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The Case for Baccalaureate-Prepared Nurses

Editor's Note: The nursing workforce plays a central role in our present health care system, and will likely have an even greater role in the future. Nurses already provide the vast majority of care to patients in hospitals, and so it should come as no surprise that the quality of nursing care affects patient outcomes. Over the past decade, studies have linked certain nursing characteristics—such as staffing levels, education, job satisfaction, and work environment—with better outcomes in hospitals. This Issue Brief adds to that evidence with a longitudinal study that links changes in nurse education with improvements in surgical patients' survival. It also discusses how a more educated nurse workforce could fill a range of new roles in primary care, prevention, and care coordination as health reform is implemented.

Increasingly, studies show that nurses' educational level matters

Consensus is growing that a more highly educated nursing workforce is needed to manage the increasing complexity of hospital care and to feed the pipeline of advanced-practice nurses and nursing faculty.

- The educational pathway for entry into nursing varies: about 60% of new registered nurses graduate from associate's degree programs, 36% from baccalaureate degree programs, and 3% from hospital-sponsored diploma programs. Overall, about 45% of nurses in the U.S. have earned a baccalaureate degree.
- Previous research has shown that hospitals with a higher proportion of nurses holding at least a baccalaureate degree had lower surgical patient mortality and failure-to-rescue (that is, death following the development of a complication).
- The underlying mechanisms for this association are unclear, but it may be linked to the nurses' role as the surveillance system for early detection of complications and problems in care. As part of their practice, registered nurses continually assess and monitor a patient's condition, identifying changes that could indicate clinical deterioration, and intervening when necessary.
- In 2010, an Institute of Medicine (IOM) report recommended that the proportion of nurses in the U.S. who hold at least a baccalaureate degree be increased to 80% by 2020, and urged that nurses with associate's degrees and diplomas enter baccalaureate programs within five years of graduation.

Study of Pennsylvania hospitals tracks nursing characteristics and patient outcomes over time

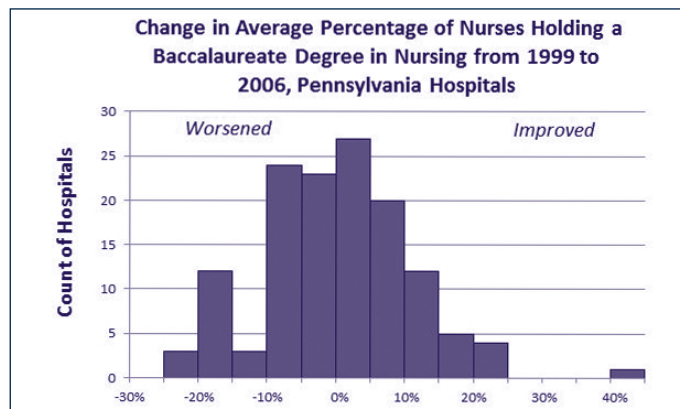
Kutney-Lee and colleagues used 1999 and 2006 data from 134 Pennsylvania hospitals to examine whether changes in the percentage of nurses with baccalaureate degrees were accompanied by concomitant changes in mortality rates among surgical patients.

- They used information from staff nurse surveys, patient discharge data from the Pennsylvania Health Care Cost Containment Council, and the American Hospital Association Annual Survey. The study included 134 hospitals, which represented more than 80% of all acute care hospitals in Pennsylvania in 2006.
- The researchers aggregated nurse survey data to create hospital-level measures of nurse education, nurse staffing (patient-to-nurse ratio), skill mix (percentage of nurses who were registered nurses as opposed to licensed practical nurses or unlicensed assistive personnel), and years of experience as a registered nurse.
- They studied outcomes among patients aged 20-85 undergoing general, vascular, or orthopedic surgery. Outcomes included 30-day mortality rates and failure-to-rescue rates (deaths among patients who experienced complications, such as wound infection, sepsis, and shock).

Nurses' educational level is linked to lower mortality and failure-to-rescue

The study revealed a number of changes over time in nursing characteristics and patient outcomes in the study hospitals. The investigators analyzed whether these changes in nursing characteristics were associated with changes in surgical mortality and failure-to-rescue, after controlling for patient age, sex, admission type, surgical diagnosis group and 27 comorbidities.

- Across hospitals, the percentage of nurses with baccalaureates remained the same at 32%, but the percentages in individual hospitals changed over time. Some hospitals increased their percentage of nurses with baccalaureate degrees, while many others had decreases. And some of the changes in both directions were sizable, as shown in the chart below.



- Adjusting for other factors, increases in the percentage of nurses with baccalaureate degrees from 1999 to 2006 were associated with significant reductions in surgical mortality rates and failure-to-rescue rates over the same time period.
- In contrast, changes in nurse-reported staffing levels, skill mix, and years of experience were not associated with changes in mortality or failure-to-rescue rates.
- A ten-point increase in a hospital's percentage of baccalaureate nurses was associated with an average reduction of 2.12 deaths for every 1,000 patients. For the subset of patients with complications, the average reduction was 7.47 deaths per 1,000 patients.
- These results suggest that if all the hospitals in this study had increased their percentage of baccalaureate nurses by ten points, about 500 deaths might have been prevented.
- Extrapolating even further, if all of the study hospitals had moved to a nursing workforce containing 80% of nurses with baccalaureate degrees, more than

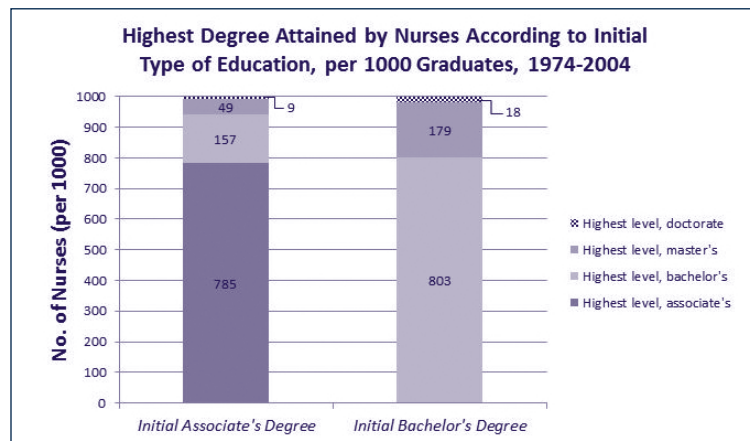
2,000 lives might have been saved—which equals 60% of the observed deaths in 2006. Although these projections include some assumptions, they nevertheless demonstrate the clinical significance of the study's findings.

- If something on the order of 2,000 deaths could be prevented in one state by increasing baccalaureate nurses to 80%, as recommended by the Institute of Medicine, meeting this target nationally could substantially improve care outcomes.

Baccalaureate-prepared nurses are more likely to pursue graduate degrees needed for faculty or advanced practice

A shortage of nurse faculty threatens the nation's future supply of nurses, and a national shortage of primary care threatens access for millions of newly insured patients resulting from implementation of the Affordable Care Act. In addition to improved patient outcomes, higher proportions of baccalaureate-prepared nurses may yield a greater number of graduate-level nurses prepared to take on advanced-practice positions in primary care or become nurse faculty.

- Aiken used 30 years of data from the Health Resources and Services Administration to calculate the highest degree attained by nurses according to their initial type of education.
- As the chart below indicates, just 5.8% of nurses with initial associate's degrees between 1974 and 1994 eventually earned a master's degree or higher, compared to 19.7% of nurses with an initial baccalaureate degree.
- Had the proportions of registered nurses with initial education in baccalaureate and associate's degree programs been reversed between 1974 and 1994, Aiken estimated that there might have been 50,000 more nurses today with master's or higher degrees.



POLICY IMPLICATIONS

These findings suggest that it is in the public's interest to move to a largely baccalaureate nurse workforce as soon as possible, and that public policies should be designed to promote this transition. These two studies provide evidence that hospitals employing more nurses with a baccalaureate education over time experience greater reductions in surgical mortality than other hospitals, and that nurses obtaining baccalaureate degrees initially are significantly more likely to obtain a master's degree that is required for all nursing faculty and advanced practice nurses that are in such short supply.

- The American Association of Colleges of Nursing estimates that the nation will need to produce more than 760,000 additional nurses with baccalaureates by 2020 to meet the Institute of Medicine's recommended goal. The most recent data from

POLICY IMPLICATIONS

Continued

the Department of Education show that about 75,000 baccalaureate degrees in nursing were awarded in 2010, compared to more than 82,000 associate degrees.

- Public policy should direct a substantial shift toward more baccalaureate-prepared nurses. One specific recommendation is to target all new public funding toward this goal, through a variety of innovations such as the granting of baccalaureate degrees by community colleges.
- As the IOM notes, an increase in baccalaureate-prepared nurses would create a workforce poised to attain the master's and doctoral degrees needed to serve as primary care providers, nurse researchers, and nurse faculty. One way to promote advanced education is to redirect the approximately \$160 million per year in Medicare funding for nurse education away from hospital diploma programs and toward clinical training of graduate-level advanced-practice nurses. A CMS demonstration is underway now in five sites nationally, including the Greater Philadelphia Graduate Nurse Education Network, to test the feasibility of shifting Medicare nursing education payments to advanced-practice nurses. The Hospital of the University of Pennsylvania is one of those sites.

This Issue Brief is based on the following articles: A. Kutney-Lee, D.M. Sloane, L.H. Aiken. An increase in the number of nurses with baccalaureate degrees is linked to lower rates of post-surgery mortality, Health Affairs, March 2013, vol. 32, pp. 579-586; L.H. Aiken. Nurses for the future. New England Journal of Medicine, January 20, 2011, vol. 364, pp. 196-198.

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