Nursing Home Medical Staff Organization: Correlates With Quality Indicators

Paul R. Katz, MD, Jurgis Karuza, PhD, Julie Lima, PhD, and Orna Intrator, PhD

Objectives: Little is known about the relationship between how medical care is organized and delivered in nursing homes. Taking a lead from the acute care arena, we hypothesize that nursing home medical staff organization (NHMSO) is an important predictor of clinical outcomes in the nursing home.

Methods: A total of 202 usable surveys from a 2-wave survey process using the Dillman Method were returned from medical directors who were randomly selected from the AMDA membership and were asked to fill out a survey on the structure of medical organization in their primary nursing home practice. Quality measures that are likely to be affected by physician practice patterns were culled from NH Compare and OSCAR data sets and matched to the physician surveys, ie, long stay residents’ prevalence of pain, restraint use, catheter use, pressure ulcers, pneumococcal vaccination, influenza vaccination, presence of advanced directives, prescription of antibiotics, and prevalence of depression.

Results: Using a series of hierarchical multiple regressions, significant $R^2$ changes were found when the medical staff organization dimensions were added in the regressions after controlling for nursing home structural characteristics for the following outcomes: pneumococcal vaccination and restraint use. Near significant findings were noted for pain prevalence among long-stay residents, catheter use, and prevalence of pressure ulcers.

Conclusions: This study is the first to demonstrate a relationship between medical staff organizational dimensions and clinical outcomes in the nursing home setting and as such represents an initial “proof of concept.” NHMSO should be considered as a potentially important mediating or moderating variable in the quality of care equation for nursing homes. (J Am Med Dir Assoc 2011; 12: 655–659)

Keywords: Nursing home; medical staff organization; physician practice; quality outcomes

Nursing homes (NHs) have evolved significantly over the past 2 decades. They have come to accommodate an increasingly frail population with an array of both acute and chronic care needs.1 Understandably, the quality of care delivered in US NHs remains a high priority among all the relevant stakeholders, including NH residents and their families, state and federal regulators, policy makers, and the full array of professional caregivers employed in NHs.2,3

Although quality of care has improved over the past few years, in large part as a result of reforms emanating from a series of critical Institute of Medicine and Government Accountability Office reports, much remains to be done.4,5 Indeed, quality of care in the NH has been linked to a number of structural and process variables.6 Although some of these variables are mutable (eg, nurse staffing ratios), others, such as NH size and proprietary status, are relatively fixed. Surprisingly, little is known about the relationship between how medical care is organized and delivered in NHs and outcomes, despite governmental and professional organizations’ public recognition of the critical role played by physicians in NHs and explicit regulatory mandates specific to physicians.7

Taking a lead from the acute care arena, we hypothesize that NH medical staff organization (NHMSO) is an important predictor of clinical outcomes in the NH. The relationship between medical staff organization and quality in acute care hospitals was first described more than 30 years ago. In their classic article, Roemer and Friedman8 defined 7 dimensions that could describe medical organization in hospitals: staff composition, appointment process, job commitment of physicians, reporting and coordination systems, number of control committees, documentation, and informal interpersonal relationships. Hospitals’ performance, as measured by national accreditation, was related to the aspects of the physician’s job commitment and the more tightly structured hospital staff organization. Results from Shortell and his colleagues9 and Flood and Scott10 further suggest that structured medical staffs

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have better medical/surgical outcome. Together these studies suggest that quality of care is related more to how physicians interact as a professional group and the extent of their ties to the institution than the characteristics of the physician. Although not physician specific, NH “culture” has recently been linked to the use of feeding tubes and antipsychotics in N.Hs.

Capitalizing on the organizational framework for acute care hospitals, Karuza and colleagues developed and validated an analogous framework and scale to define and measure NH medical staff organization. The scale’s dimensions, along with the specific components that define them, are presented in Table 1.

Given the preliminary stage of our inquiry, we sought to demonstrate “proof of concept” by empirically examining whether the overarching medical staff organization construct is associated with clinical outcomes of NH residents above and beyond the previously studied NH structural characteristics, such as for-profit status. Our strategy was to quantify the medical staff organization dimensions using data from a survey of a random national sample of NH medical directors and to match and merge it with the NH resident outcome data from the Centers for Medicare and Medicaid Services (CMS) Nursing Home Compare and Minimum Data Set (MDS), both nationally administratively derived databases. NH structural characteristics were obtained from the MDS and a second national administrative database, ie, Online Survey Certification and Reporting System (OSCAR). Hierarchical multiple regression analyses were performed to test whether a model that included the medical staff organizational construct explained significantly more variance in the NH resident outcomes than was explained by a model that included only NH structural characteristics.

METHODS

Respondents

As described in Karuza et al, it was reasoned that 200 respondents would yield a sample size that would permit the detection of a moderately sized significant R² of 0.12, P < .05 with a power of at least 0.8 in the hierarchical multiple regression analyses described later in this article. Four hundred respondents were selected randomly from the American Medical Directors Association (AMDA) membership in anticipation of a 50% response rate, which would yield the necessary number of subjects. The inclusion criteria for the respondents were the following: licensed physician and currently serving as a medical director of a freestanding, nonpediatric, licensed NH that was able to be matched to OSCAR and the MDS.

Whereas we initially achieved a 91% response rate (n = 204), the mailing list contained a number of individuals who did not meet eligibility criteria (eg, retired, nonphysician, no longer in NH practice). Thus, of the 204 respondents, 95 were excluded, leaving a total of 109 usable surveys. To reach the goal of 200 surveys, a second sample of 400 randomly selected AMDA members was thus generated. A second mail survey was conducted using the same procedures as the initial survey. There were 233 surveys returned in this second wave for a response rate of 58% with 93 respondents meeting eligibility criteria. Combining the 2 surveys resulted in a total sample of 202 usable surveys. Duplicate surveys were excluded.

Procedure

The study received approval from the University of Rochester Institutional Review Board. The Dillman “Total Design Method” was used for the mail surveys. Initially, a crafted cover letter under AMDA letterhead was sent with the survey and a self-addressed stamped return envelope. A thank

<table>
<thead>
<tr>
<th>Table 1. Nursing Home Medical Staff Organization Dimensions</th>
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<tbody>
<tr>
<td><strong>Dimension 1: Composition of Staff</strong></td>
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<tr>
<td>• how many attendings provide care</td>
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<tr>
<td>• do physician extenders see residents*</td>
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<tr>
<td>• extent of “closed staff model”†</td>
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<tr>
<td><strong>Appointment Process</strong></td>
</tr>
<tr>
<td>• formal process for granting attending privileges‡</td>
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<tr>
<td>• does nursing home have a written contract with physicians‡</td>
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<td>• does the nursing home employ physicians directly‡</td>
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<tr>
<td>• detail of bylaws§</td>
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<tr>
<td><strong>Documentation</strong></td>
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<td>Formal Review Process to evaluate physicians‡</td>
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</table>

**Commitment:**

Physician cohesion|||
• collegial relationships among the physicians|||
• decision-making process is consensus building|||
• great deal of organizational loyalty|||
• identifiable practice style to which we all try to adhere|||

Leadership Turnover/Capability
• administrator turnover in the past 5 years
• director of nursing turnover in the past 5 years

Departmentalization:

Physician Supervision
• leadership style as involves checking up on physician|||
• quality of each physician’s work is monitored closely|||

Physician Autonomy
• physician has greater freedom to act independently|||
• emphasis on physician individuality|||

Physician Interdisciplinary Involvement
• physician is primary nursing home representative for families|||
• physicians are expected to attend care plan meetings|||
• physicians are expected to assume the leadership role in team meetings|||

Informal Dynamics: Interpersonal Relationships
• quality of your relationship between medical director and administrator#
• quality of your relationship between medical director and the director of nursing#

**Medical staff gets no respect in the nursing facility**††

* Do nurse practitioners or physician assistants see residents in the facility.
† Percentage of residents whose attending is not a community-based practitioner.
‡ Measured by yes = 1; no = 0.
§ Measured on a 5-point scale anchored by not at all = 0, somewhat = 1, moderately = 2, quite a bit = 3, very = 4.
¶ Measured on a 5-point scale anchored by strongly disagree = 1, disagree = 2, neutral = 3, agree = 4, strongly agree = 5.
# Subscore is computed by averaging the individual items.
§§ Measured on a 5-point scale anchored by poor = 1, fair = 2, good = 3, very good = 4, excellent = 5.
** Reverse scored.
you/reminder postcard was mailed to all respondents 1 week after
the initial mailing. Nonrespondents received up to 2 additional
follow-up mailings of the survey done over a 3-week period. Responses
were mailed back to the University of Rochester where they were entered into an Excel database.
A 10% data check was done to ensure its accuracy. The survey
instructed respondents to identify the NH that was the basis for
their answers. The survey instructed the respondents who were
medical directors in more than one facility to answer the survey
questions based on the facility they consider their primary NH.

The respondent medical directors were primarily male
(85%) primary care physicians (43% family physicians, 45% internists) who averaged almost 19 years in NH practice. Forty-five percent were certified medical directors (CMD) whereas 39% held a CAQ (certificate of added qualifications)
in geriatrics. Most of the respondents were part-time medical
directors (84%) and derived an average of 24% of their income
from NH practice.

As described in Karuza et al,14 comparison of the NH charac-
teristics of this sample to all US NHs in the OSCAR data-
base indicates that this sample is representative of US NHs.
The survey data were merged with NH characteristics and
outcome data obtained from OSCAR data and from quality
pare, both from 2006, the calendar year when the survey
data were collected.

Measures

Nursing Home Medical Staff Organization

The dimensions of NH medical staff organization were quan-
tified by the scale developed by Karuza et al.14 It is presented in
Table 1. The scale consists of 25 items that are subsumed under
6 dimensions: Composition of Staff, Appointment Process,
Commitment, Departmentalization, Documentation, and In-
formal Dynamics.

Nursing Home Structural and Staffing Characteristics

The NH characteristics obtained from the OSCAR data in-
cluded (1) the OSCAR acuity index,16 (2) total nursing hours
per day per resident, (3) ratio of registered nurses (RNs) to
total nursing staff, (4) OSCAR total beds in facility, (5) OS-
CAR occupancy rate, (6) for-profit status, and (7) whether
facility was part of a chain.

Clinical Outcome Indicators

There has been considerable research focused on the differ-
ent dimensions of health care quality.17–20 Although many argue about which dimensions of quality are the most salient,
there is agreement that quality is multidimensional. Indeed,
empirical work based on the MDS as well as other sources of
patient-level data have consistently found that there are mul-
tiple dimensions and that facilities that perform well in one
domain of quality do not necessarily perform well in all.17,20
Thus, it is important to examine the relationship of medical
staff models with a variety of quality measures. We chose mea-
sures that are theoretically likely to be affected by physician
practice patterns. Although it was understood that perfor-
mance on most of these measures was not dependent on a
sole discipline, in the end we chose items that were more
“physician centric.” In other words, physician performance
was thought to be more directly linked to the outcome
whether through the need to write a specific order or craft
diagnostic approach to a given problem. The selected mea-
sures also reflected a finite time frame wherein physician
action would result in a given change. In particular, we used
quality indicators from NH compare that measured long-stay
residents’ prevalence of pain, restraint and catheter use, and
from OSCAR, which measured pressure ulcer and depression
prevalence, pneumonia and influenza vaccination rates,
presence of advanced directives, and prescription of antibiotics.

RESULTS

A series of multiple regressions were performed on the qual-
ity indicators as the dependent measures. First, a model was
constructed consisting of the NH structural and staffing char-
acteristics noted previously and the adjusted R² was noted.
Then a second model was constructed, adding the NH medical
staff dimensions, as the predictor variables to the first model,
and the adjusted R² was noted. For the first 3 dimensions (staff
composition, appointment process, and documentation), the
individual items that defined the dimension were entered indi-
vidually. For the remaining dimensions, the scale subscores,
computed by averaging the individual items in the dimension
were entered into the regression. For example, under physi-
cian interdisciplinary involvement, a mean score was com-
puted that averaged together the answers from the 3 items
comprising the subscale, and the average was then entered
into the regression equation. A change in adjusted R² was
then calculated to determine whether the second model,
which included both NH medical staff organization dimen-
sions and the NH structural characteristics, significantly
explained more variance in the quality indicators than the first
model, indicating that there was a unique contribution of
the medical staff organization dimensions.

Among the 9 quality indicators, significant R² changes (P <
.05) were found for restraint use and pneumonia vaccination
rates while near significant R² change (P < .10) was found
for prevalence of pain, pressure ulcers, and catheter use. The
results are presented in Table 2. As can be seen in Table 2,
medical staff organization, as a whole, was significantly asso-
ciated with quality outcomes above and beyond NH structural
characteristics, ie, after controlling for the NH structural
characteristics variables, as hypothesized. No relationship
was found between NHMSO and prevalence of advance direc-
tives, depression, influenza vaccination, and antibiotic use.

DISCUSSION

This study is the first to demonstrate a relationship between
medical staff organizational dimensions and clinical outcomes
in the NH setting and as such represents an initial “proof of
concept.” Extending logic applied to acute care hospitals
several decades earlier, NHMSO should be considered as a
potentially important mediating or moderating variable in the
quality of care equation for NHs.
The NHMSO framework described in the present study might reasonably be considered as a “black box.” It is not known which specific facets of the NH medical staff organization are the most potent predictors of care outcomes. The inconsistent relationship between the NHMSO domains, as seen in the nonuniformity of the beta weights, speaks to the small sample size and the limited sensitivity of the outcome measures. These relationships also demonstrate that the links between medical staff characteristics and quality are complex, similar to the relationships between single quality measures and overall quality. Studies using a much larger number of subjects as well as more physician-centric quality measures (ie, process based) will be necessary before arriving at any further definitive conclusions. Recent reports demonstrating a relationship between nurse and certified nursing assistant hours per resident day and adherence to standardized medical treatment guidelines suggest new approaches to studying the impact of the medical staff on outcomes of care in the NH.

**Table 2.** Hierarchical Multiple Regression Analyses of Study Outcomes with Nursing Home Medical Staff Organization Dimensions as Predictors Controlling for Nursing Home Structural Variables

<table>
<thead>
<tr>
<th>Model</th>
<th>Predictor Variables</th>
<th>Outcome Variables</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Pain (long stay)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Beta (SE)</td>
</tr>
<tr>
<td>1</td>
<td>Case mix (acuity index)</td>
<td>0.31 (0.20)</td>
</tr>
<tr>
<td></td>
<td>Total nursing hours per day/resident</td>
<td>0.85 (0.44)</td>
</tr>
<tr>
<td></td>
<td>Percentage of nursing staff who are RNs</td>
<td>−0.22 (1.41)</td>
</tr>
<tr>
<td></td>
<td>Total beds</td>
<td>0.01 (0.01)</td>
</tr>
<tr>
<td></td>
<td>For-profit status</td>
<td>1.18 (0.60)</td>
</tr>
<tr>
<td></td>
<td>If facility part of a chain</td>
<td>0.15 (0.57)</td>
</tr>
<tr>
<td></td>
<td>Occupancy rate</td>
<td>−6.15 (2.40)</td>
</tr>
<tr>
<td><strong>R² Model 1</strong></td>
<td>0.10</td>
<td>0.16</td>
</tr>
<tr>
<td>2</td>
<td>Case mix (acuity index)</td>
<td>0.35 (0.21)</td>
</tr>
<tr>
<td></td>
<td>Total nursing hours per day/resident</td>
<td>1.26 (0.47)</td>
</tr>
<tr>
<td></td>
<td>Percentage of nursing staff who are RNs</td>
<td>−1.01 (1.47)</td>
</tr>
<tr>
<td></td>
<td>Total beds</td>
<td>0.01 (0.01)</td>
</tr>
<tr>
<td></td>
<td>For-profit status</td>
<td>1.40 (0.61)</td>
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<tr>
<td></td>
<td>If facility part of a chain</td>
<td>0.68 (0.59)</td>
</tr>
<tr>
<td></td>
<td>Occupancy rate</td>
<td>−5.53 (2.45)</td>
</tr>
<tr>
<td></td>
<td>How many attending physicians provide care (composition of staff)</td>
<td>−0.01 (0.02)</td>
</tr>
<tr>
<td></td>
<td>Do physician extenders see residents (composition of staff)</td>
<td>−0.24 (0.58)</td>
</tr>
<tr>
<td></td>
<td>Extent of “closed staff model” (composition of staff)</td>
<td>−0.11 (0.72)</td>
</tr>
<tr>
<td></td>
<td>Formal process for granting attending privileges (appointment process)</td>
<td>−0.52 (0.59)</td>
</tr>
<tr>
<td></td>
<td>Does nursing home have a written contract with physicians (appointment process)</td>
<td>−0.82 (0.80)</td>
</tr>
<tr>
<td></td>
<td>Does the nursing home employ physicians directly (appointment process)</td>
<td>−0.98 (0.99)</td>
</tr>
<tr>
<td></td>
<td>Detail of bylaws (appointment process)</td>
<td>−0.33 (0.26)</td>
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<tr>
<td></td>
<td>Physician cohesion scale (commitment)</td>
<td>0.81 (1.83)</td>
</tr>
<tr>
<td></td>
<td>Leadership turnover scale (composition of staff)</td>
<td>−3.68 (2.09)</td>
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<td></td>
<td>Physician supervision scale (departmentalization)</td>
<td>1.16 (1.36)</td>
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<td></td>
<td>Physician autonomy scale (departmentalization)</td>
<td>3.79 (1.35)</td>
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<td></td>
<td>Physician interdisciplinary involvement scale (departmentalization)</td>
<td>−1.47 (1.29)</td>
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<td></td>
<td>Formal review process (documentation)</td>
<td>0.34 (0.68)</td>
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<tr>
<td></td>
<td>Interpersonal relationships scale (informal dynamics)</td>
<td>1.57 (1.73)</td>
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<tr>
<td></td>
<td>Constant</td>
<td>−2.18 (3.90)</td>
</tr>
<tr>
<td><strong>R² Model 2</strong></td>
<td>0.21</td>
<td>0.28</td>
</tr>
<tr>
<td><strong>R² Change</strong></td>
<td>0.11‡</td>
<td>0.12*</td>
</tr>
</tbody>
</table>

*P < .05.
†P < .10.
For investigators accustomed to examining quality based on large administrative data sets, the NHMSO tool presents new challenges. As a self-reported survey it requires considerably more time to complete and is predicated on individual medical director input. Moreover, an institution’s “culture” and the nature of relationships between professionals is essential in understanding the decision-making process that ultimately drives care, then NHMSO-like tools will be invaluable and necessary in understanding the underpinnings of quality.

Some may question whether medical directors have the necessary insights in contrast to other NH leaders. The perception of NH physicians as “missing in action” and not professionally committed can now be contrasted to the facts. The respondents of the study describe practicing in the NH setting on average for almost 2 decades with the NH comprising up to one quarter of their total practice income. Indeed, in many instances the medical director carries much greater seniority than their administrators and directors of nursing, where turnover remains a major problem.

Several limitations of our study are noteworthy. Because the medical director subjects were randomly selected from among AMDA members, it is impossible to determine whether the results generalize to non-AMDA medical directors. Contemporary surveys of medical directors, however, would indicate that AMDA members not only represent most NHs in the United States but also mirror the training and commitment to non-AMDA physicians. Although the relationship between NHMSO- and Medicare-derived quality measures was found to be significant, these measures are also clearly influenced by other professionals and systems of care. Testing new, more physician-centered measures (i.e., preventable hospitalizations) may make for an even more compelling case.

CONCLUSIONS

The NHMSO tool now sets the stage for several new lines of inquiry. Demonstrating the relationship between specific dimensions of NHMSO and clinical outcomes, when further validated, will likely inform future policy (i.e., encouraging closed medical staffs).

REFERENCES