Variations Between Adult Day Services Centers in the United States by the Racial and Ethnic Case-Mix of Center Participants

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Abstract

This is the first nationally representative study to identify differences between adult day services centers, a unique home- and community-based service, by racial/ethnic case-mix: Centers were classified as having a majority of participants who were Hispanic, non-Hispanic Black, or non-Hispanic other race/ethnicities and non-Hispanic White. The associations between racial/ethnic case-mix and geographic and operational characteristics of centers and health and functioning needs of participants were assessed using multivariate regression analyses, using the 2014 National Study of Long-term Care Providers' survey of 2,432 centers. Half of all adult day centers predominantly served racial/ethnic minorities, which were more likely to be for-profit, had lower percentages of self-pay revenue, more commonly provided transportation services, and had higher percentages of participants with diabetes, compared with predominantly non-Hispanic White centers. Findings show differences by racial/ethnic case-mix, which are important when considering the long-term care needs of a diverse population of older adults.

Keywords

adult day care; diversity and ethnicity; health services; home and community-based care and services; long-term services & supports

Research shows differences in older racial/ethnic minorities' use of and quality of care from long-term care services and supports (LTSS), compared with their non-Hispanic White counterparts. Little is known about racial/ethnic differences in characteristics of adult day services centers (ADSC), a type of home- and community-based service (HCBS) for adults with disabilities and their caregivers. There is little standardization among HCBS providers, and ADSCs vary considerably in the services they provide and the communities they serve. The characteristics of ADSCs have implications for the care of racial/ethnic minorities, especially because ADSCs are more ethnically diverse than other forms of long-term care such as nursing homes or assisted living facilities (Harris-Kojetin et al., 2016, 2019). Given

the expected increase in minority populations in the United States through 2060 (Census Bureau, 2015), and the growing importance of HCBS as an alternative for individuals who otherwise may be institutionalized (Ng et al., 2015), ADSCs may expect to serve increasingly diverse populations. This study is the first to provide a nationally representative profile of ADSCs that predominantly serve racial/ethnic minorities, which builds upon research on racial/ethnic differences in LTSS.

Racial/Ethnic Differences in Long-Term Care

A considerable body of literature shows disparities by race/ethnicity in long-term care. Black and Hispanic older adults are less likely to use nursing homes than Whites (Thomeer et al., 2015; Wallace et al., 1998) and racial/ethnic minorities tend to experience a lower quality of nursing home care and to reside in racially segregated nursing homes (Campbell et al., 2016; Smith et al., 2007). Black older adults are less likely to use hospice and palliative care (Hazin & Giles, 2011) and Asian and Pacific Islander older adults have a lower percentage of hospice use in the last year of life, compared with non-Hispanic Whites (Ngo-Metzger et al., 2008).

Studies tend to show fewer racial/ethnic differences in utilization and quality of care of HCBS, when accounting for sociodemographic characteristics, economic resources, and health needs (Miller et al., 1996; Wallace et al., 1998). A recent study found no significant differences in the utilization of ADSCs between Black, Hispanic, White, and Asian home health patients, controlling for demographics and need (Brown et al., 2014). In 2014 and 2016, over 56% of ADSC participants were minorities: over 20% were Hispanic, between 15% and 17% were non-Hispanic Black, and about 19% were non-Hispanic races/ethnicities other than Black and White (Harris-Kojetin et al., 2016, 2019). This is in contrast to the percentages of all minorities in 2014 and 2016, respectively, using home health care (26%; 24%), nursing homes (24%; 25%), hospice (16%; 16%), and residential care communities (16%; 19%). These studies point to the importance of HCBS as a resource for serving racial/ethnic minorities who may have less access to or preferences for nursing home and residential care options.

Adult Day Services Centers

Adult day services are a growing HCBS sector in the United States, which provides services for community-dwelling older adults with disabilities and adults with mental illness or intellectual and developmental disabilities. Centers offer day-time social and medical care intended to improve quality of life, reduce rates of institutionalization, and provide respite for unpaid and informal caregivers (Anderson et al., 2014; Dabelko-Schoeny et al., 2014; Zarit et al., 2013). ADSCs vary by state and U.S. regions, organizational characteristics, services provided, revenue sources, and participant needs, all of which may have implications for quality of care (Lendon & Rome, 2018; Park-Lee et al., 2015; Rome et al., 2015). Although there seems to be similar levels of HCBS utilization by race/ethnicity, there is little information about how ADSCs may differ by operational characteristics and services that affect the ability to meet the needs of racial/ethnic minorities. Previous research on ADSCs found minorities are more likely to be enrolled in for-profit centers (Park-Lee et al.,

2015) and immigrant users of ADSCs have reported improvements in health and well-being (Sadarangani & Murali, 2018). However, associations with other characteristics and participant health are unknown. Given differences in U.S. regions, resources, and health needs by race/ethnicity, it is likely that ADSCs may differ by the populations they serve.

Several regional characteristics may be related to differences by race/ethnicity, including Census region, metropolitan statistical area (MSA) status, and the proportion of minority populations at the county level. Studies of nursing homes have indicated that access to care may be related to residential geography (Smith et al., 2007). Thus, U.S. regions and counties with a higher population of minorities and metropolitan areas were expected to account for a substantial amount of variation in ADSCs by racial/ethnic case-mix.

Center-level characteristics, including chain status, ownership status, and revenue sources, were examined because they have been shown to be associated with disparities in nursing home quality by racial/ethnic groups (Hillmer et al., 2005; Mor et al., 2004; O'Neill et al., 2003). Minorities were more likely to reside in larger, for-profit, urban nursing homes compared with Whites, and nursing homes with more minority residents had a greater percentage of their revenue from Medicaid (Campbell et al., 2016). Differences in disease-specific programming and services offered by ADSCs by race/ethnic case-mix were also examined, which may have implications for meeting the needs of participants.

This study also examined differences in aggregate-level demographic and health-related characteristics of center participants. Little is known about the health of racial/ethnic minorities who participate in ADSCs. In general, older racial/ethnic minorities tend to have greater levels of disability and needs for personal assistance (Nuru-Jeter et al., 2011), and higher prevalence of chronic conditions (Hayward et al., 2000), thus predominantly minority centers were expected to have a higher percentage of participants with health needs.

Study Importance and Aims

Little information is known about the characteristics of ADSCs and their participants, compared with other sectors and users of LTSS, but this knowledge gap is particularly salient for centers that predominantly serve racial/ethnic minority participants. This is the first nationally representative study to describe ADSCs that predominantly serve racial/ethnic minorities, focusing on characteristics of centers that have been commonly used in the examination of quality of care among other providers of LTSS, and may ultimately inform policy and practices in adult day services. Use of HCBS LTSS is growing, and compared with other institutional and HCBS LTSS providers, ADSCs are the most ethnically and racially diverse. This study has two primary aims: (a) to identify characteristics of centers that may differ by racial/ethnic case-mix; and (b) to identify participant health and disability needs that may differ by racial/ethnic case-mix.

Data, Measures, and Method

Data

This study uses the 2014 survey of ADSCs from the second wave of the National Study of Long-Term Care Providers (NSLTCP) conducted by the National Center for Health Statistics in the United States. NSLTCP is a biennial study that produces nationally representative statistical information about providers and service users in five major sectors of long-term care services in the United States. The data are collected from ADSC directors or managers at the provider level and contain information about ADSCs and aggregate-level characteristics about participants. A census of ADSCs was obtained from the National Adult Day Services Association's (NADSA) database of ADSCs operating in the United States. Eligibility criteria were assessed using a self-report screener included as part of the mailed questionnaire packet, which identified centers that (a) were licensed or certified by the state specifically to provide adult day services, or authorized or otherwise set up to participate in Medicaid; (b) had one or more average daily attendance of participants based on a typical week; and (c) had one or more participants enrolled at the center at the location at the time of the survey. The respondents were center directors, administrators, or otherwise knowledgeable proxies. Initial questionnaires were mailed in June 2014 and follow-up mailings and computer-assisted telephone interviews of nonrespondents were conducted through January 2015. For additional information about NSLTCP, see Harris-Kojetin et al. (2016) and survey documentation (NSLTCP, 2014, 2015).

In addition to the NSLTCP, 2014 county population estimates, by race and ethnicity, were used (U.S. Census Bureau: https://www.census.gov/programs-surveys/popest/data/tables.html). The county estimates were linked to the individual ADSCs such that each ADSC had variables indicating the percentage of Hispanic, non-Hispanic Black, non-Hispanic White, and non-Hispanic other races populations of all ages, in the county where the ADSC was located.

Sample.—The sampling frame consisted of 5,443 ADSCs; of these, 618 centers were invalid, out of business, or ineligible based on screener questions included in the questionnaire. Of the remaining 4,825 centers, 2,763 eligible centers completed the questionnaire, with a response rate of 58.0% (NSLTCP, 2015).

From the total of 2,763 respondents, there were 2,432 centers where more than 50% of enrolled participants were of the following four mutually exclusive racial/ethnic categories: Hispanic ($n = 292$), non-Hispanic Black ($n = 411$), non-Hispanic other ($n = 195$), and non-Hispanic White ($n = 1,534$). About 331 centers where the percentage of enrolled participants was not more than 50% for any of the four race/ethnicity categories were excluded from analyses, to focus on centers that served specific racial/ethnic groups.

Measures

ADSCs predominantly serving a race/ethnicity category.—Race/ethnicity data were collected by asking how many participants are in one of several categories of race and ethnicity. Centers were categorized as "predominantly serving" one of four racial/ethnic

groups where more than 50% of enrolled participants were non-Hispanic White; Hispanic; non-Hispanic Black; or "non-Hispanic other" (including non-Hispanic Asian, non-Hispanic American Indian or Alaska Native, non-Hispanic of two or more races, and non-Hispanic Native Hawaiian or Other Pacific Islander). Three indicator variables were then created to compare each of the predominantly serving minority centers to predominantly serving non-Hispanic White centers. These race and ethnicity variables are based on percentages obtained by dividing the number of participants in the specific race and ethnicity category by the total number of participants in the center. The average distribution in each racial/ethnic category showed high percentages of participants of the corresponding race/ethnic group and small percentages for the other three noncorresponding groups. For predominantly non-Hispanic White centers, on average, 82.9% of participants were non-Hispanic White, 8% non-Hispanic Black, 5.3% Hispanic, and 3.4% other race/ethnicity. In predominantly non-Hispanic Black centers, 79.5% of participants were non-Hispanic Black, 15.7% non-Hispanic White, 3.1% Hispanic, and 1.5% other race/ethnicity. For predominantly Hispanic centers, 90% were Hispanic, 5.6% non-Hispanic White, 2.6% non-Hispanic Black, and 1.9% other participants. For predominantly other centers, 88.8% were other race/ethnicity, 5.4% non-Hispanic White, 4% Hispanic, and 1.7% non-Hispanic Black.

The cutoff of more than 50% was chosen as a simple, mutually exclusive categorization that allows for a comparison of each race/ethnic group separately. Concentrating on these centers could support culturally driven programming, tailoring of services to the unique needs of a specific community, and the identification of differences in characteristics and service elements that may underscore disparities. This division was also sensitive to statistically significant differences among the independent variables, compared with a higher cutoff. A cutoff of more than 75% was tested and the same variables had the same direction of statistically significant effects as when using the >50% cutoff with larger odds ratios. Lower percentage cut points and percentiles were also considered but cutoffs of 25% to 50% did not represent mutually exclusive comparison categories. This strategy was similar to research on nursing home case-mix of racial/ethnic minorities that operationalized a high concentration of minorities as more than 35% of residents (Campbell et al., 2016), though this study uses a higher cutoff for a "high concentration."

Regional Characteristics

Three measures were included to account for the regional characteristics: U.S. Census regions, MSA, and county-level racial/ethnic minority populations. Region was measured by grouping of coterminous states into geographic areas corresponding to groups used by the U.S. Census Bureau (see: http://www.census.gov/geo/maps-data/maps/pdfs/reference/us_regdiv.pdf). Region consisted of Northeast, Midwest, South, and West and was included in the logistic regression model with Northeast as the referent category. MSA was delineated using the Office of Management and Budget definition and was coded to compare metropolitan and nonmetropolitan areas. MSA was excluded from logistic regression analyses of predominantly Hispanic and predominantly other race/ethnicity models because of small cell sizes. The 2014 Census county-level population included three variables: proportion of Hispanics of any age per county, proportion of non-Hispanic Blacks of any age per county, and proportion of non-Hispanic other races and ethnicities of any age by county.

ADSC Characteristics

Five concepts were measured to account for center characteristics. First is whether the center was part of a national or regional chain. Second, the type of ownership of the center was categorized as for-profit and nonprofit or government. Third, disease-specific programming included four measures indicating whether a center offered each of the following programs for: Alzheimer's disease or other dementia, depression, diabetes, and cardiovascular disease. Fourth, four measures indicated whether or not a center provided each of the following services: transportation to and from the center, to medical appointments or to social activities; nursing or skilled nursing services; social work services; and physical, occupational, or speech therapies. Services were provided by paid center employees or arranged for or paid for by outside providers. Services for which the center only provided referrals were not considered to be provided by the center. And fifth, revenue sources included three items measured as the percentage of revenue received from the following three sources: Medicaid (including Medicaid managed care programs), other government sources (not Medicaid or Medicare), and self pay by the participant or family.

Participant Characteristics

Four concepts were measured to account for participant characteristics that are important indicators of health and disability needs of ADSC participants. Aggregate participant characteristics included the percentage of participants per center with these characteristics: female; aged 65 and older; difficulty eating, dressing, bathing, toileting, and walking; and with each of the following diagnosed health conditions: intellectual or developmental disabilities (IDD), Alzheimer's disease or other dementias, severe mental illness, depression, cardiovascular disease, and diabetes.

Method

This study included bivariate analyses, followed by multiple logistic models to further examine associations while adjusting for all regional, center, and participant characteristics. The bivariate analyses examined all characteristics among centers belonging to each of the three racial/ethnic groups to compare each minority group to the non-Hispanic White group. Differences were evaluated using chi-square tests for categorical provider-level variables and *t* tests for percentages of revenue sources and participant-level variables that represent the mean percentage of participants having the relevant characteristics. Three logistic regression analyses were used to identify statistically significant associations between each of the characteristics and centers predominantly serving each racial/ethnic minority: (a) predominantly Hispanic centers, compared with predominantly non-Hispanic White centers; (b) predominantly non-Hispanic Black centers, compared with predominantly non-Hispanic White centers; and (c) predominantly non-Hispanic other race/ethnicity centers, compared with predominantly non-Hispanic White centers. In these models, the racial/ethnic minority group was entered as the dependent variable to test associations while controlling for all of the characteristics (geographic, county-level racial/ethnic populations, center-level, and participant-level characteristics), which were entered as independent variables.

Analyses accounted for the complex survey design of the 2014 NSLTCP. Weights were used to adjust for unknown eligibility status of nonresponding ADSCs and for nonresponse bias.

Results are nationally representative. See the 2014 NSLTCP readme documentation for details about the weighting methods (NSLTCP, 2015). All analyses used Stata/SE, version 14 (StataCorp, 2015) and applied appropriate weights. Cases with missing data ranged from 1% to 4.2% per variable. Only cases with no missing data on all analysis variables were used in the logistic regression models, resulting in a reduction of approximately 8% of cases in each model.

Results

About 40% of ADSCs had a population that was at least 50% made up of a single racial/ethnic minority: 13% of centers were predominantly Hispanic, 17% were predominantly non-Hispanic Black centers, 9% were predominantly other non-Hispanic minority centers, and 61% were predominantly non-Hispanic White centers. Table 1 shows the profiles of characteristics for each predominantly minority center and denotes statistically significant differences as compared with predominantly non-Hispanic White centers. Compared with predominantly non-Hispanic White centers (79.5%), a higher percentage of predominantly Hispanic (91.9%) and predominantly non-Hispanic other centers (93.3%) were in MSAs. Predominantly Hispanic (74.8%) and predominantly non-Hispanic Black (68.4%) centers were mostly located in the South and predominantly non-Hispanic other centers were mostly located in the West (62.1%), compared with predominantly non-Hispanic White centers that were more evenly distributed across the country. Compared with predominantly non-Hispanic White centers, a higher percentage of all three groups of predominantly racial/ethnic minority centers were for-profit (Hispanic: 77.4%; non-Hispanic Black: 52.5%; non-Hispanic other: 64.7%; non-Hispanic White: 31.8%) and received a higher percent of revenue from Medicaid (Hispanic: 77.1%; non-Hispanic Black: 67.8%; non-Hispanic other: 69.5%; non-Hispanic White: 41.5%). All three groups of predominantly racial/ethnic minority centers had a lower percentage of revenue from other government sources and from self pay, compared with predominantly non-Hispanic White centers.

Overall, a higher percentage of predominantly Hispanic, non-Hispanic Black, and non-Hispanic other centers provided disease-specific programming compared with predominantly non-Hispanic White centers. Compared with predominantly non-Hispanic White centers, a lower percentage of predominantly Hispanic centers provided social work (32.3%; non-Hispanic White: 51.1%) and therapeutic services (30.1%; non-Hispanic White: 50.0%).

A higher percentage of participants in all three groups of predominantly racial/ethnic minority centers were women (Hispanic: 61.7%; non-Hispanic Black: 62.3%; non-Hispanic other: 66.0%), compared with 57.4% of participants in non-Hispanic White centers. All three groups of predominantly racial/ethnic minority centers had comparable or lower percentages of participants with IDD, Alzheimer's disease or other dementias, and severe mental illness, compared with non-Hispanic White centers. Predominantly racial/ethnic minority centers had higher percentages of participants with depression, cardiovascular disease, and diabetes, compared with non-Hispanic White centers, with the exception of non-Hispanic Black centers that had a lower percentage with depression. All three groups of predominantly racial/ethnic minority centers had a comparable or lower percentage of

participants with activity of daily living (ADL) limitations, except non-Hispanic other centers had a higher percentage of participants needing assistance with walking (38.4%), compared with predominantly non-Hispanic White centers (33.7%).

Table 2 shows odds ratios with confidence intervals from each of the three logistic regression models. Many of the statistically significant differences found in the bivariate analyses were no longer statistically significant after adjusting for all of the characteristics.

Predominantly Hispanic Centers Compared With Predominantly Non-Hispanic White Centers

Table 2 shows that, as expected, predominantly Hispanic centers were more positively associated with counties having higher percentages of Hispanics and non-Hispanic other racial/ethnic minorities. Predominantly Hispanic centers were more likely to be in the South (odds ratio [OR] = 2.55, $p < .01$), but less likely to be in the West (OR = .15, $p < .001$) than in the Northeast. Compared with predominantly non-Hispanic White centers, having a predominantly Hispanic case-mix was positively associated with centers that provide transportation services (OR = 3.87, $p < .05$) and negatively associated with centers that received revenue from other government (OR = .99, $p < .05$) and self pay sources (OR = .97, $p < .001$). Predominantly Hispanic centers were associated with having more female participants (OR = 1.02, $p < .05$) and participants diagnosed with diabetes (OR = 1.04, $p < .001$). Predominantly Hispanic centers were associated with having fewer participants diagnosed with depression (OR = .97, $p < .001$) and cardiovascular disease (OR = .98, $p < .01$); and greater odds of having participants diagnosed with diabetes (OR = 1.04, $p < .05$).

Predominantly Non-Hispanic Black Centers Compared With Predominantly Non-Hispanic White Centers

Table 2 shows the results for predominantly non-Hispanic Black centers compared with non-Hispanic White centers. They were more likely than predominantly non-Hispanic White centers to reside in counties with higher percentages of Hispanic, non-Hispanic Black, and non-Hispanic other minorities. Centers with a predominantly non-Hispanic Black case-mix were positively associated with being located in a MSA (OR = 2.44, $p < .001$) and located in the Midwest (OR = 1.97, $p < .05$) and South (OR = 3.33, $p < .001$), compared with the Northeast. Compared with predominantly non-Hispanic White centers, predominantly non-Hispanic Black centers were positively associated with for-profit centers (OR = 1.42, $p < .05$) and centers that provide transportation services (OR = 2.93, $p < .01$); but negatively associated with centers that provide programs for cardiovascular disease (OR = .52, $p < .50$) and receiving self pay revenue (OR = .95, $p < .001$). In terms of participant characteristics, compared with predominantly non-Hispanic White centers, predominantly non-Hispanic Black centers were associated with centers having more female participants (OR = 1.02, $p < .001$) and participants with diabetes (OR = 1.03, $p < .001$). They were associated with centers having fewer participants age 65 and over (OR = .98, $p < .001$); and fewer participants diagnosed with intellectual and developmental disabilities (OR=.98, $p<.001$) and depression (OR = .97, $p < .001$).

Predominantly Non-Hispanic Other Centers, Compared with Predominantly Non-Hispanic White Centers

The third section of Table 2 shows that predominantly non-Hispanic other centers were located in counties with higher percentages of Hispanic, non-Hispanic Black, and non-Hispanic other minorities and were more likely to be located in the Midwest (OR = 2.52, p < .05) than in the Northeast. Compared with predominantly non-Hispanic White centers, centers with predominantly non-Hispanic other case-mix were positively associated with for-profit centers (OR = 1.98, p < .01) and centers that provide programs for diabetes (OR = 4.97, p < .01). They were negatively associated with centers receiving self pay revenue (OR = .96, p < .001). Predominantly non-Hispanic other centers were associated with centers having more female participants (OR = 1.04, p < .001) and participants age 65 and over (OR = 1.02, p < .01). Predominantly non-Hispanic other centers were negatively associated with having participants with difficulties bathing (OR = .99, p < .05); toileting (OR = .98, p < .01); diagnosed with intellectual and developmental disabilities (OR = .97, p < .001); diagnosed with Alzheimer's disease or other dementias (OR = .98, p < .01); diagnosed with severe mental illness (OR = .97, p < .01); and diagnosed with depression (OR = .97, p < .001). Predominantly non-Hispanic other centers were positively associated with having participants with difficulty walking (OR = 1.01, p < .01) and diagnosed with diabetes (OR = 1.02, p < .05).

Discussion

Using survey data on ADSCs from the 2014 NSLTCP, this study examined the characteristics associated with ADSCs where more than 50% of currently enrolled participants were Hispanic, non-Hispanic Black, or non-Hispanic of other races, respectively, compared with ADSCs where more than 50% of enrolled participants were non-Hispanic White. The findings showed some differences by the racial and ethnic categories, even when accounting for regional differences and county-level percentages of racial and ethnic minority populations. Some differences were found by region, center-level characteristics, and characteristics of participants.

As expected, being in MSAs was associated with centers predominantly serving non-Hispanic Black adults. Centers in counties with higher percentages of minorities were more likely to predominantly serve the three minority groups. The South was more likely to have centers that predominantly served Hispanic and non-Hispanic Black participants, whereas centers predominantly serving participants of other race/ethnicities were in the Midwest.

In terms of center characteristics, for-profit ADSCs were associated with predominantly minority centers (specifically, non-Hispanic Black and other race/ethnicity); centers providing transportation services were more likely to be predominantly non-Hispanic Black and other race/ethnicity centers; and programming for diabetes was more likely in predominantly other race/ethnicity centers, compared with predominantly non-Hispanic White ADSCs. However, centers having cardiovascular programs were less likely in predominantly non-Hispanic Black centers. The percentage of self-pay revenue sources was lower in predominantly minority centers.

Previous research on nursing homes shows that racial/ethnic minorities are more likely to reside in for-profit nursing homes and that nursing homes serving minorities had a greater percentage of their revenue from Medicaid (Campbell et al., 2016). Several studies have concluded that for-profit status and disproportionate reliance on Medicaid as a revenue source can be associated with quality deficiencies in nursing homes (Hillmer et al., 2005; Mor et al., 2004; O'Neill et al., 2003). As little is known about ADSC quality, particularly about possible disparities for racial/ethnic minority participants, we do not know whether these characteristics have similar quality implications for ADSCs. The differences in revenue sources, programming, and services offered between predominantly minority and non-Hispanic White ADSCs are a new finding, suggesting some differences in resources and services for different populations.

All three groups of the predominantly racial and ethnic minority centers had a higher percentage of participants with diabetes, which is consistent with a higher prevalence of diabetes among Hispanic, non-Hispanic Black, and other minorities (Centers for Disease Control and Prevention, 2020). Predominantly minority centers either showed no differences or had lower percentages of the other health-related characteristics, compared with predominantly non-Hispanic White ADSCs. These findings seem in contrast to research showing that Black and Hispanic older adults, in general, are more likely than White older adults to have Alzheimer's disease and cognitive impairment (Alzheimer's Association, 2019; Lines et al., 2014), to have more symptoms of depression (Skarupski et al., 2005), and more likely to die from cardiovascular disease (Heron & Anderson, 2016). However, ADSC participants tend to be younger and have lower rates of Alzheimer's disease, depression, heart disease, and ADLs, compared with users of other long-term care providers (Harris-Kojetin et al., 2016, 2019). The findings in this study may indicate racial/ethnic minority users of ADSCs may be different from minority users of other long-term care providers or the general population of older adults of racial/ethnic minority groups. Trends in certain health conditions, such as the projected increase in Alzheimer's disease/dementia among older adults from 5.8 in 2020 to 13.8 in 2050 (Alzheimer's Association, 2019), may impact the types of LTSS that minorities use.

Limitations

This study was descriptive and causal relationships cannot be drawn. Nor can the findings determine whether differences by race/ethnic case-mix were due to centers responding to the needs of their participants or whether centers were more likely to have participants of a particular race/ethnicity enrolled because of the services they provided and the community in which the center is located. For example, transportation services may be more prevalent in locations that have fewer public transportation options or private car ownership, but some centers may be more likely to provide transportation services when enrolled participants have the need, regardless of community-level transportation infrastructure. Due to the aggregate-level of participant information based on the survey design, the analyses cannot control for individual-level demographic, behavioral, psychosocial, attitudinal, or enabling factors that may be associated with racial/ethnic minorities' use of ADSCs. The comparisons between predominantly minority centers and predominantly non-Hispanic White centers, both in bivariate analyses and by examining odds ratios from the logistic regression models,

show small, but statistically significant differences in some cases, whereas other differences may seem larger, yet do not meet statistical significance at $p < .05$. This article excluded the category of centers that did not primarily serve any one racial and ethnic group because the focus was on comparing specific racial and ethnic groups; however, these diverse centers may also represent a unique group of ADSCs to include in future analyses.

Despite these limitations, the study used the latest data on a census of ADSCs in the United States. The analyses uniquely account for regional and community-level characteristics along with center-level and participant characteristics.

Conclusion

Overall, this study showed that predominantly minority centers were very similar to predominantly White centers, but there were several key differences by center- and participant-level characteristics. All three groups of predominantly minority ADSCs were more likely to be for-profit, received a lower percentage of revenue from self pay, and had a higher percentage of participants with diabetes. Given that a higher percentage of participants of ADSCs were racial/ethnic minorities in 2014 and 2016, compared with other long-term care sectors, ADSCs have the potential to provide needed services to a growing population of disabled and aging racial and ethnic minorities.

Over the years, ADSCs have undergone policy changes, including Medicare Advantage coverage (Span, 2018) and increased use of Medicaid HCBS waiver programs (Fabius et al., 2019; Gorges et al., 2019). Some studies have examined how these ongoing shifts from institutional settings to the community and variations in state funding sources may produce racial/ethnic disparities in HCBS use (Fabius et al., 2019; Gorges et al., 2019). In 2020, LTSSs were significantly affected by the novel coronavirus pandemic, leading to many operational changes and closures of ADSCs. Coronavirus disease 2019 disproportionately affects older adults, those with pre-existing conditions, and racial and ethnic minorities in the United States (Gardner et al., 2020; Laurencin & McClinton, 2020) and the pandemic may have a lasting impact on ADSCs and racial/ethnic minority participants. Findings from this study can help fill the current knowledge gap on racial/ethnic differences in the use of an important HCBS, and provide a baseline for studying diverse users of ADSCs.

Acknowledgments

References

Alzheimer's Association. (2019). 2019 Alzheimer's disease facts and figures. Alzheimer's Dementia, 15(3), 321–387. https://www.alz.org/media/documents/alzheimers-facts-and-figures-2019-r.pdf

Anderson KA, Park JH, Monteleone RG, & Dabelko-Schoeny HI (2014). Heterogeneity within adult day services: A focus on centers that serve younger adults with intellectual and developmental

disabilities. Home Health Care Services Quarterly, 33(2), 77–88. 10.1080/01621424.2014.907554 [PubMed: 24766624]

Brown EL, Friedemann ML, & Mauro AC (2014). Use of adult day care service centers in an ethnically diverse sample of older adults. Journal of Applied Gerontology, 33(2), 189–206. 10.1177/0733464812460431 [PubMed: 24652954]

Campbell LJ, Cai X, Gao S, & Li Y (2016). Racial/ethnic disparities in nursing home quality of life deficiencies, 2001 to 2011. Gerontology and Geriatric Medicine, 2, 1–9. 10.1177/2333721416653561

Bureau Census. (2015). U.S. Census Bureau projections show a slower growing, older, more diverse nation a half century from now http://www.census.gov/newsroom/releases/archives/population/cb12-243.html

Centers for Disease Control and Prevention. (2020). National diabetes statistics report: Estimates of diabetes and its burden in the United States https://www.cdc.gov/diabetes/pdfs/data/statistics/national-diabetes-statistics-report.pdf

Dabelko-Schoeny H, Anderson KA, & Guada J (2014). Adult day services: A service platform for delivering mental health care. Aging and Mental Health, 17(2), 207–214. 10.1080/13607863.2012.724653

Fabius CD, Ogarek J, & Shireman TI (2019). Racial disparities in Medicaid home and community-based service utilization among white, black, and Hispanic adults with multiple sclerosis: Implications of state policy. Journal of Racial and Ethnic Health Disparities, 6(6), 1200–1207. 10.1007/s40615-019-00621-9 [PubMed: 31359384]

Gardner W, States D, & Bagley N (2020). The coronavirus and the risks to the elderly in long-term care. Journal of Aging & Social Policy, 4 2020, 1–6. 10.1080/08959420.2020.1750543

Gorges RJ, Sanghavi P, & Konetzka RT (2019). A national examination of long-term care setting, outcomes, and disparities among elderly dual eligibles. Health Affairs, 38(7), 1110–1118. 10.1377/hlthaff.2018.05409 [PubMed: 31260370]

Harris-Kojetin L, Sengupta M, Lendon JP, Rome V, Valverde R, & Caffrey C (2019). Long-term care providers and services users in the United States, 2015–2016 (National Center for Health Statistics, Vital & Health Statistics, Series 3, No. 43) https://www.cdc.gov/nchs/data/series/sr_03/sr03_43-508.pdf

Harris-Kojetin L, Sengupta M, Park-Lee E, Valverde R, Caffrey C, Rome V, & Lendon J (2016). Long-term care providers and services users in the United States: Data from the National Study of Long-Term Care Providers, 2013–2014 (National Center for Health Statistics, Vital & Health Statistics, Series 3, No. 38). http://www.cdc.gov/nchs/data/series/sr_03/sr03_038.pdf

Hayward MD, Crimmins EM, Miles TP, & Yang Y (2000). The significance of socioeconomic status in explaining the racial gap in chronic health conditions. American Sociological Review, 65(6), 910–930. https://www.jstor.org/stable/2657519

Hazin R, & Giles CA (2011). Is there a color line in death? An examination of end-of-life care in the African American community. Journal of the National Medical Association, 103(7), 609–613. 10.1016/S0027-9684(15)30387-4 [PubMed: 21999036]

Heron M, & Anderson RN (2016). Changes in the leading cause of death: Recent patterns in heart disease and cancer mortality (NCHS Data Brief No. 254). National Center for Health Statistics.

Hillmer MP, Wodchis WP, Gill SS, Anderson GM, & Rochon PA (2005). Nursing home profit status and quality of care: Is there any evidence of an association? Medical Care Research and Review, 62(2), 139–166. 10.1177/1077558704273769 [PubMed: 15750174]

Laurencin CT, & McClinton A (2020). The COVID-19 pandemic: A call to action to identify and address racial and ethnic disparities. Journal of Racial and Ethnic Health Disparities, 7, 398–402. 10.1007/s40615-020-00756-0 [PubMed: 32306369]

Lendon JP, & Rome V (2018). Variation in adult day services center participant characteristics, by center ownership: United States, 2016 (NCHS Data Brief No. 296) www.cdc.gov/nchs/products/databriefs/db296.htm

Lines LM, Sherif NA, & Wiener JM (2014). Racial and ethnic disparities among individuals with Alzheimer's disease in the United States: A literature review (RTI Press Publication No. RR-0024–1412) RTI Press. http://www.rti.org/rtipress

Miller B, Campbell RT, Davis L, Furner S, Giachello A, Prohaska T, Kaufman JE, Li M, & Perez C (1996). Minority use of community long-term care services: A comparative analysis. The Journals of Gerontology, Series B: Psychological Sciences & Social Sciences, 51(2), 70–81. 10.1093/geronb/51B.2.S70

Mor V, Zinn J, Angelelli J, Teno JM, & Miller SC (2004). Driven to tiers: Socioeconomic and racial disparities in the quality of nursing home care. The Milbank Quarterly, 82(2), 227–256. 10.1111/j.0887-378X.2004.00309.x [PubMed: 15225329]

National Study of Long-Term Care Providers. (2014). Survey documentation. http://www.cdc.gov/nchs/data/nsltcp/nsltcp_2014_survey_methodology_and_documentation.pdf

National Study of Long-Term Care Providers. (2015). Adult day services center survey restricted data file data description and usage (readme). https://www.cdc.gov/nchs/data/nsltcp/nsltcp_2014_adsc_readme_rdc_release.pdf

Ng T, Harrington C, Musumeci M, & Reaves EL (2015). Medicaid home and community-based services programs: 2012 data update. Kaiser Family Foundation http://kff.org/medicaid/report/medicaid-home-and-community-based-services-programs-2012-data-update/

Ngo-Metzger Q, Phillips RS, & McCarthy EP (2008). Ethnic disparities in hospice use among Asian-American and Pacific Islander patients dying with cancer. Journal of American Geriatric Society, 56(1), 139–144. 10.1111/j.1532-5415.2007.01510.x

Nuru-Jeter AM, Thorpe RJ, & Fuller-Thompson E (2011). Black-white differences in self-reported disability outcomes in the US: Early childhood to older adulthood. Public Health Reports, 126(6), 834–843. 10.1177/003335491112600609 [PubMed: 22043099]

O'Neill C, Harrington C, Kitchener M, & Saliba D (2003). Quality of care in nursing homes: An analysis of relationships among profit, quality, and ownership. Medical Care, 41(12), 1318–1330. https://www.jstor.org/stable/3768307 [PubMed: 14668664]

Park-Lee E, Harris-Kojetin LD, Rome V, & Lendon JP (2015). Variation in adult day services center participant characteristics, by center ownership: United States, 2014 (NCHS Data Brief No. 227) National Center for Health Statistics.

Rome V, Harris-Kojetin LD, & Park-Lee E (2015). Variation in operating characteristics of adult day services centers, by center ownership: United States, 2014 (NCHS Data Brief No. 224) National Center for Health Statistics.

Sadarangani TR, & Murali KP (2018). Service use, participation, experiences, and outcomes among older adult immigrants in American adult day service centers: An integrative review of the literature. Research in Gerontological Nursing, 11(6), 317–328. 10.3928/19404921-20180629-01 [PubMed: 29989644]

Skarupski KA, De Leon CFM, Bienias JL, Barnes LL, Everson-Rose SA, Wilson RS, & Evans DA (2005). Black–White differences in depressive symptoms among older adults over time. The Journals of Gerontology, Series B: Psychological Sciences & Social Sciences, 60(3), 136–142. 10.1093/geronb/60.3.P136

Smith DB, Feng Z, Fennell ML, Zinn JS, & Mor V (2007). Separate and unequal: Racial segregation and disparities in quality across U.S. nursing homes. Health Affairs, 26(5), 1448–1458. 10.1377/hlthaff.26.5.1448 [PubMed: 17848457]

Span P (2018, 7 20). Medicare advantage is about to change. Here's what you should know. The New York Times. https://www.nytimes.com/2018/07/20/health/medicare-advantage-benefits.html

StataCorp. (2015). Stata statistical software: Release 14 College Station, TX: StataCorp LP.

Thomeer MB, Mudrazija S, & Angel JL (2015). How do race and Hispanic ethnicity affect nursing home admission? Evidence from the Health and Retirement Study. The Journals of Gerontology, Series B: Psychological Sciences & Social Sciences, 70(4), 628–638. 10.1093/geronb/gbu114

Wallace SP, Levy-Storms L, Kington RS, & Andersen RM (1998). The persistence of race and ethnicity in the use of long-term care. The Journals of Gerontology, Series B: Psychological Sciences & Social Sciences, 53(2), 104–112. 10.1093/geronb/53B.2.S104

Zarit SH, Kim K, Femia EE, Almeida DM, & Klein LC (2013). The effects of adult day services on family caregivers' daily stress, affect, and health: Outcomes from the Daily Stress and Health (DaSH) Study. The Gerontologist, 54(4), 570–579. 10.1093/geront/gnt045 [PubMed: 23690056]

Table 1.

Bivariate Analyses of Predominantly Hispanic, Non-Hispanic Black, Non-Hispanic Other Centers, Compared With Predominantly Non-Hispanic White Adult Day Services Centers, NSLTCP 2014.

Characteristics	Hispanic (n = 292) %	SE	NH Black (n = 411) %	SE	NH other (n = 195) %	SE	NH White (n = 1,534) %	SE
Metropolitan statistical area								
Metropolitan	91.9 *	1.2	81.2	1.2	93.3 *	1.2	79.5	0.6
Micropolitan or neither	8.1 *	1.2	18.8	1.2	6.7 *	1.2	20.5	0.6
U.S. region								
Northeast	6.8 *	1.0	11.0 *	1.0	15.2 *	1.7	26.9	0.4
Midwest	1.1 *	0.4	15.8 *	1.0	10.3 *	1.4	24.2	0.4
South	74.8 *	1.8	68.4 *	1.3	12.3 *	1.8	20.3	0.4
West	17.3 *	1.7	4.8 *	0.9	62.1 *	2.4	28.6	0.5
Organizational characteristics								
Chain	41.9	2.3	32.9 *	1.7	45.4	2.9	43.0	0.8
For profit	77.4 *	1.9	52.5 *	1.8	64.7 *	2.7	31.8	0.8
Disease-specific center programming								
Alzheimer's disease/ dementias	70.2	2.2	77.3 *	1.6	74.0 *	2.5	68.2	0.8
Depression	68.0 *	2.3	62.5 *	1.8	68.7 *	2.6	48.0	0.8
Diabetes	76.5 *	2.0	77.5 *	1.5	75.9 *	2.4	57.8	0.8
Cardiovascular disease	72.7 *	2.1	68.5 *	1.7	68.9 *	2.6	53.1	0.8
Center services provided								
Transportation services	94.5 *	1.1	94.1 *	0.8	91.7 *	1.4	87.5	0.6
Skilled nursing services	69.7 *	2.1	79.9 *	1.5	76.5 *	2.4	62.4	0.8
Social work services	32.3 *	2.2	57.5 *	1.7	73.9 *	2.4	51.1	0.8
Therapeutic services	30.1 *	2.2	49.5	1.9	66.6 *	2.6	50.0	0.8

Percent of center revenue from following sources

Characteristics	Hispanic (*n* = 292) %	SE	NH Black (*n* = 411) %	SE	NH other (*n* = 195) %	SE	NH White (*n* = 1,534) %	SE
Medicaid	77.1 *	1.6	67.8 *	1.3	69.5 *	2.1	41.5	0.6
Other government sources	8.9 *	1.2	13.7 *	1.0	9.8 *	1.4	25.7	0.6
Self-pay	4.6 *	0.6	8.8 *	0.6	12.8 *	0.9	21.9	0.5
Participant demographics								
Female	61.7 *	0.6	62.3 *	0.6	66.0 *	0.8	57.4	0.3
Age 65 and up	61.5	1.3	60.1	1.0	86.4 *	1.4	62.5	0.6
Participant activity of daily living limitations								
Needs help with eating	14.5 *	1.1	25.0 *	0.9	19.4 *	1.5	32.8	0.5
Needs help with dressing	22.6 *	1.4	36.6 *	1.1	38.1	2.0	40.3	0.6
Needs help with bathing	23.2 *	1.5	39.0 *	1.3	42.1	2.2	43.6	0.6
Needs help with toileting	22.0 *	1.3	36.6 *	1.0	30.7 *	1.8	41.7	0.5
Needs help with walking	23.0 *	1.2	33.9	1.0	38.4 *	2.0	33.7	0.5
Participant diagnosed conditions								
Intellectual or developmental disability	21.1 *	1.5	20.5 *	1.0	8.6 *	1.4	34.5	0.7
Alzheimer's disease or other dementias	19.2 *	1.1	33.8 *	1.0	33.2 *	1.5	40.0	0.6
Severe mental illness	6.9	0.7	9.1	0.7	5.1 *	0.7	8.2	0.3
Depression	26.3 *	1.2	17.5 *	0.7	25.2 *	1.4	21.6	0.4
Cardiovascular disease	40.4 *	1.4	45.1 *	1.1	55.1 *	2.0	34.5	0.5
Diabetes	41.0 *	1.2	31.8 *	0.8	35.0 *	1.3	19.7	0.3

Source. NCHS, National Study of Long-Term Care Providers (2014).

Note. Percentages and SEs are rounded up to the nearest tenth. NSLTCP = National Study of Long-term Care Providers; NH = non-Hispanic; NCHS = National Center for Health Statistics.

*
Chi-square or *t* tests were statistically significant at the *p* < .05 between each minority group and the non-Hispanic White group.

Table 2.

Multiple Logistic Regression Models for Predominantly Hispanic, Non-Hispanic Black, Non-Hispanic Other Centers, Compared With Predominantly Non-Hispanic White Adult Day Services Centers, Respectively, NSLTCP 2014.

Characteristics	Hispanic (n = 292) OR	95% CI		NH Black (n = 411) OR	95%CI		NH other (n = 195) OR	95% CI	
Geographic and center-level characteristics									
County minority population percentage									
Percent non-Hispanic Black	1.02	0.98	1.07	1.18 ***	1.16	1.20	1.07 ***	1.04	1.10
Percent non-Hispanic other	1.08 **	1.03	1.12	1.06 **	1.02	1.10	1.17 ***	1.14	1.19
Percent Hispanic	1.13 ***	1.11	1.15	1.03 ***	1.01	1.04	1.04 ***	1.02	1.06
Metropolitan statistical area	n/a			2.44 ***	1.53	3.88	n/a		
U.S. region (Northeast referent)									
Midwest	0.81	0.31	2.11	1.97 *	1.12	3.44	2.52 *	1.24	5.11
South	2.55 **	1.35	4.81	3.33 ***	1.96	5.65	1.61	0.79	3.29
West	0.15 ***	0.06	0.41	0.65	0.31	1.38	1.91	0.86	4.23
For profit	1.45	0.84	2.51	1.42 *	1.01	2.02	1.98 **	1.25	3.14
Diabetes disease programming	1.15	0.42	3.14	1.78	0.89	3.57	4.97 **	1.75	14.12
Cardiovascular disease programming	0.91	0.34	2.38	0.52 *	0.27	0.99	0.43	0.16	1.14
Transportation services provided	3.87 *	1.16	12.90	2.93 **	1.33	6.45	1.00	0.39	2.55
Percent center revenue from other government sources	0.99 *	0.98	1.00	1.00	0.99	1.00	1.00	0.99	1.01
Percent center revenue from self-pay	0.97 ***	0.95	0.98	0.95 ***	0.93	0.96	0.96 ***	0.95	0.97
Participant-level characteristics									
Female	1.02 *	1.00	1.04	1.02 ***	1.01	1.04	1.04 ***	1.02	1.05
Age 65 and up	1.00	0.99	1.02	0.98 ***	0.97	0.99	1.02 **	1.00	1.03
Needs help with bathing	0.99	0.99	1.00	0.99	0.98	1.00	0.99 *	0.98	1.00

Characteristics	Hispanic (*n* = 292)			NH Black (*n* = 411)			NH other (*n* = 195)		
	OR	95% CI		OR	95%CI		OR	95% CI	
Needs help with toileting	0.99	0.98	1.00	0.99	0.99	1.00	0.98 **	0.97	0.99
Needs help with walking	1.00	0.99	1.02	1.00	0.99	1.01	1.01 **	1.01	1.02
Intellectual/developmental disorder	0.99	0.98	1.00	098 ***	0.97	0.99	0.97 ***	0.96	0.99
Alzheimer's disease/other dementias	0.99	0.98	1.00	1.01	1.00	1.01	0.98 **	0.97	0.99
Severe mental illness	1.00	0.99	1.01	1.01	0.99	1.02	0.97 **	0.96	0.99
Depression	0.97 ***	0.96	0.99	0.97 ***	0.96	0.98	0.97 ***	0.96	0.98
Cardiovascular disease	0.98 **	0.97	0.99	1.00	1.00	1.01	0.99	0.99	1.00
Diabetes	1.04 ***	1.02	1.05	1.03 ***	1.02	1.04	1.02 *	1.00	1.03

Source. NCHS, National Study of Long-Term Care Providers (2014).

Note. ORs and CIs are rounded up to the nearest one hundredth. Analyses also included the following variables, which were not statistically significant: chain status, Alzheimer's disease, depression disease specific programming, nursing, social work, and therapeutic services provided, Medicaid revenue source, and needs help with eating and dressing. NSLTCP = National Study of Long-Term Care Providers; NH = non-Hispanic; OR = odds ratio; CI = confidence interval; NCHS = National Center for Health Statistics.

*
p < .05.

**
p < .01.

***
p < .001.