Home Health Agencies With More Socially Vulnerable Patients Have Poorer Experience of Care Ratings

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Abstract
Objectives: Examine the relationships between dual eligibility and race/ethnicity characteristics of Medicare-Certified Home Health Agencies (CHHAs) and experience of care ratings.

Methods: Analysis of 2017 national Consumer Assessment of Healthcare Providers and Systems and matched datasets of 10,906 CHHAs

Results: CHHAs with higher concentrations of dual-eligible patients were less likely to have high experience of care ratings for all three domains (e.g., for care delivery, quartile 4 vs. 1: odds ratio [OR] = 0.622, \(p < .001\)); CHHAs with higher concentrations of racial/ethnic minorities generally were less likely to have high experience of care ratings in care delivery (e.g., Black: quartile 4 vs. 1: OR = 0.418, \(p < 0.001\)), communication (e.g., Black: quartile 4 vs. 1: OR = 0.316, \(p < 0.001\)), and specific care issues (e.g., Hispanic: quartile 4 vs. 1: OR = 0.397, \(p < .001\)).

Discussion: CHHAs with greater concentrations of dual-eligible patients and racial/ethnic minorities were more likely to have poor experience of care ratings.

Keywords
experience of Care, Home Health Care, Dual Eligibility, Medicare, Racial/Ethnic Disparities

Introduction
The Agency for Healthcare Research and Quality (2021) considers the experience of care—a patient’s self-reported perception of his/her experience of care an essential aspect of quality of care that is distinct from objective measures of clinical outcomes or processes (Smith et al., 2017). The Institute for Healthcare Improvement (2021) designates improving experience of care as a critical outcome in the Triple Aim Initiative. Since 2012, the Centers for Medicare and Medicaid Services (CMS) has been publicizing experience of care ratings in various health care sectors, including acute, primary and long-term care settings (CMS, 2020). In 2020, the CMS introduced “Care Compare” to further illustrate the variation in experience of care (1–5 stars) to help patients make informed decisions when choosing their health care providers (CMS, 2021).

Home health care (HHC) is a major type of Medicare-reimbursed skilled care provided in the patient’s home (Harrison et al., 2020). In 2018, 6.3 million 60-day HHC episodes from over 11,500 Medicare-Certified Home Health Agencies (CHHAs) were provided for 3.4 million Medicare beneficiaries (Medicare Payment Advisory Commission, 2019). HHC provides essential in-home support through skilled nursing (SN), physical/occupational therapy (PT/OT), speech pathology (SP), and social work (SW) services as well as HHC aide (HA) assistance. HHC services are important to treatment adherence (e.g., medication management), symptom assessment (e.g., pain detection), and functional improvement (e.g., training on home exercise) (Brody et al., 2016; Harrison et al., 2020; Madigan et al., 2012; Osakwe et al., 2019; Wang et al., 2021a; Wang et al., 2018; Wang, Yu, Cai et al., 2020). HHC clinicians also coordinate care of the patients with other providers, such as primary care providers and hospitalists (CMS, 2015). Abundant evidence has shown that HHC improves physical function, promotes quality of...
life, and reduces hospitalizations among older adults (Brody et al., 2016; Madigan et al., 2012; Osakwe et al., 2019; Wang, Ying, et al., 2020; Wang et al., 2020; Wang, Yu, et al., 2020; Wang et al., 2021b).

Similar to the overall Medicare population, a sizable proportion (approximately 25%) of HHC recipients belong to a racial/ethnic minority group (Harris et al., 2016; Medicare Payment Advisory Commission, 2021). Substantial socioeconomic and racial/ethnic disparities exist in HHC outcomes. National studies have shown that after adjusting for covariates that justified the need for HHC services (such as age, diagnosis, and physical and cognitive function), Medicare and Medicaid dual-eligible patients and racial/ethnic minorities, when compared to Medicare-only patients and non-Hispanic whites, respectively, tend to receive less HHC, particularly SN and PT, and more likely to receive care from CHHA with lower quality of care star ratings (Freburger et al., 2012; Joynt Maddox et al., 2018; Peng et al., 2003; Yeboah-Korang et al., 2011).

An important aspect of assessing the quality of HHC, and its socioeconomic and racial/ethnic disparities, is through examining experience of care. Smith et al. used HHCAHPS data in 2012 and found racial/ethnic disparities in patient experience of care with HHC (Smith et al., 2015). Due to data limitation in HHCAHPS, this important study did not include adjustment of variation in important patient characteristics (e.g., comorbidities and function) and community characteristics (e.g., the supply of healthcare service regionally). Moreover, no published national study has examined how experience of care in HHC varies across patients of different socioeconomic status, such as that defined by Medicare-Medicaid dual eligibility. To address these gaps, in this study, we used multiple national datasets in the HHC sector in recent years (2017) that included a comprehensive range of variables at multiple levels.

The objectives of this study were to examine the relationships of CHHA experience of care with 1) CHHA proportion of Medicare-Medicaid dual-eligible beneficiaries and 2) CHHA proportion of racial/ethnic minorities. We hypothesized that CHHAs with higher proportion of dual-eligible beneficiaries and higher proportion of racial/ethnic minorities will have lower experience of care ratings across three domains, including overall delivery of care, provider-patient communication, and specific care issues such as pain, medication, and home safety.

Design and Methods

Study Design

This study utilized several 2017 national datasets, including CHHA-level data from the Outcome and Assessment Information Set (OASIS) that are linked to HH Compare, the Home Health Care Consumer Assessment of Healthcare Providers and Systems (HHCAHPS), Master Beneficiary Summary Files (MBSF), and Area Health Resources Files (AHRF) files (CMS, 2018; CMS, 2019a). The datasets and variables were summarized in Supplementary Table S1.

Population and Settings

The sample included 10,916 CHHAs that served the entire population of Medicare beneficiaries at 65 years or older who received at least one HHC visit in CY 2017 (6,668,630), with the exclusion of beneficiaries who deceased during the HHC episode (31,333), was included (N=6,637,497).

Variables and Measures

Dependent Variables: Experience of Care Ratings. Experience of care was measured using the HHCAHPS survey that includes 34 questions that, due to the multiple languages spoken by HHC recipients, has been made available in multiple languages (e.g., English, Spanish, Chinese, Russian, Vietnamese, and Eastern Armenian). The HHCAHPS survey has been implemented nationwide since July 2010 and publicly reported on HH compare since April 2012 (CMS, 2019a).

Raw HHCAHPS data are officially computed by CMS into global and composite measures (CMS, 2019a). The global measures include 1) overall summary rating—“How do patients rate the overall care from the home health agency?” and 2) recommendation—“Would patients recommend the home health agency to friends and family?” The composite measures include 1) professional delivery of care (“delivery”), 2) effective communication between HHC providers and the patient (“communication”), and 3) discussion of specific care issues such as medication, pain, and home safety (“direct care”) (CMS, 2019a). The questions in the HHCAHPS survey and related measures were described in Supplementary Table S2.

We used the HHCAHP “overall summary rating” to categorize all CHHA into high- (4–5 star) and low-rated (1–3 star) when presenting baseline characteristics (Table 1). In inferential analyses, we used the composite HHCAHPS measures as dependent variables because composite HHCAHPS measures have been shown to be more sensitive than global measures in detecting differences and are less likely to be influenced by systematic differences in responding styles across different population groups, such as patients of different racial/ethnic groups, in prior research (Fongwa et al., 2008; Saha & Hickam, 2003; Smith et al., 2017; Weech-Maldonado et al., 2004; Weech-Maldonado et al., 2008). Each of the composite measures was used to categorize CHHA into the high- (4–5 star) or low-rated (1–3 star) group.

The total number of active CHHAs in 2018 was 11,556 (Medicare Payment Advisory Commission, 2021), which is slightly larger than our sample size (10,916 because not all CHHAs are included in the HHCAHPS, due to multiple reasons. Some are exempt from participating in the HHCAHPS,
Table 1. Sample Characteristics (Aggregated at the CHHA\textsuperscript{a} level).

| Variable | Overall Experience of Care Rating\textsuperscript{b} Cohorts (N = 10,906) | \(p\)-value |
|----------|-------------------------------------------------|------------|
|          | Low: 1–3 Stars (3,043) | High: 4–5 Stars (2,667) | Missing Data in Experience of Care Ratings (5,206) |
| Age, mean (S.D.) | 76.2 (3.99) | 76.0 (3.08) | 72.7 (8.83) | .020 |
| Female, % | 39.0% | 38.8% | 38.9% | .22 |
| Living situation, % | | | | < .001 |
| Living with others | 62.0% | 65.2% | 63.1% |
| Living alone | 23.8% | 26.3% | 26.5% |
| Assisted living facilities | 14.2% | 8.5% | 10.4% |
| Race/ethnicity, % | | | | < .001 |
| Non-Hispanic White | 70.8% | 79.4% | 18.9% |
| Black or African American | 13.4% | 11.1% | 27.5% |
| Hispanics | 11.2% | 6.9% | 16.8% |
| Other (e.g., Asian) | 4.5% | 2.6% | 6.7% |
| Medicaid enrollment status, % | | | | < .001 |
| Medicare only | 64.7% | 66.8% | 40.2% |
| Medicare-Medicaid dual-eligible | 35.3% | 33.2% | 59.8% |
| Number of chronic conditions (0–27), mean (S.D.) | 9.7 (1.95) | 9.9 (1.56) | 52.3% | < .001 |
| Specific comorbidities, % | | | | |
| Chronic obstructive pulmonary disease | 44.4% | 48.7% | 58.0% | < .001 |
| Heart failure | 50.5% | 52.8% | 65.2% | < .001 |
| Diabetes | 53.7% | 53.5% | 62.9% | .63 |
| Chronic kidney disease | 56.1% | 57.1% | 7.6% | < .001 |
| Hip/pelvic fracture | 9.5% | 9.6% | 31.3% | .41 |
| Osteoporosis | 29.2% | 28.7% | 76.9% | .06 |
| Osteoarthritis/rheumatoid arthritis | 69.9% | 73.5% | 30.4% | < .001 |
| Stroke/transient ischemic attack | 27.8% | 27.8% | 16.7% | .70 |
| Cancer | 17.9% | 18.5% | 41.1% | < .001 |
| Alzheimer’s disease and related dementias | 35.8% | 33.7% | 62.5% | < .001 |
| Depression | 54.4% | 55.2% | 32.1% | .011 |
| Severe pain, % | 30.2% | 32.3% | 4.9% | < .001 |
| Unhealed pressure ulcer at stage II or higher, % | 5.2% | 5.0% | 58.4% | .013 |
| ADRD diagnosis or cognitive impairment, % | 50.6% | 49.2% | 63.4% | .001 |
| Depressive symptoms, % | 47.1% | 44.4% | 3.9 (1.20) | < .001 |
| Composite ADL limitation score, mean (S.D.) | 4.1 (0.77) | 4.1 (0.82) | 2.3 (1.64) | .17 |
| Number of domains with caregiving deficits (0–7), mean (S.D.) | 2.5 (1.45) | 2.5 (1.56) | .52 |
| Region, % (N) | | | | < .0001 |
| Urban | 85.8% (2,611) | 63.7% (1,698) | 89.3% (4845) |
| Suburban | 8.3% (252) | 19.1% (510) | 5.0% (272) |
| Rural | 5.8% (175) | 17.1% (457) | 5.7% (307) |
| Missing | 0.2% (5) | 0.1% (2) | 0.1% (3) |
| Ownership, % (N) | | | | < .0001 |
| Non-profit | 78.8% (2,397) | 63.2% (1,685) | 86.4% (4688) |
| For-profit | 19.0% (579) | 28.7% (766) | 6.6% (357) |
| Government | 2.2% (67) | 8.1% (216) | 3.0% (161) |
| Annual number of visits, mean (S.D.) | 1318.7 (2532.49) | 1072.2 (1816.49) | 123.5 (376.59) |
| Comprehensive service mix (including all six types of services, i.e., skilled nursing, physical therapy, occupational therapy, speech pathology, social work, and home health aids), % (n) | 86.7% (2638) | 79.2% (2111) | 67.2% (3649) |

Note:
\textsuperscript{a}CHHA = Medicare-Certified Home Health Agencies.
\textsuperscript{b}Measure of overall experience of care rating ("How do patients rate the overall care from the home health agency?") was obtained from the Home Health Care Consumer Assessment of Healthcare Providers and Systems Survey.
particularly CHHAs that serve less than 60 unique patients/year. Some CHHAs participated in HHCAHPS but had fewer than 100 patients completed the survey, or had zero, or very few, patients meeting the survey’s inclusion criteria (i.e., Medicare/ Medicaid, ≥ 18 years old, having received at least one skilled visit in the sample month and two visits during the lookback period, not currently receiving hospice care, not state-regulated); these CHHAs were also not included in the publicly available HHCAHPS data. Last, because the HHCAHPS survey is administered on a monthly basis, CHHAs that joined the survey late in the year also did not have their survey results available for that year. Among CHHAs included in the HHCAHPS, the national response rate is approximately 30% (CMS, 2019a).

Independent Variables. Dual eligibility: Patient Medicare-Medicaid dual eligibility status was obtained from the MBSF. Within each CHHA, we calculated the proportion of patients with Medicaid eligibility.

Racial/ethnic minority: Patient race was obtained from the MBSF. Within each CHHA, we calculated the proportions of patients who were African Americans, Hispanic, or other non-Caucasian non-Hispanic racial/ethnic minorities (e.g., Asians).

In inferential analyses, the proportion of patients with dual eligibility and proportions of patients of racial/ethnic minorities were categorized into quartiles.

Covariates

We controlled for average patient characteristics and structural characteristics of the CHHAs, and geographic characteristics in inferential analysis, because these variables may affect the way in which patients respond to survey questions or the overall delivery of care in HHC (Adelani et al., 2018; Cabin & Siman, 2014; Chen et al., 2018; Smith et al., 2017).

Average patient characteristics of the CHHAs included age, sex, living situation, caregiver support, health status (number of chronic conditions), specific diagnoses known to worse HHC outcomes (diabetes, heart failure, chronic obstructive pulmonary disease, chronic kidney disease, stroke, cancer, osteoporosis, osteoarthritis/rheumatoid arthritis, Alzheimer’s disease, and related dementias), and mental health status affecting one’s experience (cognitive impairment and depressive symptoms, pressure ulcer, ADL limitations, and pain). These characteristics were calculated for each CHHA as mean or percentages (Supplementary Table S1).

CHHA structural characteristics included 1) agency size (total annual number of HHC visits), 2) location (urban/suburban/rural), 3) ownership (government/for-profit/not-for-profit), 4) service mix (if CHHA offers all six types of services [SN, PT, OT, SP, SW, HA]: Yes/No), 5) number of completed HHCAHPS surveys, and 6) response rate of HHCAHPS surveys.

Geographic characteristics included 1) state, and 2) county-level supply of health services (i.e., numbers of hospital beds, skilled nursing facility beds, and CHHA/1,000 residents).

Statistical Analysis

Descriptive statistics summarized sample characteristics as means (standard deviations [SD]) or median (interquartile range) for continuous variables and frequency (%; [N]) for categorical variables. Three logistic regression models were constructed with high experience of care in care delivery, communication, and specific care issues as the dependent variable, respectively, and the quartiles of CHHA proportion of Medicaid beneficiaries and CHHA proportion of racial/ethnic minorities as the independent variables. Models adjusted for CHHA average patient characteristics and structural characteristics, and geographic covariates. Sensitivity analyses were conducted to examine 1) if the independent variables were related to having missing HHCAHPS data (logistic regression), 2) if the independent variables were related to the two global measures in HHCAHPS (logistic regression and linear regression), and 3) if using different quartiles as the reference group for the independent variables would alter the results. This study was approved by the Institutional Review Board of University of Rochester.

Results

Of the 10,906 CHHAs included in this study, 3,043 (28%) were rated low in overall experience of care, 2,667 (24%) rated high, and 5,206 (48%) had missing HHCAHPS data (Table 1). Compared with CHHA with low overall experience of care, CHHAs with high overall experience of care had smaller proportions of patients living in AL, racial/ethnic minorities, and dual-eligible beneficiaries, served relatively younger patients with slightly more medical complexity and a higher prevalence of severe pain. CHHAs with high overall experience of care were also more likely to be for-profit or government-owned, to locate in rural or suburban regions and regions with higher concentration of skilled nursing facilities, yet tended to make fewer HHC visits annually and to not offer all six types of services (SN, PT, OT, SP, SW, and HA) as compared with CHHA with low overall experience of care.

In multivariate logistic regression (Tables 2–4), CHHAs with higher concentration of dual-eligible patients were less likely to have a high experience of care rating in overall care delivery (quartile 4 vs. 1: odds ratio [OR] = 0.622; 95% confidence interval [CI]: 0.407, 0.948; p < .001), communication (quartile 4 vs. 1: OR = 0.489; 95% CI: 0.311, 0.769; p < .001), and specific care issues (quartile 3 vs. 1: OR = 0.759; 95% CI: 0.587, 0.982; p = .036). Similarly, CHHAs with higher concentration of racial/ethnic minorities were less likely to have a high experience of care rating in overall care delivery (e.g., Black [quartile 4 vs. 1] OR = 0.418, 95% CI:
Sensitivity analysis (Supplementary Table S3) showed that CHHAs with higher concentration of dual-eligible patients and Black patients were more likely to have missing data in HHCAHPS, and CHHAs with higher concentration of Hispanic patients and patients of other racial/ethnic minorities were less likely to have missing data in HHCAHPS. These findings suggest that CHHAs with higher concentration of dual-eligible patients and Blacks were under-represented, and CHHAs with higher concentration of Hispanics and other racial/ethnic minorities were over-represented in the HHCAHPS data.

Sensitivity analyses of the two global outcome measures in HHCAHPS (i.e., overall summary of patient experience of care [Supplementary Table S4] and patient recommendation [Supplementary Table S5]) showed largely consistent results, where CHHAs with higher concentration of dual-eligible patients and racial/ethnic minorities in general tended to have lower summary ratings in patient experience of care and patient recommendation.

Sensitivity analyses using quartile 2, 3, or 4 as the reference group also showed consistent results as analysis using quartile 1 as the reference group (results not shown).

Discussion

This study leveraged rich national datasets to examine the relationships of dual eligibility and racial/ethnic minority with experience of care in HHC among 10,916 CHHA in the United States. The principal finding was that CHHAs that serve a higher concentration of dual-eligible persons and racial/ethnic minorities were more likely to have poor experience of care ratings across all three domains, that is, delivery of care, communication, and specific direct care issues.

The finding that CHHAs with greater concentration of dual-eligible patients having lower experience of care rating are consistent with prior findings that dual-eligible patients tended to receive care from CHHA with lower quality of care, which is a different concept from experience of care (Joynt Maddox et al., 2018). The finding that CHHAs with higher proportions of racial/ethnic minorities were less likely to have lower summary ratings in patient experience of care and patient recommendation.
a high experience of care rating was also consistent with findings in an earlier study (Smith et al., 2017). The current study extends our existing knowledge about worse clinical outcomes of dual-eligible persons and racial/ethnic minorities in HHC, such as higher risk of acute care admission and less ADL improvement (Chase et al., 2018; Fortinsky et al., 2014; Joynt Maddox et al., 2018; Osakwe et al., 2019; Rosati et al., 2003; Towne et al., 2015), shedding light on an important yet understudied measure of care quality—patient experience of care—as a potential answer to observed disparities in HHC.

Several factors may help explain the findings of our study. First, socially vulnerable patients often live in low-income neighborhoods and CHHA located in these neighborhoods tend to have fewer resources and lower expertise for providing high-quality care (Joynt Maddox et al., 2018; Wang et al., 2017). Although quality of care is a different measure from experience of care, the two measures are related and both indicate higher risk of adverse outcomes. Given that dual-eligible and racial/ethnic minority patients are more likely to have adverse outcomes (e.g., less functional improvement and higher risk of hospitalization) while receiving HHC (Chase et al., 2018; Fortinsky et al., 2014; Joynt Maddox et al., 2018; Osakwe et al., 2019; Rosati et al., 2003; Towne et al., 2015), it is not surprising that they report being less pleased with the HHC received than others, thus lower experience of care ratings for the CHHA that serve higher percentages of dual-eligible and racial/ethnic minority patients.

Second, there are likely gaps between the HHC services provided for patients and the needs of patients, and these gaps may be more pronounced among socially vulnerable patients, which may underlie the lower experience of care ratings for CHHAs with higher proportions of these patients. The literature has shown that socially vulnerable patients tend to have less social and family support and more healthcare needs (Black et al., 2019), and therefore they may expect a greater amount of support from CHHA that may exceed what the CHHAs can provide for them. This explanation can be supported by the following facts: 1) CHHAs with higher levels of medical complexity and functional limitations tend to have lower experience of care ratings than others (Chen et al., 2018); and 2) providing more intensive HHC, particularly PT and SW, was related to better experience of care ratings (Cabin & Siman, 2014).

Third, disparities in HHC may be related to broader systematic issues related to health policies. Recent payment reforms in HHC, such as the HHVBP and Patient Driven Grouping Models (PDGM) that have reduced the maximal amount of Medicare-reimbursable HHC services the CHHAs can provide, may worsen such discrepancy between patient

| Table 3. Association Between CHHAa Characteristics of Dual Eligibility and Race/Ethnicity and CHHA Ratings in Effective Communicationb,c. |
|---|---|---|---|
| Outcome: Effective Communication (High [4–5 Stars] vs. Low [1–3 Stars]) | Odds Ratio | p-value | 95% Confidence Interval |
| Quartiles of the proportion of Medicare-Medicaid dual-eligible persons within CHHA (reference: quartile 1) | | | |
| Quartile 2 | 0.830 | .040 | 0.695 0.991 |
| Quartile 3 | 0.473 | < .001 | 0.358 0.625 |
| Quartile 4 | 0.489 | .002 | 0.311 0.769 |
| Quartiles of the proportion of Blacks or African Americans within CHHA (reference: quartile 1) | | | |
| Quartile 2 | 0.888 | .228 | 0.732 1.077 |
| Quartile 3 | 0.645 | < .001 | 0.509 0.816 |
| Quartile 4 | 0.316 | < .001 | 0.225 0.443 |
| Quartiles of the proportion of Hispanics within CHHA (reference: quartile 1) | | | |
| Quartile 2 | 0.746 | .002 | 0.620 0.899 |
| Quartile 3 | 0.554 | < .001 | 0.430 0.715 |
| Quartile 4 | 0.410 | < .001 | 0.293 0.573 |
| Quartiles of the proportion of other non-Hispanic non-White race/ethnicities within CHHA (reference: quartile 1) | | | |
| Quartile 2 | 0.968 | .785 | 0.768 1.221 |
| Quartile 3 | 0.812 | .111 | 0.628 1.049 |
| Quartile 4 | 0.850 | .343 | 0.607 1.190 |

Notes:
a. CHHA= Medicare-Certified Home Health Agencies.
b. Measure of effective communication was derived from the Home Health Care Consumer Assessment of Healthcare Providers and Systems survey.
c. Logistic Regression models adjusted for age, gender, living situation, number of chronic conditions, specific comorbidities (chronic obstructive pulmonary disease, heart failure, diabetes, chronic kidney disease, hip/pelvic fracture, osteoporosis, osteoarthritis/rheumatoid arthritis, stroke/transient ischemic attack, cancer, Alzheimer’s disease and related dementias, and depression), pain, pressure ulcer, depressive symptoms, depressive symptoms, limitations in activities of daily living, caregiving support, region, ownership, annual number of visits, type of services provided, number of completed HHCAHPS surveys, HHCAHPS response rate, number of home health agencies, hospital beds and skilled nursing facility beds per 1000 older adults age 65+ in the county of patient’s residence, and state dummies.
expectation of care and care that CHHAs can feasibly provide. For example, the HHVBP is a value-based purchasing model that rewards or penalizes CHHA based on quality of care ratings, including experience of care, of up to 8% of annual Medicare HHC payment (CMS, 2019b). Evidence has shown that albeit having a modest impact on improving outcome measures, HHVBP has not led to any improvement in experience of care in HHC (Teshale et al., 2020). Rather, the value-based payment reform may penalize more CHHAs with fewer clinical and administrative resources, thus worsening the socioeconomic and racial/ethnic disparities in HHC (Ankuda et al., 2020).

Multiple quality initiatives have been implemented in HHC since 2012, such as the HHVBP and the more recent PDGM that may have affected the experience of home health care among Medicare beneficiaries and socioeconomic and racial/ethnic disparities (Alliance for Home Health Quality and Innovation, 2021). Further research is needed to examine the impact of these policy initiatives on socioeconomic disparities in patient experience of care in HHC.

Last, it is possible that patients across socioeconomic and racial/ethnic groups have responded to the HHCAHPS survey in systematically different ways (Weech-Maldonado et al., 2008). However, we think that this possibility, albeit exists, is not a main reason for the findings of this study because previous studies showed that the specific experience of care measures examined in this study were less likely to be influenced by response bias than global measures (Fongwa et al., 2008; Saha & Hickam, 2003; Weech-Maldonado et al., 2008). As such, the differences we identified in experience of care ratings of CHHAs with greater concentration of low socioeconomic status and racial/ethnic minority groups were more likely due to disparities in HHC delivered rather than response biases.

### Study Limitations

This study has several limitations. First, due to data limitation, our analyses were at the CHHA level and some CHHAs (5,206) were not included in the publicly available HHCAHPS data, thus excluded from this study. However, the total number of CHHAs included in this study was similar to those in previous studies that utilized publicly available HHCAHPS surveys (Schwartz et al., 2020). Sensitivity analyses have also shown that the findings were not due to under-representation of CHHAs with high concentration of dual-eligible and racial/ethnic minority patients. Second, this study did not have access to patient-level HHCAHPS data to examine disparities in experience of care. Thus, we could not ascertain if individual patients of dual eligibility or racial/ethnic minority groups receiving care from CHHAs with lower ratings actually experienced poorer care. Finally, we

### Table 4. Association Between CHHA Characteristics of Dual Eligibility and Race/Ethnicity and CHHA Ratings in Specific Care Issues.

| Outcome: Specific Care Issues (High [4–5 Stars] vs. Low [1–3 Stars]) | Odds Ratio | p-value | 95% Confidence Interval |
|---|---|---|---|
| Quartiles of the proportion of Medicare-Medicaid dual-eligible persons within CHHA (reference: quartile 1) | | | |
| Quartile 2 | 0.838 | 0.043 | 0.706 0.994 |
| Quartile 3 | 0.759 | 0.036 | 0.587 0.982 |
| Quartile 4 | 1.045 | 0.835 | 0.693 1.575 |
| Quartiles of the proportion of Blacks or African Americans within CHHA (reference: quartile 1) | | | |
| Quartile 2 | 0.845 | 0.080 | 0.700 1.020 |
| Quartile 3 | 0.804 | 0.059 | 0.641 1.009 |
| Quartile 4 | 0.676 | 0.014 | 0.495 0.924 |
| Quartiles of the proportion of Hispanics within CHHA (reference: quartile 1) | | | |
| Quartile 2 | 0.743 | <0.001 | 0.617 0.895 |
| Quartile 3 | 0.555 | <0.001 | 0.433 0.711 |
| Quartile 4 | 0.397 | <0.001 | 0.289 0.545 |
| Quartiles of the proportion of other non-Hispanic non-White race/ethnicities within CHHA (reference: quartile 1) | | | |
| Quartile 2 | 1.086 | 0.484 | 0.862 1.368 |
| Quartile 3 | 1.161 | 0.244 | 0.903 1.492 |
| Quartile 4 | 1.222 | 0.214 | 0.891 1.675 |

Notes:

*CHHA = Medicare-Certified Home Health Agencies.

Measure of specific care issues was derived from the Home Health Care Consumer Assessment of Healthcare Providers and Systems survey.

Logistic Regression models adjusted for age, gender, living situation, number of chronic conditions, specific comorbidities (chronic obstructive pulmonary disease, heart failure, diabetes, chronic kidney disease, hip/pelvic fracture, osteoporosis, osteoarthritis, rheumatoid arthritis, stroke/transient ischemic attack, cancer, Alzheimer’s disease and related dementias, and depression), pain, pressure ulcer, depressive symptoms, depressive symptoms, limitations in activities of daily living, caregiving support, region, ownership, annual number of visits, type of services provided, number of completed HHCAHPS surveys, HHCAHPS response rate, number of home health agencies, hospital beds and skilled nursing facility beds per 1000 older adults age 65+ in the county of patient’s residence, and state dummies.
adjusted for multiple levels of covariates in the analyses, yet there may be residual confounding not controlled for. Despite these limitations of the HHCAHPS, it is the only publicly available, patient-reported, national measure of experience of care in HHC in the United States and we believe that findings in this study will provide important insights on providing patient-center HHC for socially vulnerable older Americans.

**Implications and Future Directions**

Evidence in HHC has shown that better patient experience of HHC is related to greater improvements in symptom management, ADL function, and medication management (Schwartz et al., 2020), highlighting the importance of future efforts to improve experience of care in HHC, particularly among the dual-eligible and racial/ethnic minority patients. Findings in this study provide direction for future improvement, such as by enhancing the efficiency of communication and clinical attention to specific direct care issues. For instance, one issue in direct care that is of particular concern to patients of low socioeconomic status is pain management (Lines et al., 2018). A large body of literature has shown that low-income patients are more likely to have chronic pain, particularly severe pain (Grol-Prokopczyk, 2017; Ikeda et al., 2019), but they are less likely to receive effective pain management such as analgesics than patients of higher socioeconomic status (Joynt et al., 2013). Thus, addressing disparities in pain management may help reduce disparities in experience of care in HHC. Conceptual mapping showed that receiving care from clinicians who are caring, supportive, patient, empathetic, respectful, and considerate is important to patients’ experience of care (Lines et al., 2018) and this shall be promoted in HHC. HHC leaders should also consider other aspects relevant to experience of care, such as continuity of care (Santomassino et al., 2012), seamless monitoring (Grant et al., 2015)), and communication as well as care coordination with other providers (Chimenti et al., 2020; Collins et al., 2019; Sarzynski et al., 2019).

In conclusion, CHHAs with greater concentration of Medicare-Medicaid dual-eligible patients and racial/ethnic minorities were less likely to have high experience of care ratings across all three measured domains, namely, professional care delivery, effective communication, and specific issues in direct patient care. Findings suggest disparities in HHC among these socially vulnerable patients and highlight the importance of improved patient-centered HHC in this population to meet their healthcare needs.

**Declaration of Conflicting Interests**

The author(s) declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: An abstract of this manuscript has been submitted to the 2021 Annual Conference of the Gerontological Society of America. Other than this, this manuscript has not been previously published and is not under consideration in the same or substantially similar form in any other peer-reviewed media. All authors listed have contributed sufficiently to the project to be included as authors, and all of those who are qualified to be authors are listed in the author byline.

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**Supplemental Material**

Supplemental material for this article is available online.

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