JAMDA xxx (2018) 1–8

JAMDA

journal homepage: www.jamda.com

Original Study

Socioeconomic and Geographic Disparities in Accessing Nursing Homes With High Star Ratings

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Keywords:
Nursing home star rating
staffing
quality of care
socioeconomic disparities
geographic disparities

A B S T R A C T

Objectives: The Centers for Medicare & Medicaid Services Nursing Home Compare (NHC) serves as the most comprehensive repository of Medicaid- and/or Medicare-certified nursing homes providing services to approximately 1.4 million US residents. A gap in the literature exists in understanding on the national level whether residents from socioeconomically disadvantaged counties experience disparities in the access to nursing homes with higher NHC star ratings. The study aimed to examine nursing home quality variations with regard to county-level socioeconomic, geographic, and metropolitan status, while adjusting for nursing home facility-level characteristics.
Design: Cross-sectional ecological study.
Setting and participants: 15,090 Medicaid/Medicare-certified nursing homes with nonmissing star ratings.
Measures: Study outcomes were NHC overall, health inspection survey, nurse staffing, and quality measure star ratings. County-level measures included SES index, geographic regions, and metropolitan status. Facility-level characteristics included ownership, chain affiliation, type and length of Medicaid/Medicare certification, hospital affiliation, continuing care retirement community status, number of certified beds, and occupancy.
Results: Counties with average adjusted overall, nurse staffing, and quality measure star ratings below 3 stars appeared to be clustered in the South. Nursing homes located in counties with lower SES were associated with lower overall star ratings [adjusted mean stars: 3.66 to 3.84, 95% confidence interval (CI): (3.54, 3.79) to (3.73, 3.95)]. A similar pattern was observed in staffing [adjusted mean stars: 3.75 to 4.23, 95% CI: (3.54, 3.97) to (4.10, 4.35)] and quality ratings [adjusted mean stars: 3.29 to 3.52, 95% CI: (3.12, 3.47) to (3.35, 3.69)].
Conclusions: Residents in socioeconomically disadvantaged counties experience disparities in accessing nursing homes with higher star ratings. These areas may lack sufficient resources to adequately staff the facility and deliver care that meets industry quality standards. These issues are likely to persist and possibly even worsen for the lower- and middle-class geriatric population given the current uncertainty around healthcare reform.

There are currently more than 48 million US residents aged 65 and older.[1] These older adults often have multiple chronic diseases[2,3] or ailments requiring long-term care (LTC).[4] Spending on LTC services at nursing homes and continuing care retirement communities (CCRCs) accounted for $162.7 billion in 2016, is projected to be $174.6 billion in 2018, and is expected to grow at an accelerated annual rate of over 4%

The authors declare no conflicts of interest.

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https://doi.org/10.1016/j.jamda.2018.05.017
1525-8610/

in the next decade.[5] Nursing homes play a key role in providing LTC for those needing skilled care or daily living assistance.[4,6] To service this need, there are more than 15,000 Medicaid and/or Medicare-certified nursing homes, providing care to approximately 1.4 million residents.

Nursing homes are regularly monitored and inspected by state and federal agencies to ensure compliance with quality and efficiency standards. The Centers for Medicare & Medicaid Services (CMS) maintains a publicly available repository, Nursing Home Compare (NHC), of the metrics used to evaluate Medicare- and/or Medicaid-certified nursing homes.[7] CMS collects data from on-site health inspection surveys, hours of care provided by nurse staffing adjusted for the needs of the residents, and quality of care by residents' health-related outcomes. On a 5-star scale, Medicare- and/or Medicaid-certified nursing homes receive ratings on each of these domains and an overall rating.[7]

Variations in the quality of nursing homes with regard to organization-level factors have been previously documented in the literature. Nursing homes that are nonprofit,[8,9] non–chain affiliated,[10] or with higher occupancy rates[11] have been shown to provide comparatively better quality of care. More recent streams of literature have begun to examine the influence of socioeconomic status (SES) and geographic locations on nursing home quality. The pioneering study by Mor et al noted nursing homes as a "2-tier" system and documented that nursing homes of the "lower tier" were disproportionately located in poorer counties and had worse performance in staffing and quality of care.[12] Recent studies have shown that nursing homes located in rural areas had lower staffing levels,[13] poorer quality of end-of-life care,[14] and were less likely to achieve high star quality ratings.[15] Research by Konetzka et al in the Chicago area found that 5-star nursing homes congregated around the more affluent neighborhoods.[16] However, prior studies have not yet examined the difference in the quality of nursing homes as reported by the NHC with respect to SES and geographic locations, especially at the national level.

In this study, we aimed to address this gap by assessing the socioeconomic and geographic disparities in US nursing homes, while adjusting for the variations in the quality of care on the nursing home facility level. We hypothesized that nursing homes located in (1) counties with higher SES, (2) the Northeast, and (3) metropolitan areas are associated with better NHC star ratings compared with the ones in their respective counterparts. Using the most recent NHC and census data, this study contributes up-to-date evidence on the persistent disparities in the access to nursing homes of better quality for geriatric residents living in socioeconomically disadvantaged counties. With the expected need and projected future cost increases for long-term care,[5] our findings emphasize the critical need for policies that support additional resources for nursing homes in underserved and less populated areas.

Methods

Data Source

Study data were derived from 3 publicly available sources linked on the Federal Information Processing Standard (FIPS) codes: (1) the CMS 2015 NHC annual data (fourth quarter) for nursing home star ratings and provider information,[17] (2) the Census Bureau 2015 American Community Survey 5-year estimate for county-level SES characteristics,[18] and (3) the 2013 National Center for Health Statistics (NCHS) Urban-Rural Classification Scheme for Counties to determine the county metropolitan status by Metropolitan Statistical Area (MSA).[19]

Inclusion/Exclusion Criteria

Of the 15,657 nursing homes certified by Medicaid and/or Medicare to provide skilled nursing care, rehabilitation services, and other related care to residents, we excluded homes from the study if they (a) were not located in a US state (n = 6); (b) had missing star ratings on the health inspection survey, nurse staffing, and quality measure (n = 478); and (c) were "Special Focus Facilities" (SFF) (n = 83). On average, nursing homes that are determined by the CMS as SFF have a greater number of deficiencies, a persistent history of severe quality problems,[7,20] and are under more stringent enforcement from the CMS, which includes more frequent health inspection surveys and the potential of being terminated from the Medicare/Medicaid certification.[7] In addition, SFF nursing homes cannot receive ratings greater than 3 stars.[7] The final study sample consisted of 15,090 nursing homes, located in 2882 US counties.

SES Characteristics and SES Index

Based on previous literature,[21–23] we identified six county-level SES characteristics from the census: median household income, percentage of high school graduates or above, percentage of population below 100% federal poverty level (FPL), median owner-occupied house value, labor force participation rate, and unemployment rate in the population 16 years and older. We combined these county-level SES indicators after standardization through principal component analysis (PCA) to create a composite SES index for each county, similar to prior research by Yost et al[21] and Yu et al.[24] The SES index was represented by the component score of the retained principal component that took the form of a Z-score. The higher the component score, the higher the county's SES status. Counties were sorted into quintiles by the composite SES index.

Geographic Regions and Metropolitan Status

We analyzed US census regions (Northeast, Midwest, South, and West)[25] and metropolitan status of the counties. We determined the metropolitan status of the 2882 counties by the NCHS Urban-Rural Classification Scheme: "metropolitan" for counties in MSA, representing the densely populated, urbanized core areas with adjacent communities that are socially and economically tied to these areas; and "nonmetropolitan" for the remaining.[19]

Nursing Home Characteristics

We included nursing home facility-level characteristics that would be associated with quality variations on the basis of previous research[8–10,26,27]: ownership (nonprofit, for-profit, government-owned), chain affiliation [non–chain affiliated, small chain (2-10 facilities), medium chain (11-70 facilities), large chain (>70 facilities), and missing], Medicaid and/or Medicare certification (Medicaid only, Medicare only, both Medicaid and Medicare), number of years certified by Medicaid and/or Medicare (in quartiles), hospital affiliation (yes, no), member of CCRC (yes, no), number of certified beds (by median), and occupancy of certified beds (by median).

Statistical Analysis

The unit of analysis was the nursing home. We described the distribution of nursing homes and the average overall, health inspection survey, nurse staffing, and quality measure star ratings by county-level SES index, region, and metropolitan status, as well as by facility-level characteristics.

The overall and individual domain star ratings took values from 1 star to 5 stars, with 1-star increments.[7] Because the underlying scores that these star ratings were based on were continuous, and that the distributions of the star ratings were not highly skewed, we used multivariable linear regression to analyze the ordinal star ratings.[28] Specifically, we examined the variations in overall and individual