Nursing Home Safety: Does Financial Performance Matter?

Reid M. Oetjen, Mei Zhao, Darren Liu, and Henry J. Carretta

Objectives: This study examines the relationship between financial performance and selected safety measures of nursing homes in the State of Florida.

Methods: We used descriptive analysis on a total sample of 1,197. Safety information was from the Online Survey, Certification and Reporting (OSCAR) data of 2003 to 2005, while the financial performance measures were from the Medicare cost reports of 2002 to 2004. Finally, we examined the most frequently cited deficiencies as well as the relationship between financial performance and quality indicators.

Results: Nursing homes in the bottom quartile of financial performance perform poorly on most resident-safety measures of care; however, nursing homes in the top two financial categories also experienced a higher number of deficiencies. Nursing homes in the next to lowest quartile of financial performance category best perform on most of these safety measures.

Conclusions: The results reinforce the need to monitor nursing home quality and resident safety in US nursing homes, especially among facilities with poor overall financial performance.

Key words: nursing homes, safety, quality, financial performance.

Florida’s nursing home industry has experienced close scrutiny since the mid-1990s when it had a significant increase in litigation for poor quality. In 2004, Florida’s state legislature enacted Senate Bill 1202, which raised nursing home staffing standards in an attempt to improve the quality of care provided in nursing homes. Its nursing homes have achieved a reduction in total deficiencies, in both frequency and severity, since the enactment of this law. The quality of care in Florida nursing homes, however, still cannot compete with that of the majority of states, with Florida ranking 35th in total number of nursing home deficiencies in 2006. These issues warrant a closer look at nursing home safety.

Around the same time of the passage of this bill, Florida’s nursing home industry experienced significant financial difficulties. In 2003, its average shortfall in Medicaid reimbursement equaled $11.76 per Medicaid patient-day. This number increased to $14.38 in 2004 and again to $14.58 in 2006. Medicare has historically cross-subsidized these nursing homes, but this source of revenue has declined with refinements to the Medicare payment system.

The multidimensional concept of quality includes many dimensions, especially as it pertains to nursing homes. The Joint Commission and the Institute of Medicine include safety as one of their dimensions of quality; the Joint Commission defining it as “the degree to which the healthcare

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intervention minimizes risks of adverse outcomes for both patient and provider and the degree to which the risk of an intervention and risk in the care environment are reduced for the patient and others, including the healthcare provider.9

Despite the fact that many continue to examine nursing home industry quality, only a few pieces of literature address nursing home safety as compared with care delivered in other settings. Previous research on nursing home quality focused on organizational issues in nursing homes, such as quality improvement initiatives, teamwork, communication, and leadership. Other studies investigated such specific patient-safety issues as falls, pressure sores, restraint usage, medication administration, and infection rates.9 To date, only O’Neill, Harrington, Kitchener, and Saliba10 have linked nursing home financial performance to quality of nursing home care. Although many of these studies examined safety issues in nursing homes, no research to date has investigated the relationship between financial performance and nursing home safety.

Despite the lack of research in this area, a link regarding the financial performance and safety can be hypothesized based upon the fact that one can argue that investments that affect staffing levels, training budgets, and the provision of additional direct care services ultimately impact nursing home quality and safety. Given that many of these activities that enhance resident care quality involve considerable costs, the financial performance of nursing facilities may prove to be a valuable predictor of safety, one of the key dimensions of quality performance. Therefore, nursing homes experiencing poor financial performance may eliminate some of these activities. In fact, existing quality studies in the hospital industry support this assertion.11 This study is exploratory in nature and examines the relationship between financial performance and select safety measures in nursing homes in Florida from 2003 to 2005.

Financial viability and quality of nursing home care are of significant interest to Florida’s taxpayers and government agencies, as nearly 17 percent of the population has reached the age of 65 or older—the highest percentage of any state.12 Efforts in monitoring financial stability and safety of the care in Florida’s nursing homes prove critical to ensuring care for the state’s elder population.

Methods

Sample and Data

Data were collected from Florida’s federally certified nursing homes for the years 2003 to 2005. Only freestanding nursing homes were included in the analysis. Nursing homes that were part of another facility, such as an acute-care or rehabilitation hospital, were excluded because these facilities generally have higher reimbursement and staffing levels.

The data sources for this study included the Online Survey, Certification and Reporting (OSCAR) data reports for 2003 to 2005, and the Centers for Medicare & Medicaid Services (CMS) Medicare cost reports for 2002 to 2004.

A national database, OSCAR comprises self-reported nursing home information provided to state surveyor agencies during annual inspections. This database included data on quality and resident safety indicators—the total number of deficiencies cited during each
standard recertification survey. The Medicare cost-reports data for nursing homes provided data on financial performance.

To eliminate extreme outliers, nursing homes with a total margin beyond three standard deviation points from the mean in either direction were excluded. Approximately 400 nursing homes remained in each year, for a total sample of 1,197; the study used descriptive analysis.

Safety Measures

This study utilized nine safety measures from OSCAR data—specifically, the total number of deficiencies reported for each nursing home by surveyors as a result of the annual federal survey mandated by CMS for all facilities participating in the Medicaid or Medicare programs. Although federal law requires nursing homes to be surveyed each fiscal year, investigators can conduct surveys up to 15 months from the previous survey. CMS defines the standards the nursing home industry must meet to receive reimbursement from Medicare and Medicaid. Violations of these standards result in deficiencies, reported through OSCAR databases.

Figure 1 shows the most frequently cited deficiencies in Florida related to safety for 2006. Among the top-20 cited deficiencies, this study focused on the following nine to represent nursing home safety:

1. Food sanitation (F-371);
2. Records complete (F-514);
3. Accuracy of assessments (F-278);
4. Assessment by qualified staff (F-282);
5. Drug storage (F-432);
6. Pharmacy procedures (F-426);
7. Infection control (F-441);
8. Medication errors greater than 5 percent (F-332); and
9. Unnecessary drugs (F-329).

These nine measures represent both organizational issues and specific clinical processes related to resident safety.

**Figure 1. Most Frequently Cited Nursing Home Deficiencies in Florida, 2006**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Tag</th>
<th>Requirement</th>
<th>Facilities Cited (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F-371</td>
<td>Food sanitation</td>
<td>50.73%</td>
</tr>
<tr>
<td>5</td>
<td>F-514</td>
<td>Records complete</td>
<td>28.01%</td>
</tr>
<tr>
<td>7</td>
<td>F-278</td>
<td>Accuracy of assessments</td>
<td>20.09%</td>
</tr>
<tr>
<td>8</td>
<td>F-282</td>
<td>Assessment by qualified staff</td>
<td>18.18%</td>
</tr>
<tr>
<td>10</td>
<td>F-432</td>
<td>Drug storage</td>
<td>17.45%</td>
</tr>
<tr>
<td>12</td>
<td>F-426</td>
<td>Pharmacy procedures</td>
<td>16.86%</td>
</tr>
<tr>
<td>13</td>
<td>F-441</td>
<td>Infection control</td>
<td>16.42%</td>
</tr>
<tr>
<td>18</td>
<td>F-332</td>
<td>Medication errors &gt; 5%</td>
<td>14.22%</td>
</tr>
<tr>
<td>20</td>
<td>F-329</td>
<td>Unnecessary drugs</td>
<td>11.44%</td>
</tr>
</tbody>
</table>

To better understand what each measure entails, a brief description of the intent and safety implications of each regulation follows together with the validity of these measures.

**Food Sanitation**

The food sanitation regulation aims to prevent the spread of food-borne illness by ensuring that nursing homes store, prepare, distribute, and serve food under sanitary conditions. Compliance with this regulation proves especially important because foodborne illness often becomes fatal for nursing home residents.\(^\text{16}\)

**Records Complete**

The records complete regulation endeavors to ensure each nursing home maintains accurate, organized, accessible, and complete clinical records for each resident. The presence of a complete record that provides an accurate functional representation of the actual experience of the resident signals an indication that the facility knows the status of its patients and has adequately planned for each resident’s care.\(^\text{17}\)

Previous research has shown that the communication of inappropriate or inaccurate information in nursing homes were barriers to timely care, which ultimately has the potential of affecting the safety of nursing home residents. Based upon this reasoning, the completeness and accuracy of a resident’s record could have a significant impact on the resident’s safety.\(^\text{18}\)

**Accuracy of Assessments**

The accuracy of assessments regulation attempts to guarantee each resident receives an accurate assessment by appropriate personnel to ascertain each resident’s medical, functional, and psychosocial problems. This assessment provides a baseline for ongoing assessment and assures residents have safe-care plans.\(^\text{19}\)

**Assessment by Qualified Staff**

The purpose of the assessment by qualified staff regulation is to ensure qualified staff members care for residents. Direct caregivers must be knowledgeable about the care, services, and expected outcomes of the care they provide; otherwise, the safety of this care can become suspect.\(^\text{20}\) This is an important indicator of safety because research has shown that improved outcomes are associated with use of properly trained nurses.\(^\text{21}\) Thus, residents who are assessed by unqualified, or poorly trained staff, may be at risk of receiving improper assessments which could negatively impact patient safety.

**Drug Storage**

The drug storage regulation maintains only authorized personnel should have access to drugs. Nursing homes must limit access to drugs to authorized personnel and store all drugs in locked compartments in accordance with all state and federal laws to prevent residents from becoming exposed to potentially dangerous situations.\(^\text{22}\)

**Pharmacy Procedures**

The pharmacy procedures regulation attempts to safeguard the drug needs of each resident. To maintain the optimal health and functional status of each resident, each facility “must provide pharmaceutical services (including procedures that assure the accurate acquiring, receiving, dispensing, and
administering of all drugs and biologicals) to meet the needs of each resident.” Previ-
ous research regarding adverse drug events (ADEs) in nursing homes found that most
errors occurred most often at the stage of prescribing and monitoring. Thus, there is
a clear link between the proper distribution and storage of drugs (drug storage, phar-

macy procedures) and patient safety.

**Infection Control**

The infection control regulation requires the facility to have an effective infection
control program for investigating, controlling, and preventing infection; it ensures
each facility protects its residents from the transmission of disease and infection and
provides a safe, sanitary, and comfortable environment. Better nursing home out-
comes have been linked to the presence of an effective infection control program; thus, an
effective infection control program is critical in maintaining patient safety.

**Medication Errors Greater Than 5 Percent**

This regulation aims to safeguard residents from medication errors in excess of 5 per-
cent. If facilities have error rates in excess of 5 percent, this indicates systemic problems
exist within their drug-distribution systems. Previous study regarding medication errors
in nursing homes has shown that medication errors have the potential to impact patient
safety. In fact, researchers have shown that 7 percent of medication errors have the poten-
tial to harm patients.

**Unnecessary Drugs**

The unnecessary drugs regulation addresses each resident’s drug regimen to en-
sure they are not prescribed any unnecessary drugs. In the interest of safety, residents
should only receive prescriptions for psychopharmacological drugs when they suffer
from mental illness and not from underlying environmental or psychosocial stressors.

**Florida’s Most Frequently Cited Deficiencies**

These nine deficiencies help paint a picture of resident safety. Unnecessary drugs,
drug storage, pharmacy procedures, and medication errors represent critical mea-
ures necessary to assuring residents receive proper medications and dosages. Complete
records, accurate assessments conducted by qualified staff members, and infec-
tion control serves as a proxy underlying management practices. The presence of
deficiencies in these areas may indicate managerial oversight lacks something criti-
cal to providing the best quality of care. Among these measures, food sanitation
represents the number 1 deficiency in Florida’s nursing homes.

**Financial Performance Measures**

Total margin, the excess of revenue over expenses divided by total revenues, repre-
sented financial performance in this analysis. It reflects profits from both nursing home
operations and nonoperational sources (typically investment income). Owing to typical
lag in time that occurs between a facility’s financial problems and any subsequent qual-
ity and safety changes, nursing home financial measures from the previous year were
collected.

This study classified the financial performance of each nursing home relative to
all nursing homes based on their rank in the percentile distribution of total margin. In
particular, it distinguished facilities based on whether they fell into the first, second, third,
or fourth quartiles. Previous studies have used the percentile distribution of financial indicators to distinguish nursing facilities' financial performance. The advantage of classifying nursing homes in this way emerges from the ability to assess whether relatively broad financial performance categories, rather than small incremental differences, are associated with resident safety problems for study subjects.

Results

The median total margin for this analysis was 0.8 percent (ranging from -93.2% to 29.3%); the first quartile was -4.2 percent, and the third quartile was 4.2 percent. Figure 2 presents results for the four drug-related quality indicators. Drug storage, prescription administration, and distribution play important roles in meeting the needs of residents and ensuring nursing home safety. Figure 3 presents the results for the infection, staffing, and management quality indicators. The food sanitation indicator stands alone, because it represents the most commonly occurring deficiency (see Figure 3).

Drug-related deficiencies were found in 5.9 percent to 24.1 percent of the facilities, depending on their financial performance (see Figure 2), and from 8.7 percent to 23.1 percent for the indicators in Figure 3. The proportion of nursing homes with deficiencies was higher in the lowest financial performance group (quartile 1), compared with facilities in the second lowest financial performing category (quartile 2). For example, 21.4 percent of nursing homes in the lowest financial performance category received citations for deficiencies in accuracy of

![Figure 2. % of Facilities Cited for Deficiencies over Four Financial Categories: Drugs and Management](image-url)
assessments; this number was only 13.9 percent in the second lowest financial performance category. Similarly, drug storage citation was 24.1 percent and 16.4 percent for the poorest financial performance category and the second poorest category, respectively.

Interestingly, six of these eight safety indicators occurred less often among nursing homes in the second lowest performance category, rather than those in the highest financial performers in the third and fourth quartiles. For example, the proportion of nursing homes cited for infection control was 12.3 percent in the second lowest financial performance quartile, compared with 17.1 percent in the second highest financial performing category (see Figure 3).

Similarly, unnecessary drug citations occurred in only 8.9 percent of the facilities in the second quartile compared with 12.7 percent in the third quartile (see Figure 2). This finding implies nursing homes experiencing very poor financial performance may not have sufficient resources to ensure resident safety and the proper level of quality to meet the requirements for federal and state survey agencies. Therefore, they are more likely to receive citations. On the other hand, nursing homes with the highest margins may have achieved these results by sacrificing the quality of care provided to and safety of its residents.

Figure 4 illustrates the relationship between financial performance and food-sanitation citations. Nursing homes in the poorest financial group had the highest percentage of food sanitation citations, whereas those in the third financial group had the lowest proportion of citations for food deficiencies. This contradicts the findings for most of the other indicators, which occurred least in the second financial group.
Discussion

The nursing home industry in Florida has undergone an intense period of public scrutiny regarding quality and resident safety while simultaneously experiencing widespread financial difficulties. The findings from this study suggest these two phenomena may have some relation to each other.

Results indicate nursing homes in the bottom quartile of financial performance perform poorly on most of the resident safety measures of care. However, nursing homes in the next to lowest quartile of financial performance category perform the best on most of these safety measures. Nursing homes in the higher margin categories (quartiles 3 and 4) tend to have more deficiency citations, as compared with those in the second quartile of financial performance. These findings are consistent with previous study findings that found increased margin is more likely to affect quality adversely in proprietary facilities.30

Our study had several limitations. First, although Florida has more than 600 nursing homes, this study represents only 4 percent of US nursing facilities. Therefore, the results of this analysis cannot be generalized to other states. Future studies should expand the sample size to the national nursing homes and further examine the relationship between financial performance and specific safety indicators. Second, because this study only includes nine measures of nursing home safety, these measures cannot fully reflect the dimension of nursing home quality. Future research should examine other indicators that relate to safety.

Third, data in the OSCAR and CMS cost report files have limitations associated with the study of nursing home safety. That is, the surveyors who collect OSCAR exercise
judgment could only base on their education and experience. This may lead to a low inter-rater reliability among surveyors. This may understate or overstate the frequency and severity of quality issues in the annual survey process.³¹

Fourth, data from OSCAR surveyors summarize facility-level data, rather than resident-level data, which preclude a more refined approach than one might use with patient-level assessment of safety measures. Additionally, OSCAR data only provide a snapshot of safety at a point in time; they may not accurately represent some facilities over longer periods. Nursing home financial data from CMS may have shortcomings in relation to their accuracy and completeness because many financial statements were not audited.

Finally, the analysis only comprised one measure of financial performance; future research should include many other factors that could influence nursing home resident safety, such as size, ownership, chain affiliation, and staffing, so that the potentially confounding effects could be controlled for.

Despite these limitations, this study does suggest the importance of certain issues for policy makers and providers. In particular, the results reinforce the need to monitor nursing home quality and resident safety in US nursing homes, especially among facilities with poor overall financial performance. Nursing homes with the weakest financial performance appear to have more deficiency citations relevant to patient-safety measures. This suggests that such homes may not have financial resources to provide residents with a safe environment. Policymakers may want to consider increased surveillance of these poor performers or changes to reimbursement formulas to increase the likelihood that residents in these facilities remain safe.

Nursing homes in the top two financial categories also experienced a higher number of deficiencies. This suggests that the top performers may overemphasize financial performance at the expense of resident safety. On the other hand, nursing homes in the second performance category outperformed both lower performing and higher performing facilities in all but two safety measures. This implies they may have arrived at a more optimal level of resource allocation for patient safety measures than other facilities in this study; this might prove useful in further assessment of the relationship between financial performance and nursing home patient safety indicators.

Conclusion

The nursing home industry plays a critical role in providing long-term care to elders. This study makes several contributions to the literature on nursing home safety. First, it examines the overall financial health of nursing homes, rather than the effects of a specific policy change. Second, this study has clearly shown the poorest performing nursing homes produce the least favorable safety results. In order for this segment of the industry to improve quality, it must either improve efficiency or rely on policy makers to increase reimbursement. Lastly, it provides evidence that nursing homes in the top two financial performance categories have more deficiency citations compared with those in the second quartile of financial performance. This finding warrants closer examination and further study to ensure Florida nursing homes provide their residents a safe, quality environment.
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22. Supra, n.16.

23. Id.


25. Supra, n.18.

26. Supra, n.16.
