

## Nursing Assignment Through Acuity to Skill Mapping: Literature Review Study

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### Original Research Article

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#### Article History

Received: 05.11.2017

Accepted: 13.12.2017

Published: 30.12.2017

#### DOI:

10.36348/sjmps.2017.v03i12.021



**Abstract:** Optimizing nurse assignments is crucial for maintaining quality care and improving patient outcomes, as nurse staffing represents 40% of hospital costs. A change from assigning nurses at random to using scientific criteria has affected operations, funding, worker happiness, and patient safety. Patient diagnoses, continuity of care, and nurse-to-patient ratios are important factors to take into account. Improving nursing productivity and lowering turnover now depend on skill mapping, which assesses nurses' competencies according to hospital requirements. Improving nurse satisfaction and the caliber of patient care requires effective staffing strategies that are adapted to the needs and acuity of the patients. This review of the literature looks at how skill mapping and acuity tools can be combined to improve patient outcomes, maximize resource usage, and improve nursing activities. It demonstrates how useful Perroca's instrument is in guiding care planning and management decisions.

**Keywords:** Nursing, Skill Mapping, nursing activities.

## INTRODUCTION

Optimizing nurse assignments is critical to maintaining standards of quality care and improving patient outcomes, since nurse staffing accounts for 40% of hospital costs[1]. The distribution of nursing assignments in healthcare settings has changed from being a random procedure to one that follows scientific principles[2].

This evolution has been driven by a number of reasons, including worker satisfaction, patient safety, funding, and operations. The nurse-to-patient ratio that must be followed, the patient's medical diagnosis, and the continuity of care from shift to shift are all important factors in nursing assignments. In reality, nursing activities will fluctuate throughout a patient's duration of stay based on a combination of prescribed including education, nursing interventions, and psychosocial requirements, in addition to medical diagnosis. The hours per patient day (HPPD) is the benchmark used by the NDNQI staff assignment technique to assess staffing levels [1,3]

Some studies have shown that nurses are assigned to patients according to patient acuities,

nursing skills, and patient mix on a given day after the appointment schedule is determined [4]. Skill mapping is the process of identifying nurses' levels based on the core requirements established by the hospital. The world has recognized professional mapping patterns since the 1970s to ensure improvements in nurses' competencies and the quality of services [5]. One of the biggest problems affecting the productivity and financial success of healthcare companies is nursing turnover. For healthcare companies to effectively deliver patient care, they need nursing staff that is steady, highly trained, and totally engaged. It has been estimated that the financial loss of losing a single nurse would be around double the nurse's yearly wage[6].

The financial health of a healthcare organization, patient happiness, and the quality of patient treatment are all positively impacted by having a sufficient number of nurses on staff and low nursing turnover [7]. This study highlights that effective nursing tasks are crucial for providing high-quality patient care and maintaining nurse satisfaction. One way to enhance nursing tasks is by integrating acuity tools and skill mapping. The literature review explores how combining these approaches can improve nursing tasks, enhance

patient outcomes, and ensure the effective use of nursing resources. results confirmed that it is recommended to use Perroca’s tool to identify patients’ care needs effectively to guide decisions of nurses and nurses’ managers in care planning, care effectiveness, and staff management[8].

Devel- oping an effective staffing plan that addresses unique patient needs is the responsibility of nurse managers(9). It is therefore important to adjust nursing care delivery to the exact needs of patients based on acuity, assessment and measurement[10,11].

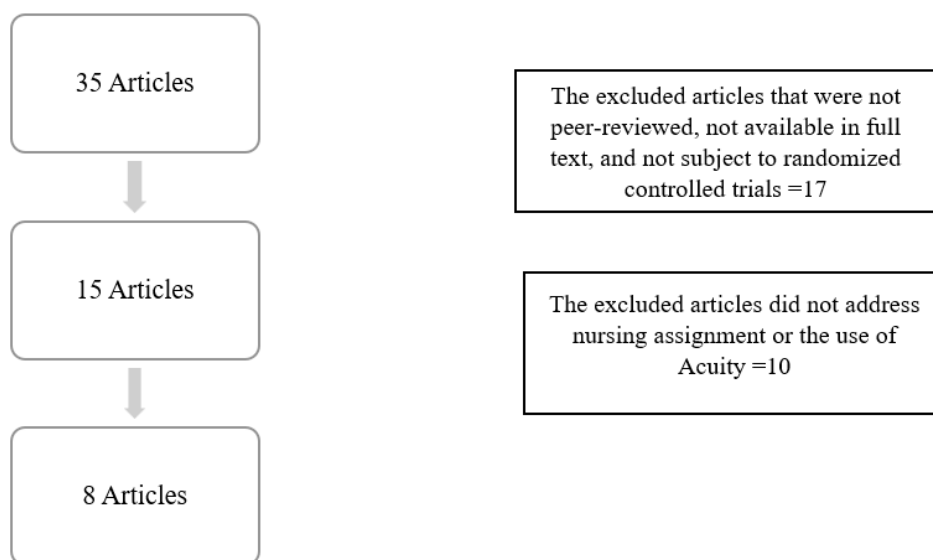
**METHODS**

This review was conducted according to PRISMA guidelines. A literature search was performed in Google Scholar, PubMed, and ResearchGate for articles published between 2007 and 2017. As part of the systematic analysis, the researchers examined study characteristics in terms of study title, country of origin, purpose, sample, study design, results, and conclusions. A total of 35 full-text articles were retrieved; titles were

assessed for relevance, and abstracts were read carefully. All studies that did not meet the inclusion criteria were excluded.

The search strategy included keywords related to nursing tasks, patient acuity, and skill mapping. Inclusion criteria encompassed any study published in English and conducted on nurses in hospital units. Any study that was not peer-reviewed, did not report significant nursing outcomes, or did not report on the use of acuity-based skill assignment among nurses in hospital units was excluded.

A total of 8 studies were included in this review according to the inclusion and exclusion criteria after reviewing the title, abstract, and full text of the articles. The studies consisted of randomized controlled trials, a type of computational study to assess the performance of proposed nurse assignment and patient scheduling models, observational studies on nurses, and exploratory studies.



**Figure 1: Studies Selection Summary**

**RESULTS**

The literature review yielded insights into the effectiveness of nursing tasks based on acuity and skill mapping. All the nurses involved in the study were from hospital units. Most studies reported a positive relationship between the use of acuity tools and job satisfaction among nurses. The Perroca Acuity Tool (PAT) and similar instruments facilitated better workload management and improved perceptions of care quality.

Integrating acuity assessments with skill mapping allowed for a more precise matching of nurses’ competencies with patient needs, ultimately leading to enhanced care delivery. Despite the benefits, several

studies highlighted challenges in the practical implementation of acuity-based tasks, including resistance to change and the need for ongoing training.

Improved acuity-based nursing tasks were associated with better patient outcomes, including reduced missed care and increased overall satisfaction with the care received. Continuous assessment and real-time adjustment of nursing tasks based on acuity evaluations were emphasized as crucial for maintaining high standards of care. These findings underscore the importance of leveraging acuity tools and skill planning to enhance nursing tasks and improve nurse satisfaction and patient outcomes in healthcare settings (Table 1).

**Table 1: Included Studies Summary**

Authors	nursing assignment	Participant	Result
<i>Tutik Sri Hariyati R., et al., 2017.</i> (12)	The purpose of the study is to determine nurses' perception of the career ladder system (CLS) and continuing professional development (CPD) of nurses and the correlation between perception and nurse satisfaction with their job. The non-experimental descriptive survey method was used for this study.	The survey was carried out in eight hospitals. Respondents were selected by relative sample and the sample size was 1487 nurses.	There is a positive correlation between CPD and nurse satisfaction, as better perception of CPD would increase nurse satisfaction, while a negative correlation was found between system implementation and satisfaction. Content: A good understanding of the implementation of a continuing professional learning system would increase nurses' expectations and if expectations were not met, it would reduce satisfaction.
<i>Deliens, Tom, et al., 2014.</i> (13)	This study explores nurses' perspectives about the nursing assignment process after implementing a project to promote an improved nursing assignment process in medical/ surgical wards by using Perroca patient acuity tool (PAT).	Qualitative approach was used with two focus group discussions including a total of 13 participants, selected by purposive sampling.	Four main themes were generated from the data. The main study themes were: assignment based on acuity score, challenges and limitation, change journey and participants' suggestions, and recommendations for improving the assignment process.
<i>Liang B, Turkcen A., 2016.</i> (4)	computational study to evaluate the performance of proposed nurse assignment and patient scheduling models. solve 30 problems with different number of patients, patient acuities, and treatment durations. There are 40 to 68 patients per day, each patient has an acuity level from 1 to 3, and their treatments last from 1 to 9 slots (30 minutes to 4.5 hours).	a Mult objective optimization model with the objectives of minimizing patient waiting times and nurse overtime is proposed to solve the nurse assignment problem.	Computational results show that the proposed models provide multiple nondominated solutions, which can be used to determine the optimal staffing levels.
<i>Tomic K, 2017</i> (14)	Using a patient acuity tool to allocate nursing shift tasks can increase nurse job satisfaction compared to tasks that rely solely on the charge nurse's judgment.	The CVIMCU unit had 30 eligible RNs, with 25 agreeing to participate in the EBP project. Ultimately, 20 completed the program and participated in the pre/post-test surveys on job satisfaction. Five declined to participate, and three who completed the pretest left before project completion, resulting in two being excluded from data analysis.	The study found significant differences in one item regarding on-the-job learning $t(19) = -2.67, p < .05$ . Other survey items were not statistically significant ( $p > .05$ ). Participants reported that the tool was quick and easy to use; 60% observed improvements in shift equity, and 85% desired to continue using it post-project. Additionally, 55% noted better-balanced shift assignments. Long-term use of the acuity tool may enhance nursing job satisfaction.
<i>Tai-Seale, Ming, et al., 2017</i> (15)	This study describes the ongoing, hospital-wide effort to evaluate and implement a nursing assignment tool based on	EHR records of individual patient workload scores from all hospital units from August 2016 to June 2017.	Mean patient-specific workload scores varied greatly across hospital units. Unit-specific nurse-to-patient ratios were factored into NWM

	electronic health record (EHR) functionality and auto-calculated nursing workload scores.		scores to create ranges for assignments that were relatively consistent across the institution.
Cho, S-H., <i>et al</i> , 2015 (16)	This study Aimed To compare the patient acuity, nurse staffing and workforce, missed nursing care and patient outcomes among hospital unit-clusters.	Descriptive design with data from four unit-clusters: medical, surgical, combined and step-down units. Descriptive statistics were used to compare acuity, nurse staffing coverage, education and expertise, missed nursing care and selected nurse-sensitive outcomes.	Patient acuity in general (medical, surgical and combined) floors is similar to step-down units, with an average of 5.6 required RN hours per patient day. In general wards, available RN hours per patient day reach only 50% of required RN hours to meet patient needs. Workforce measures are comparable among unit-clusters, and average missed nursing care is 21%. Patient outcomes vary among unit-clusters.
Allen, Tosha Irene, 2014 (17)	This study aimed at assessing nurses' satisfaction related to implementing of patient acuity tool-based assignment. Experimental posttest only design was used. This study was conducted in critical care units at the Menoufia University Hospitals in Shebin Elkom .	Simple random sample of nurses was selected from the previous units that was divided equally into two groups: experimental group (n=89) and control group (n=89). Additionally, all first line managers of the same units were selected (n=33) .	revealed that the majority of nurses in the experimental group were satisfied with method of assignment that based on acuity scores after implementation of the program. Also, there was no statistically significant difference between nurses' satisfaction in the experimental group and their personal data except regarding their educational level and years of experience that was highly statistical.
Allen S, 2015 (18)	Identify purposes and decision factors of the nurse-patient assignment process.	This was an exploratory study involving interviews with 14 charge nurses from 11 different nursing units in 1 community hospital.	Charge nurses identified 14 purposes and 17 decision factors of the nurse-patient assignment process.

## DISCUSSION

Practical training in nursing is essential to ensure a high level of competence. Nurses require continuous training, which is important for their cultural growth, accountability, and professional development. Obtaining an individual competency map from the hospital and developing a profile that outlines all experiences, skills, and abilities can enhance the appreciation of a person's expertise, ensuring a high level of qualification and competence as a mark of professionalism in patient care. Al Dweik and Ahmed., study that linking PAT to nursing shift assignment has several positive outcomes. It increases nurses' satisfaction and serves as managers voice for important staffing decisions like recruitment, assignment distribution, employing new staff, and improving quality of care [19].

It is important to consider how to foster nurses who are a graduate from the vocational nurse in order to fulfill the needs of patients. The allocation or mapping

of nurses would be maximized by using the Career Ladder System. As the result of study Hariyati *et al.*, skill-mix in allocation is not appropriate and it would lead to inappropriate delivering of nursing care to patients [20].

Nurses' responsibilities are authorized based on the competency. Utilizing the Career Ladder System to assess nurse's competency and allocate nurses according to their competencies ensuring the match between nurse's competency and required competency at each ward to hospital(20). can be developed by developing competency mapping rearrangement. Competency mapping can be a baseline of implementing the nursing credentials. Directing function, ongoing evaluation should be part of the implementation of the career path [21–24].

The process of identifying and documenting the competencies, experiences, and qualifications of the nursing staff (skill mapping) is essential. By creating a

comprehensive inventory of skills, healthcare organizations can effectively allocate resources based on individual strengths. This not only enhances job satisfaction but also promotes professional growth among nurses. The level of nursing competence directly affects the quality of care provided to patients [24].

Measuring patient acuity is a fundamental element in providing specialized patient care. Furthermore, acuity-based staffing in nursing can impact patient safety, productivity, patient outcomes, and service quality. As noted by Al-Dweik G, Ahmad M., all participants in the study agreed that matching the Perroca Acuity Tool with the staffing process enhanced their focus, concentration, performance level, and service quality [13].

Integrating acuity assessments with skill planning enhances the effectiveness of task distribution in nursing. By accurately evaluating patient needs, the most competent nurses can be assigned to manage the more complex cases. This not only improves the quality of care but also helps reduce stress on nurses, leading to higher job satisfaction levels. Additionally, a study by Ageiz and El-Mageed showed that assigning nurses based on patient acuity scores organizes the number of nurses on each shift according to patient needs, thereby balancing the nurses' workload and enhancing their satisfaction with staffing [4,7,14,25,26].

Nurse managers play a pivotal role in addressing the structural staffing shortages in general wards to maximize patient safety outcomes. The continuous integration of the patient acuity tool into nurses' tasks and its dissemination across other nursing units significantly impacts the appropriate distribution of nursing shift tasks and improves nurse satisfaction. Effectively implementing the patient acuity tool enhances nurses' satisfaction with staffing. Furthermore, the highest percentage of frontline managers agreed on the implementation of acuity-based staffing [25].

It was found that patient acuity in general floors (medical, surgical, and combined) is similar to that in graduated units, with an average of 5.6 hours of registered nurse time required per patient day. In general wards, the available registered nurse hours per patient day reach only 50% of the hours required to meet patient needs. Workforce metrics are comparable across unit groups, with an average of 21% of nursing care being missed. Patient outcomes vary among unit groups [16].

It can be concluded that patient acuity is similar among unit groups, while the coverage of nursing staff is half in general wards. Although the education level of registered nurses, experience, and missed care are comparable across unit groups,

mortality rates, skin injury rates, and the risk of family compassion fatigue are higher in general ward [16].

## CONCLUSION

The literature review concludes that integrating acuity-based staffing and skill mapping in nursing assignments enhances patient care quality and nurse satisfaction. Matching nurses' competencies with patient needs leads to better care delivery, reduced missed care, and higher job satisfaction. Utilizing tools like the Perroca Acuity Tool improves workload management and allows for real-time adjustments based on patient acuity, leading to better patient outcomes and addressing challenges associated with nursing turnover and staffing shortages.

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