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Nursing Home Quality, Cost, Staffing, and Staff Mix

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Purpose: The purpose of this study was to describe the processes of care, organizational attributes, cost of care, staffing level, and staff mix in a sample of Missouri homes with good, average, and poor resident outcomes. ***Design and Methods:*** A three-group exploratory study design was used, with 92 nursing homes randomly selected from all nursing homes in Missouri and classified into resident outcome groups. Resident outcomes were measured by use of quality indicators derived from nursing home Minimum Data Set resident assessment data. Cost and staffing information were derived from Medicaid cost reports. Participant observation methods were used to describe the care delivery processes. ***Results:*** In facilities with good resident outcomes, there are basics of care and processes surrounding each that staff consistently do: helping residents with ambulation, nutrition and hydration, and toileting and bowel regularity; preventing skin breakdown; and managing pain. The analysis revealed necessary organizational attributes that *must* be in place in order for those basics of care to be accomplished: consistent nursing and administrative leadership, the use of team and group processes, and an active quality improvement program. The only facility characteristic across the outcome groups that was significantly different was the number of licensed beds, with smaller facilities having better outcomes. No significant differences in costs, staffing, or staff mix were detected across the groups. A trend in higher total costs of $13.58 per resident per day was detected in the poor-outcome group compared with the good-outcome group. ***Implications:*** For nursing homes to achieve good resident outcomes, they must have leadership that is willing to embrace quality improvement and group process and see that the basics of care delivery are done for residents. Good quality care may not cost more than poor quality care; there is some evidence that good quality care may cost less. Small facilities of 60 beds were more likely to have good resident outcomes. Strategies have to be considered so larger facilities can be organized into smaller clusters of units that could function as small nursing homes within the larger whole.

Key Words: Nursing homes, Quality of care, Quality indicators, Quality measurement, Minimum Data Set (MDS), Costs of care, Staffing, Staff mix, Registered nurse staffing

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Quality, cost, and staffing in nursing homes are common controversial topics among the public, policy makers, and researchers. Ten years after the initial Institute of Medicine (IOM) report on nursing homes (Committee on Nursing Home Regulation, 1986), a follow-up IOM report concluded that the "quality of care provided by some nursing facilities still leaves much to be desired" (Committee on the Adequacy of Nurse Staffing in Hospitals and Nursing Homes, 1996, p. 140). The report called for continued research designed to "improve both the processes and the outcomes of care" (p. 140); "address the [staffing and skill mix] relationship of licensed practical nurses and nursing assistants to quality of care" (p. 18); and "clarify relationships between quality and costs [that are] complex and difficult to disaggregate" (p. 191).

Using existing mandated secondary databases, augmented by direct observation of care processes, we sought to address the goals and recommendations of both landmark IOM committees. In this study, we aimed to describe and compare the care delivery processes in a sample of Missouri nursing facilities with good, average, and poor resident outcomes, to identify exemplar care processes related to these resident outcomes, and to explore organizational attributes in facilities achieving the best outcomes. We also sought to compare the cost of care, staffing level, and staff mix and describe their relationship to the care delivery processes associated with the range of resident outcomes.

We measured resident outcomes by using quality indicators (QIs) derived from nursing home Minimum Data Set (MDS) resident assessment data. We derived cost and staffing information from Medicaid cost reports. We used participant observation methods to describe the care delivery processes, and they proved useful in identifying differences in care delivery processes in facilities where resident outcomes were considered best. A theoretical model of the organizational attributes of nursing facilities achieving good resident outcomes emerged from the qualitative data analysis. A guiding focus of our efforts is to assist staff to improve care and resident outcomes.

Background

Minimum Data Set and Quality Indicators

We have examined the range of QI performance in nursing facilities throughout our state for the past 10 years (Rantz et al., 1996). We have also measured the apparent relationship among the QIs, facility citations, and an independent measure of nursing home care quality developed in our pilot work (Rantz et al., 1997b). The costs of care were investigated (Hicks et al., 1997), and we validated the accuracy of the QIs in a sample of facilities in Missouri (Karon & Roberts, 1999) by using the methods applied in prior QI validation studies (Karon & Zimmerman, 1997). In an intervention study that assisted facilities to design and implement quality improvement programs, we developed longitudinal QI feedback reports that displayed QI information in easy to interpret graphs (Rantz et al., 1997a, 2000, 2001). The findings of the intervention study and the feedback reports became the foundation for a state-sponsored, statewide quality improvement clinical consultation service by gerontological nurse experts (Rantz et al., 2003).

In 1998, when this study was designed and implemented, the use of MDS data, and specifically MDS QIs for research, was not widely supported by nursing home researchers. From the outset, many questioned and continue to question the accuracy of the MDS and such derivatives as the MDS QIs. In a recent national evaluation study, the researchers, some of whom were developers of the MDS instrument and assessment process, concluded that there is "strong evidence" that many of the MDS QIs reviewed do "capture meaningful aspects of nursing facility performance" whereas others remain questionable (Morris et al., 2002, p. 8). In addition, the controversy about MDS accuracy and public reporting of QIs prompted two General Accounting Office (GAO) reports about the issue. In the first, it was pointed out that 33 states do not have an MDS review program other than the review at time of survey to influence accuracy of the completion of the required instrument (GAO, February 2002). In the second, the GAO recommended delaying the November 2002 national public reporting of QIs "until there is greater assurance that quality indicators are appropriate and based on accurate data" (GAO, October 2002, p. 4). However, public reporting began with those MDS QIs that had the "strongest degree of evidence that they represent real care processes in nursing facilities" (Morris et al., 2002, p. 8). These included, for those needing chronic care, the following: loss of ability with basic daily tasks, pressure sores, pain, physical restraints, and infections.

The version of MDS QIs used in this study was developed in the late 1980s by researchers from the Center for Health Systems Research and Analysis (CHSRA) at the University of Wisconsin–Madison and collaborators from the Multistate Nursing Home Case Mix and Quality Demonstration Project (NHCMQ). The QIs measure potentially good or poor care practices (Zimmerman et al., 1995). The most recent version includes 30 different QIs, measuring a variety of domains and clinical problems (e.g., accidents, or use of nine or more scheduled medications; Karon & Zimmerman, 1996; also see CHSRA, 1997). Some QIs are risk adjusted to account for differences in residents' characteristics across facilities. QIs have been reported to nursing facilities nationwide and have been used in the survey process since 1999.

Using MDS data to analyze quality of care and resident outcomes in nursing homes is of interest

because these data, by federal mandate, are routinely obtained for all nursing home residents upon admission, at times of significant change in condition, quarterly for selected items, and annually for all facilities participating in Medicaid and Medicare. The multidimensional resident-specific aspects encompassed by MDS data items provide a way to measure quality of care more directly than using proxy measures such as facility survey citations, which are commonly used in nursing home research (Harrington et al., 2000, 2001; Munroe, 1990; Spector & Takada, 1991). Survey citations provide a limited view of quality because they view quality from the perspective of compliance with minimum standards instead of achievement of higher quality standards.

The 23 QIs that can be calculated from quarterly MDS assessments and were used in this study as quality outcome measures for residents are displayed in Table 1. We have accomplished interpretation of QI scores using expert panel thresholds by using the methods established by Rantz and colleagues (1997a); each QI score has thresholds set so that scores can be interpreted within good, average, or poor ranges. These methods have been used successfully in other research (Rantz et al., 2000, 2001) and were used in this study.

Table 1. MDS Quality Indicators Used in This Study

New fracture
Falls
Behavioral symptoms
Symptoms of depression
Depression without antidepressant therapy
Use of 9 or more medications
Onset of cognitive impairment
Bladder or bowel incontinence
Incontinence without a toileting plan
Indwelling catheters
Fecal impaction
Urinary tract infection
Weight loss
Tube feeding
Dehydration
Bedfast
Decline in late loss ADLs
Antipsychotic use
Antianxiety or hypnotic medication use
Hypnotic medication use
Daily physical restraints
Little or no activity
Pressure ulcers

Notes: MDS Quality Indicators Version 6.1 for MDS Two Page Quarterly. Center for Health Systems Research and Analysis, University of Wisconsin–Madison.

Processes of Care and Organizational Attributes

In the context of quality measurement, ''process measures examine actual services or activities provided to or on behalf of residents'' (Committee on the Adequacy of Nurses Staffing in Hospitals and Nursing Homes, 1996, p. 129). There is a limited number of studies examining care processes in nursing homes; the most notable are those resulting from the Teaching Nursing Home Program (TNHP), funded by the Robert Wood Johnson Foundation from 1982 to 1988 (Kraft, Neubauer, & LeSage, 1987; Shaughnessy, Kramer, Hittle, & Steiner, 1995). Kraft, Neubauer, and LeSage succinctly concluded that ''process, or what the staff does or fails to do in the nursing home setting, seems to be the best way to measure the care actually being given'' (p. 43).

The investigation of what the nursing home staff do and fail to do has been limited, as has research on the perspectives of the nursing staff. Observational research on the interaction between residents and nursing staff (Burgio, Engel, Hawkins, McCormick, & Scheve, 1990) concluded that nursing staff devote most of their time to resident needs and relatively little time to nonproductive activities. Rantz and Miller (1983) reached a similar conclusion from their research on how nurses and nursing assistants spend their time and how care is delivered. Similarly, Bowers and Becker (1992) observed nursing assistants to better understand their job, how they organize their work, and how they think about quality of care. Their results reveal that nursing assistants focus on getting the work done, but they have little time for concerns about quality of care.

Other process measures used in nursing home quality and outcome research include catheter use rates, skin care rates, participation in activities, multiple medication usage, psychotropic drug use, physical restraint use, and percentage of residents with skilled care (Mosely, 1994; Spector & Takada, 1991). The impact of the work environment is relevant to the processes of care and has had some evaluation (Kayser-Jones, 1990, 1991, 1996; Timko, Nguyen, Williford, & Moos, 1993), as has the work environment on the nursing home worker (Schaefer & Moos, 1996) and on the staff and residents (Kane, 1997). Although results are not conclusive, environment does appear to influence care processes.

The relationship of other structural attributes (e.g., for-profit or not-for-profit status, and staffing) to quality of care has also been explored. Researchers found that not-for-profit homes in Pennsylvania had better staffing and resident outcomes (Aaronson, Zinn, & Rosko, 1994). For-profit homes in Wisconsin generally had more survey violations than not-for-profit homes (Riportella-Muller & Slesinger, 1982). Most recently, Harrington colleagues (2001) concluded that for-profit nursing homes ''provide worse care and less nursing care than not-for-profit or public homes'' (p. 9).

Staffing, Staff Mix, and Cost

Several studies have found that increased staffing, particularly for registered nurses, is associated with

better quality of care (Braun, 1991; Harrington et al., 2000; Munroe 1990; Spector & Takada, 1991). In 455 Medicare-certified skilled nursing facilities in California, for every 25% increase in the ratio of registered nurse (RN) to licensed practical nurse (LPN) hours, there was a decrease of 0.53 in the number of health-related deficiencies in the facilities (Munroe, 1990). In Maryland, as the ratio of total staffing increased, a quality-of-care index increased and a survey-deficiency index decreased (Johnson-Pawlson & Infeld, 1996). In Rhode Island, higher staff levels and lower RN turnover were related to functional improvement (Spector & Takada, 1991). These findings are similar to those of Bleismer and colleagues (Bleismer, Smayling, Kane, & Shannon, 1998), who identified that licensed nursing hours are related to improved functional ability, increased probability of discharge to home, and decreased probability of death. Using survey citations as a quality measure, Harrington and colleagues (2000) found, in a national study of certified nursing facilities, that less RN and nursing assistant staffing was associated with more survey citations, particularly those for quality of care.

Nursing home costs and quality relationships have had some examination with mixed results. Facilities in New York rated as having good or very good nursing service quality reported higher (although not statistically significant) labor costs of $1.67 per resident day than facilities rated as needing improvement or as unsatisfactory in nursing service quality (Ullman, 1985). A higher ratio of RNs was associated with higher resident care costs, but lower total costs per resident day (Felton, 1993). Mukamel and Spector (2000) identified a U-shaped relationship between quality and costs, and they concluded that, in some cases, higher quality is associated with lower costs. From the reverse perspective, improved resident outcomes have been linked to higher RN staffing and higher costs in Texas nursing facilities (Anderson, Hsieh, & Su, 1998). In a recent GAO report (June 2002), no consistent relationship was found between nursing home expenditures and quality-of-care deficiencies in three states.

This study was designed to extend understanding about the complex relationships of staffing, cost, and quality of nursing home care, as well as to fill some gaps in knowledge about processes of care (what the staff does for, with, and to nursing home residents) and the context of care delivery. What is most important is that the study sought to illuminate the relationships among care processes and link those practices to resident outcomes.

Methods

Study Design

We used a three-group exploratory study design to describe the processes of care delivery in facilities that have good resident outcomes, to describe how these processes differ in facilities that have average or poor resident outcomes, and to describe exemplar care delivery processes and organizational attributes of facilities achieving the best resident outcomes. In addition, the costs of care, staffing levels, and staff mix in facilities with good, average, and poor resident outcomes were described, as was the relationship of these variables to care delivery processes associated with these outcomes.

Using statewide MDS data, we created three groups based on resident outcomes, as measured by their facility-level MDS QI scores: Group 1 had predominately good, Group 2 had predominately average, and Group 3 had predominately poor resident outcomes. A random sample of 30 facilities from each group was selected and their costs of care, staffing levels, and staff mix were compared. Our intention was to identify differences in care delivery processes by using inductive qualitative methods and making comparisons across the three groups. Furthermore, we intended to use quantitative methods and cross-group comparisons to identify how differences in costs and staffing contribute to resident outcomes.

Sample

Sample selection began with all certified Missouri nursing facilities with 30 or more beds ($N = 443$) that collect and submit MDS data. This included facilities of varying size and ownership, in both urban and rural locations, that are certified to participate in Medicaid or Medicare programs. Because there can be excessive variation in individual MDS QIs when a change in just a few individuals causes a large percentage change, seven small facilities with fewer than 30 beds were excluded.

Using statewide MDS data, we analyzed resident outcomes for each facility by using the MDS QIs defined by the CHSRA at the University of Wisconsin–Madison (see Table 1) that have been measured in Missouri and used as outcome measures in other studies (Rantz et al., 1996, 1997b, 2001). We then interpreted QI scores as good, average, or poor in relation to their threshold range, using thresholds established in earlier research (Rantz et al., 1997a, 2000.) As QI data are inherently multidimensional, there is no simple way to combine them to obtain an overall facility quality score. Next, we plotted the numbers of MDS QIs each facility had in the good or poor ranges to examine the range of performance in the state. None of the facilities had all their QIs exclusively in the good or poor ranges. (Plots are available from the authors upon request.) We then classified facilities into groups by considering the numbers of MDS QIs each facility had in the good, average, or poor ranges. Our definitions allowed for a facility to have QIs in various ranges. A facility was

classified as "good" if it had more than 5 QIs in the good threshold range and fewer than 2 in the poor range, "poor" if it had fewer than 5 in the good threshold range and more than 5 in the poor range, "average" if it was classified as neither good nor poor and had 15 or more in the average threshold range.

When the 443 facilities were classified in outcome groups, we randomly selected study homes from within each group to avoid selection bias. Thus, all facilities had an equal chance of being represented in the appropriate subsample, regardless of resident characteristics or structural characteristics, such as number of beds, urban or rural location, ownership (for profit and not for profit), and payer source (Medicaid, Medicare, or private pay). We identified counties as urban, metro, or rural by using the U.S. Department of Agriculture County Typology (Cook & Mizer, 1989).

Enrollment in the Study

We selected random samples of 10 facilities from each outcome group in four phases as the study progressed. This staggered enrollment approach was important so that we could minimize the time between sample selection based on MDS QI performance and observation for the qualitative data collection. The average time from sample selection to observation was 5 months. We contacted 114 facilities to solicit participation in the study, with 92 agreeing to participate. Refusals to participate were evenly distributed across the three outcome groups. Facility administrators gave informed consent for their facility to participate; employees consented to be observed; no identifiable resident information was collected from the facilities.

Qualitative Instruments and Data Collection

Qualitative participant observation methods described by Patton (1990) were used. The underlying theoretical perspective for the data collection was systems theory. Given the complex and interdependent nature of nursing facility care delivery, using the systems perspective provided a guide for understanding and describing the processes of care delivery and designing the instruments so that information would be collected about the systems of care, such as those surrounding a resident's request for toileting or individual meal or bathing preferences. The systems perspective guided data coding and analysis.

The qualitative data collection instrument (QI Observation Instrument) developed in a preliminary study (Rantz et al., 1997b) guided the data collection so that information was systematically collected regarding care delivery related to each MDS QI. In addition, data collection for pain was added to accommodate field testing of an MDS QI about pain in the state, and to include processes of care about pain management. For example, for the MDS QIs "bladder or bowel incontinence," "occasional or frequent bladder or bowel incontinence without a toileting plan," "indwelling catheters," and "fecal impaction," the nurse was directed to make rounds with the nursing assistants after a meal or before or after nap time and observe whether residents were toileted, staff response to resident requests for being taken to the bathroom, if staff were checking and changing incontinence products, if residents who wore incontinence products were toileted, and so on. The nurse asked staff about the use of Foley catheters and the routines for bowel regularity, and facility records were examined for the occurrence of impactions.

The QI Observation Instrument was semistructured to guide data collection and facilitate identification of care processes and services provided by staff. The tool also guided collection of information from multiple sources: observation of care processes, facility records, pharmacy records, and staff interaction. The semistructured format of the instrument ensured that critical processes were observed while ensuring that other unplanned observations could be made; it outlined when and what critical details and impressions were to be recorded to ensure that observations potentially essential to understanding critical processes were captured for analysis. (The QI Observation Instrument is available from the authors.)

Qualitative Procedures

Four part-time research nurses with long-term care experience, most with master's preparation, were trained to adhere to the complex data collection procedures. Initial observations of the facilities were completed by the nurses working in pairs, as they learned the data collection procedures and to ensure consistency among data collectors. Their detailed field notes were reviewed to confirm consistency (Lincoln & Guba, 1985). After initial observations in pairs, the nurses completed observations independently, with ongoing review of the data for consistency. The use of multiple nurses enabled independent observations of facilities and allowed us to enhance dependability and confirmability of the data collection (Lincoln & Guba, 1985). Experienced nurses were knowledgeable about clinical care, nursing facility residents' needs, care delivery, and research. Each facility was observed by one of the research nurses for 2 to 4 days to observe care delivery around the clock by the day, evening, and night shifts. Although 2 days were sufficient in most facilities observations, 3 to 4 days were needed for larger facilities. For credibility of the data collection process to be ensured, the research nurses were blinded to the group designation of facilities and they were unaware of the facility's performance on particular MDS QIs.

Qualitative Data Management and Data Analysis

Research nurses typed descriptive field notes during and at the end of each nursing facility observation, according to the QI Observation Guide. These transcripts were reviewed along with other documents collected by the research nurses (such as activity calendars, building floor plans, or particular policies or procedures the facility was willing to share), and they were managed and coded with N-5 software (Richards, 2000). An advanced practice nurse with qualitative data analysis experience completed the primary coding of the data, with guidance and independent confirmation of the codes from other study investigators.

Data pertinent to each MDS QI were coded so that processes of care delivery for each QI could be identified within and across groups. The nurse doing the coding added each facility's actual MDS QI scores and resident outcome classification to each facility document so that analysis would include these important quantitative scores. The concepts of care processes and resident outcomes were used as beginning indigenous concepts (Patton, 1990) for initial qualitative coding to make comparisons across the groups. Then, codes related to patterns, themes, and categories emerged from the data, reflecting the terms used by the nurse observers and recorded in their field notes. Conclusions were reached on the basis of this inductive analysis by using qualitative methods described by Patton (1990) and Hutchinson (1993). After data collection was complete and the data analysis progressed, project research staff discussed causes, consequences, and relationships (Patton, 1990) among the emerging concepts with the nurses who completed the observations. Their insights were particularly useful in distinguishing *observed* care processes from those *reported* by facility staff.

Results were summarized by describing and comparing the care delivery processes identified in facilities with good, average, or poor resident outcomes as measured by their MDS QIs. These written descriptions were verified with the nurse observers and a sample of nursing personnel from the facilities participating in the study, who were asked to provide feedback on the accuracy of the descriptions. Minor clarifications were made on the basis of their feedback and data review.

Quantitative Data Collection and Analytic Plan

Each long-term care facility participating in the Missouri Title XIX (Medicaid) program is required to file an annual cost report (the Financial and Statistical Report for Nursing Facilities) to the Missouri Division of Medical Services, Institutional Reimbursement Unit, within 90 days of the close of the provider's fiscal year. This report includes the number of beds certified, total resident days and types of resident days for the reporting period, facility expenditures and revenues for major categories, and staffing information for RNs, LPNs, and nurse's aides (NAs). Data describing other facility characteristics of urban or rural location, ownership, and percentage of Medicaid or Medicare funding for care were obtained from the Medicaid cost reports as in preliminary work (Hicks et al., 1997).

The cost report for the year the site visit was conducted was used for each facility in the analyses, so that staffing and cost information was closely matched with the date of nurse observation in each facility. Costs and staffing information was standardized for analysis across facilities as costs or hours per resident day. Costs were evaluated in terms of direct resident care expenditures per resident day (measured by staffing salaries and benefits), administrative expenditures per resident day, and total costs (all costs, resident care, ancillary, capital, and other costs) per resident day. Costs per resident day were calculated for RN, LPN, and NA costs, total nursing cost (the sum of RN, LPN, and NA), and direct resident care cost. When the types of expenditures in nursing homes were analyzed separately, it was possible to determine which components were significantly different among the groups of homes with good, average, and poor resident outcomes.

As a way to ensure comparability for staffing and staff-mix measures, the staffing information was converted to hours of RNs, LPNs, and NAs per resident day. These staffing rates were then used to compare the three groups of homes. Because excessive staff turnover has a negative impact on staffing costs, hours of direct resident care were analyzed separately from total hours paid, which would include turnover, training, and orientation costs.

Other structural characteristics of nursing homes, such as ownership (for profit, not for profit, governmental), bed size, percentage Medicaid days, location (urban, metro, or rural), resident case mix using resource utilization groups III (Fries et al., 1994), and resident cognitive performance measures were examined. The relationships of these characteristics and the primary variables of quality, costs, and staffing were analyzed, because these may account for differences in quality, cost, or staffing.

Summary statistics are presented as percentages or median values as appropriate for the type of data. Because many of the variables in this study have moderate to heavily skewed distributions, the sample median is a more accurate measure of central tendency than is the sample mean. The Wilcoxon Rank Sum Test was used to test for group differences with respect to cost and staffing measures.

Preliminary Analysis

As qualitative and quantitative results were reviewed, a question about stability of the MDS

QIs was raised. This led to two additional analyses: calculation of MDS QI scores and classification of the facilities into the good, average, and poor outcome groups by using MDS data *at the point of observation* of the facility (recall there was an average of 5 months between sample selection and actual observation of each facility), and a statewide analysis of MDS QI stability comparing 6 months of MDS data with a subsequent 6 months.

The additional analyses revealed that only 11 of the 30 facilities classified at the time of sample selection as Group 1 (good) remained classifiable as good at the time of observation; the remaining 19 facilities "slid" into average ($n = 16$) or poor ($n = 3$). Within the original Group 2, 16 of the 32 classified as average continued to meet criteria for group membership at the time of observation; of the remaining 16 facilities, 6 improved and 10 declined. Within the original Group 3, 20 of the 30 remained as poor at the time of observation; the remaining 10 improved to average. In the statewide analysis ($N = 486$), only 45% of facilities were classified into the same group by using two consecutive 6 months of MDS data (first 6 months of 2000 with last 6 months of 2000 and first 6 months of 2001 with last 6 months of 2001).

On the basis of this information, we reanalyzed all qualitative and quantitative data by using a six-group approach to the data. Each group designated with the suffix A consistently remained in the same group during both periods; each group designated with the suffix B differed at time of selection and observation. Table 2 displays the QI scores for the six groups. As we expected, the median and quartile ranges for the scores are lower for the good groups (indicating better performance) as compared with the average and poor groups, as would be expected with QI scores.

Comparisons of the groups at the extremes of good- and poor-outcome performance, Group 1A (good at selection and observation) and Group 3A (poor at selection and observation), are most insightful to answer these research questions: How do care delivery processes differ in a sample of Missouri nursing facilities with good, average, and poor resident outcomes? What are the exemplar care delivery processes that uniquely characterize nursing facilities with good resident outcomes? What are the costs of care, staffing level, and staff mix in each group? What is the relationship of cost of care, staffing level, and staff mix to the care delivery processes associated with resident outcomes in each group?

Results

Demographics and Structural Attributes

Demographics and structural attributes of the groups reveal some differences and many similarities. Recall that facilities were randomly selected for site visits based on their resident outcome classification. Thus, differences among the groups are indications of organizational attributes characterizing the facilities that are able to achieve the range of resident outcomes from good to poor. Table 3 displays the demographic and structural characteristics of the facilities in each of the original three groups with breakdowns for the subgroups formed from the analysis of QI stability.

The only statistically significant difference among the groups is bed size ($p = .006$). For facilities classified as Group 1A, the median number of licensed beds was 60, compared with 130 for Group 3A. These differences were also apparent in the complete Group 1 facilities (median 73 licensed beds) and Group 3 (median 120 licensed beds). Statewide, 22% of facilities have 60 beds or fewer, 22% have more than 120 beds, and 56% have between 61 and 120 beds.

Facilities classified into all the groups had similar median occupancy rates and they all participated in the Medicaid program. Comparisons of cognitive performance of the residents using the MDS Cognitive Performance Scale (CPS; Morris et al., 1994) revealed no differences in either cross-sectional or admission scores.

Although not statistically significant, location and case mix trends were examined further (see Table 3, where Group 1A had a case-mix median and admission case-mix median of 0.73 and Group 3A had 0.84 and 0.95, respectively).

For these trends to be examined further in a larger sample, a post hoc analysis of calendar year 2000 statewide MDS data that classified facilities ($N = 496$) into outcome groups as applied in this study was conducted, with the additional requirement that facilities remain in their outcome groups for the two consecutive 6-month periods. The facilities with consistently good resident outcomes ($n = 21$) were then compared with those facilities with consistently poor outcomes ($n = 93$). Facility size remained significantly different ($p = .006$). Facilities in the consistently good resident outcome group had a median size of 80 beds, whereas facilities in the poor resident outcome group were larger, with a median of 120 beds. Location remained statistically not significant, although the same rural trend was noted (23% of the good-outcome group was in rural locations, compared with 15% of the poor-outcome group) and ownership remained not significantly different. The cross-sectional case mix trend was verified in this sample, with facilities with good outcomes having a lower median case-mix index (0.73) than those with poor resident outcomes (0.82; $p = .005$). However, admission case mix was not significantly different (0.92 for facilities with good and 0.96 for facilities with poor resident outcomes). One potential explanation for this is that facilities admit residents of similar case mix, but those going

Table 2. Medians, Standard Deviations, and Lower and Upper Quartiles Quality Indicator Scores

	Group 1A ($n = 11$)		Group 1B ($n = 19$)		Group 2A ($n = 16$)		Group 2B ($n = 16$)		Group 3A ($n = 20$)		Group 3B ($n = 10$)	
QI	*Mdn* (*SD*)	Lower–Upper Quartile	*Mdn* (*SD*)	Lower–Upper Quartile	*Mdn* (*SD*)	Lower–Upper Quartile	*Mdn* (*SD*)	Lower–Upper Quartile	*Mdn* (*SD*)	Lower–Upper Quartile	*Mdn* (*SD*)	Lower–Upper Quartile
1: New fracture	0.00 (0.81)	0.00–1.59	1.89 (2.07)	0.00–2.99	1.35 (1.91)	0.00–2.14	1.87 (1.27)	0.41–2.61	1.71 (1.43)	0.78–3.29	1.31 (1.57)	0.84–3.09
2: Falls	11.86 (5.15)	8.33–14.00	14.93 (9.61)	9.52–18.95	14.17 (8.07)	12.86–21.77	17.31 (7.38)	13.05–20.89	17.39 (4.88)	14.41–19.25	16.02 (5.17)	9.64–19.51
3: Behavior	15.0 (13.34)	7.81–32.20	21.62 (14.14)	11.86–29.69	19.20 (12.45)	12.91–31.40	24.48 (11.42)	18.77–31.41	28.65 (13.39)	19.82–32.48	15.28 (4.91)	11.36 18.52
4: Symptoms of depression	1.56 (4.75)	0.00–8.33	11.58 (13.63)	3.39–20.00	9.25 (11.89)	5.11–23.15	10.78 (10.32)	3.50–16.15	16.18 (16.22)	8.25–23.05	5.75 (7.72)	2.41–8.82
5: Depression with no treatment	1.56 (2.91)	0.00–5.56	5.97 (8.31)	1.56–11.43	3.83 (6.35)	2.03–10.10	5.71 (5.79)	1.56–8.68	8.35 (7.36)	4.71–10.46	1.29 (5.29)	0.84–3.73
6: Use of 9+ different meds	26.00 (21.96)	20.51–35.0	34.38 (11.58)	26.23–41.79	44.86 (13.62)	35.10 48.99	33.81 (12.29)	26.46–42.26	40.96 (11.02)	33.52–48.12	40.31 (11.70)	29.41–48.03
7: Onset of cognitive impairment	0.00 (5.68)	0.00–7.94	9.68 (12.75)	3.70–27.78	7.32 (5.20)	5.36–8.62	14.96 (9.57)	11.04–18.18	13.64 (6.65)	10.13–19.05	8.33 (6.26)	6.67–9.68
8: Bladder–bowel incontinence	40.00 (17.92)	30.00–56.76	50.00 (12.06)	40.79–60.38	41.94 (12.21)	38.86–50.14	49.67 (15.16)	41.23–55.07	59.63 (11.54)	51.86–69.30	46.95 (10.94)	36.52–52.63
9: Incontinence with no plan	30.43 (23.49)	19.05–43.75	24.70 (30.20)	10.00–60.00	10.00 (15.74)	4.88–21.15	26.92 (33.10)	6.25–76.19	51.65 (29.03)	27.53–76.33	30.20 (16.39)	17.39–48.00
10: Indwelling catheters	4.65 (4.04)	3.17–6.78	4.88 (3.74)	2.70–7.08	4.08 (3.76)	1.25–8.11	5.02 (2.47)	3.61–6.77	6.34 (3.22)	3.89–9.10	6.16 (2.47)	4.88–8.11
11: Fecal impaction	0.00 (0.99)	0.00–1.67	0.00 (1.33)	0.00–1.69	0.63 (2.21)	0.00–1.46	0.37 (1.85)	0.00–1.77	1.18 (2.50)	0.00–3.23	0.00 (0.63)	0.00–0.34
12: UTIs	3.39 (3.87)	0.00–6.35	8.57 (3.52)	6.17–10.81	6.58 (2.98)	5.52–8.43	6.48 (7.86)	3.32–10.09	8.99 (5.49)	4.04–12.89	6.61 (4.63)	4.55–9.46
14: Weight loss	3.17 (5.02)	0.00–6.20	9.52 (5.91)	7.81–18.64	12.40 (4.19)	9.42–15.06	11.42 (6.82)	7.10–14.71	12.82 (5.04)	8.98–17.6	7.82 (3.96)	6.50–11.81
15: Tube feeding	2.27 (3.94)	0.00–8.33	3.28 (5.06)	1.69–4.94	2.84 (5.01)	0.69–5.20	3.61 (2.84)	1.66–5.16	5.63 (6.47)	2.09–8.29	4.57 (2.50)	2.71–6.76
16: Dehydration	0.00 (0.23)	0.00–0.00	1.33 (1.56)	0.00–2.65	0.54 (0.95)	0.00–0.94	1.35 (1.54)	0.00–2.75	0.18 (1.38)	0.00–1.07	0.34 (1.01)	0.00–1.22
17: Bedfast residents	0.00 (2.18)	0.00–2.27	4.69 (3.62)	0.00–6.17	2.26 (2.51)	1.81–5.34	3.61 (2.78)	2.48–5.14	4.91 (4.39)	3.30–7.76	4.06 (1.84)	2.70–5.88
18: Decline in late loss ADLs	7.02 (5.45)	3.03–12.24	18.03 (7.15)	10.71–22.86	12.43 (4.40)	9.00–15.52	14.69 (11.15)	9.43–23.79	15.79 (6.05)	11.97–20.51	11.21 (6.67)	5.56–17.31
21: Anti-psychotic med use	14.94 (7.60)	6.06–18.18	13.11 (5.50)	11.39–17.46	18.18 (15.62)	11.52–23.29	14.09 (5.41)	9.85–18.12	17.07 (7.37)	12.18–22.86	17.61 (6.29)	14.29–22.00
23: Antianxiety–hypnotic med use	11.31 (6.89)	8.42–12.96	17.46 (8.29)	12.20–22.86	14.10 (8.21)	10.65–18.11	15.58 (5.73)	13.08–18.45	18.20 (8.56)	12.04–23.43	18.67 (6.77)	10.61–22.50
24: Hypnotic med use	1.67 (5.08)	0.00–3.39	1.03 (4.50)	0.00–2.11	1.74 (2.27)	0.00–3.49	1.75 (1.53)	1.16–3.56	2.53 (3.78)	0.89–5.13	2.79 (2.49)	2.37–5.69
26: Daily physical restraints	2.27 (9.39)	0.00–11.86	6.00 (6.54)	2.38–9.52	6.69 (6.89)	1.90–12.38	4.70 (7.30)	2.55–10.09	14.34 (10.09)	5.72–20.13	8.69 (5.51)	4.82–10.51
27: Little or no activity	28.13 (19.45)	12.40–41.67	31.43 (19.33)	11.61–43.33	29.40 (15.97)	17.84–37.77	38.37 (18.08)	26.02–50.08	47.09 (17.56)	26.48–57.32	14.71 (13.39)	8.11–19.75
28: Stage 1–4 PUs	2.33 (3.47)	0.00–4.00	6.25 (4.41)	5.41–11.86	6.41 (3.94)	5.66–9.82	8.10 (5.51)	5.01–12.29	10.57 (4.90)	8.68–14.15	8.48 (2.96)	6.82–9.76

Notes: QI = quality indicator; UTIs = urinary tract infections; ADLs = activities of daily living; PUs = pressure ulcers.

to facilities classified with good resident outcomes are subsequently improving more than those going to facilities with poor resident outcomes.

Costs

There were no statistically significant differences across the groups in costs per resident day. Costs per resident day were analyzed for RN, LPN, NA, total nursing (the sum of RN, LPN, and NA), direct resident care, administrative, and total costs (all costs, resident care, ancillary, capital, and other costs).

Of interest is a $13.58 difference in total cost measured between Group 1A (good) and Group 3A (poor), that is, $82.08 per resident day median total costs and $96.55, respectively. Although this is not a statistically significant difference, it is likely a cost difference that nursing home providers would find meaningful; however, further work in larger studies would be needed to confirm a true difference between group costs. Similarly, the total nursing, direct resident care, and administrative costs were lower in Group 1A than those in Group 3A. These trends were confirmed in the previously described post hoc analysis linking calendar year 2000 statewide cost data to MDS data. Direct resident care was significantly different and total costs per resident day had the same trend, with lower costs for facilities with good resident outcomes. For facilities with good outcomes, the median direct resident cost was $43.52 compared with $52.95 for those with poor outcomes ($p = .03$), a difference of $9.43 per resident day; the median total resident costs for facilities with good outcomes was $85.35 compared with $92.31 for those with poor outcomes ($p = .10$), a difference of $6.96 per resident day.

Hourly wages were examined across the groups and no statistically significant differences were found. Nor were obvious trends in patient care wage differences noted. For example, the Group 1A median RN hourly wage was $17.69, higher than Group 3A's $17.34; for NAs, Group 1A's median was $7.35, lower than Group 3A's $8.18. The administrator wage was an additional cost of about $6.00/hr for the poor group; the Group 1A median administrator hourly wage was $23.22 and that of Group 3A was $29.20. In the post hoc analysis of statewide cost data, there were no statistically significant differences in hourly wages across groups either.

Staffing

There were no statistically significant differences across the groups in staffing hours per resident day for total hours or for patient-related hours. Although not significantly different statistically, Group 1A appeared to have slightly higher total resident-related hours (3.22), compared with Group 3A (3.07). Contract hours were also compared and were not

Table 3. Demographics and Structural Attributes of Groups

		Size (No. Beds)				Location			Ownership			Occupancy (*Mdn*)		Resident Characteristics (*Mdn*)			
Group	*n*	1–60 (%)	61–120 (%)	121+ (%)	Licensed beds* (*Mdn*)	Metro (%)	Urban (%)	Rural (%)	Governmental (%)	Nonprofit (%)	For Profit (%)	Occupancy (%)	Medicaid Share (%)	Case Mix	Admission Case Mix	CPS	Admission CPS
1A	11	7 (64)	3 (27)	1 (9)	60	4 (36)	5 (45)	2 (18)	1 (9)	2 (18)	8 (73)	84	76	0.73	0.73	2.7	2
1B	19	5 (26)	11 (58)	3 (16)	102	8 (42)	8 (42)	3 (16)	1 (5)	4 (21)	14 (74)	82	62	0.82	0.92	2.8	1.9
1: Total	30	12 (40)	14 (47)	4 (13)	73	12 (40)	13 (43)	5 (17)	2 (7)	6 (20)	22 (73)	83	67	0.79	0.91	2.8	2
2A	16	4 (25)	6 (38)	6 (38)	105	9 (56)	7 (54)	0	1 (6)	6 (38)	9 (56)	91	68	0.78	0.91	2.8	2
2B	16	4 (25)	10 (63)	2 (13)	86	5 (31)	11 (69)	0	0	4 (25)	12 (75)	86	65	0.82	0.98	2.9	2.2
2: Total	32	8 (25)	16 (50)	8 (25)	98	14 (44)	18 (56)	0	1 (3)	10 (31)	21 (66)	90	66	0.82	0.92	2.8	2.1
3A	20	3 (15)	7 (35)	10 (50)	130	13 (65)	5 (25)	2 (10)	3 (15)	6 (30)	11 (55)	88	66	0.84	0.95	3	2.2
3B	10	0	6 (60)	4 (40)	120	6 (60)	4 (40)	0	0	4 (40)	6 (60)	83	64	0.83	1.0	2.7	2.2
3: Total	30	3 (10)	13 (43)	14 (47)	120	19 (63)	9 (30)	2 (7)	3 (15)	10 (33)	17 (57)	87	65	0.84	0.95	2.8	2.2

Notes: Group 1A = good classification at selection and observation times; Group 1B = good classification at selection and average or poor at observation; Group 2A = average classification at selection and observation times; Group 2B = average classification at selection and good or poor at observation; Group 3A = poor classification at selection and observation times; Group 3B = poor classification at selection and average at observation; CPS = Cognitive Performance Scale.

*$p = .006$.

significantly different; contract means ranged from 0.000 to 0.087 hours per resident day, revealing that contract staffing is a very small portion of staffing and staff mix.

Staff mix, as a percentage of each type of direct care staff, is virtually identical across the groups. Roughly, 70% of staff were NAs, 10–14% were RNs, and 14–20% were LPNs. Again, no significant differences were found in staff mix across the groups. In the post hoc analysis of statewide cost data, there were no statistically significant differences in staffing hours or staff mix across groups.

Processes of Care

In the qualitative analysis of data about the processes of care that are related to resident outcomes, two core variables were identified: leadership and basics of care. These core variables emerged as comparisons were made in specific care delivery processes across the six groups. The frequency and patterns of occurrence for such things as length of employment of the director of nurses or ambulation or toileting were coded in the analysis, and differences were particularly apparent when Group 1A was compared with Group 3A. However, in most cases, the patterns were in an increasing or decreasing pattern of occurrence across the six groups with extreme differences most clearly identifiable between Group 1A and Group 3A. The core variables of leadership and basics of care were used to organize the results of the analysis of care processes related to each MDS QI. Because the QI scores and classification group were inserted into the qualitative data collected for each QI in each facility, the actual performance on QIs could be included in the qualitative analysis.

Leadership Differences

There were four leadership differences identified in the qualitative data analysis. A strong pattern in the data revealed that directors of nursing in facilities with good outcomes were much more likely to have been in their jobs for many years (more than 5), compared with those who were much more likely to be recently hired (less than a year) in facilities with poor resident outcomes. A similar but weaker pattern revealed that administrators were more likely to have been in their jobs for more years in facilities with good outcomes or be recently hired in facilities with poor outcomes.

Group or committee processes are commonly used in facilities with good outcomes, and most of these facilities had active quality improvement programs. An interesting finding about quality improvement teams emerged from the data from facilities in Group 3B (those poor at selection and improved at observation). This subgroup had a remarkably high number of facilities with active quality improvement programs, compared with almost none in Group 3A (those poor at selection and observation). It may be that the way these facilities were improving their quality was by developing and using an active quality improvement process.

Basics of Care Differences

There were major differences in the processes of care for what can be described as the ''basics of care'' in facilities with good outcomes, compared with those in facilities with poor resident outcomes. Staff in the facilities with good resident outcomes were observed doing key care delivery processes for ambulation, nutrition and hydration, and toileting and bowel regularity; for preventing skin breakdown; and for managing pain.

Staff in the facilities with good resident outcomes could discuss with the nurse observer what the plan of care was for residents and what the care *should* be for each resident, and they were observed *actually doing* the care. This was in stark contrast to the staff in facilities with poor resident outcomes. In facilities with poor outcomes, staff could relate what *should* be done, but they were *not* observed actually doing the care. Furthermore, it was common to find a ''disconnect'' in the reports from different supervision layers of the organization about how the care was being done. For example, the administrator would tell the nurse observer that all residents in the facility were toileted on an individualized plan; the director of nursing would claim that most residents were successfully toileted; the charge nurse would explain that some residents on her unit were toileted; and the NA would explain that they ''check and change the incontinence briefs as needed throughout the day.''

A common care process observed in facilities with good resident outcomes was the staff's use of assessment processes for risk or for decision making about care. Fall risk and skin breakdown risk assessments were common, as was restraint assessment before the initiation or continued use of a restraint using a group or committee process. An assessment process that included *follow-up* by a RN was another key care process for residents with weight loss. Assessment of causes for incontinence was frequently observed in facilities with good resident outcomes, as was assessment of pain, in some cases by use of assessment instruments.

Fundamental basics of care observed were ambulation, nutrition, and hydration. Staff were observed encouraging and *actually doing* ambulation with residents in facilities with good outcomes, and staff were doing several things to correct or prevent weight loss. These included, for example, serving good appealing food, serving food with the plate directly on the table in front of the resident (not on a tray), using restaurant-style serving methods (including choice and presentation), using tables

and chairs of the correct height so residents could easily reach their food and drinks, and using adaptive devices to help residents eat more independently. A key finding was that in facilities with good resident outcomes, staff helped residents eat, and those who needed to be fed were helped with a *ratio of one or two residents per staff*. In facilities with poor outcomes, staff fed more than two residents at a time, and, in many cases, *more than five or six at a time*. It appears that staff in facilities with good resident outcomes organized their work so that more staff would be available to assist with meals and to make sure that residents who can use adaptive devices to help them eat actually would get devices to use at every meal.

In facilities with good outcomes, there were fewer residents with tube feedings. It may be that the better food, dining processes, and RN follow-up on weight loss resulted in fewer situations where families and staff saw a need for tube feeding. In facilities with poor outcomes, field notes also indicated there were problems with advance directives not being followed or solicited before situations occurred that resulted in tube-feeding placements. Hydration was emphasized in facilities with good resident outcomes, and these facilities had fewer problems with dehydration. Residents had fluids readily accessible and were encouraged to drink. In contrast, in facilities with poor resident outcomes, fluids were on the table at mealtimes but many residents were unable to reach them or to independently use the type of glass or cup provided. In many cases, staff seemed not to notice and did not assist residents who appeared to need assistance to drink.

In facilities with good outcomes, residents were toileted frequently and routinely. Staff not only *reported* that they toileted residents, they were *observed* toileting residents. Residents in facilities with good outcomes rarely experienced problems with impactions. Both good and poor groups had care processes to monitor bowel function and had routine medications or dietary aids to assist with bowel function. However, fluids were not readily accessible and encouraged in facilities with poor outcomes and ambulation was not emphasized, which may have influenced developing impactions in those facilities.

Developing pressure ulcers within the facilities with good outcomes was an infrequent event; the rate of occurrence of facility-acquired pressure ulcers was less than one per facility as recorded by the nurse observer. After differences in facility size between the groups were accounted for, facilities with poor outcomes have several times more acquired pressure ulcers than facilities with good outcomes. Differences in acquired pressure ulcer occurrence may be related to the admission skin risk assessment processes that are in place in most facilities with good outcomes. Differences are also likely related to the emphasis on the basics of care, such as toileting, ambulation, better meals, fluid access, and better hygiene, in facilities with good resident outcomes.

Similarities in Care Delivery Shared by Facilities

Some processes of care are similar for both facilities with good or poor resident outcomes. For example, some dining practices are common, such as placing fluids on the table at mealtimes, providing cues to eat and drink at mealtime, having fluids available with activities, and making snacks available. Weight and bowel monitoring practices are common in both groups. Both have a registered dietician follow up on weight loss and both have dietary options for residents to assist with bowel function. However, it is likely that these care processes are necessary but not sufficient to improve resident outcomes for dehydration, weight loss, or impactions.

Other observed similarities were in the use of restraints and complaints about staffing. Physical restraints with lap-buddies or belts, geri-chairs, and side rails were commonly seen in all facilities in the study, although a few facilities claimed to be "restraint free." Staff reported the devices were "enablers," but residents did not appear to be able to release the devices on their own. The same result was identified for Haloperidol, a psychotropic drug often used as a chemical restraint; it was commonly used across all groups in the study. Complaints of staffing problems and reports of staff retention or turnover problems were a strong common thread across the groups of facilities. The severity of the staffing problem varied somewhat from facility to facility, but all facilities identified this as a concern.

Regulatory and statutory requirements seem to be related to these similarities across the groups. These requirements may be prescribing minimum standards needed for some fundamental aspects of care; however, it appears they are not sufficient as guides for clinical practices to achieve good resident outcomes.

Theoretical Model Derived From Findings

As a way to understand better the data and implications of this field study about care processes related to resident outcomes, the qualitative data and results were carefully reviewed and a theoretical model emerged. Figure 1 displays the Theoretical Model of Organizational Attributes of Nursing Facilities Achieving Good Resident Outcomes.

Consistent nursing and administrative leadership are paramount in the model. Nursing leadership is needed to put the other components of the model in place and ensure that processes of care are actually being done for the residents. Administrative leadership sets the stage and expectations of what will be done for the residents and staff. There is a team and

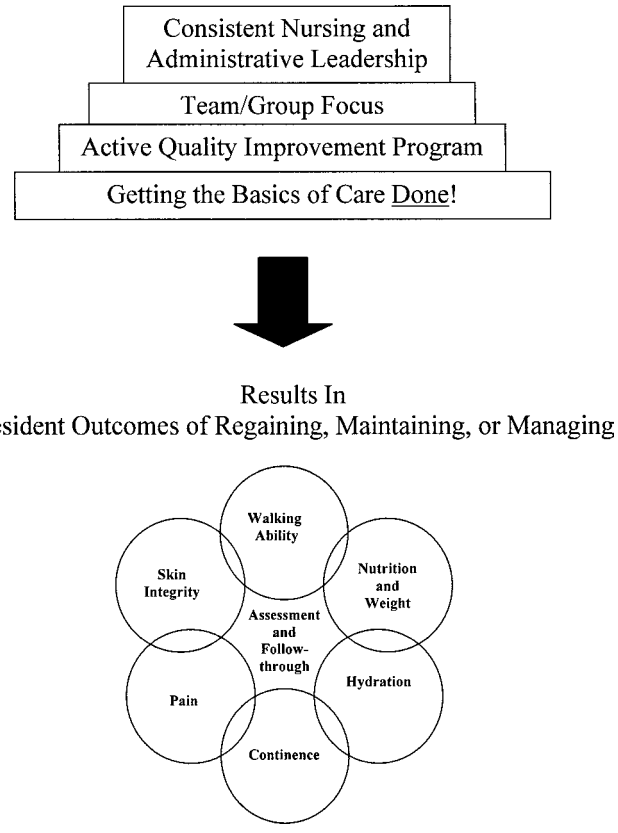

Figure 1. Theoretical model of organizational attributes of nursing facilities achieving good resident outcomes.

group process focus on getting decisions made and being sure processes of care are in place that will ensure the basics of care are done. The group process is also necessary for an active quality improvement program, the next component of the model. These first three components are essential to ensure that the fourth is a primary focus of the staff: getting the basics of care *done*. The basics of care are ambulation, nutrition and hydration; toileting and bowel regularity; preventing skin breakdown; and managing pain. If the four components are successfully implemented in the facility, they result in resident outcomes of regaining, maintaining, or managing walking ability, nutrition and weight, hydration, continence, skin integrity, and pain management. As the model illustrates, the resident outcomes are linked with each other; for example, walking ability affects appetite, skin integrity, continence, and others. An important feature in the model is the assessment of the basics of care and continual follow through by licensed nurses and the administrator to see that the basics of care are done and resident outcomes are achieved.

Discussion

There are key processes of care that facilities use to achieve good resident outcomes. This study's qualitative analysis revealed basics of care and processes surrounding each that are essential for staff to accomplish consistently: helping residents with ambulation, nutrition and hydration, toileting and bowel regularity; preventing skin breakdown; and managing pain. The analysis also revealed there are necessary organizational attributes that must be in place in order for those basics of care to be accomplished: consistent nursing and administrative leadership, the use of team and group processes, and an active quality improvement program.

The findings suggest that delivering good quality care may not result in higher costs. Trends in total costs and total direct care costs from this study of 92 randomly selected nursing facilities were confirmed in a post hoc statewide analysis of cost data. This is consistent with findings from other research suggesting there are nursing homes in which higher quality is associated with lower costs (Mukamel & Spector, 2000). Clearly, management of financial resources appears related to quality in a way that emphasizing quality will not only improve care but control costs.

Although costs were different across the groups of facilities with good, average, or poor resident outcomes, staff mix and staffing levels were virtually the same. This result is surprising because there are studies confirming that greater RN presence in the nursing home improves quality of care and improves outcomes of function, discharge to home, and mortality of residents (Anderson et al., 1998; Bliesmer et al., 1998; Harrington et al., 2000; Munroe, 1990; Spector & Takada, 1991). Furthermore, a recent GAO analysis indicated quality of care is more likely related to staffing than expenditures (GAO, June 2002). The lack of statistical significance in our study may be related to the very similar levels of staffing and staff mix used in the facilities in the sample, so that differences in hours per resident day are too small to detect. This similarity in staffing levels and staff mix has been reported in other staffing studies. For example, Harrington and colleagues (2000) found that staffing hours alone predicted less than 1% of the total variance in survey citations; when staffing was combined with resident and facility characteristics, the combination became a significant predictor of total citations, explaining 21% of the variance. Similarly, Bliesmer and colleagues (1998) found mixed results in their study investigating the relationship between staffing and resident outcomes.

The source of differences in costs remains uncertain. Because wage rates and staffing hours per resident day are nearly identical, yet direct patient care costs and total costs are higher in poor quality facilities, it appears that the additional costs are not related to significantly higher wages or hours of care. Perhaps staff retention and the high costs associated with high turnover can account for these differences. Turnover is a significant problem in nursing homes, with some studies finding more than 100% turnover

of nursing assistant staff and nearly 70% among licensed staff (Munroe, 1990; Serow, Cowart, Chen, & Speake, 1993). However, other studies reported lower rates of 23% on average and as high as 75% (Banaszak-Holl & Hines, 1996; Remsburg, Armacost, & Bennett, 1999). Costs of turnover of nursing staff in nursing homes are substantial. For example, Pillemer (1996) estimated that it costs $4,000 to replace a NA. As Straker and Atchley (1999) showed, net savings associated with reducing turnover can be significant, even if it means increasing hourly pay rates or providing health insurance coverage.

Lower costs in good-outcome facilities may also be explained by their more effective care processes as revealed in the qualitative analysis. We observed care processes that both supported and reinforced effective and consistent actions by staff focused on basics of care such as walking with residents, helping them eat and drink, helping them to the bathroom regularly, helping them bathe, and helping them manage pain. Accomplishing the basics of care such as helping with toileting, walking, eating, and drinking may lower costs of incontinence supplies, other supplies, and expensive food supplements. Maintaining or regaining walking ability is likely to reduce the demand for multiple staff to assist individual residents. From what we observed, direct care staff and leadership were committed to excellent care. Findings showed that the connection of consistent leadership, effectively using group or team processes, and quality improvement programs enable the staff to focus and consistently accomplish the basics of care. There may be efficiencies gained from this team and quality focus that result in cost savings.

It is likely that consistent direct care staff assignments are key to implementing systems of care such as toileting, bathing, and helping residents eat and drink. Consistent assignment is promoted by the Eden Alternative (Barba, Tesh, & Courts, 2002; Drew & Brooke, 1999; Thomas, 1992) and other researchers who underscore the importance of staff knowing individual needs and resident preferences, and this is possible when staff are routinely assigned to the same group of residents (Eaton, 2000; Kane et al., 1997). The finding in this study that smaller facilities were more likely to have good resident outcomes may relate to consistent staff assignment, or that in a small facility of 60 beds, it is possible for the staff to know all of the residents and families. The size of the facility also may promote the use of group and team processes to accomplish the work. Leaders in large facilities may want to consider ways to create smaller ''nursing homes'' within their facility, decentralizing their staff by permanently assigning them to these smaller areas and creating smaller work groups.

Another noteworthy finding is the frequent instability of MDS QIs as measures to classify facilities according to quality of care. At the study's outset, MDS data were limited, as statewide electronic data submission did not begin until a year after the study was implemented. An assumption we made about relative stability of the QIs was incorrect, because a post hoc analysis revealed only 45% of the facilities in the state remained classified into the same outcome group using two consecutive 6 months of MDS data. Apparently, our classification method was more subject to alteration by changes in individual QI scores than the percentile ranking approach used by Karon, Sainfort, and Zimmerman (1999). They found high correlations between three consecutive quarters of MDS QI score rankings using 1996 MDS data from two states ($n = 512$). As we did in our post hoc statewide analysis, future studies using our more conservative classification of facilities should examine consecutive 6 months of data to check for stability and require that facilities be consistently classified in their outcome groups for at least two consecutive 6-month periods before classifying into outcome groups. An alternative explanation for the apparent instability in our classification method using MDS QIs may be continuous resident turnover within facilities. With the population continually changing, resident needs and outcomes are likely to shift. It remains unclear if quality fluctuates rapidly in nursing homes, if our classification method using thresholds is too stringent so that small changes in scores result in classifying into a different group, or if there is something else affecting the measures.

Because this study was limited to one state, future research should examine similar data in other regions of the country. The limitations of using existing QI measures and considering classification of outcomes based on facilities with predominance of good, average, or poor scores on individual QIs should also not be minimized. There is no question that overall classification of nursing homes in relation to QI outcomes remains an evolving science. A further limitation was the small groups that resulted when we discovered that facility outcome classification drifts between selection and observation. However, among those nursing homes with stable classifications (Groups 1A, 2A, and 3A), cost differences and staffing similarities are apparent, as are their observed differences in processes of care.

The use of multiple methods proved successful in this study. Beginning with a statewide quantitative analysis of resident outcomes, classifying nursing facilities according to their outcome status, randomly selecting from each of the classification groups, using participant observation methods (with the observer blind to the outcome group) to identify what the staff was actually doing in the facilities, and qualitatively analyzing the observation data revealed attributes and clinical practices of nursing homes that affect resident outcomes. With the understanding gained from this study, our next step is to design clinical interventions to assist facilities to improve their care processes by building systems that

reinforce doing the basics of care consistently. The likelihood of success of the clinical interventions can be markedly improved by designing them within the context of the organizational attributes discovered in this study, as well as with an understanding of the cost and staffing implications of delivering good quality care. Findings related to cost and staffing analyses challenge the views of those who claim that good quality care will always cost more. It seems more likely that good quality care may not cost more than poor care and there is some evidence that it may actually cost less.

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