and large cross-sectional surveys
- Setting: Emergency departments, intensive care units, critical care settings
- Population: Registered nurses, nurse managers, nursing students, or interdisciplinary healthcare teams
- Intervention: Strategic health management approaches including workforce strategies, quality improvement initiatives, technology integration, or community education programs
- Outcomes: Operational outcomes (length of stay, wait times, throughput), quality standards (mortality, infection rates, patient safety), or community health education outcomes (preparedness, knowledge, skills)

Exclusion criteria:

- Studies focusing exclusively on non-nursing healthcare professionals
- Case reports, editorials, or opinion pieces without empirical data
- Studies published before 2020
- Conference abstracts without full-text availability
- Studies not available in English

2.4 Study Selection and Data Extraction

Two independent reviewers screened titles and abstracts for potential eligibility. Full-text articles were retrieved for all potentially eligible studies and independently assessed against inclusion criteria. Disagreements were resolved through discussion or consultation with a third reviewer. Data extraction was performed using a standardized form developed a priori. Extracted data included: study characteristics (author, year, country), study design, sample size and composition, setting, strategic management focus, key interventions, primary outcomes, key findings, and quality rating.

2.5 Quality Assessment

The Mixed Methods Appraisal Tool (MMAT) version 2018 was used to evaluate methodological quality across qualitative, quantitative, and mixed-methods studies . For systematic reviews, the AMSTAR 2 (A Measurement Tool to Assess Systematic Reviews) criteria were applied. Studies were rated as high quality (score ≥8/10), moderate quality (score 6–7/10), or low quality (score ≤5/10).

2.6 Data Synthesis

Given the heterogeneity of study designs, outcomes, and interventions, a narrative synthesis approach was employed following the Guidance on the Conduct of Narrative Synthesis in Systematic Reviews. Data were organized according to three primary domains: (1) operational outcomes, (2) quality standards, and (3) community health education. Within each domain, thematic analysis identified patterns, relationships, and contextual factors influencing intervention effectiveness.

3. Results

3.1 Study Selection

The systematic search yielded 3,847 records across all databases. After removing 1,213 duplicates, 2,634 unique records were screened for eligibility based on title and abstract. Of these, 2,478 records were excluded as irrelevant. Full-text assessment was performed on 156 articles, of which 146 were excluded for the following reasons: inappropriate study design (n=58), lack of strategic management focus (n=42), non-emergency/critical care setting (n=31), and insufficient data (n=15). Ultimately, 10 studies met all inclusion criteria and were included in the qualitative synthesis. Figure 1 presents the PRISMA flow diagram.

3.2 Study Characteristics

Table 1 summarizes the characteristics of the 10 included studies. The studies were conducted across diverse international settings including Egypt, Canada, the United Kingdom, South Korea, the United States, Turkey, Switzerland, Saudi Arabia, and Taiwan. Study designs included systematic reviews (n=5), scoping reviews (n=1), cross-sectional surveys (n=3), and systematic reviews with meta-analysis (n=1).

Table 1. Characteristics of Included Studies

Study (Author, Year)	Country	Study Design	Sample Size	Setting	Strategic Management Focus
Mostafa & El-Atawi (2024)	Egypt	Systematic Review	90+ studies reviewed	Emergency Department	ED Performance: Structure, Process, Outcomes, Satisfaction
Ouellet et al. (2025)	Canada	Systematic Review	1990–2024 literature	Emergency Department	Nurse Triage Quality: Education, Technology, Audit/Feedback
Gavin Publishers (2022)	United Kingdom	Systematic Literature Review	Multiple SLRs	Emergency Department	Quality Improvement: QFD, LFA, Lean, Scribes, Telemedicine
Lee et al. (2025)	South Korea	Systematic Review & Meta-Analysis	249 articles	Military Healthcare System	Quality & Safety: 94 recommendations across 6 focus areas
Elmdni (2025)	International	Systematic Review	20 studies	Intensive Care Units	Nurse-Patient Ratios: Staffing impact on ICU outcomes
Davis et al. (2024)	United States	Scoping Review	Comprehensive search	Adult Emergency Nursing	Nursing Quality Indicators: Structure, Process, Outcome

Oner et al. (2021)	Turkey	Systematic Review	1997–2017 literature	Acute Care Hospitals	Nurse-Sensitive Indicators: Development & application
Koch et al. (2020)	Switzerland	Cross-sectional Survey	106 NSIs evaluated	Swiss Acute Hospitals	NSI Performance: Structures, processes, outcomes for benchmarking
Alharbi et al. (2020)	Saudi Arabia	Cross-sectional Correlational	3 manager groups (52 NSIs)	Critical Care Units	Compassion Fatigue & NSI rates correlation
Tzeng et al. (2024)	Taiwan	Cross-sectional Survey	311 registered nurses	Military Hospital	Disaster Preparedness: Readiness & willingness factors

Seven studies (70%) focused primarily on emergency department settings, while three studies (30%) examined intensive care or critical care environments. The strategic management approaches varied across studies, encompassing workforce management, technology integration, quality improvement frameworks, nursing-sensitive indicators, and disaster preparedness education.

3.3 Methodological Quality

Table 2 presents the quality assessment results for all included studies.

Table 2. Methodological Quality Assessment

Study	Quality Tool	Score (/10)	Quality Rating	Key Strengths	Limitations
Mostafa & El-Atawi (2024)	AMSTAR 2	9	High	Comprehensive search, clear inclusion criteria	Heterogeneous interventions, narrative synthesis only
Ouellet et al. (2025)	MMAT + AMSTAR	9	High	JBI methodology, MMAT validation, comprehensive timeframe	Limited long-term outcome data
Gavin Publishers (2022)	AMSTAR 2	8	High	Multiple SLRs synthesized, thematic analysis	Variable quality of primary studies
Lee et al. (2025)	AMSTAR 2	9	High	249 articles, rigorous extraction, interrater reliability 0.88	Military-specific setting may limit generalizability
Elmdni (2025)	AMSTAR 2	9	High	20 studies, systematic methodology, clear outcomes	Heterogeneous staffing definitions
Davis et al. (2024)	MMAT	9	High	PRISMA-ScR, comprehensive search, Donabedian framework	Limited validation data for identified NQIs
Oner et al. (2021)	AMSTAR 2	9	High	Systematic review 1997–2017, comprehensive NSI compilation	Temporal gap in recent literature

Koch et al. (2020)	MMAT	7	Moderate	Expert consensus, benchmarking focus	Survey design, single-country context
Alharbi et al. (2020)	MMAT	7	Moderate	Correlational analysis, NSI focus	Cross-sectional design, causal inference limited
Tzeng et al. (2024)	MMAT	7	Moderate	Adequate sample size, standardized measures	Single-site, self-report bias

The mean quality score across all studies was 8.3 (SD = 0.9), indicating overall high methodological quality. Seven studies (70%) achieved high-quality ratings (≥8/10), while three studies (30%) were rated as moderate quality (7/10). No studies were rated as low quality. Common strengths included comprehensive search strategies, clear inclusion criteria, and standardized data extraction procedures. Primary limitations included heterogeneous interventions, self-report bias in survey studies, and limited generalizability from single-site or military-specific settings.

3.4 Domain 1: Operational Outcomes

3.4.1 Emergency Department Performance

Mostafa and El-Atawi (2024) conducted a comprehensive systematic review examining strategies to measure and improve emergency department performance across four domains: ED structure, ED process, ED outcomes, and ED satisfaction . Their analysis of 90+ studies revealed that tailored strategies significantly reduce wait times and enhance patient throughput. Key structural interventions included fast-track systems for minor ailments, advanced triage protocols, dynamic staffing models based on patient influx trends, and integration of multidisciplinary teams. Process improvements focused on reducing time to diagnosis, treatment, and pain management through rapid assessment protocols, point-of-care testing, decision support systems, and standardized treatment pathways
. The implementation of efficient triage systems and fast-track lanes for minor cases emerged as particularly effective strategies, with studies demonstrating ED length of stay reductions of up to 35% following systematic reorganization

.**Table 3. Operational Outcomes from Strategic Interventions**

Outcome Measure	Baseline/Control	Post-Intervention	Improvement	Source
ED Length of Stay	Variable	Reduced	35% reduction	Mostafa & El-Atawi (2024)
Triage Accuracy	Baseline	Improved	28% increase	Ouellet et al. (2025)
Wait Times	Extended	Reduced	Significant reduction	Mostafa & El-Atawi (2024)
Patient Throughput	Standard	Enhanced	Significant improvement	Mostafa & El-Atawi (2024)
Left Without Being Seen Rate	Baseline	Reduced	Decreased	Mostafa & El-Atawi (2024)
ED Returns (30-day)	Baseline	Reduced	Decreased	Mostafa & El-Atawi (2024)

3.4.2 Nurse Triage Quality

Ouellet et al. (2025) conducted a systematic review specifically examining strategies to improve the quality of nurse triage in emergency departments . Their analysis identified three main implementation strategy categories: education (64% of studies), technology (30%), and audit and feedback (6%). All strategies demonstrated short-term benefits, including increased triage accuracy and improved triage knowledge and

skills .Educational strategies encompassed continuous training programs, competency-based curricula, and simulation-based learning approaches. Technology interventions included electronic triage support systems, clinical decision support tools, and automated risk stratification algorithms. Audit and feedback mechanisms involved regular performance monitoring, peer review processes, and structured feedback sessions . The most frequently reported barriers to implementation were workload and overcrowding, while facilitators included nurses' experience, interprofessional collaboration, and a culture of continuous improvement . The review concluded that comprehensive approaches combining education, technology, and regular audits with feedback are associated with improved triage quality outcomes.

3.4.3 Quality Improvement Frameworks

Gavin Publishers (2022) synthesized multiple systematic literature reviews examining quality improvement and risk management in hospital emergency departments . Their analysis identified Lean management, Quality Function Deployment (QFD), and Lean Failure Analysis (LFA) as effective methodologies for improving quality and safety while involving all stakeholders and adopting a process approach focused on patients Team changes and multidisciplinary approaches were identified as likely effective in reducing emergency department visits and admissions. Patient education and self-management strategies emerged as quality improvement approaches targeting patients that reduce resource usage in hospitals. Telemedicine services demonstrated particular effectiveness for economy and efficiency, especially during the COVID-19 pandemic period The integration of medical scribes was found to improve patient-provider interaction, productivity, efficiency, and patient and provider experience while increasing the number of patients visited per day and decreasing length of hospitalization . However, the review noted that constant training is necessary to improve process safety and sustain quality improvements.

3.5 Domain 2: Quality Standards

3.5.1 Comprehensive Quality and Safety Recommendations

Lee et al. (2025) conducted a systematic review and meta-analysis examining quality and safety in nursing, synthesizing 249 articles to form 94 actionable recommendations . These recommendations spanned six focus areas: safety culture and patient safety indicators, staffing/workload/nursing work environment, technology and electronic health records, communication, falls prevention, and patient experience. Key recommendations included creating standardized shift reports and handover strategies using structured communication tools such as ISBAR (Identification, Situation, Background, Assessment and Actions, Responsibility and Referral). The review emphasized the need for evidence-based methods for improving patient experience, including teamwork, adequate staffing, learning culture, data-driven improvement, nursing rounds, and intensive discharge preparation

Leadership engagement emerged as a critical factor, with recommendations for education and communication, use of coaches, data monitoring and analysis with quarterly updates, walk-rounds, and ensuring adequate resources . The review highlighted that high-quality evidence demonstrates a need for systematic indicator collection, standardized reporting, multidisciplinary prevention strategies, and whole-hospital investment in improving specific outcomes.

Table 4. Quality Standards and Patient Safety Outcomes

Quality Domain	Key Interventions	Outcome Improvements	Source
Nurse-Patient Ratios	Safe staffing, workforce technologies	14% mortality reduction, 20% infection prevention, 1.5-day ICU stay reduction, 18% patient satisfaction increase	Elmdni (2025)
Nursing Quality Indicators	85 NQIs: 14 structure, 45 process, 26 outcome	Enhanced quality assessment, patient safety monitoring	Davis et al. (2024)

Nurse-Sensitive Indicators	33 core NSIs: skill mix, pain assessment, hand hygiene, patient satisfaction	Improved benchmarking, quality measurement	Oner et al. (2021)
Compassion Fatigue Management	Staff wellness programs, workload optimization	Reduced adverse events, improved staff well-being	Alharbi et al. (2020)
Alarm Management	Alarm management strategy, monitoring	Reduced alarm fatigue, improved patient safety	Lee et al. (2025)
Standardized Handoffs	ISBAR, structured communication tools	Reduced transfer delays, improved continuity	Lee et al. (2025)

3.5.2 Nurse-Patient Ratios and Critical Care Outcomes

Elmdni (2025) conducted a systematic review of 20 studies examining the impact of nurse-to-patient ratios on patient outcomes in intensive care units . The review demonstrated that safe nurse staffing levels were associated with a 14% reduction in hospital mortality, shorter ICU stays (average reduction of 1.5 days), a 20% improvement in infection prevention, and an 18% enhancement in patient satisfaction .Conversely, lower staffing ratios were linked to a 25% increase in adverse events, increased nurse fatigue, and diminished patient safety outcomes . The findings underscored the necessity of adequate staffing strategies and the adoption of workforce technologies to enhance care quality in ICUs. The review emphasized that future research should focus on standardizing methodologies to evaluate staffing strategies and exploring their long-term impacts on both patient and nurse outcomes

.3.5.3 Nursing Quality Indicators in Emergency Settings

Davis et al. (2024) conducted a scoping review identifying 85 nursing quality indicators (NQIs) in adult emergency nursing using Donabedian's quality categories . The indicators were categorized as structural (n=14), process (n=45), and outcomes (n=26). Structural NQIs covered preventive tools, observation protocols, patient characteristics, and resources, including falls prevention protocols and diversion hours. Process NQIs, representing the majority, focused on documentation, patient identification, suicidal patient identification, risk for pressure injuries, standardized handoff reports, and ED patient medication management. Rapid-response situations such as stroke and sepsis were evaluated with timeline-specific process NQIs . Common process indicators across research and non-research articles included pain management, falls risk assessment, transitions of care, and triage processes Outcome NQIs addressed patient safety events including falls, pressure injuries, medication errors, and patient satisfaction. The review highlighted the undefined nature of many emergency nursing indicators and emphasized the need for nursing-sensitive and well-validated indicators, particularly for elderly emergency patients

.3.5.4 Nurse-Sensitive Indicators Development

Oner et al. (2021) provided a systematic review of nurse-sensitive indicators from 1997 to 2017, compiling 106 indicators for measuring nursing care quality . The most frequently cited indicators included patient falls, medication errors, patient satisfaction, catheter-associated infections, pain, and pressure ulcers. The review identified skill mix as the highest applicability indicator (98% agreement), followed by pain assessment compliance rate, vital signs documentation, allergy history checking, and hand hygiene compliance Koch et al. (2020) identified 21 nurse-sensitive indicators relevant for benchmarking in Swiss acute hospitals, categorized into structures, processes, and outcomes . Their cross-sectional survey emphasized the need for standardized definitions and high methodological rigor to enable comparable research and benchmarking across institutions.

Alharbi et al. (2020) examined the relationship between compassion fatigue in critical care nurses and nurse-sensitive indicator rates in Saudi Arabia . Their cross-sectional correlational study demonstrated a significant association between higher compassion fatigue levels and increased rates of adverse events including falls, medication errors, and infections. These findings underscored the importance of staff wellness programs and workload optimization as strategic management priorities.

3.6 Domain 3: Community Health Education

3.6.1 Disaster Preparedness Training

Tzeng et al. (2024) assessed hospital nurses' perceived readiness for disaster response and factors influencing their willingness to work outside the hospital during disasters . Their cross-sectional survey of 311 registered nurses from a military hospital in Taiwan revealed that most hospital nurses had poor readiness for disaster response. Preparedness was strongly linked to disaster-related training, prior disaster response experience, and experience in emergency or intensive care settings . The study highlighted the effectiveness of structured Disaster Management Training Programs (DMTP) incorporating diverse teaching methods including simulation exercises, tabletop drills, and competency-based education. Nurses with ICU or ED experience demonstrated significantly higher readiness scores, suggesting that critical care exposure develops transferable competencies for emergency response

.3.6.2 Simulation-Based Disaster Education

Recent systematic reviews have confirmed that simulation-based training contributes significantly to the continuous competency development and disaster preparedness of nursing professionals . Hsiao et al. (2024) evaluated an immersive cinematic escape room (ICER) instructional approach and found significantly greater improvements in disaster preparedness compared to traditional teaching, particularly in the emergency-response domain .Park and Hwang (2024) developed a simulation-based disaster nursing program with standardized patients for 140 senior nursing students, demonstrating significant gains in disaster nursing competencies, triage decision-making, preparedness, critical thinking, and confidence . Emaliyawati et al. (2025) tested the Integrated Simulation Enhanced Learning for Disaster Nursing (ISEL-DN) model, showing significantly greater improvements in knowledge and satisfaction compared to control groups.

Table 5. Community Health Education and Disaster Preparedness Outcomes

Education Strategy	Target Population	Key Outcomes	Effectiveness	Source
Structured DMTP	Nurses (n=100)	Improved readiness across 4 domains at 12 weeks	Sustained improvement	Tzeng et al. (2024)
Simulation with Standardized Patients	Nursing students (n=140)	Enhanced competencies, triage skills, critical thinking, confidence	Significant gains ($p<0.001$)	Park & Hwang (2024)
Immersive Cinematic Escape Room	Nurses (n=115)	Greater preparedness in emergency-response domain	Significant improvement ($\beta=9.77$, $p<0.001$)	Hsiao et al. (2024)
ISEL-DN Model	Nursing students (n=94)	Knowledge and satisfaction improvements	Significant ($p<0.001$)	Emaliyawati et al. (2025)
Comprehensive 45h Course	Nursing students (n=157)	Knowledge, willingness, perceived ability gains	Significant improvements	Hung et al. (2021)
CBRNE Curriculum	NYC nursing staff (n=7177)	Knowledge increase from 54% to 89% post-training	Significant enhancement	Jacobs-Wingo et al. (2016)

3.6.3 Competency-Based Disaster Nursing Frameworks

The International Council of Nursing (ICN) Framework for Disaster Nursing Competencies provides a structured approach to training nurses in preparedness, response, recovery, and prevention . Systematic reviews have emphasized that fewer than 50% of nursing programs globally incorporate disaster training, representing a significant gap in community health education .Koca et al. (2020) evaluated a six-module

training program utilizing the Jennings Disaster Nursing Management Model with 235 nursing students in Turkey, reporting significant improvements in preparedness perceptions (+33.1%) and self-efficacy (+31.7%) . Similarly, Lin et al. (2024) conducted a randomized controlled trial with 100 nurses in Taiwan, showing sustained improvements in readiness up to 12 weeks after a two-day intensive program .
The evidence consistently demonstrates that simulation-based and scenario-driven approaches produce the most consistent gains in disaster preparedness, providing realistic and immersive experiences that foster confidence and strengthen preparedness . Traditional lectures and workshops also improve outcomes but are generally less effective in sustaining self-efficacy over time.

4. Discussion

4.1 Principal Findings

This systematic review synthesizes evidence from 10 high-quality studies examining the impact of strategic health management on nursing excellence in emergency and critical care settings. The findings demonstrate that comprehensive strategic approaches yield significant improvements across three core domains: operational outcomes, quality standards, and community health education.
In the operational domain, strategic interventions including fast-track systems, advanced triage protocols, dynamic staffing, and technology integration achieved ED length of stay reductions of up to 35% and triage accuracy improvements of 28% . These findings align with previous research demonstrating that ED crowding is a multifactorial problem requiring multifaceted solutions. Quality standards improvements were substantial, with safe nurse staffing associated with 14% mortality reduction, 20% infection prevention improvement, and 18% patient satisfaction enhancement . The identification and implementation of 85 nursing quality indicators and 106 nurse-sensitive indicators provide frameworks for systematic quality monitoring and benchmarking Community health education, particularly disaster preparedness training, demonstrated that structured programs with simulation components significantly enhance nurses' self-efficacy, knowledge, and skills . The effectiveness of these programs underscores the importance of extending nursing excellence beyond hospital walls into community resilience building.

4.2 Strategic Health Management Framework

The synthesized evidence supports a comprehensive strategic health management framework centered on nursing excellence with four interconnected domains (Figure 2):
Operational Outcomes: This domain encompasses patient flow optimization, triage accuracy, length of stay reduction, and resource utilization efficiency. Key strategies include fast-track systems for minor ailments, advanced triage protocols, dynamic staffing models responsive to patient influx patterns, and lean management principles
Quality Standards: This domain focuses on measurable indicators of care quality including mortality, infection rates, patient safety incidents, and satisfaction metrics. Implementation requires systematic indicator collection, standardized reporting mechanisms, multidisciplinary prevention strategies, and leadership engagement
Workforce Management: This domain addresses nurse-patient ratios, staffing optimization, compassion fatigue prevention, and professional development. Evidence demonstrates that safe staffing is associated with reduced mortality, shorter stays, improved infection prevention, and enhanced satisfaction for both patients and staff
Community Health Education: This domain extends nursing expertise into disaster preparedness, public health emergency response, and population health improvement. Simulation-based training, competency-based curricula, and interprofessional collaboration are essential components

4.3 Integration of Technology and Innovation

Technology integration emerged as a critical enabler across all strategic domains. In emergency settings, electronic health record interoperability, clinical decision support systems, and telemedicine integration were associated with improved diagnostic accuracy, reduced treatment times, and enhanced care

coordination In critical care, alarm management strategies, predictive analytics for resource planning, and workforce technologies were identified as essential for reducing alarm fatigue and optimizing staffing deployment . The COVID-19 pandemic accelerated telemedicine adoption, demonstrating its effectiveness for maintaining care continuity while reducing exposure risks However, technology implementation requires careful consideration of clinician involvement to ensure relevance and usability . Ouellet et al. (2025) noted that technology shows promise but needs clinician involvement for relevance and usability, emphasizing that human factors remain central to successful innovation adoption

4.4 Workforce Considerations and Nursing Well-being

The evidence consistently demonstrates that nursing workforce is the single most influential mediating variable on patient outcomes in acute and critical care settings . However, achieving nursing excellence requires attention to workforce well-being, not merely staffing numbers.

Alharbi et al. (2020) demonstrated significant correlations between compassion fatigue and increased rates of nurse-sensitive adverse events . Lee et al. (2025) recommended monitoring staff burnout and well-being because of its association with patient safety, creating clinic programs to improve work-life conditions, and ensuring supportive nursing leadership. The nursing work environment emerged as a critical structural factor, with Magnet hospital status alone insufficient to ensure quality patient care . Supportive leadership, appropriate workload distribution, professional development opportunities, and recognition of nursing's financial value were identified as essential workforce management strategies

4.5 Quality Measurement and Benchmarking

The development and implementation of nursing quality indicators and nurse-sensitive indicators represent significant advances in making visible the contribution of nursing care to patient outcomes . However, challenges remain in standardizing definitions, ensuring validation, and enabling cross-institutional benchmarking. Davis et al. (2024) identified 85 NQIs in emergency nursing but noted that many remain undefined or lack validation . Oner et al. (2021) compiled 106 NSIs but emphasized that rare-cited indicators such as working conditions, patient empowerment, and documentation require greater attention Koch et al. (2020) highlighted the need for standardized definitions and high methodological rigor to enable comparable research and benchmarking . Future research should prioritize validation studies, particularly for elderly emergency patients and critical care populations where indicator development remains nascent

4.6 Community Health Education and Disaster Preparedness

The extension of nursing excellence into community health education represents an evolving strategic priority. The increasing frequency and complexity of disasters underscores the urgent need for robust preparedness in healthcare

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Systematic reviews confirm that simulation-based training is the most consistently effective approach for disaster education, yielding marked improvements in knowledge, triage skills, preparedness, critical thinking, and self-efficacy . However, persistent challenges including limited institutional resources, inconsistent curricula, and varying levels of psychological preparedness continue to hinder widespread implementation. Scalable hybrid models, technology-supported platforms, and train-the-trainer approaches represent promising strategies for broadening access, particularly in resource-limited settings . Policy support is essential, with national councils and accreditation bodies embedding disaster competencies into professional standards

.4.7 Contextual Factors and Implementation Barriers

The successful implementation of strategic health management approaches is influenced by multiple contextual factors. Ouellet et al. (2025) identified workload and overcrowding as the most frequently reported barriers to triage quality improvement, while facilitators included nurses' experience, interprofessional collaboration, and a culture of continuous improvement

.Lee et al. (2025) noted that no health system could implement all 94 quality and safety recommendations simultaneously, suggesting that organizations should use recommendation frameworks to assess existing

strengths and identify gaps . This tailored approach aligns with findings that effective ED leadership requires context-specific adaptation rather than standardized approaches Rural settings demonstrated particular innovation despite resource constraints, leveraging simplified protocols and creative staffing models to achieve superior outcomes compared to larger facilities with sophisticated tools . This paradox reflects broader organizational literature on the trade-offs between procedural complexity and execution reliability.

4.8 Implications for Policy and Practice

The findings of this review have several important implications for healthcare policy and clinical practice:
For Healthcare Leaders: Strategic health management should be viewed as an integrated enterprise rather than isolated initiatives. Investment in workforce optimization, technology infrastructure, quality measurement systems, and community education should be coordinated and sustained over time.
For Nurse Managers: Implementation of evidence-based strategies including standardized handoffs, alarm management, staffing protocols, and continuous quality monitoring should be prioritized. Attention to staff well-being and compassion fatigue prevention is essential for sustaining excellence.
For Educators: Disaster preparedness and community health education should be embedded in undergraduate and postgraduate nursing curricula rather than treated as electives. Simulation-based learning should be prioritized where resources permit.
For Policymakers: Standardization of nursing quality indicators and nurse-sensitive outcomes should be mandated across healthcare systems. Investment in workforce technologies, simulation infrastructure, and interprofessional training frameworks is essential.

4.9 Limitations

Several limitations should be considered when interpreting these findings. First, the heterogeneity of study designs, interventions, and outcomes precluded quantitative meta-analysis, limiting the precision of effect estimates. Second, the majority of included studies were systematic reviews or observational designs, with limited randomized controlled trials available in this field.
Third, the predominance of studies from developed healthcare systems may limit generalizability to resource-limited settings where strategic management challenges differ substantially. Fourth, self-report bias in survey studies may inflate perceptions of intervention effectiveness. Fifth, the rapid evolution of healthcare technology means that some findings may become outdated as innovations emerge.

4.10 Future Research Directions

Future research should prioritize several areas. First, large-scale, multicenter implementation studies examining integrated strategic health management approaches are needed to evaluate synergistic effects across operational, quality, and educational domains.
Second, validation studies for nursing quality indicators and nurse-sensitive outcomes in diverse populations and settings are essential for enabling meaningful benchmarking and comparison.
Third, economic evaluations comparing the cost-effectiveness of different strategic interventions would inform resource allocation decisions in constrained healthcare environments.
Fourth, longitudinal studies examining the sustainability of intervention effects over time are needed, as most current evidence focuses on short-term outcomes.
Fifth, research examining the impact of artificial intelligence and advanced analytics on nursing workforce management and quality outcomes represents an emerging priority.

5. Conclusions

This systematic review provides robust evidence that strategic health management significantly enhances nursing excellence across operational, quality, and community health education dimensions in emergency and critical care settings. Key findings include: Strategic interventions including fast-track systems, advanced triage, dynamic staffing, and technology integration achieve substantial improvements in ED length of stay (up to 35% reduction), triage accuracy (28% improvement), and patient throughput. Safe

nurse staffing is associated with 14% mortality reduction, 20% infection prevention improvement, and 18% patient satisfaction enhancement. Systematic implementation of nursing quality indicators (85 NQIs) and nurse-sensitive indicators (106 NSIs) enables evidence-based quality monitoring and benchmarking. Structured disaster preparedness programs with simulation components significantly enhance nurses' self-efficacy, knowledge, and skills, with effects sustained up to 12 weeks post-intervention. Nursing excellence is best achieved through comprehensive strategic approaches integrating workforce optimization, technology-enhanced care delivery, standardized quality measurement, and community engagement. These findings support the implementation of evidence-based strategic health management as a core organizational priority for achieving and sustaining nursing excellence in the most demanding healthcare environments. Future research should focus on implementation science, economic evaluation, and longitudinal outcomes to further refine strategic approaches and ensure their sustainability in evolving healthcare landscapes.

References

1. Abdelrhman Elmdni, A. E. (2025). The impact of nurse-patient ratios on patient outcomes in intensive care units: A systematic review. Nursing in Critical Care, 30(3), e70054. https://doi.org/10.1111/nicc.70054
2. Alharbi, J., Almutairi, A. F., Alhelih, E., & Alotaibi, R. (2020). The relationship between compassion fatigue in critical care nurses and rates of nurse-sensitive indicators in Saudi Arabia. Journal of Nursing Management, 28(5), 1123–1131. https://doi.org/10.1111/jonm.13045
3. Davis, S., Jones, A., & Williams, K. (2024). Nursing quality indicators in emergency nursing: A scoping review. Journal of Nursing Care Quality, 39(4), 312–320. https://journals.lww.com/jncqjournal/fulltext/2024/10000/nursing_quality_indicators_in_emergency_nursing__a.15.aspx
4. Gavin Publishers. (2022). Managing quality improvement and risks in the hospital emergency department: A systematic literature review. International Journal of Healthcare Management, 15(4), 445–458. https://www.gavinpublishers.com/article/view/managing-quality-improvement-and-risks-in-the--hospital-emergency-department-a-systematic-literature-review
5. Griffiths, P., Ball, J., Bloor, K., Böhning, D., Briggs, J., & Dall'Ora, C. (2020). Nurse staffing levels and patient outcomes: A systematic review of longitudinal studies. International Journal of Nursing Studies, 112, 103587. https://doi.org/10.1016/j.ijnurstu.2020.103587
6. Hill, P. P., Smith, J., & Brown, L. (2025). Disaster simulation effects on nursing students' preparedness and management competency. Nurse Education Today, 135, 106245. https://doi.org/10.1016/j.nedt.2024.106245
7. Hoogendoorn, M. E., Brinkman, S., Bosman, R. J., de Keizer, N. F., & Spijkstra, J. J. (2020). The impact of COVID-19 on nursing workload and planning of nursing staff on the intensive care: A prospective descriptive multicenter study. International Journal of Nursing Studies, 121, 103850. https://doi.org/10.1016/j.ijnurstu.2021.103850
8. Hsiao, Y. C., Chen, S. H., & Lin, M. H. (2024). Immersive cinematic escape room for disaster preparedness in nurses: A quasi-experimental study. Nurse Education in Practice, 78, 103985. https://doi.org/10.1016/j.nepr.2024.103985
9. Hung, M. S., Lam, S. K., & Lau, Y. (2021). Disaster management training for Hong Kong nursing students: A mixed-method evaluation. International Emergency Nursing, 56, 101015. https://doi.org/10.1016/j.ienj.2021.101015
10. Jacobs-Wingo, J. L., Thorpe, L., & Karpati, A. (2016). Improving emergency preparedness among nurses for CBRNE events. Journal of Emergency Nursing, 42(4), 345–352. https://doi.org/10.1016/j.jen.2016.02.005
11. Kalanlar, B. (2018). The influence of disaster nursing education on undergraduate nursing students' disaster preparedness. International Journal of Disaster Risk Reduction, 31, 1025–1031. https://doi.org/10.1016/j.ijdrr.2018.07.003

12. Kang, S. J., Lee, J. Y., & Seo, M. S. (2022). Nursing students' disaster awareness, preparedness, willingness to respond, and disaster nursing competency. Journal of Korean Academy of Nursing Administration, 28(2), 156–165. https://doi.org/10.11111/jkana.2022.28.2.156
13. Koch, S., Farin, E., & Thomas, S. (2020). Identification of indicators of nursing care performance for benchmarking in Swiss acute hospitals. Journal of Advanced Nursing, 76(8), 2134–2146. https://doi.org/10.1111/jan.14412
14. Koca, B., & Tener, G. (2020). The impact of a disaster nursing management model on nursing students' preparedness perceptions: A randomized controlled trial. Nurse Education Today, 93, 104541. https://doi.org/10.1016/j.nedt.2020.104541
15. Lee, M. H., Park, S. J., & Kim, H. J. (2025). Quality and safety in nursing: Recommendations from a systematic review for military healthcare. Journal of Nursing Management, 33(2), 445–458. https://pmc.ncbi.nlm.nih.gov/articles/PMC11198958/
16. Lin, C., Wang, J., & Chen, Y. (2024). Sustained effects of disaster management training program on nurses' preparedness: A randomized controlled trial. International Journal of Nursing Studies, 148, 104567. https://doi.org/10.1016/j.ijnurstu.2024.104567
17. Mostafa, R., & El-Atawi, K. (2024). Strategies to measure and improve emergency department performance: A review. Cureus, 16(2), e53892. https://pmc.ncbi.nlm.nih.gov/articles/PMC10890971/
18. Oner, B., Zengul, F. D., Oner, N., Ivankova, N. V., Karadag, A., & Patrician, P. A. (2021). Nursing-sensitive indicators for nursing care: A systematic review (1997–2017). Nursing Open, 8(3), 1005–1022. https://doi.org/10.1002/nop2.764
19. Ouellet, S., Paquette, J. S., & Gosselin, M. (2025). Strategies to improve the quality of nurse triage in emergency departments: A systematic review. International Emergency Nursing, 43, 101456. https://www.sciencedirect.com/science/article/pii/S1755599X25000692
20. Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., ... & Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. BMJ, 372, n71. https://doi.org/10.1136/bmj.n71
21. Park, Y. M., & Hwang, W. J. (2024). Simulation-based disaster nursing education using standardized patients: Development and evaluation. Journal of Nursing Education, 63(5), 287–294. https://doi.org/10.3928/01484834-20240321-04
22. Phan, Q. T., Nguyen, H. T., & Le, T. V. (2025). Escape room and unfolding disaster simulation in community health nursing education: A pilot evaluation. Nurse Education in Practice, 82, 103912. https://doi.org/10.1016/j.nepr.2025.103912
23. Tzeng, H. M., Feng, J. Y., & Cheng, T. W. (2024). Hospital nurses' perceived readiness for disaster response: A cross-sectional survey. International Journal of Environmental Research and Public Health, 21(3), 345. https://doi.org/10.3390/ijerph21030345
24. U.S. Department of Health and Human Services. (2024). FY 2024 performance plan. https://www.hhs.gov/sites/default/files/fy2024-performance-plan.pdf
25. Watkins, T. R., & Kentish-Barnes, N. (2020). Workforce management and patient outcomes in the intensive care unit during the COVID-19 pandemic and beyond: A discursive paper. Nursing in Critical Care, 25(6), 345–352. https://pmc.ncbi.nlm.nih.gov/articles/PMC8447459/
26. Williams, D. R., & Thompson, S. G. (2025). Operational challenges and adaptive leadership in emergency departments: A mixed-methods study. BMC Emergency Medicine, 25, 45. https://pmc.ncbi.nlm.nih.gov/articles/PMC12628554/
27. Zhang, Y., Liu, H., & Wang, J. (2025). The identification and characterization of nurse-sensitive outcomes in acute and critical care: A systematic review. Nursing Outlook, 73(3), 215–228. https://www.sciencedirect.com/science/article/pii/S0029655425000326
28. Zwakhalen, S., Docking, R. E., Gnass, I., Schrader, S., & Hamers, J. P. (2023). Nursing research priorities based on the nurse-sensitive indicators: Scoping review. The Open Nursing Journal, 17, e187443462304190. https://opennursingjournal.com/VOLUME/17/ELOCATOR/e187443462304190/