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A study in nursing home effectiveness in Texas

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A STUDY IN NURSING HOME EFFECTIVENESS IN TEXAS

By

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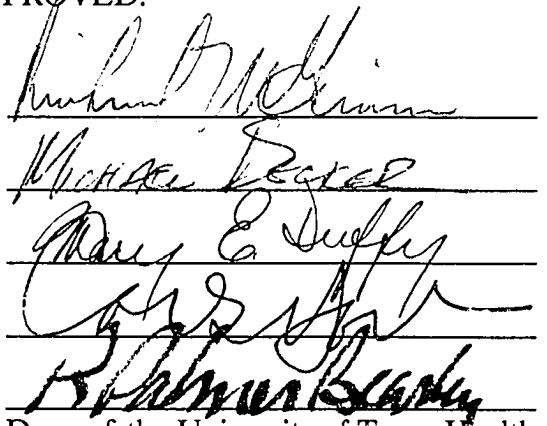
APPROVED:



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This exploratory study was conducted to examine the relationship between nursing home organizational variables and variations in financial efficiency and effectiveness in Texas nursing homes. Efficiency was defined in terms of nursing home profit, contribution margin, and administrative costs. Effectiveness was defined as the level of the quality of care measured by Texas Department of Health annual surveys of Medicaid certified facilities.

A sample of 318 intermediate care facilities was selected from a population of 1,026 Texas nursing homes operating in 1987. Location was not found to be related to nursing home effectiveness. Nursing home ownership was positively related to financial efficiency. A moderate amount of quality of care variation was explained by examining nursing

home size, employee turnover rate, labor hours per patient day and occupancy rate.

The number of labor hours per patient day and employee turnover rate were significantly related negatively to both measures of profitability and quality of care.

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Chapter 1

INTRODUCTION

Background

The provision of care and its related costs for the elderly population will be a problem that will affect most Americans during the next two decades. Paying for long term care for an aging population will become increasingly troublesome in large part because the elderly are the most extensive users of health services.

Nursing Home Utilization

Nursing home care is of growing importance as the population ages. In 1987, 29.8 million Americans were age 65 and older--about 12% of the U.S. population. The number of Americans age 65 and older in the year 2020 is estimated to be about 50 million--about 20% (OMB Watch, 1990). The old-old age group consisting of persons 85 and over is the fastest growing segment of the population. The growth of this age group is especially significant as this cohort has the highest use rate (45%) of nursing home services (Schneider, 1990).

Demand for nursing facilities has grown faster than the population. Two reasons for this are the aging of the population and accelerated hospital discharges for elderly. The rising severity of illness among nursing home residents is expected to continue. This is coupled with

an increasing average length of stay from 2.6 years in 1977 to 2.9 years in 1985 (NCHS, 1989).

In 1990, the number of nursing home facilities in this country exceeded 17,000. At present, there are 1049 nursing homes in Texas. Nursing home demand projections show a growth in demand for nursing homes of 17% from 1990 to the year 2010 (Porter, 1991). It is estimated that 81 new beds must be added every day during this time to meet the growing demand for beds. Presently, there are over 1.5 million residents in nursing homes in the United States. Industry analysts estimate that as many as 80,000 to 160,000 new nursing home beds will be needed annually to meet the needs of the graying population in this country (Rosen, 1990). A shortage of nursing home beds is anticipated.

Nursing Home Costs

Nursing home costs have grown faster than any other type of health care costs during the last 25 years. Expenditures in 1990 amounted to over $65 billion (Leiken, 1991). Nursing home care is expensive averaging over $30,000 a year per resident in 1990. Nursing home charges increased 20% from 1988 to 1990. Medicaid covers costs for approximately 55% of all residents in nursing homes (Marion, 1991). The nursing home industry is dominated by for-profit organizations (73.6%). For-profit nursing homes accounted for over 70% of nursing home beds in 1990 (Marion, 1991).

Quality of Care

The nursing home industry has been the target of major state and federal regulations aimed at monitoring and improving the care rendered to the aged. Government regulation of nursing homes is ineffective in preventing substandard nursing homes to continue in operation. The inability of the current regulatory system to force substandard facilities to improve their care prompted the study of nursing home care conducted by the Institute of Medicine and published in 1986 (Institute of Medicine, 1986).

Texas has one of the largest nursing home networks in the country with 1,090 licensed nursing homes that care for 85,500 residents (Stancill, 1990). Over 64% of the Texas nursing home residents are supported by Medicaid. Medicaid paid over $677 million to Texas nursing homes in 1989 (Stancill, 1990).

Need for Study

Uncontrolled increases in health care costs offer strong support for the study of nursing home performance. Although there is an abundance of literature available describing the failure of nursing homes to perform effectively in providing quality of care to residents (Institute of Medicine, 1986), there is little research reported on the organizational factors which influence the effectiveness of nursing home management in providing efficient and high quality care. Considerable work is needed to develop reliable and

valid measures of the structural variables that administrators can manipulate to increase effectiveness of nursing homes.

Regulatory and reimbursement policies have been developed on the assumption that a trade-off exists between the quality of health care and cost control. Current instruments available to perform quality assessment in nursing homes cannot answer questions about the organizational factors that produce high quality service. It is not clear what optimal level of resources or economies leave residents safe and satisfied, and which result in avoiding poor resident care outcomes.

New instruments and perspectives on the optimal use of resources can be developed by investigating the relationship that may exist between the distribution and organization of resources used for resident care and the conditions found in nursing homes. Models for assessing quality-cost tradeoffs in nursing homes are needed, especially in the areas of nurse staffing and personnel training decisions.

Monetary cost and quality are interrelated. In the nursing home industry, research is needed which establishes linkage between resource use and resident outcomes to enable decision makers to understand the relationship between costs of care and quality of care. Texas ranks 47th among the states in Medicaid reimbursement rates to nursing homes. The

low rates have been cited as a reason for poor care in Texas nursing homes (Stancill, 1990).

Two major factors have been shown to affect the quality of care in nursing homes. These are the number and quality of nursing staff in relation to the facility's requirements (Institute of Medicine, 1986). Assigning staff among alternate forms of care that differ in costs requires knowledge about expected benefits from those forms of care. Knowing when to require more care demands understanding of the relationship between marginal costs and returns to care.

Cost control efforts have exacerbated problems of quality of care in nursing homes. Pressure to reduce costs poses a threat to the quality of care in nursing homes. Although there is recognition among administrators and industry regulators that cost and quality are related, there is little research available to describe with any precision the nature of the relationship. Cost is easily defined and routinely measured. However, there is limited agreement on what constitutes quality, and even less agreement on how to measure it.

A crucial determinant of cost efficiency in this industry is the management of human resources. Labor costs exceed 60% of revenues in nursing homes. Texas nursing homes have experienced a 260% turnover rate among personnel in nursing homes (Stancill, 1990).

As the nursing home industry continues to undergo drastic changes in the delivery of its services, there will remain a need to examine the effectiveness of these services and their relationship to the quality of care delivered and find new methods by which to measure quality.

Costs of care for an aging population will continue to increase, especially for those over age 85. More efficient use of resources in nursing home services without impaired quality of care seems an imperative. Competition, regulation of costs, resource constraints, revenue constraints, and new regulations are substantially changing the way health care is delivered in nursing homes.

PURPOSE

The purpose of this study was to determine which structural characteristics in nursing homes were important in explaining variability in nursing home effectiveness. The study describes the interrelationships that exist between selected structural characteristics of nursing homes and nursing home performance as measured by selected outcome variables describing efficiency and effectiveness in the delivery of nursing home services.

The study attempted to answer the following questions:

1. To what extent do organizational characteristics explain variability in financial efficiency in nursing homes?

2. To what extent do organizational characteristics explain variability in quality of care in nursing homes?

These questions were answered by analyzing a variety of measures of organizational performance. These measures were then compared with identified structural variables to determine if different methods of organization are associated with nursing home's effectiveness.

Chapter 2

LITERATURE REVIEW

Any approach to measuring management performance in a health care setting must be broad enough to cover both measures of efficiency and quality of the care delivered. Performance measures for nursing homes must be analyzed within the context of those distinctive factors that shape and influence managerial decision-making in nursing homes.

This section reviews this literature on pertinent management theory as it relates to the organization's environment, structure, and managerial effectiveness. Health care management theory will be reviewed for appropriate coroliaries to nursing home management. Finally, literature specific to measures of nursing home effectiveness will be reviewed to determine an appropriate framework for analyzing nursing home performance.

Management Theory

Concepts formulated by management theorists continue to apply in organization management. Principles of management such as unity of command, span of control, and line versus staff, provide appropriate methods of analyzing and planning within the organization. However, more recently developed theoretical concepts may better reflect the complexity of present day organizations-- especially health care organizations.

Environment

Early management theorists did not regard the organization environment as affecting the organization. Beginning with Eric Trist (Pugh, 1984), theorists began to adopt a more open system view of the organization. With this view, organizations were thought to have dynamic continuous interchanges across the boundaries with their environments. Management's primary task was to relate the system to its environment (Pugh, 1987).

Organizations were described as having a symbiotic relationship with the environment (Katz and Kahn, 1966). Others described the organization as an input-output system that functioned by importing, transforming, and exporting energy to and from larger systems. The environment and the organization are intricately intertwined. When viewed as an open system, the organization is perceived as interacting regularly with external forces in its environment, and both affecting and affected by this interaction (Simon, 1964).

Every organization must operate within an environment. Environmental forces affect the structure of this organization. Lawrence and Lorsch (1969) understood the organization as an open system whose purpose was to find solutions to environmental problems as well as to satisfy the needs of its members.

Distinctions were drawn between the external and internal environment in the organization and their respective influence on the

structure of the organization (Pugh, 1985). Management theorists have defined the environment along several dimensions. The organizational environment is described by Pfeiffer and Goodstein (1988) in two parts: (1) the general economic, social, and political environment; and (2) the organization specific environment. Both of these represent external forces which impact the organization.

Others, among them Tom Burns, describe the environment as a force that influenced the managerial systems and structure of the organization (Pugh, 1985). The organizational component referred to as the environment is cited in the literature along with climate, constraints, and milieu, as the contextual variables which enclose and interact with organization structure.

Organizations are viewed as linked to their environments. They are linked by social-legal types of apparatus that define and control the nature and limits of the relationship as well as customer-supplier relationships and competitive relationships (Lock, 1986). Whether one is describing public organizations, private organizations, small or large organizations, organizations must transact with elements in their environment to acquire needed resources (Burns and Stalker, 1961).

Modern day theorists perceive the environment as a concrete reality, a determinant of organizational life, a consequence of organizational action, and as an influence on the structure of the organization. There is

widespread agreement that every organization must operate within an environment which exerts a significant influence on organization design. Although the distinction drawn between organization and environment creates a division between the world inside and outside the organization, the reality is the distinction may not be so real (Smircich, 1982).

Structure

The organizational characteristic referred to as structure was perceived by theorists as a tool for achieving organizational goals, a product of technology, and an outcome of political processes as well as a result of the influence of the environment (Pugh, 1984).

Max Weber, Robert Michels, and Frederick Taylor viewed the structure of the organization as a mechanism for controlling organization behavior (Pugh, 1985).

Henri Fayol believed that organization structure was derived from goals and the planning process of the organization (Pugh, 1985). Pugh's main area of research was the organizational structure. In his view, organization context and strategic management choices determined the structure of the organization. Organization context consisted of its origin and history, ownership and control, purpose, technology, size and interdependence (Pugh, 1963).

Pugh (1963) and others have described these as environmental demand characteristics and have classified them as contextual variables.

These include organizational size, control, ownership, technology, and location. The contextual variables are believed to have primary influence on the organization's structure. Philip Selznick believes organization performance should be focused on adapting to changes in the environment by adapting the structure of the organization to fit the environment (Selznick, 1949). Morgan has written that effective organizations are those that achieve a good fit between their organization structure and environments (Morgan, 1989).

Lawrence and Lorsch (1969) used the contingency theory approach to relate environmental conditions to the internal structures and processes. Organizations in which the environment and structure are well matched are regarded as having the potential for the highest performance. This performance is contingent on the external function through position, competence, and information. Management's role is perceived as monitoring the environment and preparing the organization for adaptation. Contingency theory supports the requirement for differences in management's approach to structure and performance based on characteristics of the environment.

Presently, organizational structure generally refers to the pattern of jobs and grouping of jobs in the organization that serve to control or distinguish its parts. It is the configuration of activities within the organization (Gibson, 1985). The role of management is to shape the organization through structure and behavior (March, 1965). Internal structure must change to

accommodate the environment (Selznick, 1949). Organizations in which environment and structure are well matched are regarded as high performing organizations (Lawrence, 1969).

Effectiveness

Organizational effectiveness is the degree to which an organization meets its stated goals. These goals are typically described in terms of profits, efficiency or productivity. Managerial performance has been described as goal attainment, survival, adaptation, as a consequence and determinant of structure.

Earlier theorists described managerial performance as effective if it was efficient (Taylor, 1947). Chester Barnard (1971) felt that organization survival was more important than efficiency. Elton Mayo (1945) measured organizational performance by effectiveness which he described as goal attainment plus efficiency.

Oliver Williamson (1981) measured organizational performance by efficiency rather than profit maximization. Pfeffer and Salanick (1978) believed management's role was to manage the environment to assist the organization in adjusting given its context. Effectiveness was measured by how well the organization met external demands.

Causes of organizational effectiveness have been attributed to such organizational characteristics as environment, technology, strategic choices,

structure, and processes (John Child, 1975). Contingency management theorists have defined effectiveness as the accomplishment of explicit or implicit goals (Kast, 1985). A subset of effectiveness is efficiency which refers to the relationship of output to input.

Pfeffer and Salanick (1978) described the measurement of organizational performance as its ability to meet external demand and to survive in the context of its environment. Performance of the organization was described as goal attainment, survival, adaptation, a consequence of structure as well as a determinant of structure.

Goal attainment is often called effectiveness or efficiency. Performance measures should consider the environmental forces which impacted the organization and influenced managerial decision-making in structuring the organization to achieve adaptive capability.

Health Service Management

Aspects of health service management examined for this review were environment, structure, and measures of effectiveness. Measures of effectiveness will be divided into two subcomponents--measures of efficiency and measures of quality of care delivered.

Environment and Structure

Lawrence and Lorsch (1969) as well as Neuhauser (1972) and Grimes (1972) proposed the contingency theory approach to health care

management. Contingency theory relates environmental conditions to the organization's internal structures and processes. Organizations in which the environment and structure are well matched are regarded as having the potential for the highest performance. This performance is contingent on the external function through position, competence, and information. Management's role is perceived as monitoring the environment and preparing the organization for adaptation.

The contingency approach to organizational theory holds that the best way to organize is dependent on the nature of such underlying factors as the strategy, environment, and technology. The contingency approach to organizational design dictates that different organization structures facilitate different purposes.

Health service organizations such as hospitals and nursing homes have become more complex and enveloped in larger organizational relationships in the form of other corporate counterparts and other organizations such as federal and state agencies (Shortell, 1976). The increasing involvement of large corporations as well as the government as both payers and review bodies have been major forces in reshaping the delivery of health services. The environment in which health service organizations must operate has become increasingly complex and subject to rapid change.

The health care environment is described by Grimes (1972) as having three distinct aspects: external environment, the employee environment, and the internal attributes. Management's role is to select the structure needed to accomplish or objectives of the organization. Each external force requires an internal organizational response by management (Daft, 1983).

Organizational environments within the health care industry are highly turbulent with a high degree of resource scarcity, uncertainty, and change (Shortell, 1976). Contingency theorists propose that effectiveness of an organization is a function of the fit between management strategies and structures and the technology and environment of the organization. This is referred to as strategic coalignment--the internal consistency among key strategic choices and critical contingencies posed by environmental contexts (Venkatraman, 1990).

Effective strategic decision-making occurs when managers fit structure and strategy to the environment and technology of the organization. Organizational structures are "patterned arrangement of positions or jobs" (Azumi & Hage, 1972). Thus, structure of an organization is dependent on a variety of factors within and outside the organization.

The organization should be structured in ways that enable it to be efficient and yet flexible and adaptive. Structure represents the tools for

achieving organizational goals. Researchers who contributed to the contingency design theory have suggested that a number of variables influence design decisions. Among these variables are the size of organization, form of ownership, and technology.

In his framework for analyzing the impact of the external environment on internal structure and performance of health service organizations, Shortell (1976) suggested analyzing the following variables: environment, goals, technology, and size. He suggested that these contextual variables are not under management's control. These contextual or exogenous variables are environment, goals, technology and size.

Neuhauser (1971) concluded that an important variable in determining structure and authority in the health service organization is the amount of professionalism and specialization of skills. The behavior of the organization and the structure of the organization are influenced by individuals in the organization and their level of professionalism.

Performance

J. Thompson (1967) used the framework of "coalignment between the organization design and the external environment". Efficiency and quality of care attained in a health service organization depends on the extent the organization's structure is matched with the environment. Shortell (1976) suggested that work specification procedures, structure, reward systems, and

coordination and control mechanisms are endogenous variables and under management's control. For health service organizations, he suggested that performance variables include efficiency and quality of care. Georgopoulos(1976) described health care organizational performance in terms of both clinical effectiveness and efficiency of costs of care. The hospital's performance is a consequence of the organization's structure according to Flood and Scott (1987). Structural features are viewed as partially determined by the environment within which the hospital must operate. R. Grimes and S. Mosely (1976) formulated an index to measure administrative effectiveness of hospitals. The index included Donabedian's (1980) patient care variables as well as administrative variables to be measured in determining hospital performance.

Nursing Homes

Organizational theory, applicable to the management of nursing homes, is not specifically identified in the literature. Few writers have attempted to relate general management theory to nursing home management. Research on nursing home performance typically has been based on the relationship between ownership, costs of care, and quality of care.

The contextual variables of ownership, control, size, technology, and location cited earlier by Pugh (1963) are appropriate as measures of environmental demand when examining the performance of nursing homes.

Previous studies have examined the performance of nursing homes based on differences in these contextural variables.

A useful way to review the influence of the environment on nursing home performance is to examine the three aspects mentioned earlier by Grimes (1972). Grimes divides the health care environment into the three distinct layers: external environment, employee environment, and internal attributes. For purposes of this review, the key external environmental influences will include the contextual variables of nursing home ownership and size.

Nursing Home Ownership

Ownership has been used in studies to measure differences in costs of care as well as the quality of care delivered. Previous studies have examined differences in nursing homes as they related to the contextual characteristic of ownership. One study by Winn (1974) examined the relationship between type of ownership (nonprofit versus proprietary) and the cost of patient care. A matched sample of 24 proprietary and nonprofit nursing homes in the state of Washington were surveyed to compare the costs and quantity and staffing types between the two groups. Although there was no significant difference in nursing costs between the two groups, ownership was significantly related to the total employee time per patient day.

Gottesman and Bourestom (1974) reported results on quality of care in nursing home residents in 1974. The researchers used rating scales, tests, and observation-based measures of quality in nursing home residents. They concluded the highest quality care was noted among residents who were residing in nonprofit homes. No cost analysis was performed in this study.

Arling, Nordquist and Capitman (1987) also studied the interaction effects of nursing home cost and ownership. They found that ownership class was a significant predictor of cost. Not-for-profit nursing homes were found to have costs ranging from $2.50 to $7.00 higher per patient day than for-profit nursing homes. Cost was not found to be significantly affected by patient severity in these facilities. Researchers suggested that the results may be symptomatic of inefficiencies in operations and/or reflect multiple standards of care.

Another study was performed by Shaughnessy, Schlenker, and Yslas (1983), who examined the relationships between case mix, quality, and cost between freestanding and hospital-based nursing homes in Colorado. Cost, case mix, and quality data was analyzed for 1980 for 78 Colorado nursing homes and 1843 patients. Higher quality of care was associated with higher cost, especially higher nursing costs. Results suggest that case mix and quality differences are associated with a significant proportion of cost differences between the facilities.

The contextual variable of size as well as ownership was examined in a cost analysis of Ohio nursing homes by Caswell and Cleverley (1983). They examined 1532 Medicaid Cost reports for 1976 to determine if the effect of size (economies of scale) and ownership on nursing home costs. Economies of scale were not found important amounting to a difference of less than a $0.20 per patient day between smaller and larger facilities. Proprietary facilities were consistently less costly than nonproprietary facilities. The specific cost difference was in the direct patient care cost component. However, this study did not attempt to correlate these differences with quality of care measures.

Cost differences between nursing homes based on ownership type are well documented in the literature. For-profit nursing homes have a history of lower costs and higher economic efficiency. What has not been clearly documented is the relationship of these costs to quality of care.

Several studies have attempted to link nursing home patient care costs with quality of care. Linn, Furel, and Linn (1977) studied the relationship between higher professional staff-to-patient ratios to patient outcomes in nursing homes. They studied 1,000 males transferred from hospitals to 40 nursing homes. The study population was classified according to physician expectations of outcome within six months and on the basis of functional status. Nursing homes were measured on their structural variables

every six months. Homes with more RN hours per patient day were associated with lower patient mortality, improved physical functioning, and more discharges to home.

In a model developed to assess the quality-cost tradeoff in nursing homes, Leiken, Saxton, And Silkman (1976) included quality-related considerations that were also sensitive to changes in patient needs, and labor availability. Quality-cost tradeoffs were simulated for ratios for RNs to LVNs and staff to residents. The model was applied to a nursing home in upper state New York. Registered nurses were found to be more cost effective in providing patient care for the specified tasks.

Studies on the linkages between structural measures and the outcome measures of nursing home care have not found strong relationships (Kurkowski, 1981). However, there is substantial research to support the strong influence of structural differences in nursing homes and their influence upon nursing home residents well-being. The influence of registered nurse staffing on the quality of nursing home care was studied by D. Munroe (1990). Data from 455 nursing facilities in California were analyzed. A positive significant relationship was found between nursing home quality and the ratio of RN hours to licensed vocational nursing hours per resident day.

Shaughnessy, Schlenker, Brown, and Yslas (1983) examined nursing home quality of care and its relationship to case mix and Department of

Health survey violations over a three year period in Colorado. The study analyzed data from Medicaid Cost Reports and Department of Health surveys for 157 facilities from 1978 through 1980. Surrogate quality indicators pertained predominantly to the characteristics of the nursing staff and the number of violations found when surveyed by the Department of Health. Facilities with more licensed practical nurses per patient day had fewer violations.

Measures of effectiveness in the performance of nursing homes have related mainly to costs of care and possible linkages of costs to quality of care. Ullman (1985) studied 494 proprietary, nonprofit, and government nursing home facilities in New York State. He examined the relationship between quality and costs. He concluded that capital-intensive aspects of patient care affected costs, however, he concluded that labor-intensive aspects of quality of care did not affect costs.

The attributes of quality in nursing homes differ from the attributes of quality in the acute care setting. These differences stem primarily from the fact that the nursing home is both a residential "home" and a place for medical treatment. The social support services provided by staff, as well as the health care services, provide the structure of the care setting. Care-givers, particularly nurses and nurse's aides, represent a large portion of the social support of nursing home residents. Because many residents in nursing homes

remain for long periods of time, their well-being is profoundly affected by the quality of the caregivers. Measures of performance in the organization's delivery of quality care should take such considerations into account when assessing the environmental influences on residents well being.

Internal Attributes

Presently, 15% of nursing personnel in the nation's nursing homes are registered nurses, 14% are licensed practical nurses, and 71% are nurse's aides. (Institute of Medicine, 1986). Several studies have shown the strength of the relationship between the quality of staff and the quality of care received by residents in nursing homes. Although outcome variables measuring quality of care are not consistent from one study to the other, all incorporate resident's satisfaction as a measure for determining quality of care.

Campbell, Converse, and Rodgers (1976) identified residents' feeling of satisfaction as a major determinant of well-being in nursing homes. Maran's (1975) research indicated the importance of the physical environment in his model of assessing nursing home residents' satisfaction. Environments that fostered personalized care promoted better morale and resident adjustment. A major component of perceived well-being for nursing home residents was the dialogue and interaction with staff.

In a study of institutionalized elderly adults, Langer and Rodin (1976) sought to determine how much of what was perceived as physical, behavioral, and psychological deficits might be environmentally determined. Langer suggested that "environmental factors" either enhanced or eroded a sense of control. In their study, nursing home residents were assigned to two groups. Both groups were matched for socioeconomic, physical, and psychological health status. One group was subjected to control enhancement treatment. Langer and Rodin concluded those nursing staff that encouraged autonomy and responsibility of the residents had a significant effect on residents physical and psychological well-being, with decreased mortality of 50% in the control enhancement group. Seven of the forty-seven residents control enhancement group died over an eighteen month follow-up period, while thirteen of forty-four residents in the comparison group died. Thus, social relationships provided by nursing home staff may erode or contribute to the residents' sense of control, hence their well-being.

In the Quality of Life Nursing Care (QLNC) research and demonstration project during 1985-86, Cox and Kaeser (1986) examined the issues associated with provision of nursing care that promoted quality of life for nursing home residents and tested the effectiveness of selected interventions on resident care. Three nursing homes were used in the study. Two nursing units were matched according to the mix of residents based upon

their level of functioning. One unit in each nursing home served as the experimental unit for purposes of testing interventions, and the second the comparison unit with no intervention. The interventions were centered on maximizing staff accountability for the personalized car of specific residents, which afforded residents a significant increase in the control of their care.

The staff participants included nurses and nurse aides on each study unit. Measurement of staff attitudes and perceptions during this experiment showed that registered and licensed vocational nurses had a significantly more favorable attitude toward resident control than did the nurses aides. The conclusion of the study was that quality of nursing care for nursing home residents depended on many factors. However, resident-centered staff accountability, as well as resident control of choice contributed to a resident's sense of well-being.

Hoelker and Harel's (1978) study aimed at identifying predictors of well-being and survival among residents in a long-term care facility. Fourteen nursing homes were selected and 125 residents completed surveys. Two years after the completion of the survey, a follow-up study was conducted to investigate resident survival and health and functional changes. The results of this study led the researchers to state "primary predictors of personal well-being for this sample of residents in long term care facilities were subjective factors relating to resident perceptions of the facility and staff.

Summary

The attributes of quality in nursing homes differ from the attributes of quality in the acute care setting. These differences stem primarily from the fact that the nursing home is both a residential "home" and a place for medical treatment. The social support services provided by staff, as well as the health care services, provide structure to the care setting. Caregivers, particularly nurse aides, provide a large portion of the social support of nursing home residents. Because many residents reside in nursing homes for long periods of time, their well-being is profoundly affected by the quality of the caregivers.

A review of the literature on the relationships between quality, costs, and ownership types in nursing homes leaves many questions unanswered. Although ownership has been associated with lower costs, there are no definitive studies which show lower costs alone are associated with lower quality. There does not appear to be research reflecting any economies of scale with regard to size of the nursing facility and costs per patient day.

Several studies have shown the strength of the relationship between the quality of staff and the quality of care received by residents in nursing homes. There remains a need to investigate this impact of environmental demand characteristics of nursing homes such as size and location on the structure of the nursing home.

Conceptual Model

This study analyzed nursing home performance in Texas using two measures of effectiveness. One measure involved financial efficiencies and the other measure the quality of care.

Examination of organizational performance involved analyzing a variety of nursing home structural variables and relating these to outcomes in terms of financial performance and patient care performance. In terms of general hypotheses, these may be stated as:

1. Ho: The organizational structure of nursing homes will have no measurable impact on the nursing home financial efficiency.

2. Ho: The organizational structure of nursing homes will have no measurable impact on nursing home quality of care.

The task of this study was to examine the context of nursing homes and its relationship to nursing home structures and performance.

Chapter 3

STUDY DESIGN AND METHODOLOGY

Purpose of The Study

This study investigated the performance of Texas nursing homes and the structural differences among nursing homes which explain variations in nursing home efficiency and effectiveness. It was hypothesized that structural characteristics would have a measurable impact on nursing home performance as measured by efficiency and effectiveness. Environmental demand characteristics such as size, ownership, and location were analyzed as structural variables in this study.

For purposes of this study, nursing home environment components included location--either rural or urban setting; ownership either for-profit or not-for-profit, and nursing home size--the number of licensed beds.

Two comparisons were made. The first involved the financial efficiency of nursing homes. The second involved organizational factors that were associated with nursing home effectiveness in providing a minimum level of quality of care.

Setting

This study was conducted using publicly disclosed data obtained from the Texas Department of Health as well as the Texas Division of the Department of Human Services. The data was limited to the State of Texas

Medicaid certified nursing homes in operation during 1987 which did not contain skilled nursing units.

Population

The population studied consisted of 1026 Medicaid certified Texas nursing homes that filed Medicaid Cost Reports for 1987 and had completed Texas Department of Health survey reports.

Sample

The sample consisted of 381 nursing homes randomly selected from a population of 618 nursing homes without skilled units that contained complete financial data on Medicaid cost reports and Texas Department of Health survey results for 1987.

Instrumentation

Medicaid Cost Reports are submitted annually to the Department of Human Services within each state. These reports are standardized cost reports that categorize the costs of nursing homes operations. The Department of Human Service's Medicaid Cost Reports for the year 1987 were utilized to obtain cost data related to the variables of interest in this study. The data was available on computer tape for use on a mainframe computer. Variables of interest were downloaded from tape to personal computer disks using SPSS-X and SPSS-PC programs. Data was reformatted and labeled for use in statistical analysis.

Reliability of the data from the cost reports is high with approximately 5% of all nursing home cost reports receiving annual audits from the Department of Human Services during any given calendar year. Audited cost reports are reported to accurately reflect actual costs with an average variance of less than 2% (Department of Human Services, 1989). The variances are most commonly related to administrative costs and not to patient care costs.

The Texas Department of Health conducts annual Medicaid surveys to each Medicaid certified facility. The survey instrument is used to determine the quality of patient care and compliance with over 500 Medicaid and Medicare standards, policies, and procedures. A summary document that lists 32 measures of quality indicators is produced in book form each year.

Procedures for Data Collection

All data for Medicaid Cost Reports were obtained directly from the Texas Department of Human Services in Austin. Copies of the summary survey reports conducted by the Texas Department of Health were obtained from the government printing office in Washington, D.C.

Medicaid cost reports were downloaded from data tape to personal computer disks and all variables of interest were sorted by vendor number for each nursing home in the population. Nursing homes were recoded for rural versus urban based on whether or not the nursing home was in a county that

was within a primary or secondary SMSA based on Census Bureau classification.

Data from summary Department of Health survey reports for quality of care measures were entered into a Lotus 1-2-3 spreadsheet and totalled. Data was recoded to develop an index score on deficiencies based on survey results.

Survey report variables were then translated and imported into the SPSS-PC statistical package for analysis. Frequencies and statistics were run on the data from cost reports and survey results including correlations between selected variables.

Study Design and Variables

To describe and analyze organizational factors contributing to nursing home performance, 381 Medicaid certified Texas nursing homes were selected. These 381 nursing facilities contained only intermediate care units.

Nursing home financial effectiveness is measured by the extent to which its outputs accomplish its goals (providing cost effective quality care of its residents). Its efficiency is measured by the relationship between the resources used and the resultant outcomes or outputs. Three separate measures of efficiency are used in this study.

Effectiveness

PROFITABILITY: This refers to the extent to which the nursing home provided services for costs less than their income as reflected on their Medicaid Cost Reports.

EFFICIENCY ONE: Two additional measures of efficiency were analyzed. One measure of efficiency was defined as the percentage of administrative costs over total costs for each facility.

EFFICIENCY TWO: A second measure of efficiency calculated the contribution margin per patient day by subtracting patient care revenue from patient care cost and dividing by the number of patient days for each nursing home.

QUALITY: This variable was formed from the score obtained from summarizing the survey results from the Department of Health. The score would total 32 points if the nursing home met each standard.

The following organizational structural variables were measured and obtained from the Medicaid Cost report for each nursing home.

Organizational Structure

PATIENT CARE LABOR HOURS: Labor hours per patient day were obtained by dividing the total labor hours by the number of patient days for each facility.

LICENSED LABOR HOURS: Labor hours for licensed personnel (R.N. or L.V.N.) per patient day were computed by dividing licensed labor hours by patient days.

EMPLOYEE TURNOVER RATE: Employee turnover rate was computed as the number of staff employed at the beginning of the year divided by number of employees employed at the end of the year.

PAYOR MIX: The payor mix for each nursing home was calculated as the percentage of patient days paid by Medicaid.

OCCUPANCY: The average occupancy rate was calculated from nursing home bed size and number of patient days listed on the costs reports. Actual patient days was divided by the number of beds X 365.

OWNERSHIP: Nine categories of ownership were collapsed into two categories. One was for-profit nursing homes. The second was not-for-profit nursing homes.

LOCATION: Nursing homes were classified as being in urban areas if they were located in a primary or secondary SMSA. Otherwise, the nursing home was considered rural.

SIZE: Nursing home size was determined by the number of licensed beds listed on the cost reports.

Methods of Analysis

1. Descriptive statistics were computed for all variables in the study and examined for marked skewness, outliers, and systematic missing data.
2. All variables which demonstrated marked skewness were normalized using appropriate transformation methods.
3. Internal consistency reliabilities (Cronbach's alphas) were computed on subscales and total scores of the nursing home survey items.
4. Dummy variables were created for all nominal level variables so that they could be used in multivariate analyses.
5. Pearson product moment intercorrelations of all study variables were computed and the resultant matrices examined for singularity and multicollinearity.

The first research question was answered using hierarchical multiple regression analyses. The independent variables of location, size, ownership, patient care labor hours, licensed labor hours, employee turnover rate, payor mix, and occupancy were entered in a stepwise regression. The dependent variable consisted of three separate measures of efficiency.

The second research question was answered using hierarchical multiple regression analyses. The independent variables of location, size, ownership, patient care labor hours, licensed labor hours, employee turnover rate, payor mix, and occupancy were entered in a stepwise regression. The dependent variable was a score on performance indicators for quality of care measured by Department of Health Surveys.

Chapter 4

RESULTS

This chapter is organized the following sections: 1) description of the sample; 2) analysis of the data; 3) additional analysis; and 4) summary.

The objective of the analysis was to provide answers to two questions: 1) to what extent do organizational variables explain variations financial efficiency among nursing homes; and 2) to what extent do organizational variables explain variations quality of care among nursing homes? The nursing home organizational variables used to answer these questions included: ownership based on profit status, location, size, labor mix, payor mix, occupancy rate, employee turnover rate, and labor hours per patient day. The measures of financial efficiency were based on the amount of profit, contribution margin, and administrative costs. A measure of quality of care was based on an performance indicators obtained from the Texas Department of Health Surveys for each nursing home for the year 1987.

Description of the Population

The population was comprised of 619 nursing homes in Texas that were Medicaid certified and contained no skilled units for the year 1987 and had complete Medicaid Cost Reports and Department of Health survey results. The population contained 546 (88%) for-profit nursing homes and 73 (12%) not-for-profit nursing homes. The location of the nursing homes was as follows: 299 (48%) were located in rural settings and 320 (52%) were located

in urban settings. The nursing homes ranged in size from 22 licensed beds to 330 licensed beds.

Description of the Sample

A random sample of 318 nursing homes was selected for analysis. The sample was randomly obtained from the population of 619 Medicaid certified nursing homes which had no skilled units and which contained completed cost reports for 1987 and contained survey results. The sample contained 282 (87%) for-profit nursing homes and 162 (13%) not-for-profit nursing homes. Table 1 reports the descriptive statistics for the population (N=619). Table 2 lists the descriptive statistics of the sample (N=318). A comparison of these two tables shows the sample to be similar to the population.

Descriptive statistics on the continious dependent and independent variables were computed. These variables included: size, profit, employee turnover contribution margin, percentage of administrative costs, labor hours per patient day, licensed labor hours per patient day (labor mix), payor mix, and occupancy rate. These statistics are reported in Table 3.

Analysis of Data

Prior to answering the research questions, the following analyses were undertaken. Pearson product moment correlations among study variables were computed and scatterplots between pairs of variables were examined for the presence of nonlinear relationships and none were found.

The correlation matrix (Table 4 and Table 5) were next examined for the presence of multicollinearity among the predictors. All correlations were below .70, indicating that the variables were not redundant (Tabachnick and Fidell, 1989). A criterion level of $p \leq .05$ was set for both the standardized regression coefficients and for the significance of the r^2 change for explaining the variables in the equation.

Table 1

Frequencies and Percentages
of Selected Descriptive Variables
of Texas Nursing Homes
Without Skilled Units
(N=618)

Variable	Frequency	Percentage
Ownership		
Sole owner	35	5.0
Partnership	29	5.0
LTD Partnership	19	3.2
Corporation	399	64.5
Sub-S Corporation	64	10.4
Nonprofit-religious	31	5.0
Nonprofit-nonreligious	24	3.9
Nonprofit-assn-religious	3	.5
Nonprofit-assn-nonreligious	3	.5
Government-county	2	.3
Government-municipal	2	.3
Government-special district	8	1.3
Location		
Rural	299	48.3
Urban	320	51.7
Total Beds		
Size	22-330	

Table 2

Frequencies and Percentages
of Selected Descriptive Variables
of Texas Nursing Homes
Sample (N=318)

Variable	Frequency	Percentage
Ownership		
Sole owner	22	6.9
Partnership	11	3.5
LTD Partnership	11	3.5
Corporation	197	62.0
Sub-S Corporation	41	6.3
Nonprofit-religious	12	3.7
Nonprofit-nonreligious	14	3.8
Nonprofit-assn-religious	1	.3
Nonprofit-assn-nonreligious	2	.3
Government-county	0	.0
Government-municipal	3	.3
Government-special district	4	6.5
Location		
Rural	345	44.0
Urban	440	56.0
Total Beds		
Size	22-330	

Table 3

Means, Standard Deviation and Ranges of Continious Variables in Study (N=318)

Variable	N	Mean	Std. Dev	Ranges
SIZE	318	96.5	43.6	22 to 330
PROFIT	318	56,354	138,692	-687,796 to 591,326
TURNOVER	315	2.5	1.5	.20 to 9.9
EFFIC	318	.12	.04	.01 to .28
EFFIC2	318	22	3.9	-10.6 to 52.6
LHPTDYS	318	2.3	1.9	1.22 to 28.7
NURRAT	318	.27	.05	.12 to .46
PAYORMIX	318	.62	.57	.01 to .97
OCCUPANCY	318	.82	.90	.37 to .99
QUALITY	318	30.5	1.7	22 to 32

Index to Variable Names:

EFFIC - Percentage of Administrative Costs to Total Costs
EFFIC2 - Patient Care Revenue - Patient Care Cost/Patient Day
PROFIT - Total Revenues Minus Total Costs Before Income Tax
QUALITY - Score on Department of Health Survey
SIZE - Number of Licensed Beds in Nursing Facility
TURNOVER - Employee turnover rate for facility
LHPTDY - Patient Care Labor Hours Per Patient Day
NURRAT - Number of Licensed Labor Hours Per Patient Day
OCCUPANCY - Occupancy Rate of Nursing Facility
PAYORMIX - Pay Mix Based on Percentage of Medicaid Residents

Table 4

Correlation of Independent Variables Used in the Study

(N=315)

Variable	Size	Owner	Locate	Turn over	LHPTDY	NUR	Occup	Payor
Size	1.0							
Owner	-.07	1.0						
Locate	.05	.00	1.0					
Turnover	.23**	.23**	.11	1.0				
Lhptpd	.00	.16*	.08	-.12	1.0			
Nurrat	.03	.08	-.04	.11	.04	1.0		
Occup	-.37**	.24**	.04	-.19	.06	-.20**	1.0	
Payor	.25**	-.20**	.04	-.08	-.09	.09	.46**	1.0

(*=p<.05)
(**=p<,01)

Index to Variable Names:

Size - Number of Licensed Beds in Nursing Facility
Owner - Ownership (1 = profit) (2 = nonprofit)
Locate - Location (0 = rural) (1= urban)
Turnover - Employee Turnover Rate for Facility
Lhptpd - Patient Care Labor Hours Per Patient Day
Nurrat - Number of Licensed Hours Per Patient Day
Occup - Occupancy Rate of Nursing Facility
Payor - Payor Mix Based on Percentage of Medicaid Residents

Table 5

Correlation of Dependent and Independent Variables
(N=315)

Variable	Effic	Effic2	Profit	Quality
Effic	1.00			
Effic2	.32**	1.00		
Profit	.14*	.45**	1.00	
Quality	-.03	.05	.02	1.00
Size	.04	.29**	.07	-.09
Owner	-.30**	-.08	-.12	.17*
Locate	-.07	.06	.02	.01
Turnover	.23**	.16*	.07	-.08
Lhptdy	-.15*	.02	-.01	.07
Nur	.09	.02	-.14*	-.11
Occup	-.13*	-.08	.29**	.16*
Payor	.14*	-.31**	.09	.00

Index to Variable Names: (*=p<.05) (**=p<,01)

Effic	-Percentage of Administrative Costs to Total Costs
Effic2	-Patient Care Revenue - Patient Care Cost/Patient Day
Profit	-Total Revenues Minus Total Costs Before Income Tax
Quality	-Score on Department of Health Survey
Size	-Number of Licensed Beds in Nursing Facility
Owner	-Ownership (1 = profit) (2 = nonprofit)
Locate	-Location (0 = rural) (1= urban)
Turnover	-Employee Turnover Rate for Facility
Lhptpd	-Patient Care Labor Hours Per Patient Day
Nurrat	-Number of Licensed Hours Per Patient Day
Occup	-Occupancy Rate of Nursing Facility
Payor	-Payor Mix Based on Percentage of Medicaid Residents

Research Question Number One

Stepwise multiple regression was used to answer research question number 1: To what extent do organizational variables explain variations financial efficiency among nursing homes? The organizational variables in this analysis were: ownership based on profit status, location, size, labormix, payormix, occupancy rate, employee turnover rate, and labor hours per patient day. Three measures of financial efficiency - profit, contribution margin, administrative costs, were used and three separate regression analyses were computed. The results of these analyses are reported in Table 6, Table 7 and Table 8.

Table 6

Summary Table of Stepwise Multiple Regression
Contribution Margin
(N= 315)

Step	Variable Entered	Multiple R	R^2	F	P	Beta	Adj R^2
1	Payormix	.31	.09	32.8	.000	-.31	
2	Size	.38	.14	26.6	.000	.23	
3	Occupancy	.40	.16	20.3	.000	.16	
4	Ownership	.44	.19	19.0	.000	-.20	
							19%

The R^2 indicated that the model explained 19% of

the variance. The Adjusted R^2 which indicates shared variability between patient care contribution margin and the set of predictors was also 19%. Based on these results nursing homes with lower percentages of Medicaid residents, larger in size, with for-profit ownership status and higher occupancy rates were more likely to report higher contribution margins.

Table 7

Summary Table Stepwise Multiple Regression
Administrative Costs
(N = 315)

Step	Variable Entered	Multiple R	R^2	F	P	Beta	Adj R^2
1	Turnover	.33	.10	38.5	.000	.33	
2	Ownership	.40	.16	31.0	.000	-.24	
3	Payormix	.42	.18	22.5	.000	.12	
							17%

The adjusted variance R^2 indicated that the model explained 17% of the variance. Thus, nursing homes with higher employee turnover rates with for profit ownership status and higher numbers of Medicaid residents were associated with lower administrative costs.

Table 8

Summary Table of Stepwise Multiple Regression
Profit before Taxes
(N= 315)

Step	Variable Entered	Multiple R	R^2	F	P	Beta	Adj R^2
1	Occupancy	.30	.09	30.1	.000	.30	
2	Size	.35	.13	22.5	.000	.21	
3	Ownership	.40	.16	20.3	.000	-.20	
4	Payormix	.42	.17	16.5	.000	-.13	
							16%

The adjusted R^2 indicated that the model explained 16% of the adjusted variance. Thus, nursing homes with higher occupancy, larger size, for profit ownership status, and lower percentages of Medicaid residents are associated with higher profits.

Research Question Number 2

Stepwise multiple regression was also used to answer question number 2) To what extent do organizational variables explain variability in quality of care among nursing homes? The organizational variables used to answer this question included the following: ownership based on profit status, location, size, labormix, payormix, occupancy rate, employee turnover rate, and labor

hours per patient day. The measure of quality of care was a score which measured performance indicators and was obtained from Department of Health surveys results.

Table 9

Summary Table of Stepwise Multiple Regression
Quality of Care
(N= 315)

Step	Variable Entered	Multiple R	R^2	F	P	Beta	Adj R^2
1	Ownership	.17	.03	9.0	.003	.17	
2	Occupancy	.21	.04	7.3	.001	.13	3.8%

The adjusted R^2 indicated that the model explained 3.8% of the variance. Thus, the organizational variables of ownership and occupancy can explain a small amount of shared variability with this measure of index of quality of care as a measure of effectiveness.

ADDITONAL ANALYSIS

Additional analysis was performed on the data in an effort to analyze variables which may be associated with the measures of effectiveness collectively for profit and quality of care. In order to statistically analyze the study variables in this manner, cannonical correlation was selected. This

technique allows one to examine patterns of interrelationships between sets of variables.

Canonical analysis extends regression to a more complex analysis when one seeks to analyze a set of dependent variables taken together. In this situation, the combination of the variables of nursing home profit and quality are examined in combination as they relate to a combination of independent organizational variables (Levine, 1990). Results are shown in Table 10.

Table 10
Canonical Correlational Analysis Summary Table
Between Organizational Factors (SET 1) and
Efficiency and Quality Measurements
(N=315)

	Canonical Variate	
VARIABLE SETS	1	2
SET 1		
ORGANIZATIONAL FACTORS		
Size	.12	-.44*
Location	.03	.02
Ownership	-.21	.79*
Turnover	.13	-.38*
Labor hrs/pt.day	--	.32*
Lic. Labor hrs/pt.day	-.36*	-.36*
Occupancy Rate	.74*	.47*
Payor Mix	.21	-.06
SET 2		
EFFICIENCY & QUALITY MEASURES		
Profit	.99*	-.16
Quality	.17	.99*
Cononical Correlation	.42	.24
Variance Explained	79%	21%
Total Variance Explained	100%	

The first canonical correlation was .42; and the second was .24. The two pairs of canonical variates accounted for the significant relationships between the two sets of variables. Shown in Table 11, these significant canonical variates explained a total of 100% variance. Inspection of this variance indicates the first pair of canonical variates are strongly related and the second pair are moderately related.

Using a cutoff correlation of .30 for interpretation purposes, the first canonical variate, explaining 79% of variance, was strongly influenced by occupancy rate which was positively related and by licensed labor hours per patient day which was negatively related to higher profits. Thus, nursing homes that are profitable are more likely to have higher occupancy rates and lower numbers of licensed nurses per patient day.

The second canonical variate, explaining 21% of variance, was influenced by nursing home size, employee turnover, licensed labor hours per patient day, and payor mix which were negatively related to ownership, labor hours per patient days, and occupancy rates which were positively related to higher scores on the quality of care measurement. This indicates that nursing homes which are smaller with lower employee turnover rates, lower licensed hours per patient day, less Medicaid payor rates, who have nonprofit status, more labor hours per patient day, and higher occupancy rates are related to higher scores on the quality of care index.

Summary

A descriptive explanatory research design was used to determine the extent to which selected organizational variables explained nursing home effectiveness as measured by efficiency and quality of care in Texas nursing homes.

When Stepwise Multiple Regression was computed with contribution margin as the dependent variable, payor mix, size, occupancy, and ownership significantly explained 19% of its variance. When percentage of administrative costs was used as the dependent variable, employee turnover, ownership, and payor mix significantly explained 17% of its variance. When profit was used as the dependent variable, occupancy, size, ownership, and payormix significantly explained 16% of its variance.

When Stepwise Multiple Regression was computed with quality of care as the dependent variable, ownership and occupancy significantly explained only 3.8% of its variance.

Cannonical analysis was used to examine the dependent variables of profit and quality of care taken together as they related to combinations of independent variables in a pattern of association. The first canonical variate explained 79% of the variance and showed profitable nursing homes were strongly influenced by higher occupancy rates and lower numbers of licensed labor hours per patient day.

The second canonical variate explained 21% of variance and showed that higher scores on quality of care were moderately influenced by smaller nursing homes with lower employee turnover rates, less licensed labor hours per patient day, lower Medicaid payor mix, nonprofit ownership, more labor hours per patient day, and higher occupancy rates.

Chapter 5

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

This study was conducted to examine the relationship between structural characteristics of nursing homes and their effectiveness in providing efficient and quality care. The purpose of this chapter is to discuss the results of the study, draw conclusions, consider implications for nursing home administration, and make recommendations for future research.

Discussion

For the first research question, the results from the regression analysis indicated that whether efficiency was measured by the nursing home's level of profitability, amount of contribution margin per patient day, or percentage of administrative costs per patient day, ownership status significantly influenced efficiency.

Lower percentages of Medicaid payor mix, larger size, higher occupancy rates, and for profit ownership status were significant in explaining variability in nursing home performance on measures of amount of profit and contribution margin per patient day. Higher employee turnover rates, for profit ownership status, and higher percentages of Medicaid payor mix significantly explained variability in the amount of administrative costs per patient day.

The relationship between nursing home ownership status and financial efficiency is consistent with the analysis performed by Caswell and Cleverley (1983) in which proprietary facilities were consistently less costly and more efficient than nonproprietary facilities.

The results did not support or refute the research the research of Lieken, Saxton, and Silkman (1976), who contended that registered nurses were found to be more cost effective. This study did not examine registered nurses alone as a separate component of manpower. It examined licensed vocational nurses in combination with registered nurses.

The relationship between higher administrative costs per patient day and higher employee turnover rates and more Medicaid payors is not previously cited in the literature. Nursing facilities with higher levels of Medicaid residents would have less opportunity to use cost shifting from private pay residents to offset the low Medicaid reimbursement rates. As a result, it is plausible that employees may enjoy less amenities and lower wages and this may influence the turnover rate. Additionally, higher administrative costs as a percentage of total costs may reflect higher administrator and administrative staff turnover for the same reasons.

For the second research question, the results indicate that not for profit ownership and occupancy rate can only explains a small amount of

variability in quality of care when the Health Department survey instrument is used as an index of care for nursing home residents. These findings support Kurkowski's (1981) conclusion that the linkage between structure and quality outcome variables is not strong.

Findings were consistent with Gottesman (1974) that quality of care may be slightly higher in nonproprietary nursing homes. The findings were not consistent with Linn's (1977) findings that higher nursing ratios were positively related to better resident outcomes. However, this study did not study outcome variables but rather looked at process variables.

Exploratory Analysis

Additional analysis, canonical correlation, was performed on the data in an effort to analyze variables which may be associated with measures of effectiveness collectively for profit and measures of quality of care.

The cluster of variables in the first variate

are consistent with published nursing home financial analysis.

Significantly asssociated with profit was higher occupancy and lower licensed labor hours per patient day. Higher occupancy rates would logically be related to a nursing home's level of profit as increases in occupancy translate into higher profits because incremental revenues associated with increases in the number of patient days often exceed incremental costs (Cleverly 1989).

Higher occupancy rates are usually associated with higher operating margins. This results in lower costs per patient day because fixed costs are able to be spread over more units.

Licensed labor hours per patient day in this study referred to licensed vocational and registered nurses. Licensed staff is more costly than nonlicensed staff. Nonlicensed staff are usually paid minimum wages. The use of licensed personnel is far more costly to nursing homes and having a higher employee mix of licensed persons per patient day is consistent with higher costs, thus lower profits.

The second canonical variate pair, showed a significant relationship between the higher levels of quality of care and the following variables; smaller nursing home size, lower employee turnover, lower licensed labor hours, not for profit status, higher levels of patient care labor hours per patient day and higher occupancy rates.

Nursing home size has not previously been cited in the literature as being associated with higher quality of care. The higher quality of care association with lower employee turnover rates and higher labor hours per patient day were consistent with The Institute of Medicine's findings (1986) which found the stability, quality, and number of nursing home staff impacted the quality of life of residents.

The association between not for profit ownership status was again consistent with consistent with Gottesman (1974) that quality of care may be slightly higher in nonproprietary nursing homes.

Higher quality and more profitability both were significantly associated with higher occupancy rates and lower levels of licensed labor hours per patient day. The association of predictor variables with these two outcome variables is not previously cited in the literature.

A plausible explanation for this association may be that increased utilization of nursing aides at lower wages provides lower costs than licensed nurses. This association may also imply that higher numbers of lower waged staff, under some circumstances, may impact the items measured by the states quality measurement care in a more positive manner than a smaller number of higher waged staff.

Conclusions

Based on the findings and discussion of this research study, the following conclusions are made:

1. The nursing home organizational variables payor mix, size, occupancy rate, and ownership status significantly explained a moderate amount of variance in efficiency whether contribution margin per patient day or profit was used as the financial measurement of efficiency.

2. The nursing home organizational variables employee turnover, ownership status, and payor mix ownership status significantly explained a moderate amount of variance in efficiency when administrative costs per patient day was the financial measurement of efficiency.

3. The nursing home organizational variables of ownership status and occupancy rate significantly explained only a very small amount of variance in the quality of care measured from survey results.

Additional Analysis

When canonical correlation analysis was performed on the data the following conclusions were made:

1. The organizational variable of licensed labor hours per patient day and occupancy rate were significantly correlated with both profit and the quality of care measurement.

2. The quality of care variance was significantly explained by several organizational variables. These included size, ownership status, turnover rate, labor hours per patient day, licensed labor hours per patient day and occupancy rate.

The location of a nursing home whether urban or rural was not found to be associated with either the efficiency or the quality of care measurements examined in this study. Higher occupancy rates for a nursing home and lower

numbers of licensed labor hours have financial implications on the nursing home. Higher occupancy rates would provide more revenue to cover total costs in nursing homes. Lower number of licensed personnel to nonlicensed personnel would result in less patient care variable costs.

The Medicaid Cost Report appears to be a reliable instrument for accurately measuring nursing home costs. It's use is recommended for studies of this type. However, the use of large aggregate numbers such as those in this study may mask discrete differences between individual nursing homes. Future research with this instrument may warrant the use of smaller samples of nursing homes within a predetermined smaller geographical area.

The use of the Department of Health Survey as a measure of quality of care has not been tested or established. Interpretation of the nursing home survey may not have beeen consistently applied from one nursing facility to another. As a result of criticisms of this instrument, a new comprehensive standardized survey has been developed and is presently being tested for reliability in measuring the quality of resident care in nursing homes (HCFA, 1990). It is recommended that this new instrument be used in this type so that it's efficacy can be determined.

Levels of resident functioning were not controlled for in this study. Although all the facilities were intermediate care facilities, residents' level of

functioning varies widely. More data needs to be collected on the residents' level of functioning to provide more precision on quality of care outcomes. The level of functioning of residents can significantly influence the number and mix of manpower needed to provide quality care to these residents.

In conclusion, the following recommendations for future research are based on the findings and conclusion of this study.

1. An initial assessment of the level of functioning of residents in nursing homes under study is necessary to control for differences in resident care needs.

2. Design of a more comprehensive survey instrument that would provide more objective measurable resident care outcomes.

3. Development of a cost report instrument that would collect more detailed data on specific areas of variable resident care costs.

4. Development of a research instrument to measure the minimum training needed of personnel caring for aged persons in nursing homes.

Summary

In summary, location of nursing homes was not found to be related to nursing home effectiveness. Nursing home ownership status was appears to be positively related to financial efficiency. It cannot be determined from this study if this reflective of greater efficiency or varying levels of a standard

of care. Financial efficiency can be explained by examining the significant organizational variables of occupancy rate and number of licensed labor hours per patient day. However, only a moderate amount of quality of care variance can be explained and this requires examining several organizational variables such as nursing home size, ownership status, employee turnover rate, labor hours per patient day and occupancy rate.

APPENDIX A

NURSING HOME PROFILE

Street Address: **City and State:**

Participation:	# of Beds:	Type of Ownership:	Survey Date:

Compliance Action:
If there has been any Federal/State compliance action completed against this facility a result of the findings of either of the last two surveys, please refer to page V (Sources of information) in the introductory materials of this volume.

COMPLIANCE ACTION? YES

SELECTED RESIDENT CHARACTERISTICS

Total Residents on Day of Survey	Medicare Residents:	Medicaid Residents:

Caution: A large number of residents with these characteristics does not indicate whether those residents are receiving appropriate or inappropriate care. It may reflect the facility's ability to provide highly specialized care and services.	FACILITY #	FACILITY %	STATE %	NATION %
Bathing Residents requiring some or total assistance in bathing.				
Dressing Residents requiring some or total assistance in dressing.				
Toileting Residents requiring some or total assistance in toileting.				
Transferring Residents requiring some or total assistance in moving from bed to chair or to tub or toilet.				
Continence Residents with catheters or partial or total loss of bladder or bowel control.				
Residents on individually written bowel and bladder retraining program.				
Eating Residents receiving tube feedings or requiring assistance with eating.				
Completely bedfast residents.				
Residents confined to chairs.				
Residents requiring restraints.				
Confused or disoriented residents.				
Residents with bed sores.				
Residents receiving special skin care.				

SELECTED PERFORMANCE INDICATORS

"Facility" column indicates deficiencies found at the time of the survey. The federal government requires facilities to correct deficiencies immediately or to submit a plan indicating deficiencies will be corrected within a reasonable period of time. "State" and "Nation" columns indicate number and percentage of occurrence of deficiencies in similar facilities in the State and Nation. "Met" means that the facility is in compliance with the specific requirement. "Not Met" means the facility was deficient in the area at the time of the survey.

Reminder: The selected performance indicators represent only 32 of the more than 500 distinct requirements a facility must meet. A list of the requirements most that most directly affect resident care and that were not met by the facility during its most recent survey follows this section of the profile. Remember that deficiency information does not necessarily reflect the severity or duration of problems. A deficiency may represent an on-going problem or a one-time failure of a single staff person.	FACILITY MET/ NOT MET 87/88	FACILITY MET/ NOT MET 88/89	NUMBER & PERCENT OF FACILITIES NOT MEETING REQUIREMENTS 88/89			
			STATE		NATION	
			#	%	#	%
The facility ensures that its written procedures regarding the rights and responsibilities of residents are followed.						
The facility uses a system that assures full and complete accounting of residents' personal funds. An accounting report is made to each resident in a skilled nursing facility every three months.						
Each resident is free from mental and physical abuse.						
Drugs to control behavior and physical restraints are only used when authorized by a physician in writing for a specified period of time or in emergencies.						
Each resident is given privacy during treatment and care of personal needs.						
Each resident is allowed to communicate, associate, and meet privately with individuals of his/her choice unless this infringes upon the rights of another resident.						
Each resident is allowed to retain and use his/her personal possessions and clothing as space permits.						
Except in a medical emergency, a resident is not transferred or discharged, nor is treatment changed radically, without consultation with the resident or, if the resident is incompetent, without prior notification of next of kin or sponsor.						
The facility assures that the health care of each resident is under the continuing care supervision of a physician.						
Emergency services from a physician are available and provided to each resident who requires emergency care.						
Nursing services are provided at all times to meet the needs of residents.						
Each resident receives daily personal hygiene as needed to assures cleanliness, good skin care, good grooming, and oral hygiene taking into account individual preferences. Residents are encouraged to take care of their own self care needs.						
Each resident receives care necessary to prevent skin breakdown.						
Each resident with a bedsore receives care necessary to promote the healing of the bedsore including proper dressing.						
Each resident who has problems with bowel and bladder control is provided with care necessary to encourage self control, including frequent toileting and opportunities for rehabilitative training.						
Each resident with a urinary catheter receives proper routine care, including periodic evaluation.						

SELECTED PERFORMANCE INDICATORS

Reminder: The selected performance indicators represent only 32 of the more than 800 distinct requirements a facility must meet. A list of the requirements most that most directly affect resident care and that were not met by the facility during its most recent survey follows this section of the profile. Remember that deficiency information does not necessarily reflect the severity or duration of problems. A deficiency may represent an on-going problem or a one-time failure of a single staff person.	FACILITY MET/ NOT MET 87/88	FACILITY MET/ NOT MET 88/89	NUMBER & PERCENT OF FACILITIES NOT MEETING REQUIREMENTS 88/89			
			STATE		NATION	
			#	%	#	%
Each resident receives proper care for injections (shots), fluids supplied through tubes, colostomy/ileostomy, respiratory (breathing and tracheotomy care, suctioning and tube feeding.						
Each resident receives rehabilitative nursing care to promote maximum physical functioning to prevent loss of ability to walk or move freely, deformities and paralysis.						
Each resident needing assistance in eating or drinking is provided prompt assistance. Specific self-help devices are available when necessary.						
Drugs are administered according to the written orders of the attending physician.						
Menus are planned and followed to meet the nutritional needs of each resident in accordance with physicians' orders, and to the extent medically possible, based on the recommended dietary allowances of the Food and Nutrition Board of the National Research Council, National Academy of Sciences.						
Therapy is provided according to orders of the attending physician in accordance with accepted professional practices by qualified therapists or qualified assistance.						
Services are provided to meet the residents' social and emotional needs by the facility or by referral to an appropriate agency.						
An ongoing program of meaningful activities is provided, based on identified needs and interests of each resident. It is designed to promote opportunities for engaging in normal pursuits, including religious activities of the resident's choice, if any.						
Appropriate staff develop and implement a written health care plan for each resident according to the instructions of the attending physician.						
Toilet and bath facilities are clean, sanitary, and free of odors.						
All common resident areas are clean, sanitary, and free of odors.						
All essential mechanical and electrical equipment is maintained in safe operating condition.						
Resident care equipment is clean and maintained in safe operating condition.						
Isolation techniques to prevent the spread of infection are followed by all personnel.						
The facility has available at all times a quantity of linen essential for proper care and comfort of residents.						
Food is stored, refrigerated, prepared, distributed, and served under sanitary conditions.						

Reminder: The results of the full survey are available from the State survey agency or the State ombudsman.

LISTING OF FACILITY DEFICIENCIES

Listed below are the deficiency code numbers for each of the Federal requirements that most directly affect resident care and that were not met by the facility during its most recent survey. A copy of the form used by the surveyors to report their findings can be found at the end of this volume. To determine the nature of any requirement listed below, consult the form and match the listed code number(s) with the number(s) located in the left-hand column of the survey report form. For more information about the specific problems found in this facility, you may wish to contact the State survey agency or the State ombudsman.

THIS FACILITY WAS CITED FOR THE FOLLOWING DEFICIENCIES IN ITS MOST RECENT SURVEY:

NOTE: AN * INDICATES THAT THE LISTED DEFICIENCY IS AMONG THE 32 SELECTED PERFORMANCE INDICATORS.

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BIOGRAPHY

Sharon Lee Zill was born in Wilmington, Delaware. She has been a registered nurse since 1975. Her formal education consists of the following: B.S.N. from the University of Illinois in Chicago in 1978, and B.Accy from the University of Houston in 1981. Additionally, she earned an M.S. in Health Care Administration in 1985 from the University of Houston-Clearlake and an M.S.N. in Nursing Administration from the University of Texas Health Science Center at Houston in 1989. She completed her Ph.D. in Community Health Management and Policy in December, 1991.

Sharon Zill has worked in various positions in health care for over eighteen years. She has also held positions in public accounting conducting financial and internal audits for four years. She owned her own consulting company for two years specializing in health care financial audits and medical malpractice reviews. She has taught at the University-level for the past four years in the areas of health care finance, gerontology and nursing administration.