CONCEPT PAPER

An Approach for Patient Classification and Nurse Staffing in Nigerian Hospitals: A Concept Paper

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ABSTRACT

The delivery of institutional nursing care in Nigeria is changing rapidly. Many hospitals are experiencing heavier patient loads in terms of patient care requirements due to population increase, especially in the cities. Today's inpatients typically require more intensive nursing care than those in the past due to new technology and therapies, specialization of nursing units, changes in policies and procedures in ancillary support departments. As a result, the intensity and complexity of activities on nursing units have increased enormously. The use of a patient classification system as a means of assessing, evaluating, monitoring and responding to the nursing requirements of patients in Nigerian hospitals could be a significant alternative to historical practices based on patient daily census. Any patient classification and nurse staffing system used should therefore consider all these complexities over and above patients' requirements for care to accurately reflect total nursing workload. Review of the literature did not reveal much on studies done on the use of patient classification systems and influences on nurse staffing policy in Nigerian hospitals. Hence, this paper addresses the approach for the proper method of patient classification and nurse staffing system that can be adopted in Nigerian hospitals.

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Introduction:

The most single largest item in the budget of most of the hospitals worldwide is the salaries of nurses and Nigeria is not exceptional. In this day of utilization review and cost controls; the utilization of nursing services is not adequately measured in most of the hospitals (Simborg, 1976). Patient Classification Systems (PCSs), which measure patients' needs for care and care activities, have been used since the 1960s in hospitals worldwide as the basis of workload monitoring systems that determine staffing (Prescott and Soeken, 1996). Fugulin (2002) stated that nursing services play an essential role in the care process. Hence; managing human resources should receive special attention in the analysis of health services supply in order to balance issues such as cost, efficiency and quality of care.

According to Tanos et al. (2000) the quantitative and qualitative aspects of human resources in nursing are directly linked to the quality of care offered to patients. Hence, these require special attention from managers since inappropriate proportions of such resources negatively reflects on care delivery. Jennings (2008) stated that PCSs have numerous limitations, such as (a) validity and reliability are infrequently monitored; (b) the tools are often complex and require considerable time to complete; (c) they lack credibility among staff nurses and administrators; and (d) they are not designed to detect census variability throughout the day from patient movement due to admissions, discharges, transfers, and short-stays. Patient classification systems for the nursing departments must be developed such that information derived from such system is translated into action plans for the most cost-effective deployment of available resources. Monitoring the utilization of nursing personnel resources on an on-going basis is very imperative in order to identify trends and be able to predict future needs. In a cost conscious economy, justification must be provided for spending an ever increasing amount of health costs on personnel resources.

The lack of evidence on nurse staffing levels that meets both quality and cost imperatives presents a challenge to policymakers and managers in hospitals (Kovner et al., 2002). For example, California enacted legislation in 1999 to mandate registered nurse-to-patient ratios in acute-care hospitals (Purdum 1999 and Rundle 1999). Under this legislation, California's Department of Health Services must define and enforce RN-to-patient ratios by 2002 (Spetz et al., 2000). People were worried that this mandate may produce increased hospital costs or the opposite (Buerhaus, 1997). That is, hospitals with high nurse staffing levels actually may decrease staffing to a lower mandated level that may be inadequate and compromise quality of care, while hospitals with low staffing levels may raise staffing levels to meet the mandate, yet this increase may still be insufficient to bring about intended increases in quality (Kovner et al., 2002). In Nigeria discussions of errors in patient care are rare in the literature. Discussions of the classification of errors in patient care are even rarer. This study represents a first attempt to deal with this significant problem and examines whether and how mistakes in patient care are classified across five professional health groups in one of Nigeria's largest tertiary health care institutions (Ayayi, 2009). According to Stone et al. (2011), patient classification system enables hospitals to remove emotion from the equation by demonstrating through hard data that its decisions are valid, not arbitrary. While these Patient classification systems have been criticized on a number of grounds according to Gioventti et al. (1984), they can be helpful adjuncts to seasoned administrator if they are constructed and used appropriately. The tool applies an evidence based approach to assign, match, and schedule nurses where they are needed the most based on patient acuity level.

However, according to study done by Kane et al. (2007), it was concluded that increased nursing staff in hospitals was associated with lower hospital-related mortality, failure to rescue, and other patient outcomes, and the association is not necessarily causal. The likelihood of making medication and procedural errors (actual and near miss errors) increased with longer work hours and was three times higher when nurses worked shifts lasting 12.5 hours or longer according to Rogers et al. (2004) and Needleman et al. (2002) stated that hospitals with inadequate nurse staffing have higher rates of adverse events such as hospital acquired infection, shock, and failure to rescue. In the study by Kovner et al. (2002) that examined the impact of nurse staffing on selected adverse events hypothesized to be sensitive to nursing care between 1990 and 1996, it was concluded that the inverse relationship between pneumonia and nurse staffing are consistent with previous findings in the literature. The results provided additional evidence for health policy makers to consider when making decisions about required staffing levels to minimize adverse events.

According to Sasichay-Akkadechanunt et al. (2003), the ratio of total nurse staffing to patients was significantly related to in-hospital mortality in both partial and marginal analyses. Also, the ratio of total nursing staff to patients was found to be the best predictor of in-hospital mortality among the nurse staffing variables. As reported by Cho et al. (2008) in

tertiary hospitals, a greater likelihood of dying was found among patients who were admitted to a mixed Intensive Care Unit (ICU) (odds ratio [OR] = 1.61, 95% confidence interval [CI] = 1.14-2.26) and where there was no board-certified physician present for 4 or more hours per day (OR = 1.56, 95% CI = 1.20-2.01). In secondary hospitals, every additional patient per registered nurse was associated with 9% increase in the odds of dying (OR = 1.09, 95% CI = 1.04-1.14), and nurse experience had no significant relationship with mortality. Mortality rates decreased as staffing level per occupied bed increased for medical residents, registered nurses, registered pharmacists, medical technologists, and total hospital personnel (Bond et al., 1999). Having the right skill mix and nurses with the necessary skills readily available to take care of the right patient at the right time is essential to quality of care, patient safety and financial health (Stone et al., 2011). Hence, patient classification approach will be advantageous to the management of the nurse staffing requirement in Nigerian hospitals.

Aim of the Study:

The aim of this paper is to develop an approach for the implementation of patient classification system and the determination of unit specific staffing standards for hospitals in Nigeria.

Methods

The methodology activities used in this paper are directed toward the development and implementation of a comprehensive patient classification and nurse staffing management system; consisting of customized classification instruments and the quantification of unit and shift¬ specific staffing standards, and the design of maintenance mechanisms to assure continued success of the system over time.

The specific methods to be used in this paper are the following:

1. To develop and validate patient classification system for the inpatient nursing units.
2. To develop staffing standards for each nursing unit in order to determine staffing requirements from shift to shift, and on a retrospective basis.
3. To determine the mechanisms for monitoring the reliability and validity of the patient classification and nurse staffing system on an on-going basis. Also, to outline a methodology to adjust care hour standards based upon average census and category mix information.

Two additional methodologies: a reliability monitoring system and a validity monitoring system will also be discussed, which support the continued effectiveness of the patient classification system over time.

The implementation process includes the following activities:

1. Need to conduct orientation sessions for the staff that would be using the system.
2. Need to solicit feedback and modify the system as needed, focusing on the identification of ways to individualize the system to meet the unique needs of each unit.
3. Conducting reliability checks of nurse staff classifiers for the new system on all units prior to the work sampling activities.

In order to ensure a successful study outcome and to determine care-hour standards the following formal activities must be considered:

1. The development and implementation of customized classification system instruments and decision rules for each of the nursing inpatient units.
2. Reliability testing, which precedes the quantification process. The purpose of reliability testing is to measure the percentage of agreement between the expert classifier and nursing unit personnel.
3. Reliability monitoring is considered to be a continuous process. Periodic monitoring of the accuracy of user classification for the number of patients in each category and appropriateness of indicator selection is critical to the identification of the need for a unit or hospital-wide reliability test, which in turn, is helpful in identifying the need for in-service education or other interventions directed toward the continued accuracy of the classification process.

Quantification of Care Hour Standards:

Following the implementation of the patient classification system, one must perform tasks aimed toward measuring nursing activities and staffing requirements to determine the hours of care staffing standards to be used in conjunction with the patient classification system for the units. Several approaches to the quantification of patient classification care categories have been used in nursing. The selection of an approach depends on consultation with nursing administration and in-house management engineering (if any), based on factors such as time, cost, and level of confidence required, user acceptability, and the compatibility with the philosophy of nursing at such

hospital. For example, it could be agreed that the methodology that measures both the average direct care time provided to patients within each of the care categories, and the average percentage of time nursing personnel devote to all unit activities would best meet the criteria for selection. This will involve sampling the direct care provided to patients and sampling the activities performed by nursing personnel. In order to guard against systematic biases, data collectors must be rotated to different units, different shifts, and to different types of sampling methods. The staff activity and direct patient care sampling activities are described below:

Staff Activity Sampling of Nursing Personnel:

The major purpose of conducting the staff activities sampling study was to determine the percentage of time nursing staff devoted to direct care of patients, indirect care, unit-related activities, and personal time. The staff activities sampling process consisted of observing each nursing staff member at 15-minute intervals throughout each shift and recording their activity on a data collection form. A minimum of twelve shifts of observational data could be collected over a two-week period on each study unit: four day shifts, three evening shifts, and three night shifts. The sample must include a minimum of one weekend day.

Direct Patient Care Sampling

The purpose of the direct patient care sampling was to determine the amount and nature of direct nursing care provided to each category of patient and to determine the level of personnel providing that care.

The process of direct patient care sampling consist of observing nursing staff providing direct care to all patients on the unit at 10-minute intervals and the recording of these observations on a data collection form. As with the staff activities sampling study; ten shifts could be studied with the same allotment of day, evening, and night shifts. Each patient on the unit must have a separate data collection form with their category of care recorded.

Implementation of Staffing Standards and System Maintenance Mechanisms

The hours of care standards and the required staffing by unit and shift developed during the work sampling activities must be presented to nursing administration representatives for review, after which a plan for implementing the hours of care standards would be discussed. Additional methodologies could be designed to support the patient classification

system. These methodologies are; a reliability monitoring system and a validity monitoring system.

Reliability Monitoring

Reliability refers to the consistency or repeatability of a measurement instrument. A reliability testing procedure in patient classification assures that two independent classifiers will achieve the same results. This type of testing confirms that no one is overrating or underrating patients to manipulate staffing. Achieving high reliability scores aids in maintaining user acceptance. A reliability testing procedure is most complete when it includes the percentage of agreement between both categories and indicators selected. Although the percentage of agreement for selected indicators is generally lower than that obtained between categories, a low percentage of agreement between indicators may indicate potential problems and should not be ignored. The minimally acceptable percentage level of agreement between nurse classifiers could be 80% or more. Reliability testing should be a continuous process, initially conducted every two to three weeks. The frequency of the monitoring will be determined primarily by the results of prior reliability testing findings for each unit.

Validity Monitoring

The registered nurses perception of the nursing staff's ability to provide nursing care under a variety of staffing conditions assists in gaining insight into the amount of staff required under various workload levels. An indirect approach to validity identifies the level of user acceptability of the nurse's and staff's agreement, as to the appropriateness of the patient classification and staffing coefficients for determining the number of nursing personnel. This evaluation is recommended as part of the maintenance system and consists of a self-administered questionnaire to be provided to a designated registered nurse on each shift. Appropriate policies and procedures should be developed and provided on each unit for future reference. Definitions of the four major groups of activities for the work sampling methodology are described below:

- Direct Care Nursing Activities are the activities that are patient centred and in the presence of the patient and/or family.
- Indirect Care Activities are the activities which are done away from the patient and/or family, but relate to only one patient.
- Unit Related Activities are such activities necessary for the general management, coordination, and organization of a nursing unit.

- Personal Activities are the activities not directed toward patient care or unit management (mealtimes, breaks, non-productive time).

It is very important not to overlook the differences in the distribution of time devoted to various activities among units, which are associated in part to differences in patient populations, personnel mix, therapeutic modalities, unit layout and design, care practices and behaviours, and leadership patterns.

Two of the factors that could be used in the determination of the suggested hours-of-care standards for each unit and shift are:

1. The average total direct patient care minutes per category level of patient by shift.
2. The average direct patient care percentage by shift.

Staffing calculations incorporated these two key variables to derive the standards. Specifically, the equation to be used is:

$$\begin{pmatrix} Average\ total\ direct \\ care\ time\ per\ category \\ level\ of\ patient \end{pmatrix} X \begin{pmatrix} 100\%\ (one\ shift) \\ average\ percentage \\ direct\ patient\ care \end{pmatrix} = \begin{pmatrix} total\ care\ time \\ per\ category\ level \\ of\ patient\ (^{min}/_{hrs}) \end{pmatrix} \dots \quad (1)$$

Areas of activities could be categorized as follow:

Direct Care

1. Communication
2. Medication, I.V. (administration)
3. Nutrition & Elimination
4. Patient Hygiene
5. Patient Movement
6. Positioning and exercising
7. Rounds and Assist M.D.
8. Routine Checks / Rounds
9. Specimen gathering, testing
10. Treatments and Procedures
11. Vital Signs / Assessment

Indirect Care

1. Checking, Updating
2. Communication
3. Preparing Medications
4. Transcribe Orders

Unit Related

1. Cleaning – Housekeeping
2. Clerical
3. Communication with others
4. Errands Off Unit

5. Meetings, In-service, etc.
6. Supplies, Check, Restock of patients consumables

Personal

1. Personal (for example; break time, meal time and others)

The daily core staffing pattern for each unit and shift could be determined from data analysis of average daily census and the percentages of patients per category level. Future staffing requirements will be a function of these two factors in the application of variable staffing on a shift by shift basis. If there are significant changes in either the average daily census or categorization mix information used to derive staffing required hours, adjustments may be needed in the recommended daily staffing pattern for those units affected. The use of a float pool of nursing personnel can be a successful resource to hospitals whose census and category mix of patients fluctuates significantly around core staffing requirements for each unit. The float pool can meet unit needs for appropriate number and mix of personnel needed; particularly when there is a marked increase in all the units staffing requirements and inter-unit floating of personnel is less than adequate to meet the increased total patient care demand.

Conclusion and Implication for Practice

Patient classification is to be completed once each shift for all units based upon the care given and documented during the shift. The established procedures for reliability and validity monitoring should be reviewed frequently to assure system maintenance and effective system. The percentage of time presently devoted to direct care, indirect care, unit related, and personal activities on each unit should be reviewed when changes in patient care modalities, nursing procedures and practices, physician practices and/or the design of units occur. Nurse Managers should carefully review utilization of time by level of personnel to determine opportunities for operational improvements and the most appropriate staff mix to deliver quality care. An educational program should be implemented outlining the patient classification system, reliability testing, and validity testing procedures for all orientees and available to current staff on an intermittent schedule.

Investigation into the feasibility of charging patients according to their nursing requirements, with respect to patient classification, should be pursued. For example, monetary value can be assigned to the total time spent on each category of activities for the determination of the patient charges for service or for

the nursing staff budget justification in the hospital. Hospitals administrations in Nigeria could benefit immensely from the proper approach and use of patient classification financially, and in quality of care and patient safety.

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