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DOI: 10.1111/1475-6773.12337
RESEARCH ARTICLE

Racial/Ethnic Pay Disparities among Registered Nurses (RNs) in U.S. Hospitals: An Econometric Regression Decomposition

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Objective. To detect the presence of racial and ethnic pay disparities between minority and white hospital RNs using a national sample.

Data Sources/Study Setting. The National Sample Survey of Registered Nurses, 2008, which is representative at both the state and national level.

Study Design. Cross-sectional data were analyzed using multivariate regression and regression decomposition. Differences between groups were decomposed into differences in the possession of characteristics and differences in the value of the same characteristic between different groups, the latter being a commonly used measure of wage discrimination.

Data Collection/Extraction Methods. As the majority of minority hospital RNs are employed within the most densely populated (central) counties of metropolitan statistical areas (MSAs), only hospital RNs employed in the central counties of MSAs were selected.

Principal Findings. Regression decomposition found that black and Hispanic RNs earned less than whites and Asians, while Asian RNs earned more than white RNs. The majority of pay variation between white RNs, versus Asian, black, or Hispanic RNs was due to unexplained differences in the value of the same characteristic between groups.

Conclusions. Differences in earnings between underrepresented and overrepresented hospital RNs is suggestive of discrimination.

Key Words. Regression decomposition, racial/ethnic wage disparities, minority RNs

There is growing recognition of the importance of health workforce diversity in improving cultural competence in health care and reducing health disparities. Registered nursing, like many other health professions, is not as racially and ethnically diverse as the country's population. Black/African American and Hispanic/Latino registered nurses (RNs) are underrepresented in nursing compared to their presence in the population, while non-Hispanic whites and

Asian/Pacific Islanders are overrepresented (U.S. Department of Health and Human Services 2010).¹ Furthermore, recent studies have found that minority RNs earned less than white RNs (McGinnis and Martiniano 2008; McGregory 2011). While wage gaps by race and ethnicity have long been acknowledged, much of the blame has been ascribed to lower educational attainment and the segregation of racial and ethnic minorities into lower paying occupations.

However, the presence of within-occupation wage gaps raises questions about the reasons for earnings inequality. Given the compelling need for a nursing workforce that is racially and ethnically diverse and culturally competent, it is critical to further study the potential presence of these wage disparities and to better understand the reasons for them.

Racial/Ethnic Diversity in Nursing

RNs in the United States are predominantly white and not representative of the diversity of the U.S. population. In 2008, for example, the national RN workforce was estimated to be 83.2 percent white (vs. 65.6 percent of the U.S. population), 5.4 percent black (vs. 12.2 percent of the U.S. population), 3.6 percent Hispanic (vs. 15.4 percent of the population), and 5.8 percent Asian (vs. 4.5 percent of the population) (U.S. Department of Health and Human Services 2010). Lack of diversity in the registered nursing profession is particularly concerning, as the relationship between health disparities and lack of cultural competence in health care systems has been widely acknowledged (Chin 2000; Brach and Fraser 2002; Anderson et al. 2003; Beach et al. 2005; Betancourt et al. 2005; Geiger 2006). While registered nursing has long recognized and promoted culturally competent nursing care, there is concern that such efforts have not focused on improving the diversity of the profession (Eliason 1999; Giddings 2005; Drevdahl, Canales, and Dorcy 2008). Further, there is potential for racial/ethnic wage disparities to discourage minorities from pursuing careers in registered nursing.

Potential Sources of Racial/Ethnic Income Inequality

Compared to white Americans, some minority groups in the U.S. population earn lower incomes on average and are more likely to live in poverty (U.S.

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Census Bureau 2014). Lower labor force participation among disadvantaged minorities is clearly a factor, but even when comparing those working full time² and year round, the differences are striking. One explanation for these disparities is the segregation of different racial and ethnic groups into different occupational categories with varying levels of both material (e.g., income, benefits) and intangible (e.g., prestige, power) rewards (Hout 1984; Tomoskovic-Devey and Skaggs 1999). Occupational segregation, however, fails to explain the presence of salary disparities within a single occupation such as registered nursing.

One potential explanation for within-occupation wage disparities points to racial/ethnic differences in human capital that contribute to higher earnings (Becker 1985; O'Neill 1990; Carnoy 1996; Browne et al. 2001). The concept of human capital was first introduced in the early 1960s by the economist Theodore Schultz, who described it as those characteristics of individuals that are valued in the labor market, such as educational attainment, experience, skills, and competencies (Schultz 1961). Human capital differences may contribute to occupational segregation and may also affect within-occupation wage disparities.

A second explanation for the presence of racial/ethnic wage disparities is differences in the value an individual RN places on wage versus nonwage attributes of a job. Research suggests that some employers offering “family-friendly” fringe benefits may, in fact, pay lower starting salaries (Baughman, DiNardi, and Holtz-Eakin 2003). Consequently, RNs seeking benefits such as flexible work hours, child care assistance, or supportive family leave policies may be inclined to accept a lower paying job that provides the desired benefit in lieu of a higher paying job without the benefit (Lowen and Sicilian 2009). Further, some RNs may prefer jobs they perceive as less stressful even if the job pays less than jobs perceived as more stressful. While these value differences could clearly contribute to within-occupation wage disparities, they are not easily measured.

A third explanation for the presence of racial/ethnic wage disparities is discrimination. Two nursing studies examined racial/ethnic bias in RN promotions. Hagey et al. (2001) conducted qualitative case studies of nine minority RNs who had immigrated to Canada and filed discrimination grievances against their employers. The researchers obtained detailed information on the experiences that these RNs believed to be discriminatory and that adversely affected their opportunities for promotion. They identified recurring themes drawn from these descriptions and, based on these themes, recommended potential strategies to address concerns about racial discrimination in the

workplace (Hagey et al. 2001). A sample survey of California RNs conducted in 2004 found that minority RNs reported barriers to promotional opportunities more often than their white counterparts. Over 40 percent of those minority RNs, many of whom worked in hospitals, attributed their race/ethnicity as the reason for being denied a promotion (Seago and Spetz 2005). A national study of job discrimination in 1999 found that hospitals were one of the 10 industries with the highest rates of intentional discrimination against minorities and women (Blumrosen and Blumrosen 2002). There is enough concern about salary inequity and discrimination in health care organizations that strategies have been proposed to measure racial/ethnic pay disparities in the workforce (Yamatani 2006).

Racial/Ethnic Wage Disparities for Hospital RNs

Hospitals play an important role in the U.S. nursing labor market. Over 62 percent of all RNs in the country worked in hospitals in 2008 (U.S. Department of Health and Human Services 2010) and, based on 5 years of pooled data from the federal Bureau of Labor Statistics, RNs were found to be the single largest occupation in hospitals, accounting for almost 30 percent of total employment in general medical and surgical hospitals in 2010 (U.S. Department of Labor 2012).

An analysis of the wages of hospital RNs in New York City (McGinnis and Moore 2009) found that minority RNs earned less on average than white RNs. Regression decomposition was applied to these data to investigate how much of the variation could be attributed to differences in the characteristics of the four racial/ethnic groups and how much could be attributed to differences in the value of the same characteristic for each of the four racial/ethnic groups. While some of the variation was due to differences in the distribution of characteristics across different racial/ethnic groups (e.g., educational level, years of experience, title, etc.), a substantial amount was due to differences in the value of the same characteristic; that is, factors associated with higher pay for white RNs were less likely to be associated with the same amount of pay for minorities. However, this analysis was geographically limited to the New York City metropolitan area.

Another more recent study (McGregory 2011) found that the average hourly wage of nonunionized black RNs was nearly 8 percent less than that for nonunionized white RNs, while minimal wage differences were found between unionized black and white RNs. The study has an important limitation: the data were taken from the Current Population Survey, which

uses primary sampling units (PSUs) that are heterogeneous (i.e., they include both rural and urban counties). As minority RNs are disproportionately more likely to work in urban counties where pay tends to be higher compared with white RNs, this creates what is known as an errors-in-variables bias, whereby the effect at the PSU level will “average out,” masking any actual patterns, and biasing the regression parameter estimates toward zero (Geronimus, Bound, and Neidert 1996). Consequently, any analysis of wage disparities must utilize more homogeneous geographic units to increase the validity of study findings.

The research study presented in this paper builds on the previous work of McGinnis and Moore (2009) to extend this econometric analysis geographically. Specifically, a regression decomposition of hospital RN salaries was conducted to detect the presence of racial/ethnic pay disparities for hospital RNs working in the central counties of the most populous metropolitan statistical areas in the United States. It is hypothesized that minority hospital RNs (black, Hispanic, and Asian) earn less than white hospital RNs across the United States.

Data and Methods

Data for this study were drawn from the 2008 National Sample Survey of Registered Nurses (NSSRN), which is one of the most comprehensive and representative national sources of data on RNs. Exploratory analysis indicated over 90 percent of active minority hospital RNs worked in metropolitan statistical areas (MSAs). By definition, an MSA is a county or group of counties with a relatively densely populated urban area as its core, plus adjacent communities with a high degree of economic and social integration with the core (U.S. Office of Management and Budget 2009). The central counties of the MSA comprise the largest urban area and the most densely populated communities within the MSA. Outlying counties are not as densely populated and represent the adjacent communities within the MSA.

Among those working in MSAs, between half to three-quarters of minority hospital RNs worked in MSAs with a population of over 1 million, and were most likely to work in the central counties of an MSA. Therefore, the sample drawn from the 2008 NSSRN for this study included all hospital RNs who worked in the United States in an MSA with a population of 1 million or greater *and* worked in a central county of that MSA to sufficiently capture the primary geographic environment of active minority hospital RNs. In all, 4,028 cases were included in the study. Given the relatively small size of the sample of minority RNs, a single analysis of the entire sample was con-

ducted. A regression decomposition was run to disaggregate the total economic value of human capital and job characteristics of this national sample of hospital RNs into constituent direct and indirect monetary worth. Human capital variables included years working as an RN, having the same employer as 1 year ago, highest nursing degree, and country of training (United States or outside the United States). Structural variables included title, that is, staff RN (vs. nurse manager, advanced practice RN, or nurse educator/researcher), working in a unionized hospital, working overtime, and the cost of living index for all metropolitan areas in the sample.³

The ratio of observations to the 11 independent variables for each of the four racial/ethnic groups resulted in (1) White, 2,939/17 = 173; (2) Black, 429/17 = 25; (3) Hispanic, 179/17 = 11; and (4) Asian, 481/17 = 28. Consequently, the sample size for each of the four racial/ethnic groups exceeded the most conservative minimum standards (10 cases per group) and was therefore adequate for this study (Bartlett, Kotlik, and Higgins 2001). The unweighted number of cases and percentages of the four racial/ethnic groups are presented in Table 1, along with the weighted mean hourly wages for each group. Asians had the highest mean hourly wage overall (\$34.19), followed by whites, then blacks, then Hispanics. A breakdown by country of training (Table 1) found that Asians trained in the Philippines earned more than whites in any category, although Asians trained in a non-Philippine foreign country earned less than their white counterparts. Blacks and Hispanics in all categories earned less than white RNs. Fully 94 percent of all RNs trained in the Philippines held bachelor's degrees (BSN) or higher in nursing, which is associated

Table 1: Weighted Mean Hourly Wage and Unweighted Number and Percent of RNs by Race/Ethnicity and Country of Initial RN Program

	<i>White</i>	<i>Black</i>	<i>Hispanic</i>	<i>Asian</i>
Unweighted percent of total sample	73	10.7	4.4	11.9
Mean hourly wage	\$33.05	\$32.07	\$30.76	\$34.19
Unweighted percent trained in United States	97.9	89.3	91.1	32
Mean hourly wage (United States)	\$33.02	\$31.92	\$30.72	\$33.53
Unweighted percent trained in foreign country, excluding the Philippines	2.1	10.7	8.4	19.8
Mean hourly wage (foreign country excluding the Philippines)	\$34.61	\$33.33	\$30.70	\$33.16
Unweighted percent trained in the Philippines	0	0	0	48.2
Mean hourly wage (the Philippines)	N/A	N/A	\$42.61	\$35.06
Total cases	2,039	429	179	481

with higher wages; almost half (48 percent) of all Asian RNs were trained in the Philippines.

Table 2 shows differences by race ethnicity for all of the variables of interest. White RNs worked longer in nursing, on average, and were much less likely to work in an area with a high cost of living index compared with the other three groups. Asian RNs were most likely to possess a bachelor's degree or higher in nursing (nearly 75 percent) and to have completed their initial nursing education outside of the United States (67 percent). The average adjusted hourly wage is highest for Asian RNs (\$34.19), followed by white RNs (\$33.05), black RNs (\$31.93), and Hispanic RNs (\$30.76).

METHODS

Human capital and structural variables were used in a regression analysis to estimate earnings. Years worked as an RN has been found to affect nursing wages in a nonlinear fashion (Jones and Gates 2004) and as such was included as a series of dummy variables. Adjusted hourly wage was the dependent variable and was calculated using primary nursing position for full-time hospital RNs derived from the NSSRN question, "Please estimate your 2008 pretax earnings from your principal nursing position. Include overtime and bonuses, but exclude sign-on bonuses." To compute hourly pay, the answer to question 26 (number of months worked per year) was first multiplied by 4.333 (the number of weeks per month) and then multiplied by the answer to question 27a, "number of hours worked, including all overtime and on-call hours, except on-call hours that were stand-by only." Hourly pay was then calculated by dividing the total annual 2008 pretax earnings by this number. As overtime earnings could not be separated from total earnings, overtime hours were included as a control variable. A geographic adjustment, the 2008 Pay Relative developed by the Bureau of Labor Statistics,⁴ was added to the hourly wage based on the MSA of employment to control for geographic influences on RN earnings. This adjustment is based on both occupational category as well as MSA of employment and provides a standardization of wages, much as cost of living indices provide a standardization of living expenses by metropolitan area. Standardizing hourly wages decreases the likelihood of committing Type I error or incorrectly concluding that a significant wage difference exists between different racial/ethnic groups when in fact it does not. An analysis of the skewness of the adjusted hourly pay revealed a skewness value of 1.227 with a standard error of only .004. Skewness values that fall in the

Table 2: Summary Table of Descriptive Statistics for Hospital RNs by Race/Ethnicity (weighted cases)

	White RNs		Black RNs		Hispanic RNs		Asian RNs	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Years worked as RN	15.46	11.42	13.26	10.43	9.77	9.05	11.95	10.18
Adjusted hourly wage	33.05	9.31	32.07	8.32	30.76	7.17	34.19	8.39
Cost of living index	112.25	23.70	121.09	31.31	119.22	26.05	131.51	30.96
	Weighted N	%	Weighted N	%	Weighted N	%	Weighted N	%
Worked as RN less than 5 years	79,030	24.1	11,824	27.3	10,842	41.1	21,419	33.6
Worked as RN 5–10 years	57,004	17.4	9,679	22.3	5,853	22.2	14,249	22.4
Worked as RN 11–15 years	47,907	14.6	5,630	13.0	2,979	11.3	7,852	12.3
Worked as RN 16 or more years	144,589	44.0	16,199	37.4	6,696	25.4	20,209	31.7
Highest nursing degree ≥BSN (1 = Yes, 0 = No)	173,423	52.8	21,108	48.7	14,736	55.9	46,972	73.7
Country of nursing education (1 = Not US, 0 = U.S.)	6,410	2.0	4,663	10.8	1,781	6.8	42,872	67.3
Other title (1 = Nurse Manager/APRN/Nurse Educator/Research, 0 = Staff RN)	293,019	24.3	40,878	25.8	24,143	17.5	60,156	19.2
Worked paid overtime (1 = Yes, 0 = No)	108,005	32.9	16,961	39.1	10,633	40.3	21,411	33.6
Union (1 = Yes, 0 = No)	57,042	17.4	12,258	28.3	7,074	26.8	19,160	30.1
Same employer as 1 year ago (1 = Yes, 0 = No)	277,712	91.0	36,598	90.1	20,010	88.2	50,181	91.4

range from +2 to -2 are considered to be normally distributed (Curran, West, and Finch 1996; Garson 2012); therefore, the variable was estimated without using the natural log.

Separate regression equations were then estimated for each racial/ethnic group in the weighted sample, and regression decomposition was performed (Canudas 2003) to determine how much of the variation in earnings explained by the independent variables was due to differences in group characteristics known in the literature as “endowments” (i.e., human capital, job characteristics, structural variables) versus differential valuation of those endowments by race/ethnicity in the labor market. The latter has been commonly used as a measure of discrimination in earnings (Cowell 2000; Fields and Yoo 2000; Canudas 2003; Gindling 2009). The following formula was used:

$$\bar{y}_2 - \bar{y}_1 = (\alpha_2 - \alpha_1) + \sum_{k=1}^K \left(\frac{\bar{x}_{1k} + \bar{x}_{2k}}{2} \right) (\beta_{2k} - \beta_{1k}) + \sum_{k=1}^K \left(\frac{\beta_{1k} + \beta_{2k}}{2} \right) (\bar{x}_{2k} - \bar{x}_{1k})$$

RESULTS

Adjusted *R*-squares for the four separate ordinary least squares regressions of the different racial/ethnic groups (Table 3) varied widely from .296 for Hispanics compared to .164 for Asian RNs, .178 for white RNs, and .185 for black RNs. The regression decomposition, depicted on Table 4, reflects both the total differences in earnings between white and black RNs, white and Hispanic RNs, and white and Asian RNs in the sample, as well as a delineation of the differences by each of the selected characteristics. The Δx column shows the effects of differences in the possession of a characteristic on earnings between the two groups, while the $\Delta\beta$ column shows the effects of differences in the value of the same characteristic on earnings between the two groups. When the value of Δx is greater than the value of $\Delta\beta$, the earnings differential is primarily affected through differences in the possession of a characteristic. When the value of $\Delta\beta$ is greater than the value of Δx , the earnings differential is primarily affected through differences in the value of the same characteristic for the two groups.

Both black RNs and Hispanic RNs earned less than white RNs, while Asian RNs earned more than white RNs. Specifically, the analysis found that black RNs earned about .97 cents less per hour than white RNs (as seen in the

Table 3: Ordinary Least Squares (OLS) Regression Coefficients Predicting Estimated Earnings at Primary Nursing Job for Full-Time Hospital RNs by Race/Ethnicity

	White		Black		Hispanic		Asian	
	β	SE	β	SE	β	SE	β	SE
(Constant)	19.611**	0.093	30.034**	0.207	20.392**	0.251	25.929**	0.197
Worked as RN 5-10 years	4.327**	0.050	2.580**	0.109	2.554**	0.112	5.439**	0.089
Worked as RN 11-15 years	4.986**	0.053	4.927**	0.135	4.042**	0.143	6.012**	0.110
Worked as RN 16+ years	7.105**	0.043	6.051**	0.103	5.500**	0.119	6.024**	0.087
Country of nursing education (1 = Not United States, 0 = United States)	0.922**	0.106	1.344**	0.122	0.302	0.159	0.399**	0.072
Highest nursing degree \geq BSN (1 = Yes, 0 = No)	1.601**	0.031	1.780**	0.079	2.985**	0.089	0.785**	0.075
Other title (1 = Nurse manager, advanced practice nurse or nurse educator/Researcher, 0 = Staff RN)	2.733**	0.035	0.262**	0.088	2.498**	0.105	2.066**	0.081
Worked paid overtime (1 = Yes, 0 = No)	-1.114**	0.033	-3.344**	0.077	-1.363**	0.090	-0.050	0.069
Union (1 = Yes, 0 = No)	1.759**	0.042	2.877**	0.096	1.432**	0.107	1.055**	0.075
Worked for same employer last year (1 = Yes, 0 = No)	0.999**	0.054	-0.105	0.127	0.776**	0.134	1.737**	0.119
Cost of living index	0.054**	0.001	-0.015**	0.001	0.044**	0.002	0.012**	0.001
Adjusted R^2	0.178		0.185		0.296		0.164	

**Significant at .01 or less.

Table 4: Regression Decomposition of the Differential in Full-Time Earnings between White and Black, Hispanic, and Asian Full-Time Hospital RNs

	Black-white			Hispanic-white			Asian-white		
	$\Delta\beta$	ΔX	T	$\Delta\beta$	ΔX	T	$\Delta\beta$	ΔX	T
(Constant)	10.423	0.000	10.423	0.731	0.000	0.731	6.318	0.000	6.318
Worked as RN 5-10 years	-0.347	0.172	-0.175	-0.351	0.167	-0.184	0.221	0.245	0.465
Worked as RN 11-15 years	-0.008	-0.079	-0.087	-0.122	-0.148	-0.270	0.138	-0.124	0.014
Worked as RN 16+ years	-0.429	-0.436	-0.865	-0.557	-1.173	-1.731	-0.409	-0.807	-1.217
Country of nursing education (1 = Not United States, 0 = United States)	0.027	0.100	0.127	-0.027	0.029	0.002	-0.181	0.431	0.251
Highest nursing degree \geq BSN (1 = Yes, 0 = No)	0.091	-0.069	0.022	0.752	0.071	0.823	-0.516	0.250	-0.266
Other title (1 = Nurse manager, advanced practice nurse or nurse educator/Researcher, 0 = Staff RN)	-0.771	-0.037	-0.808	-0.067	-0.209	-0.276	-0.187	-0.210	-0.397
Worked paid overtime (1 = Yes, 0 = No)	-1.163	-0.108	-1.271	-0.457	-0.055	-0.512	0.021	-0.001	0.021
Union (1 = Yes, 0 = No)	0.255	0.253	0.509	-0.072	0.151	0.079	-0.167	0.179	0.012
Worked for same employer last year (1 = Yes, 0 = No)	-0.999	-0.004	-1.003	-0.200	-0.024	-0.224	0.673	0.006	0.680
Cost of living index	-8.009	0.171	-7.838	-1.114	0.340	-0.774	-5.063	0.633	-4.430
Total contribution	-0.930	-0.037	-0.967	-1.484	-0.852	-2.336	0.848	0.601	1.449
% Contribution	96%	4%	100%	64%	36%	100%	59%	41%	100%

T column under Total Contribution), which was estimated to represent about \$2,018 annually. About 4 percent of the difference was attributed to differences in the possession of characteristics, including years of experience and educational level, while fully 96 percent was attributed to differences in the value of the same characteristics. Compared to whites, blacks earned less across a number of different variables, including working for the same employer as last year, having a job title other than staff nurse, working overtime, and the local cost of living index.

Hispanic RNs earned \$2.34 less per hour than white RNs, which was estimated to represent about \$4,867 annually. Approximately 36 percent of the earning differential was due to differences in characteristics, most notably fewer years of experience, while 64 percent was due to differences in the value of the same characteristic between the two groups. Compared to whites, Hispanics earned less across a number of different variables, including years working as an RN, having a job title other than staff nurse, working overtime, working for the same employer as last year, and the local cost of living index. Having a BSN or higher was worth more to the earnings of Hispanic RNs compared to white RNs.

Asian RNs earned \$1.45 more per hour than white RNs, which was approximately \$3,016 annually. About 41 percent of the earning differential was based on differences in characteristics, most notably working as an RN for 5–10 years and being foreign-trained. Approximately 59 percent was due to differences in the value of the same characteristic between the two groups, for example, working for the same employer as last year was worth more to Asian RNs than white RNs.

Some of the unexplained differences were worth less to Asian RNs than white RNs, including working 16 or more years as an RN, working in a title other than staff nurse, having a BSN or higher degree, and the local cost of living index. Some of the differences in years of RN experience may be due to the fact that different racial/ethnic groups have entered nursing during different time periods—for example, 44 percent of white RNs have worked for 16 years or more, compared with only 25 percent of Hispanic RNs. Moreover, research has found diminishing returns of wage differentials for RN experience (Jones and Gates 2004). It is likely that an interaction between these two factors contributes to diminishing returns in experience.

The practice pattern of minority RNs within an urban area is likely to contribute to differences in salary across comparable cost of living areas. A study of hospital RNs in New York City (McGinnis and Martiniano 2008) found that underrepresented minority RNs were more likely to work in public

hospitals, which are typically located in poorer communities, compared to private hospitals. In addition, studies found that underrepresented minority nurse practitioners were more likely to practice in underserved communities (Kippenbrock et al. 2002; McGinnis, Moore, and Continelli 2006). If minority RNs disproportionately practice in publicly sponsored health facilities in underserved areas, their salaries are likely to be lower relative to white RNs.

The results between this research and the McGinnis and Moore (2009) NYC study illustrate several similarities and one notable difference. In both studies, black and Hispanic RNs earned less than white RNs. Furthermore, in both studies, while the magnitude of the dollar difference in salary was greater for Hispanics, compared to blacks, a greater percentage of the difference was due to unexplained variation for black RNs, compared to Hispanic RNs.

However, in both studies, the majority of the variation in salary for both groups was unexplained. A noteworthy difference in findings is that in McGinnis and Moore (2009), Asian RNs also earned less than white RNs, while results from this research study indicate that Asian RNs earned more than white RNs.

DISCUSSION

The results of this study only partially support the proposed hypotheses for this research. Specifically, the research supported the hypothesis that white RNs earned more than black and Hispanic RNs. However, Asian RNs earned more than white RNs, not less. Furthermore, a high percentage of the variation in pay for Asian, black, and Hispanic hospital RNs, compared to whites, was due to differences in the value of the same characteristic between the groups. Both whites and Asians are overrepresented in the RN workforce, relative to their distribution in the general population. Blacks and Hispanics, on the other hand, are underrepresented in the nursing workforce compared to their distribution in the general population.

A key finding from this study is that black and Hispanic hospital RNs earned less than their white and Asian counterparts and, according to the decomposition, nearly all of the difference for black RNs (96 percent) and nearly two thirds of the difference for Hispanic RNs (64 percent) is unexplained by differences in human capital. A number of policy implications emerge from the study findings. Both blacks and Hispanics are underrepresented in nursing. The RN workforce has not kept pace with the changing diversity of the U.S. population. Between 2004 and 2008, the percent of His-

panic RNs in the United States has more than doubled (from 1.7 to 3.6 percent), and yet it falls well below the percent of Hispanics in the U.S. population (15.4 percent in 2008). The percent of black RNs in the United States has grown more slowly over the years (from 3.6 percent in 1988 to 5.4 percent in 2008), and it also remains well below the percent of blacks in the U.S. population (12.2 percent in 2008). Clearly, the nursing profession must redouble its efforts to increase the number of underrepresented minorities within its ranks. Increasing diversity requires a commitment to strengthen the pipeline to recruit minorities into nursing education programs and provide the needed supports to retain them (Bednarz, Schim, and Doorenbos 2010). Black RNs earned less than white RNs in part because they were less likely to hold BSNs. As noted previously, there has been increasing attention to the importance of educational attainment in registered nursing (Institute of Medicine 2010). Furthermore, the BSN is crucial for further advancement in registered nursing, that is, advanced practice RNs are master's prepared or higher. Career ladders in nursing that support advancement from an associate degree in nursing to BSN are critical to efforts that can reduce wage disparities for black RNs based on education level. Further, employer support for pursuing advanced nursing education is also vital to success. Support can take many forms, including tuition reimbursement, flexible scheduling, and paid leave to attend classes.

Black, Hispanic, and Asian RNs earned less than white RNs due to both explained and unexplained variation in pay when working in higher level nursing titles (nurse manager, APRN, or nurse educator/researcher). Although blacks RNs were slightly more likely to hold these titles compared to white RNs, Hispanic and Asian RNs were less likely (Table 2); moreover, when each of the three racial/ethnic groups did hold these titles, their pay was less than that of white RNs. Two studies examining racial/ethnic bias in RN promotions (Hagey 2001; Seago and Spetz 2005) found evidence of discriminatory practices that limited advancement opportunities for minority RNs. Health care employers must provide professional development programs that give RNs the knowledge and skills needed to advance to higher level positions, including training and mentoring that can support systematic career advancement. Further, in order for this to succeed, there must be a commitment to leadership development that targets underrepresented minorities. Increasing the number of underrepresented minority RNs in leadership positions can reduce the likelihood of bias in career advancement decision making.

There are several limitations in this study. The 2008 NSSRN dataset contains an unweighted total of 13,694 RNs full-time (30 hours or greater)

hospital RNs working in the United States. Spetz, Gates, and Jones (2014) found that internationally educated RNs are disproportionately concentrated in a few states; more than half are found in four states (California, New York, Texas, and Florida), and over 90 percent work in urban areas. To adequately adjust for geography, only the central counties of MSAs with a population of a million or greater were selected for analysis; furthermore, the hourly wage was adjusted using the Pay Relatives by metropolitan area, and the cost of living index was controlled for in all prediction equations. Our final study sample therefore included full-time hospital RNs employed in the central counties of MSAs with a million or greater population, which totaled 4,028 unweighted cases, or 29.4 percent of the relevant sample. While these measures helped to standardize hourly wage across divergent geographic locations, the results of this research study may not be generalizable to RNs employed in either rural or smaller urban areas, in nonhospital settings, or working part-time. Another limitation in this study is that it only considered educational attainment in nursing and did not include nonnursing educational attainment. It is widely recognized that both contribute to human capital and could impact wage disparities. The wage data obtained from the NSSRN and used in the analysis were self-reported and may be subject to bias. The wage data reported in the NSSRN were limited to the principal nursing position and did not include income from other nursing positions held.

This study was able to detect the presence of racial/ethnic pay disparities for RNs and determine the extent to which these disparities were attributable to either differences in the possession of human capital and job characteristics or differences in the value of the same characteristic across different racial/ethnic groups. However, the study could not identify the reasons for differences in the value of the same characteristic for different racial/ethnic groups. Further, the study could not control for other potential sources of wage disparities for RNs, including value differences individual RNs place on wage versus nonwage attributes of a job.

Efforts to eliminate pay disparities for underrepresented minorities in nursing require a multifaceted strategy that involves collaborations between key stakeholders, including educators, health care providers, and nurse leaders, among others. It is critical to build pathways into registered nursing for underrepresented minorities that support successful completion of basic nursing education, to develop career ladders in nursing that start with an associate's degree in nursing and can go as far as advanced degrees in nursing, and to support career advancement in nursing.

ACKNOWLEDGMENTS

Joint Acknowledgment/Disclosure Statement: The authors acknowledge support for this research provided by the State University of New York at Albany, School of Public Health, specifically the Center for Health Workforce Studies and the Department of Health Policy, Management, and Behavior.

Disclosures: None.

Disclaimers: None.

NOTES

1. Hereafter, racial/ethnic categories are shortened: non-Hispanic white is referred to as white; non-Hispanic black/African American is referred to as black; Hispanic/Latino is referred to as Hispanic; and non-Hispanic Asian/Pacific Islander is referred to as Asian.
2. Full-time was defined as working 30 or more hours per week, and all wages were adjusted to 2012 dollars based on an income adjustment variable in the American Community Survey dataset.
3. The Cost of Living Index is listed on the U.S. Bureau of the Census website for 2010 at http://www.census.gov/compendia/statab/cats/prices/consumer_price_indexes_cost_of_living_in dex.html. These data are collected by the Council for Community and Economic Research and used by both the Census Bureau and the Bureau of Labor Statistics. The 2008 data were ordered from the Council for Community and Economic Research at the following address: <http://www.c2er.org/products/> and used for this research. A handful of cities were not listed in 2008 and were supplemented by values from 2010, which were downloaded from the Census website listed above.
4. http://www.bls.gov/news.release/archives/ncspay_07242009.pdf

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SUPPORTING INFORMATION

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

Appendix SA1: Author Matrix.