Nursing Care Efficiency; A Concept Analysis

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Abstract

Nursing care efficiency has become a critical concern in contemporary healthcare due to increasing patient complexity, workforce shortages, digital transformation, and financial constraints. Despite its growing importance, the concept remains inconsistently defined across nursing, health informatics, and health systems research, leading to theoretical ambiguity and practical challenges in measurement and implementation. This paper presents a concept analysis of Nursing Care Efficiency using Walker and Avant's framework to clarify its meaning, defining attributes, antecedents, consequences, and empirical referents. A structured literature review informed the analysis, drawing on studies addressing nursing workload, staffing models, digital health systems, workflow design, and hospital performance. The analysis identifies three core defining attributes of nursing care efficiency: optimal resource utilization, streamlined workflow, and quality-preserving care delivery. Key antecedents include adequate and resilient staffing, interoperable digital systems, standardized documentation, and supportive leadership. Major consequences include improved patient safety, enhanced patient experience, reduced length of stay, decreased documentation burden, and greater organizational sustainability. Empirical referents encompass measurable indicators such as documentation time, workload indices, nurse-to-patient ratios, adverse events, patient satisfaction, and hospital efficiency scores. The findings demonstrate that nursing care efficiency is a multidimensional, sociotechnical construct that integrates human, technological, and organizational factors. This concept analysis provides a clear theoretical foundation to guide future research, inform policy development, and support practical interventions aimed at optimizing nursing practice and health system performance.

Keywords: Nursing care efficiency; nursing workflow; nurse staffing; digital health; patient safety

1. Introduction

Nursing care efficiency has emerged as a central concern in contemporary healthcare systems as hospitals confront rising patient demand, workforce shortages, rapid digital transformation, and escalating financial pressures. Nurses represent the largest professional group within healthcare and are pivotal to the delivery of safe, high-quality, and sustainable care. Despite their critical role, the concept of nursing care efficiency remains inconsistently defined in the literature and is frequently conflated with related constructs such as productivity, performance, or cost containment. This conceptual ambiguity complicates efforts to design evidence-based policies, management strategies, and clinical interventions

that both optimize nursing contributions and protect patient outcomes. Technological advancements, particularly in artificial intelligence and digital health, have fundamentally altered how nursing care is delivered, documented, and evaluated. Evidence shows that artificial intelligence applications in nursing such as predictive monitoring, clinical decision support, and automated documentation can enhance care quality and nurses' preparedness for clinical decision-making, positioning digital innovation as an important dimension of contemporary nursing efficiency (Ng et al., 2022). At the same time, efficiency is shaped not only by technology but also by organizational and operational conditions within hospitals. Ward-level operational efficiency has been shown to significantly predict nursing workload, demonstrating that efficiency is largely a systemic characteristic rather than an individual nurse attribute (Ren et al., 2025). Similarly, staffing models with higher baseline nurse numbers have been found to be more cost-effective and safer for patients than low-baseline flexible staffing approaches, reinforcing that efficiency must be balanced with adequate workforce capacity (Griffiths et al., 2021). Workflow design and health information systems further influence nurses' ability to work efficiently. Redesigning electronic health record documentation workflows has been associated with reduced documentation time, lower click burden, and improved productivity, enabling nurses to devote more time to direct patient care (Lindsay & Lytle, 2022). Complementary time-and-motion evidence shows that a substantial proportion of nursing activities can be streamlined, with standardized

time estimates helping to enhance care efficiency without compromising quality (Al-Moteri et al., 2023). At a broader level, systematic evidence indicates that investments in nursing education, clinical safety, and advanced practice roles contribute to both improved patient outcomes and hospital economic sustainability, highlighting nursing efficiency as both a clinical and financial imperative (Bárcenas-Villegas et al., 2025). Despite these advances, existing research tends to examine nursing efficiency through fragmented lenses focusing separately on technology, staffing, workflow, or economics without offering a unified conceptual definition. Moreover, efficiency is often measured using hospital-level indicators rather than being explicitly linked to nursing-sensitive processes and outcomes. Nursing-sensitive indicators have been proposed as valid measures that directly connect nursing care to patient outcomes and system performance; however, there remains no coherent conceptualization of what constitutes "nursing care efficiency" (Afaneh et al., 2021). This lack of conceptual clarity constrains the development of valid measurement tools, theoretical models, and targeted interventions. Given these gaps, a systematic concept analysis of nursing care efficiency is warranted. Guided by Walker and Avant's (2011) method, this paper seeks to clarify the defining attributes, antecedents, consequences, and empirical referents of nursing care efficiency. By synthesizing evidence across digital health, workforce management, workflow optimization, hospital operations, and quality outcomes, this analysis aims to establish a coherent conceptual foundation that can inform future research, guide managerial decision-making, and support policy development in nursing and healthcare systems.

2. Methodology

2.1 Selection of the Concept

The concept of Nursing Care Efficiency was deliberately selected because it has become increasingly central to contemporary nursing practice, patient safety, workforce sustainability, and health system performance. Healthcare systems today are characterized by rising patient complexity, chronic nursing shortages, rapid digital transformation, and financial constraints, all of which place significant pressure

on nurses to deliver high-quality care while using time and resources optimally. Despite extensive empirical research on efficiency in healthcare, the meaning of nursing care efficiency remains fragmented across nursing science, health informatics, and health economics, making conceptual clarification essential for theory, research, and practice (Yakusheva et al., 2024). The concept was chosen because empirical evidence consistently links nursing efficiency to patient outcomes, care quality, and organizational performance. Studies demonstrate that inefficient workflows, excessive documentation, and poor staffing allocation contribute to missed nursing care, increased workload, and professional burnout, whereas digital tools, standardized processes, and resilient staffing models can enhance both efficiency and quality of care (Griffiths et al., 2021). Nursing process software has been shown to improve clinical decision-making efficiency and reduce documentation burden in patient care settings (Hosseini et al., 2021). Furthermore, recent theoretical work reframes nursing as a human capital investment whose efficiency directly influences organizational sustainability and patient outcomes (Yakusheva et al., 2024). These findings justify the selection of nursing care efficiency as a critical concept requiring formal analysis.

2.2 Determination of the Aim of Analysis

The primary aim of this concept analysis is to clarify the meaning, attributes, antecedents, and consequences of Nursing Care Efficiency using Walker and Avant's method. Although many studies examine efficiency in healthcare, there is no consistent definition specific to nursing practice, which limits theoretical clarity and comparability across research. Some literature equates efficiency with productivity, others with time management, workload balance, or cost containment, while still others emphasize quality preservation, creating conceptual ambiguity that weakens evidence-based decision-making in nursing leadership (Yakusheva et al., 2024). A secondary aim is to differentiate nursing care efficiency from related concepts such as productivity, effectiveness, and performance. Efficiency refers to achieving desired outcomes with optimal use of resources, whereas effectiveness refers to whether outcomes are achieved, and productivity refers to the ratio of output to input (Wang & Jia, 2021). Clarifying these distinctions strengthens theoretical rigor and supports more precise research designs, measurement tools, and policy frameworks in nursing management. Another key aim is to connect nursing care efficiency with patient safety, workflow usability, and organizational sustainability. Evidence shows that redesigning electronic health record workflows significantly reduces documentation time, click burden, and cognitive workload while improving productivity (Lindsay & Lytle, 2022). Time–motion studies further indicate that eliminating non-value-added activities increases the time available for direct patient care without reducing care quality (Al-Moteri et al., 2023). At the system level, misallocation of healthcare resources has been shown to reduce actual utilization efficiency across hospitals and primary care facilities (Wang & Jia, 2021).

2.3 Identification of All Uses of the Concept

The concept of nursing care efficiency is used across clinical nursing, health informatics, health economics, and organizational management. In clinical nursing literature, efficiency is most commonly associated with workload management, documentation practices, staffing adequacy, and time allocation. Many studies highlight that excessive documentation reduces time available for direct patient care and

negatively affects both efficiency and professional satisfaction (Lindsay & Lytle, 2022). In health informatics, nursing care efficiency is closely linked to digital technologies such as electronic health records, standardized terminologies, and decision-support systems. Standardized nursing terminologies have been shown to facilitate care planning, reduce errors, and support evidence-based practice, thereby indirectly improving efficiency (Zhang et al., 2021). Interoperable electronic health records have been associated with improved medication safety, fewer adverse events, and better care coordination, although findings vary across settings (Li et al., 2022). Immersive virtual reality has also been used in nursing education to enhance cognitive and psychomotor performance, preparing nurses for more efficient clinical practice (Choi et al., 2022). In health economics and workforce planning, efficiency is conceptualized in terms of technical and allocative efficiency, focusing on how nursing resources are distributed and utilized within healthcare systems. Simulation studies show that resilient baseline staffing improves both efficiency and patient outcomes compared with minimal staffing strategies (Griffiths et al., 2021). Network consolidation of health workforce resources has been shown to reduce workload per worker and enhance system-level allocative efficiency (Jithitikulchai, 2022). Ward-level operational efficiency has also been linked to nursing workload based on case mix, bed occupancy, and patient acuity (Ren et al., 2025).

2.4 Determination of Defining Attributes

Three defining attributes of nursing care efficiency were identified: optimal resource utilization, streamlined workflow, and quality-preserving care delivery. Optimal resource utilization refers to the effective allocation of nursing time, skills, and staffing to meet patient needs without waste or overload. Evidence shows that misallocation of healthcare resources reduces actual utilization efficiency across health systems (Wang & Jia, 2021). Conversely, network consolidation strategies can improve workforce efficiency by redistributing workload more equitably (Jithitikulchai, 2022). Streamlined workflow emphasizes minimizing unnecessary documentation, reducing cognitive burden, and aligning digital systems with clinical practice. Redesigning electronic health record documentation significantly reduces documentation time, click burden, and redundancy while improving productivity (Lindsay & Lytle, 2022). Nursing process software has also been shown to enhance clinical decision-making efficiency and reduce documentation errors (Hosseini et al., 2021). Standardized nursing terminologies further support efficient care planning and monitoring of patient outcomes (Zhang et al., 2021). Quality-preserving care delivery ensures that efficiency improvements do not compromise patient safety or outcomes. Resilient staffing models demonstrate that higher baseline nurse staffing leads to better patient outcomes while remaining cost-effective (Griffiths et al., 2021). Time–motion studies indicate that eliminating wasted activities increases time available for direct patient care without reducing quality (Al-Moteri et al., 2023). Together, these attributes define nursing care efficiency as the ability to deliver safe, high-quality care through optimal use of time, technology, and human resources.

2.5 Identification of a Model Case

A model case of nursing care efficiency involves a medical ward that integrates interoperable electronic health records, standardized nursing terminologies, and evidence-based staffing models. Nurses use optimized documentation templates that minimize redundant data entry and align with clinical

workflows. Staffing levels are adjusted according to patient acuity using a validated classification system, ensuring adequate coverage without unnecessary overstaffing (Griffiths et al., 2021). In this ward, nurses spend most of their shift on direct patient care rather than administrative tasks because workflow redesign has significantly reduced documentation burden (Lindsay & Lytle, 2022). Digital tools support real-time decision-making and seamless interdisciplinary communication. Patient outcomes are continuously monitored using standardized indicators, and care quality remains consistently high. Cost-effectiveness is achieved through better resource allocation rather than staffing cuts (Wang & Jia, 2021). This case demonstrates all three defining attributes of nursing care efficiency.

2.6 Identification of Borderline, Related, and Contrary Cases

A borderline case includes some but not all attributes of nursing care efficiency. For example, a hospital may have implemented electronic documentation but still suffers from poorly designed interfaces that increase click burden and slow workflow. Although digital tools are present, they do not fully streamline practice, resulting in partial rather than complete efficiency (Lindsay & Lytle, 2022). A related case involves concepts closely associated with efficiency but not identical to it, such as productivity or job performance. Nurses may complete many tasks per shift, indicating high productivity, yet still experience inefficiency due to excessive documentation or inadequate staffing. Psychological resilience has been positively associated with job performance among nurses, but this does not necessarily equate to efficient care delivery (Hoşgör & Yaman, 2022). A contrary case represents the absence of nursing care efficiency. This may involve chronic understaffing, fragmented documentation systems, high workload, and frequent discharge delays. In such settings, nurses spend excessive time on non-clinical tasks, patient safety is compromised, and hospital performance declines. Delays in discharge processes have been shown to increase length of stay and reduce hospital efficiency (Abuzied et al., 2021).

2.7 Identification of Antecedents and Consequences

Key antecedents of nursing care efficiency include adequate staffing, interoperable digital systems, standardized documentation, and supportive leadership. Evidence indicates that resilient baseline staffing is essential for maintaining efficiency under variable demand (Griffiths et al., 2021). Usable electronic health records aligned with clinical workflows are necessary to reduce documentation burden (Lindsay & Lytle, 2022). Standardized nursing terminologies facilitate efficient care planning and error reduction (Zhang et al., 2021). The consequences of nursing care efficiency include improved patient safety, reduced length of stay, enhanced patient satisfaction, and greater organizational sustainability. Efficient workflows allow nurses to spend more time with patients, which positively influences patient experience and loyalty (Chen et al., 2022). Reduced documentation burden decreases cognitive workload and risk of burnout among nurses (Lindsay & Lytle, 2022). Streamlined discharge processes shorten hospital stays and improve quality outcomes (Abuzied et al., 2021). At the system level, efficient resource use contributes to economic sustainability and cost-effective care delivery (Bárcenas-Villegas et al., 2025).

2.8 Definition of Empirical Referents

Empirical referents for nursing care efficiency include measurable indicators such as documentation time, nurse-to-patient ratios, workload indices, length of stay, and rates of adverse events. Time–motion studies provide objective data on how nurses allocate their work time across clinical and non-clinical tasks (Al-Moteri et al., 2023). Electronic health record audit logs can quantify documentation time and click burden before and after workflow redesign (Lindsay & Lytle, 2022). Patient outcomes such as satisfaction, readmissions, and safety events also serve as empirical referents. Structural equation modeling shows that better nursing care experience predicts higher patient loyalty and satisfaction (Chen et al., 2022). Staffing resilience metrics based on patient classification systems can assess efficiency under fluctuating demand (Griffiths et al., 2021). At the organizational level, data envelopment analysis scores and workload per worker measures can be used to evaluate hospital efficiency (Chiu et al., 2022). Figure 1 should depict the systematic process used to identify, screen, and select articles for this concept analysis. It should include the number of records identified through database searches, duplicates removed, records screened by title and abstract, full-text articles assessed for eligibility, and final studies included in the analysis. The diagram demonstrates transparency, rigor, and replicability in the literature selection process consistent with PRISMA principles.

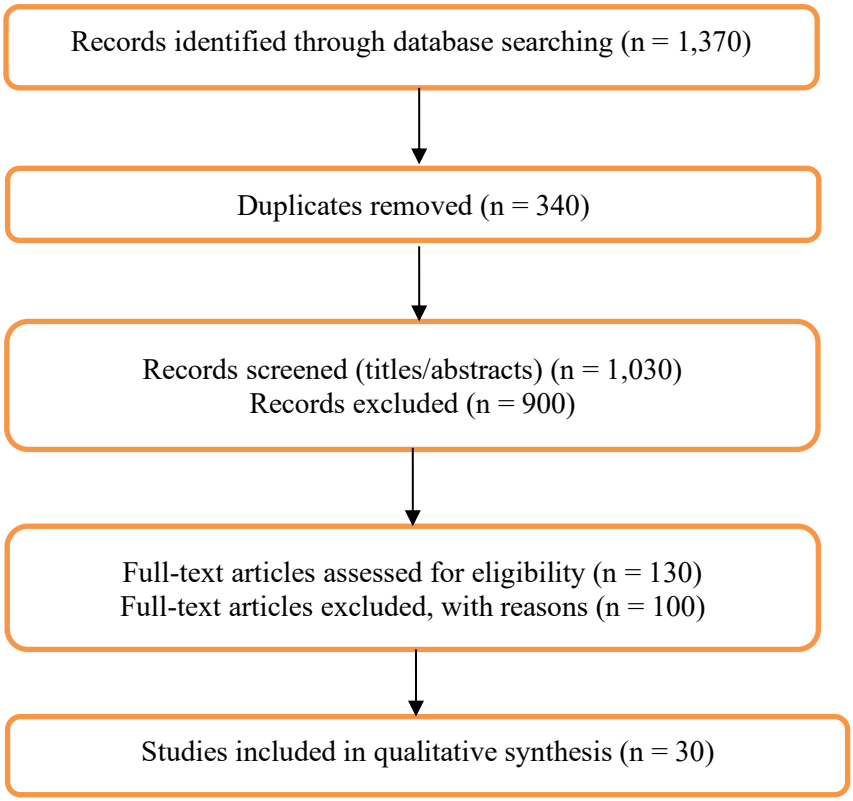

Figure 1. PRISMA-style flow diagram of article search, screening, and selection process

3. Results of Concept Analysis

3.1 Defining Attributes

The defining attributes of Nursing Care Efficiency were derived inductively from the reviewed studies and are summarized in Table 1, which presents descriptive data of each study in terms of author, year, context, method, and main findings. Across the literature, three core attributes consistently characterize nursing care efficiency: optimal resource utilization, streamlined workflow, and quality-preserving care delivery. These attributes emerged repeatedly in empirical, conceptual, and evaluative studies addressing efficiency in nursing and healthcare systems. Optimal resource utilization refers to the strategic allocation and use of nursing time, skills, and staffing to meet patient needs without waste or overload. Evidence from tertiary hospital wards demonstrates that nursing workload is strongly shaped by case mix index, bed occupancy, number of critically ill patients, and surgical complexity, indicating that efficiency depends on matching resources to patient acuity rather than fixed staffing levels (Ren et al., 2025). Workforce network consolidation in Thailand showed that redistributing health workers within local systems reduced workload per worker and improved allocative efficiency without increasing total staffing (Jithitikulchai, 2022). These findings indicate that efficient nursing care requires dynamic rather than static resource allocation. Streamlined workflow is the second defining attribute and relates to minimizing unnecessary documentation, reducing cognitive burden, and aligning digital systems with clinical practice. Studies show that poorly designed electronic health records create inefficiencies through excessive clicks, redundant data entry, and fragmented information display. Conversely, workflow redesign significantly reduced documentation time, click burden, and redundancy while improving productivity (Lindsay & Lytle, 2022). Time–motion research further shows that nurses spend a substantial proportion of their shift on non-clinical tasks, suggesting that eliminating wasteful activities is essential to achieving true efficiency (Al-Moteri et al., 2023). The use of nursing process software has also been shown to improve clinical decision-making efficiency and reduce documentation errors among nursing students (Hosseini et al., 2021). Quality-preserving care delivery is the third defining attribute and ensures that efficiency improvements do not compromise patient safety or outcomes. Evidence shows that minimal baseline staffing may reduce short-term costs but increases risks, length of stay, and adverse events, whereas resilient staffing models maintain safety and remain cost-effective (Griffiths et al., 2021). Standardized nursing terminologies improve care planning, monitoring, and outcome evaluation, thereby supporting both efficiency and quality (Zhang et al., 2021). Together, these three attributes define nursing care efficiency as the ability to deliver safe, high-quality care through optimal use of time, technology, and human resources.

Table 1. Descriptive data of the research studies

No.	Citation	Setting (Domain)	Key Attributes (Conceptual / Methodological)
1	Ng et al. (2022)	Global; clinical nursing & digital health	Scoping review; AI applications in nursing (documentation, diagnosis, care planning, monitoring, fall prediction, wound care).
2	Sommersguter-Reichmann (2022)	International; health economics	Review of nonparametric efficiency models; links quality indicators with efficiency measurement.
3	Ibrahim et al. (2022)	Egypt; hospital design	Analytical study comparing nursing unit layouts; racetrack design improved efficiency and nurse movement.
4	Zhong et al. (2022)	China; operating room nursing	Propensity score–matched study; fixed nurse teams reduced infections and turnover time.
5	Berdida (2024)	Philippines; intensive & critical care	Cross-sectional SEM; patient safety and self-efficacy reduce missed nursing care.

No.	Citation	Setting (Domain)	Key Attributes (Conceptual / Methodological)
6	Hosseini et al. (2021)	Iran; nursing education & clinical care	Randomized clinical trial; nursing process software reduced documentation time and significantly improved efficiency of the nursing process.
7	Yakusheva et al. (2024)	International; nursing economics & workforce	Conceptual model (Nursing Human Capital Value Model); links investment in nursing to outcomes, ROI, and organizational performance.
8	Hoşgör & Yaman (2022)	Türkiye; hospital nursing during COVID-19	Cross-sectional correlational study; psychological resilience positively associated with job performance.
9	Jithitikulchai (2022)	Thailand; public hospital workforce	Counterfactual simulations; network consolidation improved allocative efficiency and reduced workload per worker.
10	Ren et al. (2025)	China; tertiary hospital wards	Prospective observational study; ward operational efficiency significantly predicts nursing workload.
11	Griffiths et al. (2021)	UK; hospital staffing & efficiency	Agent-based simulation and economic modelling; compared baseline staffing plans and showed higher "resilient" staffing is more cost-effective and safer than low flexible staffing.
12	Chiu et al. (2022)	Taiwan; medical centers	Dynamic Data Envelopment Analysis (DDEA) with beta regression; identified nurse–patient ratio, bed occupancy, and assets as key predictors of hospital efficiency.
13	Zhang et al. (2021)	International; nursing informatics	Systematic review; standardized nursing terminologies improve care planning, monitoring, outcomes, and evidence-based practice.
14	Imani et al. (2022)	Global; hospital performance	Systematic review; classified efficiency indicators into input, process, and output variables for comprehensive efficiency measurement.
15	Ali et al. (2022)	Global; digital health & nursing care	Scoping review; synthesized evidence on how digital technologies affect compassionate nursing care and identified best practices for education and practice.
16	Choi et al. (2022)	International; nursing education & simulation	Systematic review; immersive virtual reality improved cognitive and psychomotor learning, with usability barriers related to hardware and simulation sickness.
17	Li et al. (2022)	High-income countries; digital health & patient safety	Systematic review; EHR interoperability generally improved medication safety and reduced adverse events, but evidence on productivity was mixed.
18	Lindsay & Lytle (2022)	USA; hospital EHR workflow	Quality-improvement pre/post study; redesign of documentation workflow reduced EHR time, click burden, and redundancy while improving productivity.
19	Al-Moteri et al. (2023)	Saudi Arabia; inpatient wards	Time-and-motion study; quantified nursing activities, identified wasted time, and proposed standard times to enhance care efficiency.
20	Wang & Jia (2021)	China; health system resource allocation	Quantitative policy analysis; showed that resource misallocation lowers utilization efficiency and highlighted the need for primary-care investment.
21	Bárcenas-Villegas et al. (2025)	International; hospital nursing & health economics	PRISMA systematic review; evidence that nursing education, clinical safety, and advanced practice nursing improve efficiency, reduce admissions, and enhance economic sustainability.
22	Chen et al. (2022)	China; inpatient nursing care	Multicenter cross-sectional survey with SEM; patient experience with nursing care positively predicts patient satisfaction and loyalty.
23	Vlassi et al. (2023)	Greece; healthcare workforce	Cross-sectional survey; burnout, workload, and staffing shortages are associated with reduced employee efficiency and increased errors.
24	Ahmadpour et al. (2021)	Iran; emergency departments	Staff perception survey; physical design features (central station, decentralized rooms, circulation paths) influence efficiency, teamwork, and infection control.
25	Karam et al. (2021)	International; primary healthcare	Scoping review; synthesized nursing care coordination activities into patient-, team-, and system-focused categories; highlighted communication, continuity of care, and home visits as core elements.

No.	Citation	Setting (Domain)	Key Attributes (Conceptual / Methodological)
26	Lukewich et al. (2022)	International; primary care	JBI systematic review; RN-led interventions improved patient outcomes, self-efficacy, health behaviors, and patient satisfaction.
27	El-Gazar & Zoromba (2021)	Egypt; hospital management	Cross-sectional survey with mediation analysis; nursing HR practices improved hospital performance excellence through better nurse performance.
28	Abuzied et al. (2021)	Saudi Arabia; tertiary hospital	FOCUS-PDSA quality-improvement project; optimized discharge process reduced length of stay, readmissions, and mortality.
29	Silva et al. (2021)	International; hospital nursing management	Integrative review; identified three management models: care-focused, efficiency-focused, and cost-focused nursing leadership.
30	Afaneh et al. (2021)	Conceptual; nursing quality	Walker & Avant concept analysis; clarified nursing-sensitive indicators as measures linking nursing care to patient outcomes and cost-effectiveness.

3.2 Antecedents

Antecedents are the conditions that must exist before nursing care efficiency can occur. Four primary antecedents were identified: adequate staffing, interoperable digital systems, standardized documentation practices, and supportive organizational leadership. Adequate and resilient staffing is a fundamental antecedent of nursing care efficiency. Studies demonstrate that staffing models based on real-time patient acuity, rather than fixed ratios, enable hospitals to respond flexibly to fluctuating demand while maintaining safety and efficiency (Griffiths et al., 2021). Inadequate staffing is associated with increased workplace errors, reduced performance, and lower professional efficiency among healthcare workers (Vlassi et al., 2023). These findings confirm that staffing sufficiency is a necessary condition for efficient nursing care. Interoperable and usable digital health systems constitute a second key antecedent. When electronic health records are interoperable, they facilitate seamless information exchange, reduce duplication, and improve medication safety, all of which support efficient clinical practice (Li et al., 2022). Standardized nursing terminologies provide a common language for documentation and care planning, enabling more efficient monitoring of patient outcomes (Zhang et al., 2021). Without functional digital infrastructure, nurses must rely on fragmented systems that increase cognitive load and slow workflow. Supportive leadership and organizational culture also emerge as critical antecedents. Hospitals that invest in nursing human capital, professional development, and advanced practice roles achieve greater efficiency and sustainability (Yakusheva et al., 2024). Leadership commitment to workflow redesign, staff training, and quality improvement further facilitates efficiency by aligning policies with clinical realities. Evidence from discharge process improvement initiatives shows that multidisciplinary leadership interventions significantly reduced length of stay and improved efficiency (Abuzied et al., 2021).

3.3 Consequences

The consequences of nursing care efficiency are evident at the patient, professional, and organizational levels. At the patient level, efficient nursing care is associated with improved safety, better experience, and enhanced satisfaction. Positive patient experience with nursing care directly increases patient loyalty to hospitals and is partially mediated by satisfaction with overall care (Chen et al., 2022). Efficient workflows that free nurses' time for bedside care strengthen nurse–patient relationships and improve

perceived quality of care. At the professional level, nursing care efficiency reduces workload-related stress and documentation burden, which can mitigate burnout and improve job performance. Workflow redesign interventions that reduce click burden and redundant documentation have been shown to improve productivity and decrease cognitive overload during shifts (Lindsay & Lytle, 2022). Time–motion findings also suggest that reclaiming time from non-value-added tasks allows nurses to focus on meaningful clinical activities, which enhances professional satisfaction (Al-Moteri et al., 2023). However, persistent understaffing continues to threaten efficiency and well-being in many settings (Vlassi et al., 2023). At the organizational level, nursing care efficiency contributes to shorter hospital stays, reduced readmissions, and greater economic sustainability. Quality improvement initiatives targeting discharge processes significantly reduced length of stay without compromising safety in a tertiary hospital in Saudi Arabia (Abuzied et al., 2021). System-level analyses further indicate that efficient allocation of nursing resources enhances overall healthcare utilization efficiency (Wang & Jia, 2021). A recent systematic review highlights that investment in nursing specialty roles and advanced practice nurses improves both clinical outcomes and economic sustainability of hospitals (Bárcenas-Villegas et al., 2025).

3.4 Empirical Referents

Empirical referents are observable and measurable indicators that demonstrate the presence of nursing care efficiency in practice. These include time-based, workload-based, outcome-based, and system-level measures. Documentation time, click burden, and proportion of shift spent on direct patient care are key time-based indicators. Time–motion studies show that a substantial proportion of nurses' work time is spent on non-value-added activities that can be eliminated through workflow redesign (Al-Moteri et al., 2023). Electronic health record audit logs can quantify reductions in documentation time following usability interventions (Lindsay & Lytle, 2022). Workload measures such as case mix index, bed occupancy rate, and number of critically ill patients serve as empirical indicators of operational efficiency at the ward level (Ren et al., 2025). At the system level, workload per worker and allocative efficiency scores provide meaningful metrics for evaluating workforce distribution across hospitals and regions (Jithitikulchai, 2022). Outcome-based referents include patient safety events, readmission rates, length of stay, and patient satisfaction. Efficient staffing models reduced surgical site infections and improved turnover times in operating rooms (Zhong et al., 2022). Improved discharge processes reduced length of stay while maintaining safety (Abuzied et al., 2021). Higher patient experience scores with nursing care are associated with greater loyalty and satisfaction, indicating efficient care delivery (Chen et al., 2022). Data envelopment analysis scores provide quantitative benchmarks for comparing hospital efficiency across institutions (Chiu et al., 2022).

3.5 Summary of Findings

The results of this concept analysis demonstrate that Nursing Care Efficiency is a multidimensional construct characterized by optimal resource use, streamlined workflow, and quality-preserving care delivery. These defining attributes were consistently supported across empirical studies in nursing, health informatics, and health economics. The antecedents of nursing care efficiency include adequate staffing, interoperable digital systems, standardized documentation, and supportive leadership. When these

conditions are present, nurses are better able to deliver efficient, safe, and patient-centered care. When they are absent, inefficiency, missed care, and professional burnout increase. The consequences of nursing care efficiency are broadly positive, including improved patient safety, enhanced patient satisfaction, reduced length of stay, and greater organizational sustainability. Efficiency also benefits nurses by reducing cognitive burden and documentation overload, thereby supporting professional well-being. Finally, empirical referents such as documentation time, workload indices, patient outcomes, and hospital efficiency scores provide measurable ways to assess nursing care efficiency in practice. Together, these findings establish a clear conceptual foundation for future research, measurement, and intervention design in this field.

4. Discussion

4.1 Theoretical Implications

The findings of this concept analysis make several important theoretical contributions to nursing science and health systems research. First, the analysis advances the conceptual clarity of Nursing Care Efficiency by distinguishing it from closely related constructs such as productivity, effectiveness, and performance. Efficiency is framed not merely as doing more with less, but as achieving high-quality patient outcomes through optimal use of nursing time, skills, and digital resources, which aligns with contemporary theories of nursing as human capital investment in healthcare systems (Yakusheva et al., 2024). This reframing strengthens theoretical links between nursing practice, organizational performance, and economic sustainability. Second, the identification of three defining attributes optimal resource utilization, streamlined workflow, and quality-preserving care delivery integrates previously fragmented perspectives from nursing, informatics, and health economics into a coherent conceptual model. Prior research has often treated workload, documentation, staffing, and efficiency as separate domains, whereas this analysis positions them as interdependent dimensions of a single overarching construct (Ren et al., 2025). The finding that operational characteristics such as case mix and bed occupancy systematically shape nursing workload supports the theoretical argument that efficiency must be contextual, dynamic, and acuity-sensitive rather than static or ratio-based (Ren et al., 2025).

Third, this analysis reinforces sociotechnical theories of healthcare by demonstrating that efficiency emerges from the interaction between nurses, digital systems, organizational structures, and care environments. Evidence that electronic health record usability directly affects nursing efficiency highlights the inseparability of technology design and clinical performance (Lindsay & Lytle, 2022). Similarly, the positive role of standardized nursing terminologies in improving care planning and outcome monitoring strengthens theories that emphasize shared language and interoperability as foundational to high-performing health systems (Zhang et al., 2021). Finally, the concept analysis bridges nursing theory with systems-level efficiency models in health economics. Findings that workforce network consolidation reduces workload and improves allocative efficiency provide empirical grounding for theories of distributed workforce management and integrated care systems (Jithitikulchai, 2022). Overall, the study positions Nursing Care Efficiency as a multidimensional, sociotechnical, and value-generating concept that should be explicitly incorporated into future nursing and health policy theories.

4.2 Management and Policy Implications

From a management perspective, the findings underscore that improving nursing care efficiency requires strategic investment rather than cost-cutting. Evidence that higher baseline nurse staffing is both safer and more cost-effective challenges traditional policies that prioritize minimal staffing to reduce short-term expenditures (Griffiths et al., 2021). Hospital administrators should therefore adopt resilient staffing models that adjust to patient acuity in real time rather than relying on fixed ratios or ad hoc temporary staffing. At the policy level, governments and health authorities should recognize nursing human capital as a core driver of health system efficiency and sustainability. The Nursing Human Capital Value Model suggests that investments in nursing education, professional development, and advanced practice roles generate long-term returns through improved patient outcomes and organizational performance (Yakusheva et al., 2024). Policymakers should therefore allocate funding not only to infrastructure and technology but also to workforce development and retention strategies. Digital health policy should prioritize interoperability, usability, and standardization. The mixed evidence regarding electronic health record interoperability indicates that technology alone is insufficient unless systems are designed around nursing workflows and clinical needs (Li et al., 2022). Regulatory frameworks should require vendors to meet usability benchmarks and support standardized nursing terminologies to reduce documentation burden and enhance data quality (Zhang et al., 2021). At the system level, workforce redistribution strategies such as network consolidation offer viable solutions to workforce shortages without increasing total staffing levels (Jithitikulchai, 2022). Health ministries should explore regional workforce planning models that allow flexible redistribution of nurses based on demand, case mix, and service complexity. Additionally, policies that support multidisciplinary leadership in discharge planning can significantly reduce length of stay and improve hospital efficiency (Abuzied et al., 2021). Overall, management and policy interventions must align staffing, technology, and organizational culture to achieve sustainable nursing care efficiency.

4.3 Practical Applications

In clinical practice, the findings highlight the urgent need to redesign documentation workflows to reduce non-value-added tasks. Hospitals should conduct usability audits of electronic health record systems and implement evidence-based template redesigns that minimize clicks, redundancy, and cognitive load (Lindsay & Lytle, 2022). Such interventions can free substantial nursing time for direct patient care, thereby improving both efficiency and patient experience. Time–motion studies should be routinely used in hospital units to identify wasted activities and guide workflow optimization. Evidence that nearly one-quarter of nurses' time may be spent on potentially eliminable tasks suggests that systematic process redesign can yield meaningful efficiency gains without increasing staffing (Al-Moteri et al., 2023). Nurse managers can use these data to reallocate responsibilities, delegate non-clinical tasks, and streamline care processes. In education, nursing curricula should integrate training on digital tools, standardized terminologies, and workflow efficiency. The demonstrated benefits of nursing process software in improving clinical decision-making support the incorporation of digital decision-support tools into undergraduate and postgraduate programs (Hosseini et al., 2021). Similarly, immersive virtual reality can enhance cognitive and psychomotor skills that contribute to future clinical efficiency (Choi et al., 2022). At the bedside, patient-centered care strategies should be strengthened as a mechanism for improving efficiency. Evidence that better nursing care experience predicts higher patient loyalty and

satisfaction indicates that efficiency is not merely operational but relational (Chen et al., 2022). Finally, operating room teams should consider fixed nurse team models, which have been shown to reduce surgical site infections and improve turnover times (Zhong et al., 2022). These practical applications translate the concept of nursing care efficiency into actionable clinical and managerial strategies.

4.4 Future Research Directions

Future research should further refine and operationalize the concept of Nursing Care Efficiency using standardized, multidimensional measurement tools. Existing studies use heterogeneous indicators ranging from documentation time to economic efficiency scores, making cross-study comparison difficult (Chiu et al., 2022). Researchers should develop and validate a comprehensive Nursing Care Efficiency Index that integrates workload, staffing resilience, digital usability, and patient outcomes. Longitudinal and experimental designs are needed to establish causal relationships between digital interventions and nursing efficiency. While workflow redesign has shown promising results, more randomized controlled trials are required to confirm long-term effects on patient outcomes, nurse well-being, and organizational performance (Hosseini et al., 2021). Similarly, further research is needed to clarify how electronic health record interoperability influences efficiency across different care settings (Li et al., 2022). Future studies should also examine efficiency in primary care, community health, and integrated care systems. Evidence that registered nurses improve a wide range of patient outcomes in primary care suggests that efficiency models should extend beyond hospital settings (Lukewich et al., 2022). Comparative research across countries and health systems would also strengthen generalizability. Finally, research should explore the relationship between nursing care efficiency, professional resilience, and burnout. Findings that staffing shortages and stress undermine efficiency highlight the need for integrated models linking workforce well-being with system performance (Vlassi et al., 2023). Mixed-methods studies combining quantitative workload metrics with qualitative nurse experiences would provide deeper insight into how efficiency can be achieved without compromising professional dignity or care quality. Overall, future research should position Nursing Care Efficiency as a central outcome in nursing science, health policy, and digital transformation initiatives.

5. Conclusion

This concept analysis has clarified the meaning, structure, and application of Nursing Care Efficiency within contemporary healthcare practice. By applying Walker and Avant's framework, the study synthesized diverse evidence from nursing, health informatics, and health systems research to articulate a coherent and comprehensive understanding of the concept. Nursing care efficiency is not merely a technical or economic measure, but a multidimensional construct that integrates optimal resource use, streamlined workflows, and the preservation of high-quality, patient-centered care. The analysis demonstrated that efficiency in nursing emerges from the dynamic interaction between staffing models, digital systems, organizational leadership, and clinical processes. When these elements are aligned, nurses are better able to deliver safe, timely, and compassionate care while minimizing unnecessary workload and documentation burden. Conversely, when systems are fragmented, staffing is inadequate, or technology is poorly designed, efficiency deteriorates and patient outcomes, professional well-being, and organizational performance are compromised. The findings highlight that achieving nursing care

efficiency requires strategic investment rather than cost containment. Effective workforce planning, interoperable digital infrastructure, and supportive leadership are essential foundations for sustainable efficiency. At the same time, workflow redesign, standardized documentation, and evidence-based staffing practices translate conceptual insights into practical improvements at the bedside and across healthcare systems.

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