



EFFECT OF NURSING WORKLOAD IN INTENSIVE CARE UNITS; A SIMPLE REVIEW

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Abstract:

Background: The demand for healthcare resources has been on the rise due to various factors such as aging populations, technological advancements, and emerging epidemics, leading to changes in healthcare management systems. Adequate nursing staffing is crucial for providing quality care in intensive care units (ICUs) and improving patient outcomes. Studies have shown that an increased nurse-to-patient ratio is associated with reduced mortality rates, while a decreased ratio can lead to increased workload, job dissatisfaction, and higher complication rates. It is essential to assess nursing workload and its impact on patient care quality and outcomes in ICUs.

Objective: This review aims to evaluate the impact of nursing workload on patient outcomes in ICUs, assess the relationship between workload and nurse job satisfaction, identify factors contributing to high workload, explore strategies for workload management, and examine the association between workload and quality of care in ICUs. Evidence-based recommendations for optimizing nursing workload to enhance patient outcomes and nurse well-being will be provided.

Conclusion: Nursing workload significantly influences patient outcomes in ICUs, with higher workload associated with increased complications and mortality rates. Adequate nurse staffing levels are crucial for improving patient safety and care quality. Effective workload management strategies, interdisciplinary collaboration, and leveraging technology are essential for optimizing nursing workload in ICUs. Further research on factors affecting nursing workload is necessary to enhance healthcare delivery in critical care settings. By implementing evidence-based recommendations and promoting teamwork, healthcare facilities can improve patient outcomes and nurse well-being in ICUs.

Keywords: intensive care unit, nursing, workload, adverse events, complications

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Introduction:

The recent surge in demand for healthcare resources is influenced by a multitude of factors, including but not limited to the aging population, shifts in epidemiology, advancements in technology, and the emergence of new epidemics. This surge has prompted significant changes in healthcare management practices, resulting in enhanced care quality and reduced costs [1]. Nursing plays a crucial role in delivering effective healthcare services, particularly within intensive care units (ICUs). However, the nature of nursing activities can vary significantly depending on factors such as the work environment, disease severity, workload, staff qualifications and skills, cost-effectiveness, and the clinical outcomes of patients. Ensuring adequate nursing staffing levels has become a pivotal factor in sustaining and enhancing care quality, ultimately leading to improved patient satisfaction and better clinical outcomes [2].

Research conducted by Aiken *et al* [3] has demonstrated a clear correlation between increased nurse-to-patient ratios and decreased mortality rates. Conversely, a decrease in nurse-to-patient ratios resulting from either an increase in patient numbers or a reduction in nursing staff can lead to heightened workloads, potentially resulting in job dissatisfaction, decreased efficiency, and increased complications and mortality rates among patients. It is imperative to reassess the allocation of healthcare resources and nursing staff based on the workload of healthcare facilities to mitigate risks such as nosocomial infections [4]. Patients in the ICU are particularly vulnerable to complications and adverse events due to their heightened need for attention and nursing care. Aiken *et al.* estimated that approximately 20% of ICU patients experience additional adverse events when nurse-to-patient ratios are low.

Existing literature underscores the importance of employing various assessment strategies to enhance ICU patient care. These assessments may encompass monitoring for pneumonia, nosocomial infections, pressure ulcers, fractures, potential medication-related adverse events, and other relevant factors [5]. Such approaches can contribute to the development of a cohesive and efficient nursing team that delivers high-quality care to patients. Therefore, maintaining optimal nursing practices within the ICU setting necessitates a comprehensive evaluation of managerial and organizational aspects to ensure superior healthcare provision. As evidenced by previous studies, nursing workload significantly

impacts the outcomes and safety of ICU patients. This review aims to build upon prior research findings to underscore the critical influence of nursing workload on the outcomes and safety of ICU patients [6].

Objectives:

The main objectives of this review are:

1. To assess the impact of nursing workload on patient outcomes in Intensive Care Units (ICUs).
2. To evaluate the relationship between nursing workload and nurse job satisfaction and burnout in ICUs.
3. To identify factors contributing to high nursing workload in ICUs and potential strategies for workload management.
4. To explore the association between nursing workload and quality of care provided in ICUs.
5. To provide evidence-based recommendations for optimizing nursing workload in ICUs to improve patient outcomes and nurse well-being.

Effect of nursing workload on ICU patients:

According to the research conducted by the Agency for Healthcare Research and Quality (AHRQ) [7], an escalation in the nursing workload has been linked to a decline in patient survival rates, potentially due to the provision of suboptimal care to certain patients. This situation can have repercussions on the overall quality of care provided to patients. Past investigations have predominantly concentrated on examining the impact of staffing levels on patient safety and satisfaction. Research findings have consistently demonstrated a strong association between reduced staffing levels and various nursing-sensitive outcomes among patients.

Moreover, a comprehensive analysis involving more than 124,000 patients revealed a significant link between decreased nursing staffing and the incidence of pneumonia in patients requiring intensive nursing care [8]. Notably, a multicenter study in the United States highlighted a heightened risk of pneumonia among surgical patients, which decreased by 8.9% with an additional hour of nursing care per day [9]. Similarly, another study conducted in the U.S. underscored a substantial reduction in pneumonia rates associated with enhanced nursing staffing levels in the hospitals under scrutiny [10].

It is imperative to acknowledge that while staffing levels play a crucial role in shaping the impact of reduced nursing care, other factors such as economic conditions, pandemics, facility size, and patient caseloads also warrant further investigation [11].

Therefore, a holistic approach to understanding the complexities of nursing workload and its implications on patient outcomes is essential for future research endeavors.

Evidence-based results regarding nursing workload in intensive care units:

Several studies have indicated a strong connection between nursing workload and the prevalence of nosocomial infections. For instance, in the context of surgical patients, it was found that a higher percentage of care administered by registered nurses was linked to lower rates of urinary tract infections ($P=0.04$), while an increased number of hours of care provided by registered nurses per day was associated with decreased rates of "failure to rescue" ($P=0.008$). Harbarth et al. conducted research in a neonatal ICU and discovered that decreased nursing staffing levels were significantly correlated with higher incidence rates of *E. cloacae* infections [12]. Similarly, a study by Archibald et al. in Philadelphia, United States, revealed that reduced working hours for registered nurses led to significantly lower monthly rates of nosocomial infections. Needleman et al. conducted a study across 11 centers in the United States and found that higher nursing hours provided by registered healthcare workers were associated with lower rates of failure to resuscitate and decreased mortality rates [13]. It was also observed that an increased workload per patient could contribute to higher in-hospital mortality rates. Aiken et al. concluded that a rise in a registered nurse's workload by one patient could result in a 7% increase in the risk of mortality within the corresponding population [14]. Manheim et al. reported that augmenting hospital nursing staff could lead to a reduction in mortality rates and an enhancement in the quality of care provided [15]. Pronovost et al. discovered that patients undergoing abdominal aortic surgeries experienced a 20% increase in hospital stay duration when the nurse-to-patient ratio fell below 1:2 per day [16]. Lichtig et al. demonstrated that elevated nursing workloads, as reflected in increased work hours, were significantly linked to decreased complications and shorter hospital stays [17]. In Australia, Beckmann et al. found that a reduced nurse-to-patient ratio in the ICU was significantly associated with higher rates of incidents such as drug self-administration, ventilation, self-extubation, lack of supervision, and inadequate documentation [18]. Furthermore, a meta-analysis of nine observational studies suggested that diminishing mortality rates in the ICU were not notably related to increased nursing

workload and staffing levels. However, the study acknowledged that its findings were inconclusive due to methodological flaws in the studies included [19]. Thompson and colleagues conducted an extensive observational study across 35 hospitals and 45 ICUs, revealing a noteworthy correlation between heightened nursing working hours and the quality of care provided [20]. Their findings indicated that a 20-hour increase in weekly working hours significantly elevated the risk of acquiring nosocomial infections and prolonged the hospital stay for patients. Similarly, Chang et al. highlighted a significant association between nurse-to-patient ratios and in-hospital mortality rates, patient resuscitation, and overall care quality [21].

In a separate study, Jung et al. delved into the relationship between in-hospital mortality and nursing workload within their study population [22]. By categorizing patients into four groups based on the center's estimated bed-to-nurse ratio, they discovered a significant correlation between in-hospital mortality rates and an increased bed-to-nurse ratio (<0.63 or more). Notably, this significance was not observed in patients not requiring mechanical ventilation, as the additional demands of ventilated patients, such as medications, procedures, and equipment, heightened the workload for nurses and potentially compromised their effectiveness [23].

The impact of nursing workload on ICU patient outcomes was further underscored by Neuraz et al., who found that patient safety is jeopardized when the patient-to-physician ratio exceeds 14 on the Therapeutic Intervention Scoring System (TISS) [24]. While the nurse-to-patient ratio is commonly used to assess patient safety in relation to nursing workload, it is acknowledged that nursing workload is a multifaceted issue that cannot be solely determined by a simple ratio like nurse-to-patient [25].

Contrastingly, a meta-analysis suggested that maintaining an appropriate nurse-to-patient ratio could play a pivotal role in reducing adverse events in ICU patients, thereby curbing healthcare costs, conserving resources, and shortening hospital stays [26]. Furthermore, Kane et al., in another meta-analysis encompassing 28 studies, revealed that heightened nursing staffing was significantly linked to lower mortality rates in ICU patients. Additionally, they noted a significant reduction in cardiac arrest, unexplained extubation, nosocomial pneumonia, and respiratory failure rates with each additional nurse assigned per patient [27].

Nursing workload and patient safety:

According to reports from the Systems Engineering Initiative for Patient Safety (SEIPS), the quality of patient care can be directly impacted by nursing workload, thereby influencing patient safety [28]. The increased workload in the ICU, resulting from factors such as lack of time and additional tasks for nurses, plays a significant role in this scenario. Nurses often encounter challenges in managing their tasks effectively and delivering the necessary care to patients in need. Griffith et al. highlighted that the heightened utilization of healthcare resources could hinder healthcare professionals' ability to channel nursing skills effectively [29]. Similarly, Baggs et al. suggested that an increased workload could compromise the quality of care, as nurses may have limited time for interactions with physicians, potentially leading to errors and reduced care quality [30]. Furthermore, decreased communication between nurses and patients could also contribute to this issue. Cavanagh et al. noted that a heavier workload could result in job dissatisfaction, ultimately affecting performance and the quality of care provided [31]. Previous studies have demonstrated a correlation between patient satisfaction and care quality, emphasizing the importance of job satisfaction in delivering high-quality care [32].

Moreover, heightened workload levels can lead to increased burnout and stress among nurses, impacting their capacity to work efficiently and potentially diminishing the quality of care due to reduced cognitive and physical abilities [33]. The likelihood of errors and mistakes also rises with a heavier workload on nursing staff [34]. Addressing the shortage of nursing efforts resulting from increased workload requires identifying and rectifying contributing factors. Carayon et al. highlighted factors such as nurse-to-patient ratios, fatigue, stress, inadequate equipment, and ease of access to patients as key elements that need attention [35]. Therefore, it is crucial to propose human-engineering approaches tailored to these challenges to alleviate the burden stemming from the heightened workload of nursing personnel [36].

Recommendations for optimizing nursing workload in ICUs:

In order to enhance the efficiency of nursing workload management within intensive care units (ICUs) and enhance both patient outcomes and nurse well-being, it is imperative to incorporate evidence-based recommendations. One pivotal suggestion

involves ensuring optimal nurse-to-patient ratios in ICUs, as research indicates that increased nurse staffing levels correlate with improved patient outcomes, including decreased mortality rates and shorter hospital stays. Furthermore, equipping nurses with adequate resources and support, such as access to state-of-the-art technology and continuous training opportunities, can empower them to deliver superior care more effectively [37]. The integration of electronic health records, automated medication dispensing systems, and other technological solutions can help streamline nursing duties and diminish the time spent on administrative tasks, allowing nurses to dedicate more attention to patient care. Fostering interdisciplinary collaboration within the ICU team is also crucial, as collaborative efforts with other healthcare professionals can assist nurses in managing their workload more efficiently and delivering comprehensive care to patients. Moreover, the implementation of standardized protocols and guidelines for common ICU procedures can optimize workflow and minimize the likelihood of errors [38].

Conclusion:

In conclusion, the research article highlights the significant impact of nursing workload on patient outcomes in intensive care units (ICUs). The evidence presented underscores the importance of maintaining appropriate nurse-to-patient ratios to enhance patient safety, reduce mortality rates, and improve the quality of care provided. Factors such as increased workload leading to job dissatisfaction, burnout, and higher rates of complications emphasize the need for effective workload management strategies in healthcare settings. Implementing evidence-based recommendations, promoting interdisciplinary collaboration, and leveraging technology can help optimize nursing workload in ICUs, ultimately benefiting both patient outcomes and nurse well-being. Further research and focus on factors influencing nursing workload are crucial for enhancing healthcare delivery in critical care settings.

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