Race and mental health disorders' impact on older patients' nursing home admissions upon hospital discharge

Yu (Sunny) Kang[a,*], Nancy A. Miller[b], Huey-Ming (HM) Tzeng[c], Ting Zhang[d]

[a] School of Health and Human Services, University of Baltimore, College of Public Affairs, Liberal Arts and Policy Building, 10 W. Preston St., Baltimore, MD 21201, United States
[b] School of Public Policy, University of Maryland, Baltimore County, 1000 Hilltop Circle, Baltimore, MD 21250, United States
[c] School of Nursing, University of Saskatchewan, E4122 Health Sciences, Saskatoon, SK S7N 5E8, Canada
[d] Department of Accounting, Finance and Economics, Jacob France Institute, Merrick School of Business, University of Baltimore, 1420 N. Charles St., Baltimore, MD 21201, United States

A B S T R A C T

Introduction: Despite policy efforts to reduce unwanted nursing home (NH) admissions, NH residents increasingly are being admitted from hospitals, with a significant share diagnosed with mental health disorders.
Objectives: We examined interactive effect of Black race and mental health disorder's impact on older patients' (age 65 and older) NH admission upon hospital discharge.
Material and methods: We analyzed 186,646 older patients using pooled data from the 2007 through 2010 National Hospital Discharge Survey. Logistic regression analyses were used to examine the risk factors for NH admission.
Results: Diagnosis of mental health disorders increased the odds of NH admission among the older sample patients (OR = 1.15, 95%CI[1.04,1.28]). Black race was not associated with higher odds, whereas black patients experienced higher odds if they were diagnosed with mental health disorders (OR = 1.60, 95%CI[1.43,1.79]). Medicare as primary payer was associated with greater odds of NH admission. Admission from nursing facilities substantially increased the odds of NH admission upon hospital discharge. Patients discharged with diagnoses of stroke, lower-limb fractures, and a chronic ulcer, as well as those with a longer length-of-stay (> 5 days) experienced increased odds of NH admission. Being discharged from a larger hospital (with > 200 beds) decreased the odds for NH admission; as did being discharged from a government-owned hospital.
Conclusions: Older Black patients with mental health disorder experienced significantly greater odds of NH admission after adjusting for other factors. Public policy initiatives are needed to address the specific needs in the vulnerable population to avoid unwanted NH admission.

1. Introduction

An increasing number of nursing home (NH) residents are being admitted from hospitals, with a growing share of residents comprised of Black patients and patients with mental health conditionss [Centers for Medicare & Medicaid Services (CMS, 2015b]. Between 2011 and 2014, the share of the nursing home population which is Black increased from 13.8% to 14.2% (CMS, 2015b). In addition, between 1999 and 2005, the number of individuals admitted with mental health conditions increased from 168,721 to 187,478 (Fullerton, McGuire, Feng, Mor, & Grabowski, 2009). Examination of the pattern of Black patients with mental health conditions' hospital discharge to NH facilities will help

policy makers to understand the factors related to their NH use.

1.1. Federal laws and policy initiatives addressing NH admissions

When discharged from the hospital, patients have established rights by the law and federal policies in choosing their preferred setting of long-term care (LTC) services. The 1990 Americans with Disabilities Act (ADA) established the legislative foundation to maintain the legal rights of individuals with disabilities. This was followed by the 1999 Supreme Court *Olmstead* decision, which affirmed the right of individuals with disabilities to receive community-based services and considered the unwarranted institutional segregation of individuals with disabilities

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discrimination and in violation of the ADA (ADA, n.d.; Duckett & Guy, 2000; Fries et al., 2005). The 2001 New Freedom Initiative further enabled individuals with disabilities to live in community-based settings. In 2001, Congress also authorized the Real Choice Systems Change grant program. As part of the Deficit Reduction Act of 2005, CMS implemented the Congressionally authorized "Money Follows the Person" (MFP) demonstration. Additionally, the 2010 Patient Protection and Affordable Care Act (ACA) includes several provisions to support efforts to enhance home and community-based service (HCBS) choice (Kaiser Family Foundation, 2010).

1.2. Mental health conditions and NH admission

Among all NH residents, a significant share were diagnosed with mental health or cognitive conditions. Older individuals diagnosed with cognitive impairment or depression were at higher risk for NH admission (Gaugler, Duval, Anderson, & Kane, 2007; Hajek et al., 2015; Harris, 2007; Xiang & An, 2015). Moreover, Grabowski et al. found that newly admitted NH residents with mental illness tend to be younger and more likely to stay longer (Grabowski, Aschbrenner, Feng, & Mor, 2009). Miller and colleagues found that an increasing share of both working-age and older adults were admitted to NHs with mental health conditions, with the trend more pronounced among working age adults (Miller, Pinet-Peralta, & Elder, 2012).

1.3. Racial disparities in nursing home utilization

As estimated in 2014, about one in five of the U.S. population will be age 65 or older by 2030; moreover, more than half of the U.S. population will be a racial or ethnic minority by 2044 (U.S. Census Bureau, 2018). Given the increase in population and the healthcare needs for minority populations, the Department of Health and Human Services *Healthy People* has been targeting the elimination of health disparities for the past two decades (HealthyPeople.gov, 2018). By 2014, the share of NH residents who were Black was substantially higher in the District of Columbia (83.8%) and several states, especially in Mississippi (35.1%), Maryland (34.0%), Georgia (33.3%), and South Carolina (30.8%) relative to their share of the state population (CMS, 2015b). Over the past few decades, the growth of minority individuals being admitted to NHs has exceeded their share in the general U.S. population. The growth among racial minority NH residents is explained in part by their unqual access to HCBS alternatives (Feng, Fennell, Tyler, Clark, & Mor, 2011).

Besides the growth in NH utlization, racial minorities were more likely to be admitted to NHs with deficiencies (Grabowski, 2004); and minority residents were more likely to experience lower-quality of care, which includes non-healing pressure ulcers, a higher prevalence of incontinence and not receiving incontinence prevention programs (Bliss et al., 2017, 2013). In addition, Blacks NH residents were at higher risk for 30-day rehopitalizations, and Black individuals were more likely to be admitted to small-sized NHs with a high re-hospitalization rate (Li, Cai, & Glance, 2015).

1.4. Study aim and major hypothesis

A large number of studies regarding NH admission examine racial disparities or the impact of mental health conditions. However, the interactive effect between race and mental health conditions were not the focus but were included as a point in the discussion. This study analyzed national survey data to study older hospitalized patients' discharge disposition (NH admission versus going home), examining the interactive effect between mental health conditions and Black race on the pattern of NH admissions after controlling for the other factors. We developed the major hypothesis based on the study aim: compared to the older White patients with mental health conditions (age 65 +), older Black patients with mental health conditions are more likely to be

admitted to a NH upon hospital discharge.

2. Material and methods

2.1. Data source

This study analyzed pooled data from the 2007 through 2010 National Hospital Discharge Survey (NHDS). The NHDS was a sequence of national level longitudinal surveys that have provided information on inpatient hospital utilization since 1964 (Centers for Disease Control and Prevention [CDC, 2018a]). Since 1988, to be included in the NHDS, hospitals must fullfill two criteria: (1) have six or more staffed beds; and (2) be short stay (30 days or less) hospitals, or with general specialty, or children's hospitals (CDC, 2018a).

The NHDS utilized a two-stage probability sampling method in each year 2007 through 2010. Between 2007 and 2010, 477, 239, 239, and 239 hospitals were sampled each year, with a response rate of 88%, 87%, 86%, and 86% respectively. In the second step, discharged patients were selected from the hospitals through a systematic random sampling procedure. Particularly, 365,648, 165,630, 162,151, and 151,551 patients' information was collected each year respectively (CDC, 2018b).

2.2. Dependent variable and independent variables

This study used a binary measure that describes patients' hospital discharge disposition, whether the patient was discharged or transferred to a NH (including both skilled nursing facility and LTC institutions) versus being discharged to a home setting.

According to Andersen's behavioral model of health services use, the factors that affect older patients' NH admission upon hospital discharge are categorized into predisposing, enabling, and need characteristics (Andersen, 1995). The predisposing factors include demographic characteristics, such as gender, age and racial group. The enabling factors include marital status and sources of payment (i.e., Medicare, Medicaid, other government compensations, private insurance, self-pay, and other types of payment). The need factors include type of admission, source of admission, diagnoses at discharge, and length of stay (LOS). In addition, this study included facility characteristics, such as facility size measured by the number of bed, ownership type and region, as a fourth category.

The primary independent variable of interest was the interaction variable between Black race and mental health conditions. We included all mental health conditions corresponding to International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes ranging from 290 to 319, drawn from the first seven discharge diagnoses from NHDS (diagnoses #8 to #15 are not available in NHDS 2007–2010).

2.3. Analytic approach

2.3.1. Descriptive analysis

Bivariate analyses were conducted to describe the factors in the sample dataset. Characteristics of each category of independent variables were reported in percentages. Chi-square statistics were used to test the joint statistical significance (p-value) of the independent variables among the general older sample against the dependent variable (discharged to NHs versus discharged to home setting; Table 1).

2.3.2. Multivariate analysis & correlation coefficient analysis

We conducted logistic regression analyses to examine the interactive impact between Black race and mental health conditions as risk factors for NH admission, controlling for four categories of characteristics. Based on the Pearson correlation coefficient analysis, admitting diagnoses were highly correlated with the final (discharge) diagnoses (> 50%); the admission type was also highly correlated with the