

# Medicare skilled nursing facilities' occupancy and payer source: The moderating role of financial performance

SAGE Open Medicine  
Volume 12: 1–11  
© The Author(s) 2024  
Article reuse guidelines:  
sagepub.com/journals-permissions  
DOI: 10.1177/20503121241275368  
journals.sagepub.com/home/smo



Hyunmin Kim<sup>1</sup>, Asos Mahmood<sup>2,3</sup> , Cyril F. Chang<sup>4</sup>  
and Aram Dobalian<sup>5</sup>

## Abstract

**Objectives:** While extensive research has focused on patient outcomes in skilled nursing facilities, a critical gap remains in understanding factors influencing their managerial performance, particularly occupancy rates. This study examines the occupancy rates of skilled nursing facilities and assesses the significance of two important drivers of managerial performance that have not received sufficient attention—the influence of payer mix and total profit margin. Specifically, we focused on the role played by a nursing home's financial performance (as assessed by profit margin) in influencing the relationship between payer mix and occupancy rate among skilled nursing facilities.

**Methods:** Data were extracted from the 2019 to 2020 Joint Annual Report of Nursing Homes for a sample of 612 skilled nursing facilities in Tennessee, USA. Regression analysis was performed by fitting a generalized estimating equation of occupancy rate.

**Results:** Compared to skilled nursing facilities in the lowest quartile of profit margin, for example, those in the highest quartile had approximately 18 percentage points higher occupancy rates per unit increase in resident days of care covered by traditional Medicare ( $\beta = 0.18$ ,  $p = 0.0028$ ). Similarly, skilled nursing facilities in the second highest quartile of profit margin had a higher occupancy rate by approximately 23 percentage points per unit increase in Medicare Advantage ( $\beta = 0.23$ ,  $p = 0.0375$ ) when compared to those in the lowest quartile of profit margin.

**Conclusions:** Skilled nursing facilities with stronger financial performance generally have higher occupancy rates, particularly notable in relation to an upswing in payer sources such as traditional Medicare and Medicare Advantage, when compared to skilled nursing facilities with weaker profitability. Given the increasingly larger role of Medicare in long-term care funding, policymakers and nursing home managers may find it useful to consider our findings when evaluating opportunities to enhance managerial performance of skilled nursing facilities.

## Keywords

Skilled nursing facilities, occupancy rate, length of stay, financial performance, profit margin, payer source, Medicare, Medicare advantage, Medicare Part C

Date received: 23 April 2024; accepted: 29 July 2024

## Introduction

In the United States, there are about 15,000 nursing homes (NHs) serving more than 1.2 million residents.<sup>1,2</sup> Skilled nursing facilities (SNFs), a subset of NHs, are a specific type of long-term care facilities recognized by Medicare and Medicaid for providing both subacute care and skilled rehabilitation services. During the COVID-19 pandemic, SNFs were among the hardest-hit healthcare institutions.<sup>3</sup> The pandemic exacerbated the already existing operational challenges facing SNFs as available evidence indicates that the industry is struggling with multiple financial and workforce shortage issues.<sup>4</sup> Further, longitudinal evidence indicates that while the supply

<sup>1</sup>School of Health Professions, The University of Southern Mississippi, Hattiesburg, MS, USA

<sup>2</sup>Center for Health System Improvement, College of Medicine, University of Tennessee Health Science Center, Memphis, TN, USA

<sup>3</sup>Department of Medicine-General Internal Medicine, College of Medicine, University of Tennessee Health Science Center, Memphis, TN, USA

<sup>4</sup>Fogelman College of Business and Economics, The University of Memphis, Memphis, TN, USA

<sup>5</sup>Division of Health Services Management and Policy, College of Public Health, The Ohio State University, Columbus, OH, USA

### Corresponding author:

Hyunmin Kim, School of Health Professions, The University of Southern Mississippi, 118 College Drive #5122, Hattiesburg, MS 39406, USA.

Email: Hyunmin.Kim@usm.edu



of all nursing facilities dropped by 4% between 2015 and 2023, the number of residents decreased much more, by as much as 12%,<sup>2</sup> thus continuing the long-term trend of a steady decrease in SNF occupancy rates since the 1970s.<sup>5</sup> These challenges facing the NH industry will undoubtedly have serious consequences for post-acute and long-term care, as well as for healthcare quality and equity in the United States.<sup>6</sup>

Long-term care facilities typically require sufficient capacity to effectively manage utilization and patient care outcomes.<sup>7</sup> But persistently low levels of occupancy invariably lead to financial difficulties that can jeopardize service quality and patient care outcomes.<sup>7-9</sup> Further, poor financial performance due to low occupancy or other capacity factors is typically associated with a higher likelihood of administrative instabilities and, if not corrected, facility closures.<sup>10,11</sup> It is essential for a NH to maintain an adequate and consistent level of occupancy as a managerial outcome.<sup>7,8</sup>

Occupancy rate, by definition, is determined by two key operation factors: It increases with length of stay and decreases with the total number of available beds.<sup>12-14</sup> But this relationship can be complicated by a third factor: whether the facility has a large proportion of long-stay residents. Empirical studies of NHs thus typically focus on either short- or long-term facilities in order to remove this complication.

Another factor that can complicate NH research is that facilities do not have the same payer mix, which can significantly affect outcome performance. In the United States, for example, Medicare and Medicaid are the predominant financing sources for NH care.<sup>15-17</sup> Medicare spends extensively on SNFs, primarily for short-stay residents, and it covers SNF residents for up to 100 days of stay based on a resident's eligibility criteria.<sup>18</sup> It was reported that total Medicare fee-for-service (FFS) expenditures for all post-acute care reached \$56.8 billion in 2021. Of this total, more than half, or about 27.7 billion, was spent on SNFs.<sup>19,20</sup> Further, Medicare Advantage, Medicare's managed care program (aka, Medicare Part C), which currently covers more than 30% of total Medicare NH residents in the United States, has increasingly placed patients in NHs that show better performance by selectively contracting with NHs that provide higher-quality post-acute care.<sup>22,21</sup>

Medicare Advantage was initially introduced as a strategy to reduce costs compared to traditional FFS Medicare and offers both lower premiums to enrollees and caps out-of-pocket spending.<sup>22</sup> It also covers certain services that traditional Medicare does not, including fitness memberships, hearing and vision care, and dental care services. Furthermore, most Medicare Advantage plans offer Medicare drug or Part D coverage as opposed to traditional Medicare, for which it is optional. These coverage benefits may have attracted increasingly more Medicare Advantage beneficiaries, particularly considering federally regulated out-of-pocket spending limitations.<sup>23</sup> To date, the role of Medicare Advantage in influencing the outcome of SNFs has received scant attention in the literature.

There is another research gap in need of attention. Much has been written about NHs clinical outcomes,<sup>24-27</sup> and prior studies have investigated organizational and ownership differences in length of stay and occupancy rate.<sup>21,24,28-32</sup> A few of them have noted the influences of payer mix, ownership status, and market competition.<sup>27,33-39</sup> Others have observed a connection between quality metrics of structure, process, and outcomes and financial stability.<sup>29</sup> But few have explicitly explored the interconnections between payer source, financial performance, and occupancy rate as a focus of their study.

In this study, we examined occupancy rate as the main managerial outcome of SNFs and explored the association between occupancy rate and payer mix. We were particularly interested in the role of financial performance in influencing this relationship and the effects of Medicare Advantage as a payer source that had grown significantly in recent years. Specifically, we tested the hypothesis that SNFs with stronger financial performance exhibit higher occupancy rates, other things being equal, when compared to those with weaker financial performance. We further tested whether this relationship is influenced by various payer sources, particularly by the growth of traditional Medicare and Medicare Advantage.

## Methods

### Data and study sample

This quantitative study employed 2 years of data (2019–2020) from the Tennessee Joint Annual Report of Nursing Homes administered and maintained by the Tennessee Department of Health. This well-documented annual dataset includes facility-level information on all licensed NHs, including facility characteristics, types of services provided, patient characteristics, and financial indicators. The availability of detailed financial information on payer sources, including traditional Medicare and Medicare Advantage, makes it particularly suited for our purpose.

Our study sample included 612 NHs, after excluding SNFs that were hospital-based ( $n=11$ ) and non-Medicare SNFs ( $n=4$ ). We excluded the former group because they differ considerably from non-hospital-based SNFs in terms of operating procedures, resources, and constraints.<sup>40</sup> Further, we excluded four non-Medicare SNFs because they are mostly small in size and/or serve residents with special needs.

### Variables and measures

Our dependent variable is the the occupancy rate of a SNF. It is calculated by dividing the total resident days served by a facility by the total available bed days defined as the product of total available beds and 365 days. We used the number of reported licensed beds as a proxy for available beds.

The primary independent variables of interest were proportions of payer sources, which included traditional Medicare,

Medicare Advantage, TennCare (Tennessee's Medicaid program), Private Ininsured (self-pay), and Others (including Access TN, long-term care insurance, other government and non-government, and Veterans affairs (VA) contracts). These were identified as payer sources that paid for Level II/skilled nursing care. For each payer source, we computed the total resident days of care for Level II/skilled nursing care paid for as a proportion of facility's total resident days. For instance, the variable "traditional Medicare" indicates the proportion of all other Medicare sources employed for resident days of care for Level II/skilled nursing care.

Another independent variable of interest is total profit margin (PM), and we used it as a proxy for financial performance to see if it played a moderator in the association between payer source and occupancy. We chose to use total PM and not the narrower measure of operation margins to assess the availability of all resources and not just those coming from running the facility.<sup>41</sup> Both the continuous and categorical forms of this variable were used in the models.

To examine the extent to which SNFs fall into higher or lower financial performance, we categorized SNFs into four quantiles of PM (Q1 ( $n=74$ ), Q2 ( $n=73$ ), Q3 ( $N=74$ ), and Q4 ( $n=73$ )). We first computed the total lagged PM and calculated the ratio of profit over revenue (i.e., (total revenue - total expense)/(total revenue)). We then grouped SNFs into the four categories of PM ( $\pi$ ) quantiles: Q1 ( $-0.0315 \geq \pi \geq -5.1861$ ), Q2 ( $0.0408 \geq \pi > -0.0315$ ), Q3 ( $0.0958 \geq \pi > 0.0408$ ), and Q4 ( $1.0000 \geq \pi > 0.0958$ ). Additionally, we examined PM by categorizing it into two groups:  $PM < 0$  and  $PM \geq 0$ . The results are presented in Supplemental Table 1. We also constructed PM quantiles (Q1-Q4) to compare SNFs with a higher PM versus those with a lower PM (see Supplemental Table 2). Specifically, we used 2019 information for total revenues and expenses to calculate lagged total PM to see if prior year financial performance provides a better regression fit and to avoid simultaneity bias.

Our covariates were selected following Donabedian's Structure-Process-Outcome conceptual framework.<sup>42</sup> Specifically, structural covariates included total licensed beds, being part of a chain organization, and resident-staff ratios of key SNF personnel including full-time equivalent physicians, registered nurses, licensed practical nurses, and certified nursing assistants. Process factors included the receipt of antipsychotics (the proportion of residents who received antipsychotics on the last day of the reporting period) and providing skilled care procedures (chemotherapy, dialysis, intravenous medication, intake/output, ostomy care, oxygen therapy, radiation, suctioning, tracheotomy care, transfusions, and ventilator/respirator). Additionally, we also included aggregate patient characteristics (age, sex, race, etc.) and SNF's geographic location in the model based on prior research.<sup>11,21</sup> Concerning the geographic location, a new variable "urban/rural status" was created based on the Office of Management and Budget's definition of

metropolitan and non-metropolitan counties in the United States.<sup>43</sup> To assess the functional status of SNF residents, the activities of daily living score (0-5) was used.<sup>44</sup>

### Statistical procedure

Applying descriptive analytical techniques to two consecutive years of pooled cross-sectional data, we first analyzed the overall characteristics of SNFs. We also stratified the results into those with a high proportion of short-stay residents ( $\geq 75\%$  who stayed less than 100 days) and those with a low proportion ( $< 75\%$  of residents who stayed less than 100 days). This stratification is consistent with the belief that SNFs with a high proportion of short-stay residents tend to have more traditional Medicare and Medicare Advantage residents and fewer residents receiving Medicaid/TennCare benefits, which reimburse providers at a lower rate but cover long-term care. The choice of 100 days followed examples of prior research that cited Medicare's practice of covering SNF utilization up to 100 days.<sup>15,18</sup>

Our regression analysis was performed using a generalized estimating equation (GEE) technique to investigate the association between payer sources and occupancy rate. We analyzed both the baseline model without the covariates and the full model that took into account the confounding effects the covariates. Employing GEE was due to having a non-normal distribution of the data as confirmed by the Shapiro-Wilk test ( $p < 0.0001$ ) and also having repeated measures. To examine the "effect modification" (i.e., the effect of one variable on another and how it varies across a third variable) of SNFs' financial performance, we added several interaction terms ("each of the lagged total PM quantiles (Q1-Q4)"  $\times$  "each of the payer sources") to the equation. Additionally, we conducted several subgroup analyses according to the proportion of short-stay SNF residents (i.e.,  $< 75\%$  vs  $\geq 75\%$ ) and for-profit status (a categorical variable) to examine whether the associations varied across long- vs. short-stay residents, and the for-profit versus nonprofit status. All statistical analyses were performed using SAS version 9.4 statistical software (SAS Institute Inc., Cary, NC, USA ©2014). This study made use of de-identified, publicly available secondary data and was considered as non-human subjects research. Thus, it was exempt from obtaining additional Institutional Review Board (IRB) approval.

### Results

Table 1 presents the overall characteristics of SNFs and the differences by the proportions of short-stay residents. In brief, SNFs in Tennessee reported an average occupancy rate of 74.42% in 2019-2020, but with no statistically significant difference between those with high and low short-stay proportions. In terms of payer mix, the mean proportions of traditional Medicare, Medicare Advantage, Medicaid/TennCare, Private (self-pay), and other payer sources

**Table 1.** Characteristics of SNFs and differences by short-stay resident proportion, the Tennessee Joint Annual Report of Nursing Homes, pooled data from 2019 to 2020.

Characteristics	Mean (SD) or N (%)	LOS less than 100 days		p <sup>a</sup>
		<75% (N=535)	≥75% (N=77)	
		Mean (SD) or N (%)	Mean (SD) or N (%)	
<b>Structure</b>				
Part of chain	240 (39.28)	203 (38.01)	37 (48.05)	0.0918
Ownership				0.2673
For profit	457 (80.18)	402 (80.89)	55 (75.34)	
Not for profit	113 (19.82)	95 (19.11)	18 (24.66)	
Total number of beds	194.41 (185.78)	155.43 (115.32)	463.69 (314.78)	<0.0001
<b>Staffing<sup>b</sup></b>				
Physicians	0.10 (0.52)	0.10 (0.54)	0.06 (0.24)	0.2924
RNs	7.46 (4.61)	7.18 (3.84)	9.44 (7.94)	0.0170
LPNs	15.93 (8.32)	15.87 (8.31)	16.31 (8.44)	0.6728
CNAs	14.72 (17.77)	16.78 (18.07)	0.27 (1.70)	<0.0001
<b>Payer source</b>				
Traditional Medicare <sup>c</sup>	0.58 (0.24)	0.58 (0.24)	0.57 (0.21)	0.4754
Medicare advantage <sup>c</sup>	0.27 (0.18)	0.27 (0.18)	0.27 (0.17)	0.7855
Medicaid/TennCare <sup>d</sup>	0.07 (0.19)	0.07 (0.20)	0.04 (0.13)	0.0621
Private (Self-pay) <sup>c</sup>	0.02 (0.09)	0.02 (0.08)	0.05 (0.14)	0.0587
Other <sup>e</sup>	0.05 (0.11)	0.05 (0.11)	0.05 (0.09)	0.9650
Geographic location				0.0289
Urban	342 (55.97)	290 (54.31)	52 (67.53)	
<b>Patient characteristics</b>				
Aged 65 and older	219.05 (189.63)	190.24 (146.83)	418.85 (301.92)	<0.0001
Women <sup>f</sup>	0.61 (0.10)	0.61 (0.11)	0.61 (0.08)	0.6877
African American <sup>g</sup>	0.13 (0.19)	0.13 (0.19)	—	—
Functional status				
ADL score (0–5)	3.70 (0.72)	3.70 (0.72)	3.66 (0.77)	0.6841
<b>Process</b>				
Receiving antipsychotics	15.52 (11.37)	15.73 (10.72)	14.12 (15.04)	0.3736
Skilled care procedures				
Dialysis	475 (77.74)	412(77.15)	63 (81.82)	0.3576
IV medication	590 (96.56)	514 (96.25)	76 (98.70)	0.2706
Intake/Output	594 (97.22)	519 (97.19)	75 (97.40)	0.9159
Ostomy care	604 (98.85)	527 (98.69)	77 (100.00)	0.3123
Radiation	76 (12.44)	66 (12.36)	10 (12.99)	0.8761
Suctioning	578 (94.60)	504 (94.38)	74 (96.10)	0.5320
Tracheotomy care	495 (495)	436 (81.65)	59 (76.62)	0.2933
Transfusions	58 (9.49)	51 (9.55)	7 (9.09)	0.8976
Ventilator/Respirator	65 (10.64)	58 (10.86)	7 (9.09)	0.6376
Profit margin	0.007 (0.40)	0.02 (0.26)	0.0003 (0.43)	0.5996
<b>Outcome</b>				
Licensed occupancy rate	74.42 (16.796)	73.69 (17.14)	76.55 (15.65)	0.1781

SNFs, skilled nursing facilities; LOS, length of stay; SD, standard deviation; RNs, registered nurses; LPNs, licensed practical nurses; CNAs, certified nurse's aides; ADL, activities of daily living; MCO, managed care organizations.

<sup>a</sup>Chi-square test for categorical variables; t-test for continuous variables.

<sup>b</sup>Full-time equivalent workforce.

<sup>c</sup>Level II care/Skilled nursing care.

<sup>d</sup>TennCare MCO plans and all other Medicaid/TennCare.

<sup>e</sup>Access TN, long-term care insurance, other government and non-government, VA contract.

<sup>f</sup>Proportion of women aged 65 and older.

<sup>g</sup>Proportion of African Americans aged 65 and older.

**Table 2.** Moderating effects of financial performance in the association between occupancy rate and payer source in SNFs.

Variable	Unadjusted		Adjusted <sup>a</sup>	
	Estimate	<i>p</i>	Estimate	<i>p</i>
Traditional Medicare × PM <sup>b</sup>	7.61	0.3558	0.17	0.1756
Traditional Medicare × PM Q1	Reference		Reference	
Traditional Medicare × PM Q2	-0.01	0.8048	-0.01	0.8364
Traditional Medicare × PM Q3	0.12	0.0463	0.14	0.0267
Traditional Medicare × PM Q4	0.16	0.0053	0.18	0.0028
MA × PM <sup>b</sup>	1.07	0.9437	-0.13	0.5879
MA × PM Q1	Reference		Reference	
MA × PM Q2	0.07	0.5403	0.05	0.6936
MA × PM Q3	0.26	0.0184	0.23	0.0375
MA × PM Q4	0.22	0.0728	0.20	0.1228
Medicaid/TennCare × PM <sup>b</sup>	-7.84	0.5631	-0.12	0.5805
Medicaid/TennCare × PM Q1	Reference		Reference	
Medicaid/TennCare × PM Q2	0.05	0.7777	0.07	0.6848
Medicaid/TennCare × PM Q3	0.04	0.7110	0.04	0.7592
Medicaid/TennCare × PM Q4	0.06	0.7127	0.09	0.6351
Private (Self-pay) × PM <sup>b</sup>	46.44	0.1532	0.64	0.2320
Private (Self-pay) × PM Q1	Reference		Reference	
Private (Self-pay) × PM Q2	0.83	0.0758	0.35	0.4672
Private (Self-pay) × PM Q3	0.68	0.1455	0.76	0.0905
Private (Self-pay) × PM Q4	0.24	0.4023	0.27	0.3517
Other × PM <sup>b</sup>	6.80	0.8561	-0.07	0.9009
Other × PM Q1	Reference		Reference	
Other × PM Q2	-0.04	0.8199	-0.09	0.5871
Other × PM Q3	0.27	0.3341	0.25	0.3744
Other × PM Q4	0.29	0.4177	0.25	0.4875

SNFs, skilled nursing facilities; MA, Medicare Advantage; PM, profit margin; Q, Quantile.

<sup>a</sup>Adjusted for age, sex, functional status, facility-related factors (total number of beds), part of a chain, and staffing (LPNs), rural/urban status, skill care procedure (dialysis), and process measures (receipt of antipsychotics).

<sup>b</sup>Given PM was not-normally distributed, it was square-root transformed.

reimbursed for SNF resident days were 0.58, 0.27, 0.07, 0.02, and 0.05, respectively. Most of the SNFs (80.18%) were for-profit, less than 40% were part of a chain, and more than half (55.97%) were located in urban areas.

In terms of staffing, each SNF had an average of 0.10 for physicians, 7.46 for registered nurses, 15.93 for licensed practical nurses, and 14.72 for certified nursing assistants. SNFs with  $\geq 75\%$  residents who stayed less than 100 days were more likely to be part of a chain, not-for-profit, have a higher number of total beds, be in urban areas, and have a lower licensed occupancy rate compared with their counterpart SNFs with  $< 75\%$  residents who stayed less than 100 days. Further, SNFs with a higher proportion of short-stay residents tended to have more physicians and certified nursing assistants, but fewer registered nurses and licensed practical nurses compared to those with a lower proportion.

The results of our regression analysis of occupancy rates are presented in Table 2. Notably, we presented results of the moderating effects of financial performance in the association between occupancy and payer sources in SNFs. The results show that in comparison to SNFs in PM Q1, those in PM Q3

had 14 percentage points higher licensed occupancy rates per unit increase in traditional Medicare employed for resident days of care, after adjusting for the covariates ( $\beta=0.14$ ,  $p=0.0267$  (PM Q3)). Similarly, SNFs in PM Q4 had 18 percentage points higher licensed occupancy rates followed by a unit increase in traditional Medicare, after adjusting for the confounders ( $\beta=0.18$ ,  $p=0.0028$  (PM Q4)). Compared to those in PM Q1, SNFs in PM Q3 also showed a 23 percentage points higher licensed occupancy rate per unit increase in Medicare Advantage after controlling for the covariates ( $\beta=0.23$ ,  $p=0.0375$  (PM Q3)). However, no significant results were observed concerning other payer sources.

The results from the subgroup analysis by short-stay resident proportion are presented in Table 3. Among SNFs with  $< 75\%$  of short-stay residents, SNFs with higher financial performance had higher licensed occupancy rates per unit increase in traditional Medicare ( $\beta=0.16$ ,  $p=0.0363$  (PM Q3);  $\beta=0.15$ ,  $p=0.0288$  (PM Q4)) and Medicare Advantage ( $\beta=0.28$ ,  $p=0.0418$  (PM Q3)) compared to those in PM Q1. Among SNFs with  $\geq 75\%$  of short-stay residents, SNFs in PM Q4 had a 20 percentage points higher licensed occupancy rate per unit increase in traditional Medicare ( $\beta=0.20$ ,

**Table 3.** Subgroup analysis by short-stay resident proportion.

Variable	LOS less than 100 days			
	<75%		≥75 %	
	Estimate	<i>p</i>	Estimate	<i>p</i>
Traditional Medicare × PM <sup>a</sup>	0.30	0.2699	0.04	0.7716
Traditional Medicare × PM Q1	Reference		Reference	
Traditional Medicare × PM Q2	-0.03	0.6827	0.06	0.5717
Traditional Medicare × PM Q3	0.16	0.0363	0.03	0.6867
Traditional Medicare × PM Q4	0.15	0.0288	0.20	0.0354
MA × PM <sup>a</sup>	0.08	0.8504	-0.01	0.9690
MA × PM Q1	Reference		Reference	
MA × PM Q2	0.01	0.9154	0.19	0.3033
MA × PM Q3	0.28	0.0418	0.20	0.2357
MA × PM Q4	0.19	0.2295	0.27	0.1323
Medicaid/TennCare × PM <sup>a</sup>	-1.65	<.0001	0.27	0.2695
Medicaid/TennCare × PM Q1	Reference		Reference	
Medicaid/TennCare × PM Q2	0.07	0.6856	-0.09	0.9142
Medicaid/TennCare × PM Q3	0.24	0.1255	-0.77	0.0001
Medicaid/TennCare × PM Q4	0.18	0.3426	-0.69	0.0327
Private (Self-pay) × PM <sup>a</sup>	0.32	0.5375	3.22	0.0643
Private (Self-pay) × PM Q1	Reference		Reference	
Private (Self-pay) × PM Q2	1.11	0.2076	0.63	0.1676
Private (Self-pay) × PM Q3	1.43	0.0701	0.11	0.8037
Private (Self-pay) × PM Q4	0.95	0.5792	0.17	0.4560
Other × PM <sup>a</sup>	-0.66	0.6313	0.23	0.7122
Other × PM Q1	Reference		Reference	
Other × PM Q2	-0.07	0.7024	0.23	0.5850
Other × PM Q3	0.38	0.2233	-1.29	0.1914
Other × PM Q4	0.21	0.6040	0.75	0.3345

LOS, length of stay; MA, Medicare Advantage; PM, profit margin; Q, Quantile.

<sup>a</sup>Given PM was not-normally distributed, it was square-root transformed.

$p=0.0354$  (PM Q4)) compared to those in PM Q1. Further, when compared to those in PM Q1, SNFs with higher financial performance had lower licensed occupancy rates per unit increase in Medicaid/TennCare ( $\beta=-0.77$ ,  $p=0.0001$  (PM Q3);  $\beta=-0.69$ ,  $p=0.0327$  (PM Q4)).

Furthermore, the results from the subgroup analysis by for-profit status are shown in Table 4. Among for-profit SNFs, those in PM Q3 had a 16 percentage points higher licensed occupancy rate per unit increase in Medicare Advantage ( $\beta=0.31$ ,  $p=0.0159$ ) compared with those in PM Q1. Among not-for-profit SNFs, SNFs in PM Q4 had a 21 percentage points higher licensed occupancy rate per unit increase in traditional Medicare ( $\beta=0.21$   $p=0.0282$ ) compared with those in PM Q1.

## Discussion

Financial performance is an indicator of how well a business can utilize resources based on its products and services to generate revenues. For instance, having more financial resources to invest in staff training, technology, and

equipment could positively affect the outcome of NHs.<sup>24</sup> It is essential for NHs to be both financially sound and sustainable, particularly for those with higher operating costs.<sup>27,45</sup> Importantly, our occupancy study advanced our understanding of NH performance and the significance of payer sources, especially the growth of traditional Medicare and Medicare Advantage coverages of SNF care.

Our study advances the NH literature in another way, by examining the modifying role of financial performance in the association between SNFs' payer sources and occupancy rate. Although a handful of studies have examined financial performance as an indicator of organizational outcome,<sup>27,37,38</sup> much less attention has been paid to it as a moderating effect in studies of NHs. The premise of this study was based on Porter's generic strategy in which three basic strategies are suggested for firms or organizations to gain a comparative advantage in a market: cost leadership, differentiation, and focus. In particular, differentiation involves making the product or service different from that of competitors, thereby attracting more customers. In other words, differentiation can prevent a firm from having adverse competition by

**Table 4.** Subgroup analysis by for-profit status.

Variable	For-profit		Not-for-profit	
	Estimate	<i>p</i>	Estimate	<i>p</i>
Traditional Medicare × PM <sup>a</sup>	−0.02	0.8884	0.33	0.1979
Traditional Medicare × PM Q1	Reference		Reference	
Traditional Medicare × PM Q2	−0.07	0.3321	0.05	0.5677
Traditional Medicare × PM Q3	0.13	0.0838	0.01	0.8459
Traditional Medicare × PM Q4	0.11	0.0962	0.21	0.0282
MA × PM <sup>a</sup>	0.04	0.8683	−0.27	0.6299
MA × PM Q1	Reference		Reference	
MA × PM Q2	0.06	0.6294	0.06	0.7722
MA × PM Q3	0.31	0.0159	0.09	0.6697
MA × PM Q4	0.26	0.0688	−0.10	0.6542
Medicaid/TennCare × PM <sup>a</sup>	−0.01	0.9477	0.01	0.9852
Medicaid/TennCare × PM Q1	Reference		Reference	
Medicaid/TennCare × PM Q2	0.06	0.7256	−0.16	0.8520
Medicaid/TennCare × PM Q3	0.19	0.2041	−0.79	0.2675
Medicaid/TennCare × PM Q4	0.05	0.7608	0.21	0.6600
Private (Self-pay) × PM <sup>a</sup>	0.49	0.3814	0.96	0.4674
Private (Self-pay) × PM Q1	Reference		Reference	
Private (Self-pay) × PM Q2	0.97	0.2027	0.62	0.1340
Private (Self-pay) × PM Q3	1.12	0.1572	0.28	0.4659
Private (Self-pay) × PM Q4	0.21	0.4893	0.51	0.4922
Other × PM <sup>a</sup>	0.20	0.7629	−0.07	0.9583
Other × PM Q1	Reference		Reference	
Other × PM Q2	−0.10	0.6246	0.22	0.5951
Other × PM Q3	0.42	0.2523	0.28	0.5158
Other × PM Q4	0.39	0.3666	−0.31	0.5658

MA, Medicare Advantage; PM, profit margin; Q, Quantile.

<sup>a</sup>Given PM was not-normally distributed, it was square-root transformed.

creating reliable, loyal customers and protecting the firm from competitors.<sup>46</sup> It is plausible that NHs, particularly for-profit NHs, may use available resources to offer perceived higher-quality services, thus differentiating themselves from their competitors. In the NH setting, this could mean that they utilize innovative ways or strategies to provide care or implement protocols that enhance quality while simultaneously reducing costs.<sup>25,47</sup>

Another finding of the study was that among SNFs with a lower proportion of short-stay residents, we observed a 28 percentage points higher occupancy rate per unit increase in Medicare Advantage compared to those in the lowest PM category. Furthermore, SNFs with a higher proportion of short-stay residents had a lower occupancy rate associated with an increase in Medicaid/TennCare; this was particularly evident among those with higher financial performance. After Medicare covers 100 days of SNF care, Medicaid or other long-term care insurance may take over to cover longer-stay residents. This is because Medicaid and long-term care insurance are more flexible and will cover longer (over 100 days) resident stays without need for residents' private or out-of-pocket pay.<sup>18</sup> Further, it is plausible that SNFs with higher financial performance may be better positioned to generate

revenue from traditional Medicare and Medicare Advantage beneficiary residents and therefore may be more likely to accept residents with those insurance types. Thus, in turn, they have higher occupancy rates potentially leading to a more stable and predictable income, fewer SNF administrative burdens, and better financial and operational planning.

Since 2010, Medicare Advantage enrollment has increased considerably. In 2015, Medicare Advantage enrollment amounted to approximately 17.8 million or one-third of Medicare beneficiaries,<sup>48</sup> and it is projected to continue to rise.<sup>49</sup> Medicare Advantage incorporates a monthly capitation payment and utilization review. These capitated payment incentives, along with potential additional financial incentives under the Medicare Advantage Star Ratings system, could help reduce costs, including the use of costly therapies.<sup>49,50</sup> Compared with traditional Medicare, Medicare Advantage plans have been found to be positively associated with higher performance on many clinical metrics while maintaining lower utilization overall.<sup>49</sup>

For example, a retrospective cohort study by Jung et al.<sup>21</sup> examined longitudinal trends and characteristics of Medicare Advantage beneficiary patients in NHs and facility characteristics and found increased Medicare Advantage

enrollment among Medicare beneficiaries in NH patients. NHs with a higher proportion of Medicare Advantage patients were more likely to be larger, be part of a chain, and have better quality indicators (specifically less use of antipsychotics and lower hospitalizations). Additionally, Johnson and colleagues examined the characteristics of the US counties where Medicare Advantage has increased the most using Medicare data for years 2014–2017 and found that the communities that had the largest increase in Medicare Advantage penetration were poorer, tended to be in the South or Northeast, and have more African American residents.<sup>48</sup> This relationship was more pronounced in communities with more primary care physicians per capita and with more total physicians. Medicare Advantage plans that employ a primary care-oriented model tend to encourage the use of personal doctors and reduce the use of discretionary care procedures and specialists.<sup>49</sup> Medicare Advantage directly benefits SNF residents as Medicare Advantage plans have more flexibility in covering daily co-insurance for resident stays from day 21 through day 100.<sup>18</sup>

SNFs are costly; more than 50% of Medicare FFS spending (~27.7 billion) on post-acute care in 2021 went to SNF services.<sup>20,51</sup> Policymakers may wish to consider efforts to reduce costs associated with SNF use and a few examples stand out.

Kumar and colleagues compared rehabilitation service use and patient outcomes between Medicare FFS and Medicare Advantage beneficiaries with a hip fracture after being discharged to a SNF. They found that compared with FFS patients, Medicare Advantage patients were less likely to use rehabilitation services and had shorter SNF stays, while their outcomes were similar or better.<sup>52</sup> Notably, after controlling for various patient and facility characteristics, their findings indicate that use of therapy (>400 min) and fewer SNF stays (i.e., five or fewer SNF length of stay) did not negatively affect the outcome of transfer to home. Their findings suggest the possibility of achieving the same or comparable outcomes without extending SNF length of stay or reducing utilization of therapy.

New evidence also suggests that it is questionable whether having patients stay in an NH to provide post-acute care services for an extended time is preferable as it is associated with high healthcare costs<sup>31</sup>; SNFs receive per diem payments and thus may have little financial incentive to curb length of stay.<sup>19</sup> Others reported that Medicare Advantage coverage, as compared to traditional Medicare, is associated with reduced hospitalization rates 180 days post-SNF discharge and higher rates of successful community discharge with decreased medical costs post-discharge.<sup>53</sup> Furthermore, comparisons across clinical outcomes and SNF discharge status indicate that type of insurance might determine discharge time from SNFs and hence influence patient outcomes such as in the case of traditional Medicare coverage,<sup>29</sup> and the Medicare copayment policies,<sup>31</sup> both have been associated with poor resident health outcomes and an earlier discharge from SNFs.

## Study limitations

Caution is warranted when interpreting the study findings, and certain limitations may be considered. First, the reimbursement structure of Medicare for NH stays may preclude precisely capturing a mixed pool of NH stays with various reimbursement mechanisms. There could be other related factors that we were unable to measure (e.g., market share, turnover rate for NH workers, multiple quality metrics, and community relationships with other health systems, etc.).

Second, we utilized only 2019–2020 administrative data, and the availability of more longitudinal data would have made the findings more robust. Further, it is possible that the study period where the pandemic occurred could have disproportionately affected NHs, especially for the year 2020. For example, the much smaller proportion of private pay residents in NHs relative to the national average may be attributable to the impact of the pandemic.

Third, the findings may lack generalizability beyond SNFs in Tennessee, particularly because of the variations across states in NHs and payment policies. This is the primary limitation of utilizing all state-level administrative data. Fourth, the study did not consider the potential influence of the SNF Value-Based Purchasing Program due to limited information in the dataset. Additionally, given that the study utilized the secondary data that were already available, we did not necessarily employ power analysis. Lastly, the extent to which short-stay residents' length was examined is constrained by a lack of data, although the study incorporated a generally accepted threshold. These limitations provide opportunities for future research in the field.

## Conclusions

The current study investigated the interconnections between payer source, financial performance, and occupancy rate at SNFs. Particularly, it investigated the role played by organizational financial performance (as a moderator) in influencing the relationship between payer mix and occupancy rate among SNFs. Our findings suggest that SNFs with higher financial performance had a higher occupancy rate per unit increase in payer sources such as traditional FFS Medicare and Medicare Advantage compared to their counterpart SNFs in the lowest PM category, and the magnitude of the effect was greater for Medicare Advantage. Further, the result for Medicare Advantage appeared to be more prominent among SNFs with a lower proportion of short-stay residents.

It is essential for any organization, including SNFs, to optimize the efficiency and effectiveness of resources, which can lead to improved performance and outcomes. Persistently low levels of occupancy invariably lead to financial difficulties that can jeopardize service quality and patient care outcomes. Financial performance has a critical role in shaping the overall performance, operational stability, and quality of care at SNFs. It often has a bidirectional relationship with the occupancy rate,



as financially well-positioned SNFs could employ sustainable operational strategies and maintain high care standards. Thus, they could potentially attract and retain residents and maximize occupancy rates and revenue. Given that Medicare is a significant payer for long-term care and that financial performance may affect SNF utilization, healthcare managers and policy-makers should consider our findings when assessing opportunities to improve NH outcomes. Future studies of prospective design are needed to further dissect the complex causal pathways linking payer source, financial performance, and occupancy rate at SNFs.

### Acknowledgements

None.

### Author contributions

Conceptualization: HK; Data curation: HK; Formal analysis and investigation: HK; Methodology: HK; Project administration: HK; Resources: HK and AM; Supervision: HK and AM; Validation: HK, AM, CFC, and AD; Writing—original draft preparation: HK, AM, CFC, and AD; Writing—review and editing: HK, AM, CFC, and AD.

### Data availability

Data utilized in the current study can be accessed and downloaded from the Tennessee Department of Health official website @ <https://www.tn.gov/health/health-program-areas/statistics/health-data/jar.html>

### Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

### Ethical statement

This paper utilized institutional-level, secondary data from a database that is publicly available to download and utilize. The study did not include human or animal subjects and was exempt from obtaining Institutional Review Board approval.

### Informed consent

Not applicable.

### Trial registration

Not applicable.

### ORCID iD

Asos Mahmood  <https://orcid.org/0000-0002-2680-9110>

### Supplemental material

Supplemental material for this article is available online.

### References

1. CDC. Nursing home care, <https://www.cdc.gov/nchs/fastats/nursing-home-care.htm> (accessed 20 June 2024).
2. Kaiser Family Foundation. A look at nursing facility characteristics between 2015 and 2023, <https://www.kff.org/medicaid/issue-brief/a-look-at-nursing-facility-characteristics/> (2024, accessed 20 June 2024).
3. McGarry BE and Grabowski DC. Nursing homes and COVID-19: a crisis on top of a crisis. *Ann Am Acad Polit Soc Sci* 2021; 698: 137–162.
4. Heiks C and Sabine N. Long term care and skilled nursing facilities. *Delaware J Public Health* 2022; 8: 144.
5. Laes-Kushner R. Skilled nursing facilities: too many beds, <https://repository.escholarship.umassmed.edu/handle/20.500.14038/26962> (2018, accessed 25 June 2024).
6. American Health Care Association & National Center for Assisted Living. State of skilled nursing facility industry in-depth analysis on increasing costs and local impact, <https://www.ahcancal.org/News-and-Communications/Fact-Sheets/FactSheets/AHCA%20-%20State%20of%20Skilled%20Nursing%20Facility%20Industry%20-%20In-Depth%20Analysis%20on%20Increasing%20Costs%20and%20Local%20Impact.pdf#search=Skilled%20Nursing%20Care%20Centers> (2022, accessed 20 June 2024).
7. Zinn J, Mor V, Feng Z, et al. Determinants of performance failure in the nursing home industry. *Soc Sci Med* 2009; 68: 933–940.
8. ASPE. Changes in ownership among skilled nursing facilities from 2016 to 2021: variations by size, occupancy rate, penalty amount, and type of ownership, <https://www.aspe.hhs.gov/sites/default/files/documents/9c4c5c8f2d48309c83e87f544b1aed90/snf-ownership-changes-variations.pdf> (2024, accessed 20 June 2024).
9. Bostick JE, Rantz MJ, Flesner MK, et al. Systematic review of studies of staffing and quality in nursing homes. *J Am Med Dir Assoc* 2006; 7: 366–376.
10. Bowblis JR. Ownership conversion and closure in the nursing home industry. *Health Econ* 2011; 20: 631–644.
11. Feng Z, Lepore M, Clark MA, et al. Geographic concentration and correlates of nursing home closures: 1999–2008. *Arch Intern Med* 2011; 171: 806–813.
12. Nyman JA, Bricker DL and Link D. Technical efficiency in nursing homes. *Med Care* 1990; 28: 541–551.
13. Rosko MD, Chilingirian JA, Zinn JS, et al. The effects of ownership, operating environment, and strategic choices on nursing home efficiency. *Med Care* 1995; 33: 1001–1021.
14. Tran A, Nguyen K-H, Gray L, et al. A systematic literature review of efficiency measurement in nursing homes. *Int J Environ Res Public Health* 2019; 16: 2186.
15. Keeler EB, Kane RL and Solomon DH. Short-and long-term residents of nursing homes. *Med Care* 1981; 19: 363–370.
16. Liu K and Manton KG. The characteristics and utilization pattern of an admission cohort of nursing home patients (II). *Gerontologist* 1984; 24: 70–76.
17. Shapiro E and Roos NP. Predictors and patterns of nursing home and home care use. In: Katz P and Lawton MP (eds), *Health care of the elderly: an information sourcebook*. Springer Publishing Company, 1989, pp. 127–166.

18. American Council on Aging. Paying for nursing home care: bridging the benefits of Medicare, Medigap & Medicaid, Medicaid Planning Assistance. <https://www.medicaidplanning-assistance.org/who-pays-for-nursing-homes/> (2024, accessed 20 June 2024).
19. Huckfeldt PJ, Escarce JJ, Rabideau B, et al. Less intense post-acute care, better outcomes for enrollees in Medicare Advantage than those in fee-for-service. *Health Aff* 2017; 36: 91–100.
20. MedPAC. *A data book: health care spending and the Medicare Program*. Washington, DC: Medicare Payment Advisory Commission.
21. Jung H-Y, Li Q, Rahman M, et al. Medicare Advantage enrollees' use of nursing homes: trends and nursing home characteristics. *Am J Manag Care* 2018; 24: e249.
22. Agarwal R, Connolly J, Gupta S, et al. Comparing Medicare Advantage and traditional Medicare: a systematic review: a systematic review compares Medicare Advantage and traditional Medicare on key metrics including preventive care visits, hospital admissions, and emergency room visits. *Health Aff* 2021; 40: 937–944.
23. Keohane LM, Grebla RC, Mor V, et al. Medicare Advantage members' expected out-of-pocket spending for inpatient and skilled nursing facility services. *Health Aff* 2015; 34: 1019–1027.
24. Chisholm L, Weech-Maldonado R, Laberge A, et al. Nursing home quality and financial performance: does the racial composition of residents matter? *Health Serv Res* 2013; 48: 2060–2080.
25. Mukamel DB and Spector WD. Nursing home costs and risk-adjusted outcome measures of quality. *Med Care* 2000; 38: 78–89.
26. Rahman M, Meyers DJ and Mor V. The effects of Medicare Advantage contract concentration on patients' nursing home outcomes. *Health Serv Res* 2018; 53: 4087–4105.
27. Weech-Maldonado R, Neff G and Mor V. Does quality of care lead to better financial performance?: the case of the nursing home industry. *Health Care Manag Rev* 2003; 28: 201–216.
28. Brasel KJ, Lim HJ, Nirula R, et al. Length of stay: an appropriate quality measure? *Arch Surg* 2007; 142: 461–466.
29. Haghverdian BA, Wright DJ and Schwarzkopf R. Length of stay in skilled nursing facilities following total joint arthroplasty. *J Arthropl* 2017; 32: 367–374.
30. Kummet C, Schneider K, Wang C, et al. Medicare beneficiary factors associated with skilled nursing facility lengths of stay. *J Appl Gerontol* 2022; 41: 1365–1375.
31. Werner RM, Konetzka RT, Qi M, et al. The impact of Medicare copayments for skilled nursing facilities on length of stay, outcomes, and costs. *Health Serv Res* 2019; 54: 1184–1192.
32. Werner RM, Coe N, Qi M, et al. The value of an additional day of post-acute care in a skilled nursing facility. *Am J Health Econ* 2023; 9: 1–21.
33. Bos A, Boselie P and Trappenburg M. Financial performance, employee well-being, and client well-being in for-profit and not-for-profit nursing homes: a systematic review. *Health Care Manag Rev* 2017; 42: 352–368.
34. Bos A and Harrington C. What happens to a nursing home chain when private equity takes over? A longitudinal case study. *Inquiry* 2017; 54: 004695801774276.
35. Pradhan R, Ghiasi A, Davlyatov G, et al. Beyond the balance sheet: investigating the association between NHA turnover and nursing home financial performance. *RMHP* 2024; 17: 249–260.
36. Weech-Maldonado R, Laberge A, Pradhan R, et al. Nursing home financial performance: the role of ownership and chain affiliation. *Health Care Manag Rev* 2012; 37: 235–245.
37. Weech-Maldonado R, Lord J, Pradhan R, et al. High Medicaid nursing homes: organizational and market factors associated with financial performance. *Inquiry* 2019; 56: 004695801882506.
38. Weech-Maldonado R, Pradhan R, Dayama N, et al. Nursing home quality and financial performance: is there a business case for quality? *Inquiry* 2019; 56: 004695801882519.
39. Ying M, Temkin-Greener H, Thirukumaran CP, et al. Skilled nursing facility participation in a voluntary Medicare bundled payment program: association with facility financial performance. *Med Care* 2022; 60: 83–92.
40. Hung P, Casey M and Moscovice I. Nurse staffing levels and quality of care in rural nursing homes. *Policy Brief*, [https://www.researchgate.net/profile/Peiyin-Hung/publication/270761033\\_Nurse\\_Staffing\\_Levels\\_and\\_Quality\\_of\\_Care\\_in\\_Rural\\_Nursing\\_Homes/links/54b43ffa0cf28ebe92e46ab7/Nurse-Staffing-Levels-and-Quality-of-Care-in-Rural-Nursing-Homes.pdf](https://www.researchgate.net/profile/Peiyin-Hung/publication/270761033_Nurse_Staffing_Levels_and_Quality_of_Care_in_Rural_Nursing_Homes/links/54b43ffa0cf28ebe92e46ab7/Nurse-Staffing-Levels-and-Quality-of-Care-in-Rural-Nursing-Homes.pdf) (2015, accessed 25 June 2024).
41. Sharma H, Hefele JG, Xu L, et al. First year of skilled nursing facility value-based purchasing program penalizes facilities with poorer financial performance. *Med Care* 2021; 59: 1099–1106.
42. Donabedian A. The quality of care: how can it be assessed? *JAMA* 1988; 260: 1743–1748.
43. OMB. 2020 Standards for delineating core based statistical areas, <https://www.federalregister.gov/documents/2021/07/16/2021-15159/2020-standards-for-delineating-core-based-statistical-areas> (2021, accessed 17 August 2023).
44. Morris JN, Fries BE and Morris SA. Scaling ADLs within the MDS. *J Gerontol A Biomed Sci Med Sci* 1999; 54: M546–M553.
45. Bishop CE. Where are the missing elders? The decline in nursing home use, 1985 and 1995: despite an aging population, the nation's nursing homes have not seen an expected surge in residents. *Health Aff* 1999; 18: 146–155.
46. Phillips LW, Chang DR and Buzzell RD. Product quality, cost position and business performance: a test of some key hypotheses. *J Market* 1983; 47: 26–43.
47. Linn MW, Gurel L and Linn BS. Patient outcome as a measure of quality of nursing home care. *Am J Public Health* 1977; 67: 337–344.
48. Johnson G, Figueroa JF, Zhou X, et al. Recent growth in Medicare Advantage enrollment associated with decreased fee-for-service spending in certain US counties. *Health Aff* 2016; 35: 1707–1715.
49. Landon BE, Zaslavsky AM, Anderson TS, et al. Differences in use of services and quality of care in Medicare Advantage and traditional Medicare, 2010 and 2017: study examines differences in use of services and quality of care comparing Medicare Advantage and traditional Medicare. *Health Aff* 2023; 42: 459–469.
50. Guram JS and Moffit RE. The Medicare Advantage success story—looking beyond the cost difference. *N Engl J Med* 2012; 366: 1177–1179.

51. Tian W. An all-payer view of hospital discharge to postacute care, 2013: statistical brief# 205. *Healthcare cost and utilization project (HCUP) statistical briefs*, <https://europecmc.org/books/n/hcupsb/sb205/?extid=27559565&src=med> (2006, accessed 27 September 2023).
52. Kumar A, Rahman M, Trivedi AN, et al. Comparing post-acute rehabilitation use, length of stay, and outcomes experienced by Medicare fee-for-service and Medicare Advantage beneficiaries with hip fracture in the United States: a secondary analysis of administrative data. *PLoS Med* 2018; 15: e1002592.
53. Casebeer AW, Schwartz R, Patel H, et al. Post-SNF outcomes and cost comparison: Medicare Advantage vs Traditional Medicare. *Am J Manag Care* 2021; 27: 140.