



Intersectionality of Alignment Between Human Capital Investment and Role Utilization of Black Women Nurses

D'Jaris James, Juritsa Ford



Abstract: *Diverse representation in the nursing workforce does not automatically align with equity in role utilization, advancement, compensation, or leadership. This study examines the alignment between human capital investment and role utilization among black women nurses. Along with the Nursing Human Capital Value Model, advanced degree attainment was selected as the measure of human capital investment and advanced nursing role utilization as the measure of occupational alignment. A quantitative, non-experimental secondary data design was employed to analyze a sample of 769 women nurses from the publicly available Survey of Income and Program Participation. Based on the sample, higher degree attainment was associated with advanced nursing role utilization at a notably high rate. However, race-specific results showed an alignment gap. Among White women nurses, 137 held a master's degree or PhD, and 77 worked in advanced nursing roles. Among Black women nurses, 12 held a master's degree or a PhD, but none were represented in advanced nursing roles. Advanced degree attainment alone may not ensure advanced role utilization across racial groups. This study highlights the necessity for health care organizations to examine internal mobility, promotion pathways, credential review, and talent management practices to ensure that advanced-educated black female nurses are equitably positioned in roles aligned with their preparation.*

Keywords: Role Utilization, Human Capital, Advanced Education Attainment, Black Nurse

Nomenclature:

HRSA: Health Resources and Services Administration

APRN: Advanced Practice Registered Nurse

I. INTRODUCTION

Nurses are key to health care delivery, patient advocacy, care coordination, and the advancement of health equity in the United States [1]. The nursing workforce is an essential part of healthcare workforce planning because health systems continue to experience shortages, unbalanced workforce distribution, and increased demand for qualified nursing professionals [2], [14].

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Health Resources and Services Administration (HRSA) projects shortages of registered nurses and licensed practical nurses, with greater registered nurse shortage pressure projected in nonurban areas by 2038 [2]. These workforce concerns are often framed as external supply problems, yet staffing challenges may highlight how health care organizations identify, develop, and utilize nurses already present within their internal workforce [30], [31].

Graduate-level education attainment is typically required for most advanced nursing roles, including but not limited to nurse practitioners, nurse anaesthetists, and midwives [4], [5]. In addition to graduate-level attainment, specialized training, certification, and preceptorship are also required [4], [5], [15]. The problem is not only whether diverse candidates exist in the external labour market, but whether health care organizations are developing and advancing the qualified talent already inside the nursing workforce.

A. Intersectionality and Advancement in Nursing

Greater diversity in the nursing workforce has not necessarily resulted in equal access to advancement, compensation, leadership, or opportunities to move into different roles [6], [16]. According to HRSA's 2022 National Sample Survey of Registered Nurses, non-Hispanic Black nurses represented approximately 11% of the registered nurse workforce [6]. Although this representation is important, entering the profession and having the same opportunity to advance within it are different matters. Black nurses continue to report barriers such as racism, limited mentorship and sponsorship, biased hiring practices, and restricted access to leadership pathways [4], [5], [17]. These experiences suggest that education and professional credentials alone may not produce the same career outcomes when access to opportunity is also influenced by race and gender [18].

For Black women nurses, race and gender are not separate experiences that can always be examined independently. Both can shape how a nurse experiences the workplace and the opportunities available throughout her career [7]. Previous studies focusing on Black nurses have examined career advancement challenges and have contributed to organizational structures, workplace culture, lack of access to professional development, and limited leadership visibility [4], [5]. Workplace well-being is another key consideration, especially when occupational stress occurs alongside experiences of marginalised groups [8] [32]. Ultimately, the question for Black women nurses is not only whether they have gained the education and experience needed to advance,



but whether organisations recognise that preparation and provide opportunities for it to translate into meaningful career progression [20].

B. Human Capital Theory

Human capital theory provides the foundation for this study because it offers a way to examine the relationship between education, professional preparation, and occupational outcomes [3]. This theory highlights how education and skill development would increase an employee's leadership readiness and create greater access to specialised roles [3]. This connection is especially relevant in nursing, where advanced roles are closely tied to graduate-level education, credentialing, and specialised professional competencies [1]. When nurses who obtain advanced education move into roles that reflect that preparation, the outcome is consistent with the expected relationship between educational investment and occupational advancement.

For Black women nurses, however, education may be only one part of the advancement process. An advanced degree can increase professional preparation, but organizational practices still influence whether that education is recognised, rewarded, and connected to meaningful career opportunities [4], [5], [21]. A Black woman nurse may have the educational preparation associated with an advanced role while still facing limited access to positions or pathways that allow her to use that preparation. In these circumstances, the concern involves both the utilisation of human capital and equitable access to advancement [3], [7], [22]. Intersectionality helps explain why the career return on educational and professional investment may vary across race and gender. The Nursing Human Capital Value Model bridges nursing education, workforce development, and role allocation to the value nurses contribute within health care systems [9], [19].

C. Gap in Literature

Prior research has examined nursing shortages, workforce diversity, and the barriers Black nurses may encounter when pursuing advancement [4], [5], [6]. However, less attention has been given to whether the educational investments made by Black women nurses are reflected in the roles they ultimately hold. Existing studies have identified racism, limited mentorship and sponsorship, and inequitable advancement practices as factors that may affect career progression for Black nurses [4], [5], [23]. Although this research helps explain barriers within the profession, fewer studies have examined education and actual role placement together using national workforce data. Advanced education is generally viewed as an important pathway to advanced nursing practice, yet the extent to which that education translates into advanced role utilisation for Black women nurses remains unclear. In the present sample, 12 Black women nurses held a master's degree or PhD, but none were employed in advanced nursing roles. This pattern points to a possible disconnect between educational attainment and occupational placement and provides the basis for examining education-to-role alignment more closely. The secondary dataset initially included additional demographic groups. However, fewer than 20 respondents were men, and no Hispanic-identified

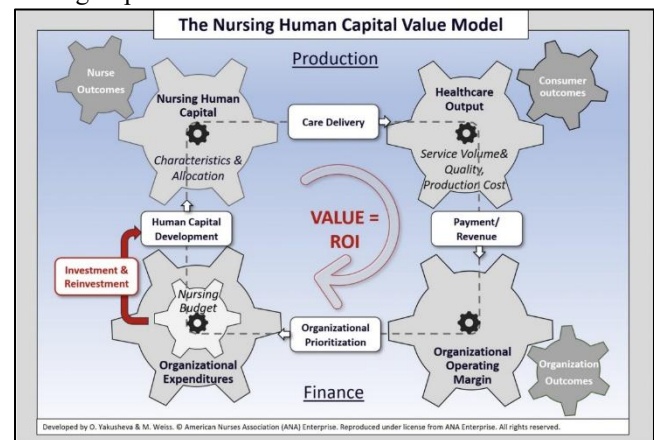
nurses met the study criteria. Because those groups were too small for meaningful comparison, the analysis was limited to women identified through the dataset response codes as White alone, Black alone, or Asian alone.

II. STUDY DESIGN

A. Model Framework

This study is guided by the Nursing Human Capital Value Model, which positions nursing education, workforce development, and role allocation as part of the value nurses contribute to health care systems [9]. The model connects nursing human capital investment to the way nurses are utilised within the workforce. Advanced degree attainment represents human capital investment, while advanced nursing role utilisation represents whether that investment is aligned with occupational placement.

Advanced nursing roles, including nurse anaesthetists, nurse midwives, and nurse practitioners, typically require at least a master's degree, making advanced degree attainment an appropriate threshold for examining role alignment [10] [35]. Because the focus is on Black women nurses, the model is applied through an intersectional lens. Intersectionality allows the study to examine whether race and gender shape how advanced educational preparation translates into advanced role utilisation [11]. Hence, this study does not examine education only as individual achievement; it examines whether advanced education is aligned with advanced nursing role placement for Black women nurses compared with women nurses from other racial groups.



[Fig.1: Nursing Human Capital Value Model]

Yakusheva et al. (2024).

B. Research Questions and Hypotheses

Examining the relationship between advanced degree attainment and advanced nursing role utilisation through the Nursing Human Capital Value Model was essential to the study [9]. The questions show the intersectionality focus by centring Black women nurses while allowing comparison across racial groups [11]. Because advanced practice nursing roles typically require at least a master's degree, the study focuses on whether advanced degree attainment is aligned with occupational placement rather than simply whether education exists in the sample [10].

Research Question 1: To what





extent is human capital investment, measured by advanced degree attainment, aligned with advanced nursing role utilisation among Black women nurses?

H0₁: Advanced degree attainment is not associated with advanced nursing role utilisation among Black women nurses.

H1₁: Advanced degree attainment is associated with advanced nursing role utilisation among Black women nurses.

Research Question 2: How does the alignment between advanced degree attainment and advanced nursing role utilisation among Black women nurses compare with that of women nurses from other racial groups?

H0₂: There is no statistically significant difference in education-to-role alignment between Black women nurses and women nurses from other racial groups.

H1₂: There is a statistically significant difference in education-to-role alignment between Black women nurses and women nurses from other racial groups.

C. Research Methodology

This study used a quantitative, non-experimental, secondary data design. A quantitative design was appropriate because the study examined measurable relationships among categorical variables, including race, education, and nursing occupation. A non-experimental design was appropriate because the study used existing secondary data and did not involve treatment assignment, experimental manipulation, or direct interaction with participants. A secondary data approach was appropriate because the Survey of Income and Program Participation provide nationally representative information on income, employment, household composition, education, health insurance, and related indicators [12].

Analysis employed descriptive statistics to summarise the sample by age, race, education, occupation, and residence. Descriptive statistics were used because the study first needed to establish the demographic and occupational profile of women nurses in the analytic sample. Cross-tabulations were used to examine the relationship between race, education, and occupational role utilisation. Cross-tabulations were suitable for categorical variables. Chi-square tests were used to determine whether statistically significant associations existed between categorical variables in a secondary data study. The use of cross-tabulations and chi-square testing was informed by Patton et al. (2023), who applied the same general analytical approach to examine the association between race and health insurance type using secondary survey data [34]. The independent variable was advanced degree attainment, defined as having a master's degree or higher. This coding captured advanced practice registered nursing roles, including nurse anaesthetists, nurse midwives, and nurse practitioners, which typically require at least a master's degree [10]. The dependent variable was advanced nursing role utilisation, defined as employment in an advanced nursing role rather than a registered nurse role. The advanced nursing role category included nurse anaesthetists, nurse practitioners, and nurse midwives. Registered nurses were treated as the non-advanced role category.

To evaluate potential discrepancies in education-to-

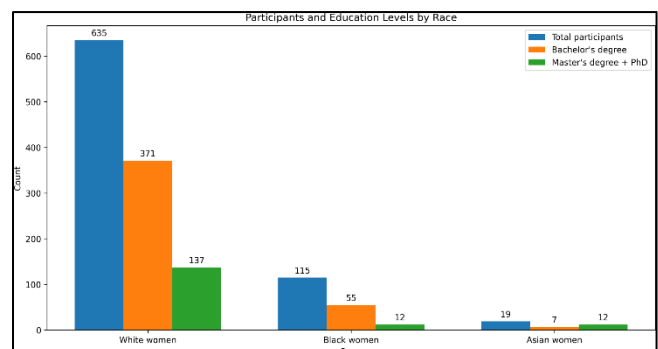
role alignment across demographic categories, race served as the primary variable. Black female nurses were operationalised using the "Black alone" self-reported dataset, with cohorts identifying as "White alone" and "Asian alone" establishing the comparative baseline. Due to limited sample sizes in the comparative groups, most notably among Asian and Black female nurses occupying advanced practice roles, subgroup analyses require cautious interpretation. Given that diminished expected cell counts reduce statistical power, descriptive metrics and exact non-parametric tests offer a methodologically superior framework for interpretation relative to standard regression models.

D. Target Population

This study analysed female nurses using data from the Survey of Income and Program Participation (SIPP). Based on the SPSS output, the final analytic sample consists of 769 valid, all-female cases. The research specifically focuses on Black women nurses, identified in the analytic dataset as Black alone. This intersectionality research in nursing emphasises the importance of examining how race and gender operate together rather than treating them as separate characteristics [11]. Nursing leadership literature shows that racism, limited mentorship, and hiring practices can affect the advancement of Black nurses into leadership and higher-level roles [5], [24], [25].

The analytic sample included 635 White women nurses, 115 Black women nurses, and 19 Asian women nurses. The sample included 692 registered nurses, 12 nurse anaesthetists, and 65 nurse practitioners and nurse midwives. Education was distributed across associate's degree, bachelor's degree, master's degree, and PhD categories. These demographic and study characteristics will be presented in

Table I: Demographic Characteristics



E. Data Sources

This study used publicly available secondary data from the Survey of Income and Program Participation. The

U.S. Census Bureau describes SIPP as a nationally representative longitudinal survey that provides information on income, employment, household composition, government program participation, education, wealth, health insurance, child care, and food security [12]. SIPP allowed for the inclusion of education and employment variables used to examine the relationship between advanced degree attainment and occupational role utilisation [12].

The analytic dataset was



restricted to respondents with valid data for sex, race, education, age, residence, and nursing occupation. The SPSS output showed no missing cases for the primary demographic and study variables. Education was first examined using three categories:

bachelor's degree, master's degree, and PhD. For the primary analysis, education was collapsed into two categories: BSN or lower and master's degree or higher. Master's degree or higher was used to represent advanced degree attainment because it represents the minimum educational preparation typically required for advanced practice registered nursing roles [10].

The education-to-role alignment analysis will be summarised in.

Table II: Advanced Degree Attainment and Role Utilisation by Race

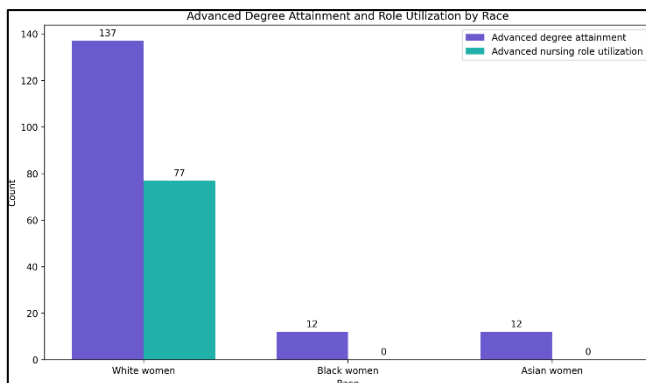


Table II will show whether respondents with advanced degrees were employed in registered nurse roles or advanced nursing roles. This table will directly support the article's focus on whether human capital investment is aligned with occupational role utilisation among Black women nurses.

F. Data Access and Material Availability Statement:

The source data used for this study are publicly available through the U.S. Census Bureau's Survey of Income and Program Participation data resources. The file was derived from public-use secondary data and did not require the collection of new identifiable human subject data. Since this study used publicly available de-identified secondary data, no direct participant consent, clinical trial registration, animal research approval, or biological material repository was required.

III. RESULTS AND FINDINGS

The final study sample included **769 women nurses**. The sample included **635 White women nurses**, **115 Black women nurses**, and **19 Asian women nurses**. Table I shows the demographic characteristics of the study sample. Table II presents education and role utilisation by race. Figure 1 illustrates advanced degree attainment and advanced nursing role utilization across racial groups.

A. Demographic Characteristics of the Study Sample

Participants ranged in age from **24 to 78 years**, with a mean age of **47 years**. Most respondents identified as White alone (**n = 635, 82.6%**), followed by Black alone/Black (**n = 115, 15.0%**) and Asian alone (**n = 19, 2.5%**). Educational attainment included associate's degree (**n = 175, 22.8%**),

bachelor's degree (**n = 433, 56.3%**),

master's degree (**n = 137, 17.8%**), and PhD (**n = 24, 3.1%**).

Most respondents were registered nurses (**n = 692, 90.0%**), while **77 respondents (10.0%)** were employed in advanced nursing roles.

B. Education and Role Utilisation by Race

Education and role utilisation differed across racial groups. Among White women nurses, **137** held a master's degree or PhD, and **77** were employed in advanced nursing roles. Among Black women nurses, **12** held a master's degree or a PhD, but none were employed in advanced nursing roles. Among Asian women nurses, **12** held a master's degree or a PhD, but none were employed in advanced nursing roles. These findings show that advanced degree attainment was present among Black and Asian women nurses, but advanced nursing role utilisation was not indicated for either group in the study sample.

C. Statistical Findings

A chi-square test examined the association between education and nursing role utilisation. Among respondents with a BSN or lower, **596** were registered nurses, and **12** were in advanced nursing roles. Among individuals with a master's degree or higher, **96** were registered nurses, and **65** were in advanced nursing positions. The association between education and role utilisation was statistically significant, $\chi^2 (1, N = 769) = 208.304, p < .001$. A second chi-square test showed a statistically significant association between race and role utilisation, $\chi^2 (2, N = 769) = 18.057, p < .001$; however, this result should be interpreted cautiously because subgroup counts were small and no Black or Asian women nurses were represented in advanced nursing roles.

IV. DISCUSSION

A. Interpretation of Findings

The findings showed a significant relationship between advanced degree attainment and advanced nursing role utilisation in the study sample. This pattern is consistent with the expectation that higher levels of education are connected to movement into advanced nursing roles. The race-specific results, however, showed a different pattern. Black women nurses with master's degrees or PhDs were represented in the sample, but none were employed in advanced nursing roles. This suggests that educational attainment alone may not fully explain how nursing human capital is translated into occupational placement.

B. Alignment Between Advanced Degree Attainment and Role Utilisation

The results point to the importance of looking at education-to-role alignment rather than degree attainment alone. The Nursing Human Capital Value Model connects nursing education and role allocation to the value nurses bring to the workforce [9]. In this study, advanced education was reflected in advanced role placement for some White women nurses. Still, that same pattern was not observed among Black or



Asian women nurses with advanced degrees. This distinction matters because advanced nursing roles generally require advanced educational preparation, yet having an advanced degree did not lead to advanced role utilisation across all racial groups [10].

C. Implications for Black Women Nurses

For Black women nurses, the findings raise important questions about organisational investment in pipeline-to-advanced-role pathways. The study does not explain why Black women nurses with advanced degrees were not represented in advanced nursing roles, but it does identify a measurable alignment gap. Prior research purports that Black nurses may experience advancement barriers related to mentorship, racism, and hiring practices [5], [26],

[27]. Therefore, hospitals and health systems should examine whether internal mobility, credential review, promotion practices, and talent management systems equitably identify advanced-educated nurses for roles that match their preparation [28].

These findings have important workforce planning implications. HRSA projects continued nursing workforce shortages and identifies workforce planning as a national priority [2]. Access to professional support and development opportunities may also influence career progression for Black and minority ethnic nurses and midwives [19]. In this context, hospitals should not rely only on external hiring to address staffing needs. They should assess whether advanced-educated nurses already exist within their internal workforce and whether those nurses have equitable pathways into advanced roles. Strengthening internal mobility may help address workforce gaps, support retention, and improve the use of existing nursing human capital [33].

D. Limitations of the Study

This study has several limitations. First, the analysis relied solely on secondary data. Secondly, it was limited to the variables available in the dataset. While the dataset included sex, race, education, age, residence, and nursing occupation, there was a gap regarding information on licensure status, speciality certification, field of degree, years of experience, employer type, mentorship access, workplace discrimination, promotion history, and career preferences. As a result, advanced degree attainment should be viewed as an indicator for human capital investment rather than as confirmation of Advanced Practice Registered Nurse (APRN) eligibility.

V. CONCLUSION

The analysis focused on the alignment between human capital investment and role utilization among Black women nurses through an intersectional lens. Advanced degree attainment was used to represent human capital investment, while advanced nursing role utilization served as the measure of occupational alignment. Education was significantly associated with role utilisation when analyzing the full sample. However, when the results analyzed race, the pattern was not as evident. Black women nurses with master's degrees or PhDs were present in the sample; however, none reported being in advanced nursing roles.

This difference suggests that degree attainment alone may not fully explain whether advanced educational preparation translates into advanced occupational placement. The analysis also adds to nursing workforce and human capital research by showing that educational investment may not, on its own, account for differences in role advancement. Although advanced education provides an important pathway into advanced nursing practice, movement from education into corresponding occupational roles may vary across racial groups. This distinction is particularly relevant to the Nursing Human Capital Value Model, which connects nursing education, workforce development, and role allocation to the value nurses contribute within health care systems [9]. If advanced-educated nurses are not positioned in roles that amply use their preparation, then both the individual nurse and the health care system may experience a loss of human capital value.

These findings have present implications for health care human resource leaders, nursing executives, and workforce planning teams. As HRSA projects future nursing shortages and notes larger projected RN shortages in nonmetropolitan areas, hospitals and health systems may need to look beyond external hiring alone and examine whether advanced-educated nurses are already present within their internal workforce [2]. Organizations should use internal mobility, succession planning, performance pathways, and other talent management practices to identify nurses whose education, licensure, and career interests align with advanced nursing roles. Creating these pathways gives nurses with advanced education greater opportunities to use their skills in areas such as clinical decision-making, patient care, and leadership. This matters because nurse burnout has been associated with lower patient safety, lower quality of care, and lower patient satisfaction, making workforce stability and appropriate role utilization important organizational concerns [13].

Health care organisations may need to look closely at whether their hiring practices, internal promotion processes, mentorship opportunities, and role-matching systems create meaningful pathways for advanced-educated Black women nurses to move into positions that reflect their preparation.

[29]. Prior research has identified mentorship gaps, racism, and hiring practices as factors that can affect advancement for Black nurses, making these organisational processes important areas for continued review [5]. Future research should build on these findings with larger samples and more detailed workforce information. Including variables such as licensure status, degree field, certification type, organisational setting, years of experience, promotion history, mentorship access, and hiring pathways could provide a clearer picture of how advanced education translates into advanced nursing roles. Qualitative research could also add important context by capturing how Black women nurses experience educational advancement, career progression, and role placement. Examining both the human capital nurses bring to the workforce, and the organisational systems that influence how that capital is used may offer a fuller understanding of how to support a more equitable and effective nursing workforce.



DECLARATION STATEMENT

After aggregating input from all authors, I must verify the accuracy of the following information as the article's author.

- **Conflicts of Interest/ Competing Interests:** Based on my understanding, this article has no conflicts of interest.
- **Financial Assistance:** This article has not been sponsored or funded by any organization or agency.
- **Ethical Approval and Consent to Participate:** No, the article does not require ethical approval and consent to participate, with evidence.
- **Data Access Statement and Material Availability:** Yes, it is relevant. Availability of These data are accessible to the public at <https://www.census.gov/prgrams-surveys/sipp/data/datasets/2023-ata/2023.html>
- **Authors' Contributions:** D'Jaris James, doctoral student and primary author Credit Statement: Conceptualisation, Data Curation, Methodology, Writing-Original Draft. Dr Juritsa Ford CRediT Statement: Supervision, Writing-Review & Editing

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