

THE IMPACT OF WORKLOAD OVERLOAD IN NURSING AND ITS CONSEQUENCES FOR PATIENT CARE

O IMPACTO DA SOBRECARGA DE TRABALHO NA ENFERMAGEM E SUAS CONSEQUÊNCIAS PARA O CUIDADO AO PACIENTE

EL IMPACTO DE LA SOBRECARGA DE TRABAJO EN ENFERMERÍA Y SUS CONSECUENCIAS PARA LA ATENCIÓN AL PACIENTE



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Camila Alves Samartino¹, Maria Antonia Queiroz Miranda², Clarissa Albuquerque Vaz Nunes³, Livia Moreira da Silva⁴, Bruna Marçal Guidoti Eleutério⁵, Fabricio Sidnei da Silva⁶, Amanda Oliva Spaziani⁷, Rauer Ferreira Franco⁸

ABSTRACT

This integrative review analyzes the impact of nursing workload and burnout on patient safety and the quality of care. The global shortage of professionals, combined with stressful environments, generates high exhaustion rates, which were dramatically exacerbated by the COVID-19 pandemic. The study consistently demonstrates that inadequate nurse-to-patient ratios are directly associated with increased hospital mortality, higher readmission rates, and prolonged lengths of stay. Additionally, team burnout correlates with a lower safety climate and an increase in adverse events, encompassing healthcare-associated infections, medication administration errors, and the omission of essential vigilance and hygiene care. Contrary to the perception of high cost, economic analyses show that investing in adequate staff sizing yields a positive return, as costs are offset by the reduction in complications. It is concluded that workload must be addressed as a systemic organizational phenomenon. Adopting safe minimum ratio policies is cost-effective, essential for mitigating risks, and fundamental for preserving lives.

Keywords: Workload. Occupational Burnout. Patient Safety. Nurse Staffing. Quality of Care.

RESUMO

Esta revisão integrativa analisa o impacto da sobrecarga de trabalho e do burnout na enfermagem sobre a segurança do paciente e a qualidade assistencial. A escassez global de profissionais, aliada a ambientes estressantes, gera altas taxas de exaustão, que foram dramaticamente exacerbadas pela pandemia de COVID-19. O estudo demonstra de forma

¹ Undergraduate in Nursing. Universidade Brasil. E-mail: camilaasamartino@gmail.com

² Undergraduate in Nursing. Universidade Brasil. E-mail: mariaantoniaqmiranda@gmail.com

³ Master's student in Nursing. Faculdade de Medicina de São José do Rio Preto (FAMERP). E-mail: Clarissa.nunes@edu.famerp.br

⁴ Master's degree in Environmental Sciences. Universidade Brasil. E-mail: enf.lms@gmail.com

⁵ Doctoral student in Biomedical Engineering. Universidade Brasil. E-mail: Bruna.eleuterio@ub.edu.br

⁶ Dr. in Biomedical Engineering. Universidade Brasil. E-mail: Prof.fabricio@ymail.com

⁷ Master's in Health Sciences. Universidade Brasil. E-mail: spazianimedicina@gmail.com

⁸ Doctoral student in Health Sciences. Universidade Brasil. E-mail: rauer.franco@ub.edu.br

consistente que proporções inadequadas de pacientes por enfermeiro estão diretamente associadas ao aumento da mortalidade hospitalar, maiores taxas de readmissão e prolongamento do tempo de internação. Adicionalmente, o burnout na equipe correlaciona-se com um clima de segurança inferior e elevação de eventos adversos, englobando infecções relacionadas à assistência à saúde, erros de administração de medicamentos e a omissão de cuidados essenciais de vigilância e higiene. Contrariando a percepção de alto custo, análises econômicas evidenciam que o investimento no dimensionamento adequado da equipe apresenta retorno positivo, pois os custos são compensados pela redução de complicações. Conclui-se que a sobrecarga deve ser abordada como um fenômeno organizacional sistêmico. A adoção de políticas de proporções mínimas seguras é custo-efetiva, essencial para mitigar riscos e fundamental para preservar vidas.

Palavras-chave: Sobrecarga de Trabalho. Burnout Ocupacional. Segurança do Paciente. Dimensionamento de Pessoal. Qualidade do Cuidado.

RESUMEN

Esta revisión integradora analiza el impacto de la sobrecarga de trabajo y el agotamiento profesional en enfermería sobre la seguridad del paciente y la calidad de la atención. La escasez mundial de profesionales, sumada a entornos estresantes, genera altas tasas de agotamiento profesional, que se han visto drásticamente exacerbadas por la pandemia de COVID-19. El estudio demuestra consistentemente que una proporción inadecuada de pacientes por enfermero se asocia directamente con un aumento de la mortalidad hospitalaria, mayores tasas de reingreso y una estancia hospitalaria prolongada. Además, el agotamiento profesional en el equipo se correlaciona con un clima de seguridad deficiente y un aumento de eventos adversos, incluyendo infecciones asociadas a la atención sanitaria, errores de medicación y la omisión de la vigilancia y la higiene esenciales. Contrariamente a la percepción de un alto costo, los análisis económicos muestran que la inversión en niveles adecuados de personal genera un retorno positivo, ya que los costos se compensan con una reducción de las complicaciones. Se concluye que la sobrecarga de trabajo debe abordarse como un fenómeno organizacional sistémico. La adopción de políticas de ratio mínimo seguro es rentable, esencial para mitigar riesgos y fundamental para preservar vidas.

Palabras clave: Carga de Trabajo. Agotamiento Profesional. Seguridad del Paciente. Dotación de Personal. Calidad de la Atención.

1 INTRODUCTION

Nursing workload represents a critical and growing challenge for global health systems, with direct and measurable implications for the safety and quality of patient care. This phenomenon is not new, but it has intensified in recent decades due to multiple converging factors that put pressure on health systems around the world.

1.1 HISTORICAL CONTEXT AND EVOLUTION OF THE RESEARCH

The relationship between nursing personnel and clinical outcomes has deep historical roots. Florence Nightingale, through meticulous records and application of groundbreaking statistics, documented that more British soldiers in military hospitals during the Crimean War died due to unsafe hospital conditions than from battle injuries.^[1] His solution was the introduction of trained nurses, which his research demonstrated to be associated with a reduction in hospital deaths. More than 150 years later, nurses continue to save lives in modern hospitals, and research suggests that harm to patients can be further reduced by investments in nursing staffing.^[1]

Over the past three decades, robust evidence has demonstrated that adequate levels of nursing staffing are associated with improved clinical outcomes, including reduced mortality and adverse events.^[2] An important milestone was the study published in 2002 by Aiken et al., which demonstrated for the first time on a large scale that each additional patient in the average nurses' workload was associated with a 7% higher chance of mortality and a 7% higher chance of rescue failure (mortality after complications).^[3] This study estimated that if the staffing ratio in all hospitals was 6 patients per nurse instead of 4 patients per nurse, 2.3 additional deaths per 1,000 patients and 8.7 additional deaths per 1,000 patients with complications would be expected.^[3]

In 2014, The Lancet published an international study involving nearly half a million patients in 300 hospitals in nine European countries, demonstrating that patients in hospitals with better levels of nursing staff were less likely to die in hospital than those treated in understaffed hospitals.^[1] This study consolidated decades of research linking staffing levels to outcomes including mortality, readmissions, length of stay, adverse events, and patient satisfaction.^[1]

1.2 THE GLOBAL CRISIS OF THE NURSING WORKFORCE

Currently, the world is facing an unprecedented crisis in the nursing workforce. Nurses constitute the largest segment of the health workforce, and their effective allocation is critical to the quality and efficiency of health systems.^[2] In 2019, it was estimated that the world had

104.0 million health workers, including 29.8 million nurses and midwives.^[3] However, to achieve 80 out of 100 in the index of effective universal health coverage, at least 70.6 nurses and midwives per 10,000 population would be needed.^[4]

The global analysis revealed alarming deficits: in 2019, national health workforces fell short of these minimum thresholds by 30.6 million nurses and midwives globally.^[4] The largest gaps were observed in Sub-Saharan Africa (deficit of 5.6 million), Southeast Asia, East Asia and Oceania (deficit of 8.8 million) and South Asia (deficit of 11.0 million).^[4] These regions face high rates of disease burden, as well as growing health care needs due to the increasing prevalence of noncommunicable diseases and population growth.^[4]

Nurse shortages are reported in many developed countries, including the US, Canada, the UK, Ireland, Australia, and in many low- and middle-income countries in South America, Africa, and Asia.^[5] It is estimated that there will be a global shortage of around nine million nurses/midwives by 2030.^{[6][5]} The difficulty in recruiting and retaining nurses is linked to difficult working conditions, insecure nurse-to-patient ratios, stress, and low pay.^[5] Studies have identified that the younger generation of nurses is the most likely to leave the profession, mainly due to highly demanding work, burnout, and dissatisfaction with salary levels.^[5]

1.3 GLOBAL PREVALENCE OF BURNOUT IN NURSING

Nursing burnout, characterized by emotional exhaustion, depersonalization, and decreased sense of personal fulfillment, has become a globally recognized occupational phenomenon.^[7] The World Health Organization recently declared burnout as an "occupational phenomenon" in the 11th revision of the International Classification of Diseases (ICD-11), recognizing burnout as a serious health issue.^[8]

The global prevalence of burnout among nurses is alarming. A pre-pandemic meta-analysis involving 113 studies with 45,539 nurses in 49 countries found a global prevalence of burnout symptoms of 11.23%.^[8] Another meta-analysis of 94 studies covering more than 30 countries estimated the global prevalence of nursing burnout syndrome at 30.0% (95% CI: 26.0%-34.0%) for the period 2012 to 2022.^[9] It is important to highlight that the meta-regression indicated a gradual upward trend over the last 10 years, with significant increases in Europe, Africa and in specialties such as obstetrics.^[9]

Among nurses, burnout is particularly prevalent due to work being associated with stress, the need to demonstrate understanding, compassion, and commitment, along with the simultaneous need to maintain the necessary emotional distance.^[10] The percentages of nurses suffering from burnout in the surveys presented ranged from 14.3% to 84.7%, with

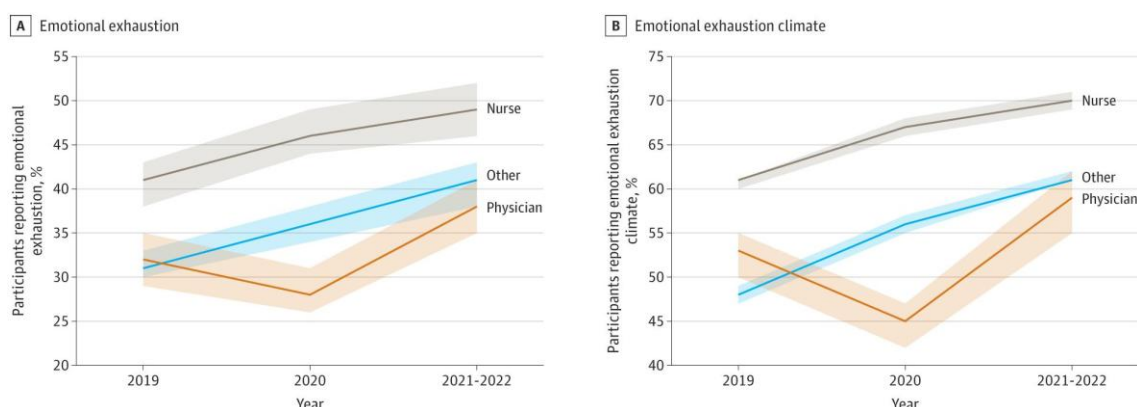
the highest value of burnout among nurses who worked in ICUs during the COVID-19 pandemic.^[10]

1.4 THE IMPACT OF THE COVID-19 PANDEMIC

The COVID-19 pandemic has dramatically exacerbated the crisis of work overload and burnout in nursing. During the pandemic, the prevalence of burnout increased substantially. An updated meta-analysis involving 19 studies from 11 countries indicated an overall burnout prevalence rate of 59.5% in the nurse population during COVID-19.^[11] Analyses of 37 studies with 15,015 nurses revealed a combined prevalence rate for emotional exhaustion of 36.1%, for depersonalization of 32.4%, and for reduction of personal fulfillment of 33.3%.^[11]

Figure 1

Reported Emotional Exhaustion and Emotional Exhaustion Climate by Aggregated Health Care Worker Role undefined



Source: Authors.

Nurses consistently reported the highest levels of exhaustion across all three time periods and showed steady increases each year, rising from approximately 41% in 2019 to 49% in 2021-2022.^[12] The majority of practicing nurses (84%) reached the threshold for emotional exhaustion during the pandemic.^[13]

The main risk factors that increased nurses' burnout during the pandemic included: younger age, decreased social support, poor family and colleague readiness to deal with the COVID-19 outbreak, increased perceived threat of COVID-19, longer working time in quarantine areas, working in a high-risk environment, working in hospitals with inadequate and insufficient material and human resources, increased workload and lower level of specialized training on COVID-19.^[14] More than 70% of nurses experienced moderate to high

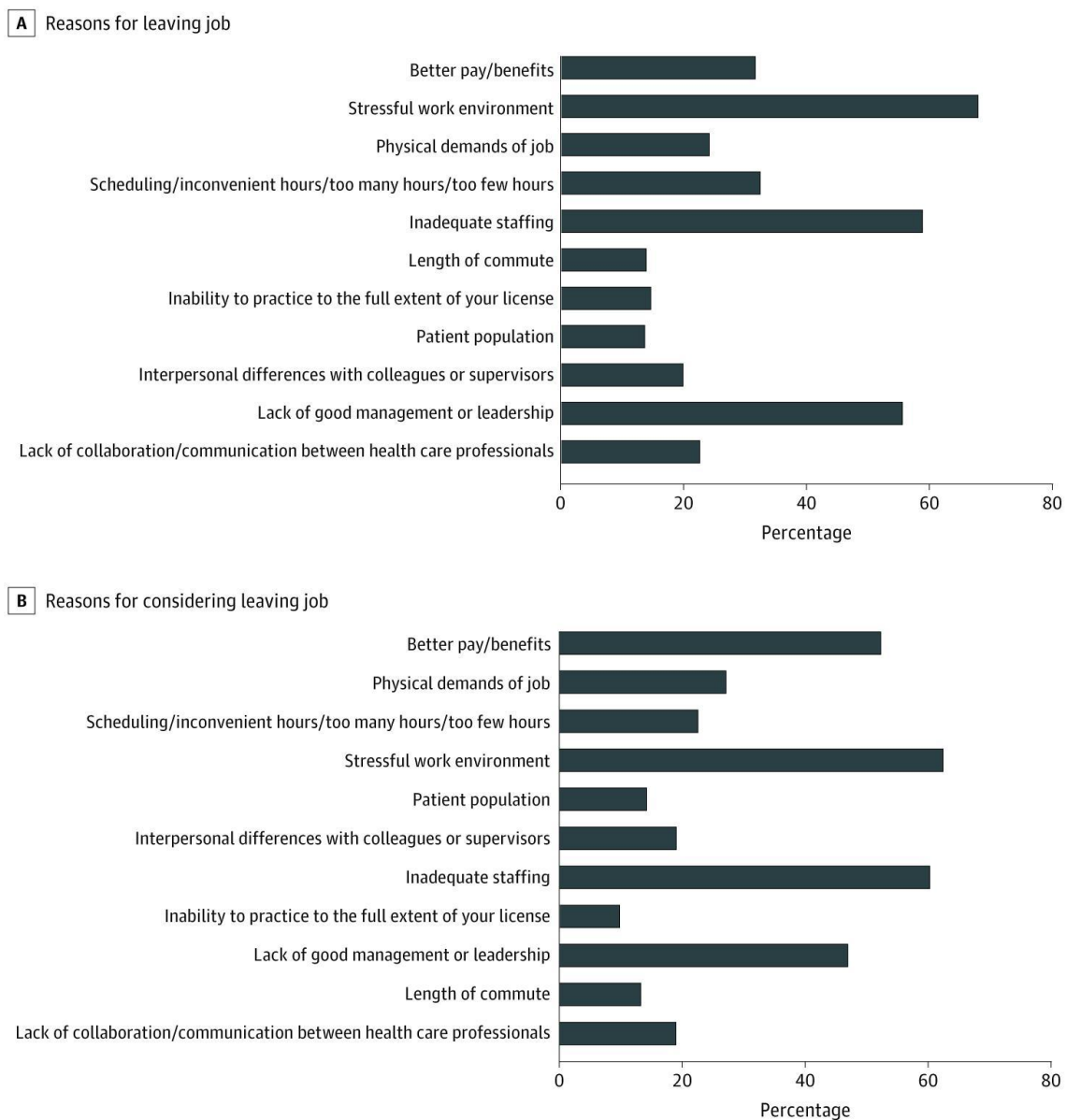
emotional exhaustion, with higher exposure to COVID-19 correlating with increased burnout.^[15]

1.5 DETERMINANTS OF WORK OVERLOAD

Work overload in nursing is a multidimensional phenomenon influenced by factors related to the patient, the nurse and the workflow. Studies have identified that workload has physical, mental, and emotional dimensions, each with specific determinants.^[16]

Figure 2

Overlap of Work Reasons for Nurses Who Left or Considered Leaving Their Jobs Owing to Burnout undefined



Source: Authors.

Among nurses who left their jobs citing burnout as a reason, the overwhelming majority also reported experiencing a stressful work environment and inadequate staffing as contributing factors, with these two questions showing the greatest overlap with burnout.^[17] Recent research has shown that 39% of active practice nurses planned to leave their employer within a year, with factors associated with departures including younger age, abusive events, emotional exhaustion, unfavorable workplaces, and inadequacy of staffing and resources.^[18]

Significant predictors of perceived workload include: patient acuity, staffing resources, patient transfers, documentation, patient isolation, unscheduled activities, and patient specialties.^[19] Physical workload was predicted by all variables tested; mental workload was determined by patient complexity or isolation, nursing staff suitability and skill mix, and unscheduled activities; and emotional workload was predicted by all variables except staffing suitability and education of others.^[16]

Twenty to forty percent of nurses reported being unable to provide care in the time available, understaffed, and inadequate skill mix. More than 60% believed that processes to address workload issues were inadequate.^[20] Institutional influences on staffing levels and skill mix are resulting in implicit rationing of care, impacting patient safety.^[20]

2 BACKGROUND AND OBJECTIVES

Despite the extensive literature on the subject, no meta-analysis had estimated the association between nursing burnout and quality and safety of health care and patient morbidity and mortality until recently.^[7] This gap is particularly significant considering that nurses are on the front lines of patient care in hospitals and other settings, often present when doctors are not, and tasked with making important clinical decisions.^[7]

In 2020-21, the World Health Organization designated the International Year of the Nurse and Midwife to honor the 200th anniversary of Florence Nightingale's birth.^[1] This global recognition highlights the critical importance of nursing to health systems and the urgent need to address the challenges faced by these professionals.

This integrative review synthesizes the scientific literature on the impact of work overload on nursing and its consequences for patient care, with the following objectives: (1) to examine the relationship between nursing workload, nurse-patient ratios and clinical outcomes; (2) to evaluate the association between nursing burnout and patient safety, satisfaction, and quality of care; (3) identify mechanisms by which work overload affects patient outcomes; and (4) to analyze the cost-effectiveness of interventions to improve the dimensioning of nursing staff.

3 METHODOLOGY

This integrative review examined published studies that investigated the relationship between nursing workload, nurse-patient ratios, burnout, and clinical outcomes. Prospective and retrospective studies, systematic reviews, and meta-analyses that evaluated outcomes related to patient safety, quality of care, and mortality were included.

4 RESULTS

4.1 IMPACT OF THE NURSE-PATIENT RATIO ON MORTALITY

International studies consistently demonstrate that inadequate nurse-to-patient ratios are associated with higher in-hospital mortality. A prospective study in Queensland, Australia, involving 27 interventional hospitals and 28 comparison hospitals, demonstrated that after the implementation of minimal nurse-to-patient ratios, mortality rates were significantly lower in interventional hospitals (adjusted OR 0.89; 95% CI 0.84-0.95; $p=0.0003$).^[1] Each additional patient per nurse was associated with a 7% higher chance of patient death at 30 days in a European study involving nearly half a million patients.^[1]

Data from New York showed that each additional patient per nurse was associated with a higher chance of in-hospital mortality for both surgical (OR=1.13; $p=0.0262$) and clinical (OR=1.13; $p=0.0019$) patients.^[21] It was estimated that if hospitals were sized with a ratio of 4:1 patients per nurse, 4,370 lives would be saved over a 2-year period.^[21]

A recent Japanese study using large-scale administrative data and robust methods demonstrated that nursing undersizing (defined as levels below the unit-specific annual median) was associated with increased in-hospital mortality, higher 30-day readmission rates, and longer hospital stays, particularly during the day shift and over the 24-hour period.^[2]

4.2 NURSING BURNOUT AND PATIENT SAFETY

A systematic meta-analysis involving 85 studies with 288,581 nurses from 32 countries revealed that nursing burnout is associated with multiple adverse outcomes.^[7] Burnout was associated with a lower safety climate (DME -0.68; 95% CI -0.83 to -0.54), lower safety classification (DME -0.53; 95% CI -0.72 to -0.34), and a higher frequency of nosocomial infections (DME -0.20; 95% CI -0.36 to -0.04), patient falls (DME -0.12; 95% CI -0.22 to -0.03), medication errors (DME -0.30; 95% CI -0.48 to -0.11), adverse events (DME -0.42; 95% CI -0.76 to -0.07) and omitted care (DME -0.58; 95% CI -0.91 to -0.26).^[7]

Burnout was also associated with lower patient satisfaction scores (DME -0.51; 95% CI -0.86 to -0.17) and lower quality of care assessed by nurses (DME -0.44; 95% CI -0.57 to

-0.30).^[7] The emotional exhaustion and depersonalization dimensions of burnout were more strongly associated with patient safety than low personal achievement.^[7]

4.3 HEALTHCARE-ASSOCIATED INFECTIONS

Excessive nursing workload was identified as a major risk factor for healthcare-associated infections (HAIs). A prospective study in ICUs demonstrated that excessive nursing workload (measured by the Nursing Activities Score - NAS) was the main risk factor for HAI (OR: 11.41; $p=0.019$), when evaluated in conjunction with other invasive devices.^[22]

Evidence shows that high bed occupancy and low levels of nursing staff are associated with increased transmission of methicillin-resistant *Staphylococcus aureus* (MRSA).^{[23][24]} Studies have estimated that more than a quarter of HAIs could be avoided if the nurse-to-patient ratio was kept above 2.2 in ICUs.^[24]

4.4 MEDICATION ERRORS

Systematic reviews have identified an association between inadequate levels of nursing staff and higher rates of medication administration errors.^[5] Three high-quality studies associated lower levels of nursing staffing with higher rates of medication administration errors and omitted care.^[5]

4.5 READMISSIONS AND LENGTH OF STAY

The Queensland study showed that readmissions increased in comparison hospitals (OR 1.06; 95% CI 1.01-1.12; $p=0.015$), but not in intervention hospitals with adequate proportions (OR 1.00; 95% CI 0.95-1.04; $p=0.92$).^[1] Although length of stay decreased in both groups, the reduction was more pronounced in intervention hospitals (adjusted IRR 0.95; 95% CI 0.92-0.99; $p=0.010$).^[1]

Each additional patient per nurse was associated with longer length of hospital stay for both surgical (IRR=1.09; $p=0.0008$) and clinical (IRR=1.05; $p=0.0023$) patients, and a higher chance of readmission at 30 days.^[21]

4.6 PATHOPHYSIOLOGICAL MECHANISMS

The underlying mechanism by which low levels of nursing staffing affect patient outcomes is related to omitted nursing care.^[2] When nurses are overworked, essential activities of patient surveillance, timely medication administration, mobilization, hygiene, and adequate preparation for discharge are often omitted, leading to adverse events such as

increased mortality, longer hospital stays, and inadequate preparation for discharge, resulting in higher readmission rates.^[2]

A post-COVID-19 pandemic Thai study demonstrated that each additional unit of emotional exhaustion was associated with a 1.61 times higher chance of omitted care, a 3.37 times higher chance of poor quality of nursing care, and a 2.62 times higher chance of poor quality of overall unit care.^[25]

4.7 COST-EFFECTIVENESS ANALYSIS

Contrary to the perception that increasing the number of nursing staff is expensive, studies have shown a positive return on investment. In the Queensland study, the costs avoided due to fewer readmissions and shorter hospital stay were more than double the cost of additional nursing staff.^[1]

A British cost-effectiveness analysis estimated that eliminating the undersizing of registered nurses and nursing assistants would cost £2,778 per quality-adjusted life year (QALY) considering personnel costs alone, £2,685 including sick leave and readmission reduction benefits, or save £4,728 including length of stay reduction benefits.^[26] According to the National Institute for Health and Care Excellence's £10,000 per QALY threshold, it is cost-effective to eliminate understaffing^[26]

Conservative estimates from New York projected savings of \$720 million over a 2-year period in shorter hospital stays and avoided readmissions if hospitals were sized 4:1.^[21]

5 DISCUSSION

The evidence accumulated over the last three decades consistently and robustly demonstrates that work overload in nursing has measurable and significant consequences for the safety and quality of patient care. The findings are consistent regardless of age, gender, nurses' professional experience, and geography.^[7]

The associations between work overload and adverse outcomes persisted over time, and the association with quality of care became increasingly negative over three decades, even after accounting for the COVID-19 pandemic.^[7] This is concerning considering decades of national and organizational efforts to improve quality.

Most anti-burnout efforts have focused on individual interventions, such as mindfulness or personal resilience training, designed to help people cope more effectively with stress, rather than interventions to reduce stress and burnout in the workplace.^[7] Many effective interventions are at the work unit level, where health workers experience teamwork, feelings of community, professional development, and recognition.^[7]

Policies of minimal nurse-to-patient ratios are feasible and produce significantly better patient outcomes and better return on public investment.^[1] Investments in nursing education and training should also be considered as a component of burnout mitigation efforts, since higher levels of nursing education were associated with lower patient mortality.^[7]

6 CONCLUSION

Work overload in nursing is not only an individual occupational issue, but an organizational and collective phenomenon that affects nurses, patients, organizations, and society as a whole. Evidence shows that inadequate nurse-to-patient ratios and burnout are associated with increased mortality, adverse events, nosocomial infections, medication errors, omitted care, longer hospital stays, readmissions and lower patient satisfaction.

Interventions at the organizational and policy level, including establishing safe minimum nurse-to-patient ratios, investing in permanent rather than temporary staff, and improving the nursing practice environment, are cost-effective and can save lives. Reformulating burnout as an organizational phenomenon, rather than an individual problem, allows for the broader perspective needed to effectively address nursing work overload and its consequences for patient care.

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