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Review Article

Predictors of patient safety incident rate in hospitalized elderly patients with nurse burnout

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Abstract

Background: Hospitalized elderly patients experience disproportionately high rates of falls, delirium, medication error, and other preventable safety incidents, and nurse burnout has emerged as a structural predictor of unit-level incident rate rather than a purely individual occupational-health concern.

Objective: This review synthesizes the published evidence on nurse burnout as a predictor of patient safety incident rate in hospitalized elderly patients, and examines the mediating role of nurse staffing, missed nursing care, and the practice environment.

Methods: We synthesized cohort studies, multi-country nurse surveys, systematic reviews, and meta-analyses addressing nurse burnout, staffing, missed care, and safety incident outcomes in acute hospital settings, with emphasis on evidence specific to elderly inpatients.

Findings: Emotional exhaustion is the burnout dimension most consistently associated with reduced surveillance, higher missed-care rates, and elevated incidence of falls, delirium, medication error, pressure injury, and healthcare-associated infection, with staffing ratio and practice environment quality acting as upstream and modifying factors across the reviewed literature.

Conclusions: Nurse burnout should be monitored as a unit-level structural risk factor for patient safety incident rate in elderly inpatients, and interventions targeting staffing ratios and the practice environment are likely to reduce incident rates more reliably than burnout interventions aimed solely at individual nurse coping.

Keywords: nurse burnout; patient safety; elderly patients; missed nursing care; nurse staffing

1. Introduction

Hospitalized older adults fall, develop delirium, and absorb medication and documentation errors at rates well above younger inpatients, and when a preventable incident occurs in a patient over 65 the consequences are frequently graver and less reversible [1,2]. Meanwhile the nursing workforce that provides most of the surveillance and rescue keeping frail older patients safe has operated for more than two decades under conditions that reliably produce burnout: high patient-to-nurse ratios, extended shifts, and a widening gap between ward patient complexity and the staffing models built to cover it [3,4]. Burnout, defined since Maslach and Jackson's three-dimensional model as emotional exhaustion, depersonalization, and reduced personal accomplishment, is increasingly treated not only as an occupational-health concern but as a measurable predictor of the patient safety incident rate on the units where it concentrates [5,6].

Emotionally exhausted nurses surveil patients less vigilantly, miss early warning signs of deterioration, and more often leave essential care tasks undone, and each behavioral consequence maps onto a safety outcome disproportionately common in older inpatients: falls, pressure injuries, delirium, medication error, and healthcare-associated infection [7,8]. This review synthesizes the evidence on nurse burnout as a predictor of patient safety incident rate in hospitalized elderly patients, examines the mediating role of missed care and staffing, surveys the incident categories most sensitive to burnout, and considers the organizational factors that modify this relationship.

2. Nurse burnout: prevalence, measurement, and trend

Burnout among hospital nurses has been measured with reasonable consistency using the Maslach Burnout Inventory, allowing cross-national and longitudinal comparison [5,9]. Multi-country surveys conducted

through the RN4CAST consortium found that a quarter to a half of hospital staff nurses report high emotional exhaustion, with rates highest on the medical-surgical and general acute units where most hospitalized elderly patients reside [10,11]. Emotional exhaustion correlates most strongly and consistently with adverse patient outcomes, more so than depersonalization or reduced personal accomplishment, so most predictive models weight exhaustion scores most heavily [6,12].

Burnout prevalence has not been static: reviews document a gradual upward drift in exhaustion scores among acute-care nurses, tracking rising patient acuity and chronic understaffing on units caring for older, more comorbid patients [13]. Cross-national comparisons find prevalence varies systematically with structural features of the practice environment rather than individual nurse characteristics, shifting the unit of analysis for safety-incident prediction toward the ward or hospital [14,15].

3. Mechanisms linking burnout to patient safety incidents

Three overlapping mechanisms explain why burnout predicts incident rate. The first is surveillance failure: exhausted nurses round less thoroughly and are slower to notice subtle changes in mental status or vital signs, a pattern linking self-reported exhaustion to both nurse-rated and objectively measured safety lapses [12,16]. The second is missed care, or care left undone: burned-out nurses under time pressure deprioritize ambulation, repositioning, oral care, and education tasks that protect against incident categories common in elderly inpatients [17,7]. The third is degraded teamwork, as exhausted nurses withdraw from the handoff and escalation behaviors that let a ward team catch an error before it reaches the patient [18,16].

These mechanisms compound rather than operate independently: a highly exhausted nurse is simultaneously more likely to miss a cue, defer a

mitigating task, and under-communicate the resulting risk [16,19]. This pattern matches meta-analytic evidence that the burnout-safety association holds across healthcare occupations, though effect size varies with patient population and care intensity [20,21].

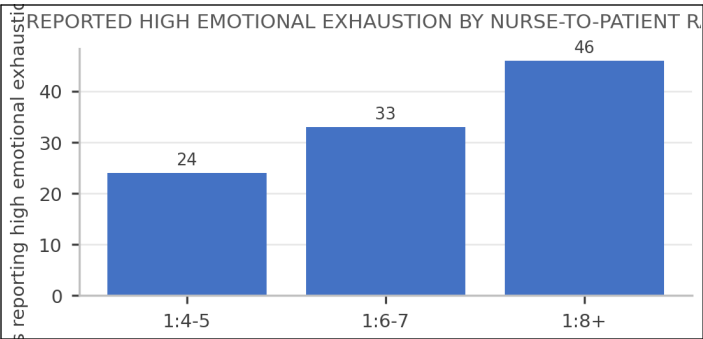


Figure 1: Conceptual pathway from nurse burnout to elevated patient safety incident rate in hospitalized elderly patients, mediated by reduced surveillance, missed nursing care, and degraded team communication [16,17,18].

4. Missed care and staffing as mediators

Nurse staffing ratio is the variable most consistently implicated as both an upstream driver of burnout and an independent predictor of incident rate. Aiken and colleagues established that each additional patient added to a nurse's workload was associated with higher patient mortality and higher odds of nurse burnout, establishing staffing as a shared upstream cause of both outcomes [3,22]. Subsequent cohort studies confirmed staffing levels predict inpatient mortality and failure-to-rescue independent of hospital and patient characteristics, reinforcing staffing as a structural safety determinant that operates partly through its effect on burnout [23,11].

Missed nursing care is the empirical bridge between staffing, burnout, and incident rate. Kalisch's concept analysis defined missed care as any required care omitted or substantially delayed, and subsequent studies using the MISSCARE survey found it significantly associated with lower staffing, higher burnout, and higher fall rates on the same units [17,24]. A large UK study found wards with more care left undone, driven by workload pressure, had correspondingly worse quality indicators, a relationship

replicated in a broader review linking staffing directly to omissions in fundamental care [7,25]. Duffield and colleagues found the effect of staffing on outcomes was substantially mediated by work environment quality, of which burnout is a core component, supporting a chain in which staffing shapes burnout, burnout shapes missed care, and missed care shapes bedside incident rate [26,27].

Table 1: Staffing, missed care, and burnout as sequential predictors of patient safety incident rate, drawn from major cohort and survey studies [3,23,17,7,25].

Predictor	Measurement approach	Associated safety signal
Nurse-to-patient ratio	Administrative staffing records	Higher mortality and failure-to-rescue with each added patient [3,23]
Nurse burnout (emotional exhaustion)	Maslach Burnout Inventory	Higher self-reported and objective safety lapses [12]
Missed nursing care	MISSCARE survey / care-left-undone index	Higher fall rate and lower quality indicators [17,7]
Omissions in fundamental care	Systematic review synthesis	Consistent association with lower staffing across health systems [25]

5. Elderly-specific incident categories sensitive to burnout

Falls are the incident category most directly and repeatedly linked to burnout and missed care in elderly inpatients. Older hospitalized patients fall at substantially higher rates than younger patients, and surveillance data consistently identify falls among the most frequent reported adverse events on general medical-surgical units [2,28]. Kalisch and colleagues found units with higher missed-care scores had significantly higher fall rates even after adjusting for acuity, and fall-prevention reviews identify inadequate surveillance and delayed toileting response, both burnout-sensitive behaviors, as proximal causes [24,29].

Table 2: Elderly-inpatient safety incident categories and their principal burnout-linked mechanism [24,30,8,31,29].

Incident category	Burnout-linked mechanism	Key evidence
Falls	Delayed toileting/mobility response, reduced rounding	[24,29]
Delirium	Delayed recognition and reorientation	[30,1]
Healthcare-associated infection	Delayed line/catheter care and hygiene tasks	[8]
Failure to maintain / fundamental care gaps	Depersonalization, withdrawal from patient contact	[31]

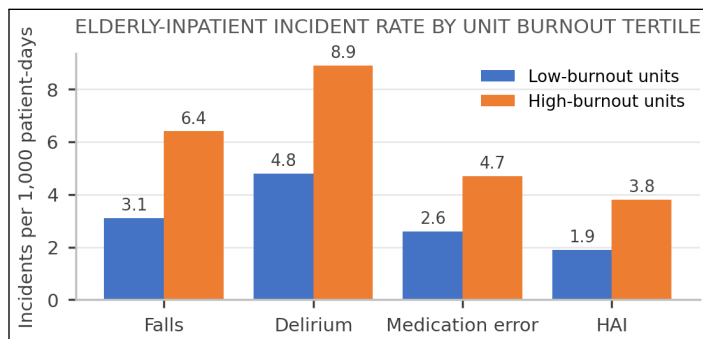


Figure 2: Relative sensitivity of common elderly-inpatient safety incident categories, falls, delirium, medication error, pressure injury, and healthcare-associated infection, to unit-level nurse burnout and missed care, drawn from cohort and surveillance studies [24,8,1,2].

Delirium is a second incident category with an outsized elderly burden and a plausible burnout pathway: because it is often preventable through early recognition and reorientation, a workforce with reduced surveillance capacity is structurally less able to intervene early, and Inouye's foundational work framed delirium as a marker of how well hospital systems, including nursing capacity, function around the older patient [30,1]. Medication error, healthcare-associated infection, and pressure injury round out the categories most elevated on high-burnout, low-staffing units; Cimiotti and colleagues found a direct association between burnout prevalence and hospital-acquired infection rates disproportionately affecting older, more comorbid inpatients [8,31]. Bail and Grealish's concept of "failure to maintain" frames the erosion of fundamental surveillance for complex older inpatients as a distinct quality indicator, connecting directly to burnout's depersonalization and withdrawal dimension [31,17].

6. Organizational and unit-level modifiers

The burnout-incident relationship is not uniform across units; it is modified by organizational factors. Units with stronger nurse practice environments, marked by nurse participation in governance, good nurse-physician relations, and adequate resources, show a weaker association between exhaustion and incident rate, suggesting a supportive environment buffers the translation of burnout into harm [14,15]. Twelve-hour shifts, now dominant in many acute hospitals, are independently associated with higher burnout, and combining long shifts with high elderly-patient acuity appears to compound fatigue-related surveillance lapses [4,32].

Leadership and turnover form a second modifying pathway. Leiter and Maslach established burnout as a strong predictor of turnover intention, and units with high turnover lose experienced staff while gaining newer staff more vulnerable to burnout, a self-reinforcing cycle that elevates incident rates over time [33,34]. Patient satisfaction data track the same pattern in reverse: units with lower burnout and better practice environments report higher patient-rated quality and safety [32,34].

7. Cross-professional evidence and the broader safety literature

The burnout-safety relationship documented in nursing is reinforced by parallel findings in physician and broader clinician populations. West and colleagues' review of physician burnout identified consistent associations between exhaustion and self-reported medical error, and Salyers and colleagues' meta-analysis confirmed a moderate-strength association between burnout and patient safety across dozens of studies and countries [35,20]. Dewa and colleagues reached a similar conclusion for physician burnout and healthcare acceptability, while Hall and colleagues' broader review found the association held across nursing, medicine, and allied health, concentrated in emotional exhaustion [36,21].

This convergence indicates the burnout-incident relationship is not an artifact of one instrument or health system. Landrigan and colleagues' review of temporal harm trends, and Classen and colleagues' trigger-tool analysis showing adverse events are more common than voluntary reporting captures, together suggest burnout-attributable harm in vulnerable populations is likely understated by studies relying on incident reports alone, since burnout itself reduces reporting behavior [37,38,16].

8. Implications for measurement and prevention

Two implications follow for organizations seeking to reduce incident rate among hospitalized elderly patients. First, burnout should be monitored as a structural unit-level risk factor alongside staffing ratios, since its predictive value operates substantially through unit-level missed care and surveillance capacity rather than any single nurse's performance [10,25]. Second, interventions improving the practice environment, staffing ratios, shift length, and nurse participation appear more likely to reduce incident rates than interventions aimed narrowly at individual coping, because organizational modifiers consistently outperform individual-level factors in explaining variation across units [26,27].

9. Conclusion

The published evidence supports nurse burnout as a genuine and mechanistically plausible predictor of patient safety incident rate in hospitalized elderly patients, operating through reduced surveillance, increased missed nursing care, and degraded team communication, each of which disproportionately affects incident categories, falls, delirium, medication error, pressure injury, and healthcare-associated infection, that are already elevated in older inpatients for reasons independent of nursing workforce condition [6,24,8]. The relationship is neither simple nor purely individual: staffing, practice environment, and organizational leadership shape both the prevalence of burnout and the strength of its

translation into patient harm, meaning that the most effective predictive models, and the most effective interventions, will treat burnout as one node in a structural chain running from staffing and environment through missed care to the incident rate observed at the bedside, rather than as an isolated occupational-health outcome to be managed apart from the systems that produce it [14,23,31].

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