Ambulatory Care Nurse-Sensitive Indicators

A Scoping Review of the Literature 2006-2021

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ABSTRACT

Background/Purpose: Meeting recommendations that nurses should partner in leading health care change is hampered by the lack of ambulatory care nurse-sensitive indicators (ACNSIs). This scoping review was conducted to identify evidence regarding ACNSI identification, development, implementation, and benchmarking.
Methods: Following the PRISMA-ScR reporting guide, we performed PubMed/MEDLINE, CINAHL, and Cochrane Library searches for the period January 2006 to March 2021.
Results: Twelve of the 1984 articles from 6 countries met inclusion criteria. All focused on identifying, developing/pilot testing indicators, and included structure, process, and outcome indicators. Seven articles were level II and all were at least grade B quality. Leverage points involved leadership support, automated data extraction infrastructure, and validating links between nurses' roles/actions and patient outcomes.
Conclusions: While high-quality work is ongoing to identify clinically meaningful and feasible ACNSIs, knowledge in this field remains underdeveloped. Prioritizing this work is imperative to address gaps and facilitate national strategic health care goals.
Keywords: ambulatory care, nurse-sensitive indicators, quality indicators, scoping review

Science, longer lifespans, and economic constraints continue to support inpatient to outpatient health care migration. Out-of-hospital costs now exceed 45% of the health care budget.[1] Outpatient services have gained prominence in the national health care goals to deliver high-quality, safe, equitable, and fiscally accountable care. Efforts to achieve these goals are informed, in part, by principles of high-reliability organizations such as clinician-led, data-driven performance improvement efforts[2] first championed by Nightingale[3] and later by the National Academy of Medicine (NAM).[4,5] As the largest group of clinical professionals, registered nurses (RNs) are strategically positioned to be at the forefront of health care change efforts, an approach endorsed by the NAM[4,5] and the American Academy of Ambulatory Care Nursing (AAACN).[6] In 2016, the AAACN published evidence-based recommendations for 12 ambulatory care nurse-sensitive indicators (ACNSIs).[7] A recent pilot study of selected AAACN endorsed ACNSIs in military primary care clinics, highlighted the lack of published ACNSI data.[8]

Due to the limited knowledge base, we chose to perform a scoping review of the literature and

expand on the efforts of Swan et al.[9] Their results provided an overview of the roles and economic value of RNs in ambulatory care. We sought to identify scholarly literature regarding ACNSIs subsequent to their work.

Our primary aim focused on describing the breadth and depth of knowledge and identifying gaps regarding ACNSIs used in primary or specialty care settings. Our secondary aim was to inform efforts and identify opportunities to develop and extend evidence in this area.

NURSE-SENSITIVE QUALITY INDICATORS

Delivering high-quality, safe, care is dependent in part, on the ability to measure and modify care and processes when needed, to improve outcomes. Nurse-sensitive quality indicators (NSIs) refer to the structures and processes of care specific to or influenced by nursing that impact health outcomes.[10]

Inpatient RNs have been using validated NSIs for over 20 years[11-13] while ambulatory care RNs have had to adapt existing NSIs as best they can due to sparse evidence for ACNSIs.[7,9] Many inpatient-focused NSIs are not useful or meaningful in ambulatory care, where monitored events (eg, hospital-acquired pressure injury) are nonoccurrences. For ambulatory care, NSIs for care coordination and preventable readmissions are more meaningful but may not fully reflect work performed by ambulatory care nursing team members.[12,14]

Ambulatory care standardized quality and safety metrics and benchmarks endorsed by agencies such as the National Quality Forum (NQF)[15] and The Joint Commission[16] are largely provider-focused, such as prescribing disease-specific medications for patients with diabetes or heart disease. The National Committee for Quality Assurance Health Effectiveness Data and Information Set also falls short of capturing nursing's impact on quality care outcomes, as these measures also focus on nurse practitioner or physician/physician associate-level actions (eg, the percentage of asthma patients who are prescribed appropriate medications).[17] Other indicators initially thought to be nurse-sensitive (eg, medication reconciliation) are not always a good fit because in many settings the RN is not responsible for patient medication education and reconciliation.

Nurse-sensitive metrics for outpatient settings are difficult to identify, due in part to the nature of ambulatory care nursing. Ambulatory care RNs manage a large volume of clients with complex health conditions during relatively short encounters, within a multitude of environments involving a diverse community of patients, caretakers, and other stakeholders.[6] The specific criteria that NSIs should meet are clearly defined in the literature. Specifically, NSIs should be *important* to improving the quality of care delivered, *sensitive to nursing* care, measured by a *scientifically reliable and valid* method, feasible to collect, and *useful* to end users.[15,18]

THEORETICAL FRAMEWORK

We identified pertinent literature relevant to the unique work environment of ambulatory care using 2 conceptual models. First, the AAACN model of ambulatory nursing care[6] is important to understand the various roles assumed by ambulatory care nurses, the needs of ambulatory care patients, the interactions that occur between them, and the internal and external environmental forces that hinder or enable that care (Figure).

The AAACN model consists of 3 overarching concepts: patient, nurse, and environment. Briefly, patients (individuals, families, caregivers, groups, or populations) are holistic systems around which all health care activities revolve. Patients retain control of their health care and collaborate with nurses. Clinically, nurses collaborate and consult with other professional colleagues to manage and advocate for patients regarding optimal health services, health promotion, education, and disease prevention in face-to-face or virtual platforms. Organizational roles refer to nursing practice within the health care/community systems and settings (eg, staff mix, competencies, workload, research, and regulatory and fiscal stewardship within and across systems). In their professional role, ambulatory care nurses must continually seek growth and learning opportunities and apply this new knowledge in their role as safety and quality champions for exceptional patient care.

Addressing our secondary aim requires an understanding of the structure, processes, and outcomes of care for patients, nurses, and organizations. For this, we selected the Donabedian model[19] that was specifically developed to assess the effects of structure and processes, which affect outcomes (S-P-O). We used this model to classify ACNSIs according to the 3 conceptual categories: (1) structure: specific organizational
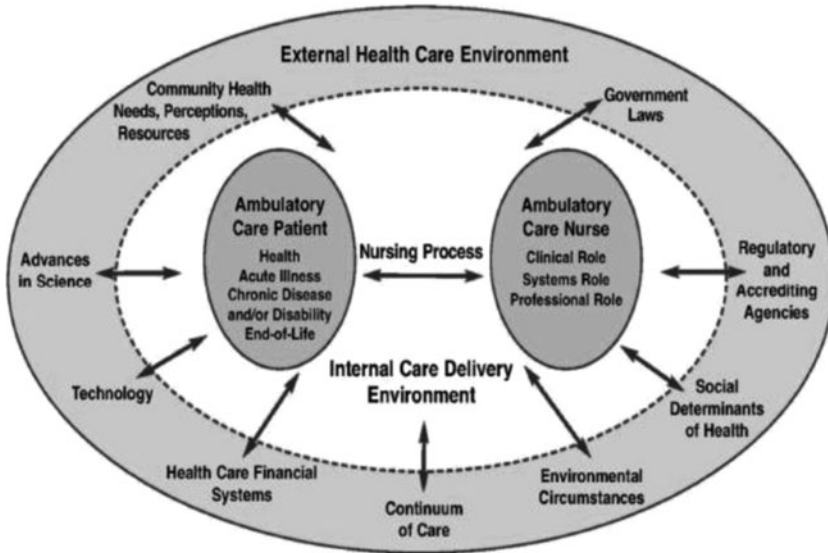
Figure. AAACN 2017 conceptual model. Copyright by the American Academy of Ambulatory Care Nursing, reprinted by permission.

or group characteristics, (2) processes: actions designed to achieve outcomes, and (3) outcomes: results of structures and processes, to identify and develop recommendations to continue scientific advancement in this area.

METHODS

Consistent with the broad aims of this project, we conducted a scoping review. Scoping reviews summarize findings, identify gaps, and provide direction for future systematic reviews and research efforts.[20] Using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews,[20] we developed, then prospectively registered the protocol with the Open Science Framework.[21] We organized results by study aims.

Literature search methods

Literature search strategies were developed by research librarians at Madigan Army Medical Center and carried out by an experienced research librarian at the National Institutes of Health. Strategies were drafted using medical subject headings and text words related to nurse-sensitive quality indicators in ambulatory care settings (see Supplemental Digital Content 1, Appendix A, available at: http://links.lww.com/JNCQ/B36). Relevant literature was identified in the following bibliographic databases: PubMed/MEDLINE (National Library of Medicine); Cumulative Index to Nursing

and Allied Health Literature (EBSCO); and Cochrane Library (John Wiley & Sons, Inc). Search strategies encompassed the concepts of *nurse-sensitive, ambulatory care, and quality indicator* using multiple subject headings and text word terms for each concept. Searches were limited to English language articles published from January 1, 2006, to March 15, 2021. Additional inclusion criteria were NSI or equivalent and ambulatory care or equivalent in the title/abstract, primary or specialty care ambulatory setting, addressed the contribution to quality of nursing care, and met published indicator requirements (eg, feasible, measurable, electronic medical record friendly, and clinician acceptable).

We initially managed all retrieved records with the EndNote X8 citation management application, and then imported all citations to the Covidence[22] website. Covidence helps manage citations and facilitates coordination of independent screening, reviewing, and data extraction activities of study team members. Using Covidence, level 1 consisted of title and abstract screening. Abstracts meeting inclusion criteria advanced to level 2, which is full text review. All articles in levels 1 and 2 were screened and reviewed independently by 2 authors per article. Disagreements were resolved by discussion and deconflicted by the first author. Editorials, expert opinions, commentaries, and meeting summaries or abstracts were excluded.

Data extraction

The level 3 data extraction template was collaboratively developed by 3 authors (see Supplemental Digital Content 2, Appendix B, available at: http://links.lww.com/JNCQ/B37). Calibration of the data extraction template was conducted iteratively by 2 authors until the team agreed upon a finalized version of the form. Data extraction for each level 3 article was performed independently by 2 authors for each article. Disagreements were resolved by discussion between raters and deconflicted by the first author.

Data elements

Data elements extracted included the specific aims, model, sample, methods, setting, design, and key findings. We assigned the level of evidence and conducted a quality appraisal using the Johns Hopkins evidence level and quality appraisal tool.[23] This tool provides a consistent framework to assess the scientific quality of the literature appropriate to the study design (see Supplemental Digital Content 3, Appendix C, available at: http://links.lww.com/JNCQ/B38). Each of the 5 levels of evidence has specific criteria indicating low, good, or high-quality evidence. Conflicts were resolved by discussion and deconflicted by the first author.

SUMMARY OF EVIDENCE

After removing duplicate publications, 1586 of 1984 articles qualified for level 1 screening, 56 for level 2, and 31 for level 3. During level 3 data extraction, an additional 19 articles were excluded, resulting in a final sample of 12 articles (see Supplemental Digital Content 4, Figure, available at: http://links.lww.com/JNCQ/B39). Most level 3 exclusions were opinions, editorials, or lacking a nurse-sensitive focus. Most articles were directly or indirectly grounded in Donabedian's S-P-O framework[19] or referenced nationally recognized criteria for NSIs such as the Collaborative Alliance for Nursing Outcomes or the NQF.[15,24] Similarly, the importance of the nurse-patient-environment AAACN model[6] was evident in all articles. The resulting evidence was a culmination of reported findings from mixed-methods studies using interviews, surveys, and literature reviews. Articles were predominantly of good quality (n = 11), with one high-quality study. Articles focused on identifying/describing (n = 3), developing (n = 5), or pilot testing (n = 4) specific indicators in 6 countries: the United States, the United Kingdom, Germany, Canada, China, and Portugal (see Supplemental Digital Content 5, Appendix D, available at: http://links.lww.com/JNCQ/B40).

Both novel (eg, arteriovenous fistula puncture rates) and previously identified ACNSIs (eg, patient and staff satisfaction) were assessed. Most structure ACNSI efforts focused on staff ratio and skill mix, followed by the work environment, triage, and practice models.[25-29] Assessment, coordination, education, and documentation by nurses were the most common process indicators studied. Other process ACNSIs included pain management, medication administration, telehealth care coordination, blood loss during hemodialysis, and fall rates in hemodialysis patients.[27,29-32] Patient and staff satisfaction led the list of outcome ACNSIs studied, while cost was addressed in just 1 study[27,30,32-34] (see Supplemental Digital Content 5, Appendix D, available at: http://links.lww.com/JNCQ/B40). Four articles pilot tested specific ACNSIs,[32,35-37] and one tested a tool for ACNSI data collection.[33] Outpatient settings included community, hospital, and government-associated clinics. Specialty areas were limited to chemotherapy,[30,33] wound care,[35] addiction,[36] dermatology,[37] and hemodialysis areas.[27]

DISCUSSION

We sought to describe the breadth and depth of scholarly ambulatory care NSI work conducted since 2006 and identify opportunities to extend the science. Articles included in this review represented a variety of ambulatory care settings from several countries. Our results indicated efforts are most concentrated on identifying and developing NSIs, mirroring recent observations of Niesen and Frost.[13]

Current knowledge, existing gaps

Evidence of a clear and robust theoretical foundation (ie, S-P-O) was present in this review, adding to the scientific quality of included articles. Efforts to date have produced mostly good quality evidence addressing all elements of the S-P-O model. Not surprising, outcomes, cost-effectiveness in particular, received the least attention. Further work to clarify the roles and responsibilities of ambulatory care nurses must be undertaken to determine approaches to improve outcomes.

Leverage points, way forward

Although no articles identified validated standardized ACNSIs available for immediate general use, positive findings were reported in all 12 articles. Major elements critical to implementing ACNSIs include organizational buy-in, peer and leadership support, adequate technological and financial resources, and identifying/clarifying nursing roles, responsibilities, and actions. Much more work needs to be done to solidify measurable staff, patient, and organizational outcomes. We envision a formalized research agenda to identify the ACNSI most critical to ambulatory nursing practice across the health care enterprise.

Limitations

Limitations present in this review include the likelihood of discovering all possible sources of evidence including gray literature and the risk of biased quality assessment for each selected source of evidence. Studies published since the time of the review may already be addressing identified gaps. Articles were limited to primary and specialty ambulatory care settings. Work conducted in surgical centers, emergency department, and other outpatient areas excluded from this review should be considered in future ACNSI S-P-O evaluations.

Implications

The number of patients managed in the ambulatory care environment has continued to increase over the past 2 decades along with associated costs. Patients who once were in the hospital environment receiving care no longer require hospitalization or have a shorter length of stay. The role of the RN in the ambulatory setting is important in supporting patients receiving close follow-up, in clinics or at home, to improve their overall health and maintain wellness. Identifying ACNSIs that guide the care in these settings is imperative.

CONCLUSIONS

While high-quality work is ongoing to identify useable, clinically meaningful and feasible NSIs, the body of knowledge in ambulatory care NSIs remains underdeveloped. Additionally, research that seeks to understand relationships between ambulatory structure, process, and outcome variables will be essential to evaluate the true contributions of nurses in this setting, as well as other contextual variables that may empower and advance the nursing discipline in ambulatory care. It is imperative researchers, clinicians, health care leaders, and policymakers prioritize this work to address gaps, endorse the value of and clarify the roles of ambulatory care nurses, and facilitate nurses' efforts to address national strategic health care goals.

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