



REVIEW ARTICLE

INDICATORS OF NURSING QUALITY: QUANTIFYING EFFECTS OF NURSING CARE INTERVENTIONS

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ARTICLE INFO

Received 16<sup>th</sup>, February, 2016,  
Received in revised form 29<sup>th</sup>,  
March, 2016, Accepted 18<sup>th</sup>, April, 2016,  
Published online 28<sup>th</sup>, May, 2016

Keywords:

nursing quality indicators, nursing-sensitive indicators, nursing metrics

ABSTRACT

Professionals qualified in nursing science everywhere in the globe have a fascinating interest regarding quality nursing care which is desired by nurses and promised by nurses (Andreas Charalambous, Rena Papadopoulus, Alan Beadsmoore,2009)<sup>2</sup>. The monitoring and reporting of the nursing care and measuring nursing's contribution to high-quality care considered as the high effect efforts of nursing and midwifery began when Florence Nightingale used statistical methods to identify the relationship between patient outcomes and environmental conditions in the 1850s (Montalvo, 2007<sup>3</sup>; Griffiths P, Jull A, 2010<sup>4</sup>). This long and respectful history tracing back to Florence Nightingale's epidemiological focus to outcome measurements attracted the respect and warm approval from statisticians and epidemiologists very much alike. Moving forward on the footmarks of Nightingale, nursing science in 21<sup>st</sup> century, with its largest group of professionals has the responsibility to shape a framework for better patient outcomes through effective quality measurement that account for their actions, contributions and significance (AWHONN, 2013)<sup>5</sup>. Nursing Quality Indicators, the pronounced priority of this article attempts to review quality indicators with reference to nursing care and presents concepts related to nursing quality indicators, nursing sensitive indicators and nursing metrics.

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INTRODUCTION

Researches on nursing quality indicators signal the beginning a new era of ascertaining nursing's contributions to patient care. These are a set of measurements to quantify and show how successful nursing care is in a specific area. Jeanette Ives Erickson (2011)<sup>6</sup> in her report states that the use of nursing-sensitive indicators as a measure of quality care emerged in mid 1990s that national healthcare organizations and regulatory agencies (US) recognized a correlation between certain interventions performed by nurses and the overall quality and safety performance of healthcare institutions. Nursing quality indicators exert force on nursing profession to move further from "what and how do you do?" toward, "what difference you are making?" Erickson once asserted. Her new presentation emphasized upon verifiable outcomes at the centre of the quality efforts, reinforced by empowerment, desirable professional practice, new knowledge, innovations and improvements and transformational leadership. Performance measurement in the words of Hoi, Elaine (2008)<sup>7</sup> is decisive to enhancing the provision of standard patient care in hospitals. Required and attainable, it frames a reliable ground work for

internal and external responsibility and answerability. Although conceptual elements are variously named and defined; most definitions gravitate around patient and nursing outcomes as results of specific nursing interventions in whole or part with variations in its quality or quantity (Doran, 2011)<sup>8</sup>. The indicators listed in this article are from reviews on nurse-sensitive outcomes, nursing-sensitive quality indicators and nursing metrics.

What are Nursing Quality Indicators (NQIs)?

Xiaoquan Xu (2015)<sup>9</sup> defines nursing quality indicators as numerical measures that quantify the effectiveness of nursing care, cost efficiency and organization performance.

Nurse-sensitive indicators demonstrate quality of nursing care delivered through quality improvement purposes at unit level and these indicators become integrated with routine nursing care (Burston S, Chaboyer W, Gillespie B., 2014)<sup>10</sup>.

The collection of data to identify and evaluate nursing outcomes on patient care or a health care system is often referred to as "Nurse-Sensitive Outcomes," or "Nursing-Sensitive Indicators" (Stephen D.Krau, 2014)<sup>11</sup>.

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The analysis by Heslop and Lu (2014)<sup>12</sup> supports that nursing quality indicators elaborate nursing care performance, quantify and measure 'what nurses do' to justify funding, quality of practice and patient outcomes. According to Susan *et al* (2012)<sup>13</sup> nursing-sensitive indicators demonstrate the impact of nurses' contribution to clinical, organizational and financial outcomes. Nursing sensitive Indicators as remarked by Foulkes M (2011)<sup>14</sup> measure nursing performance based on outcomes for which nurses could realistically be held accountable and this evidence base determines nursing's contribution to overall hospital care. Jeanette Ives Erickson (2011)<sup>6</sup> in her report stated a broad definition of nursing-sensitive quality indicators as a set of standardized performance measures intended to help hospitals assess the extent to which nurses' commitment and nursing interventions have an impact on patient safety, quality, and the professional work environment.

Persuading the view of other researchers, Tammy Haslar (2011)<sup>15</sup> claims that nursing sensitive indicators are nurses' unique contributions to health care. Griffiths *et al* (2008)<sup>16</sup> provides an explanation that indicators or metrics are ways of measuring and benchmarking the quality of nursing care. They are also yardstick to quantify nurse-delivered outcomes and results such as patient experiences of compassion, safety and effectiveness of nursing care and shows how successful nursing care in a specific area.

The definition offered by Hoi, Elaine (2008)<sup>7</sup> is that nursing quality indicators are quantitative measurements of the contribution by registered nurses to the quality of care in an inpatient setting by assessing patient health outcomes. Montalvo (2007)<sup>3</sup> argues that nursing-sensitive indicators identify configurations related to care and care processes, both of which in turn influence patient outcomes, either directly or indirectly. Further, nursing sensitive indicators are specific to nursing and differ from medical indicators of quality. As such, nursing outcome indicators are those outcomes most influenced by nursing care.

Nursing-sensitive indicators have been broadly defined by American Nurses' Association (2004)<sup>17</sup> as measures and indicators that reflect the structure, process and outcomes of nursing care and these measures reflect the impact of nursing care. Doran (2003)<sup>18</sup> described nursing-sensitive outcomes as those that are relevant, based on nurses' scope and domain of practice, and for which there is empirical evidence to link nursing inputs and interventions to the outcome. Nursing sensitive indicators demonstrate that RN's make cost effective difference in providing safe, high-quality patient care (Gallagher, 2003)<sup>19</sup>.

### **Nursing Quality Indicators List**

All the more so in the current health care scenario, nursing science must make visible and measurable its contribution to quality and confirm with greater evidences the effect of nursing to clinical outcomes (Robert & Cornwell, 2012)<sup>20</sup>. Furthermore, evidence from literature outlines the nursing quality indicator list as seen in the following text. Anne Gallen (2014)<sup>21</sup> formulated a list of standardised metrics comprises of the succeeding frequent themes: medication storage and custody, medication administration, documentation, nursing

assessment to include: pressure ulcer assessment, falls, restraint, patient observations, nursing care plan, discharge planning, nursing evaluation, environment, provision of information and personal plan. The reason offered by Heslop and Lu (2014)<sup>12</sup> in quantifying and measuring 'what nurses do' justifies funding, quality of practice and patient outcomes. The structural attributes of nursing-sensitive indicators related health service operation are: hours of nursing care per patient day and nurse staffing. Outcome attributes related patient care included: the prevalence of pressure ulcer falls and falls with injury, nosocomial selective infection and patient and family satisfaction with nursing care.

The accreditation standards of Massachusetts General Hospital (2013)<sup>22</sup> although recognized structures and processes for excellence in care, the evidence-based outcomes remain dominant: clinical quality outcomes, patient satisfaction and nurse satisfaction.

Maben (2012)<sup>23</sup> as a UK initiative traces out the evidence and theory for high quality care metrics for nursing and that are recognized indicators of nursing care quality. These comprise health care associated infection, pressure ulcers, falls, drug administration errors, patient complaints. The contextual variables regarded as wider structural indicators are workforce e.g. staffing levels, skill mix, sickness absence, staff experiences e.g. perception of the practice environment and systems e.g. admissions, discharge and handover.

Illustrated by the conceptual model on high quality metrics for nursing, Kings College London (2012)<sup>16</sup>, the aspects of quality outcomes are: workforce, staff experience and systems. The workforce elements are staffing levels, skill mix, practice environment, inter-professional relations. Staff experiences include staff wellbeing, perception of safety; employ commitment, intention to stay. Systems components are admissions, handover, and discharge, recording and reporting.

Hannah *et al* (2012)<sup>24</sup> summed up the following lists of indicators recognized by Canadian Nurses Association, confirming that nurses make a difference on the entire patient care system. The summaries of indicators are: Worked hours per patient day, proportion of RNs, RPNs/LPNs, Reg.Psych. Nurses to total nursing staff, RN-to-patient ratio, absenteeism, nursing turnover, model of nursing care delivery, education of nurses, fall risk assessment, falls prevention, pressure ulcer risk assessment, hand hygiene practice, restraint use, medication reconciliation, pain, functional status, therapeutic self care, self care index, aggressive behaviour, falls rate, falls causing injury, pressure ulcers, bladder continence, fatigue, dyspnoea, nausea.

Based on review, Doran (2011)<sup>8</sup> found a growing body of evidence that demonstrates a relationship between nursing care and patient outcomes such as functional status, symptom control, falls, pressure ulcers, self-care, health care utilization and mortality. Metrics that are most likely to be sensitive to differences in nursing input (e.g. health care associated infection, pressure ulcers, and falls) are potentially good indicators of safety (Griffiths *et al* 2008)<sup>16</sup>.

Robert *et al* (2011)<sup>25</sup> contributed significantly to the list of nursing quality indicators that matters to patients as feeling informed and being given options, staff who listen and spend time with patient, being treated as a person not a number, patient involvement in care and being able to ask questions, the

value of support services and efficient processes. The quality outcomes which can be measured in a clear, consistent and collectable manner related to safety are pressure ulcers, failure to rescue. Hinchliffe. S (2009)<sup>26</sup> identified seven nursing care indicators in a review of clinical records and assessment processes and these are: falls assessment, food and nutrition, pressure area care, pain management, patient observations, infection prevention and control and medicine prescribing and administration.

Nursing Quality Metrics (NQMs) developed by Angela Thompson (2009)<sup>27</sup> are: completion of documentation for observations, nutrition, medicines, administration, pain management, communication/discharge planning, falls, pressure area care, antibiotic prescribing and infection control. Patient experience indicators are: ward cleanliness, infection control, staff attitude, pain management, privacy, dignity, nutrition, medicines administration and communication/discharge. Patient complaints are also used to drive improvements in the quality of service provided

Rocha & Trevizan (2009)<sup>28</sup> proposed the following indicators of nursing care quality: identification of patient's bed, identification of the bed fall risk, identification of peripheral venous lines, verification of extravasations of skin injuries, identification of intravenous infusion equipment (maintenance fluids), identification of infusion speed control-graduated scale, identification of gastric-oro-and nasogastric-tubes for drainage, indwelling urinary catheter fixation, position of urine drainage bag, indwelling urinary catheter, position of the urine drainage bag spigot and elaboration of complete daily prescription by nurse. A pilot study by Loan *et al* (2003)<sup>29</sup> reported patient outcome indicators of nursing care quality data as falls, skin integrity, nosocomial infections, and satisfaction and staffing data as staff mix and nursing care hours.

In 1998, the National Database of Nursing Quality Indicators (NDNQI) established by American Nurses Association (ANA)<sup>17</sup> began formally collecting data related to ten nursing-sensitive quality indicators. In 2002, the Joint Commission incorporated nursing-sensitive indicators into its standards for accreditation. And today, nursing-sensitive quality indicators are widely used as a barometer of quality care for the Magnet recognition. A partial list of nursing-quality indicators includes: mix of nurses and unlicensed staff caring for patients in the acute-care setting, total nursing-care hours provided per patient day, nosocomial infections, patient falls, pressure ulcer rate, patient satisfaction with overall care, patient satisfaction with nursing care, patient satisfaction with pain management, patient satisfaction with educational information, and staff nurse satisfaction

Safety indicators are failure to rescue (death among patients with treatable complications), falls, healthcare-associated infection, health care-associated pneumonia (Griffiths *et al* 2008)<sup>16</sup>. Xiaoquan Xu (2015)<sup>9</sup> in her thesis on identification of nursing-sensitive indicators for nursing quality monitoring and reporting tabled an overview of NSIs and its related initiatives as shown in the following text. The national Database for Nursing Quality Indicators list (NDNQI)<sup>9</sup> established in 1998 by the American Nurses Association (ANA) are: nursing hours per patient day (including hours worked by RNs, licensed

practical/vocational nurses and unlicensed assistive), nursing turnover, nosocomial infections, patient falls, patient falls with injury, injury level, pressure ulcer rate (including community-acquired, hospital-acquired), paediatric pain assessment, intervention, reassessment cycle, paediatric peripheral intravenous infiltration, psychiatric physical/sexual assault, RN education/certification, RN survey (including Job Satisfaction Scales and Practice Environment Scale-Nursing Work Index), restraints, staff mix (including RNs, licensed practical/vocational nurses, and unlicensed assistive nurses, and percent agency staff).

California Nursing Outcomes Coalition (CalNOC)<sup>9</sup> an initiative of Association of California Nurse Leaders proposed the following indicators : hours of nursing care per patient days, skill mix, nurse-patient ratios, voluntary turnover, RN characteristics- education, experience years of service, unit rate of admissions, discharges and transfers, nursing intervention process (risk assessment, risk status, prevention protocols, PICC practice), hospital acquired pressure ulcers, fall rate and injury fall rates, restraint prevalence rate, central line-associated blood stream infection in PICC lines, medication administration error rates.

Veterans Affairs Nursing Outcomes Database (VANOD)<sup>9</sup> an establishment of Veterans Affairs Health providers (US) elaborated the indicator list as: RN education and certification, nursing hours per patient day of care (HPPD), nursing hours and cost per outpatient encounter, percentage of HPPD hours from RNs, skill mix, nursing staff injuries, nursing turnover, RN job satisfaction, nursing practice environment survey, patient pressure ulcer, patient falls, patient satisfaction.

Military Nursing Outcomes Database (MilNOD)<sup>9</sup> from Department of Defence Military hospital leaders (US) originated a list of indicators such as: nursing care hours, staff mix, staff category, nurse education/experience, pressure ulcers, restraints, falls, medication errors, patient satisfaction with planning for needs after discharge/pain management/education, nursing job satisfaction, nursing needle stick injuries, nursing work environment, patient turnover, patient acuity.

NQF-15<sup>9</sup> initiative of National Quality Forum (US) demonstrated the following indicators: Death among surgical in patients with treatable serious complications (failure to rescue), pressure ulcer prevalence, falls prevalence/falls with injury, restraint prevalence (vest and limb only), urinary catheter-associated urinary tract infection (UTI) for intensive care unit (ICU) patients, central line catheter-associated blood stream infection rate for ICU and high-nursery patients, ventilator-associated pneumonia for ICU and high-nursery nursery patients, smoking cessation counselling for acute myocardial infarction (AMI), smoking cessation counselling for heart failure (HF), smoking cessation counselling for pneumonia, skill mix (RN, Licensed Vocational/Practical Nurse (LVN/LPN), unlicensed assistive personnel (UAP), Practice Environment Scale-Nursing Work Index (PES-NWI).

Health Outcomes for Better Information and Care (HOBIC)<sup>9</sup> tables the following indicators: Functional health status, therapeutic self-care, falls, pressure ulcers, symptom (pain, dyspnoea, fatigue, and nausea), and patient satisfaction with nursing care.

Belgium Nursing Minimum Data Set (B-NMD)<sup>9</sup> initiative advocated by Belgian Ministry of Public Health formulated the following indicators: care related to hygiene, mobility, elimination and feeding, tube feeding, mouth care, pressure sore prevention, assist to dress, tracheostomy care, endotracheal tube care, nursing admission, ADL training, emotional support, care of disoriented patient, isolation care, monitor vital signs, monitor clinical signs, cast care, blood samples, medication management (intramuscular, subcutaneous, intravenous), infusion therapy, surgical wound care and trauma wound care.

Nurse Sensitive Indicators Program of the Association of UK University Hospital (UK)<sup>9</sup> gives the following lists: official complaints, drug errors, infection, slips, trips and falls, pressure ulcers and nutrition.

Donabedian (1988)<sup>30</sup> argues that nursing sensitive indicators reflect the structure, process and outcomes of nursing care. Structure of nursing care is indicated by the supply of nursing staff, the skill level of the nursing staff, and the education/certification of nursing staff. Process indicators of nursing care measures aspects of nursing care such as nursing assessments, subsequent nursing interventions and RN job satisfaction. Process indicators consider our role as nurses and conduct accurate, timely, and ongoing assessments using fall scale, skin risk score, pain scales, systems review. Process indicators consider our role as nurses in implementing all minimum components i.e. nursing interventions of the necessary policy and/or protocol on falls bundle, skin interventions, CAUTI bundle and Central Line Bundle. Outcome indicators focus on tracking those events we don't want to happen while the patient is hospitalized like falls, pressure ulcers, CA-UTI, CLABSI, etc. The evidences state that the greater the quantity and quality of nursing care the better the outcomes.

### Benefits

Nursing quality indicators methodically measure the quality of the care nurses provide and can be applied by nurse leaders to assess the structure, process and outcomes of nursing care (Bassett EG, 2015)<sup>31</sup>. Nursing quality indicators are palpable and countable quantity of nursing's contribution to patient care. As it constitute a significant addition to quality patient care, lead to outstanding insight into quality improvement efforts at all levels. They offer immense opportunity for nursing science to keep growing with high standards and performance (Griffiths P *et al*, 2008)<sup>16</sup>.

### CONCLUSION

This review sums up that nursing quality indicators express care or its results greatest in amount influenced by nursing care. By this approach, more than anything else, facts and statistics unveil obvious relationship between nursing interventions and positive clinical outcomes. When nursing quality indicators are measurements of the quality of care, similarly the process performance quality indicators provide an essential supporting structure for quantifying the fundamentals of care. Thus explained by quality indicators, the efficiency and effectiveness nursing care can be recognized and documented (Foulkes, M 2011)<sup>14</sup>.

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