Physician and Nurse Staffing in Nursing Homes: The Role and Limitations of the Online Survey Certification and Reporting (OSCAR) System

Zhanlian Feng, PhD, Paul R. Katz, MD, Orna Intrator, PhD, Jurgis Karuza, PhD, and Vincent Mor, PhD

Objectives: To assess nursing home staffing data reported in the Online Survey Certification and Reporting (OSCAR) system database for research and policy.

Design: Comparisons were made between OSCAR and a concurrent research survey of staffing data collected for the same facilities, using inter-rater agreement and correlation analyses.

Setting: Freestanding nursing homes from New York State (NYS) in 1997 (N = 327).

Measurements: Selected staffing variables were defined in comparable terms in both OSCAR and the NYS survey.

Results: The two data sources were in substantial agreement on the reported availability of a full-time physician (other than medical director) and of a physician assistant or nurse practitioner (Kappa >0.7), and they correlated well in the full-time equivalent (FTE) number of such staff (Spearman correlation >0.6). The correlation was 0.8 for FTE registered nurses (RNs), 0.7 for licensed practical nurses (LPNs), and 0.8 for certified nurse aides (CNAs). In terms of average nurse hours per patient day, separately for RNs, LPNs, CNAs, and all combined, the correlation was relatively weak (between 0.3 and 0.6). Overall staffing levels tended to be lower in OSCAR than in NYS.

Conclusion: The OSCAR data are useful for exploring relationships between staffing and various quality of care outcomes, but may not be accurate enough on a case-specific basis, or to determine policy regarding minimal staffing levels using average nurse hours per patient day measures. More systematic and timely efforts are needed to refine the OSCAR content and survey methodology to document nursing home staffing information. (J Am Med Dir Assoc 2005; 6: 27–33)

Keywords: OSCAR; nursing homes; staffing

Limited staffing in United States nursing homes, coupled with increasing shortages of direct care workers, remains a major challenge to the consistent delivery of high quality care. The need for accurate, facility-specific, staffing data is critical if the necessary support is to be garnered and government policy advanced to meet this challenge. Presently, the Centers for Medicare and Medicaid Services’ (CMS) Online Survey Certification and Reporting (OSCAR) system is the only uniform data source available to continually gauge the level of staffing in all certified nursing homes. To its credit, OSCAR data have been instrumental in informing long-term care policy and quality assurance initiatives and in stimulating research regarding the structure, process, and quality of care in nursing homes. The reliability and validity of OSCAR staffing data have, however, been an ongoing concern. In OSCAR, each facility is required to report the number of staff hours, by staff category, worked in the 14 days preceding the date of the annual survey. Despite such standardization, OSCAR data depend on self-report by facility administrative staff and are subject to few confirmatory audits.

Alternative sources of staffing data, such as cost reports and payroll records, have been compared with OSCAR with the
promise of greater reliability and consistency. Cost reports, however, are largely restricted to cost by staff category summarized over an entire fiscal year, although staffing levels are likely to be variable over any period of time due to high turnover rates among nursing staff. Moreover, expenditure data may be a poor proxy for staffing given significant wage and benefit differentials across facilities and by region, rural location, and average staff tenure. In addition, cost reports do not contain nationally uniform staffing data because personnel categories and definitions differ from state to state. Payroll data have important limitations as well. There is considerable variability in facility payroll records, and often it is difficult to ensure that staffing data extracted from payroll records actually refer to hours worked rather than hours paid but not worked (e.g., sick leave, vacation). Furthermore, payroll records do not include information on the number of patients, and would either have to be supplemented by or merged with other data.

In spite of persistent questions regarding OSCAR staffing information, consistent research findings on the relationship between staffing and various outcomes have been documented from studies using OSCAR, as compared to data derived from smaller, research driven studies. For example, non-profit and hospital-based facilities have been observed to have higher staffing levels, and nurse staff ratios have been found to be higher in facilities with more acute case mix profiles. More importantly, lower staffing levels have been correlated with an increased frequency of deficiencies and other quality of care problems. Despite numerous complaints about the inaccuracy of OSCAR staffing data, thus far there have been few studies examining the validity and reliability of these data. One study comparing 1995 OSCAR data with 1995 and 1997 survey data from the Ohio Department of Health found weak correlation between the two data sources on nurse staffing levels and staffing hours per resident. Another study commissioned by the Health Care Financing Administration assessed the quality of OSCAR staffing data as compared to payroll records (deemed as “gold standard”) and to Medicaid cost reports from 78 facilities in Ohio during the 1995 to 1997 period. This study reported relatively low correlation between OSCAR and the payroll data on nurse staffing levels, and also found that the cost report data more strongly correlated with payroll information than with OSCAR data. Cost reports, therefore, were deemed a more reliable and valid source of staffing information than OSCAR. This conclusion is likely premature, however, given the small sample size and select geography and time of the sample upon which the comparisons were made.

While there have been many studies addressing nurse staffing issues based on OSCAR data, there has been little, if any, analysis of OSCAR-derived physician staffing data. This may relate not only to concerns with data reliability but also an under-appreciation of the important role of the physician in nursing home care. The purpose of this article is to compare staffing data from a research survey of 327 nursing homes conducted in 1997 in New York State (NYS) with OSCAR data obtained from the same facilities within 1 year of the research survey data collection. The New York survey data collection, based on responses from the medical director, director of nursing, and administrator from each facility, is likely to be more reliable than OSCAR, considering the study’s explicit design and quality control to maximize convergent validity. The results of these comparisons are presented as a rationale for CMS to institute a more systematic and timely approach to collecting facility-level staffing information.

**METHODS**

**Data Sources**

The research survey used to compare with OSCAR was conducted in NYS in 1997. Survey questionnaires were designed separately for the administrator, medical director, and director of nursing, recognizing the unique perspectives of each of these professions. The administrator survey focused on issues related to facility structure, financing, allied health professionals staffing, and the range of treatment programs offered in the facility. The medical director survey asked about physician staff models, credentialing, call systems, and processes regarding clinical care. The director of nursing survey focused on nurse staffing levels, care planning, and the use of care teams. The survey followed the principles of the Dillman method to orchestrate a systematic data collection process, with three waves of survey mailing implemented. Responses were obtained from 410 (63%) of the 646 nursing homes operating at that time, according to the NYS Department of Health listings.

The OSCAR is an administrative database maintained by the CMS, which includes information on facility characteristics, patient conditions, and staffing levels routinely collected from all Medicare/Medicaid certified nursing homes as part of the licensure and certification process. CMS contracts with each state to conduct onsite inspections, which occur on average about once a year but no later than 15 months after the date of the previous standard survey. The information derived from OSCAR is self-reported by each facility, reviewed by inspectors but not formally audited. In addition, this information changes frequently as residents are discharged and admitted, or residents’ conditions change.

**The Matching Process**

Each facility in the NYS survey was merged with an OSCAR survey with the closest survey date, using the facility’s unique federal Medicare/Medicaid provider number. Facilities in NYS were surveyed in 1997, but information on the exact survey date was not available; instead, a uniform date, July 1, 1997, was assigned to all facilities. All but 9 of the 410 facilities in NYS were successfully matched with a closest OSCAR survey. Since freestanding and hospital-based facilities are different in their care orientation and staffing patterns, comparisons in this article were based on 327 freestanding facilities among all the matched cases.
Variables for Comparison

Staffing data in OSCAR are reported in the form of hours worked in the 2-week period prior to the time of each standard survey, separately for full-time, part-time, and contract, by staff category. A full-time employed staff is defined as working 35 hours or more per week, and part-time if less than 35 hours. The reported staff hours were converted to the number of full-time equivalents (FTEs) for each staff category, based on 35 hours per week over a 2-week period (ie, dividing the total hours worked over a 2-week period by 70 hours). Total FTEs include both on-staff (full- or part-time) and contract FTEs. The variables selected for comparisons pertain to physician staffing (full-time physicians, other than the medical director; physician extenders, including physician assistants and nurse practitioners; and total hours the medical director spends in the facility per week), nurse staffing (registered nurses [RNs]; licensed practical nurses [LPNs]; certified nurse aides [CNAs]; and average nurse hours per patient day, separately for RNs, LPNs, CNAs, and combined), and other professional staffing (social workers; occupational therapists [OTs]; and physical therapists [PTs]). The corresponding measures in NYS were defined in a comparable (though not always identical) manner. The most obvious difference, for example, lies in the fact that the facilities in NYS directly reported the number of FTEs without giving information about actual hours worked. Definitions of each variable, along with differences in the wording of original survey questions and instructions, are detailed in the appendix (Appendix 1). These nuances in measurement approaches are anticipated to account for part of the discrepancies in staffing levels as reported in the two data sets.

Analysis

Two statistical approaches were used. Since some staff, such as full-time physicians (other than the medical director) and physician extenders, are relatively rare in nursing homes, the relevant variables were dichotomized to indicate whether any such staff were available. Responses from NYS and OSCAR to each variable were then cross-tabulated and agreement evaluated. For each cross-tabulation, the overall agreement rate is the total percent of cases where the two datasets agree with each other (ie, all yes-yes and no-no pairs). The Kappa coefficient, a measure of inter-rater agreement, was reported to indicate the strength of agreement: the closer the Kappa is to +1 (on a −1 to +1 scale), the stronger the agreement. For staffing levels, correlation analysis was performed on the number of FTEs or staff hours, conditional on their availability (ie, greater than zero) in both surveys. The Spearman rank-order correlation was used, instead of Pearson, because the latter is sensitive to outliers.

RESULTS

Table 1 presents the inter-survey agreement rates and Kappa coefficients between the NYS survey and OSCAR regarding the availability of selected physician staff, along with the percentage of facilities with each type of staff available (as listed in the two columns under the headings “NYS” and “OSCAR”). In both surveys, about 8% of facilities reported having a full-time physician (other than the medical director), and they concurred in the reporting of this information in 96% of cases. The NYS survey recorded more facilities with physician extenders (28% with any and 17% with any on-staff) than did OSCAR (25% with any and 14% with any on-staff). The agreement rate was high on the reporting of physician extender availability (89% for any and 93% for any on-staff). The Kappa coefficients in Table 1 all exceed 0.7, indicating strong inter-survey agreement in the availability of these staff.

Table 2 reports the Spearman correlation coefficients on staffing levels, along with variable means and standard deviations based on each survey. On average, the NYS survey reported one FTE physician (other than the medical director) more than did OSCAR (4.5 and 3.4 FTEs, respectively). The correlation for this variable was 0.66 (N = 20), indicating reasonably high agreement. In conjunction with the results in Table 1, these findings suggest that the two data sources were in substantial agreement on the availability of full-time physicians (other than the medical director), although they differed substantially in the number of such physicians, if available. Although the mean number of total physician extenders (N = 63) was higher in NYS (1.5 FTEs) than in OSCAR (1.1 FTEs), the mean number of on-staff physician extenders (N = 39) was about the same (1.5 FTEs); for both, the correlation was quite reasonable (0.65 and 0.68, respectively). The two datasets were moderately correlated on total medical director hours per week (0.69), but the NYS survey reported more hours, on average, than did OSCAR (15 and 11 hours, respectively).

There was fairly strong correlation on the FTE numbers of RNs, LPNs, and CNAs (0.78, 0.71, and 0.80, respectively). In terms of average nurse hours per patient day, however, the correlation was relatively weak (0.57 for RNs, 0.45 for LPNs, and 0.43 for CNAs).
There was moderate to strong correlation for social workers, OTs, and PTs (0.62, 0.63 and 0.68, respectively).

**DISCUSSION**

In light of different measurement approaches, different data collection times and turnover rates among the administrators in New York State, surprisingly, the staffing data from the NYS survey and from OSCAR appeared to be comparable. The correlation between the two data sources for most staffing variables was fairly strong.

The assumption being made is that the NYS survey generated more reliable and valid data than OSCAR because, as a research survey, the method and protocol were more precise. All in all, rather than defining one dataset or the other as the “gold standard,” the present study should be viewed from the classic perspective of construct validity where each measurement approach is understood to generate its own unique “method variance” that distorts the validity and accuracy of the data. Quantifying and understanding this method variance is essential to establishing the utility, biases, and limitations of any nursing home dataset, including the OSCAR. This is especially relevant to OSCAR, given its preeminence in long-term care policy, quality assurance, and research.

While the overall limitations of OSCAR staffing data are well known, a number of specific measurement and design issues need to be addressed. For example, physician assistants and nurse practitioners are lumped together in OSCAR, despite the fact that they are trained differently, perform different functions, and more importantly, they are licensed and supervised differently. Therefore, data on these two types of staff should be collected separately. Besides, the licensure varies from state to state, making it very difficult to compare physician extenders across the states. It would make better sense to define the categories for physician extenders based on level of supervision (whether a physician must be directly supervising) and how they function in addition to the type of physician extender. Furthermore, a clinical nurse specialist category should be added to the OSCAR database because they may be hired by the facility as a consultant.

A number of recommendations are proposed here to refine the collection of staffing data through OSCAR. First, it is recommended that staffing data be collected quarterly. This may overlap most facilities’ current cycle of quarterly staffing expenditure reports within their own fiscal year. For consumers examining the CMS web site (Nursing Home Compare), quarterly data would be a better reflection of the consistency of staffing levels in a given home. For the inspectors, this information would be in a form more readily subject to audit and not subject to the “staffing up” phenomenon in anticipation of annual inspections, as many have speculated.

---

**Table 2. Correlation Between the NYS Survey and OSCAR on Selected Nursing Home Staffing Variables**

<table>
<thead>
<tr>
<th></th>
<th>NYS Mean (SD)</th>
<th>OSCAR Mean (SD)</th>
<th>Spearman Correlation*</th>
<th>N†</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physician staffing</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># Full-time physician (other than medical director) FTEs</td>
<td>4.5 (3.7)</td>
<td>3.4 (2.9)</td>
<td>0.66</td>
<td>20</td>
</tr>
<tr>
<td># Total physician extender FTEs</td>
<td>1.5 (1.4)</td>
<td>1.1 (1.6)</td>
<td>0.65</td>
<td>63</td>
</tr>
<tr>
<td># On-staff physician extender FTEs</td>
<td>1.5 (1.4)</td>
<td>1.5 (1.9)</td>
<td>0.68</td>
<td>39</td>
</tr>
<tr>
<td># Medical director hours per week</td>
<td>14.6 (13.4)</td>
<td>11.0 (11.3)</td>
<td>0.69</td>
<td>277</td>
</tr>
<tr>
<td><strong>Nurse staffing</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># RN FTEs</td>
<td>20.6 (24.1)</td>
<td>18.9 (18.3)</td>
<td>0.78</td>
<td>312</td>
</tr>
<tr>
<td># LPN FTEs</td>
<td>23.4 (19.1)</td>
<td>22.4 (18.0)</td>
<td>0.71</td>
<td>310</td>
</tr>
<tr>
<td># CNA FTEs</td>
<td>75.4 (56.7)</td>
<td>71.2 (52.4)</td>
<td>0.80</td>
<td>312</td>
</tr>
<tr>
<td>Average RN hours per patient day</td>
<td>0.5 (0.4)</td>
<td>0.5 (0.2)</td>
<td>0.57</td>
<td>310</td>
</tr>
<tr>
<td>Average LPN hours per patient day</td>
<td>0.7 (0.3)</td>
<td>0.6 (0.3)</td>
<td>0.45</td>
<td>309</td>
</tr>
<tr>
<td>Average CNA hours per patient day</td>
<td>2.0 (0.6)</td>
<td>2.0 (0.5)</td>
<td>0.29</td>
<td>311</td>
</tr>
<tr>
<td>Average total nurse hours per patient day</td>
<td>3.2 (1.1)</td>
<td>3.1 (0.8)</td>
<td>0.27</td>
<td>312</td>
</tr>
<tr>
<td><strong>Other professional staffing</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># Social worker FTEs</td>
<td>2.6 (2.2)</td>
<td>2.1 (2.5)</td>
<td>0.62</td>
<td>305</td>
</tr>
<tr>
<td># Occupational therapist FTEs</td>
<td>1.1 (1.4)</td>
<td>0.9 (1.4)</td>
<td>0.63</td>
<td>275</td>
</tr>
<tr>
<td># Physical therapist FTEs</td>
<td>1.3 (1.6)</td>
<td>1.3 (1.6)</td>
<td>0.68</td>
<td>310</td>
</tr>
</tbody>
</table>

NYS, New York State; FTEs, full time equivalents; OSCAR, Online Survey Certification and Reporting System; RN, registered nurse; LPN, licensed practical nurses; CNA, certified nurse aides.

* *P* <.01 for all Spearman correlation coefficients.
† Number of facilities with # FTEs or staff hours greater than zero in both NYS and OSCAR.

0.29 for CNAs, and 0.27 for all combined. There was moderate to strong correlation for social workers, OTs, and PTs (0.62, 0.63 and 0.68, respectively).
researchers and for continuous quality improvement, the availability of quarterly staffing data would allow for greater precision in addressing the relationship between staffing and quality. Second, the collection of staff turnover data should be considered in OSCAR, given high turnover rates and their impact on resident care.35 Finally, staffing data should be audited by CMS regional offices to ensure accuracy.

In the nursing home setting, medical directors are responsible for implementing resident care policies and coordinating medical care in the facility. They can also help ensure that regulatory requirements are consistent with evidence-based clinical information and therefore should play a more active role in the survey process.29 Moreover, important questions regarding physician practice in nursing homes, such as the relationship between staffing and clinically relevant outcomes remain unanswered. While previous work has demonstrated a correlation between medical staff organization (i.e., closed vs. open staff) and intensity of care,46 the relationship to quality has yet to be addressed. The putative relationship among physician practice, quality care, and nurse efficiency/turndown, as described by some observers, highlights the importance of the physician in nursing home care as well as the need for more research in this arena.

This study also examined the widely used measures of average nurse hours per patient day, separately by nurse category and combined. Although these measures were close at the means between the two data sources, their correlation was relatively weak, suggesting that these measures can not always be substantiated using alternative data sources. Given the enormous policy implications of these measures, it is recommended that CMS conduct a more comprehensive and rigorous review of the accuracy of OSCAR staffing data as well as the appropriateness of using such data for public reporting and standard setting purposes.

CMS, pushed by advocates, has already begun to publish nursing home staffing data from OSCAR on its “Nursing Home Compare” Web site (http://www.medicare.gov/NHCompare). Results from this analysis are consistent with others in demonstrating that these data are not really accurate on a case specific basis.3,5 Yet the staffing information provided by OSCAR is critically important, given the observed associations between lower staffing levels and poor quality of care outcomes.3,11,12,21–28 Reliable and valid nursing home staffing data are also necessary to understand the impact of federal policies and to properly calibrate the level of staffing needed to achieve minimal levels of resident outcome quality. Unfortunately, at this time neither CMS nor the states attempt to verify the accuracy of the staffing data on a regular basis,4 on the grounds that it is unrealistic to incorporate verification of staffing levels into the survey process based on the current state of facility records.5 In order to make the OSCAR data more valuable for public reporting efforts, it is incumbent upon the government to design a more comprehensive and systematically structured mechanism for documenting staffing information. To this end, the recommendations proposed above should be considered as the first necessary step.

CONCLUSION

The OSCAR data appear to be useful for exploring relationships in the nursing home setting, although not necessarily representing “truth” in public reports that characterize the performance of individual facilities. Results from this analysis and from previous studies should not be interpreted as an indictment of OSCAR, but they do point to the need to continue examining the construct validity of OSCAR and its limits, and to fine-tune its content and methodology. As the theory and empirical data in long-term care become more refined and advanced, it is essential that OSCAR, as a data system, keeps pace, if it is to continue to inform rational decision-making at the consumer and facility level and effective policy formation at the state and national level.

REFERENCES


ORIGINAL STUDIES Feng et al. 31
### APPENDIX 1

**Definition of Variables According to the NYS Survey and OSCAR**

<table>
<thead>
<tr>
<th>Variable</th>
<th>NYS</th>
<th>OSCAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-time physicians, other than the medical director</td>
<td>“How many physicians working full-time at the facility, other than yourself (medical director), currently receive a salary from the nursing home?” Measured in numbers/counts.</td>
<td><strong>Full-time</strong> other physicians, where “other physician” refers to “a salaried physician, other than the medical director, who supervises the care of residents when the attending physician is unavailable, and/or a physician(s) available to provide emergency services 24 hours a day.” Measured in FTEs.</td>
</tr>
<tr>
<td>Total physician extenders</td>
<td>Sum of the following, in FTEs:</td>
<td>Physician extender refers to “a nurse practitioner, clinical nurse specialist, or physician assistant who performs physician delegated services.” Note that these staff are combined in a single category and not separately reported. Measured in total FTEs (staff or contract).</td>
</tr>
<tr>
<td>On-staff physician extenders</td>
<td>Sum of (a) and (c) above.</td>
<td>On-staff FTEs, following above definition.</td>
</tr>
<tr>
<td>Medical director hours per week</td>
<td>“How many total hours in a typical week do you (medical director) spend in this facility?”</td>
<td>Total medical director FTEs multiplying 35 hours.</td>
</tr>
<tr>
<td>Registered nurses</td>
<td>“What is the actual number of FTE registered nurses currently in your facility (including the director of nursing, “agency”, and per diem nurses)?”</td>
<td>Sum of the following, in FTEs (on-staff or contract):</td>
</tr>
<tr>
<td>Licensed practical nurses</td>
<td>“What is the actual number of FTE LPNs currently in your facility (include “agency” and per diem nurses)?”</td>
<td>a. Registered nurses</td>
</tr>
<tr>
<td>Nurse aides</td>
<td>“What is the actual number of FTE nursing aides currently in your facility (include “agency” and per diem nursing aides)?”</td>
<td>b. Director of nursing</td>
</tr>
<tr>
<td>Average RN hours per patient day</td>
<td>Total RN FTEs multiplying 5 hours divided by total number of residents.</td>
<td>c. Nurses with administrative duties</td>
</tr>
<tr>
<td>Average LPN hours per patient day</td>
<td>Total LPN FTEs multiplying 5 hours divided by total number of residents.</td>
<td></td>
</tr>
<tr>
<td>Average CNA hours per patient day</td>
<td>Total CNA FTEs multiplying 5 hours divided by total number of residents.</td>
<td></td>
</tr>
<tr>
<td>Average total nurse hours per patient day</td>
<td>Combined total RN, LPN, and CNA hours multiplying 5 hours divided by total number of residents.</td>
<td></td>
</tr>
<tr>
<td>Social workers</td>
<td>Number of FTE social workers (staff or contract)</td>
<td>Same as NYS.</td>
</tr>
<tr>
<td>Occupational therapists</td>
<td>Number of FTE occupational therapists (staff or contract)</td>
<td>Same as NYS.</td>
</tr>
<tr>
<td>Physical therapists</td>
<td>Number of FTE physical therapists (staff or contract)</td>
<td>Same as NYS.</td>
</tr>
</tbody>
</table>

NYS, New York State; OSCAR, Online Survey Certification and Reporting System; FTEs, full time equivalents; RN, registered nurse; LPN, licensed practical nurses; CNA, certified nurse aides.