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Establishing Standardized Nursing Quality Sensitive Indicators

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Abstract

This is a pilot research project was prepared to assess the impact of implementing essential standardized nursing quality sensitive indicators in monitoring, evaluating, and controlling the nursing services and activities which implemented in daily nursing care works with the patients in a health institute, aiming for emphasizing the concept of "nursing quality sensitive indicators" which is valuable to elaborate nursing care performance, and for continuous upgrading of daily nursing care, which hopefully will result in more beneficial outcomes, and lesser negative or undesirable outcomes in all aspects of nursing care, and consequently the health care process, particularly regarding patient safety, patient satisfaction and nursing performance improvement. This pilot research project for the essential standardized nursing quality sensitive indicators was applied in intensive care unit (ICU) department in Qurayyat general hospital, and resulted in excellent improvement of all outcomes correlated with the essential standardized nursing quality sensitive indicators. These essential standardized nursing quality sensitive indicators are hopefully be accepted and accredited by the higher health authorities as standardized nursing quality sensitive indicators in health institutes.

Keywords

Standardized, Nursing, Quality, Sensitive, Indicators

1. Introduction

There has been growing interest in the implications of evidence-based nursing care, which are essential in highlighting the value of nursing care [1] [2] [3] [4].

The demand for efficiency in health care has led to significant and frequent changes, such as the restructuring of hospital care through staffing strategies [5] [6] [7].

Indicators that are sensitive to nursing work are those that are "relevant, based on nurses' scope and domain of practice, and for which there is empirical evidence linking nursing inputs and interventions to the outcome." [7] [8] [9] [10].

Considering that a large part of the health expenditure is attributed to staffing costs and nurses constitute the majority of healthcare workers, it is imperative to understand the relationship between cost and quality. While policymakers plan more investment in qualified nurses in some areas of the world as part of the strategy to improve quality of care, in other parts, they chose to replace a skilled nursing workforce with less paid staff assistants [11]. For this reason, the evidence of quality care is increasingly being questioned, and the nurses, like all health professionals, thrust to demonstrate the value of their care [12]. In this respect, nursing research has led to the question of whether nurses make a difference in patient care, what these differences are, and how to ameliorate these differences based on evidence [4] [13].

Examining the care indicators is an important pre-condition before evaluating the quality of nursing care [14]. In the international literature, it is seen that academics examine this subject in various parts of the world, such as Australia, Canada, China, UK, USA, and Iran [2] [6] [11] [15] [16] [17] [18] [19].

Clinical quality databases play an important role in ensuring a high and uniform health care quality through continuous monitoring of treatment, nursing and rehabilitation [20] [21], and are increasingly used in health care planning and prioritization to improve patient outcomes. Nurses, however, often lack knowledge of effective reporting and measuring of nursing activities [22].

In the past three decades, there has been great change and evolution in the concepts and theories that underpin nursing practice. This has been a time when "what nurses do" needs to be quantified and measured to justify funding, and improve practice and patient outcomes—even though we know that practice is not generic and is most often subject to context [23] [24].

"Nursing sensitive indicators" (NSIs) has been subject to considerable research development within the domain of the acute care setting where nurses have a degree of autonomy and control over processes of nursing care delivery [25] [26] [27]. The application of NSIs has developed from the vast and ongoing dialogues held between nursing executives, who manage nursing-related clinical performance and strategy initiatives in tertiary care facilities, and nursing academics who have an interest in the complex performance measurement and decision-making characteristics of contemporary healthcare organizations [28] [29] [30].

Research to develop NSIs for use and application in the acute care domain must continue for several important reasons. First, NSIs have become an increa-

singly valid and reliable means to support nursing care quality and performance measurement in the hospital unit setting, including the evaluation of nursing clinical practice improvement [4] [28] [29]. Secondly, NSIs as variables have been increasingly drawn upon in primary research studies that empirically tested effects of nursing practice enhancement strategies on nursing-related outcomes [3] [4] [26] [31].

The establishing and implementing of standardized nursing quality sensitive indicators will act effectively to monitor, assess, and control the nursing services and activities implemented in daily nursing care works in a health institute, aiming for continuous improving and upgrading of daily nursing care with the patients, with more beneficial outcomes and lesser negative or undesirable outcomes of the health care process, particularly regarding patient safety, patient satisfaction, and nursing performance improvement.

2. Research Objectives, Purpose, and Justification

- Quality is a broad term that encompasses various aspects of nursing care. Various health care measures have been identified over the years as indicators of health care quality [32] [33] [34] [35]. In 2004, the National Quality Forum (NQF), via its voluntary consensus standards process, endorsed 15 national standards to be used in evaluating nursing-sensitive care. These standards are now known as the NQF 15 [36].
- .Nursing-sensitive indicators identify structures of care and care processes, to evaluate nurse staffing and identify linkages between nurse staffing and patient outcomes, both of which in turn influence care outcomes.
- Nursing-sensitive indicators are distinct and specific to nursing, and differ from medical indicators of care quality. For example, one structural nursing indicator is nursing care hours provided per patient day. Nursing outcome indicators are those outcomes most influenced by nursing care
- Nursing Quality Indicators was established by ANA so that ANA could continue to collect and build on data obtained from earlier studies and further develop nursing's body of knowledge related to factors which influence the quality of nursing care. Linkages between nurse staffing and patient outcomes had already been identified, but continued data collection and reporting was necessary to evaluate nursing care quality at the unit level and thus fulfill nursing's commitment to evaluating and improving patient care.
- Nursing's foundational principles and guidelines identify that as a profession, nursing has a responsibility to measure, evaluate, and improve practice.
- These indicators included: Falls, Falls with Injury, Nursing Care Hours per Patient Day, Skill Mix, Pressure Ulcer Prevalence, Hospital-Acquired Pressure Ulcer Prevalence, and the RN job satisfaction indicator.
- Continuous monitoring of nursing care quality by nursing-sensitive indicators has been implemented in several countries [37].
- In the USA, the National Database for Nursing Quality Indicators (NDNQI®)

monitors nursing at the unit level across various diagnoses [7]. The clinical quality databases in Scandinavia monitor health care at a patient level in specific groups of diagnoses or treatments [38], RKKP.2021 [39]. This includes Danish databases, where steering committees of health care professionals appointed by scientific societies in different health care specialties are responsible for selecting indicators [39].

- Several nursing-sensitive indicators, measured at either the structure, process or outcome level, are recognized and used globally [37]. However, most existing indicators are measured at the structural level (e.g., nurse staffing [7], or the outcome level (e.g., mortality and adverse events such as urinary tract infections and pressure ulcers [7] [38]-[43]. By contrast, process-level nursing-sensitive indicators (e.g., mobilization, nutritional support and measuring vital signs) are rarely employed routinely [37] [44], although non-fulfillment of nursing-sensitive process indicators, sometimes referred to as missed nursing care [45] [46], or omissions in nursing care [55] is a severe problem in health care [42] [47].
- Thus, an urgent need exists to monitor fundamental nursing care at the process level to supplement existing indicators at structure and outcome levels, and thereby facilitate future research on the association of provided nursing care with patient outcomes and with structural nursing-sensitive indicators. Furthermore, this will allow nurse managers to link patient outcomes with the provided nursing care for which they are responsible, and thereby provide nurse managers with explicit
- The law of Patient Protection and Affordable Care Act of 2010 focus on prevention and wellness as well as improving quality and health system performance. One of the provisions of the law is to develop a national quality improvement strategy that will improve the delivery of services, patient outcomes, as well as population health. It will also create a process to develop and select quality measures to be used for reporting and payment [47] [48] found that 62% of medically serious adverse medical events (AMEs) occur in the outpatient setting. They suggest efforts to monitor and prevent AMEs should be undertaken. Developing nursing-sensitive indicators in the ambulatory care environment can highlight the contributions nurses make to patient outcomes [10] [50].
- This is exactly what nursing-sensitive indicators (NSIs) attempt to do. By definition "Nursing-sensitive indicators identify structures of care and care processes, both of which in turn influence care outcomes" [7]. In 1998, the National Database for Nursing Quality Indicators (NDNQI®) was established for acute care settings. The creation of nursing-sensitive indicators for RNs is a necessary first step so that performance can be benchmarked, goals for improvement can be identified, and the RN role can be utilized in the most effective way. In the acute care setting, the nurse has significant control over the patient environment, interventions, medications, and responses to treat-

ment [51].

- The provision of outcome-oriented, cost-effective health care is no longer a goal. It is a mandate. To accomplish this mandate, the relationship between the costs, quality and desired outcomes of care, and the processes involved in providing care must be reexamined. So it is required to develop nursing-sensitive quality indicators, and discusses the implications of nursing-sensitive indicators for nurse administrators. Nursing's quality indicators can be of value in the development of evidence-based health care report cards and can be used to direct change [52] [53]. Inter-rater reliability of pressure ulcer staging: Ordinal probity Bayesian hierarchical model that allows for uncertain rater response.
- The significance and purpose of establishing standardized nursing quality sensitive indicators include the following points:
- To enhance the nursing quality sensitive indicators for more crucial monitoring, assessing, and controlling the nursing services and activities implemented in daily nursing care works with the patients, particularly regarding patient safety, patient satisfaction and nursing performance improvement.
- To continue upgrading the situation of nursing staff education/certification including the following correlated items: validity of the card of Saudi Commission For Health Specialties (SCFHS), validity of the certificate of Basic Life Support (BLS) course, validity of the certificate of Advanced Cardiac Life Support (ACLS) course, total of Continuous Medical Education (CME) earned hours, nurse job satisfaction, total hours of nursing care per patient, per day, and staffing mix (nurse/patient ratio), and skills that concerning nursing care with the patient, and consequently patient safety and satisfaction.
- To improve the measures of patient attitudes and satisfaction towards the nursing care.
- To emphasize on nursing care standards implementation, and follow-up.
- To improve patient safety and satisfaction by minimizing the complications and errors correlated with nursing care with the patient, and improving the quality of nursing services as well as staff productivity in safe, timely, effective, efficient and equitable performance.
- Emphasize on the relevance to clinical practice: Once identified, nurse-sensitive indicators can be applied for quality improvement purposes, but consensus is required to fully realize their potential. Nurse Managers need to be aware of the factors that can influence the use of indicators at unit level. Strategies need to be implemented to promote these indicators becoming integrated with routine nursing care.

3. Brief Description of the Research

A pilot research project was prepared to assess the impact of implementing essential nursing quality sensitive indicators to monitor, assess, and control the nursing services and activities implemented in daily nursing care works with the

patients, and continuous upgrading educational aspects, skills, competency items, and of daily nursing care with the patients, which will result in more beneficial outcomes and lesser negative or undesirable outcomes of the health care process, particularly regarding patient safety, patient satisfaction, and nursing performance improvement.

This pilot research project for the essential standardized nursing quality sensitive indicators was applied in intensive care unit (ICU) department in Qurayyat general hospital, and resulted in excellent improvement of all outcomes correlated with the essential standardized nursing quality sensitive indicators.

These essential standardized nursing quality sensitive indicators are hopefully be accepted and accredited by the higher health authorities as standardized nursing quality sensitive indicators in health institutes.

4. Literature Review/Background

- Nursing Sensitive Indicators [7] [54].

Why they're Important and What They Mean for Nurses and Patients [55].

To provide clarity for this oft-misunderstood practice, here's an explanation of nursing sensitive indicators to help you understand how these evaluation procedures work and why they are so vital to the modern healthcare system

What are Nursing Sensitive Indicators?

Nursing sensitive indicators aim to determine whether nurses have an impact on their patients. These indicators determine what that impact looks like and whether it delivers a net positive or negative for both individual patients and the community at large.

How Do Nursing Sensitive Indicators Measure Nursing's Impact?

- This emphasizes the context under which nursing care is delivered. Key considerations include facilities, equipment, staffing, and financing.

- Any interaction between patients and nurses—within the context of delivering healthcare services

- Several elements can be defined as outcomes, including changes in health status, increased knowledge, or improved patient satisfaction.

Types of Nursing Sensitive Indicators

- Patient falls with and without injuries.
- Nurse satisfaction survey.
- Nosocomial infections.
- Nursing hours per patient day.
- Patient satisfaction with pain management.
- Patient satisfaction with nursing care.

- Nursing-sensitive indicators: a concept analysis [56]

Nursing-sensitive indicators (NSIs) are the criteria for changes in a person's health status that nursing care can directly affect, and they form the foundation for monitoring the quality of nursing care. For example, they can assist in establishing a common ground for benchmarking and in providing evidence of the

cost-effectiveness of nursing care. However, despite the considerable influence of nursing interventions on the quality of healthcare, measuring the quality of nursing care and its effects on patient outcomes and healthcare systems remains challenging.

- The National Database of Nursing Quality Indicators [7]

1) Nursing Hours per Patient Day
2) Patient Falls
3) Patient Falls with Injury, and outcomes
4) Pediatric Pain Assessment, Intervention, Reassessment (AIR) Cycle
5) Pediatric Peripheral Intravenous Infiltration Rate
6) Pressure Ulcer Prevalence, and outcomes
   - Community-acquired
   - Hospital-acquired
   - Unit-acquired
7) Psychiatric Physical/Sexual Assault Rate
8) Restraint Prevalence
9) Nurse Education /Certification
10) Nurse Satisfaction Survey Options
   - Job Satisfaction Scales
   - Practice Environment Scale (PES)
11) Voluntary Nurse Turnover rate
12) Skill Mix: Per cent of total nursing hours supplied by
13) Nurse Vacancy Rate
14) Nosocomial Infections
   a) Urinary catheter-associated urinary tract infection (UTI)
   b) Central line catheter associated blood stream infection (CLABSI)
   c) Ventilator-associated pneumonia (VAP).

- NDNQI: Nursing-Sensitive Quality Indicators, [7] [8] [57]

Nursing-sensitive indicators reflect the structure, process, and patient outcomes of nursing care

- Structure—supply of nursing staff, skill level of staff, and education of staff
- Process—assessment, intervention, and job satisfaction
- Outcomes—patient outcomes that improve if there is greater quantity and quality of nursing care.

- Nurse-Sensitive Indicator Quality Improvement Toolkit [58] [64]

Outcomes: CLABSI and CAUTI rates were reduced over time following the introduction of the Nurse-Sensitive Indicator Quality Improvement (NSIQI) Toolkit. The CLABSI standardized infection ratio (SIR) decreased by 19%, and the CAUTI SIR decreased by 19.4%.

Conclusions: The novel NSIQI Toolkit is a scalable tool for improving and sustaining CLABSI and CAUTI rates, which may have the potential for other nurse-sensitive quality indicators.

- How does nursing-sensitive indicator feedback with nursing or interprofes-

sional teams work and shape nursing performance improvement systems? A rapid realist review [59].

Results: We identified three hypotheses, subdivided into twelve generative configurations to explain how feedback mobilizes nursing or interprofessional teams. Empirically founded and actionable, these propositions are supported by expert panels. Each configuration specifies contextualized mechanisms that explain feedback and team outcomes. Socially mediated mechanisms are particularly generative of action and agency.

Conclusions: This rapid realist review provides an informative theoretical proposition to embrace the complexity of nursing-sensitive indicator feedback with nursing or interdisciplinary teams. Building on general explanations previously observed, this review provides insight into a deep explanation of feedback mechanisms.

- Nursing representatives in clinical quality databases and the presence of nursing-sensitive indicators of fundamental nursing care [42]

Results: One-third of the databases included indicators related to aspects of fundamental care. The most common aspects were *Respiration and circulation*, *Nutrition* and *Psychosocial conditions*, whereas *Skin and mucous membranes*, *Elimination* and *Pain* were rarely measured. Nurse representation on the steering committee of a quality database increased the likelihood of having indicators related to aspects of fundamental care three-fold (prevalence ratio 3.25).

Conclusion: Fundamental care was rarely monitored in Danish clinical quality databases, but databases with nurse representation on the steering committee had a higher likelihood of monitoring fundamental care.

- Nurse-sensitive indicators suitable to reflect nursing care quality: a review and discussion of issues [14].

Results: Most of the research has examined the relationship between nursing structural variables and patient outcomes in acute care settings and have explored potential indicators for specific patient groups and nursing roles. When using nurse-sensitive indicators, issues concerning the selection, reporting and sustained use are important for nurse managers to consider.

Conclusion: Evidence for the nurse-sensitivity of some commonly used indicators is inconsistent due to the disparity in definitions used, data collection and analysis methods. Further research on the application and implementation of these indicators is required to assist nurse managers in attempting to quantify the quality of nursing care. Nurses need to continue to strive to achieve agreement on the definitions of indicators, gather strong consistent evidence of nurse-sensitivity, resolve issues of regular data collection and consider selection, reporting and sustainment when implementing nurse-sensitive indicators.

- Nursing-sensitive indicators for nursing care: A systematic review (1997-2017) [37]

Results: A total of 3,633 articles were identified, and thirty-nine studies met the inclusion criteria. The quantitative assessment of investigated relationships in these studies suggests that nursing staffing, mortality, and nosocomial infec-

tions were the most frequently reported nursing-sensitive indicators.

Conclusion: This review provides a comprehensive list of nursing-sensitive indicators, their frequency of use, and the associations between these indicators and various outcome variables. Stakeholders of nursing research may use the findings to streamline the indicator development efforts and standardization of nursing-sensitive indicators.

Impact: This review provides evidence-based results that health organizations can benefit from nursing care quality.

- Nursing-sensitive indicators: a concept analysis [56]

The concept of "nursing sensitive indicators" is valuable to elaborate nursing care performance. The conceptual foundation, theoretical role, meaning, use and interpretation of the concept tend to differ. The elusiveness of the concept and the ambiguity of its attributes may have hindered research efforts to advance its application in practice.

Results

The analysis revealed two main attributes of nursing-sensitive indicators. Structural attributes related to health service operation included: hours of nursing care per patient day, nurse staffing. Outcome attributes related to patient care included: the prevalence of pressure ulcer, falls and falls with injury, nosocomial selective infection and patient/family satisfaction with nursing care.

Conclusion

This concept analysis may be used as a basis to advance understandings of the theoretical structures that underpin both research and practical application of quality dimensions of nursing care performance.

- Nursing-sensitive indicators: a concept analysis [56]

Nursing-sensitive indicators (NSIs) are the criteria for changes in a person's health status that nursing care can directly affect, and they form the foundation for monitoring the quality of nursing care. For example, they can assist in establishing a common ground for benchmarking and in providing evidence of the cost-effectiveness of nursing care. However, despite the considerable influence of nursing interventions on the quality of healthcare, measuring the quality of nursing care and its effects on patient outcomes and healthcare systems remains challenging. There is also little consensus on what constitutes an NSI, resulting in inconsistent conceptualisations for measuring the quality of nursing care and the use of several different terms to describe indicators that are sensitive to nursing interventions. This article describes a literature review and concept analysis, which enabled the authors to develop a concept model for NSIs, with the intention of improving the concept of NSIs.

- Towards Evidence-based Management: Creating an Informative Database of Nursing-Sensitive Indicators [4].

Purpose: The purpose of this paper is to describe the creation, evolution, and implementation of a database of nursing-sensitive and potentially nursing-sensitive indicators, the Military Nursing Outcomes Database (MilNOD). It discusses

data quality, utility, and lessons learned.

Design/Methods: Prospective data collected each shift include direct staff hours by levels (*i.e.*, registered nurse, other licensed and unlicensed providers), staff categories (*i.e.*, military, civilian, contract, and reservist), patient census, acuity, and admissions, discharges, and transfers. Retrospective adverse event data (falls, medication errors, and needle-stick injuries) were collected from existing records. Annual patient satisfaction, nurse work environment, and pressure ulcer and restraint prevalence surveys were conducted.

Findings and Conclusions: The MilNOD contains shift level data from 56 units in 13 military hospitals and is used to target areas for managerial and clinical performance improvement. This methodology can be modified for use in other healthcare systems.

Clinical Relevance: As standard tools for evidence-based management, databases such as MilNOD allow nurse leaders to track the status of nursing and adverse events in their facilities.

- Nursing representatives in clinical quality databases and the presence of nursing-sensitive indicators of fundamental nursing care [42].

Results: One-third of the databases included indicators related to aspects of fundamental care. The most common aspects were *Respiration and circulation*, *Nutrition* and *Psychosocial conditions*, whereas *Skin and mucous membranes*, *Elimination* and *Pain* were rarely measured. Nurse representation on the steering committee of a quality database increased the likelihood of having indicators related to aspects of fundamental care three-fold (prevalence ratio 3.25).

Conclusion: Fundamental care was rarely monitored in Danish clinical quality databases, but databases with nurse representation on the steering committee had a higher likelihood of monitoring fundamental care.

Impact: This study addressed the knowledge gap of how fundamental nursing care is measured in clinical quality databases. It introduces nurses to the measurement of fundamental care as a first step toward performing nursing intervention studies and investigating associations with patient outcomes. The increased likelihood of fundamental care monitoring in clinical databases with nurse representation on the steering committee indicates a feasible way for decision makers and nurse leaders to ensure a stronger focus on fundamental care to the patients' benefit.

- Process and outcome measures using nursing sensitive indicators [60].

Measuring the impact of high quality nursing care has become an imperative driven by several issues during the past several years. Current challenges surrounding the nursing shortage and the decreasing nursing workforce projected for the next decade alone have raised serious questions about the effect fewer registered nurses (RNs) will have on the quality of health care. In addition, heightened public attention to patient safety and adverse outcomes has prompted national organizations, such as the Joint Commission for Accreditation of Healthcare Organizations, the American Nurses Credentialing Center, and the National Quality Forum, to consider and implement recommendations for establishing

and monitoring nursing quality indicators that focus on nursing-sensitive patient outcomes. These issues, now more than ever, have provided us with a burning platform to examine exactly what nurses do and their impact on patient health outcomes.

- Nursing-sensitive indicators: a concept analysis [56]

Nursing-sensitive indicators (NSIs) are the criteria for changes in a person's health status that nursing care can directly affect, and they form the foundation for monitoring the quality of nursing care. For example, they can assist in establishing a common ground for benchmarking and in providing evidence of the cost-effectiveness of nursing care. However, despite the considerable influence of nursing interventions on the quality of healthcare, measuring the quality of nursing care and its effects on patient outcomes and healthcare systems remains challenging. There is also little consensus on what constitutes an NSI, resulting in inconsistent conceptualizations for measuring the quality of nursing care and the use of several different terms to describe indicators that are sensitive to nursing interventions. This article describes a literature review and concept analysis, which enabled the authors to develop a concept model for NSIs, with the intention of improving the concept of NSIs

- Nursing Sensitive Indicators: Why They're Important and What They Mean for Nurses and Patients [55] [61]

For years, the nursing profession's most respected authorities have aimed to define what, exactly, constitutes effective nursing—and what can be done to improve standards across the healthcare system. This practice's origins can be seen in Florence Nightingale's reliance on statistical methods to link environmental concerns with patient outcomes.

In the past few decades, the nursing field has made significant strides in standardizing quality evaluations. These days, nurses and patients alike rely on nursing sensitive indicators to provide a much-needed blueprint for effective care. Still, the concept of the nursing sensitive indicator remains a point of confusion and, sometimes, contention.

To provide clarity for this oft-misunderstood practice, here's an explanation of nursing sensitive indicators to help you understand how these evaluation procedures work and why they are so vital to the modern healthcare system:

What are Nursing Sensitive Indicators?

In 1998, the American Nursing Association (ANA) established the National Database of Nursing Quality Indicators (NDNQI). This national database provides both quarterly and annual reports about the effects of nursing at the unit level.

The overarching goal of the NDNQI? To build on a quickly growing body of knowledge referencing what, exactly, impacts the quality of nursing care. This effort is important in part because, as a profession, "nursing has a responsibility to measure, evaluate, and improve practice."

At the most basic level, nursing sensitive indicators aim to determine whether nurses have an impact on their patients. Just as importantly, however, these in-

dicators determine what that impact looks like and whether it delivers a net positive or negative for both individual patients and the community at large.

How Do Nursing Sensitive Indicators Measure Nursing's Impact?

The range of currently approved nursing sensitive indicators falls under a few key classifications first identified years ago by Avedis Donabedian [62] that remain relevant today. These categories make it easier to understand how, exactly, specific concerns play into patient care:

- This emphasizes the context under which nursing care is delivered. Key considerations include facilities, equipment, staffing, and financing.
- Any interaction between patients and nurses—within the context of delivering healthcare services—can be classified as part of the process portion of Donabedian's model.
- Several elements can be defined as outcomes, including changes in health status, increased knowledge, or improved patient satisfaction.

How Are Nursing Sensitive Indicators Developed?

Nursing sensitive indicator selection is far from haphazard. The original indicators selected for the NDNQI database passed extensive feasibility tests before they were approved. Since then, indicators have evolved to some extent to take a growing range of concerns into account. In 2001, for example, pilot testing revealed that RN job satisfaction would be a viable addition to the original indicators. Any time a nursing sensitive indicator is added, it must first pass a rigorous inspection to ensure it sufficiently impacts patient outcomes and is truly effective across the spectrum of modern healthcare.

Types of Nursing Sensitive Indicators

No one nursing sensitive indicator is sufficient on its own for measuring the profession's impact on patient care and outcomes. Rather, several elements must be considered together to provide a comprehensive view of nursing practices and results.

In addition to falling under the scope of the structure, process, and outcome classifications referenced earlier, the NDNQI database gets specific by collecting statistics for and analyzing these important indicators:

- Patient falls with and without injuries. Without proper assistance or effective treatments, patients are vulnerable to falls. These can delay recovery and prompt considerable suffering above and beyond what the patient might have otherwise experienced.
- RN satisfaction survey. As mentioned above, measures of RN satisfaction were not originally included among nursing sensitive indicators. These were added, however, because they were deemed essential for understanding work environments and promoting effective solutions for nurse recruitment and retention.
- Nosocomial infections. Often referred to as hospital-acquired infections (HAI), nosocomial transmission can sometimes reveal a lack of proper sanitary protocol within a particular unit or facility. In addition to examining general

rates of HAI, indicators may delve into specific subsets, such as those involving urinary catheters, central line catheters, and ventilators.

- Nursing hours per patient day. A key measure of staffing procedures, this was among the earliest and most important indicators approved by ANA. Nurse-to-patient ratios can hold huge implications for diagnoses, patient satisfaction, and more. This metric can be classified based on patient time spent with RNs or other nursing staff members, such as LPNs.

Indicators not included in the NDNQI database statistics, but which professional nurses should consider, nonetheless:

- Patient satisfaction with pain management. Assessment and treatment of pain is complex, and optimal pain care remains elusive. Only 63% - 74% of patients report that their pain was well-controlled. Personal biases may interfere with healthcare's ability to accurately assess pain management needs, but nurses who keep in mind the ethical principles of autonomy, beneficence, non-maleficence, and justice will be better equipped to make sound judgments.
- Patient satisfaction with nursing care. Despite the many challenges inherent in determining patient satisfaction, it has become a metric to measure payment systems for quality. The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey lists nine categories of factors contributing to patient satisfaction: communication with doctors, communication with nurses, responsiveness of hospital staff, pain management, communication about medicines, discharge information, cleanliness of the hospital environment, quietness of the hospital environment, and transition of care.

Success in nursing and across the healthcare industry lies in the ongoing collection and analysis of staffing and patient data. A range of considerations can provide insight into whether nurses deliver the level of care that patients deserve-and whether they receive the support and training they need to abide by elevated standards of care. Guided by nursing sensitive indicators, today's nurses can feel confident that they have the tools, knowledge, and assistance required to make a discernible difference in a challenging but rewarding field [46].

5. Research Design and Statistical Considerations

- This is a retrospective descriptive observational study of the changing of nursing quality sensitive indicators in ICU in Qurayyat general hospital at three months intervals, before and after applying the pilot research project about enhancing nursing quality sensitive indicators, from the beginning of November 2022 to the end of January 2023.
- Two questionnaires were designed;

- The first for the nursing staff correlated with all items of quality sensitive indicators, (Table 1), and

- The second for the research measurements and patient attitudes and satis-

faction regarding the nursing performance (Table 2).

- The characteristics of the questionnaires include the following items:

  - Structural terms

The structural terms identified included subcategory terms related to patients, nursing and setting. Patient-related structural terms were identified as "patient characteristic". The term "patient characteristic" generally refers to demographics such as the patients' gender, age and other variables such as duration of hospitalization, the type of ward, and the type of disease.

Nursing-related structural terms comprised Registered Nurses' (RNs) "education level" and "years of experience", Validity of SCFHS card, validity of BLS

Table 1. Nursing quality sensitive indicators status sheet.

No.	Name	Experience, yr.*		SCFHS Validity		BLS Validity		ACLS Validity		Competency		CME hours/Courses achievement		Date
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	
1.														
2.														
3.														
4.														
5.														
6.														
7.														

*More than 3 years.

Table 2. Research measurements.

Research Measurements	From 1 to 10*
Patient satisfaction with pain management	
Patient satisfaction with nursing care	
Patient satisfaction with overall care	
Patient satisfaction with medical information provided	
	Yes or No
Pressure ulcers	
Patient falls	
Nurse job satisfaction	
Nosocomial infections	
	No.
Total hours of nursing care per patient, per day	
Staffing mix (patient/nurse ratio)	

*Defined as per patient reply.

certificate, validity of ACLS certificate. Setting-related structural terms included "hours of nursing care per patient day", "nurse staffing", "percentage of hours supplied by RNs", and "organizational factors of the nurse practice environment" such as support for nursing education.

Process terms

Nursing-related processes included working hours per day, nurse to patient ratio, and job satisfaction. Patient related process included patient attitude towards pain management, developing of nosocomial infection, developing of bed sores, and the overall satisfaction towards caring process

Outcome terms

Three subcategories for outcome terms were identified. Terms for patient-related outcomes were the most frequent and were safety, perception, use of health care, functional status and clinical management.

Patient-related safety was generally operationalized as adverse occurrences, which included prevalence of "pressure ulcer", "falls and falls with injury", "nosocomial selective infection", "nosocomial urinary tract infection"; Patient-related perception included "patient satisfaction with nursing care" and "patient satisfaction with pain management". Nursing-related outcome terms identified included: "nursing satisfaction with job" and "safety of nursing job".

- Inclusion criteria:

Nurses working in ICU, patients were admitted in ICU during the research period.

- Exclusion criteria:

Nurses working out of ICU, patients were not admitted ICU during the research period.

- The filled questionnaires were collected, and the statistical analysis were done manually as the number of the included individuals is relatively small.

6. Research Methods

- Two questionnaires were designed;

1) The first was designed about the essential nursing quality sensitive indicators, which should be filled by information about the nurses (Table 1).

2) The second was designed about research measurements, and patient attitudes and satisfaction towards nursing performance; which should be filled by the replying information from the patients and nurses (Table 2).

- The nursing questionnaire were filled initially before enhancing the nursing quality sensitive indicators by a member of research team through an interview with ICU nurses, and filled later after the enhancing of these indicators.
- The research measurements and patient questionnaires were filled by a member of research team through an interview with ICU patients before enhancing the nursing quality sensitive indicators, and filled later after the enhancing of the nursing quality sensitive indicators.

All questionnaires were collected, and the statistical analysis was done re-

garding the results of all filled questionnaires.

Data are collected prospectively by a member of research team, based on detailed data definitions developed prior to data collection. Data are analyzed manually by a statistician and summarized in comprehensive reports. The reports include the fulfillment of quality indicators at the departmental level and also comments and recommendations from the steering committee of the individual databases on how to improve the quality of care.

7. Results

1) Nursing Quality Sensitive Indicators

30 ICU nurses were included in this pilot research; the nurse questionnaire regarding the nursing quality sensitive indicators was filled initially before enhancing the nursing quality sensitive indicators, (Table 3) and filled again later after the enhancing of the nursing quality sensitive indicators, (Table 4), which showed improvement of the nursing quality sensitive indicators, including: duration of work experience, validity of the card of Saudi Commission For Health Specialties (SCFHS), validity of the certificate of Basic Life Support (BLS) course, validity of the certificate of Advanced Cardiac Life Support (ACLS) course, total of Continuous Medical Education (CME) earning hours, nurse job satisfaction, total hours of nursing care per patient, per day, and staffing mix (patient/nurse ratio) (Table 5).

2) Research Measurements

22 ICU patients were included in this research, the patient questionnaire regarding patient attitudes and satisfaction was filled through an interview with the patient by the research team member; which showed improvement of all research measurements regarding patient attitudes and satisfaction, including: patient satisfaction with pain management, patient satisfaction with nursing care, acquisition of nosocomial infections, acquisition of nosocomial infections patient satisfaction with overall care, patient satisfaction with medical information provided, development of pressure ulcers, occurrence of patient falls (Table 6).

8. Discussion

This research showed good improvement of the values of essential nursing quality sensitive indicators, including: duration of work experience, validity of SCFHS card, validity of BLS certificate, validity of ACLS certificate, total of CME earning hours, nurse job satisfaction, total hours of nursing care per patient, per day, and staffing mix (patient/nurse ratio) (Table 5).

Also this research showed good improvement of research measurements and patient's attitudes and satisfaction towards the pain management, patient satisfaction with nursing care, acquisition of nosocomial infections, acquisition of nosocomial infections patient satisfaction with overall care, patient satisfaction with medical information provided, development of pressure ulcers, and occurrence

Table 3. Initial nursing quality sensitive indicators status.

Initial Nursing Quality Sensitive Indicators Status															
No.	Name	Experience, >3 yrs		SCFHS Validity		BLS		ACLS		Competency		CME hours/ Courses achievement		Date
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	
1.	-	4 Yrs		31\07\2024		06\10\2024		9/2023		✓		24H		1/11/2022
2.	-	4 Yrs		01\08\2024		15\03\2024		10/2024		✓		-		1/11/2022
3.	-	4 Yrs		04\01\2023		20\10\2023		NIL		✓		3H		1/11/2022
4.	-	12 Yr		25\10\2023		20\10\2023		4/2021		✓		68H		1/11/2022
5.	-	15 Yr		20\04\2024		17\06\2023		4/2021		✓		-		1/11/2022
6.	-	4 Yrs		27\07\2024		20\10\2023		NIL		✓		28H		1/11/2022
7.	-	17 Yr		31\07\2024		14\06\2023		5/2021		✓		-		1/11/2022
8.	-	3 Yrs		06\06\2023		30\05\2023		NIL		✓		-		1/11/2022
9.	-	5 Yrs		16\01\2023		20\10\2023		4/2021		✓		-		1/11/2022
10.	-	12 Yr		09\08\2024		20\10\2023		9/2023		✓		30H		1/11/2022
11.	-	12 Yr		21\10\2024		20\10\2023		NIL		✓		-		1/11/2022
12.	-	4 Yrs		30\10\2024		20\10\2023		4/2021		✓				1/11/2022
13.	-	13 Yr		20\09\2023		03\10\2023		4/2018		✓		10H		1/11/2022
14.	-	12 Yr		31\07\2024		03\07\2023		9/2022		✓		-		1/11/2022
15.	-	16 Yr		25\09\2023		14\10\2023		4/2021		✓		32H		1/11/2022
16.	-	12 Yr		08\08\2023		14\10\2022		4/2021		✓		52H		1/11/2022
17.	-	3 Yrs		06\02\2024		02\01\2024		NIL		✓		30H		1/11/2022
18.	-	4 Yrs		27\05\2023		20\10\2023		9/2022		✓		5Y		1/11/2022
19.	-	5 Yrs		31\07\2024		20\10\2023		4/2021		✓				1/11/2022
20.	-	3 Yrs		05\06\2023		15\06\2023		NIL		✓		26H		1/11/2022
21.	-	12 Yr		01\08\2022		02\12\2022		9/2023		✓				1/11/2022
22.	-	3 Yrs		08\09\2024		27\10\2022		9/2023		✓		-		1/11/2022
23.	-	3 Yrs		20\05\2024		27\05\2024		NIL		✓		-		1/11/2022
24.	-	3 Yrs		18\05\2024		08\10\2024		9/2023		✓		-		1/11/2022
25.	-	6 Yrs		18\03\2024		27\10\2022		9/2022		✓		-		1/11/2022
26.	-	6 Yrs		18\03\2024		27\10\2022		9/2023		✓		-		1/11/2022
27.	-	Orientation		22\05\2024		21\06\2023		NIL		✓		5H		1/11/2022
28.	-	4 Months		23\11\2023		NIL		NIL		✓		-		1/11/2022
29.	-	Orientation		30\05\2024		21\03\2024		NIL		✓		-		1/11/2022
30.	-	3 Yrs		07\06\2023		11\2023		NIL		✓		-		1/11/2022

Table 4. Final nursing quality sensitive indicators status.

Final Nursing Quality Sensitive Indicators Status														
No.	Name	Experience, yr. >3 yrs		SCFHS Validity		BLS		ACLS		Competency		CME hours/ Courses achievement		Date
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	
1.	-	4 Yrs		31\07\2024		06\10\2024		9/2023		✓		Yes		1/2/2023
2.	-	4 Yrs		01\08\2024		15\03\2024		10/2024		✓		Yes		1/2/2023
3.	-	4 Yrs		04\10\2023		20\10\2023		12/2022		✓		Yes		1/2/2023
4.	-	12 Yr		25\10\2023		20\10\2023		12/202		✓		Yes		1/2/2023
5.	-	15 Yr		20\04\2024		17\06\2023		12/202		✓		Yes		1/2/2023
6.	-	4 Yrs		27\07\2024		20\10\2023		12/202		✓		Yes		1/2/2023
7.	-	17 Yr		31\07\2024		14\06\2023		12/2022		✓		Yes		1/2/2023
8.	-	3 Yrs		06\06\2023		30\05\2023		NIL		✓		Yes		1/2/2023
9.	-	5 Yrs		15\01\2025		20\10\2023		12/2022		✓		Yes		1/2/2023
10.	-	12 Yr		09\08\2024		20\10\2023		9/2023		✓		Yes		1/2/2023
11.	-	12 Yr		21\10\2024		20\10\2023		12/2022		✓		Yes		1/2/2023
12.	-	4 Yrs		30\10\2024		20\10\2023		4/2021		✓		Yes		1/2/2023
13.	-	13 Yr		20\09\2023		03\10\2023		4/2018		✓		Yes		1/2/2023
14.	-	12 Yr		31\07\2024		03\07\2023		12/2022		✓		Yes		1/2/2023
15.	-	16 Yr		25\09\2023		14\10\2023		12/2022		✓		Yes		1/2/2023
16.	-	12 Yr		08\08\2023		10\11\2024		12/2022		✓		Yes		1/2/2023
17.	-	3 Yrs		06\02\2024		02\01\2024		9/2022		✓		Yes		1/2/2023
18.	-	4Yrs		27\05\2023		20\10\2023		9/2022		✓		Yes		1/2/2023
19.	-	5 Yrs		31\07\2024		20\10\2023		12/2022		✓		Yes		1/2/2023
20.	-	3 Yrs		05\06\2023		15\06\2023		122022		✓		Yes		1/2/2023
21.	-	12 Yr		31\07\2024		10\11\2024		9/2023		✓		Yes		1/2/2023
22.	-	3 Y		08\09\2024		10\11\2024		9/2023		✓		Yes		1/2/2023
23.	-	3 Yrs		18\05\2024		08\10\2024		9/2023		✓		Yes		1/2/2023
24.	-	3 Y		18\03\2024		10\11\2024		9/2022		✓		Yes		1/2/2023
25.	-	6 Yrs		18\03\2024		10\11\2024		9/2023		✓		Yes		1/2/2023
26.	-	6 Yrs		22\05\2024		21\06\2023		12/2022		✓		Yes		1/2/2023
27.	-	Orientation		23\11\2023		10\11\2024		12/2022		✓		Yes		1/2/2023
28.	-	7 Months		30\05\2024		21\03\2024		12/2022		✓		Yes		1/2/2023
29.	-	Orientation		07\06\2023		11\2023		NIL		✓		Yes		1/2/2023

Table 5. Changes in nursing quality sensitive indicators.

Indictor	Initial %	Final %	Increment%	Status
Experience (>3 yrs)	6.3	6.8	0.5	On-going
SCFHS Validity	90	100	10	Completed
BLS Validity	76.66	100	23.34	Completed
ACLS Validity	23.33	82,75	59.42	On-going
Competency Rate	100	100	0	Completed
CME earning	40	100	60	Completed
Date	01/11/2022	01/02/2023	01/02/2023	On-going

Table 6. Changes in research measurements.

Research Measurements	Before %	After %	Increment %	Status
Patient satisfaction with pain management	75.5	80.5	5	On-going
Patient satisfaction with nursing care	80	90	10	On-going
Patient satisfaction with overall care	80	90	10	On-going
Patient satisfaction with medical information provided	80.5	92.5	12	On-going
Yes or No	No	No	No	
Development of Pressure ulcers	0	0	0	Completed
Occurrence of Patient falls	0	0	0	Completed
Nurse job satisfaction	90	100	10	Completed
Acquisition of Nosocomial infections	0	0	0	Completed
No.				
Total hours of nursing care per patient, per day	4.5	9	50	Completed
Staffing mix (patient/nurse ratio)	1 to 2	1 to1	100	Completed

of patient falls (Table 6).

Furthermore, increased use of nursing-sensitive indicators in clinical quality would reflect that high-quality healthcare is the result of multidisciplinary efforts. Therefore, more fundamental care indicators need to be developed and implemented in clinical quality. Nurse leaders may strengthen the necessary focus on fundamental care to the benefit of patients by requiring systematic measurements of aspects of fundamental care, thereby placing the quality of fundamental care on decision makers' agendas.

We aimed to develop a comprehensive list of nursing-sensitive indicators and their implications on various healthcare outcomes. Based on our results, there are several conclusions and recommendations for future research in the following five areas: 1) frequency of explored relationships, 2) implications of nursing-sensitive indicators on quality, 3, 4) high numbers and variety of nurse staffing variables and lack of standardization [14].

The most frequently used terms as patient outcomes, nursing staffing, mortality, adverse event, medication error, pneumonia, failure to rescue and pressure ulcer in the abstracts of reviewed studies of nursing-sensitive indicators, patient-focused outcome indicators that followed these were pressure ulcer, patient falls, FTR, patient falls with injury, MAE, LOS, patient satisfaction, other outcomes, ADE and DVT-pulmonary embolism, nosocomial infections as the most consistently investigated patient-focused indicator. In their review, length of stay, central-line-associated bloodstream infection, ventilator-associated pneumonia, sepsis, falls with injury, re-intubation and medication errors. Nurse-focused outcome indicators included nurse job satisfaction, nurse burnout and nurse turnover, nurse experience and education.

Implications for healthcare systems and nursing service improvement: The concept of NSIs has far-reaching implications for informing national health policies and, in particular, policies related to an array of information system development associated with administrative activity, clinical activity, clinical management and business management including costing. It is known that data and information on performance are often tied, or inherently built into, administrative systems to support activity-based funding schemes where the data are used for hospital quality improvement initiatives [61] [63].

The published literature concerning the safety and quality of health care attests that undesirable clinical behaviors persist without recourse to some sort of intervention [29] [64] [65]. It has been established that meaningful quality monitoring information motivates health professionals to change practice and improve the quality and safety of clinical care if incentives are passed down to the service [9] [66]. Hence, the delivery of performance-based incentives directly to health professionals including nurses has received growing support on national quality and safety policy agendas [30] [67]. Still, studies suggest that nurses, one of the largest groups of health professionals in acute care providing vital service at the bedside, are not particularly engaged with quality monitoring activities due to the lack of meaningful data reported to them at the service level [53] [54].

To strengthen the use and application of relevant nursing data in information systems for improving quality dimensions of nursing care performance, a concerted effort is required to build mutual understanding on the language and phenomena of interest to its discipline and the refinement of conceptual terms including their attributes, properties and dimensions. NSIs must be underpinned by efforts to develop common data standards and information system terminology, which are interoperable within national healthcare data systems. Attributes of NSIs have potential to interface and feature as performance measures within clinical quality information systems.

Using Nursing Quality sensitive indicators to evaluate nursing performance is, in itself, a complex exercise that presents challenges in terms of feasibility. The proposed framework encompasses all possible indicators. However, in practice only a limited number of indicators should be selected, and these need to make

sense for the health professionals and enable a certain amount of benchmarking. The use of indicators, even if only a few, is a first step in the rigorous examination of care quality and safety and serves as a starting point for practice improvement.

The Nursing Quality Indicators are measures of Nursing care quality that use readily available hospital inpatient administrative data. While Continuous Nursing quality improvement (CNQI) is the key to care excellence to match with the paradigm shift in roles of health care professionals, expectations from consumers and technological advancements in Health care. Safety and quality are integral aspects of Nursing Care Continuum. It remains a critical element in the nursing professional tool kit to ensure accountability, transparency, and quality improvement. To carry out interdisciplinary processes to meet organizational QI goals and to measure, improve, and control nursing quality sensitive indicators (NQSIs) affecting patient outcomes specific to nursing practices. Monitor for early recognition of adverse events, complications and errors [49]. Initiating deployment of appropriate and timely nursing care to aid patients in speedy recovery. For assessing the provided care & improving the quality of care For defining strategies to achieve goals & redefining patient care. Compliance of ward nursing staff with any mandatory training. Standards Nursing Sensitive Indicators Include the supply of nursing staff, the skill level of nursing staff, equipment, education and certification levels of nursing staff. Measure methods of patient assessment and nursing interventions and competency assessment [6].

Process Indicators: Reflect patient outcomes that are determined to be nursing quality sensitive indicators because they depend on the quantity or quality of nursing care outcome. These include pressure ulcers and falls.

Nurse staffing characteristics; number of nursing staff, number of staffing ratio, nurse staffing levels nurse staffing qualifications, nurse experience, nurse education, hospital characteristics, work schedule, patient safety, patient turnover, work environment, nurse autonomy, treatment and procedures, pain management, maintenance of skin integrity, patient education nurses job satisfaction, nurse reported quality of care, nurse burnout, nurse turnover, nosocomial infection, mortality, pressure ulcer, patient satisfaction, patient falls, patient falls with injury, LOS, DVT/pulmonary embolism, physical restrain use [68].

Availability of continuing education and training options (engagement of team & newer approaches) Nurses directly affect the quality of hospital care—All efforts to train them and maintain their value should be addressed. Nurses will—in turn—pass the same value and care along to their patients. The difficulties encountered by RNs while implementing NQSIs Lack of time inadequate number of professionals Lack of knowledge on the subject. Lack of understanding of how to use the instruments. Relationship between Quality of care and Staff Empowerment as Staff Empowerment Increased Job Satisfaction, Lower job turnover increased patient satisfaction & Perception of care Higher Quality of care Nursing Quality of Care Measured through NQI. What Builds Staff Empower-

ment? 1. Leader support and teams. 2. Communication and information sharing. 3. Positive reinforcement. 4. Confidence. 5. Just Culture Barriers for Staff Empowerment? 1. Lack of senior leader support. 2. Lack of resources. 3. Poor teamwork and support. 4. Stagnation and loss of momentum for change.

9. Study Limitations

The weaknesses of our study include that unambiguous assignment of indicators to an aspect of fundamental care was not possible in all cases. Therefore, the percentages of indicators in each aspect of fundamental care are approximate indications of nursing. Furthermore, we examined only the aspects of fundamental care included in ICU. Thus, other aspects of the Fundamentals of Care framework were not considered in this study.

This research was limited to primary research data sources based upon a specified search strategy. Due to the evolving nature of the science on the topic of nursing sensitive indicators, the frequent use of surrogate terms and the limitations of database searching strategies, some relevant data sources may have been excluded..

Considering that the science of nursing quality and performance is not static or concrete, but dynamic and evolving, the attributes determined in this research, although more definitive than descriptive, are open to further review, interpretation and verification. In general, this research analysis remains largely a theoretical illustration to show where uses of the concept are embedded in evidence. These few structural and outcome attributes are offered as the most prevalent characteristics of the concept, given their frequent use in primary research.

One limitation of this study is that the evidence presented in most of the selected articles was not very strong. Also, the process of categorizing indicators was sometimes complicated because [32] some articles were muddled about the definition of terms, such as domain, indicator, and measure, [8] indicators were often formulated differently from one article to another, and indicators were often not explicitly defined.

10. Management Plan

- The features, characteristics, and impacts of the results of this research correlated with nursing quality sensitive indicators on nursing performance improvement, with its consequent outcomes on patient safety and satisfaction will be distributed to all nursing staff in all hospitals and health institutes to be considered in nursing competency and performance assessment.
- To establish standardized nursing quality & sensitive indicators in Qurayyat general hospital, as a first step. Then, to submit these indicators to Ministry of health requesting to be accepted and to be generalized to all hospitals and health institutes.
- We hereby hope to encourage the implementation of nursing quality sensi-

tive indicators in both national and international levels to ensure fundamental nursing care quality and facilitate future larger scale research into the effect of fundamental nursing care interventions on patient outcomes.

11. Expected Results Utilization

Implement these standardized nursing quality sensitive indicators in all hospitals and health institutes to improve the nursing performance outcomes on patient safety and satisfaction.

In reality, outcome indicators, in general, were necessary to standardize measurements for internal and external comparisons. Hence, these organizational reconfigurations provided the impetus for the need to identify, develop and assess measures to support nursing practice enhancements and performance strategies.

The consequences of the concept of nursing quality sensitive indicators has meant that the development of nursing quality sensitive indicators as standardized nursing data elements remains a critical and expanding area of research.

Without nursing standardized data elements, researchers must rely on proxy measures to establish associations between nursing practice and workplace enhancements and their effects on patient outcomes, intended for use by the public and other health care stakeholders to evaluate the extent to which and ways in which nurses in acute care hospitals contribute to patient safety, health care quality, and a professional work environment'.

Development of the nursing quality sensitive indicators has meant that significant steps in nursing research have supported associations, whether conclusive or not, between setting-related structural terms such as staffing and patient-related outcomes such as pressure ulcer. Nursing quality sensitive indicators could be used to build robust nursing quality sensitive databases that incorporate executive and clinical reporting information systems. A consequence of the application and use of standardized nursing quality sensitive indicators is improved patient safety and workforce planning through enhanced knowledge that can specifically support decision-making.

Also the use of common nursing data definitions and collection methodologies that has enabled nursing data to be compared across units, hospital regions and states [31]. This has led to public reporting of quality sensitive indicators likely to inform consumers' hospitals choices, but also may assist businesses and insurers with their purchasing and reimbursement decisions.

On the front lines of care, nurses and their leaders need insight. Across the inpatient care settings, our tech measures nursing quality within your organization and helps improve patient outcomes through dynamic reporting capabilities, performance improvement resources, and more, as follows:

- Turn safety into satisfaction
- Improve nursing quality
- You'll get insights and reports on your nursing organization so you can fully

understand how to drive performance, allowing you focus on the things that really make a difference.

- Empower your nurses

- Insights those are easy to share with your team and practical enough for nurses to act on right away. Plus, you can enjoy the benefits of an engaged, empowered workforce.

- Turn gaps into opportunities

When you know what's missing, you know how to fix it. Reframe gaps in nursing care as areas for improvement with our insights into performance trends—for every nursing unit in your organization.

- Banish adverse events

- Benchmarking: Rate yourself where it really matters

With our insights, you can benchmark your performance against other hospitals, work on development and feasibility for measurement and benchmarking for several Nursing quality sensitive indicators

- What's more, you can fine-tune the data down to a specific nursing unit.

- When you need to improve your nursing care, you want to know how—and how to do it with ease.

Implications of nursing-sensitive indicators on quality [14].

The most frequently examined patient-focused outcome indicators were nosocomial infections and patient satisfaction.

It is required to develop strategies to reduce infection rates.

Nursing quality sensitive indicators articulate the value of nursing's contributions by measuring elements of patient care and patient outcomes that are directly affected by nursing practice. The identification and measurement of nursing quality sensitive indicators is critical in describing the contributions and value of registered nurses (RNs) in all care settings.

12. Conclusions

This pilot research about applying essentials nursing quality sensitive indicators support the establishment of standardized nursing quality sensitive indicators for assessment and follow-up of all items correlated with nursing care works and activities in a hospital or health institute for continuous upgrading the nursing performance and outcomes on patient safety and satisfaction.

We invite nurses to use our outcomes of nursing quality sensitive indicators as inspiration for how aspects of fundamental care may be measured as a first step towards performing clinical nursing intervention studies and investigating associations with patient outcomes, as well as quality development. Finally, decision makers responsible for the quality of healthcare and nurse leaders should work towards a higher level of interdisciplinary representation on database steering committees to ensure patients' clinical outcomes.

This paper provides an analysis of the concept of nursing quality sensitive indicators where the need to develop a clear concept becomes ever more apparent

on two key fronts: theory building for nursing science in acute care and informing the development of quality dimensions of healthcare information systems. Also have been made to progress understandings of the science of nursing quality and performance measurement

Development, refinement and standardization with sufficient use and application of nursing process measures *i.e.* nursing quality sensitive indicators are considered the most direct approach to assess quality of care is an examination of the process of care itself that nursing process measures are, in the main, poorly conceptualized as standard measurements.

Support nursing-related quality improvement and clinical evaluation elaborates to help understand and generate nursing process measures inherent to different nursing role requirements, and include assessing the effectiveness of nursing interventions on patient outcomes in a general nursing setting and gaining better understandings of how Registered Nurses' role components have an impact on specific activities and health outcomes.

Nurses provide many services in acute care where nursing quality sensitive indicators have emerged. Often nursing services are neither properly understood by health service officials at many levels, nor appropriately communicated to them. Development of the concept of nursing quality sensitive indicators may illuminate the nature of nursing services and support nurses' engagement with quality monitoring and reporting. With ongoing support from primary research, further refinement of this research may also enhance theoretical knowledge that supports connections between clinical processes and the development of health information systems.

Today's national spotlights on patient safety and public reporting have increased the need for nursing to collect and monitor data related to patient outcomes. It is also critical to continue these efforts to ensure nursing has the appropriate workforce to render the care necessary to optimize patient outcomes at the unit level.

Stakeholders of nursing research may use the findings of this study to develop the future research agenda with a particular focus on nursing quality sensitive indicators.

This study has extended the theoretical framework of nursing quality sensitive indicators. It provides a more recent synthesis of the state of current knowledge on performance indicators for ICU care nursing. It enhances the nursing quality sensitive indicators.

However, much remains to be done in terms of developing measures for these indicators and setting up systems for managing performance in ICU care nursing. Finally, while it is essential to know what indicators are nursing quality sensitive, it is equally essential to incorporate these into processes for evaluating interprofessional performance.

Recommendations

I) Continue with this research actions and conclusion to establish, and im-

plement the standardized nursing quality sensitive indicators to control, improve, and upgrade nursing performance in all hospitals and health institutes throughout Kingdom of Saudi Arabia, which include the following items of Nursing Quality Sensitive Indicators:

Experience (years)

1) SCFHS card validity

2) BLS certificate validity

3) ACLS certificate validity

4) Competency Rate

5) CME earned hours

6) Patient satisfaction with pain management

7) Patient satisfaction with nursing care

8) Patient satisfaction with overall care

9) Patient satisfaction with medical information provided

10) Development of Pressure ulcers

11) Occurrence of Patient falls

12) Nurse job satisfaction

13) Acquisition of Nosocomial infections

14) Total hours of nursing care per patient, per day

15) Staffing mix (patient /nurse ratio)

16) Prepare for future developmental process of nursing quality sensitive indicators through the following points:

a) Review scientific literature for: i) evidence that some aspect of nursing case has an effect on a patient outcome; ii) specific definitions of the indicators; and iii) evidence that the indicators can be validly and reliably measured

b) Collect information from researchers in the field on threats to reliability and validity

c) Conduct expert review of draft indicator definitions, data collection guidelines, and data collection forms

d) Distribute revised definitions, guidelines, and forms to clinical experts for comments on face validity and feasibility of reliable data collection

e) Incorporate clinical expert feedback and develop revised versions of definitions, guidelines, and forms

f) Conduct a pilot study using the draft data collection materials and review data; also interview hospital study coordinators to identify additional threats to reliability and validity

g) Finalize definitions, data collection guidelines, and forms

h) Develop the indicator with draft guidelines and data collection instruments

i) The means for all medical units in a given-size facility will be compared with national standards for a given, nursing quality sensitive indicator. The process measures associated with falls are collected and reported as well as the outcome measure of a patient fall.

j) Nursing leaders at participating facilities have used the information to ad-

vocate for more staff or a different mix of staff based on their comparisons of units in comparable facilities nationwide.

k) Nursing staff are also able to identify whether their performance improved after they intervened in an area needing improvement, e.g., a decrease in the fall rate due to implementation of a new protocol.

II) Broad Accomplishments

1) Nursing quality sensitive indicators accomplishments include development of nationally accepted measures to assess the quality of nursing care, improvements in training procedures for data submission, identification of nursing workforce structures and processes that influence outcomes, and sharing best practices for improving outcomes.

2) The staff nurses and nurse leaders now have a valuable nursing tool to aid them in decision making about staffing, skill mix, patient care processes, and workforce characteristics that affect patient outcomes, thus influencing directly and indirectly the cost of patient care. The facility now has the data necessary to calculate their cost/benefit ratio based on their improvements and outcomes.

3) Researchers will also continue to benefit from these enhancements. These developments will enable researchers to fine-tune their research questions and identify additional associations between nursing workforce characteristics and processes and the observed patient outcomes.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Abbreviations and Acronyms

ICU	Intensive Care Unit
SCFHS	Saudi Commission for Health Specialties
BLS	Basic Life Support
ACLS	Advanced Critical Life Support
NSIs	Nursing-Sensitive Indicators
AIR	Assessment, Intervention, Reassessment
PES	Practice Environment Scale
UTI	Urinary Tract Infection
CLABSI	Central Line Catheter Associated Blood Stream Infection
VAP	Ventilator-Associated Pneumonia
NQSIs	Nursing Quality Sensitive Indicators
NSIQI	Nurse-Sensitive Indicator Quality Improvement
CME	Continuous Medical Education
NDNQI	National Database for Nursing Quality Indicators
NSIs	Nurse-Sensitive Indicators
RNs	Registered Nurses
CNQI	Continuous Nursing Quality Improvement
MilNOD	Military Nursing Outcomes Database
ANA	American Nursing Association