

Research BRIEF

Research to Improve the Nation's Health System

2018 . No. 7

LOWER POSTSURGICAL MORTALITY FOR INDIVIDUALS WITH DEMENTIA WITH BETTER-EDUCATED HOSPITAL WORKFORCE

Elizabeth M. White, Jessica G. Smith, Rebecca L. Trotta, Matthew D. McHugh

Journal of the American Geriatrics Society — March 20, 2018

KEY FINDINGS

Surgical patients age 65 and over with Alzheimer's disease and related dementias (ADRD) were more likely to die within 30 days of admission and to die after a complication than those without ADRD. Having better-educated nurses in the hospital improved the likelihood of good outcomes for all surgical patients, but had a much greater effect in individuals with ADRD. Specifically, a 10% increase in the proportion of nurses with a Bachelor of Science in Nursing (BSN) degree or higher was associated with 10% lower odds of death and 10% lower odds of dying after a complication for surgical patients with ADRD.

THE QUESTION

Individuals with Alzheimer's disease and related dementias (ADRD) are at high risk for adverse outcomes during hospitalization, especially after surgery, because they have high delirium risk, more comorbidities, mobility limitations, and impaired communication. Nurses serve as the primary clinical surveillance system in hospitals, and can identify complications and intervene early. This is important in individuals with ADRD, who often cannot recognize a problem or clearly signal for help when needed. More than a decade of [research](#) has demonstrated that individuals cared for in hospitals with more nurses holding a Bachelor of Science in Nursing (BSN) degree or higher have better outcomes, including lower mortality, lower rates of failure to rescue (death after a complication), fewer readmissions, and shorter stays.

Could being treated by higher-educated nurses mitigate some of the heightened risk faced by surgical patients with ADRD? Using 2006-7 Medicare claims data linked with nurse survey data in four states, the authors examined the separate and combined effects of ADRD and BSN-educated nurses on mortality and failure to rescue among surgical patients age 65 and over.

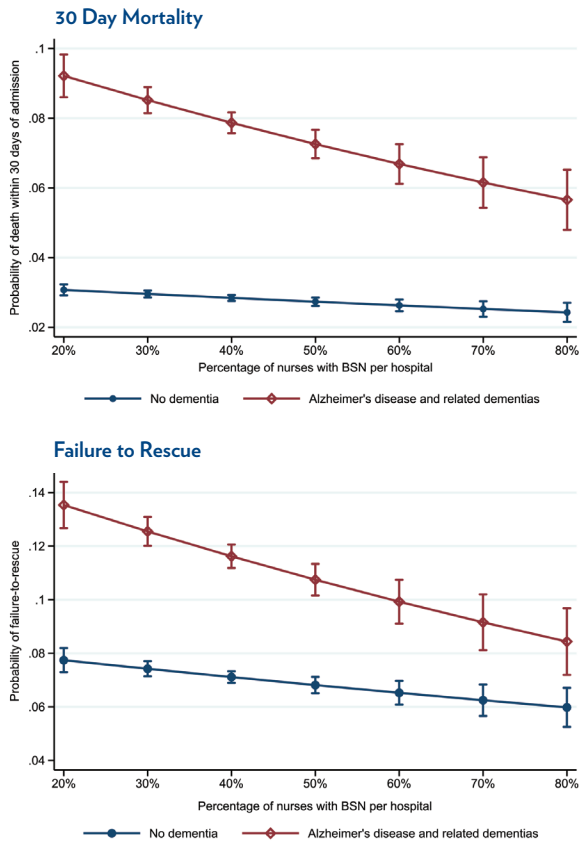
THE FINDINGS

The study included 353,333 Medicare beneficiaries who underwent general, orthopedic, or vascular surgery in one of 531 hospitals, in which the proportion of nurses holding a BSN degree or higher varied (0-73.9%, mean 38.5%, median 38.0%). Hospitals with higher proportions of BSN nurses tended to be larger, major teaching hospitals and high-technology facilities. Individuals with ADRD undergoing surgery were on average older, had more comorbidities, experienced more postoperative complications, and had longer lengths of stay than those without ADRD.

Direct ADRD and BSN nursing effects. Controlling for hospital, procedure, and individual characteristics, individuals with ADRD undergoing surgery were 88% more likely to die within 30 days of admission and 53% more likely to experience failure to rescue than those without ADRD. For all individuals undergoing surgery, each 10% increase in the proportion of nurses holding a BSN degree or higher was associated with 6% lower odds of death and 6% lower odds of failure to rescue.

Combined ADRD-BSN nursing effects. Controlling for hospital, procedure, and individual characteristics, each 10% increase in the proportion of BSN nurses was associated with 4% lower odds of death and 5% lower odds of failure to rescue for patients without ADRD, but 10% lower odds of death, and 10% lower odds of failure to rescue for patients with ADRD. The **Figure** depicts the differences in predicted probabilities of these outcomes for individuals with and without ADRD at hospitals with varying proportions of BSN nurses.

Figure. Predicted Probabilities of 30 Day Mortality and Failure to Rescue for Surgical Patients With and Without Dementia at Varying Levels of BSN Staffing



Source: *Journal of the American Geriatrics Society*

If these relationships were indeed causal, these findings suggest that increasing the proportion of BSN nurses in a hospital from 20% to 80% would lead to seven fewer deaths and 17 fewer cases of failure to rescue per 1,000 individuals without ADRD, and 35 fewer deaths and 51 fewer cases of failure to rescue per 1,000 individuals with ADRD.

THE IMPLICATIONS

As the population ages, hospitals will face the challenges of caring for a rising number of clinically complex patients with ADRD. In this study, individuals with ADRD were older, had more comorbidities and longer stays, and experienced more complications than those without ADRD. This complexity requires care from nurses who are trained to think

critically, synthesize and analyze large amounts of information, problem solve, and coordinate care across disciplines, competencies that are emphasized in BSN degree programs.

The findings highlight the role of the nurse in not only preventing complications in this vulnerable population, but mitigating the effects of complications once they occur. For example, in this study nearly 18% of patients with ADRD experienced psychosis (often due to delirium), compared to just 1% of those without ADRD. Targeted nursing interventions including risk assessment, environmental modifications, early mobilization, reorientation, and nutritional support, can help to reduce the incidence and consequences of delirium. Similarly, close surveillance and nursing interventions can prevent or reduce the effect of other complications patients with ADRD are likely to experience, such as pneumonia, pressure ulcers, and falls.

In 2010, the Institute of Medicine released its landmark *Future of Nursing* report, which recommended increasing the percentage of nurses with BSN degrees in the workforce to 80% by 2020. This study supports this recommendation by demonstrating a vulnerable group of patients' sensitivity to variation in BSN education and adds to the evidence on the value of transitioning to a largely BSN-educated workforce.

THE STUDY

This was a cross-sectional analysis of linked datasets representing California, Florida, New Jersey, and Pennsylvania hospitals. The authors used 2006-2007 Medicare data on inpatient hospitalizations and beneficiary demographics, and the 2006 Multi-State Nursing Care and Patient Safety Survey of registered nurses.

The study population included 353,333 Medicare beneficiaries who underwent general, orthopedic, or vascular surgery in one of 531 hospitals in California, Florida, New Jersey, and Pennsylvania. Hospitals were included if outcomes data were available for at least 50 patients and if there were at least 10 direct care nurses from the hospital represented in the nurse survey.

The authors estimated the direct effects of ADRD and BSN education, separately, on mortality and failure to rescue, and then the interaction effects of ADRD and BSN education on the outcomes in models fully adjusted for individual, procedure, and hospital characteristics.

White EM, Smith JG, Trotta RL, & McHugh MD (2018). Lower Postsurgical Mortality for Individuals with Dementia with Better-Educated Hospital Workforce. *Journal of the American Geriatrics Society*. DOI: [10.1111/jgs.15355](https://doi.org/10.1111/jgs.15355)



LEAD AUTHOR

ELIZABETH M. WHITE

Elizabeth White, MSN, MPH is a third year pre-doctoral fellow in the Center for Health Outcomes and Policy Research (CHOPR) within the Penn School of Nursing. Her research explores how organizational elements of nursing care affect clinical outcomes for frail, medically complex older adults. She is a board-certified adult and geriatric nurse practitioner and currently practices at Mercy LIFE West Philadelphia. Prior to this, she worked in nursing homes in New York City for eight years as an NP with Optum (formerly Evercare), a division of United Healthcare.