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Medical Staff Organization in Nursing Homes: Scale Development and Validation

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Introduction

Improving the quality of care in nursing homes has been a major theme in health care for over 30 years. In this vein, a number of structural and process characteristics of nursing homes have been examined over the years in terms of their relationship with quality. Characteristics such as facility size, ownership, chain membership, facility resources and culture, medical treatments offered, specialized care settings, and percent private pay have all been related to outcomes^{1–5}. While these factors clearly help frame the quality-of-care equation in the nursing home setting, the nature of their relationship to quality has been mixed, at best. Medical staff in nursing homes include the medical director and other attending physicians as well as nurse practitioners and physician assistants who partake in making medical decisions regarding the care of residents. These providers may, or may not have, coordinated or common practice models and standards, which we refer to as medical staff organization. The role played by medical staff organizational factors on nursing home care, has not been systematically examined. The present study seeks to construct and validate a self-report scale to measure the

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dimensions that characterize nursing home medical staff organization (NHMSO). When validated, the NHMSO dimensions may prove to be a significant factor contributing to the quality of care delivered in nursing homes. This in no way should be construed as detracting from the significant contributions of the nursing staff to overall quality of care. The conceptual basis for NHMSO is presented below followed by a description of survey development and testing.

Organizational Theory

In conceptualizing organization within a long-term care environment it is important to consider both structural and cultural attributes. With respect to structure, Donabedian's structure/process/outcome (SPO) model is frequently cited in research on measures of healthcare quality⁶. Donabedian defined structural measures of quality as the professional and organizational resources associated with the provision of care, such as staff credentials and facility operating capacities. Contingency theory also considers organizational structure, viewing effective organizations as having structures that both support the unique nature of their production process (technology) and are customized to complement their environments⁷. However, contingency theory departs from the SPO model in the conceptualization of structure. While the SPO model views structure in terms of capacities and capabilities, contingency theorists include strategic dimensions reflecting the organization's choice of mechanisms for communication, coordination and integration of effort across the organization. The elements of structure identified in contingency theory include formalization, specialization, standardization, complexity and centralization. Formalization is the amount of written documentation in the organization, including procedures, job descriptions, regulations and policy manuals. Specialization refers to the degree to which tasks are subdivided into jobs, while standardization is the extent to which similar work is performed in a uniform manner. Complexity is the number of discrete units and their arrangement in the organization. Organizations that array units in a descending hierarchy are vertically complex, while organizations with many units operating on the same level are horizontally complex. Finally, centralization refers to the level at which decision making authority is granted. An organization in which all decisions are made by top management is highly centralized. Taken in the aggregate, organizations high on these dimensions evidence more bureaucratic control.

Thus, the two theories present different but highly complementary perspectives on the salient characteristics of organizational structure⁸. While the SPO paradigm focuses on measures of organizational capacity and capability, contingency theory focuses on the mechanisms for communication, coordination and control.

Culture differs from structure in that while structure is usually explicit and visible within organizations, cultural attributes are often implicit and unobservable. Organizational culture consists of values, guiding beliefs, understandings and ways of thinking shared by members of the organization. Cultural attributes display themselves in many ways but typically evolve into a patterned set of activities carried out through social interaction. The point here is that these social interactions are the vehicle for communication, coordination and integration of activities. Finally, medical staff organizational characteristics can be expected to vary in response to differences in nursing home structural and cultural characteristics, the context in which the medical staff operates.

The conceptual framework described above has been adapted to the study of medical staff organization in acute hospitals. Roemer and Friedman⁹, in their classic and still seminal article, defined seven dimensions that could describe medical organization in hospitals: staff composition; appointment process (i.e. extant procedures to appoint the practitioner to the medical staff and permit him/her to practice medicine); job commitment of physicians; reporting and coordination systems; number of control committees; documentation and

informal interpersonal relationships. They found that these organizational dimensions were related to quality of care. Specifically, hospital 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, Becker, and Neuhauser¹⁰, and Flood and Scott¹¹, further suggest that structured medical staffs have better medical/surgical outcomes. The Shortell and LoGerfo's¹² study of 96 mid-Western hospitals found that medical staff organization characteristics such as involvement of medical staff and percent of active staff on contract were all associated with outcomes, independent of hospital and individual characteristics. 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 individual characteristics of the physician. More recently, Shortell, Schmittdiel, and Wang¹³ extend this logic to medical groups delivering chronic care in the outpatient setting. They have demonstrated that internal organizational factors (i.e., resource acquisition, resource deployment, and commitment to a quality centered culture) differentiate between high and low performing medical groups.

Distinct from the acute and outpatient settings, the nursing home environment is unique. This creates the need for an effective translation of medical organizational theory to the long term care setting, which is the focus of the following study approved by the University of Rochester IRB.

Methods

Survey Development

Starting with the conceptual model of medical staff organization described above, we a priori defined six nursing home medical staff organization (NHMSO) dimensions. While adhering to the framework originally described by Roemer and Friedman⁹ the dimensions reflect the unique nature of nursing home practice (Table 1). For example, while the nursing home analogues to staff composition, appointment process, documentation and interpersonal relationships are relatively straightforward, the underpinnings of commitment and departmentalization in the nursing home are less obvious. Roemer defined commitment as the relative dedication of physicians to the hospital. We conceptualized commitment in the nursing home as the ability of physicians to work together in a collaborative fashion thus promoting organizational loyalty and practice consistency. Leadership turnover is also posited as a critical ingredient in establishing a stable environment. Under departmentalization, Roemer⁹ refers to an authority system as well as reporting and coordinating systems. We believe that the nursing home equivalents relate to physician supervision, physician autonomy and interdisciplinary involvement or expectations.

A team consisting of the study authors (PK, JK, OI, VM, TC) was charged to define items to measure the key NHMSO dimensions outlined above. The team was informed by personal experience, reviews of the literature and results from previous surveys. In addition, a focus group was held to review the adequacy of the conceptual model (see below). The papers and discussion from the Nursing Home Physician Workforce Conference were also utilized as a source to generate the needed survey items¹⁴⁻¹⁷. Held at the University of Rochester, and funded by the Health Resources and Services Administration, this conference was used as the initial vehicle to delineate the construct of medical staff organization. The goal of the conference was to advance a research agenda on medical practice in nursing homes, including the role of medical staff organization, based on current knowledge and practice. Participants included leaders from academia, government, and relevant specialty organizations. The proceedings of the conference were recorded and published¹⁸⁻¹⁹.

Focus Group—A focus group of ten nursing home medical practitioners was recruited from the American Medical Directors Association (AMDA) and was convened by an experienced leader (PK) at a meeting of the AMDA Research Network. Participant selection criteria included: at least five years experience in nursing homes, currently medical director of at least one freestanding nursing facility, representation of the proprietary and not for profit sectors, and adequate geographic representation.

The focus group first received an introduction to the conceptual framework followed by a two-hour discussion that addressed the following themes:

1. What types of medical staff models currently exist in your nursing homes, or in the nursing homes you have experience with?
2. If you were studying medical staff organization, what would be the key elements or domains that you would focus on?

The focus group transcripts were transcribed and themes identified.

Based on the processes described above, the *Survey Development Team* developed a draft of the NHMSO survey instrument. To make the instrument as user friendly as possible, a short, self-report scale, which used a closed ended response format, was chosen, and a major priority was keeping the instrument length to a minimum.

Cognitive Interviews—During the American Geriatrics Society’s annual meeting in 2006 cognitive interviews²⁰ were conducted by a trained interviewer (AC) with four experts with extensive nursing home experience. Participants were given the draft survey instrument and were asked to “think aloud” about what the question is asking and describe what information they are using to formulate a response. Additional questions probed for item clarity and survey burden. Based on the cognitive interviews, the wording of the items and the response scales were reviewed by the *Survey Development Team* and used to revise the survey instrument.

Survey Response

Respondents—We reasoned that 200 respondents would yield a stable enough sample size to compute the psychometric properties of the scale such as the internal consistencies and would provide sufficient statistical power to detect significant moderately sized correlations. Four hundred respondents were selected randomly from the AMDA membership in anticipation of a 50% response rate, which would yield the necessary number of subjects. The inclusion criteria for the respondents were: licensed physician and currently serving as a medical director of a free standing, non pediatric, licensed nursing home which was able to be matched to the Online Survey Certification and Reporting System (OSCAR). While we initially achieved a 51% response rate (n=204), the mailing list contained a number of individuals who did not meet eligibility criteria (e.g. retired; nonphysician; no longer in nursing home 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. Two hundred thirty three surveys were returned in this second wave for a response rate of 58% with 93 respondents meeting eligibility criteria. Combining the two surveys resulted in a total sample of 202 usable surveys.

Procedure—The Dillman “*Total Design Method*” was used for the mail surveys²¹. Initially, a crafted cover letter under AMDA letterhead was sent with the survey and a self addressed stamped return envelope. A thank you/reminder postcard was mailed to all respondents one week after the initial mailing. Non-respondents received up to two additional follow-up mailings of the survey done over a three-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 nursing home 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 nursing home.

Results

Representation of Survey Nursing Homes with all U.S. Nursing Homes

To address the issue of generalizability, the samples from the first and second surveys were combined and matched to the OSCAR database. The surveys' nursing facility characteristics were compared to the national database of 14,544 freestanding, non-pediatric facilities found in 50 U.S. states and the District of Columbia in the 2006 OSCAR. The data are presented in Table 2.

Our sample was similar to the national sample in many respects, though a few significant ($p < .05$) differences did appear. Specifically, the study sample consisted of a smaller proportion of for-profit facilities not associated with a chain (19.3%) compared with the national sample (27.8%). They were larger in size (mean=144 beds versus 110 beds per facility) but had similar occupancy rates (89% vs. 85%) and were as likely to be found in urban areas, as were facilities in the national sample. A significantly greater proportion of our sample facilities contained special care units in general (36.1%) and Alzheimer units in particular (34.2%) compared to the national sample (21.7% and 19.4%, respectively). Our sample did not differ from the national sample in terms of payer mix. Though our sample did not differ from the national averages in terms of nursing hours per resident day (including RNs, LPNs and CNAs examined separately), there were twice as many physicians associated with our sample facilities than in facilities nationwide. Resident case mix did not differ between samples.

Reliability of the NHMSO Dimensions

Data from all usable surveys was used to determine the reliability and validity of the NHMSO instrument. For some of the Roemer and Friedman based dimensions⁹, such as composition of staff, several distinct items were used to define it. For other dimensions, such as commitment, individual items in the questionnaire were grouped into scales to define the characteristics, e.g., physician cohesion. A preliminary step examined the underlying reliability of the grouped items used to define these scales. Table 3 contains the descriptive statistics and reliabilities (i.e., Cronbach's alpha, a measure of internal consistency) for each of the scales used to define the major dimensions of NHMSO.

Inspection of the responses across items revealed a minimum of missing values or out of range values (< 1%). Table 3 also presents the descriptive data for each item under each dimension. As can be seen, the means indicate no ceiling or floor effects, and the standard deviations indicate acceptable variance on the item responses. Cronbach's alphas ranged from .81 to .65, providing evidence for the reliability of the scales.

Validity of the NHMSO Dimensions

To provide preliminary data on the validity of the NHMSO dimensions, intercorrelations among the items used to define the dimensions were computed on the combined data set and presented in Table 4. As can be seen in Table 4, the magnitudes of the correlations were mostly in the low range (typically defined in the literature as correlation coefficients in the .1-.2 range) with a few moderately sized correlations (typically defined in the literature as correlation coefficients in the .3-.4 range), predominantly involving the cohesiveness and quality of staff interrelationships. This pattern of intercorrelations is in keeping with the underlying

conceptualization of medical staff organization as a multidimensional construct with relatively independent dimensions.

Discussion

This report, for the first time ever, defines and validates nursing home medical staff organization (NHMSO) dimensions. This is a critical first step in determining the relationship between physician practice characteristics and the quality of care delivered in the NH. The fact that there is scant literature that specifically studies physician practice characteristics in the nursing home much less little, if any, evidence linking physician practice characteristics and outcomes may be due to the lack of an anchoring conceptual framework.²²

Great pains were taken to ensure that a thoughtful and comprehensive process was used to capture and define the salient dimensions of nursing home physician practice. Conceptually derived from organizational theory as operationalized in the acute care literature, the NHMSO dimensions were extensively vetted by experts in medical practice in long term care and subsequently tested in a survey of randomly selected AMDA members. The low rate of missing data demonstrates the feasibility of using a pencil and paper self report approach with the medical director to measure medical staff organization in the nursing home. The final number of eligible respondents reflected the fact that a substantial number of returned surveys were from non-physicians, physicians no longer in practice, or physicians who were not medical directors.

Although some sporadic differences emerged such as physician staffing the fact that many of the nursing home's structural characteristics in the study samples were similar to the national nursing home OSCAR profile provides support for the generalizability of the NHMSO instrument. Since the samples were drawn from the AMDA membership, the similarity of the samples to the national OSCAR dataset provides further evidence that the AMDA membership is representative of the nursing home industry²³.

While an involved survey development process was used, it is important to note that the reliability and validity analyses depended on the integrity of the original set of dimensions and corresponding items. The psychometric properties of the scales indicate their reliability, and the intercorrelations among the items used to define the dimensions, provide evidence of the construct validity. The pattern of intercorrelations, nearly all in the low range, with a few moderately sized correlations, reflects the conceptualization of medical staff organization as a multidimensional construct, that is medical staff organization is conceptualized and defined along several distinct dimensions. If most intercorrelations among the dimensions were in the moderate to high range (correlation coefficients .5 or higher), that would suggest that the dimensions were interrelated and that conceptually the dimensions were not different from each other. The pattern of intercorrelations also suggests the centrality of staff cohesiveness and quality professional relations to the structure of medical staff organization. Still, there may be additional aspects of medical staff organization that were overlooked by our process. We leave it to additional research to build upon our initial conceptualization of medical staff organization. Finally, from a broader perspective, we realize that medical staff organization, along with other nursing home structural variables, such as nursing staff organization, administrative organization, size, and case mix can and do affect care processes and resident outcomes. We leave it to a more ambitious research agenda to examine the interrelationship among these structural variables and their relative contribution to the processes and outcome of care. Our immediate goal was much more modest, to introduce the concept of medical staff organization and to develop a preliminary tool that could easily be used to quantify NH medical staff organization. The NHMSO dimensions provides researchers with a tool to describe and

quantify systematically nursing home medical staff organization and study its impact on the both the processes of care delivered and the quality of resident care outcomes.

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Table 1

Items Developed for Nursing Home Medical Staff Organization and Culture Dimensions

1.	<p>Composition of Staff</p> <p>how many attendings provide care</p> <p>do physician extenders see residents^a</p> <p>extent of "closed staff model"^b</p>
2.	<p>Appointment Process</p> <p>formal process for granting attending privileges^c</p> <p>does nursing home have a written contract with physicians^c</p> <p>does the nursing home employ physicians directly^c</p> <p>detail of bylaws^d</p>
3.	<p>Commitment</p> <p><i>Physician cohesion</i></p> <ul style="list-style-type: none"> • collegial relationships among the physicians^e • decision-making process is consensus building^e • great deal of organizational loyalty^e • identifiable practice style which we all try to adhere^e <p><i>Leadership Turnover/Capability</i></p> <ul style="list-style-type: none"> • administrator turnover in the last five years • director of nursing turnover in the last five years
4.	<p>Departmentalization</p> <p><i>Physician Supervision</i></p> <ul style="list-style-type: none"> • leadership style as involves checking up on physician^e • quality of each physician's work is monitored closely^e <p><i>Physician Autonomy</i></p> <ul style="list-style-type: none"> • leadership style allows the attending physician greater freedom to act independently^e • emphasis on physician individuality^e <p><i>Physician Interdisciplinary Involvement</i></p> <ul style="list-style-type: none"> • physician is primary nursing home representative for families^e • physicians are expected to attend care plan meetings^e • physicians are expected to assume the leadership role in team meetings^e
5.	<p>Documentation</p> <p>Formal Review Process to evaluate physicians^c</p>
6.	<p>Informal Dynamics (Interpersonal Relationships)</p> <p>quality of your relationship between medical director and administrator^f</p> <p>quality of your relationship between medical director and the director of nursing^f</p> <p>relationship between physicians and licensed nurses^{f,g}</p> <p>medical staff gets no respect in the nursing facility^{e,g}</p>

^a Do nurse practitioners or physician assistants see residents in the facility

^b percent of residents whose attending is not a community based practitioners

^c responses measured by yes=1; no=0

^d responses measured on a 5 point scale anchored by not at all=0 somewhat=1 moderately=2 quite a bit=3 very=4

^e responses measured on a 5 point scale anchored by strongly disagree=1 disagree=2 neutral=3 agree=4 strongly agree=5

^f responses measured on a 5 point scale anchored by poor=1 fair=2 good=3 very good=4 excellent=5

^g reversed scored

Table 2
Comparison of Sample Characteristics to All States OSCAR 2006 Data

Characteristic	Study Samples (n=202)			OSCAR 2006 (N=14544)		
	N	%	Mean Std	N	%	Mean Std
For profit chain	100		49.50		6,359	43.72
For profit no chain	39	19.31		4,042	27.79	
Not for profit	63	31.19		4,143	28.49	
Number of beds			143.62			109.98
Number of residents			128.87			93.80
Occupancy rate			89.0%			85%
Urban	148		73.27	10,105		69.53
Any Special Care Unit	73	36.14		3,155	21.69	
Alzheimer Unit	69	34.16		2,827	19.44	
% Medicare			15.28			13.28
% Medicaid			60.38			62.80
% Other payer			24.34			23.93
RN hours ^a	0.37		0.77		0.33	0.69
LPN hours ^a	0.81		0.75		0.85	1.55
CNAs hours ^a	2.40		2.44		2.42	3.72
RN+LPN hours ^a	1.18		1.46		1.17	1.95
Total MDs FTE			0.47			0.24
Total NP/PAs FTE			0.21			0.12
Resident case mix			11.06			11.07

^a per resident day

Table 3
Descriptive Statistics and Reliability Analysis (n=202)

Dimension	Item	Mean	Std	Alpha
1.	Composition of Staff			
	how many attendings provide care	10.23	12.29	
	do physician extenders see residents	66%		
2.	extent of "closed staff model"	55.27%	39.52	
	Appointment Process			
	formal process for granting attending privileges	47%		
	does nursing home have a written contract with physicians	15%		
3.	does the nursing home employ physicians directly	9%		
	detail of bylaws	2.55	1.19	
	Commitment			
	<i>physician cohesion</i>	3.40	.68	.71
	• collegial relationships among the physicians	3.46	.97	
	• decision-making process is consensus building	3.32	.97	
	• great deal of organizational loyalty	3.51	.96	
	• identifiable practice style which we all try to adhere	3.12	.89	
	<i>Leadership Turnover/Capability</i>	2.37	1.34	.81
	• administrator turnover in the last five years	2.11	1.33	
• director of nursing turnover in the last five years	2.62	1.57		
4.	Departmentalization			
	<i>Physician Supervision</i>	3.15	.90	.68
	• leadership style as involves checking up on physician	3.15	1.09	
	• quality of each physician's work is monitored closely	3.14	.96	
	<i>Physician Autonomy</i>	3.87	.78	.65
	• leadership style allows the attending physician greater freedom to act independently	3.97	.98	
	• emphasis on physician individuality	3.76	.84	
	<i>Physician Interdisciplinary Involvement</i>	2.66	.88	.74
• physician is primary nursing home representative for families	2.81	1.00		
• physicians are expected to attend care plan meetings	2.54	1.14		
• physicians are expected to assume the leadership role in team meetings	2.61	1.10		
5.	Documentation			
Formal Review Process to evaluate physicians	25%			

Dimension	Item	Mean	Std	Alpha
6.	Informal Dynamics (Interpersonal Relationships)	4.06	.62	.70
	quality of your relationship between medical director and administrator	4.05	.90	
	quality of your relationship between medical director and the director of nursing	4.13	.85	
	relationship between physicians and licensed nurses	3.82	.77	
	medical staff gets no respect in the nursing facility (r)	4.29	.93	

Table 4
Intercorrelations among the Dimensions of NHMSO from Combined Surveys (n=202)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Composition of Staff														
1 n attendings providing care	-	.13	-.27	-.08	.02	.05	-.05	.11	-.10	-.05	-.07	-.18	.10	.05
2 physician extenders [/]	-	-	.03	.23	.03	-.08	-.08	.00	.06	.02	-.04	-.15	.07	-.03
3 extent of "closed staff model"	-	-	-	.07	.31	.11	.12	-.02	.01	-.06	-.07	.13	-.08	-.10
Appointment Process														
4 process for granting privileges [/]	-	-	-	-	.16	.16	.46	.20	-.10	.30	-.15	.17	.28	-.05
5 written contract with physicians [/]	-	-	-	-	.23	.03	.03	.12	-.08	.09	-.06	.03	.10	-.04
6 employ physicians directly [/]	-	-	-	-	-	-	.04	-.01	-.13	.07	-.06	.14	-.02	.01
7 detail of bylaws	-	-	-	-	-	-	-	.29	-.11	.31	-.09	.18	.22	-.04
Commitment														
8 physician cohesion	-	-	-	-	-	-	-	-	-.21	.48	-.05	.31	.33	.28
9 leadership turnover/capability	-	-	-	-	-	-	-	-	-	-.09	-.02	-.05	-.18	-.15
Departmentalization														
10 physician supervision	-	-	-	-	-	-	-	-	-	-	-.15	.30	.38	.15
11 physician autonomy	-	-	-	-	-	-	-	-	-	-	-	-.05	-.16	.08
12 interdisciplinary involvement	-	-	-	-	-	-	-	-	-	-	-	-	.22	.06
Documentation														
13 formal physician evaluation [/]	-	-	-	-	-	-	-	-	-	-	-	-	-	.21
Informal Dynamics														
14 interpersonal relations	-	-	-	-	-	-	-	-	-	-	-	-	-	-

[/] responses scored 1=yes; 0=no

significant intercorrelations between dimensions in **bold**, $p < .05$, two tailed test