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Spetz, Joanne
Bates, Timothy

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Is a Baccalaureate in Nursing Worth It? The Return to Education, 2000–2008

Joanne Spetz and Timothy Bates

Objective. A registered nurse (RN) license can be obtained by completing a baccalaureate degree (BSN), an associate degree (AD), or a diploma program. The aim of this article is to examine the return to baccalaureate education from the perspective of the nurse.

Data Sources. National Sample Survey of Registered Nurses, 2000, 2004, and 2008.

Study Design. The effect of education on RN wages is estimated using multivariate regression, both for initial education and for completing a second degree. The coefficients are used to calculate lifetime expected earnings. Multinomial logistic regression is used to examine the relationship between education and job title.

Principal Findings. Lifetime earnings for nurses whose initial education is the BSN are higher than those of AD nurses only if the AD program requires 3 years and the discount rate is 2 percent. For individuals who enter nursing with an AD, lifetime earnings are higher if they complete a BSN. The BSN is associated with higher likelihood of being an advanced practice registered nurse, having an academic title, and having a management title.

Conclusions. Because baccalaureate education confers benefits both for RNs and their patients, policies to encourage the pursuit of BSN degrees need to be supported.

Key Words. Registered nurses, wages, school choice

Nursing is one of a few professions that have multiple educational paths for entry. In most states, a person is eligible for a Registered Nurse (RN) license after completing a baccalaureate degree program in nursing (BSN), an associate degree (AD), or a 3-year hospital-based diploma program. Associate degree education is the most common among newly graduated nurses, accounting for about 60 percent of graduates (National League for Nursing 2010) and about half of the total RN workforce (Health Resources and Services Administration 2010). However, since 1964 the American Nurses' Association (ANA) has advocated that all RNs be required to have a BSN, based on the belief that nursing has become more complex due to technological and organizational change and thus requires a higher level of education (Friss 1994; Dillon 1997; Institute of Medicine 2011). The ANA also argued that a

higher education standard would increase the status of the nursing profession and thus alleviate nurse shortages; this claim assumed that the primary cause of shortages was a lack of interested applicants. About 30 years later, the National Advisory Council on Nurse Education and Practice encouraged policy actions to achieve a minimum of 66 percent of RNs having a BSN or higher degree by 2010 (Aiken, Cheung, and Olds 2009; Altmann 2011).

Most recently, the Institute of Medicine recommended that 80 percent of RNs attain a bachelor's degree by 2020 (Institute of Medicine 2011). The IOM's report echoed the ANA's belief that the increasing complexity of nursing care warrants a higher educational standard, and also referred to a growing body of research linking higher levels of RN education with better patient outcomes in acute-care settings. Since 2000, a number of studies have found a significant association between the educational level of RNs and hospital outcomes such as mortality rates (Aiken et al. 2003; Estabrooks et al. 2005; Tourangeau et al. 2007; Friese et al. 2008; Van den Heede et al. 2009; Kendall-Gallagher et al. 2011) and in clinical skills (Giger and Davidhizar 1990; McHugh and Lake 2010). However, several other studies have not found significant associations between BSN education and patient outcomes (Blegen, Vaughn, and Goode 2001; Sales et al. 2008) or clinical expertise (Bobay, Gentile, and Hagle 2009). The National Council of State Board of Nursing, which provides the most widely used RN licensing examination, conducted an assessment of RN job tasks in 1999 and found a 98 percent Pearson correlation between the tasks conducted by AD and BSN nurses (Smith 2002). AD and BSN nurses spent most of their time performing routine nursing care activities and utilized more complex or advanced skills, such as teaching and managing care, at similarly low rates.

If baccalaureate education improves the clinical expertise and skills of RNs, then employers should pay for this increased productivity with a higher wage. This implication is derived from human capital theory, which predicts that nurses with more education will receive higher wages because the marginal product of nurses should increase with education (Freeman 1986; Willis 1986). However, until recently payers have not provided financial incentives to hospitals to provide higher quality care, and thus the benefit of

baccalaureate nurses to patient safety was a public good and not realized by hospitals. In this case, there would be a public policy argument in favor of higher educational standards, but employers would not pay a higher wage to BSN-educated nurses. Accordingly, numerous studies have found that the economic return to the BSN relative to the AD and diploma was not large enough to compensate for the foregone earnings and higher tuition costs associated with the bachelor's degree (Mennemeyer and Gaumer 1983; Booton and Lane 1985; Lehrer and White 1987; Link 1988, 1992; Lehrer, White, and Young 1991; Schumacher and Hirsch 1997; Ault and Rutman 1998; Seago and Spetz 2002; Spetz 2002).

There is reason to hypothesize that the return to baccalaureate education changed in the past decade. First, as noted above, a growing body of research has demonstrated an association between RN education and patient outcomes. Second, emerging payment reforms penalize hospitals for poor quality and reward them for high quality. This financial incentive may have led hospitals to recognize that increasing the education level of their RN employees could provide them with financial rewards—in other words, the marginal product of education changed (Kovner and Schore 1998). If so, then employers should reward baccalaureate-educated nurses with higher wages and pursue strategies to increase the education level of their employees.

Recent reports have indicated that a growing number of hospitals explicitly favor BSN nurses in their hiring practices, particularly teaching and specialty hospitals (Goode et al. 2001; Aiken 2010). For many years, the BSN has been the preferred level of education for RNs employed in community and public health (Association of State and Territorial Directors of Nursing 2003; Association of Community Health Nursing Educators 2009), and the U.S. military requires active duty RNs to have a baccalaureate degree (Institute of Medicine 2011). The Veterans Health Administration, which is the largest employer of RNs in the United States, requires that nurses have a BSN to be considered for promotion beyond entry level (American Association of Colleges of Nursing 2010).

This article examines whether the return to baccalaureate education changed for RNs in the first decade of the 2000s. Using nationally representative surveys of RNs from 2000, 2004, and 2008, a wage equation is estimated to measure the independent and interactive effects of education and experience. The results are used to estimate the lifetime value of initial RN education at the baccalaureate and associate degree levels for a prospective nurse considering his or her entry-level education. A second wage equation is estimated to explore the marginal value of obtaining a bachelor's degree after initially

completing an AD to obtain RN licensure, and the lifetime value of this sup-
plementary education is computed. Finally, we explore other labor market
outcomes, specifically whether there are systematic differences in job titles
based on the education attained by RNs.

DATA AND METHODS

Data Sources

To examine the relationships between education, experience, and wages, we
analyze data from the U.S. National Sample Survey of Registered Nurses
(NSSRN). This survey was fielded every 4 years from 1980 to 2008 by the
Health Resources and Services Administration (HRSA) of the U.S. Depart-
ment of Health and Human Services (Spetz 2010). The survey sample is based
on state license records and includes all U.S.-resident RNs holding active
licenses regardless of their employment status; prior research has found that
few nurses allow their licenses to lapse prior to retirement, even if they elect to
not work as registered nurses (Spetz, Keane, and Herrera 2011). The survey
includes detailed questions about nursing and non-nursing education,
employment setting and job title, hours worked per week and per year, earn-
ings, and demographic characteristics. Prior research on the return to nursing
education has used the surveys through 1996 (Spetz 2002); this article exam-
ines data from the 2000, 2004, and 2008 surveys. In each of these years, the
dataset includes approximately 30,000 observations.

The primary outcome variable is the hourly wage in the RN's principal
nursing position, which is constructed from other variables in the dataset. The
survey requests the nurse's total annual earnings for all nursing positions held,
as well as separately for the RN's principal nursing position. The usual num-
ber of hours worked per week in the principal nursing position is reported in
2000 and 2008, and the number of hours worked in the prior week is reported
in 2000 and 2004. Registered nurses also reported the number of weeks per
year they normally work in their principal position in 2000 and 2004, and the
number of months per year in 2008.

To construct the hourly wage, the annual earnings from the principal
nursing position were divided by the estimated number of hours worked per
year. For 2000, estimated hours per year are computed by multiplying usual
hours per week by weeks per year. In 2004, hours per year are estimated as
the number of hours actually worked last week multiplied by weeks per year.
For 2008, estimated hours per year are derived by multiplying usual hours per

week by months per year multiplied by 4.3 (average number of weeks per month). All wages are adjusted using the chained Consumer Price Index to be expressed in 2008 dollars.

The explanatory variables in the wage equation follow standard human capital models with the key variables being years of experience in nursing and initial nursing education level. Education is measured as the first nursing degree completed that qualified survey respondents for their first U.S. RN license. Because only about 3 percent of newly licensed RNs complete a nursing diploma program for their initial education (National Council of State Boards of Nursing 2012), we excluded diploma-educated RNs. We also excluded a small number of RNs whose initial education was at the graduate-degree level. Experience in nursing is measured as the number of years that have passed since the nurse's graduation from his or her initial RN education program. Other variables in the wage equation include a dummy variable to indicate male gender and a set of indicators for race/ethnicity (Latino, black/African American, Native American, Asian/Pacific Islander, and other race, with white as the excluded category). Finally, regional differences in wages are controlled with a set of dummy variables to indicate the state of the RN's residence (California is the excluded state), as well as an indicator for rural residence.

In our analysis, we also predict the decision of nurses to work. Predictors of employment include experience, initial RN education, gender, race/ethnicity, rural residence, marital status, presence of children in the home, and non-nursing income. Non-nursing income is estimated based on data describing total household income. The NSSRN asks respondents to report total household income in categories. We estimated non-nursing income by subtracting total nursing income from the midpoint of each categorical income bracket. If this calculation produced a value that was negative but within the range of error that could come from using the midpoint of income brackets, non-nursing income was recoded to zero. Other implausible values were set as missing.

Nurses educated outside the United States, those whose entry-level education was not the AD or BSN degree, nurses with improbable reported wages, and those with missing data for outside family income, years of experience, or state of residence were excluded from the analysis. Table S1 details the numbers of cases excluded for each criteria. We included observations with imputed data; data imputation was performed only for the 2008 NSSRN using regression modeling to generate likely responses for missing values (Health Resources and Services Administration 2010).

Descriptive statistics are provided in the supplemental tables (Tables S2 and S3). The share of RNs with entry-level BSN education was stable between 2000 and 2008. The mean age of the sample rose from 41.9 years in 2000 to 45.7 years in 2008. There was little change in the ethnic or gender diversity of the sample over this time period. The share of the sample employed in nursing positions increased from 86.6 to 88.1 percent between 2000 and 2008. This growth in labor force participation mostly came from a higher share of RNs working full time in 2008 (67.1 percent) than in 2000 (64.5 percent). The employment settings and job titles of employed RNs changed only slightly over this time period. The average constructed hourly wages of RNs, adjusted to 2008 dollars, increased slightly from \$28.73 in 2000 to \$30.78 in 2008. There were some differences between AD and BSN nurses in the changes of their characteristics between 2000 and 2008 (Table S3). Notably, the share of RNs with baccalaureate or higher education or health care–related employment prior to completing RN education rose between 2000 and 2008. The increase was greater for BSN nurses than for AD nurses.

Analysis of the Impact of Education on Wages

The wage premium received for nursing education can be evaluated by examining the relation between wage and a nurse's experience and educational background. Education can both increase the productivity of new entrants to the workforce and also affect the rate at which experience increases productivity. Thus, differences in the effect of education on human capital might be observed both in entry-level wage differentials and in wage increases associated with experience (Lehrer, White, and Young 1991; Spetz 2002).

Our analysis of the impact of initial RN education focuses on the estimation of a standard wage equation that has the form:

$$\log(w) = \alpha_0 + \alpha_1 \exp + \alpha_2 \exp^2 + \beta_1 \text{BSN} + \beta_2(\exp{*}\text{BSN}) + \beta_3(\exp^2{*}\text{BSN}) \\ + v(\text{PC}) + \omega(\text{location}) + \varepsilon$$

where w is the hourly wage, exp is years since completion of initial RN education, and BSN indicates initial education at the baccalaureate level. PC is a vector of personal characteristics that are observed by the employer and might affect wage; in this analysis, we include indicators for gender and racial/ethnic group. To control for geographic variation in wages, we include indicators for rural residence and for each state (California is the excluded state). AD

education is the baseline category of initial education. The coefficients α_1 and α_2 measure the effect of experience on wage. The coefficient β_1 measures the effect of BSN education on wages upon entry to the nursing profession. The coefficients β_2 and β_3 measure the impact of BSN education on the returns to experience. v and ω measure the effects of the personal characteristics and location of residence on wage. Separate equations are estimated for each survey year so that changes in the relationships between wages, education, and experience can be observed. We also estimated an equation in which all 3 years of data were pooled, and yearly dummy variables were interacted with the education and experience variables so that we could test whether there were changes in the returns to education and experience over time.

Some RNs pursue a BSN after completing an AD, in what are called RN-to-BSN programs. To examine the effect of obtaining a BSN after initially entering the nursing profession with an AD, we estimated a second equation for this subsample of RNs:

$$\log(w) = \alpha_0 + \alpha_1 \text{exp} + \alpha_2 \text{exp}^2 + \gamma_1(\text{BSN}) + \gamma_2((\text{Post-BSNexp*BSN}) + \gamma_3(\text{Post-BSNexp}^2 \text{*BSN}) + v(\text{PC}) + \omega(\text{location}) + \varepsilon$$

In this equation, exp measures years since completion of the AD, and Post-BSNexp is the years since completion of the RN-to-BSN degree.

Estimating an ordinary least squares (OLS) equation for wages using data on working nurses provides information only about those nurses who choose to be employed. If the decision to work in nursing is not random, the OLS coefficients will not measure the effects of education and experience for a randomly chosen nurse. To control for potential sample selection bias, a Heckman sample selection model is used to obtain estimates of the wage premium received by a nurse chosen randomly from the population. The explanatory variables for the labor force participation segment of the model are the same education, experience, and personal characteristic variables as in the wage segment of the equation, as well as other personal characteristics that may affect the employment decision: current enrollment in an educational program, marital status, family income (without the nurse's income), and presence of children.

To assess the choice of pursuing an AD versus a BSN, a prospective nurse should consider the lifetime value of each level of education. To measure this, we computed total expected lifetime earnings from the coefficients of the wage equations. For each year of data, we calculated expected earnings for an RN working 2,000 hours a year, living in Alabama, and who is a white female. We completed the calculations under two assumptions: (1) the prospective

nurse would have 45 years after making the education decision in which to attend school or work; (2) the nurse would have 35 years for school or work. The second calculation accounts for the fact that many RNs enter the profession later in their lives, completing initial education after age 30 (Buerhaus, Staiger, and Auerbach 2008). BSN programs typically require 4 years to complete. Although AD programs are often called "2-year" degrees, the 2 years of nursing curriculum begin after the student has already completed at least 1 year of prerequisite courses. In their entirety, most AD programs require 3 or more years of enrollment (Seago and Spetz 2002). We thus calculated lifetime earnings in two ways for the AD: as a 2-year program, and also as a 3-year program.

We obtained data on average undergraduate tuition costs for the 2008–2009 academic year from the National Center for Education Statistics, using the tuition and fee data for public colleges and universities: $2,136 per year for 2-year college, and $7,624 per year for public universities. Data from the Integrated Postsecondary Education Data System indicate that public programs produce the greatest shares of RNs: public 2-year colleges produce 68 percent of all degrees, and public 4-year colleges produce 13.6 percent. We assumed that RNs pursuing a second degree would work half-time while completing an RN-to-BSN program, and that the program would last 2 years. Expected lifetime earnings were computed with both 2 percent and 5 percent discount rates to test the sensitivity of the results.

Estimating the Effect of Education on Job Title

RN education might affect the job opportunities of RNs, specifically the job titles they may have. For example, baccalaureate RNs have been shown to be more likely to be promoted into managerial positions (Spetz 2002; Buhr 2010). We do not control for job title in the wage equations, because if it is included the wage change associated with holding higher paying nursing positions would be explained by the coefficient(s) of the job title variable(s). By excluding job title, we force the education and experience coefficients to measure the entire wage premium, which is the intent of this study (Link 1988; Lehrer, White, and Young 1991). We explore the relationship between education and job title explicitly by estimating a multinomial logistic regression of the RN's job title, with initial RN education, experience, and education-experience interactions as the key explanatory variables. In this equation, some race categories are combined due to small sample sizes.

RESULTS

Initial Education, Wages, and Lifetime Earnings

Table 1 presents the coefficients for the initial-education wage equation for all RNs, as estimated using the Heckman sample selection model. Probability derivatives from the probit portion of the equation are provided in Table S4. A likelihood ratio test found that there was significant nonrandom selection in all years.

The starting wages of BSN nurses are significantly higher than those of AD nurses in all 3 years ($p \leq .001$). When all 3 years of data are pooled and we formally test for whether the education coefficients are different across years, we find that the starting wages for BSN and AD nurses are higher in 2004 and 2008 than in 2000, and also that there are differences in the wage increases associated with experience (Table S5). The effect of BSN education on the return to experience was not statistically significantly different from

Table 1: Coefficients from Wage Equations, with Heckman Sample Selection Correction. Dependent Variable: log(wage). Sample: all RNs in 2000, 2004, and 2008

| Variable	2000	2004	2008
BSN	0.035** (0.011)	0.032* (0.014)	0.040** (0.011)
Experience	0.026** (0.001)	0.017** (0.001)	0.016** (0.001)
Experience2	−0.0005** (0.00004)	−0.0003** (0.00003)	−0.0003** (0.00002)
BSN*exp	0.0002 (0.0016)	0.003 (0.0017)	0.0025* (0.0013)
BSN*exp2	0.0001 (0.00005)	−0.0001 (0.00005)	−0.0001 (0.00003)
Male	0.089** (0.008)	0.116** (0.009)	0.132** (0.008)
Latino	0.024 (0.013)	0.017 (0.017)	−0.002 (0.012)
Black	0.060** (0.009)	0.070** (0.012)	0.011 (0.009)
Native Amer.	0.062* (0.026)	0.057 (0.033)	0.007 (0.029)
Asian	0.046** (0.018)	0.019 (0.023)	0.035* (0.015)
Other race	0.022 (0.017)	−0.030 (0.018)	0.004 (0.014)
Rural	−0.090** (0.006)	−0.095** (0.006)	−0.067** (0.005)
Constant	3.255** (0.011)	3.397** (0.014)	3.467** (0.013)
Rho	−0.011(0.037)	−0.168 (0.035)	−0.187 (0.034)
Sigma	0.281 (0.001)	0.33 (0.002)	0.304 (0.002)
Observations	20,251	21,708	24,747

Note. Race variables exclude any RN who self-identified as Latino. Standard deviations are given in parentheses. Regression equations include state dummy variables (data not shown). The usable sample excludes nurses educated outside the United States, nurses whose initial RN education was not reported as AD or BSN, nurses with improbable reported wages (such as negative income), and nurses with missing data for years of experience or state of residence.
*$p \leq .05$, **$p \leq .01$.

that of AD-educated RNs ($p > .05$). Figure 1 presents the estimated relationship between wage and experience for RNs in 2000 and 2008. The vertical axis measures the expected wage for a white female nurse employed in an urban hospital in Alabama. BSN nurses earn more than AD nurses starting with the first year of experience, and wages increase slightly more rapidly with experience for BSN nurses (although this difference is not statistically significant). In 2008, the starting wages of both BSN and AD nurses were higher than those in 2000, but the increase associated with experience was smaller. By about 16 years of experience, wages were approximately the same in 2000 and 2008.

Some race and gender differences appear in the data. Male nurses consistently receive a higher wage than women with the same human capital and employment characteristics. In addition, black, Asian, and Native American nurses received statistically significant wage premiums in 2000, blacks continued to receive a wage premium in 2004, and Asians received a higher wage in 2008. Because men exhibit a higher rate of labor force participation than

Figure 1:   Predicted Wages of RNs by Type of Initial Education, 2000 and 2008
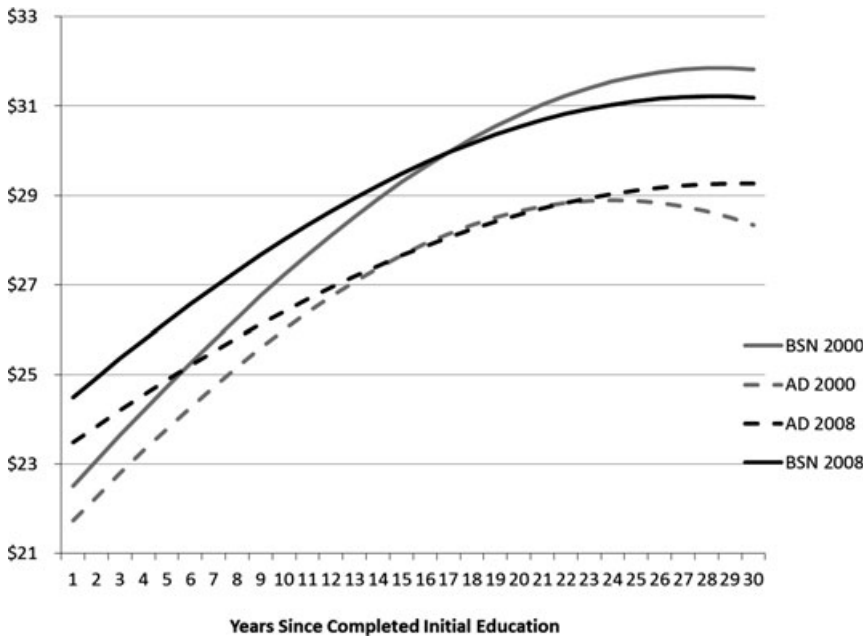
women, and minorities typically work more than whites, these wage differences may reflect unmeasured experience rather than wage discrimination. Not surprisingly, rural nurses are paid significantly less than urban nurses. This differential is not only likely to arise from cost-of-living differentials between rural and urban areas but also is consistent with the monopsony theory of the nursing labor market.

Table 2 presents lifetime earnings calculated from the coefficients presented in Table 1. The results are sensitive both to whether an AD program is expected to require 2 versus 3 years to complete, and the discount rate used. Lifetime earnings for nurses whose initial education is the BSN are higher than those of AD nurses in all three survey years if the AD program requires 3 years, the discount rate is 2 percent, and the expected education and work time period is 45 years. Lifetime earnings from the BSN are always lower if the discount rate is 5 percent. The BSN offers a lower return on investment for nurses who anticipate an education and working time frame of 35 years as compared with 45 years.

Continuing Education, Wages, and Lifetime Earnings

Table 3 presents estimated lifetime earnings for RNs whose initial education is the AD, and for those who continue to receive a BSN after initial licensure. The coefficients of the wage equation underlying these calculations are presented in Table S6. The wage equation indicates that the completion of an RN-to-BSN program confers both an immediate increase in earnings and also causes the return to experience to rise more rapidly. We calculated lifetime earnings associated with continuing education both for completing a RN-to-BSN program 5 years after initial licensure and 10 years after licensure. Regardless of when the BSN is completed or whether the discount rate is 2 or 5 percent, the expected lifetime earnings for those who complete RN-to-BSN education are greater than those who do not continue education beyond the AD. The gain is greatest when the BSN is completed 5 years after the AD, providing a total increase of 5.1 percent.

Job Titles and Initial Education

Table 4 presents the relative risk ratios from a multinomial logistic regression of the job titles held by RNs. The set of job titles examined in the regression are staff nurse, advanced practice registered nurse (nurse practitioner, nurse midwife, clinical nurse specialist, or nurse anesthetist), management (first-line,

Table 2:   Calculated Lifetime Earnings from Wage Equations, by Initial RN Education Received, 2008 Dollars

Initial Education	2000		2004		2008	
	2% Discount Rate	*5% Discount Rate*	*2% Discount Rate*	*5% Discount Rate*	*2% Discount Rate*	*5% Discount Rate*
35 education and working years						
AD – 2 years	$1,262,093	$768,405	$1,304,626	$796,578	$1,290,902	$788,360
AD – 3 years	$1,208,262	$719,211	$1,248,167	$745,395	$1,234,810	$737,618
BSN	$1,212,854	$693,186	$1,245,468	$717,576	$1,231,807	$710,726
BSN – AD (2 years)	–$49,239	–$75,219	–$59,158	–$79,001	–$59,095	–$77,634
BSN gain (2 years)	–3.9%	–9.8%	–4.5%	–9.9%	–4.6%	–9.8%
BSN – AD (3 years)	$4,592	–$26,025	–$2,699	–$27,818	–$3,003	–$26,892
BSN gain (3 years)	0.4%	–3.6%	–0.2%	–3.7%	–0.2%	–3.6%
45 education and working years						
AD – 2 years	$1,486,306	$832,912	$1,554,928	$868,418	$1,542,505	$860,541
AD – 3 years	$1,436,057	$784,731	$1,500,152	$817,707	$1,487,673	$810,151
BSN	$1,483,645	$770,927	$1,515,533	$795,090	$1,499,661	$787,582
BSN – AD (2 years)	–$2,661	–$61,985	–$39,396	–$73,328	–$42,844	–$72,959
BSN gain (2 years)	–0.2%	–7.4%	–2.5%	–8.4%	–2.8%	–8.5%
BSN – AD (3 year)	$47,587	–$13,804	$15,381	–$22,617	$11,988	–$22,568
BSN gain (3 years)	3.3%	–1.8%	1.0%	–2.8%	0.8%	–2.8%

Note. Predicted lifetime earnings were calculated from the coefficients in Table 2, for female white RNs working 2,000 hours per year in Alabama. Tuition for AD programs was assumed to be $2,136 per year and tuition for BSN programs was assumed to be $7,624 per year, based on data from the National Center for Education Statistics.

Table 3: Calculated Lifetime Earnings of Continuing Education after Initial AD, from Wage Equations, 2008 Dollars

	2008	
Overall Education	2% Discount Rate	5% Discount Rate
AD only	$1,532,031	$857,544
AD + BSN at 5 years	$1,610,221	$879,727
AD + BSN at 10 years	$1,596,327	$871,291
5 year BSN – AD only	$78,191	$22,182
BSN gain (5 years)	5.1%	2.6%
10 year BSN – AD only	$64,296	$13,747
BSN gain (10 years)	4.2%	1.6%

Note. Predicted wages were calculated from the coefficients in Table 4, for female white RNs working 2,000 hours per year in California, assuming 45 education and work years after the education decision is made. During 2 years of RN-to-BSN education, the RN works 1,000 hours per year.

Table 4: Relative Risk Ratios from Multinomial Logistic Regression of Job Title of RNs, 2008

Variable	APRN	Management	Specialist	Academic
Experience	1.226**	1.147**	1.155**	1.197**
Experience squared	0.997**	0.998**	0.997**	0.997**
BSN	4.877**	0.617**	0.982	2.130
BSN*experience	0.986	1.041**	1.005	0.992
BSN*exp2	1.000	1.000	1.001	1.001
Male	2.685**	1.155	0.590**	0.864
Latino	1.083	0.967	1.097	0.976
Black	0.825	1.216*	1.078	1.481*
Asian	0.792	0.422**	0.833	0.114*
Other race	1.361	1.044	1.127	1.500
Rural	1.064	1.499**	1.031	1.258*

Note. Race variables exclude any RN who self-identified as Latino. Base outcome is "staff nurse" job title. APRN is advanced practice registered nurse. There were 21,964 observations in regression. The usable sample excludes nurses educated outside the United States, nurses whose initial RN education was not reported as ADN or BSN, nurses with improbable reported wages (such as negative income), and nurses with missing data for years of experience, or state of residence.
*$p \leq .05$, **$p \leq .01$.

middle or upper), nurse specialist (such as quality improvement nurse, patient educator), and academic (faculty or instructor). The base outcome is the staff nurse job title. The relative risk ratios can be interpreted much like odds ratios from binomial logistic regressions.

Baccalaureate education is associated with higher likelihood of being an advanced practice registered nurse (APRN), but lower likelihood of having a management title. It magnifies the impact of experience in increasing the odds of having a management title, however. Education is not significantly associated with the odds of having a specialist or academic job title. Men are more likely to be APRNs and managers, but less likely to be specialists. Black nurses have higher odds of being in management and academic titles, and Asian nurses are less likely to be in management or academic positions. Rural RNs have a higher probability of being in management or academic positions.

DISCUSSION

This analysis of the economic returns to nurses who complete baccalaureate education updates prior work that found that nurses whose initial education was the BSN earned only a small wage premium as compared with AD RNs (Mennemeyer and Gaumer 1983; Booton and Lane 1985; Link 1988, 1992; Lehrer, White, and Young 1991; Schumacher 1997). Prior research also found that the lifetime expected returns to initial nursing education were lower for the BSN than the AD, and in fact the differential grew between 1980 and 1996 so that the BSN was an even worse investment by the mid-1990s (Spetz 2002). In 1996, lifetime BSN earnings were 12.3 percent lower than lifetime AD earnings, assuming a 2-year AD program and 5 percent discount rate. Using the same assumptions in 2008, the lifetime earnings associated with the BSN were 8.5 percent lower than those for the AD. Thus, it appears that the negative trend stabilized and may have even reversed course in the early 2000s.

The length of time required to complete an AD in nursing and the age at which a person chooses to pursue the nursing profession are important factors in the lifetime earnings associated with each type of initial education. If an AD program requires 3 years of full-time study, the BSN may be a better investment. The return to the BSN also will vary with tuition, which varies substantially across public and private programs, as well as receipt of financial assistance. People who begin their RN education at a younger age also are more likely to receive higher lifetime earnings from the BSN.

Perhaps more important, this study finds that continuing one's nursing education from the AD to the BSN is a good investment. Completing an RN-to-BSN program 5 years after finishing the initial AD education increases lifetime earnings between 2.6 and 5.1 percent, depending on the assumed discount rate. The gain for finishing an RN-to-BSN 10 years after initial

education is smaller but still positive. This is in part because we assumed that licensed RNs can work part-time while continuing their education; if they do not work while in school, continued education is less likely to produce a positive return. We also assumed that RNs would bear the full tuition costs of their RN-to-BSN programs, but it is important to acknowledge that a growing number of employers is developing partnerships with colleges and offering tuition reimbursement to support RN-to-BSN and graduate-level education (Zimmermann, Miner, and Zittel 2010; Murray et al. 2011; Sportsman and Allen 2011; Hendricks et al. 2012).

There are reasons other than financial ones that lead prospective nurses to pursue specific educational programs. For example, nurses who are interested in pursuing a career in advanced practice may know that they are more likely to be successful if they obtain an initial baccalaureate degree. Similarly, advanced practice nursing and faculty positions typically require graduate degrees, and thus beginning with baccalaureate education is desirable.

Other research has found that family background and other personal characteristics are stronger determinants of the decision to enroll in college than are opportunity costs (Manski and Wise 1983; Manski 1989). Overall, it is likely that choice of education, underlying ability, and available career paths are closely interrelated. A greater return to the baccalaureate degree may measure some of the difference in underlying ability and career focus rather than the value of the BSN alone. Four-year college students typically have more advantaged backgrounds than 2-year college students (Kane and Rouse 1995); career and social orientation can have important effects on educational choices (Humlum, Kleinjans, and Nielsen 2012). Without additional data about nurses' family backgrounds and underlying ability, it is not possible to measure the endogeneity that may exist due to nonrandom selection of educational program.

Emerging hospital payment schemes that emphasize quality of care, combined with the growing body of evidence that RN education levels are associated with patient outcomes, may lead more employers to support continuing RN education and pay higher wages for those with higher degrees. The perspectives of physicians and patients also may increase the value of the BSN for hospitals. A survey of physicians conducted as part of the Institute of Medicine's Future of Nursing report found that 76 percent of physicians strongly or somewhat agreed that nurses with a BSN are more competent than those with an AD, and 70 percent either strongly or somewhat agreed that all nurses who provide care in a hospital should hold a BSN (Robert Wood

Johnson Foundation 2010). In 2002, it was reported that 76 percent of the public thinks nurses should have 4 years of postsecondary education (Mattson 2002).

Because baccalaureate education is likely to confer benefits to both RNs and their patients, policies that encourage the pursuit of initial BSN degrees and continuing education need to be supported. These policies and programs need to be sensitive to factors that act as facilitators and barriers to pursuing higher degrees. A nurse's personal circumstances can either support or hinder continuing education; family obligations are an important predictor of whether a prospective nurse obtains an AD or BSN (Altmann 2011). Increased accessibility through community colleges and distance-based learning may help students seek and complete baccalaureate degrees. A growing number of community colleges are now offering baccalaureate degrees, including in nursing, and this has been shown to increase both the total number of nurses produced and their education level (Daun-Barnett 2011). Employers also can play an important role in educational decisions; RNs who perceive that higher education is not valued and that there is a lack of support for pursuing education are less likely to enroll in programs (Altmann 2011).

Future research should continue to monitor whether nurses' investments in baccalaureate education confer higher lifetime earnings for them. It also is important to examine in greater detail the factors that lead today's prospective nurses to pursue a specific educational program. Equally, the factors that facilitate pursuit of both the highest initial education possible as well as continuing education need to be understood, so that employers and policy makers can implement evidence-based approaches to support a highly qualified RN workforce.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article:

Appendix SA1: Author Matrix.

Table S1: Excluded Observations by Reason for Exclusion.

Table S2: Means (standard deviations) of Selected Variables.

Table S3: Comparison of Change in Mean Values by Initial Degree and Survey Year for Selected Variables.

Table S4: Probability Derivatives from Heckman Selection Equations Dependent Variable: Employment as an RN.

Table S5: Coefficients from Wage Equations, with Heckman Sample Selection Correction. Dependent Variable: log(wage). Sample: All RNs in 2000, 2004, and 2008.

Table S6: Coefficients from Wage Equation, with Heckman Sample Selection Correction. Dependent Variable: log(wage). Sample: RNs in 2008 with Initial Education of an AD.