

The Occupational Therapy Assistant Workforce in Skilled Nursing Facilities

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Prepared by:
Tracy M. Mroz, PhD, OTR/L
Arati Dahal, PhD
Susan M. Skillman, MS
Bianca K. Frogner, PhD
Center for Health Workforce Studies
University of Washington



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EXECUTIVE SUMMARY

Occupational therapy assistants (OTAs) are licensed healthcare professionals who are critical to the occupational therapy workforce in skilled nursing facilities (SNFs). OTAs work in partnership with occupational therapists (OTs) to deliver rehabilitation services to support optimal function for short-stay residents under the Medicare Part A SNF benefit and for long-stay residents under the Medicare Part B outpatient rehabilitation benefit. Recent changes to Medicare payment policy have the potential to impact the OTA workforce in SNFs, including the implementation of the Patient Driven Payment Model (PDPM) in October 2019 for post-acute care stays under Part A and the introduction of differential payments for treatments provided by OTAs versus OTs under the Medicare Physician Fee Schedule for Part B services in January 2022. In order to consider potential unintended consequences of these new policies, it is important to first establish a baseline understanding of the OTA workforce overall and variation in the OTA workforce based on SNF characteristics.

This study describes the OTA workforce in Medicare-certified SNFs in the 12-month period between October 2018-September 2019 prior to implementation of PDPM. For this study we drew from several publicly available administrative datasets from the Centers for Medicare and Medicaid Services (CMS), including the Payroll Based Journal (PBJ), Nursing Home Compare (NHC), and the Post-Acute Care and Hospice Provider Utilization and Payment Public Use File (PAC PUF). We calculated two measures of OTA staffing: 1) OTA staffing minutes per resident-day, and 2) the percent of occupational therapy practitioner staffing in SNFs attributed to OTAs. We examined variation in these two measures of OTA staffing based on SNF characteristics such as ownership, region, urban-rural location, number of certified beds, quality star rating, use of contract staff, resident acuity, and level of socioeconomic disadvantage of the community in which the SNF is located.

Findings highlight the importance of OTAs to the SNF workforce and the residents they serve:

- Nearly 95% of SNFs that provide occupational therapy services utilized OTAs.
- OTAs contributed to over half of total occupational therapy staffing minutes in SNFs.
- The contribution of OTAs to total occupational therapy staffing minutes varied by state, ranging from a low of 20% in Alaska to a high of 67% in Ohio.
- Average OTA staffing minutes were the second highest among all occupational and physical therapy practitioners at 5.6 minutes per resident-day.
- OTA staffing minutes per resident-day varied by SNF characteristics with higher amounts of OTA staffing minutes per resident-day on average in freestanding versus in-hospital SNFs, SNFs with 100 or more certified beds versus fewer than 100 certified beds, SNFs with a smaller percent of Medicaid residents, SNFs with a higher volume of short-stay episodes, and SNFs that use contract therapy staff.

- OTA staffing minutes as a percent of total occupational therapy staffing minutes also varied by SNF characteristics with a higher percent of OTA staffing minutes associated with freestanding versus in-hospital SNFs, SNFs with 50 or more certified beds versus fewer than 50 certified beds, SNFs with a higher percent of Medicaid residents, and SNFs that use contract therapy staff.
- OTAs are particularly important for provision of occupational therapy services in SNFs located in rural communities and in communities with high levels of socioeconomic disadvantage; OTA staffing minutes as a percent of total occupational therapy staffing minutes increased as rurality and level of socioeconomic disadvantage of the community in which the SNF is located increased, and OTA staffing minutes per resident-day were higher for SNFs located in large and small rural communities compared to urban communities and communities with more versus less socioeconomic disadvantage.

In summary, OTAs are an integral part of the therapy workforce in SNFs overall, but the contribution of OTAs varies by SNF characteristics. OTAs play a critical role in providing access to occupational therapy services in SNFs located in rural communities and communities with higher levels of socioeconomic disadvantage. As such, given the reported decline in occupational therapy staffing generally and OTAs in particular as a result of implementation of PDPM, it is especially important to monitor OTA workforce changes in SNFs located within these communities and the impact on access to care for residents. Differences between the two measures of OTA staffing by SNF characteristics suggest examination of both OTA minutes per-resident day and percent OTA staffing minutes is needed to understand the impact of recent policies on the OTA workforce. Whether reductions in payments for OTA services compared to OT services under Part B will impact OTA workforce in SNFs remains to be seen. Future research on potential changes in the OTA workforce in SNFs based on differential Part B payments in the context of the ongoing pandemic and maturation of PDPM should consider impacts on access to occupational therapy services and outcomes of care at the resident-level for both short-stay and long-stay residents.

INTRODUCTION

Occupational therapy assistants (OTAs) and occupational therapists (OTs) work as a team to deliver occupational therapy services in skilled nursing facilities (SNFs). According to the U.S. Bureau of Labor Statistics, SNFs were among the largest employers for occupational therapy practitioners with SNFs as the primary employer for 17% of OTAs and 8% of OTs in 2020.¹ OTs perform occupational therapy evaluations and both OTs and OTAs provide occupational therapy treatments to support optimal functioning for short-stay residents who are receiving post-acute care services with the goal of returning back to the community and long-stay residents who are receiving long-term care services.

Medicare is the primary payer for occupational therapy services provided to SNF residents through the Part A SNF benefit for short-stay residents and through the Part B outpatient rehabilitation benefit for long-stay residents. Several recent changes to Medicare payment policy have the potential to impact the OTA workforce in SNFs, including the implementation of the Patient Driven Payment Model (PDPM) in October 2019 for Medicare Part A post-acute care stays and the introduction of differential payments for treatments provided by OTAs versus OTs under the Medicare Physician Fee Schedule for Part B services in 2022. Since OTAs have the potential to increase access to occupational therapy services, a better understanding of the baseline OTA workforce in SNFs prior to implementation of these new policies is critical for considering potential unintended consequences of these policy changes.

Publicly available, facility-level data on SNF staffing from the Centers for Medicare and Medicaid Services (CMS) provide an opportunity to establish this baseline understanding of the OTA workforce in SNFs before data on the full impact of these policy changes on the OTA workforce and ultimately on resident access to care and outcomes become available.

Research Questions

The overarching goal of this study was to provide a comprehensive description of the OTA workforce in SNFs prior to implementation of PDPM and introduction of reduced payments for therapy treatments provided by OTAs versus OTs. Specific research questions included:

1. What percent of occupational therapy practitioner staffing in SNFs do OTAs represent?
2. How does OTA staffing as a percent of total occupational therapy practitioner staffing vary based on characteristics of SNFs?
3. How many minutes are OTAs staffed in SNFs overall and with respect to staffing of OTs, physical therapist assistants (PTAs), and physical therapists (PTs)?
4. How do OTA staffing minutes vary based on characteristics of SNFs?

METHODS

This study was a secondary analysis of administrative data on Medicare-certified SNFs operating from October 2018-September 2019. We used this timeframe to gain a recent baseline understanding of the OTA workforce in the 12-month period prior to implementation of PDPM as well as prior to the emergence of the COVID-19 pandemic which had a disproportionate impact on SNFs compared to the overall population and also resulted in data reporting changes. We included SNFs located in the 50 states plus the District of Columbia and excluded SNFs located in U.S. territories. To be eligible for inclusion in analysis, a SNF must have had provided at least some occupational therapy services during this timeframe.

Data Sources

The primary data sources for this study were publicly available administrative data files from CMS, including the Payroll Based Journal (PBJ), Nursing Home Compare (NHC), and the Post-Acute Care and Hospice Provider Utilization and Payment Public Use File (PAC PUF). The PBJ contains facility-level daily minutes of paid work by nursing and allied health professions as well as daily resident census. NHC provides information on SNF characteristics and facility-level quality indicators for resident care and safety. The PAC-PUF includes facility-level information on aggregate service provision in SNFs and select demographic and clinical characteristics of short-stay residents.

To create the analytic data set, data from the PBJ, NHC, and PAC PUF for the study timeframe were linked by provider identification number. Data from Long-Term Care Focus (LTCFocus), a public use dataset sponsored by the National Institute on Aging that aggregates data at the facility-level from multiple sources,² was also linked by provider identification number to provide additional information about SNF characteristics not available in NHC or PAC PUF data. LTCFocus data from CY2018 was used as it was the most recent available public use data at the time of analysis.

Two additional data sources were linked using the location of the SNF. Rural Urban Community Area (RUCA) codes for 2010, the most recent available, were linked by ZIP code of the SNF for urban-rural status. RUCA codes characterize rural-urban status based on population density, urbanization, and daily commuting.³⁻⁴ The Social Deprivation Index (SDI) was linked using the ZIP Code Tabulation Area (ZCTA) of the SNF. The SDI is a composite measure of seven demographic characteristics from the American Community Survey (ACS) that was developed using factor analysis to quantify levels of socio-economic disadvantage across small geographic areas.⁵ The seven demographic characteristics based on 5-year estimates from the 2015-2019 ACS include: income measured as percent living in poverty; education measured as percent of adults ages 25 years of more with less than 12 years of education; employment measured as percent non-employed adults under 65 years of age; household type measured as percent single-parent households with dependents; housing as measured by percent living in renter-occupied housing units and percent living in overcrowded housing units; transportation as measured by percent of households without a

car; and demographics as measured by percent high needs population (under 5 years of age, women between the ages of 15-44, and everyone ages 65 and older).⁵

Occupational Therapy Assistant Staffing Measures

We used two measures to describe the OTA workforce in SNFs: (1) OTA staffing minutes per resident-day, and (2) OTA staffing minutes as a percent of total occupational therapy staffing minutes. To calculate OTA staffing minutes per-resident day, we first adjusted for differences in resident census across SNFs by dividing daily OTA staffing minutes by daily resident census to create daily OTA staffing minutes per resident-day. Then we averaged daily OTA staffing minutes per resident-day across the four quarters of data included in the study timeframe to create a 12-month average of OTA staffing minutes per resident-day for each SNF. We also calculated a 12-month average of OT, PTA, and PTA staffing minutes using the same method. To calculate OTA staffing minutes as a percent of total occupational therapy staffing minutes, we divided the daily OTA staffing minutes by the sum of daily OTA and daily OT staffing minutes. Use of these two related, but distinct measures of OTA staffing enabled us to examine both the amount of OTA staffing minutes compared to other therapy practitioners as well as the contribution of OTAs to occupational therapy staffing regardless of the total amount of overall staffing minutes.

Skilled Nursing Facility Characteristics

SNF characteristics were selected based on available data and prior research. Ownership was characterized by profit status and chain affiliation into five categories: for-profit chain, for-profit independent, nonprofit chain, nonprofit independent, and governmental. Dichotomous indicators were used to describe whether a SNF was freestanding or located within a hospital (also known as a transitional care unit or subacute care unit), was located in a continuing care retirement community or not, contained a memory care unit or not, and was certified for participation in the Medicare program before or after implementation of the original prospective payment system in July 1998. Size of the SNF was characterized by the number of certified beds (<50, 50-99, 100-149, or 150+). Staffing model for occupational therapy practitioners was based on use of contract versus in-house staff. Contract OTA and OT staffing minutes were calculated as a percentage of overall OTA and OT staffing minutes that was then dichotomized into fewer than 50% contract staffing minutes versus 50% or greater contract staffing minutes.

Geographic location was described by the state and the CMS region in which the SNF was located. Urban-rural location was classified by using the ZIP code approximation of the RUCA codes, which characterize the rural-urban status of areas based on U.S. Census Bureau definitions and work commuting information.³⁻⁴ We used the 2010 RUCA codes to classify SNFs as located in urban (codes 1.0, 1.1, 2.0, 2.1, 3.0, 4.1, 5.1, 7.1, 8.1, 10.1), large rural (codes 4.0, 5.0, 6.0), small rural (codes 7.0, 7.2, 8.0, 8.2, 9.0), or isolated small rural (codes 10.0, 10.2, 10.3) communities.⁴ To further characterize the community in which the SNF is located, we crosswalked the ZIP code of the SNF to its corresponding ZCTA and assigned a ZCTA-level SDI score to classify the community by level of socioeconomic disadvantage.⁵ We categorized

SDI score into quartiles (scores of 1-24, 25-49, 50-75, and 75-100) with 100 representing the highest level of socioeconomic disadvantage.

SNF quality was described by quality star ratings which are based on performance on 15 measures reported on NHC. These measures are derived from the Minimum Data Set (MDS) and Medicare claims. There are six measures for short-stay residents and nine measure for long-stay residents (see **Box 1**). All claims-based measures and four of the ten MDS-based measures are risk-adjusted. Points are given for each measure based on national distributions and then summed for an overall quality score which is used to assign a star rating based on four quarters of data. We selected the quality star rating that corresponds with the four quarters of data for the study timeframe.

Box 1. Measures Included in Quality Star Rating for Skilled Nursing Facilities		
	Measure Description	Data Source
Short-stay resident measures	Percentage of residents who improved their ability to move independently	Minimum Data Set
	Percentage of residents with pressure ulcers or pressure injuries that are new or worsened	Minimum Data Set
	Percentage of residents who got antipsychotic medication for the first time	Minimum Data Set
	Percentage of residents who were re-hospitalized after a nursing home admission	Claims
	Percentage of residents who have had an outpatient emergency department visit	Claims
	Rate of successful return to home and community from facility	Claims
Long-stay resident measures	Percentage of residents whose need for help with daily activities increased	Minimum Data Set
	Percentage of residents whose ability to move independently worsened	Minimum Data Set
	Percentage of high-risk residents with pressure ulcers	Minimum Data Set
	Percentage of residents who have or had a catheter inserted and left in their bladder	Minimum Data Set
	Percentage of residents with a urinary tract infection	Minimum Data Set
	Percentage of residents experiencing one or more falls with major injury	Minimum Data Set
	Percentage of residents who got an antipsychotic medication	Minimum Data Set
	Number of hospitalizations per 1,000 resident-days	Claims
	Number of outpatient emergency department visits per 1,000 resident-days	Claims

Source: <https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/CertificationandCompliance/Downloads/usersguide.pdf>; <https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/CertificationandCompliance/FSQRS>

We also classified SNFs by quartiles of total number of Medicare short-stay episodes and percent of residents with Medicaid as a primary payer as a proxy for percent of residents who were long-stay versus short-stay. We included percent of Medicare days in the ultra-high rehabilitation Resource Utilization Group (RUG), the RUG with the highest weekly provision of overall therapy minutes and corresponding highest reimbursement associated with therapy, as an indicator of overall therapy intensity within the SNF. To provide a sense of the acuity of short-stay residents, we classified SNFs into quartiles based on average risk score using the aggregate CMS Hierarchical Condition Category (HCC) score for short-stay residents of the SNFs. The HCC uses prior diagnoses to estimate future spending compared to the overall average for the Medicare fee-for-service population, with scores greater than 1.0 associated

with above average expected spending and scores less than 1.0 associated with below average expected spending.⁶

Analytic Approach

We first calculated measures of central tendency for OTA staffing measures overall and by SNF characteristics. We compared unadjusted averages of OTA staffing measures across individual SNF characteristics using one-way analysis of variance (ANOVA). We then used separate multi-level mixed effects linear regression models to examine the adjusted associations between each OTA staffing measure and SNF characteristics. This approach enabled examination of the fixed effects of each SNF characteristic on OTA staffing measures adjusting for all other SNF characteristics, and used a random intercept for the state in which the SNF was located to account for clustering of SNFs within states. Analyses were completed using Stata, version 14. Since all data were publicly available and did not include identifiable data on individual SNF residents, this study was not considered human subjects research and did not require Institutional Review Board approval.

RESULTS

A total of 14,842 SNFs provided occupational therapy services in the 12-month period from October 2018-September 2019 and were eligible for analysis. Nearly all eligible SNFs used OTAs to provide occupational therapy services with 94.3% of these SNFs reporting at least some OTA staffing minutes.

Table 1 presents characteristics of eligible SNFs. The SNF market is dominated by for-profit, freestanding facilities that were originally certified prior to July 1998. SNFs with 50-99 certified beds make up the largest share of SNFs by size, but there are almost as many SNFs with 100-149 certified beds. Over two-thirds of SNFs are located in urban communities and SNFs are almost evenly distributed across communities with low, medium-low, medium-high, and high levels of socio-economic disadvantage. Approximately 90% of SNFs have at least 25% of residents with Medicaid as a primary payer, indicating a mix of long-stay and short-stay residents. Among short-stay residents, receipt of therapy within the ultra-high rehabilitation RUG are common, with three-fifths of SNFs providing over 50% of Medicare days within the ultra-high rehabilitation RUG. Use of contract therapy staff is also common, with over two-thirds of SNFs utilizing contract staff to provide 50% or more of total occupational therapy staffing minutes.

Table 1. Characteristics of Medicare-certified Skilled Nursing Facilities in Operation between October 2018-September 2019

	n (%) or mean (SD)
Ownership	
For-profit chain	6,466 (46.8%)
For-profit independent	3,317 (24.0%)
Nonprofit chain	1,576 (11.4%)
Nonprofit independent	1,659 (12.0%)
Governmental	814 (5.9%)
Quality star rating	
1 Star	1,154 (7.9%)
2 Stars	2,447 (16.8%)
3 Stars	3,263 (22.4%)
4 Stars	3,866 (26.5%)
5 Stars	3,844 (26.4%)
Freestanding	14,223 (96.6%)
Located in-hospital	503 (3.4%)
Not located in continuing care retirement community	13,117 (89.1%)
Located in continuing care retirement community	1,609 (10.9%)
Does not contain memory care unit	11,893 (85.4%)
Contains memory care unit	2,027 (14.6%)
Certified before July 1998	11,039 (74.4%)
Certified after July 1998	3,803 (25.6%)
Number of certified beds	
<50	1,600 (10.9%)
50-99	5,624 (38.3%)
100-149	5,023 (34.2%)
150+	2,426 (16.5%)
CMS Region	
Region 1 (CT, ME, MA, NH, RI, VT)	845 (5.9%)
Region 2 (NJ, NY)	938 (6.6%)
Region 3 (DE, DC, MD, PA, VA, WV)	1,331 (9.3%)
Region 4 (AL, FL, GA, KY, MS, NC, SC, TN)	2,583 (18.1%)
Region 5 (IL, IN, MI, MN, OH, WI)	3,208 (22.4%)
Region 6 (AR, LA, NM, OK, TX)	1,948 (13.6%)
Region 7 (IA, KS, MO, NE)	1,300 (9.1%)
Region 8 (CO, MT, ND, SD, UT, WY)	508 (3.6%)
Region 9 (AZ, CA, HI, NV)	1,248 (8.7%)
Region 10 (AK, ID, OR, WA)	391 (2.7%)
Urban-rural location	
Urban community	10,201 (69.4%)
Large rural community	2,045 (13.9%)
Small rural community	1,528 (10.4%)
Isolated small rural community	926 (6.3%)
Social Deprivation Index of community	
1-24 (Lowest)	3,117 (21.2%)
25-49	3,949 (26.9%)
50-74	4,263 (29.0%)
75-100 (Highest)	3,381 (23.0%)

Table 1. (continued)

	Mean (SD) or n (%)
Percent Medicaid residents	
<25%	1,321 (9.5%)
25-49%	2,248 (16.2%)
50-74%	6,459 (46.4%)
75%+	3,892 (28.0%)
Total Medicare short-stay episodes	159.3 (147.9)
Average risk score of Medicare short-stay residents	2.6 (0.7)
Percent of Medicare days in ultra-high rehabilitation Resource Utilization Group	
<25%	2,073 (14.5%)
25-49%	3,253 (22.8%)
50-74%	5,843 (40.9%)
75%+	3,131 (21.9%)
Use of contract occupational therapy practitioners	
<50% of staffing minutes	4,635 (31.2%)
50%+ of staffing minutes	10,205 (68.8%)

Source: University of Washington Center for Health Workforce Studies analysis of data from the Payroll Based Journal, Nursing Home Compare, and the Post-Acute Care and Hospice Provider Utilization and Payment Public Use File from the Centers for Medicare and Medicaid Services, LTCFocus, and the Social Deprivation Index.

Occupational Therapy Assistant Staffing Minutes Per Resident-Day

Table 2 presents mean and median staffing minutes per resident-day for occupational therapy practitioners and physical therapy practitioners overall, by therapist, and by assistant. Average OTA staffing minutes were the second highest among all occupational and physical therapy practitioners at 5.6 minutes per resident-day.

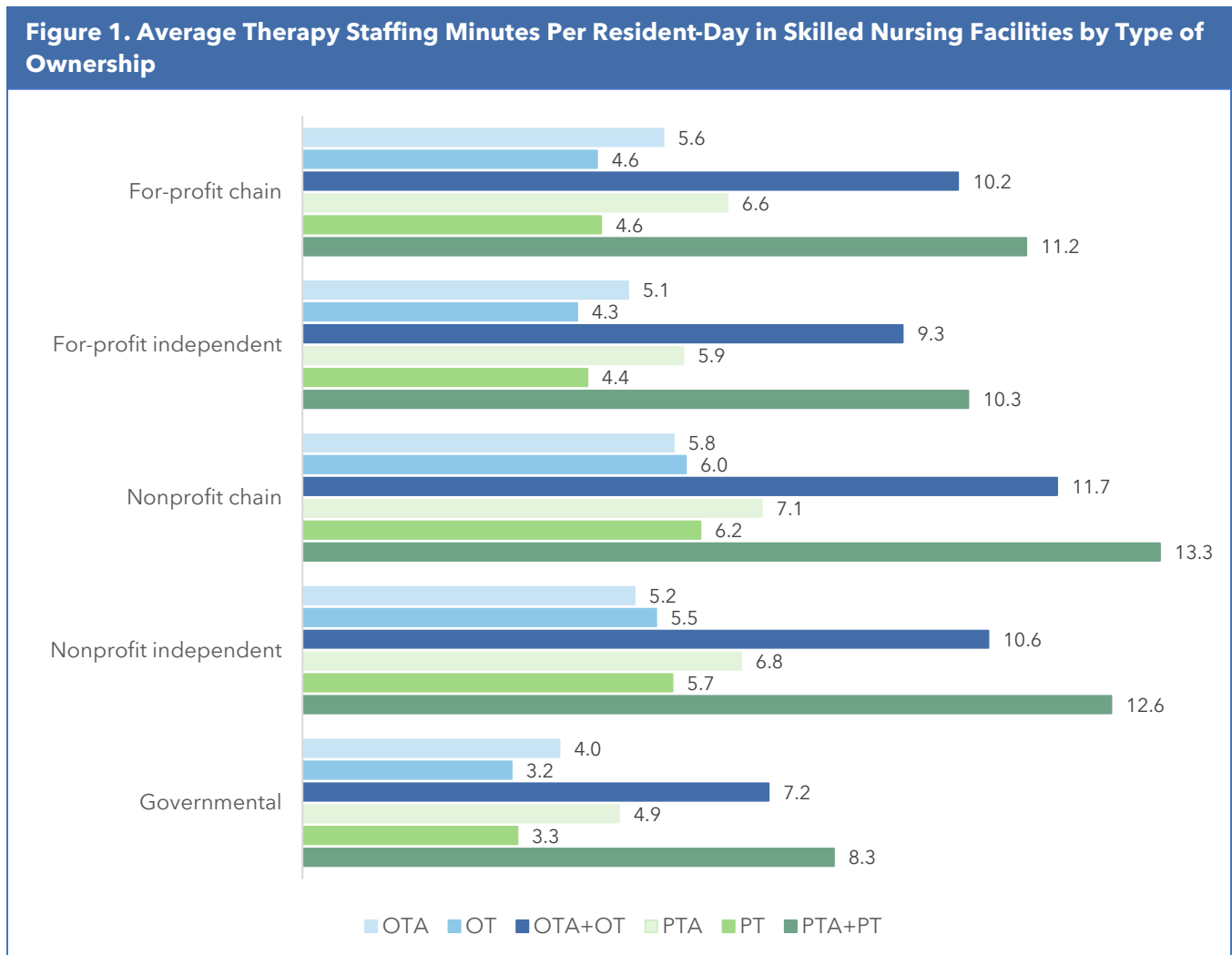
Table 2. Therapy Staffing in Skilled Nursing Facilities, October 2018-September 2019

Staffing minutes per resident-day	Mean (SD)	Median (IQR)
Total occupational therapy	10.6 (9.1)	8.5 (5.5, 12.7)
Occupational therapy assistant	5.6 (5.2)	4.6 (2.4, 7.3)
Occupational therapist	5.0 (5.8)	3.6 (1.9, 6.0)
Total physical therapy	11.9 (10.6)	9.4 (6.1, 13.9)
Physical therapist assistant	6.7 (6.2)	5.5 (3.2, 8.5)
Physical therapist	5.1 (6.0)	3.6 (1.9, 6.1)

Source: University of Washington Center for Health Workforce Studies analysis of data from the Payroll Based Journal from the Centers for Medicare and Medicaid Services.

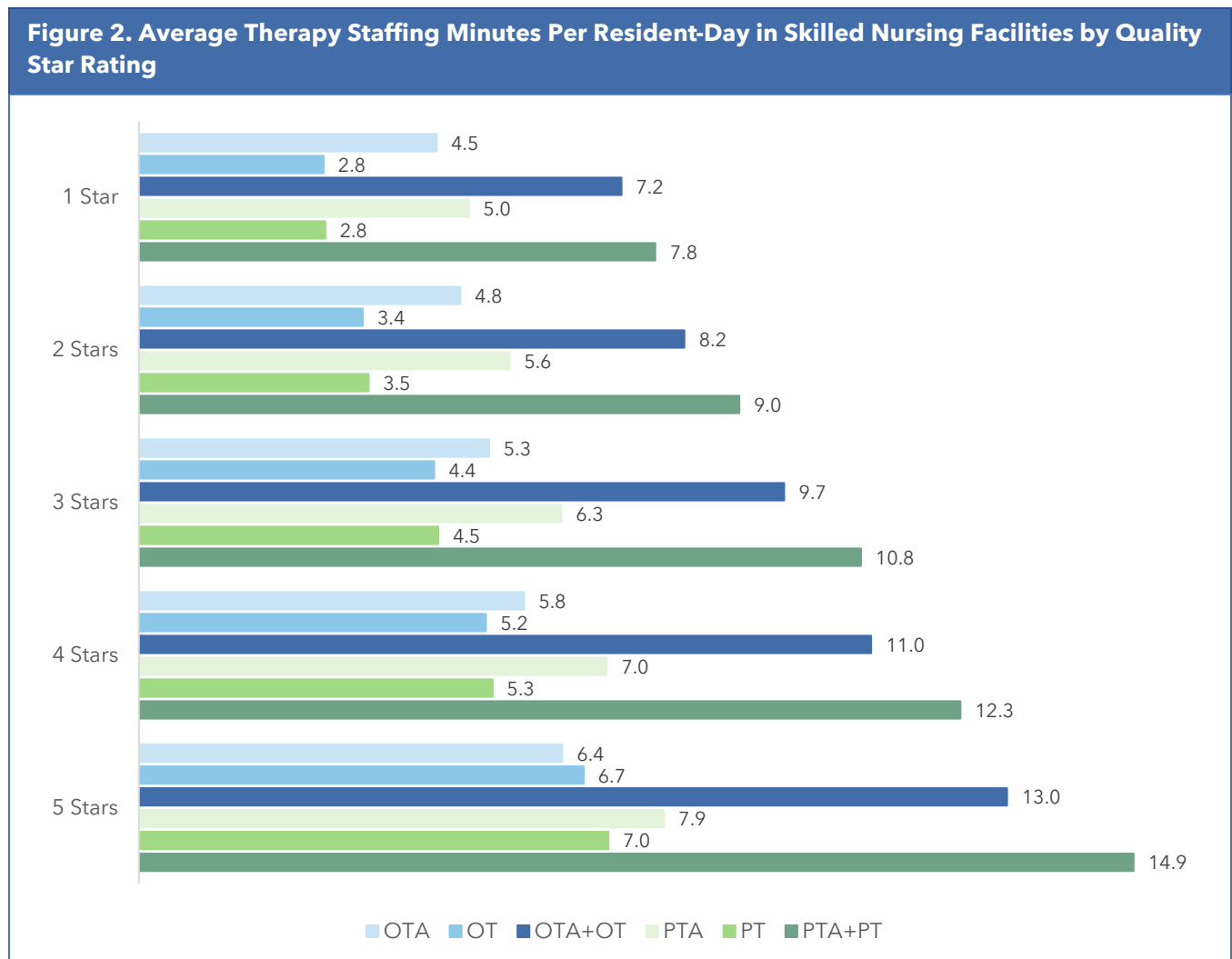
Figures 1-15 present unadjusted average therapy staffing minutes per resident-day for OTAs, OTs, PTAs, and PTs by SNF characteristics.

Total therapy staffing minutes per resident-day and staffing minutes for each provider type (OTA, OT, PTA, and PT) were higher in nonprofit SNFs compared to for-profit SNFs regardless of chain affiliation, and average OTA staffing minutes per resident day were higher in chain SNFs versus independent SNFs with the same profit status; governmental SNFs had the lowest staffing minutes across all provider types (**Figure 1**). Average OTA staffing minutes were significantly different by type of ownership ($p < .001$).



Notes: OTA=Occupational Therapy Assistant, OT=Occupational Therapist, PTA=Physical Therapist Assistant, PT= Physical Therapist.
 Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal and Nursing Home Compare from the Centers for Medicare and Medicaid Services and LTCFocus.

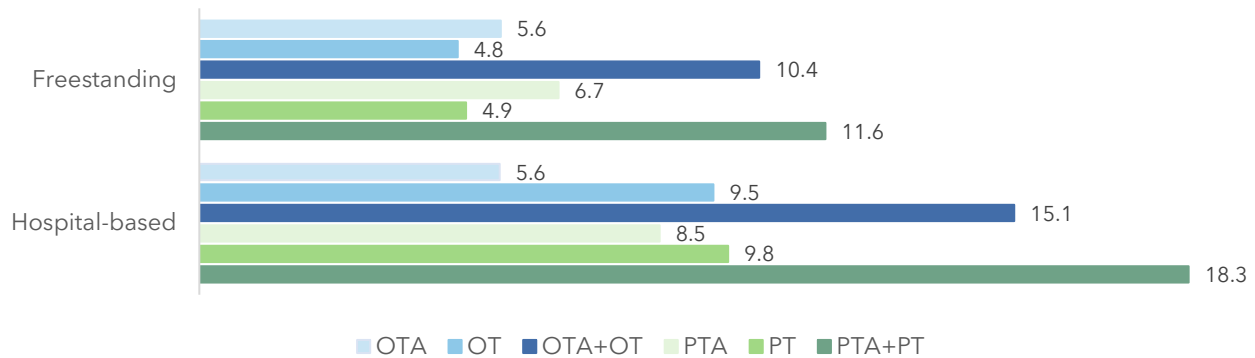
Total therapy staffing minutes per resident-day and staffing minutes for each provider type (OTA, OT, PTA, and PT) increased as quality star rating increased from 1 to 5 stars (**Figure 2**). Average OTA staffing minutes per resident-day were significantly different by quality star rating ($p<.001$).



Notes: OTA=Occupational Therapy Assistant, OT=Occupational Therapist, PTA=Physical Therapist Assistant, PT= Physical Therapist.
 Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal and Nursing Home Compare from the Centers for Medicare and Medicaid Services.

Average OTA staffing minutes per resident-day were similar in freestanding SNFs and hospital-based SNFs, even though hospital-based SNFs had notably higher total occupational therapy practitioner minutes per resident-day due to nearly double the amount of OT staffing minutes compared to freestanding SNFs (Figure 3). Average OTA staffing minutes per resident-day were not significantly different by freestanding versus in-hospital location ($p=.94$).

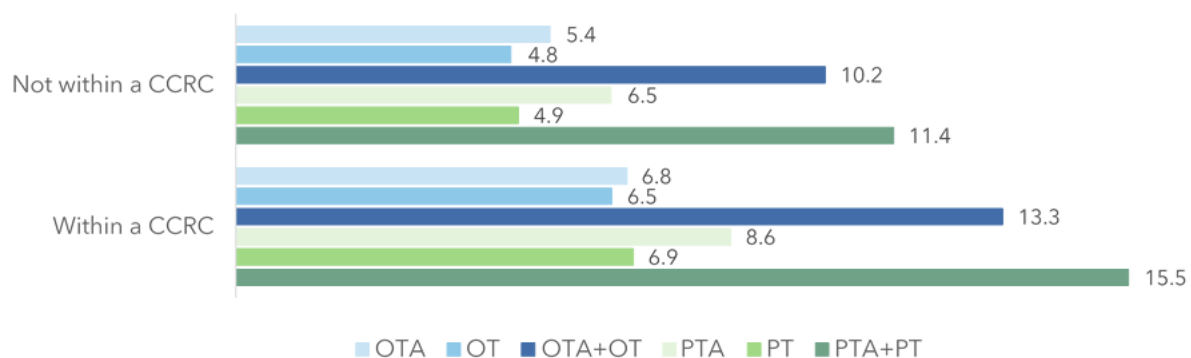
Figure 3. Average Therapy Staffing Minutes Per Resident-Day in Skilled Nursing Facilities by Freestanding versus Hospital-based Location



Notes: OTA=Occupational Therapy Assistant, OT=Occupational Therapist, PTA=Physical Therapist Assistant, PT= Physical Therapist.
 Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal and Nursing Home Compare from the Centers for Medicare and Medicaid Services.

Total therapy staffing minutes per resident-day and staffing minutes for each provider type (OTA, OT, PTA, and PT) were higher in SNFs located within CCRCs compared to SNFs not located within CCRCs (Figure 4). Average OTA staffing minutes per resident-day were significantly different by location within versus not within a CCRC ($p<.001$).

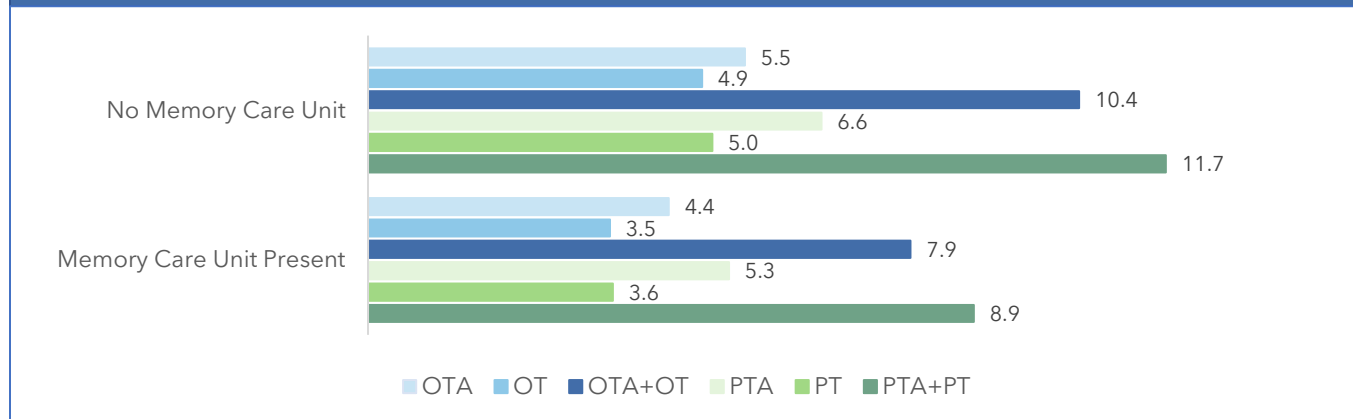
Figure 4. Average Therapy Staffing Minutes Per Resident-Day in Skilled Nursing Facilities by Continuing Care Retirement Community



Notes: OTA=Occupational Therapy Assistant, OT=Occupational Therapist, PTA=Physical Therapist Assistant, PT= Physical Therapist.
 Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal and Nursing Home Compare from the Centers for Medicare and Medicaid Services.

Total therapy staffing minutes per resident-day and staffing minutes for each provider type (OTA, OT, PTA, and PT) were lower in SNFs with memory care units compared to SNFs without memory care units (**Figure 5**). Average OTA staffing minutes per resident-day were significantly different by presence versus absence of a memory care unit in the SNF ($p<.001$).

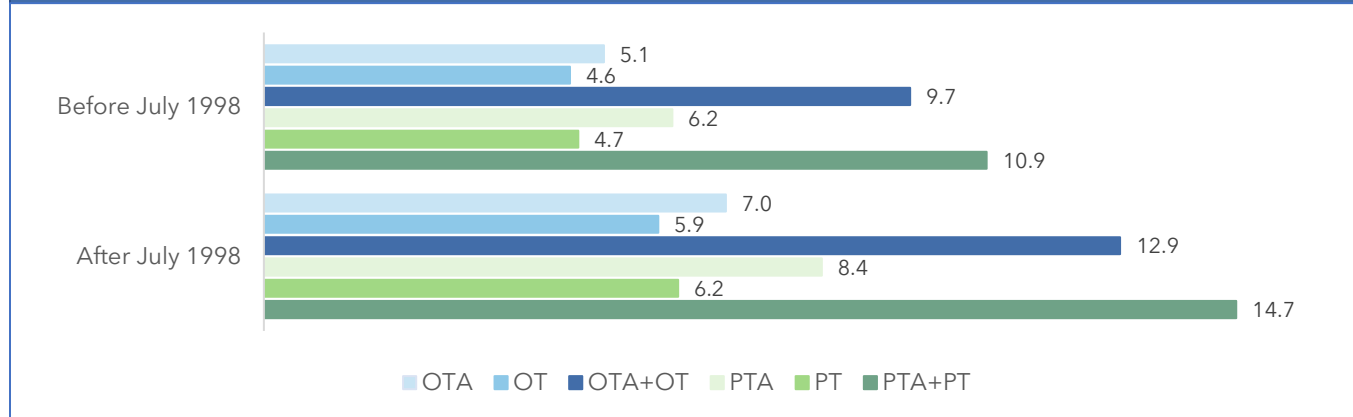
Figure 5. Average Therapy Staffing Minutes Per Resident-Day in Skilled Nursing Facilities by Presence of Memory Care Unit



Notes: OTA=Occupational Therapy Assistant, OT=Occupational Therapist, PTA=Physical Therapist Assistant, PT= Physical Therapist.
 Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal and Nursing Home Compare from the Centers for Medicare and Medicaid Services.

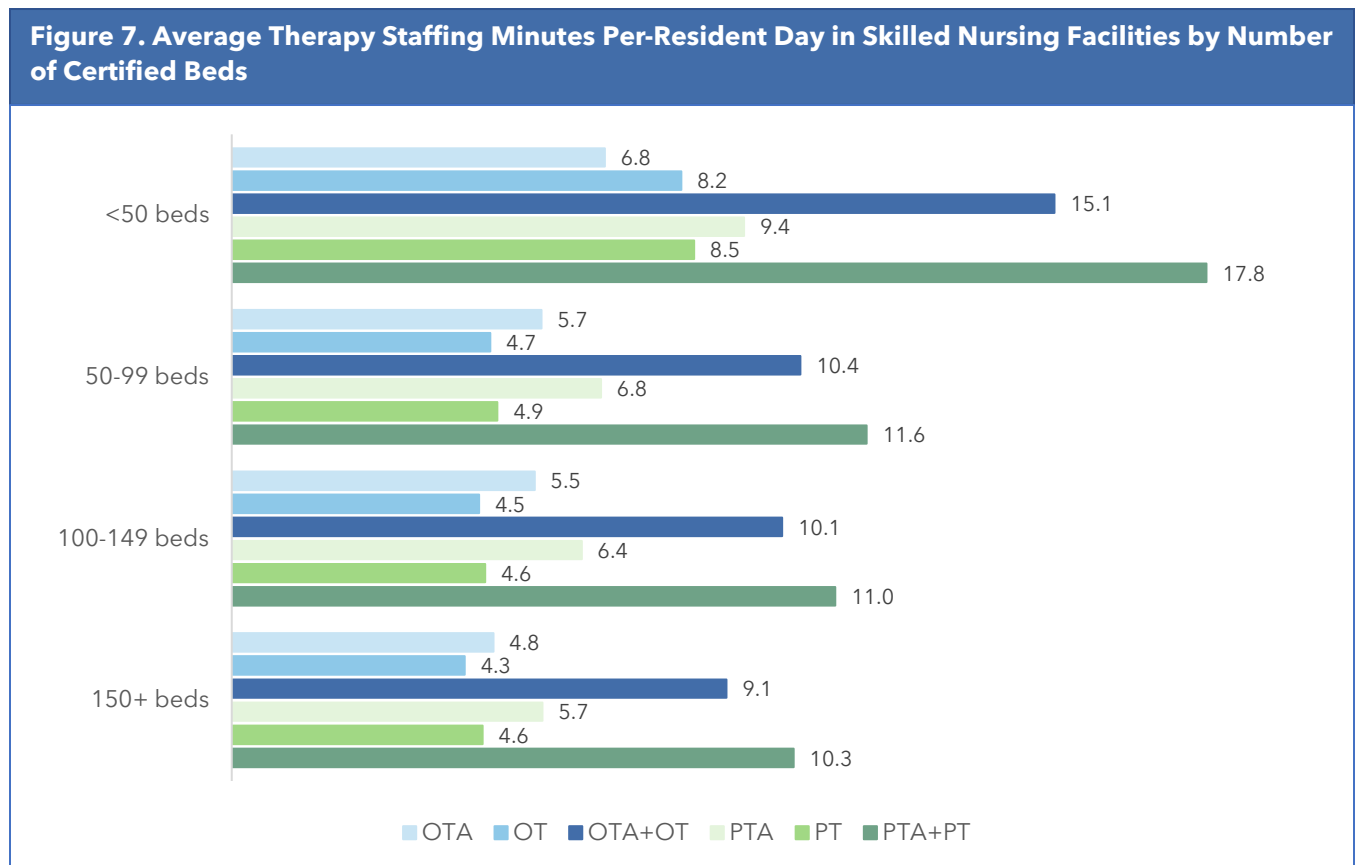
Total therapy staffing minutes per resident-day and staffing minutes for each provider type (OTA, OT, PTA, and PT) were lower in SNFs certified prior to versus after implementation of the original prospective payment system in July 1998 (**Figure 6**). Average OTA staffing minutes per resident-day were significantly different by certification date ($p<.001$).

Figure 6. Average Therapy Staffing Minutes Per Resident-Day in Skilled Nursing Facilities by Certification Date



Notes: OTA=Occupational Therapy Assistant, OT=Occupational Therapist, PTA=Physical Therapist Assistant, PT= Physical Therapist.
 Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal and the Post-Acute Care and Hospice Provider Utilization and Payment Public Use File from the Centers for Medicare and Medicaid Services.

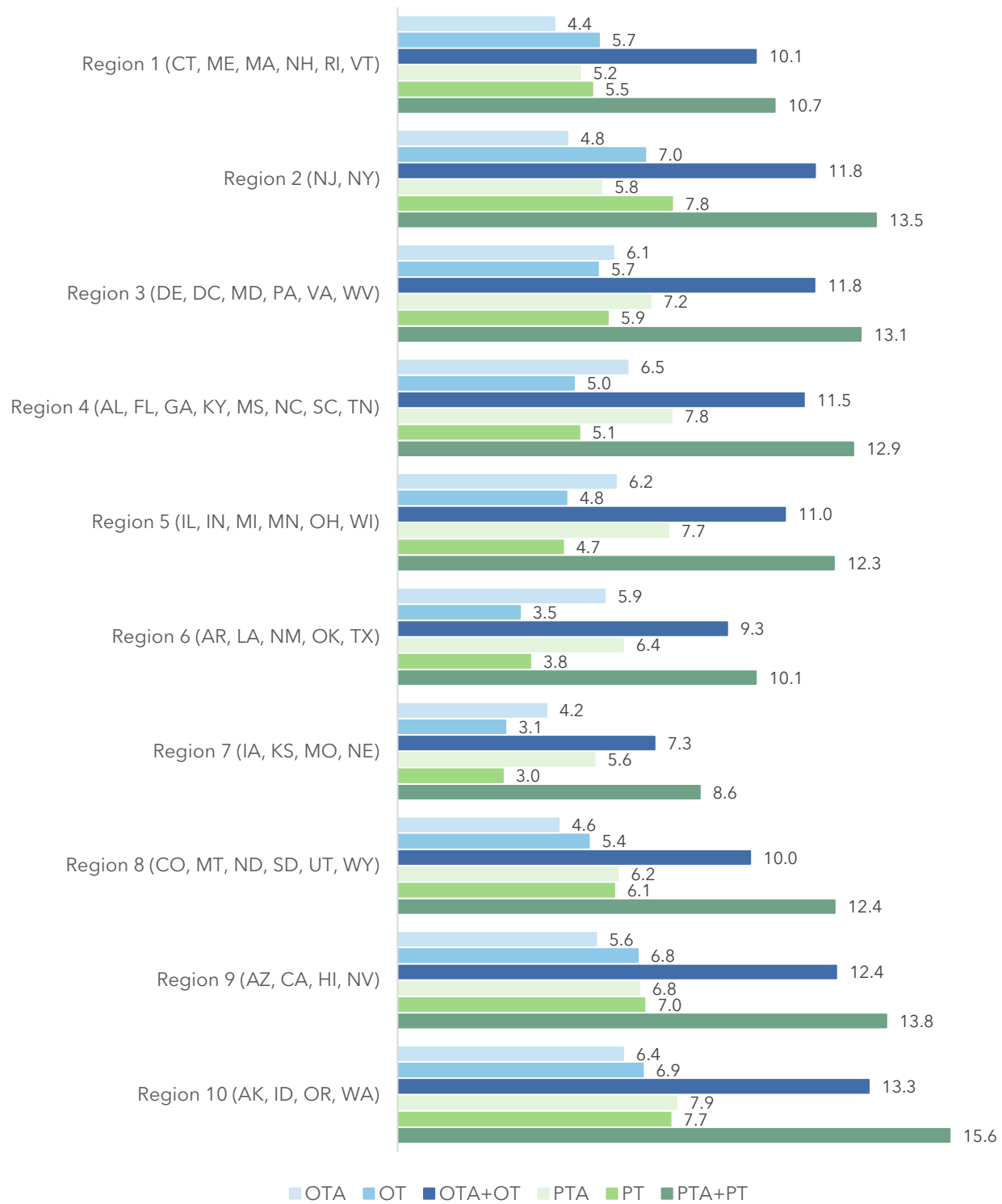
Total therapy staffing minutes per resident-day and staffing minutes for each provider type (OTA, OT, PTA, and PT) decreased as the number of certified beds increased (**Figure 7**). Average OTA staffing minutes per resident-day were significantly different by number of certified beds ($p<.001$).



Notes: OTA=Occupational Therapy Assistant, OT=Occupational Therapist, PTA=Physical Therapist Assistant, PT= Physical Therapist.
 Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal and Nursing Home Compare from the Centers for Medicare and Medicaid Services.

Total therapy staffing minutes per resident-day and staffing minutes for each provider type (OTA, OT, PTA, and PT) varied by CMS region with the highest average OTA staffing minutes in Regions 4 and 5 and the lowest average OTA staffing minutes in Regions 1 and 7 (**Figure 8**). Average OTA staffing minutes per resident-day were significantly different by CMS region ($p<.001$).

Figure 8. Average Therapy Staffing Minutes Per Resident-Day in Skilled Nursing Facilities by CMS Region

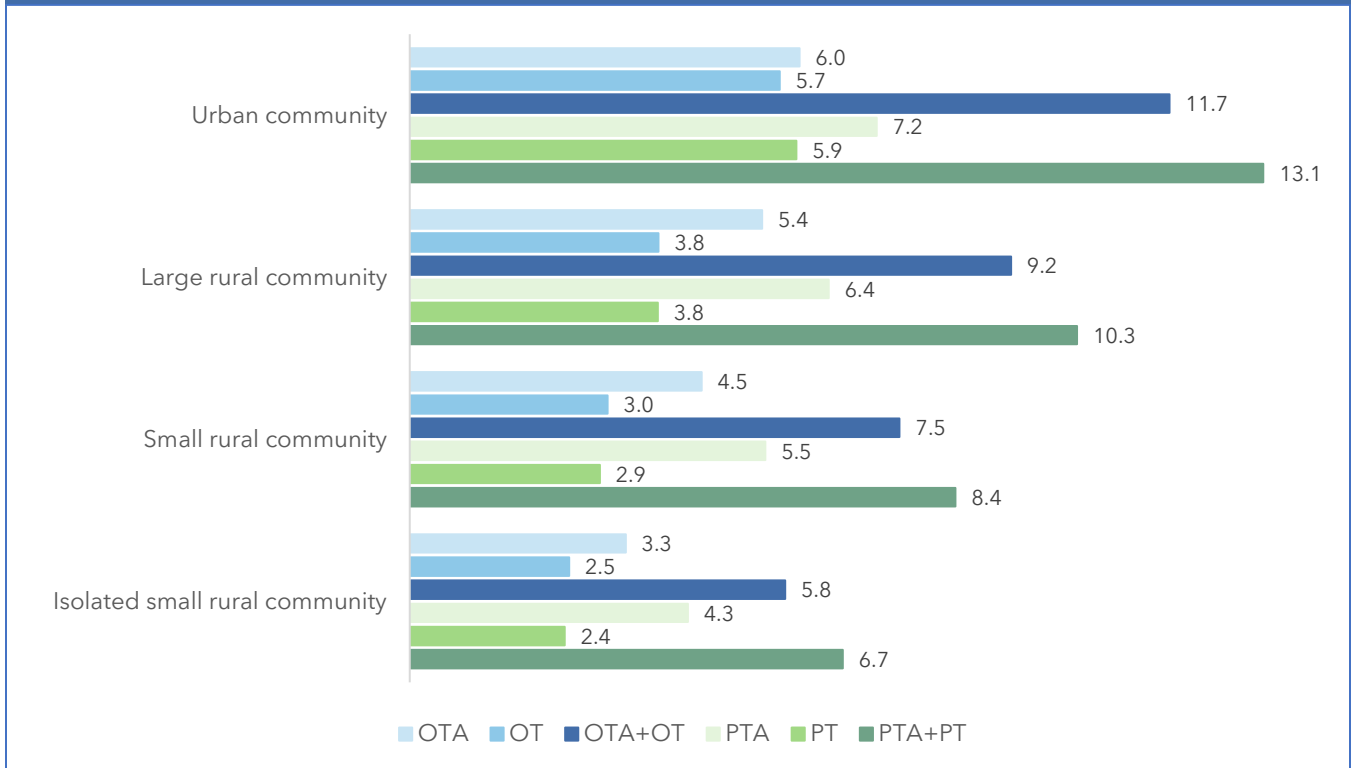


Notes: OTA=Occupational Therapy Assistant, OT=Occupational Therapist, PTA=Physical Therapist Assistant, PT= Physical Therapist, CMS=Centers for Medicare and Medicaid Services.

Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal from the Centers for Medicare and Medicaid Services.

Total therapy staffing minutes per resident-day and staffing minutes for each provider type (OTA, OT, PTA, and PT) decreased as rurality increased with average OTA staffing minutes in SNFs located in isolated small rural communities 45% lower than average OTA staffing minutes in SNFs located in urban communities (**Figure 9**). Average OTA staffing minutes per resident-day were significantly different by urban-rural location ($p < .001$).

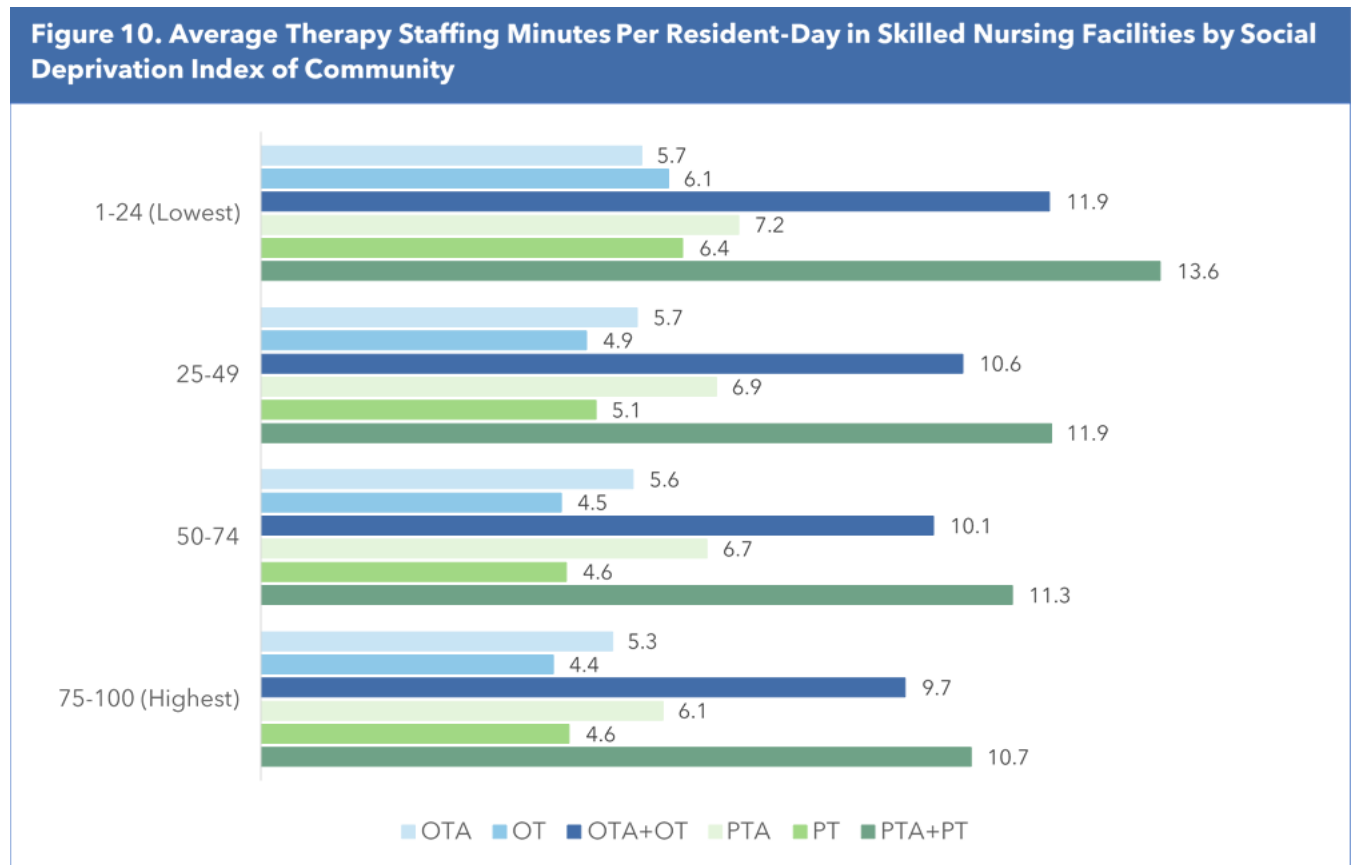
Figure 9. Average Therapy Staffing Minutes Per Resident-Day in Skilled Nursing Facilities by Urban-Rural Location



Notes: OTA=Occupational Therapy Assistant, OT=Occupational Therapist, PTA=Physical Therapist Assistant, PT= Physical Therapist. Urban-rural location was classified using Rural-Urban Commuting Area (RUCA) codes.

Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal from the Centers for Medicare and Medicaid Services.

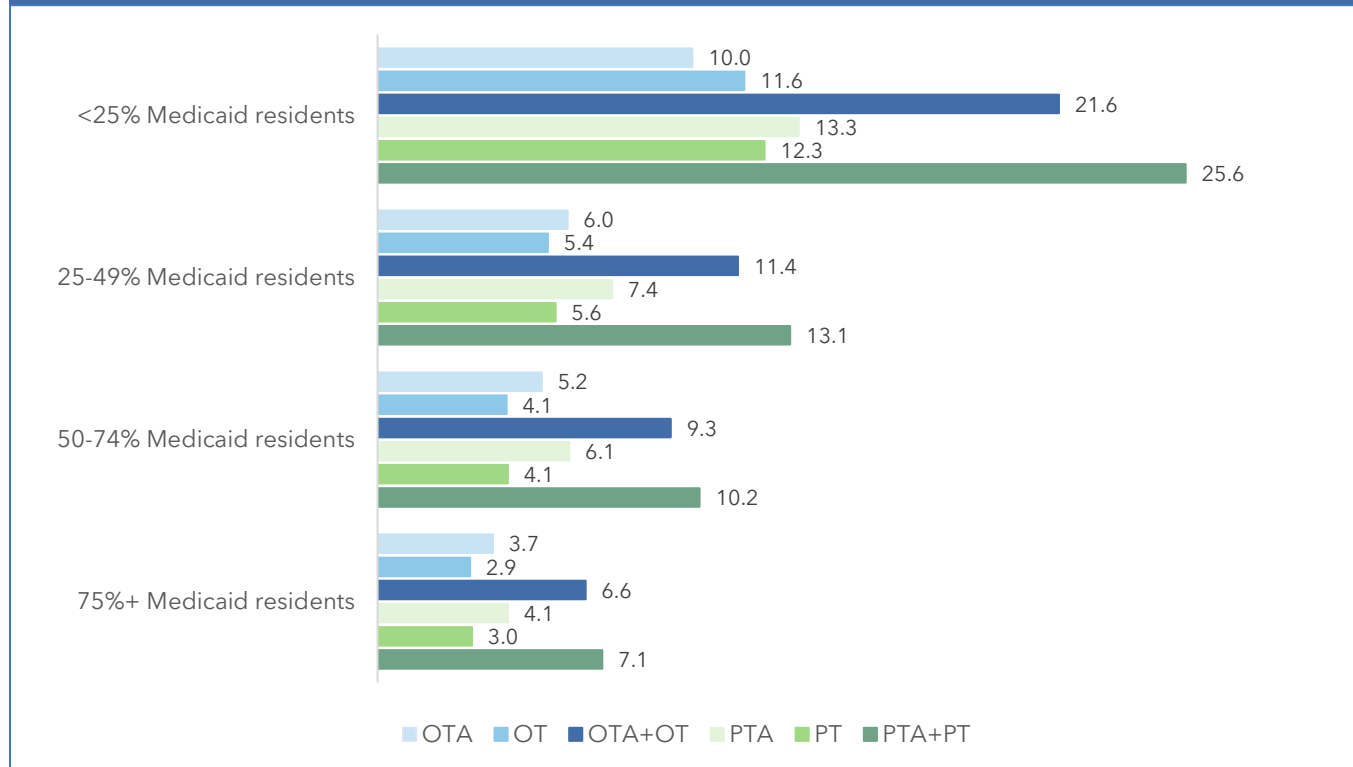
Total therapy staffing minutes per resident-day and staffing minutes for each provider type (OTA, OT, PTA, and PT) generally decreased as level of socioeconomic disadvantage in the community increased (**Figure 10**). Average OTA staffing minutes per resident-day were significantly different by level of socioeconomic disadvantage ($p=.003$).



Notes: OTA=Occupational Therapy Assistant, OT=Occupational Therapist, PTA=Physical Therapist Assistant, PT= Physical Therapist.
 Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal from the Centers for Medicare and Medicaid Services and the Social Deprivation Index.

Total therapy staffing minutes per resident-day and staffing minutes for each provider type (OTA, OT, PTA, and PT) decreased as percent of residents with Medicaid as the primary payer increased (**Figure 11**). Average OTA staffing minutes per resident-day were significantly different by percent Medicaid residents ($p < .001$).

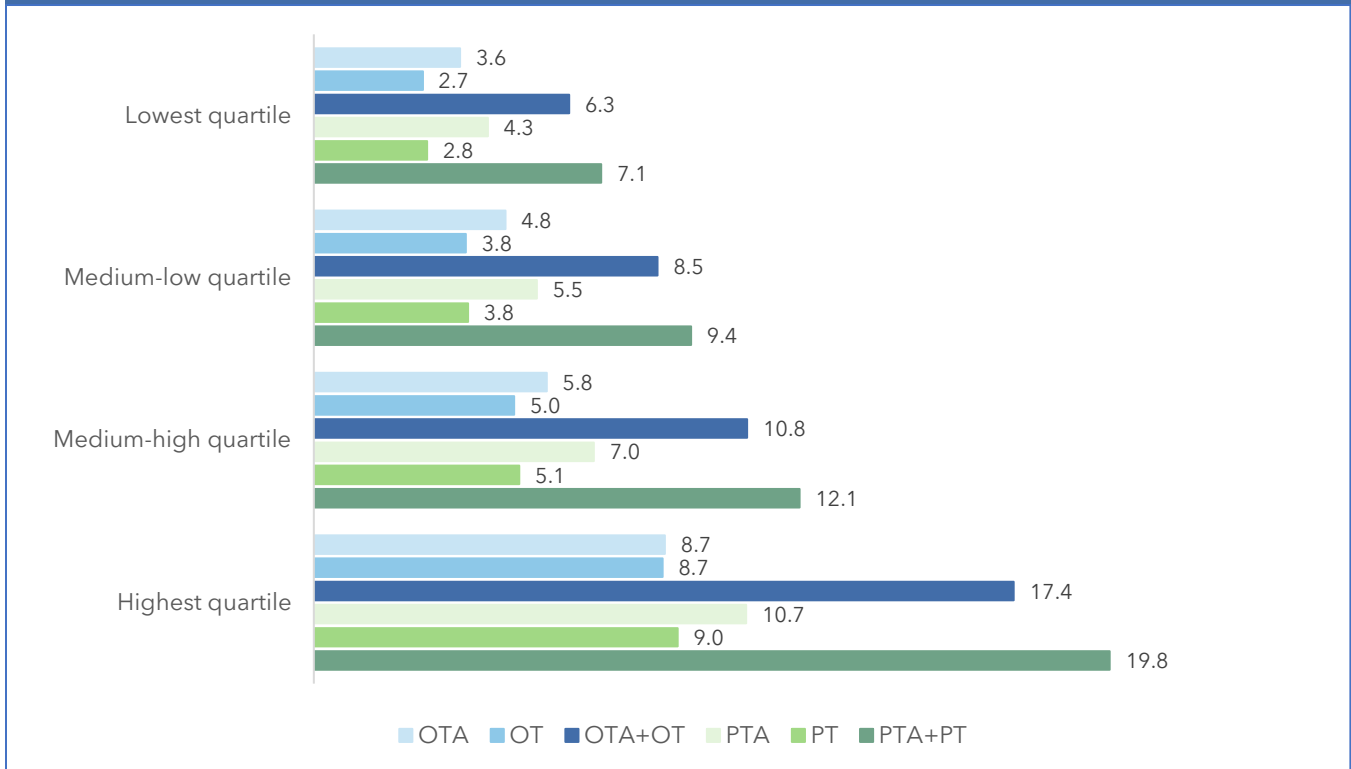
Figure 11. Average Therapy Staffing Minutes Per Resident-Day in Skilled Nursing Facilities by Percent Medicaid Residents



Notes: OTA=Occupational Therapy Assistant, OT=Occupational Therapist, PTA=Physical Therapist Assistant, PT= Physical Therapist.
 Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal from the Centers for Medicare and Medicaid Services and LTCFocus.

Total therapy staffing minutes per resident-day and staffing minutes for each provider type (OTA, OT, PTA, and PT) increased as the volume of Medicare short-stay episodes increased (Figure 12). Average OTA staffing minutes per resident-day were significantly different by Medicare short-stay episode volume ($p < .001$).

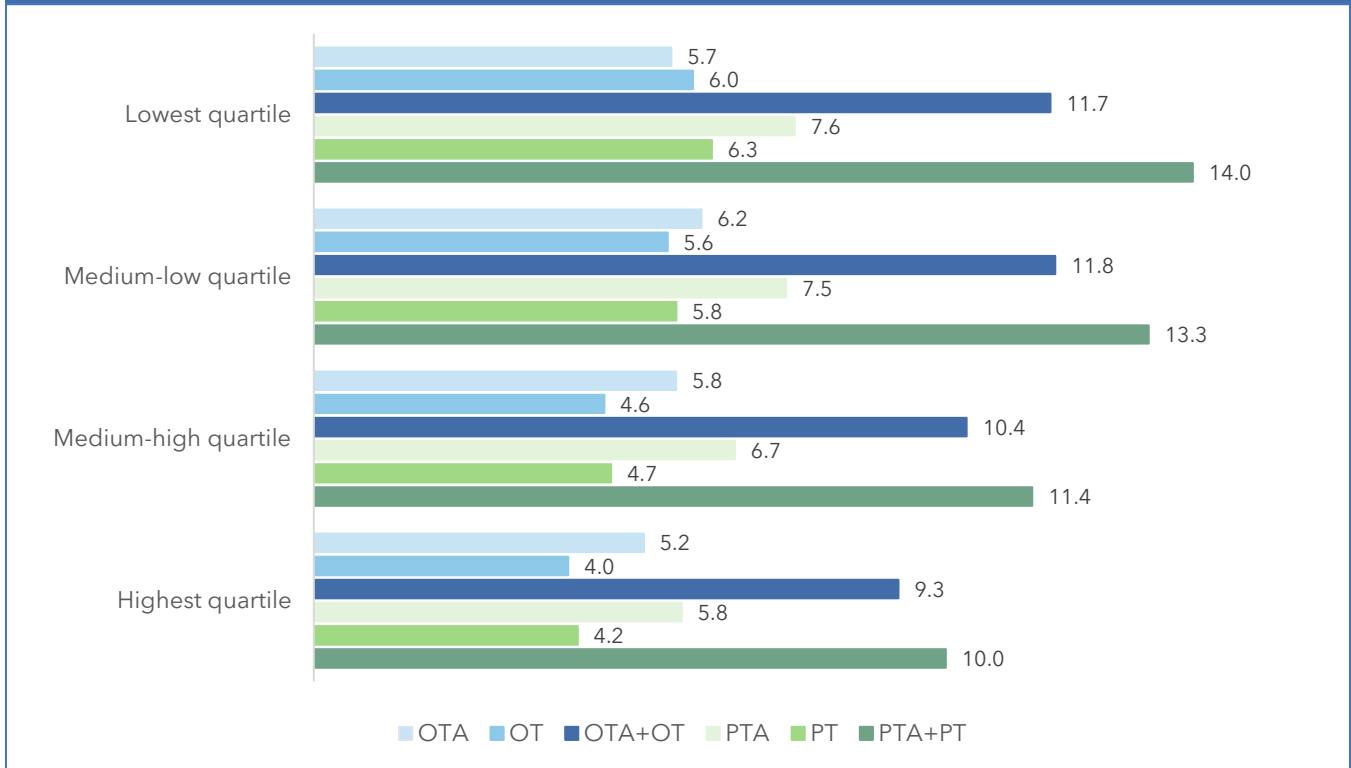
Figure 12. Average Therapy Staffing Minutes Per Resident-Day in Skilled Nursing Facilities by Total Medicare Short-stay Episodes



Notes: OTA=Occupational Therapy Assistant, OT=Occupational Therapist, PTA=Physical Therapist Assistant, PT= Physical Therapist.
 Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal and the Post-Acute Care and Hospice Provider Utilization and Payment Public Use File from the Centers for Medicare and Medicaid Services.

Total therapy staffing minutes per resident-day and staffing minutes for each provider type (OTA, OT, PTA, and PT) were higher in SNFs with lower acuity short-stay residents as measured by average risk score compared with SNFs with higher acuity short-stay residents (**Figure 13**). Average OTA staffing minutes per resident-day were significantly different by average risk score of short-stay residents ($p < .001$).

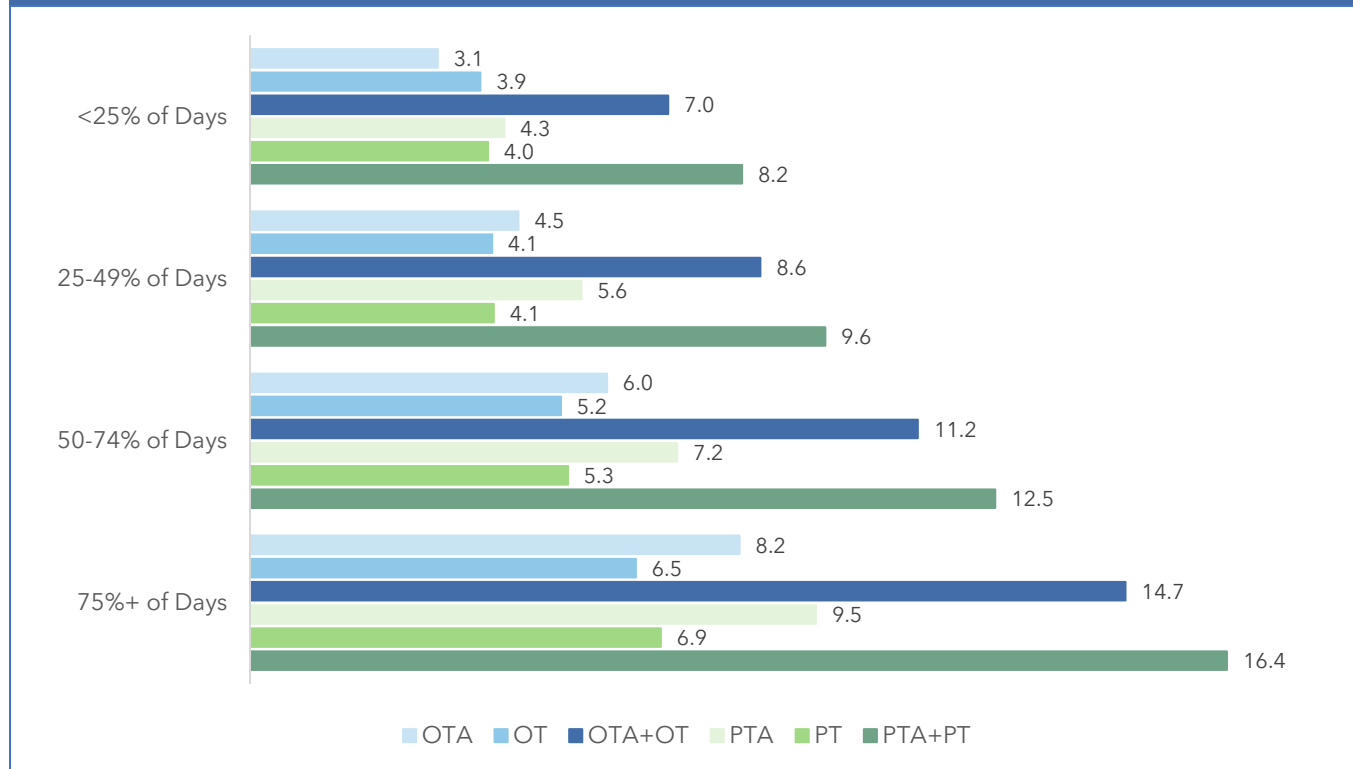
Figure 13. Average Therapy Staffing Minutes Per Resident-Day in Skilled Nursing Facilities by Average Risk Score of Short-stay Residents



Notes: OTA=Occupational Therapy Assistant, OT=Occupational Therapist, PTA=Physical Therapist Assistant, PT= Physical Therapist.
 Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal and the Post-Acute Care and Hospice Provider Utilization and Payment Public Use File from the Centers for Medicare and Medicaid Services.

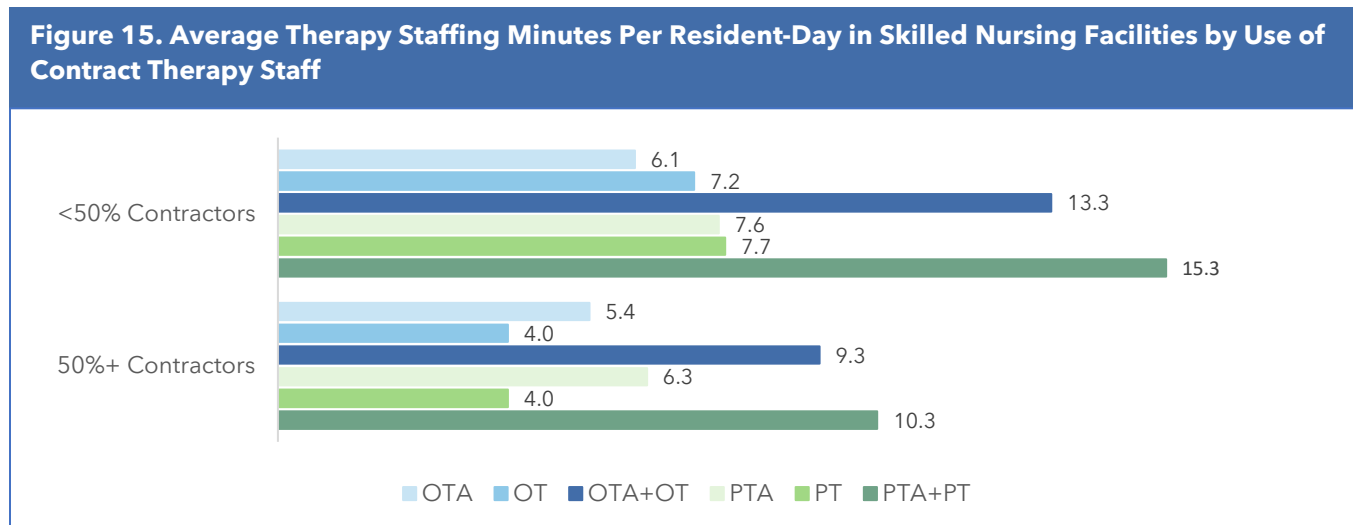
Total therapy staffing minutes per resident-day and staffing minutes for each provider type (OTA, OT, PTA, and PT) increased as the percent of ultra-high rehabilitation RUG days increased (**Figure 14**). Average OTA staffing minutes per resident-day were significantly different by percent of ultra-high rehabilitation RUG days ($p < .001$).

Figure 14. Average Therapy Staffing Minutes Per Resident-Day in Skilled Nursing Facilities by Percent Ultra-High Therapy RUG Days



Notes: OTA=Occupational Therapy Assistant, OT=Occupational Therapist, PTA=Physical Therapist Assistant, PT= Physical Therapist.
 Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal and the Post-Acute Care and Hospice Provider Utilization and Payment Public Use File from the Centers for Medicare and Medicaid Services.

Total therapy staffing minutes per resident-day and staffing minutes for each provider type (OTA, OT, PTA, and PT) were higher in SNFs with fewer than 50% of total occupational therapy minutes attributed to contract staff compared to SNFs with 50% of total occupational therapy minutes or greater attributed to contract staff (**Figure 15**). Average OTA staffing minutes per resident-day were significantly different by use of contract staff ($p < .001$).



Notes: OTA=Occupational Therapy Assistant, OT=Occupational Therapist, PTA=Physical Therapist Assistant, PT= Physical Therapist.
 Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal from the Centers for Medicare and Medicaid Services.

Table 3 presents results from the multi-level mixed effects linear regression model examining the adjusted associations between OTA staffing minutes per resident-day and SNF characteristics. Coefficients represent the fixed effects of the SNF characteristic on OTA staffing minutes with respect to the reference for that characteristic, controlling for all other SNF characteristics included in the analysis. Among otherwise similar SNFs, OTA staffing minutes per resident-day were significantly lower in nonprofit independent SNFs compared to for-profit chain SNFs; in-hospital SNFs compared to freestanding SNFs; SNFs located in CCRCs compared to SNFs not located in CCRCs; and SNFs with 100 or more certified beds compared to SNFs with fewer than 100 certified beds. Regional variation decreased in the adjusted analysis compared to the unadjusted analysis, though SNFs in CMS Regions 7 and 8 had significantly lower OTA staffing minutes compared to SNFs in Region 1. OTA staffing minutes were significantly higher in SNFs located in small rural communities compared to SNFs located in urban communities and SNFs located in communities with higher levels of socioeconomic disadvantage compared to SNFs located in communities with the lowest level of socioeconomic disadvantage. OTA staffing minutes decreased significantly as the percent Medicaid residents increased in SNFs, while OTA minutes increased significantly as the total Medicare short-stay episode volume and percent of Medicare short-stay days in the ultra-high rehabilitation RUG increased. Use of contract occupational therapy practitioners was also associated with an increase in OTA staffing minutes. OTA staffing minutes was positively associated with increasing PT and PTA staffing minutes, but negatively associated with OT

staffing minutes. Quality star rating, presence of a memory care unit, and certification date were not significantly associated with OTA staffing minutes in the adjusted analysis.

Table 3. Adjusted Relationships between Occupational Therapy Assistant Staffing Minutes Per Resident-Day and Characteristics of Skilled Nursing Facilities, October 2018-September 2019

	Coefficient	95% CI		p-value
		Lower Bound	Upper Bound	
Ownership				
For-profit chain	Ref	--	--	--
For-profit independent	-1.3	-8.7	6.1	0.728
Nonprofit chain	4.1	-5.9	14.2	0.422
Nonprofit independent	-11.8	-22.2	-1.5	0.025
Governmental	-8.6	-22.2	4.9	0.212
Quality star rating				
1 Star	Ref	--	--	--
2 Stars	-5.6	-17.6	6.3	0.354
3 Stars	-10.2	-22.0	1.5	0.088
4 Stars	-8.0	-19.9	3.8	0.185
5 Stars	-8.8	-21.2	3.5	0.161
Freestanding	Ref	--	--	--
Located in-hospital	-32.9	-51.2	-14.5	<0.001
Not located in continuing care retirement community	Ref	--	--	--
Located in continuing care retirement community	-21.0	-31.6	-10.4	<0.001
Contains memory care unit	Ref	--	--	--
Does not contain memory care unit	-7.1	-15.5	1.3	0.097
Certified before July 1998	Ref	--	--	--
Certified after July 1998	6.5	-0.9	13.9	0.086
Number of certified beds				
<50	Ref	--	--	--
50-99	-1.6	-13.0	9.8	0.784
100-149	-18.6	-31.5	-5.8	0.005
150+	-42.7	-57.7	-27.7	<0.001
CMS Region				
Region 1 (CT, ME, MA, NH, RI, VT)	Ref	--	--	--
Region 2 (NJ, NY)	-25.0	-66.9	17.0	0.243
Region 3 (DE, DC, MD, PA, VA, WV)	15.3	-18.4	49.0	0.373
Region 4 (AL, FL, GA, KY, MS, NC, SC, TN)	0.3	-29.3	29.9	0.982
Region 5 (IL, IN, MI, MN, OH, WI)	0.5	-30.4	31.3	0.975
Region 6 (AR, LA, NM, OK, TX)	5.9	-27.4	39.3	0.727
Region 7 (IA, KS, MO, NE)	-35.5	-70.2	-0.9	0.044
Region 8 (CO, MT, ND, SD, UT, WY)	-38.1	-72.6	-3.7	0.030
Region 9 (AZ, CA, HI, NV)	-0.6	-38.1	37.0	0.975
Region 10 (AK, ID, OR, WA)	-12.1	-52.1	27.9	0.554
Urban-rural location				
Urban community	Ref	--	--	--
Large rural community	8.6	-0.2	17.4	0.055
Small rural community	10.9	0.8	21.0	0.035
Isolated small rural community	4.4	-8.8	17.6	0.511

Table 3. (continued)

	Coefficient	95% CI		p-value
		Lower Bound	Upper Bound	
Social Deprivation Index of community				
1-24 (Lowest)	Ref	--	--	--
25-49	11.0	2.6	19.3	0.010
50-74	9.8	1.1	18.5	0.027
75-100 (Highest)	15.1	5.8	24.5	0.002
Percent Medicaid residents				
<25%	Ref	--	--	--
25-49%	-25.0	-37.9	-12.1	<0.001
50-74%	-38.0	-50.7	-25.2	<0.001
75%+	-52.5	-66.7	-38.3	<0.001
Total Medicare short-stay episodes				
Lowest quartile	Ref	--	--	--
Medium-low quartile	10.9	2.4	19.4	0.012
Medium-high quartile	21.7	12.1	31.3	<0.001
Highest quartile	52.9	41.2	64.7	<0.001
Average risk score of Medicare short-stay residents				
Lowest quartile	Ref	--	--	--
Medium-low quartile	21.0	12.3	29.6	<0.001
Medium-high quartile	28.8	19.1	38.6	<0.001
Highest quartile	35.4	25.2	45.6	<0.001
Percent of Medicare days in ultra-high rehabilitation Resource Utilization Group				
<25%	Ref	--	--	--
25-49%	22.4	12.4	32.3	<0.001
50-74%	44.5	34.6	54.5	<0.001
75%+	76.5	65.0	87.9	<0.001
Use of contract occupational therapy practitioners				
<50% of staffing minutes	Ref	--	--	--
50%+ of staffing minutes	8.1	1.3	14.8	0.019
Occupational therapist staffing minutes	-20.5	-21.5	-19.5	<0.001
Physical therapist staffing minutes	17.2	16.3	18.1	<0.001
Physical therapist assistant staffing minutes	37.6	36.9	38.3	<0.001

Notes: Results from mixed effects linear regression model adjusting for all other variables in table and accounting for clustering of skilled nursing facilities within states.

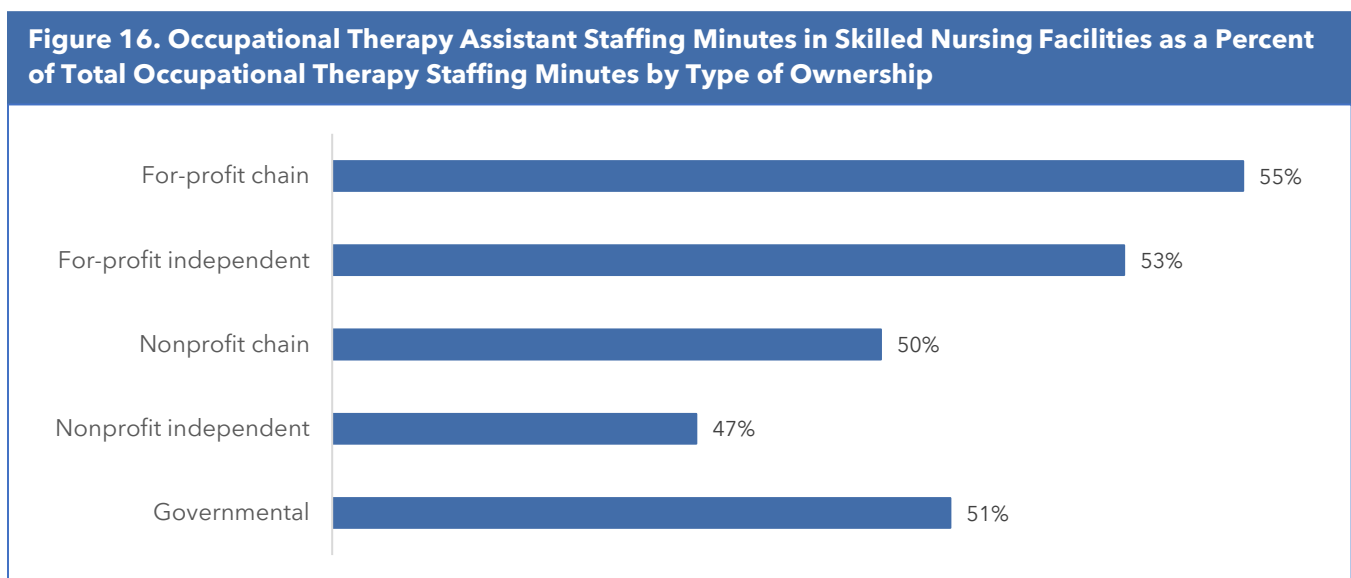
Source: University of Washington Center for Health Workforce Studies analysis of data from the Payroll Based Journal, Nursing Home Compare, and the Post-Acute Care and Hospice Provider Utilization and Payment Public Use File from the Centers for Medicare and Medicaid Services, LTCFocus, and the Social Deprivation Index.

Occupational Therapy Assistant Staffing Minutes as a Percent of Total Occupational Therapy Staffing Minutes

Among all eligible SNFs, 52.7% of total occupational therapy staffing minutes were attributed to OTAs on average. Among eligible SNFs reporting at least some OTA staffing minutes, 55.9% of total occupational therapy staffing minutes were attributed to OTAs on average.

Figures 16-32 present unadjusted OTA staffing minutes as a percent of total occupational therapy staffing minutes by SNF characteristics.

The percent OTA staffing minutes was higher within for-profit SNFs compared to nonprofit SNFs regardless of chain affiliation; the percent OTA staffing minutes was higher in chain SNFs versus independent SNFs with the same profit status (**Figure 16**). Average percent OTA staffing minutes was significantly different by type of ownership ($p < .001$).



Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal and Nursing Home Compare from the Centers for Medicare and Medicaid Services and LTCFocus.

The percent OTA staffing minutes decreased as quality star rating increased (**Figure 17**). Average percent OTA staffing minutes was significantly different by quality star rating ($p<.001$).

Figure 17. Occupational Therapy Assistant Staffing Minutes in Skilled Nursing Facilities as a Percent of Total Occupational Therapy Staffing Minutes by Quality Star Rating



Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal and Nursing Home Compare from the Centers for Medicare and Medicaid Services.

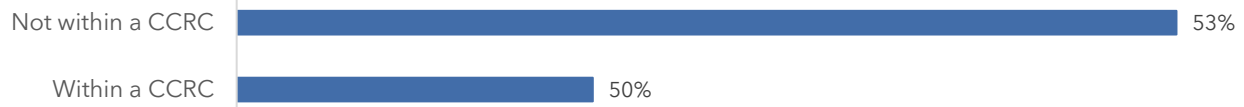
The percent OTA staffing minutes was higher for freestanding versus hospital-based SNFs, SNFs not located within a CCRC versus SNFs located within a CCRC, and for SNFs with a memory care unit versus without a memory care unit (**Figures 18-20**). Average percent OTA staffing minutes was significantly different by freestanding versus hospital-based ($p<.001$), location within or not within a CCRC ($p<.001$), and presence or absence of a memory care unit ($p=.01$).

Figure 18. Occupational Therapy Assistant Staffing Minutes in Skilled Nursing Facilities as a Percent of Total Occupational Therapy Staffing Minutes by Freestanding versus Hospital-based Location



Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal and Nursing Home Compare from the Centers for Medicare and Medicaid Services.

Figure 19. Occupational Therapy Assistant Staffing Minutes in Skilled Nursing Facilities as a Percent of Total Occupational Therapy Staffing Minutes by Continuing Care Retirement Community



Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal and Nursing Home Compare from the Centers for Medicare and Medicaid Services.

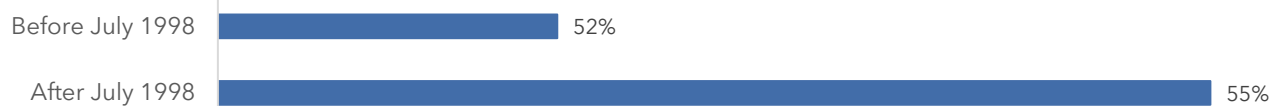
Figure 20. Occupational Therapy Assistant Staffing Minutes in Skilled Nursing Facilities as a Percent of Total Occupational Therapy Staffing Minutes by Presence of Memory Care Unit



Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal and Nursing Home Compare from the Centers for Medicare and Medicaid Services.

The percent OTA staffing minutes was lower within SNF certified before versus after implementation of prospective payment in July 1998 (**Figure 21**). Average percent OTA staffing minutes was significantly different by date of certification ($p < .001$).

Figure 21. Occupational Therapy Assistant Staffing Minutes in Skilled Nursing Facilities as a Percent of Total Occupational Therapy Staffing Minutes by Certification Date



Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal and Nursing Home Compare from the Centers for Medicare and Medicaid Services.

The percent OTA staffing minutes was higher within SNFs with 50 or more certified beds compared to SNFs with fewer than 50 certified beds (**Figure 22**). Average percent OTA staffing minutes was significantly different by number of certified beds ($p < .001$).

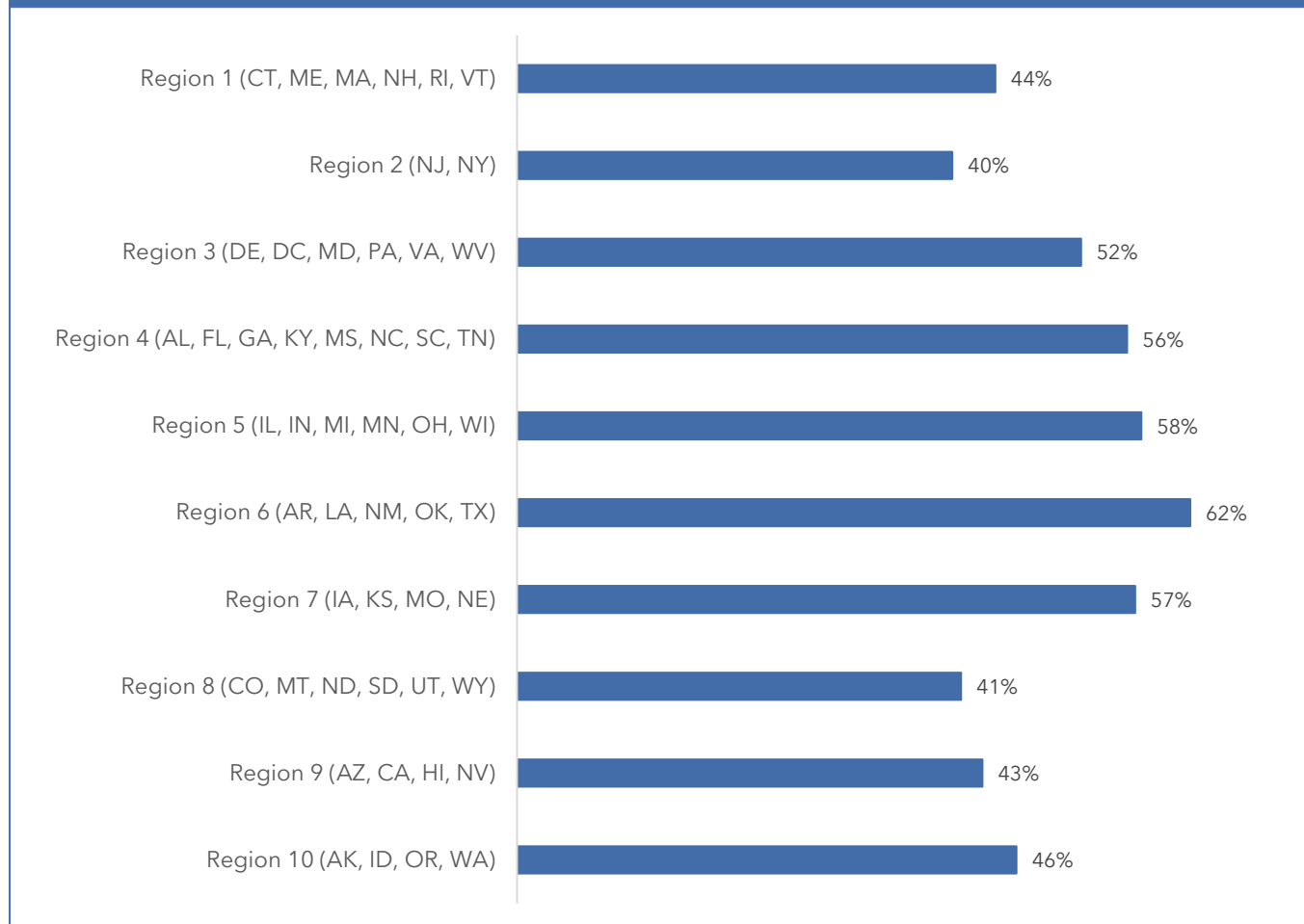
Figure 22. Occupational Therapy Assistant Staffing Minutes in Skilled Nursing Facilities as a Percent of Total Occupational Therapy Staffing Minutes by Number of Certified Beds



Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal and Nursing Home Compare from the Centers for Medicare and Medicaid Services.

The percent OTA staffing minutes varied by region with the highest percent (62%) observed in Region 6 and the lowest percent (40%) observed in Region 2 (Figure 23). Average percent OTA staffing minutes varied significantly by CMS Region ($p < .001$).

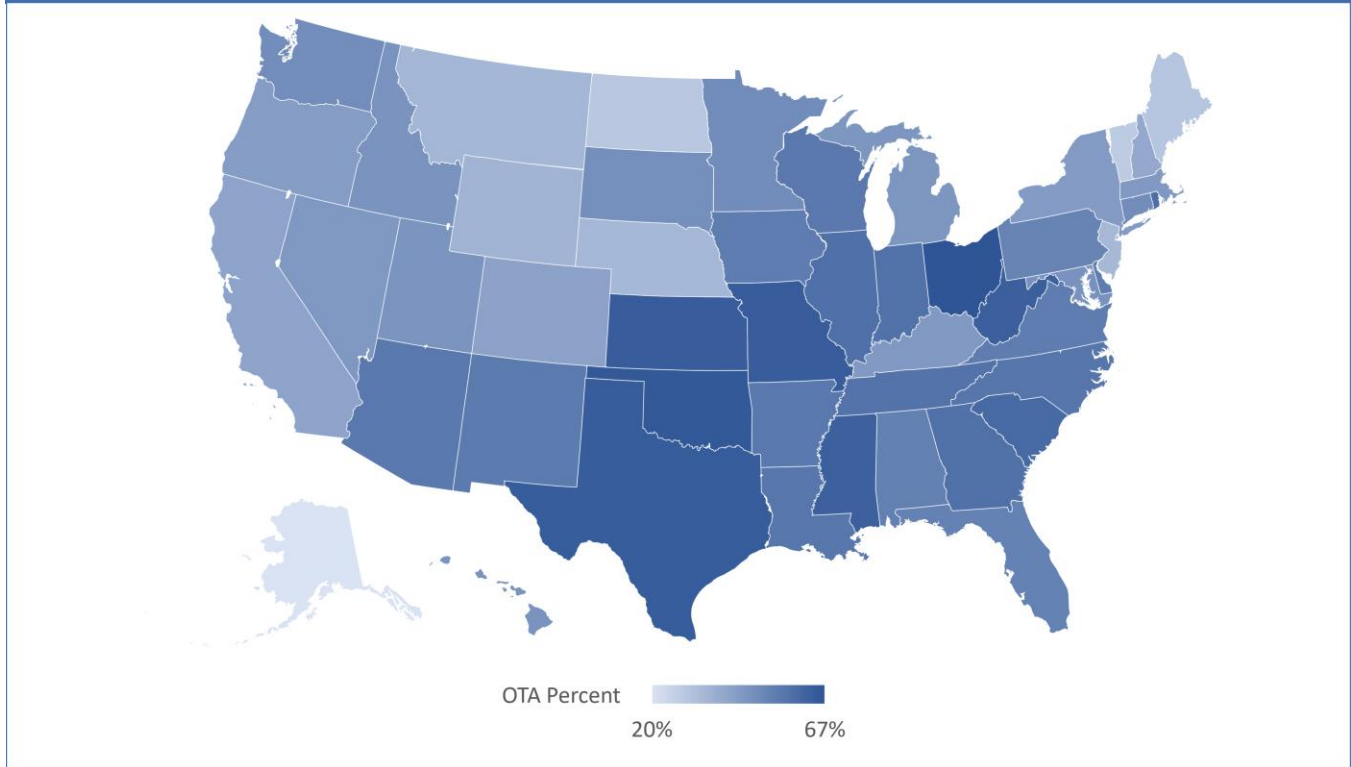
Figure 23. Occupational Therapy Assistant Staffing Minutes in Skilled Nursing Facilities as a Percent of Total Occupational Therapy Staffing Minutes by CMS Region



Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal from the Centers for Medicare and Medicaid Services.

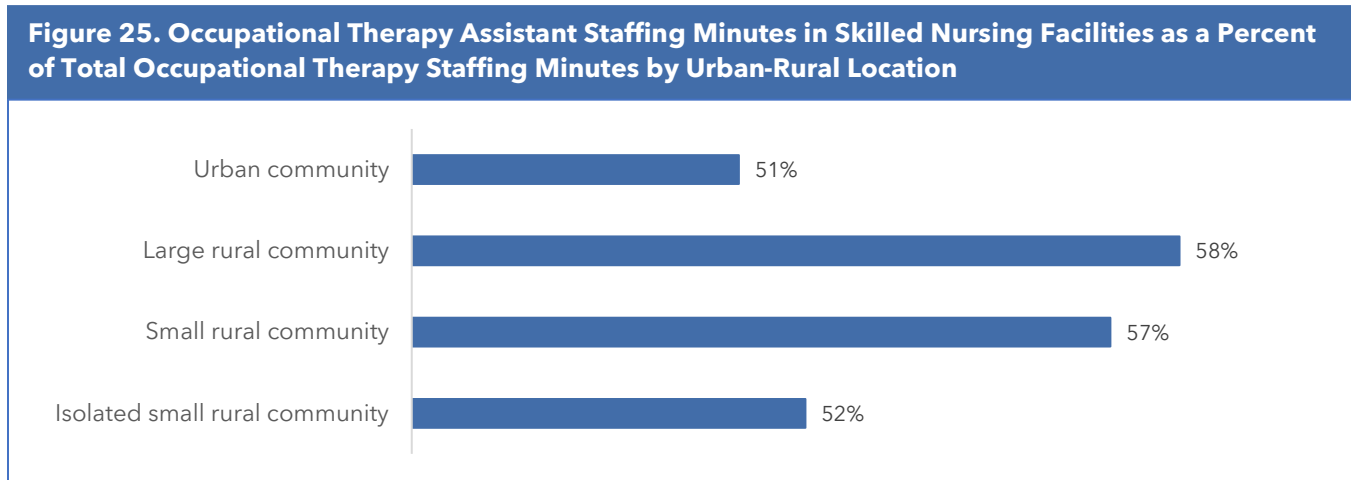
State variation in percent OTA staffing minutes ranged from a low of 20% in Alaska to a high of 67% in Ohio (Figure 24). Average percent OTA staffing minutes varied significantly by state ($p < .001$).

Figure 24. Occupational Therapy Assistant Staffing Minutes in Skilled Nursing Facilities as a Percent of Total Occupational Therapy Staffing Minutes by State



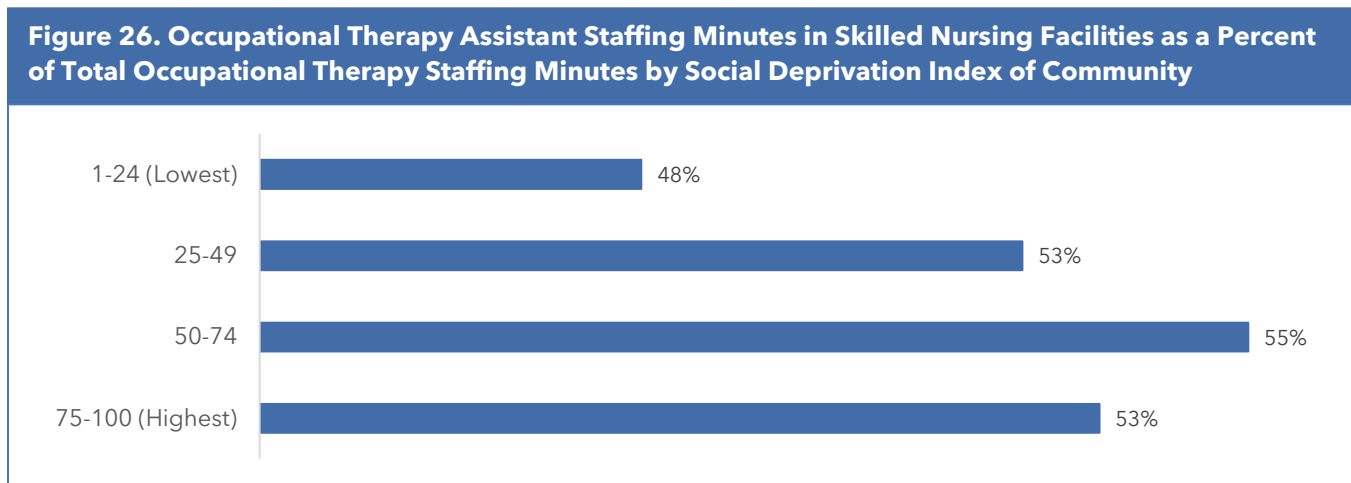
Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal from the Centers for Medicare and Medicaid Services.

The percent OTA staffing minutes was lower within SNFs located in urban communities and isolated small rural communities compared to SNFs located in large rural communities and small rural communities (Figure 25). Average percent OTA staffing minutes was significantly different by urban-rural location ($p < .001$).



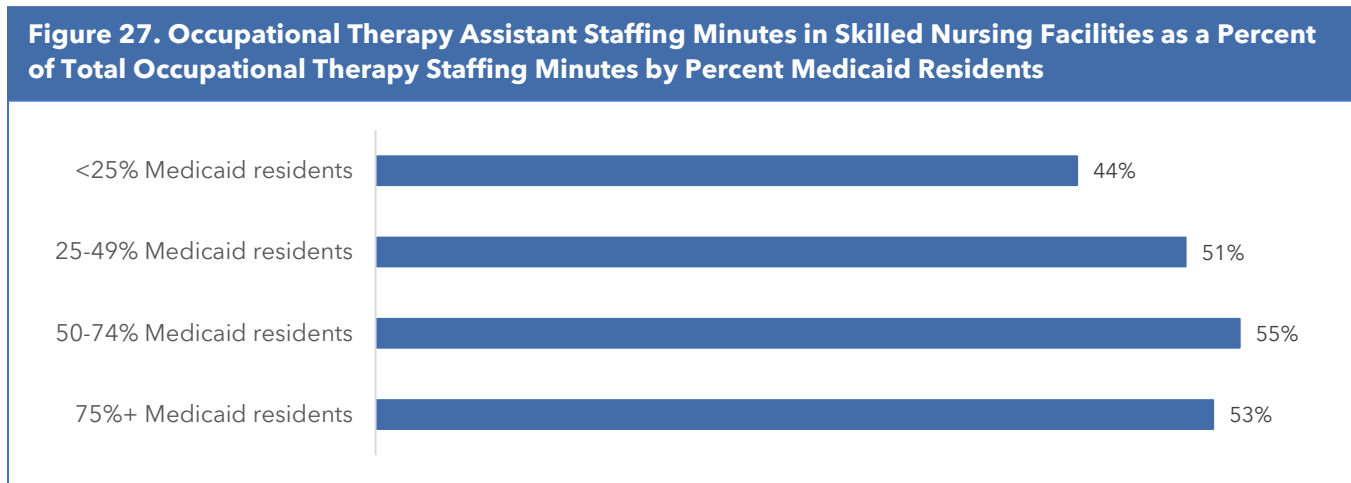
Notes: Urban-rural location was classified using Rural-Urban Commuting Area (RUCA) codes.
 Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal from the Centers for Medicare and Medicaid Services.

The percent OTA staffing minutes was higher within SNFs located in communities with higher levels of socioeconomic disadvantage compared to SNFs located in communities with the lowest level of socioeconomic disadvantage (Figure 26). Average percent OTA staffing minutes was significantly different based on level of socioeconomic disadvantage ($p < .001$).



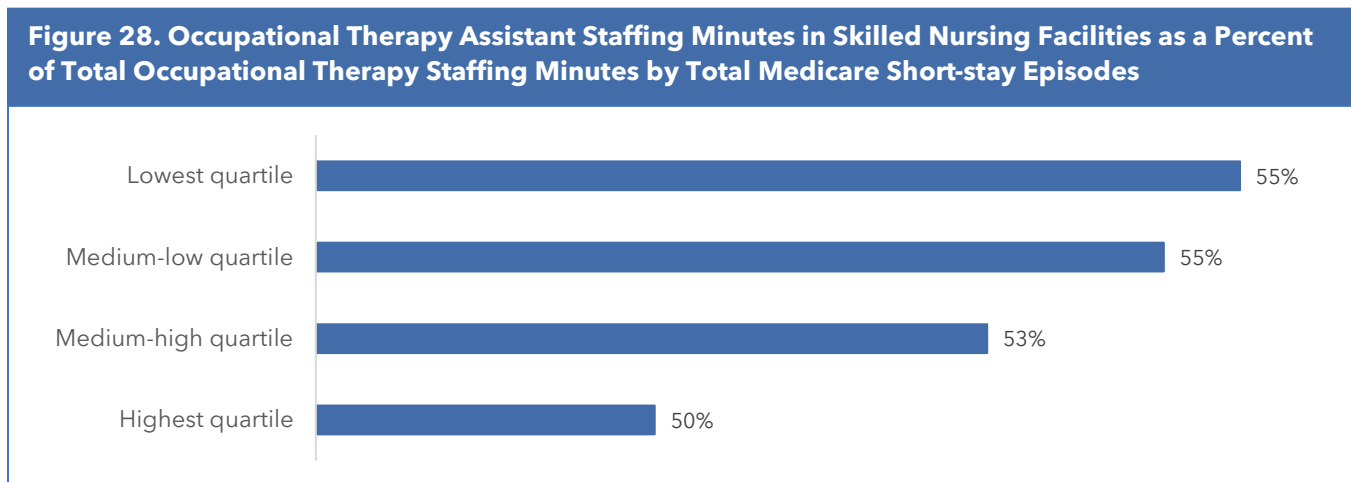
Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal from the Centers for Medicare and Medicaid Services and the Social Deprivation Index.

The percent OTA staffing minutes was higher within SNFs with 25% or more residents with Medicaid as a primary payer compared to SNFs with fewer than 25% of residents with Medicaid as a primary payer (**Figure 27**). Average percent OTA staffing minutes was significantly different by percent Medicaid residents ($p < .001$).



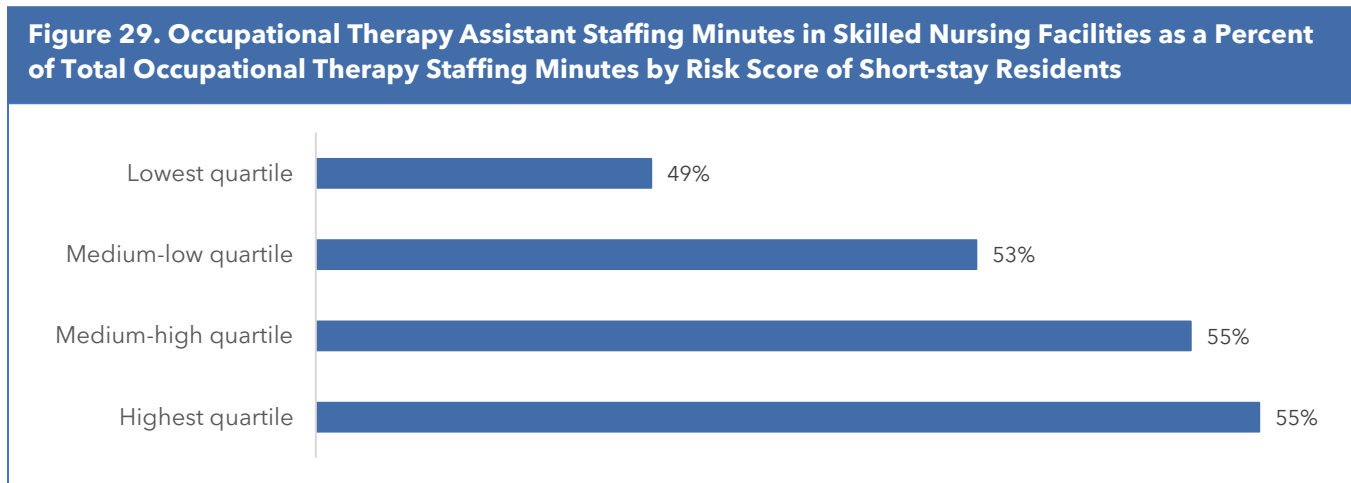
Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal from the Centers for Medicare and Medicaid Services and LTCFocus.

The percent OTA staffing minutes decreased as the volume of Medicare short-stay episodes within SNFs increased (**Figure 28**). Average percent OTA staffing minutes was significantly different by Medicare short-stay episode volume ($p < .001$).



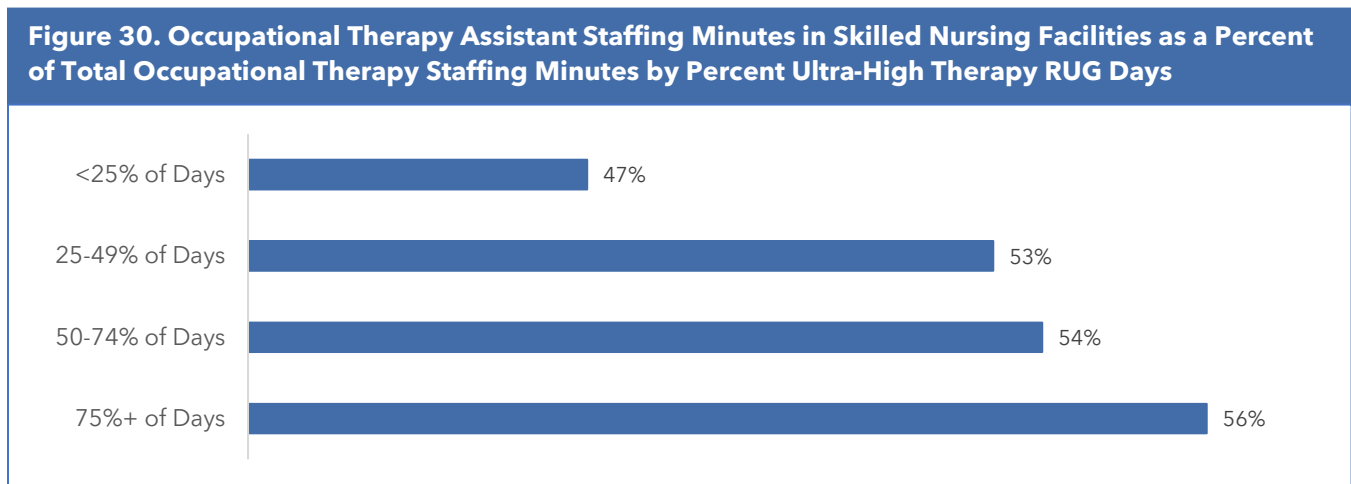
Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal and the Post-Acute Care and Hospice Provider Utilization and Payment Public Use File from the Centers for Medicare and Medicaid Services.

The percent OTA staffing minutes increased as the acuity of short-stay residents increased as measured by average risk score (**Figure 29**). Average percent OTA staffing minutes was significantly different by average risk score of short-stay residents ($p < .001$).



Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal and the Post-Acute Care and Hospice Provider Utilization and Payment Public Use File from the Centers for Medicare and Medicaid Services.

The percent OTA staffing minutes increased as the percent of ultra-high rehabilitation RUG days increased (**Figure 30**). Average percent OTA staffing minutes was significantly different based on percent of short-stay days that were ultra-high rehabilitation RUG days ($p < .001$).



Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal and the Post-Acute Care and Hospice Provider Utilization and Payment Public Use File from the Centers for Medicare and Medicaid Services.

The percent OTA staffing minutes was lower in SNFs with fewer than 50% of total occupational therapy minutes attributed to contract staff compared to SNFs with 50% of total occupational therapy minutes or greater attributed to contract staff (**Figure 31**). Average percent OTA staffing minutes was significantly different by use of contract staff ($p < .001$).

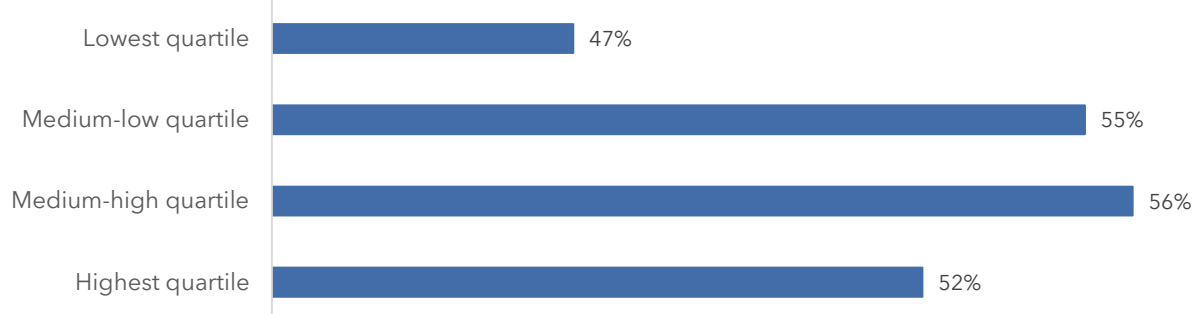
Figure 31. Occupational Therapy Assistant Staffing Minutes in Skilled Nursing Facilities as a Percent of Total Occupational Therapy Staffing Minutes by Use of Contract Therapy Staff



Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal from the Centers for Medicare and Medicaid Services.

The percent OTA staffing minutes was greater in SNFs with higher total occupational therapy staffing minutes (OT+OTA) compared to SNFs within the lowest quartile of total occupational therapy staffing minutes (**Figure 32**). Average percent OTA staffing minutes was significantly different by amount of total occupational therapy staffing minutes ($p < .001$).

Figure 32. Occupational Therapy Assistant Staffing Minutes in Skilled Nursing Facilities as a Percent of Total Occupational Therapy Staffing Minutes by Total Occupational Therapy Minutes



Source: University of Washington Center for Health Workforce Studies analysis of October 2018-September 2019 data from the Payroll Based Journal from the Centers for Medicare and Medicaid Services.

Table 4 presents results from the multi-level mixed effects linear regression model examining the adjusted associations between percent OTA staffing minutes and SNF characteristics. Coefficients represent the fixed effects of the SNF characteristic on percent OTA staffing minutes with respect to the reference for that characteristic, controlling for all other SNF characteristics included in the analysis. Among otherwise similar SNFs, percent OTA staffing minutes was significantly lower on average for nonprofit chain SNFs compared to for-profit chain SNFs; SNFs with 3-star quality ratings compared to 1-star quality ratings; in-hospital SNFs compared to freestanding SNFs; SNFs located in CCRCs compared to SNFs not located in CCRCs; and SNFs with fewer than 50 certified beds compared to SNFs with more than 50 certified beds. Significant variation in percent OTA staffing minutes was present based on CMS region. Percent OTA staffing minutes increased significantly with both increasing rurality and increasing levels of socioeconomic disadvantage within the community where the SNF was located. SNFs with 25% or more Medicaid residents had significantly higher percent OTA staffing minutes compared to SNFs with fewer than 25% Medicaid residents. Percent OTA staffing minutes decreased significantly as volume of Medicare short-stay episodes increased, but percent OTA staffing minutes increased significantly as percent of Medicare short-stay days in the ultra-high rehabilitation RUG increased. Use of contract occupational therapy practitioners and higher total occupational therapy staffing minutes were associated with higher percent OTA staffing minutes. Presence of a memory care unit and certification date were no longer significantly associated with percent OTA staffing in the adjusted analysis.

Table 4. Adjusted Relationships between Occupational Therapy Assistant Staffing Minutes as a Percent of Total Occupational Therapy Staffing Minutes and Characteristics of Skilled Nursing Facilities, October 2018-September 2019

	Coefficient	95% CI		p-value
		Lower Bound	Upper Bound	
Ownership				
For-profit chain	Ref	--	--	--
For-profit independent	-0.1%	-1.1%	0.9%	0.853
Nonprofit chain	-1.5%	-2.8%	-0.1%	0.033
Nonprofit independent	-1.3%	-2.7%	0.1%	0.063
Governmental	-1.0%	-2.8%	0.8%	0.291
Quality star rating				
1 Star	Ref	--	--	--
2 Stars	-0.2%	-1.8%	1.4%	0.803
3 Stars	-1.6%	-3.2%	0.0%	0.044
4 Stars	-1.3%	-2.9%	0.3%	0.101
5 Stars	-1.4%	-3.1%	0.2%	0.085
Freestanding	Ref	--	--	--
Located in-hospital	-3.9%	-6.3%	-1.5%	0.002
Not located in continuing care retirement community	Ref	--	--	--
Located in continuing care retirement community	-2.9%	-4.3%	-1.5%	<0.001
Does not contain memory care unit	Ref	--	--	--
Contains memory care unit	0.8%	-0.3%	1.9%	0.158
Certified before July 1998	Ref	--	--	--
Certified after July 1998	0.2%	-0.8%	1.1%	0.741
Number of certified beds				
<50	Ref	--	--	--
50-99	4.7%	3.2%	6.2%	<0.001
100-149	4.9%	3.2%	6.5%	<0.001
150+	5.2%	3.3%	7.2%	<0.001
CMS Region				
Region 1 (CT, ME, MA, NH, RI, VT)	Ref	--	--	--
Region 2 (NJ, NY)	-2.5%	-14.1%	9.1%	0.676
Region 3 (DE, DC, MD, PA, VA, WV)	11.5%	2.7%	20.4%	0.010
Region 4 (AL, FL, GA, KY, MS, NC, SC, TN)	11.4%	3.6%	19.2%	0.004
Region 5 (IL, IN, MI, MN, OH, WI)	9.9%	1.6%	18.2%	0.019
Region 6 (AR, LA, NM, OK, TX)	13.8%	5.0%	22.5%	0.002
Region 7 (IA, KS, MO, NE)	10.9%	1.7%	20.2%	0.021
Region 8 (CO, MT, ND, SD, UT, WY)	-2.4%	-10.9%	6.2%	0.587
Region 9 (AZ, CA, HI, NV)	3.9%	-5.6%	13.5%	0.422
Region 10 (AK, ID, OR, WA)	0.9%	-9.4%	11.2%	0.868
Urban-rural location				
Urban community	Ref	--	--	--
Large rural community	4.1%	3.0%	5.3%	<0.001
Small rural community	4.5%	3.2%	5.9%	<0.001
Isolated small rural community	5.9%	4.1%	7.6%	<0.001

Table 4. (continued)

	Coefficient	95% CI		p-value
		Lower Bound	Upper Bound	
Social Deprivation Index of community				
1-24 (Lowest)	Ref	--	--	--
25-49	2.5%	1.4%	3.6%	<0.001
50-74	2.8%	1.7%	4.0%	<0.001
75-100 (Highest)	4.0%	2.7%	5.2%	<0.001
Percent Medicaid residents				
<25%	Ref	--	--	--
25-49%	3.5%	1.9%	5.1%	<0.001
50-74%	4.1%	2.5%	5.7%	<0.001
75%+	3.6%	1.8%	5.4%	<0.001
Total Medicare short-stay episodes				
Lowest quartile	Ref	--	--	--
Medium-low quartile	-3.9%	-5.0%	-2.8%	<0.001
Medium-high quartile	-4.4%	-5.6%	-3.1%	<0.001
Highest quartile	-5.3%	-6.9%	-3.8%	<0.001
Average risk score of Medicare short-stay residents				
Lowest quartile	Ref	--	--	--
Medium-low quartile	0.7%	-0.4%	1.9%	0.204
Medium-high quartile	1.3%	0.0%	2.6%	0.051
Highest quartile	2.0%	0.6%	3.3%	0.004
Percent of Medicare days in ultra-high rehabilitation Resource Utilization Group				
<25%	Ref	--	--	--
25-49%	2.6%	1.2%	3.9%	<0.001
50-74%	2.9%	1.6%	4.2%	<0.001
75%+	4.6%	3.1%	6.2%	<0.001
Use of contract occupational therapy practitioners				
<50% of staffing minutes	Ref	--	--	--
50%+ of staffing minutes	9.4%	8.5%	10.2%	<0.001
Total occupational therapy staffing minutes (OTA+OT)				
Lowest quartile	Ref	--	--	--
Medium-low quartile	6.7%	5.6%	7.9%	<0.001
Medium-high quartile	9.9%	8.6%	11.1%	<0.001
Highest quartile	11.6%	10.1%	13.1%	<0.001

Notes: Results from mixed effects linear regression model adjusting for all other variables in table and accounting for clustering of skilled nursing facilities within states.

Source: University of Washington Center for Health Workforce Studies analysis of data from the Payroll Based Journal, Nursing Home Compare, and the Post-Acute Care and Hospice Provider Utilization and Payment Public Use File from the Centers for Medicare and Medicaid Services, LTCFocus, and the Social Deprivation Index.

DISCUSSION

Our findings reinforce the importance of OTAs as an integral part of the therapy workforce in SNFs. OTAs are critical for access to therapy services in SNFs given over half of all occupational therapy practitioner staffing minutes are OTA staffing minutes and OTAs represent the second highest amount of staffing minutes per resident-day of all therapy practitioners. Despite the overall importance of the OTA workforce in SNFs, we found significant variation in the OTA staffing by SNF characteristics.

Our findings are generally consistent with prior research that used the Certification and Survey Provider Enhanced Reporting (CASPER) system and Provider of Services (POS) files to examine therapy staffing in SNFs prior to availability of PBJ data and reported differences based on SNF characteristics.⁷⁻⁹ However, we did not find a strong relationship between type of ownership after adjusting for other SNF characteristics. This finding is potentially due to other SNF characteristics accounting for profit-maximizing behavior that is commonly associated with ownership; for example, percent of Medicare days in the ultra-high RUG and use of contract occupational therapy practitioners were all highly associated with increased OTA staffing minutes.

We also did not find a strong relationship between quality star rating and OTA staffing specifically which is consistent with a prior study using PBJ data that found therapy assistant staffing in SNFs was not related to readmissions or functional improvement, two measures of quality relevant to rehabilitation.¹⁰ Yet, that study also found that staffing up to 75% OTAs was associated with a higher rate of community discharge,¹⁰ suggesting that future research should examine relationships between OTA staffing and individual quality measures in addition to composite measures of quality. Other previous studies have indicated that more overall occupational and physical therapy staffing is associated with higher SNF quality,¹¹⁻¹² but more research is needed specifically on the contribution of OTA staffing and the mix of OTAs and OTs to higher SNF quality measures.

The lower use of OTAs in SNFs located within hospitals both in terms of OTA staffing minutes per resident-day and percent OTA staffing minutes may be related to sharing of occupational therapy workforce between acute and subacute units. Since acute care requires a higher ratio of evaluations to treatments compared to SNF-level care, a higher percentage of OTs may be needed in this setting if staff cover both units. While the percent of OTA staffing minutes increased as the number of certified beds increased, OTA staffing minutes per resident-day decreased, which is perhaps unsurprising given the increasing denominator available for daily resident census which was used to calculate staffing minutes per resident-day. As the percent of Medicaid residents increased, OTA minutes per resident-day decreased; in contrast, as the volume of Medicare short-stay episodes increased, OTA minutes per resident-day increased. This difference underscores the emphasis on rehabilitation for short-stay over long-stay residents which is aligned with the purpose of the post-acute care benefit, but raises questions about how the differential payments for treatments provided by OTAs under Part B will impact access to care for long-stay residents.

Geographic variation in SNF utilization and availability has been well-documented.¹³⁻¹⁵ We found stronger evidence of regional variation in percent OTA staffing minutes than OTA staffing minutes per resident-day in the adjusted analyses, which highlights the importance of examining OTA workforce in SNFs using multiple measures. Differences in percent OTA staffing minutes may be related to differences in supply of OTA workforce, an area for future research.

The critical role of OTAs in providing access to occupational therapy services is perhaps best represented in our findings related to urban-rural location and socioeconomic disadvantage of the communities in which SNFs are located. Percent OTA staffing minutes increased as rurality increased with the highest percent in isolated small rural communities, which is consistent with prior research,⁸ even though OTA staffing minutes per resident-day were lower in isolated small rural communities compared to large and small rural communities. This finding suggests the OTAs are especially important for providing occupational therapy services in the most remote rural communities. Similarly, percent OTA staffing increased as the level of socioeconomic disadvantage in a community increased and OTA staffing minutes per resident-day were also higher in areas with more socioeconomic disadvantage. While the ideal amount of therapy staffing and service provision to optimize resident outcomes is unknown, without OTA staffing in these communities, it is unclear whether underserved populations will have similar levels of access to occupational therapy services.

Limitations

PBJ data are collected as part of mandatory reporting of minutes paid by staff to work each day, so unpaid minutes, if present, are not included. In addition, PBJ data for therapy practitioners do not distinguish between time spent in direct care provision to residents versus other paid work time (e.g., documentation, staff meetings), so PBJ data represent an approximation of direct care provided by therapy practitioners rather than actual minutes of direct care provided to residents. PBJ data also do not distinguish between paid minutes for providing services to short-stay residents under the Medicare Part A benefit versus long-stay residents under the Medicare Part B benefit, precluding study of staffing for serving specific resident populations. We used facility-level measures to estimate the percent of long-stay residents and volume of short-stays, but these measures are subject to ecologic fallacy. Furthermore, PBJ data do not include paid minutes for providing services to non-residents under the Part B benefit, meaning that OTA staffing for SNFs providing a substantial amount of Part B services to non-residents may be misclassified. Also, PBJ data do not include therapy staffing minutes associated with swing bed care. Since swing beds are most often found in Critical Access Hospitals (CAHs), we are not able to examine the full extent to which OTA workforce contributes to providing care in medically underserved areas. Finally, the aggregation of PBJ data at the facility-level precludes study of care provided by OTAs at resident-level.

Implications for Policy and Practice

Our study found that OTAs provide a significant portion of occupational therapy services in SNFs, but the contribution of OTAs varies by SNF characteristics. Initial studies suggest that the implementation of PDPM resulted in a decline in occupational therapy staffing driven in large part by decreases in OTA staffing. Thus, a hypothesized shift towards increasing use of OTAs under the PDPM for short-stay residents due to decreased labor costs of employing OTAs compared to OTs does not appear to be occurring as early data suggest a greater reduction in OTA staffing as compared to OT staffing. In the only study that included OTA staffing levels separately, monthly staffing levels were reduced by 10.2% for OTAs versus 6.1% for OTs in the first quarter SNFs were operating under PDPM.¹⁶ Another study that examined therapy staffing over the first two quarters of PDPM found that total therapy staffing levels declined by 5.5% in the week immediately following PDPM implementation and then continued to decline 0.2% per week through the first six months of PDPM for a 14.7% overall decrease, with greater declines seen for assistants versus therapists.¹⁷ Whether the OTA workforce in SNFs will continue to shrink, stabilize, or grow again as SNFs gain additional experience under PDPM remains to be seen. While SNF reimbursements grew unexpectedly during the first year of PDPM despite the intent of budget neutrality,¹⁸ we do not yet know whether staffing levels have changed following the initial decreases or whether access to occupational therapy services at the resident-level has decreased. The effect of the ongoing COVID-19 pandemic on SNFs may further complicate therapy workforce issues, which in turn may impact resident access to care.

The importance of OTAs for occupational therapy staffing in SNFs overall and specifically for SNFs located in rural and socioeconomically disadvantaged communities combined with the early impacts of PDPM on OTAs has raised concerns that the 85% differential payments in Medicare Part B payments for OTAs introduced for CY2022 may have additional unintended consequences for access to care for SNF residents. Reduction in payments for treatments provided by OTAs versus OTs for long-stay residents receiving Part B services could lead to even greater declines in OTA staffing in SNFs than observed initially under PDPM, potentially further decreasing access to occupational therapy services for both short-stay and long-stay residents. Research on how the OTA workforce is impacted by these differential payments within the greater context of the ongoing pandemic and the maturation of PDPM is warranted along with monitoring of resident access to occupational therapy services and outcomes of care.

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