Going Beyond Patient Classification Systems to Create an Evidence-Based Staffing Methodology

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The Department of Veterans Affairs developed a nationally standardized nurse staffing methodology, using an evidence-based process. We present an overview, linking an integrative review of recent literature on patient classification systems, interdisciplinary expert panel consultation, operational feasibility assessment, and frontline manager involvement. This resulted in 7 candidate indicators for inclusion in unit-specific staffing models. Adaptable to all healthcare settings, this process goes beyond traditional patient classification systems.

As the largest integrated healthcare delivery system in the United States, with 153 hospitals and 788 clinics, the Department of Veterans Affairs (VA) provided healthcare to 5.7 million veterans in 2009. Not surprisingly, the VA is also the largest employer of nurses in the United States, with more than 77,000 nurses, 82% of whom are direct care nurses. Compared with its non-VA counterparts, the VA RN workforce is older than the national average by approximately 2 years. In addition, although VA vacancies and turnover had lagged behind the national average since 2000, the trend may be reversing, with VA turnover and vacancies exceeding the national average in 2007. By spring of 2009, the VA ranked nursing positions as the priority for recruitment and retention efforts based on loss rate, retirements, separations, and future needs.

Unfortunately, the VA’s staffing challenges are not unique. With an aging workforce, expected retirements, and projected increasing demand due to an aging population, the general RN nursing shortage is expected to be the worst since the mid-1960s, reaching a shortfall of 260,000 RNs by 2025. The decreased supply of nurses and increased demand could trigger a chain of events—insufficient staffing, increasing stress on the workforce, and high turnover rates—all ultimately threatening to reduce the quality of patient care. Veterans Affairs RN satisfaction data indicate a downward trend in overall nurse satisfaction since 2009, possibly reflecting these emerging circumstances. Throughout the United States, efforts are underway on many fronts to address the supply of nurses, for example, funding of educational strategies to produce more nurses and...
nursing faculty, expanded multimedia presentations promoting nursing as a career, the redesign of healthcare processes to create cultures of engagement and empowerment for nurses, and public-private partnerships. In the meantime, hospitals must manage resources to deal with the near-term shortage. In this arena, methods to determine short- and long-term staffing needs become ever more critical.

**Patient Classification Systems**

Patient classification systems (PCSs) are staffing tools used in many sectors of healthcare. Historically, they have been used to identify homogenous groups of patients, with similar dependency needs, so that nursing care requirements for a period can be quantified. According to De Groot, a PCS includes the “methods and processes of determining, validating, and monitoring individual patient care requirements over time...” so that nursing resources can be obtained and allocated appropriately. These requirements serve as indicators of work effort, factors that affect the process, and ultimately the outcomes of nursing care. Patient classification systems were first developed and widely used, in the 1960s, when they focused on patient physiological needs (versus psychosocial or other dimensions of care) and lacked reliability and validity testing. Today, PCSs incorporate a broader spectrum of patient needs and care dimensions, but with few exceptions, many still lack adequate testing of reliability and validity.

**VA Nurse Staffing Methodology**

The current VA approach to staffing, adopted in the early 1990s, was intended to go beyond the use of PCSs. It involved the use of expert panels (EPs) to guide unit and facility managers in the collection of data on multiple factors that influence nurse staffing requirements. Experts at each level determined the key elements (or indicators of nursing workload) for their specific area of responsibility and examined, for example, patient acuity and dependency, nurse characteristics (eg, education and skill mix), unit-level factors (eg, patient turnover and work setting), and facility-level characteristics (eg, hospital complexity and teaching status). These factors were then included in a staffing plan to determine the number of staff needed to care for a particular patient load.

However, the system VA used is perceived as antiquated and not useful by some despite the EP methodology. The VA’s EP approach involved the semiannual synthesis of data to determine unit staffing requirements. The advantage of the approach is that it allowed for differences in unit and facility characteristics. Although comprehensive and innovative (for its time), the disadvantage of this approach is that it was labor intensive and deemed too complex for implementation at the local hospital level. Over time, facilities adopted their own staffing methods, leading to inconsistency. Thus, a need was identified to revisit the methodology for other indicators that might be more useful until a reliable and valid PCS system is developed.

In light of nurse staffing and resource challenges, as well as a renewed commitment to Veteran healthcare, federal legislation was passed to enhance recruitment and retention of nurses in the VA. A subsequent inspection and report by the VA Office of Inspector General, entitled “Health Care Inspection Evaluation of Nurse Staffing in VHA Facilities,” highlighted the need for a consistent nurse staffing policy to drive measurable staffing standards. The VA Office of Nursing Services (ONS) responded by proposing to develop and test an evidence-based staffing methodology, using the EP Method for Nurse Staffing and Resource Management model, with future capacity to evaluate the relationship between staffing indicators and patient outcomes.

**Call to Action**

A systematic review of the literature of recent patient acuity systems used for nurse staffing was conducted. The project was approved for expedited review by the WJB Dorn VA Medical Center institutional review board. Following the literature review, a panel of interdisciplinary experts would evaluate the variables for face validity and measurability. We refer to this EP as consultants from here forward, to avoid confusion with the more general EP methodology. The consultants were an interdisciplinary team of VA and non-VA healthcare researchers, leaders, and clinical experts, with diverse backgrounds in nursing administration, workforce planning, nursing economics, and implementation, dissemination, and organizational research. The entire team participated in strategy planning meetings for the systematic review and a brainstorming workshop to share expert opinions in light of the evidence. A 3rd step was to verify that the selected variables were available in the VA system and that they could be collected without additional burden to nursing staff. The following sections discuss the methods and general findings of the systematic review, the EP, and data verification process; an initial set of specific indicators to predict staffing; and preliminary efforts to
pilot and integrate the new staffing methodology into practice.

Systematic Review

We focused our search of the literature on PCS, sometimes referred to as workload measurement systems and patient acuity systems, to achieve 3 goals:

1. Identification of completed systematic or integrative reviews of the literature on PCS. Systematic reviews are described as rigorous literature reviews that combine the evidence of multiple studies and often use meta-analysis statistical methods or narrative analysis with quasi-statistical methods to summarize and draw conclusions about multiple study findings. Integrative reviews provide a summary of the research on a specific topic and can include both theoretical and empirical literature. Similar to a systematic review, the research is summarized and analyzed, and conclusions are drawn, but the analysis is narrative in nature, because it encompasses multiple literature types.22,23

2. Analysis of the evidence for validated, reliable staffing methods

3. Identification of variables from the literature for consideration in a staffing model.

We limited our search to English-language articles published between 1983 and July 2010, applicable to general medical/surgical settings. We reviewed both empirical and theoretical articles, and all articles were reviewed for scientific quality. In the end, we identified a final set of indicators suitable for further testing.

Our review of the literature resulted in 58 articles, none of which were scientifically rigorous systematic reviews of the literature on PCS. We did find, however, important studies providing evidence relevant to our project. The articles fell generally into at least 1 of 4 categories: multiple systems (theoretical and empirical studies of at least 2 PCSs), specific PCSs (theoretical and empirical studies), indicators (reviews of specific indicators to be used in PCSs), and general knowledge (background information about specific issues related to PCSs, including nurse-sensitive outcomes and expert opinion). The results of this review have been published elsewhere.17

Summary of Findings

PCS Weaknesses

Although not part of our inclusion criteria, we extended our review back to the development of early PCSs, to provide historical context and an ability to view evolving trends. Examples of themes and general findings from the literature review, with references, are shown in Supplemental Digital Content 1, http://links.lww.com/JONA/A58. Our work supported many previous findings related to PCS weaknesses including the following:

- There is little objective and validated information regarding the many workload management systems in use.
- It is difficult to compare PCSs because of a lack of standardization of measures.
- A PCS may not be accurate enough to be used for resource allocation or for decision making.
- Patient classification systems do not adequately capture nursing work or predict nurse staffing requirements.

Although the literature is replete with descriptive studies of single-hospital PCSs, there is no criterion standard of nursing workload measurement. Few empirical studies we retrieved evaluated reliability and validity. With limited evidence of testing or monitoring, it is difficult to compare results between systems. Further research is needed to adequately assess the validity of concepts being used to measure nursing workload.

Specifications for the Ideal PCS

Several general concepts about principles to consider in developing a PCS model emerged from the literature. First, multiple measures should be included to capture the complexity of factors, including patient, nurse, and organizational characteristics. Simplicity and parsimony, however, should be the desired goal. Giovannetti14 posits that as few as 4 indicators may be sufficient to classify patients into 4 categories of care. Second, existing measures should be used where possible, minimizing additional workload for nurses. Third, the system design process should include direct care nurses and expert opinion. Finally, based on the empirical studies we reviewed, a sample of specific variables frequently included in PCSs is shown in Table 1.

The EP Process

Building on these findings, we convened our expert consultants in a brainstorming workshop to evaluate our results and compile a list of indicators that should be considered for inclusion in staffing models. The meeting with our expert consultants consisted of 3 components: a presentation and discussion of the project’s background and review of findings, a brainstorming session, and a discussion of feasibility. A summary of our findings from the literature
review was provided in advance of the meeting. The consultants were given background information about the purpose of the project, a summary of the methods and results of the systematic review, and a description of the panel’s charge. An appendix with evidence abstraction tables and seminal articles from the systematic review was included.

During brainstorming, the group identified indicators to consider in a staffing model, regardless of constraints, barriers, or measurement feasibility. The group reached consensus on a set of indicators, representing multiple layers of nursing work—patient-centered variables, nursing characteristics, and unit- and hospital-level attributes. A set of design principles, generated from our literature review as well as panel discussion, was agreed upon. The foundation of the principles was criteria for the selection and implementation of PCS. The guidelines were simple: using the list of variables retrieved from the integrative review (Figure 1) as a starting point and creating a set of indicators that are valid measures of nursing work and that are efficient and replicable across multiple clinical areas and that create minimal workload for nurses. Each of the variables was discussed in light of the design principles, until consensus was reached. Each remaining variable was reassessed in terms of availability and feasibility to be collected. The final result was a set of variables that were categorized as (1) valid, measurable, and available, using existing data; (2) valid, but requiring more information on measurability and/or availability; or (3) not valid or not measurable or not available.

The Final Set of Indicators

The set of indicators identified by the expert consultants was compared against the data sources available to nurse managers in the VA system. The objective was to verify the feasibility of collecting each of the measures at the unit level. Once we had a list of available measures, we consulted with nurse managers and other operational leaders to produce a final set of indicators considered to be feasible, measurable, and useful to frontline managers. The following indicators were presented as practical predictors of unit staffing levels:

1. Average length of stay: This is a surrogate marker for patient severity of illness.
2. Average number of medication doses administered per day: Multiple medications are another

| Table 1. Sample Variables From the Literature to Consider in a Staffing Model |
|-----------------|-----------------|-----------------|
| **Patient Variables** | **Nurse Variables** | **Unit/Organization Variables** |
| Complexity, eg, nursing diagnosis, diagnostic related groups | Education | Stability/maturity |
| Severity (length of stay) | Experience—total | Volume |
| Dependency/functional status | Experience—unit | Patient turnover (A/T/D) |
| • Activities of daily living/transports | | Interdisciplinary relationships/communication |
| Age | Skill mix | Support services |
| Patient care needs | | Unit complexity |
| • Observational needs | | • Variation (in patient type and treatment) |
| • Obesity | | Autonomy/work environment |
| • Postdischarge needs | | Protocol-driven care |
| • Psychosocial needs | | Multitasking (high frequency/low volume) |

Figure 1. Design principles for PCS.
surrogate marker used as an indicator of complexity, severity, and staff time required for administration/teaching.

3. Percentage of patients 70 years or older: Advanced age is a surrogate marker representing the additional assistance that elderly patients often require for completion of activities of daily living and comprehension of instructions.

4. Percentage of patients with body mass index of 25 kg/m² or greater: Body mass index is a surrogate marker representing additional time and staff needed for assistance with activities of daily living or the use of assistive devices.

5. Top 3 diagnostic categories on the unit: This is a surrogate marker for complexity/scope of care.

6. Average daily census: This is a unit- or organizational-level measure of patient volume and nursing workload.

7. Daily patient turnover (admissions/transfers/discharges [A/T/D]): A/T/D represents the workload/turbulence and direct care activities associated with these patient care transition processes.

Pilot Testing the Staffing Methodology

A draft staffing methodology was developed and included standardized definitions and nomenclature for the suggested final set of indicators. A step-by-step approach to determining projected staffing requirements, using these indicators, was developed for use with the EP model in the staffing methodology. Tools were developed to support the methodology, including an Excel spreadsheet that calculates projected full-time employee requirements and staff mix. The methodology and tools were pilot tested with 37 VA medical centers, using all inpatient units.

The pilot offered the facilities the opportunity to test and refine a process that has been instrumental in providing evidence for staffing decisions. Inpatient units tested the methodology for reliability and user-friendliness, functionality, and the accuracy of the tools supporting the process. The pilot provided feedback on the method for calculating nursing hours per patient day and on all training tools.

Integrating the Staffing Methodology

Meanwhile, in its ongoing evaluation of federal programs and policies, the US Government Accounting Office (GAO) reported on the state of current VA RN staffing practices (GAO Report GAO-09-17). The GAO conducted a Web-based survey of all VA nurse executives and performed interviews and focus groups of nurse executives and RNs at 8 geographically diverse VA medical centers to gather information on inpatient nurse staffing methodologies and RN recruitment and retention. The national sample of VA nurse executives (63%) reported that the VA PCS was not being used because nurses regard it as outdated, inaccurate, and unreliable. The knowledge gained through the staffing methodology project is being used by the VA ONS to address the GAO’s recommendations for a staffing methodology based on accurate estimates of actual inpatient acuity levels and nursing tasks performed.

In 2010, a new VA policy was introduced, directing chief nursing officers at all VA facilities to implement the new evidence-based nationally standardized staffing methodology effective September 2011.

The preliminary testing was instrumental in refining the methodology and tools that are now being implemented across the VA system. Further work is still needed in developing tools for use in the other settings within healthcare such as the community living centers, specialty areas, and outpatient clinics. A formal evaluation of the methodology is planned after full implementation is achieved in October 2011. Future plans call for correlating patient and organizational outcomes with staffing levels.

Summary

Throughout the United States, health systems are being asked to provide more and better care with fewer nurses. The VA addressed this threat by initiating an effort to revise its current staffing methodology. Going beyond PCSs, the approach used both integrative review of the literature and guidance by an EP of interdisciplinary consultants to identify indicators of nursing workload and develop an evidence-based staffing methodology. Based on findings from a pilot evaluation, the VA ONS introduced a national policy directing all facilities to implement this staffing methodology. This evidence-based approach could be adopted by other healthcare systems.

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