

Nurse Workload and Job-Related Burnout: Jeopardizing the Culture of Safety

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Overview

- Nurse workload
- Effects of increased nurse workload
- Job-related burnout
- Centers for Medicare and Medicaid Services

 Hospital-acquired conditions
- Healthcare-acquired infections
- Nurse workload and clinical practice
- Question and Answer



Nurse Workload: A Complex Phenomena

- Organizational Factors
 - Reduced staffing
 - Increased turnover or reduction in patient LOS
- Human factors
 - Time constraints
 - Change performance
 - Mental workload
 - Inability to perform concurrent tasks
 - Burnout
 - Emotional exhaustion

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Nurse Reported Effects of Increased Workload

- Complaints from patients or families (20% increase)
- Verbal abuse by patients (30% increase)
- Verbal abuse by staff (30%increase)
- Burnout (50% increase)
- Job dissatisfaction (50% increase)
- Work environment fair/poor (60% increase)
- Quality of care fair/poor (80% increase)
- Workload causes me to miss changes in patient condition (50% increase)
- Workload causes me to look for a new position (60% increase)



PA Nurse Workload and Patient Outcomes

- Over the past 2 decades nurses have reported
 - Not enough nurses in hospitals to provide quality care
 - Not enough staff to get the job done
 - Not enough support staff to allow time with patients
- Increased nurse workload
 - Each additional patient per nurse
 - 15% increase in job dissatisfaction
 - 23% increase in burnout





Burnout: A Complex Phenomena

- A syndrome of physical and emotional manifestations
 - Identified in care-giving and service occupations
 - Long exposure to job stressors
- Three dimensions of burnout
 - Emotional exhaustion
 - Depersonalization

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- Personal accomplishment

The Burnout Process and Patient Care

- Health care providers no longer have positive feelings, sympathy or respect for patients
- Health care providers develop cynical and dehumanizing perceptions of patients
 - Patients deserve their current condition
- Burnout plays primary role in the poor delivery of health services to people in need
- Burnout is a major factor in low worker morale, impaired performance, and high job turnover

Maslach C. (1979). The burn-out syndrome and patient care. In ed CA Garfield, Stress and Survival: The Emotional Realities of Life-Threatening Illness. St Louis, MO: CV Mosby Company.

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SOURCE Authors' analysis. **NOTES** The total number of nurse respondents for the calculation of burnout was 68,724, and the total number of nurse respondents for job dissatisfaction was 68,488. Nurses were classified as "burned out" if their score on the emotional exhaustion subscale of the Maslach Burnout Inventory was higher than the published average for health care workers. Nurses were classified as "dissatisfied" if they reported being either "very dissatisfied" or "a little dissatisfied" in their current positions on a four-point Likert-type scale.



SOURCE Authors' analysis. **NOTE** Hospitals with four subscales above the median on the Practice Environment Scale of the Nursing Work Index were classified as "better"; hospitals with two or three subscales above the median were classified as "mixed"; and those with one or no subscales above the median were classified as "poor."



SOURCE Authors' analysis. **NOTES** Hospitals with four subscales above the median on the Practice Environment Scale of the Nursing Work Index were classified as "better"; hospitals with two or three subscales above the median were classified as "mixed"; and those with one or no subscales above the median were classified as "poor."

McHugh MD, Kutney-Lee A, Cimiotti JP, Sloane DM, & Aiken LH (2011). Nurses' widespread job dissatisfaction, burnout, and frustration with health benefits signal problems for patient care. *Health Affairs*. 30(2), 202-210.



Burnout: A Global Phenomena

Burnout, Job Satisfaction, And Intentions To Leave Present Job Among Nurses Sampled In Five Countries, 1998–1999

	Ų.Ş.	Çanada	England	Scotland	Ģermany
Percent dissatisfied with present job	41.0%	32.9%	36.1%	37.7%	17.4%
Percent with scores in high burnout range according to norms ^a	43.2	36.0	36.2	29.1	15.2
Percent under age 30 Percent planning to leave present	19.0	10.3	40.6	31.9	33.6
job in the next year	22.7	16.6	38.9	30.3	16.7
Percent under 30 planning to leave in the next year	33.0	29.4	53.7	46.0	26.5

SOURCE: Nurse survey data, International Hospital Outcomes Research Consortium, 1998–1999.

^a Published norms for emotional exhaustion from Maslach and Jackson; see Note 11 in text.



Nurse-Assessed Quality of Care

	U.S.	Canada	England	Scotland	Germany
Percent confident that their patients are able to manage their own care when discharged Percent who say the quality of care in	33.8	30.0	59.7	56.1	80.9
their hospital has deteriorated in the past year	44.8	44.6	27.6	21.5	17.2

The Evidence: Health Care Quality in the U.S.

Institute of Medicine

- To Err is Human: Building a Safer Health System (1999)
 98,000 people die every year from medical errors
- Crossing the Quality Chasm: A New Health System for the 21st Century (2001)

- Deficiencies in the quality of our health care system

- Keeping Patients Safe: Transforming the Work Environment of Nurses (2004)
 - Solutions to problems that threaten patient safety
 - Nurse staffing, hours worked, mandatory overtime

CMS Hospital-Acquired Conditions

- Foreign objected retained after surgery
- Air embolism
- Blood incompatibility
- Pressure ulcers (stage III and IV)
- Falls
- Manifestations of poor glycemic control
- <u>Cather-associated urinary tract infection</u>
- <u>Vascular catheter-associated infection</u>
- Deep vein thrombosis/pulmonary embolism (post-op)
- Surgical site infection





The Facts on Healthcare-Associated Infection

- 1.7 million infections annually
- Cost \$6.2 billion annually
- 90,000 deaths annually
- Most common sites
 - Urinary tract infection (UTI)
 - Surgical site infection (SSI)
 - Bloodstream infection (BSI)
 - Ventilator associated pneumonia (VAP)
- Most common organisms
 - Staphylococci

Nursing Care and HAIs: 30 Years of Evidence

Source	Staffing ratio	Skill Mix	Hours of care
Haley, 1982 [*]	Outbreak Staphylococcus aureus		
Archibald,1997*			<u>Outbreak</u> Serratia marcescens
Harbarth, 1999	<u>Outbreak</u> Enterobacter cloacae		
Robert, 2000*	CNS, MRSA, Acinetobacter, Candida, S. marcescens,	P aeruginosa, E. faecalis, K pneumonie (float nurses)	
Anderson, 2002	Outbreak MRSA		
Alonso-Echanove, 2003*		Gram + and – cocci, fungi (float nurses)	
Manojlovich, 2011	MRSA		MRSA
Glance gate Oyletters for Disease Cont	rol and Prevention (CDC), Atlanta, GA	Sepsis (LPNs)	



PA Nurses and Hospital-Acquired Infection

- PA was the first state to begin to publically report HAIs
- Researchers at University of PA surveyed a large sample registered nurses in four states (CA, FL, NJ, and PA)
- Mailing list for the board of nursing in each state
- Generated a random sample from BON mailing list
 - Dillman methodology
 - Estimate sample bias
- 7,076 hospital-based staff nurses responded to the survey
- Survey participants were employed in 161 PA hospitals

PA Data Sources, 2006

• Nurse survey data

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- Nurse & workplace characteristics, care environment, burnout, job satisfaction, and quality of care.
- PA hospital-acquired infection report
 - Pennsylvania Health Care Cost Containment Council (PHC4). Infections defined based on CDC criteria
- American Hospital Association Annual Survey
 - Bed size
 - Teaching status
 - Technology status

PA Healthcare-Associated Infections, 2006

Infection type	Number of cases	Infection rate*
Cases with infection	30,213	19.2
Urinary tract	13,567	8.6
Surgical site	1,668	4.2
Gastrointestinal	3,959	2.5
Pneumonia	3,321	2.1
Bloodstream	2,945	1.9
Other	962	0.6
Multiple	3,730	2.4
Cases w/o infection	1,540,855	NA

* Per 1,000 cases



Data on PA Hospital-Acquired Infection

- Two types of infection were chose for analysis
 - Cather-associated urinary tract infection
 - Surgical site infection
- Rationale for using CAUTI and SSI
 - Two most prevalent infections reported by PHC4
 - Could be acquired on any unit within a hospital

PA Hospital Characteristics (n=161)

- Bed size, mean (SD)
 - 227 (186)
- Teaching status, n (%)
 - Major 19 (12%)
 - Minor 58 (36%)
- High technology, n (%)
 63 (40%)
- Nurse staffing, mean (SD)
 5.7 (1.1)



PA Registered Nurse Characteristics (n=7,076)

- Age in years, mean (SD)
 43.9 (10.6)
- Female sex, n (%)
 6,679 (94.5%)
- BSN degree or higher, n (%)
 2,672 (37.8%)
- Years of experience, mean (SD)
 17.2 (11.0)
- High burnout, n (%)
 - 2,544 (36.5%)

Registered Nurse Job-Related Burnout

- Maslach Burnout Inventory-Human Services Survey (MBI-HSS)
 - Highly reliable and extensively validated
 - 22-item, 7-point Likert-type scale on job-related attitudes
- Three distinct subscales
 - Emotional exhaustion
 - Depersonalization
 - Personal accomplishment
- Emotional exhaustion
 - Identified as a key component of burnout syndrome
 - Created hospital-level measure for proportion of nurses with high burnout



PA Registered Nurse Staffing and Hospital-Acquired Infection

- Catheter-Associated Urinary Tract Infection
 - Each additional patient added to a nurses workload was associated with a .86-unit increase (1 per 1,000) in the rate of urinary tract infection
 - 1,351 additional infections for each patient added to a nurses workload
- Surgical Site Infection
 - Each additional patient added to a nurses workload was associated with a .93-unit increase (1 per 1,000) in the rate of surgical site infection



Nurse Burnout



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PA Registered Nurse Burnout and Hospital-Acquired Infection

Nurse staffing no longer a significant predictor of infection

- Catheter-Associated Urinary Tract Infection
 - Nurse burnout was associated with a .82-unit increase in the rate of urinary tract infection
- Surgical Site Infection
 - Nurse burnout was associated with a 1.56-unit increase in the rate of surgical site infection
- 10% increase in a hospitals composition of high-burnout nurses associated with an increase in 1 CAUTI and 2 SSIs per 1,000 patients

The Cost of Nurse Burnout

Using 2006 data* on 161 Pennsylvania hospitals, researchers measured an association between nurse burnout and rates of two common patient infections. They then projected the total annual impact of reducing the proportion of burned-out nurses statewide.

Urinary tra	ct Infections		Surgical site infections		
Reduction in burnout	Infections prevented	Cost savings	Infections prevented	Cost savings	
-10%	1,335	\$1,055,640	744	\$15,082,953	
-20%	2,671	\$2,111,280	1,489	\$30,165,906	
-30%	4,006	\$3,166,920	2,233	\$45,248,859	

*Responses to questionnaires indicated that more than one-third of the nurses met a standard definition for high burnout. Infection data for 2006 were collected by the Pennsylvania Health Care Cost Containment Council (and was posted for each hospital at www.phc4.org). Average savings were based on federal estimates of per-patient cost for each infection.

SOURCE: Jeannie P. Cimiotti, American Journal of Infection Control

The Philadelphia Inquirer

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X represents VRE culture positive sites The Risk of Hand and Glove Contamination after Contact with a VRE (+) Patient Environment. Hayden M, ICAAC, 2001, Chicago, IL.



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Neonatal ICU Nurses: What's on Their Hands?

- 834 hand cultures
 - 417 alcohol-based hand sanitizer
 - 417 antiseptic soap
- 1,442 isolates
 - 1,281 (88.8%) gram-positive
 - 95 (6.6%) gram-negative
 - 66 (4.6%) fungi

Clean Hands of Nurses in the NICU

- Gram-positive bacteri
 - S. epidermidis 99.2% of nurses
 - S. warneri 97.5% of nurses
 - S. capitis-ureolyticus 20.2% of nurses
- Gram-negative bacteria
 - Acinetobacter Iwoffi 13.4% of nurses
 - Klebsiella pneumoniae, Klebsiella oxytoca, Enterobacter cloacae
 7.6% of nurses
- Fungi

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- Candida parapsilosis 22.7% of nurses
- Candida other 9.2% of nurses
- Candida albicans 4.2% of nurses



NICU Nurse Hand Flora: Proportion of Susceptible Isolates

	Oxacillin	Rifampin	Gentamicin	Levofloxacin
S. aureus	85.4%	92.7%	85.4%	92.7%
S. auricularis	53.3%	100%	86.7%	80.0%
S. capitis-capitis	92.9%	92.9%	85.7%	92.9%
S. capitis-ureolyticus	82.9%	97.1%	82.9%	94.3%
S. epidermidis	12.0%	96.6%	25.5%	93.3%
S. haemolyticus	19.2%	92.6%	55.6%	66.7%
S. hominis	48.1%	100%	66.7%	96.2%
S. simulans	60.0%	100%	75.0%	93.8%
S. warneri	14.6 <mark>%</mark>	88.6%	21.4%	93.8%



NICU Nurse Hand Flora: Antibiotic Resistance

Predictors of antibiotic resistance

- S. epidermidis
 - Increased resistance to oxacillin & gentamicin
 - Antiseptic soap
- S. warneri
 - Increased resistance to rifampin & gentamicin
 - Antiseptic soap
 - Damaged hand skin of nurses

Cook, H.A., Cimiotti, J.P., Della-Latta, P., Saiman, L., & Larson, E.L. (2007). Antimicrobial resistance patterns of colonizing flora on nurses' hands in the neonatal intensive care unit, *Am J Infect Control*, 35, 231-236.



Nurse Burnout

The Hands of Nurses





HAIs: The Process of Nursing Care (or not)

Source	Process of care
Harbarth, 1999	37% non-compliance with hand hygiene
Boyle, 2001	30% non-compliance with hand hygiene
Cohen, 2003	32% non-compliance with hand hygiene (NICU)
Eckmanns, 2007	70% non-compliance with hand hygiene (covert observation) 42% non-compliance with hand hygiene (overt observation)
Stone, 2007	43% non-compliance with hand hygiene
Khan, 2011	59% non-compliance with hand hygiene (open ICU) 70% non-compliance with hand hygiene (closed ICU)

Hand Hygiene Practices in the NICU

- Direct observation
 - One month, 38 observation periods (25 NICU 1 and 13 NICU 2)
- Level of touch
 - Individual making hand contact
 - Condition of hands
 - Glove use
- 1,472 touches
 - 55.4% by nurses
 - 16.7% by visitors
 - 13.1% by residents
 - 7.9% other HCW
 - 6.9% by attending physician

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Hand Hygiene Practices in the NICU: Findings

Level of touch

• Level 1 – outside the isolette

- 74.8% time nurse did <u>not</u> clean hands or use gloves

- Level 2 inside isolette, but not infant
 - 48.3% time nurse did **not** clean hands or use gloves
- Level 3 direct infant touch
 - 31.5% time nurse did **not** clean hands or use gloves

Cohen, B., Saiman, L., Cimiotti, J., & Larson, E. (2003). Factors associated with hand hygiene practices in two neonatal intensive care units. *Pediatr Infect Dis J*, 22, 494-498.

Staphylococcus warneri in the NICU

- Microbial flora from hands of nurses and clinical isolates from infants over a 23 month period
- Baseline and then every 3 months (over 2 years) samples from nurses hands
 - 834 samples from hands of nurse; 520/1,195 (44%)
 S. warneri
- 647 clinically relevant isolates from infants, 17 (8%) of 202 isolates that were identified at species level were *S. warneri*

Staphylococcus warneri: PFGE

PFGE:

- 12 BSI isolates available
- 9/12 (75%) type A strain

Neonates & Nurses:

- 5/6 (83%) neonates & nurse caregiver type A
- 4 nurse non-caregivers type A
- 4 adult patients and 4 adults from community (unique strains)

Staphylococcus warneri





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Implication of Increases in Nurse Workload: A Summary

- Nurse job-related burnout and job dissatisfaction
- Nurses miss important changes in patient conditions
- Nurses to fail to report important patient information at shift change
- High nurse burnout appears to be a possible explanation for the association between nurse staffing and infection.

- Nurses to fail to adhere to clinical practice guidelines

 Workload and its associated burnout jeopardize patient safety resulting in hospital-acquired conditions and poor health care outcomes



Nurse Burnout

