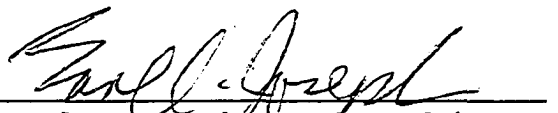
EMPLOYEE PERCEPTIONS OF QUALITY MANAGEMENT INTERVENTIONS AT A MILITARY HEALTH CARE FACILITY

By
John A. Fullinwider

M.S., Chapman University, 1992
B.S., Embry-Riddle University, 1989



Earl C. Joseph, Faculty Advisor
Professor of Administration/Management

Dissertation Submitted in Partial Fulfillment of
the Requirements for the Degree of
Doctor of Philosophy

WALDEN UNIVERSITY
February, 1995

ABSTRACT

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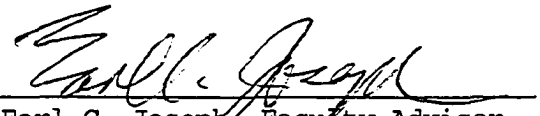

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ABSTRACT

This study measured the level of quality management awareness among military health care professionals. The goals of such measurement were the identification of perceptions of the role of quality management in military health care delivery settings, and the development of recommended strategies for the integration of quality management concepts.

The research found that awareness of quality management concepts was widespread among the members of the research sample. The research also found the perception that quality management concepts on a conceptual level were compatible with the delivery of health care in hospital situations. However, the finding of a disagreement related to the compatibility of quality management concepts in operational situations.

Findings in relation to the importance of the concept of patient satisfaction in the delivery of military health care tended to vary according to the venue. The primacy of patient satisfaction was widely supported in relation to hospital situations; however, such primacy tended to be rejected in relation to operational situations.

With regard to attitudes toward factors that would facilitate the incorporation of quality management concepts, the research found that less than one-half of the members of the research sample expressed positive

attitudes toward these factors, while almost as many expressed negative attitudes toward these factors. These findings were not affected by differences among military health care personnel associated with the independent variables.

One conclusion drawn from the findings is that the knowledge base required for a successful implementation of quality management concepts into the delivery of military health care is sufficiently strong to facilitate such an implementation. Another conclusion is that the incorporation of quality management concepts in hospital situations would likely meet little resistance, but that such an incorporation in operational situations would prove to be a highly divisive issue. The finding that a substantial proportion of military health care personnel do not hold favorable attitudes toward factors that are necessary for the success of quality management programs implies that, although a majority of military health care personnel may accept the relevance of quality management concepts at an intellectual level, these same personnel tend to reject such relevance in practice.

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CHAPTER 1

INTRODUCTION AND PROBLEM

Introduction to the Study

This study investigated the potential for the application of quality management techniques in the military health care environment. Included in this chapter are a discussion of the background information on the problem investigated; a statement of the problem investigated; a statement of the purpose of the study; a discussion of the rational basis for the conduct of the study; a statement of the research questions investigated, together with a statement of the hypotheses tested; operational definitions of variable terms included in the hypotheses; a statement of the assumptions underlying the research performed, together with limitations associated with the research; and a description of the organization of the remainder of the study.

Background of the Problem

Dynamic change characterizes the American health care delivery environment in the 1990s. Within such an environment, institutional care providers in particular must develop and implement new and effective strategies if they are to remain viable entities.

The changes in the health care delivery environment result from a combination of factors (increasing costs of health care, changing societal values, advances in treatment therapies, changing demographics, and many others). Cost is a major factor involved in changes in the delivery of health care services. It is, therefore, imperative for health care delivery organizations to develop procedures that will lead to more effective and more efficient operations. The improvement of quality in all aspects of a health care institution's activities has been linked to this goal (Cleverly & Harvey, 1992).

Statement of the Problem

The need to improve quality and control costs is especially applicable to military health care institutions. Proposed national health care reform, increased consumer demands for quality health care, and public outcries for the control of health care costs are issues that must be addressed by all health care institutions in both the public and private sectors. Budget reductions for the armed services and increased attention to the efficiency and effectiveness of governmentally-provided services of all types are added pressures for military health care institutions.

Improving the quality of the care provided is widely suggested in the 1990s as the solution to the problems

being faced by health care institutions (Phipps, 1992). While medical professionals, both civilian and military, have no quarrel with striving for high quality health care, many of these individuals do tend to reject initiatives that appear to be further manifestations of codified bureaucratic machinations that likely will have no long-lasting positive impacts on the quality of health care services (Jeffer, 1991). Nevertheless, many theorists and observers both inside and outside the medical establishment suggest that a total quality management (TQM) program or one of the other programming approaches to quality improvement can lead to improved quality in health care (Banham, 1993). The concept of quality management has been applied in virtually every discipline, and medicine is the latest field of study to be subjected to quality analysis (Richards & O'Donnell, 1993).

The basic concepts of TQM and other programmatic approaches to quality management are compatible with the philosophical beliefs long and widely held within the American medical community (Jeffer, 1991). Thus, health care professionals are not being asked to adopt something that is alien to their disciplines when it is suggested that health care may benefit from quality management (Bell, 1992).

Nevertheless, the issue of quality management tends to be divisive among some groups of health care professionals

(Solovy, 1993). The problem that must be addressed if quality management concepts are to be integrated into health care delivery environments involves the identification of the objections to such integration, and the development of implementation strategies that overcome the perceived problems.

Purpose of the Study

The purpose of this study was to measure the level of quality management awareness and acceptance among military health care professionals, military health care administrators, other military health care personnel, and technicians at military health care institutions. The goals of such measurement were the identification of perceptions of the role of quality management in military health care delivery settings, and the development of recommended strategies to facilitate the integration of quality management concepts into military health care environments.

Rational Basis for the Study

The pursuit of quality in health care environments through the implementation of quality management programs is both relatively new and controversial (Atchison, 1992). Most of the applications of quality management concepts have been in organizations operating in other than health care environments. Observers within the health care

establishment have noted, however, health care can learn from other fields with respect to the pursuit of quality (Feigenbaum, 1992).

Product quality came to the forefront in the industrial sectors of the American economy in the late 1980s, as the top managements in American companies learned that American product quality was generally perceived--by American and foreign consumers alike--to be inferior to products from other countries, particularly Germany and Japan. The initial emphasis in the quality reawakening in the United States was on manufactured goods, as opposed to services such as the delivery of health care. In the service sector of the American economy, American organizations, including health care delivery organizations, were generally competing against other American companies; thus, the pressures to improve product quality were not perceived to be as significant as they were in the manufacturing sector. The advent of economic recession, constraints on governmental spending, and consumer resistance, however, changed the perception of quality among service providers (Armstrong & Symonds, 1991). Service providers, including health care delivery organizations, became aware that quality must be emphasized in their operations if they were to retain their customer bases and remain viable entities.

Quality control refers "to a system . . . by which assurance is sought that the output produced conforms to specific parameters that define product or service quality" (Lester, Enrick, & Mottley, 1991, p. 1). An effective quality control program enhances the ability of an organization to both reduce costs and improve productivity. As a consequence, effective quality control has a positive impact on an organization's financial efficiency and stability. Quality control, in order to be effective, must be integrated throughout the production process of an organization, whether the output of that process is a good or a service. Thus, a quality control system must be developed or adopted, and that system must be incorporated into the organizational structure. Control procedures must be established at every stage of the production process.

Retention of an organization's customer base is just one advantage associated with improved levels of quality. Financial stability may be expected to improve along with productivity as quality levels rise (Hammonds & DeGeorge, 1991). Improved customer satisfaction is both the fastest and the best route to greater customer retention, and, in the 1990s, greater product quality is both the fastest and the best way to build consumer satisfaction levels (Gilbert, 1993).

Improved quality costs an organization money in the short-run. In the long-run, however, improving quality

generates greater financial efficiency for an organization. Poor quality means poor financial performance in the long-run (Weinheimer, 1993). Therefore, expenditures on quality control should not be looked at by an organization as some sort of add-on cost. Rather, such expenditures should be considered by an organization as integral production costs --whether the product being produced is a good, as in a manufacturing organization, or a service, as in a health care delivery organization. Return on investment has been found to be more a function of product quality than of price, regardless of the type of activity--manufacturing, service, and so forth (Miller & Camp, 1985).

Quality management is a feasible concept for implementation by health care delivery institutions. There is every reason to believe that military health care delivery institutions may benefit from the implementation of quality management programs, and that patient satisfaction at such institutions will be improved through the adoption of such programs.

Research Questions and Hypotheses

Five research questions were investigated. Hypotheses were tested in relation to each of the research questions. These research questions and the associated hypotheses are as follows:

Research question number 1. Does awareness among military health care personnel of quality management concepts vary according to position classification, age, gender, status, or longevity with the military health care system?

Hypothesis number 1.1. Awareness among military health care personnel of quality management concepts will not vary as a function of respondent position classification--physicians, registered nurses, and administrators or other healing arts, medical technicians, and other military health care personnel.

Hypothesis number 1.2. Awareness among military health care personnel of quality management concepts will not vary as a function of respondent age--40 years old and younger or 41 years old and older.

Hypothesis number 1.3. Awareness among military health care personnel of quality management concepts will not vary as a function of respondent gender--female or male.

Hypothesis number 1.4. Awareness among military health care personnel of quality management concepts will not vary as a function of respondent personnel status--civilian or military.

Hypothesis number 1.5. Awareness among military health care personnel of quality management concepts will not vary as a function of respondent longevity with the

military health care system--less than 10 years or 10 years or more.

Research question number 2. Do perceptions among military health care personnel of the appropriateness of incorporating quality management concepts into military health care organizations vary according to position classification, age, gender, status, or longevity with the military health care system?

Hypothesis number 2.1. Perceptions among military health care personnel of the appropriateness of incorporating quality management concepts into military health care delivery will not vary as a function of respondent position classification--physicians, registered nurses, and administrators or other healing arts, medical technicians, and other military health care personnel.

Hypothesis number 2.2. Perceptions among military health care personnel of the appropriateness of incorporating quality management concepts into military health care delivery will not vary as a function of respondent age--40 years old and younger or 41 years old and older.

Hypothesis number 2.3. Perceptions among military health care personnel of the appropriateness of incorporating quality management concepts into military health care delivery will not vary as a function of respondent gender--female or male.

Hypothesis number 2.4. Perceptions among military health care personnel of the appropriateness of incorporating quality management concepts into military health care delivery will not vary as a function of respondent personnel status--civilian or military.

Hypothesis number 2.5. Perceptions among military health care personnel of the appropriateness of incorporating quality management concepts into military health care delivery will not vary as a function of respondent longevity with the military health care system --less than 10 years or 10 years or more.

Research question number 3. Do perceptions among military health care personnel of the potential benefits associated with the incorporation of quality management concepts into military health care delivery organizations vary according to position classification, age, gender, status, or longevity with the military health care system?

Hypothesis number 3.1. Perceptions among military health care personnel of the potential benefits associated with the incorporation of quality management concepts into military health care delivery organizations will not vary as a function of respondent position classification--physicians, registered nurses, and administrators or other healing arts, medical technicians, and other military health care personnel.

Hypothesis number 3.2. Perceptions among military health care personnel of the potential benefits associated with the incorporation of quality management concepts into military health care delivery organizations will not vary as a function of respondent age--40 years old and younger or 41 years old and older.

Hypothesis number 3.3. Perceptions among military health care personnel of the potential benefits associated with the incorporation of quality management concepts into military health care delivery organizations will not vary as a function of respondent gender--female or male.

Hypothesis number 3.4. Perceptions among military health care personnel of the potential benefits associated with the incorporation of quality management concepts into military health care delivery organizations will not vary as a function of respondent personnel status--civilian or military.

Hypothesis number 3.5. Perceptions among military health care personnel of the potential benefits associated with the incorporation of quality management concepts into military health care delivery organizations will not vary as a function of respondent longevity with the military health care system--less than 10 years or 10 years or more.

Research question number 4. Do perceptions and attitudes among military health care personnel in relation to the importance of patient satisfaction in the delivery

of health care vary according to position classification, age, gender, status, or longevity with the military health care system?

Hypothesis number 4.1. Perceptions and attitudes among military health care personnel in relation to the importance of patient satisfaction in the delivery of health care will not vary as a function of respondent position classification--physicians, registered nurses, and administrators or other healing arts, medical technicians, and other military health care personnel.

Hypothesis number 4.2. Perceptions and attitudes among military health care personnel in relation to the importance of patient satisfaction in the delivery of health care will not vary as a function of respondent age--40 years old and younger or 41 years old and older.

Hypothesis number 4.3. Perceptions and attitudes among military health care personnel in relation to the importance of patient satisfaction in the delivery of health care will not vary as a function of respondent gender--female or male.

Hypothesis number 4.4. Perceptions and attitudes among military health care personnel in relation to the importance of patient satisfaction in the delivery of health care will not vary as a function of respondent personnel status--civilian or military.

Hypothesis number 4.5. Perceptions and attitudes among military health care personnel in relation to the importance of patient satisfaction in the delivery of health care will not vary as a function of respondent longevity with the military health care system--less than 10 years or 10 years or more.

Research question number 5. Do attitudes among military health care personnel in relation to factors that would affect incorporating quality management concepts into military health care delivery vary according to position classification, age, gender, status, or longevity with the military health care system?

Hypothesis number 5.1. Favorable attitudes among military health care personnel in relation to factors that would affect incorporating quality management concepts into military health care delivery will not vary as a function of respondent position classification--physicians, registered nurses, and administrators or other healing arts, medical technicians, and other military health care personnel.

Hypothesis number 5.2. Favorable attitudes among military health care personnel in relation to factors that would affect incorporating quality management concepts into military health care delivery will not vary as a function of respondent age--40 years old and younger or 41 years old and older.

Hypothesis number 5.3. Favorable attitudes among military health care personnel in relation to factors that would affect incorporating quality management concepts into military health care delivery will not vary as a function of respondent gender--female or male.

Hypothesis number 5.4. Favorable attitudes among military health care personnel in relation to factors that would affect incorporating quality management concepts into military health care delivery will not vary as a function of respondent personnel status--civilian or military.

Hypothesis number 5.5. Favorable attitudes among military health care personnel in relation to factors that would affect incorporating quality management concepts into military health care delivery will not vary as a function of respondent longevity with the military health care system--less than 10 years or 10 years or more.

Definitions of Terms

The variable terms included in the hypotheses require operational definitions. These definitions are as follows:

1. The term efficient use of available resources is defined as the resource/output ratio related to the delivery of health care services. Resource includes financial, human, and physical inputs.

2. The term garrison setting is defined as a site located outside of an operational setting, and is further

defined to mean a general hospital or an equivalent facility.

3. The term level of care is defined as the effectiveness for the patient of the health care provided.

4. The term military health care professional is defined as a military physician, military nurse, or other military professional in a healing art.

5. An operational setting is defined as one in which hostilities are either occurring or are imminent.

6. The term patient satisfaction is defined as the post-treatment perception by a patient of the health care provided by a military health care institution or activity.

7. The term quality management concept is defined, for the purposes of this study, as total quality management, continuous quality improvement, or the development of quality through team building.

Assumptions and Limitations

An assumption was made that the researcher would be permitted to collect the necessary data from military health care personnel. A further assumption was made that military health care personnel would provide accurate information. In fact, these assumptions were tested severely. Some military health care officials attempted to block the collection of data. In the end, however, the necessary data were collected, although an unanticipated

time delay was experienced. Some individuals initially resisted providing data on the grounds of confidentiality. These individuals suspected that the data collected would be provided to institutional management for assessments of departmental performance. In the end, these concerns were allayed and the required data were provided.

The principal limitation of this study is that the data upon which the research was based were collected from a single military health care institution. To the extent that the personnel at this institution are not representative of the total population of military health care personnel, the findings of the study may be compromised. The researcher, however, had no reason to believe that the personnel surveyed were not representative of the total population of military health care personnel. Another limitation of this study is that the findings were based on the perceptions of the members of the research sample, as opposed to being based upon experimental data.

Organization of the Remainder of the Study

The findings of this study are presented in five chapters. The first chapter defined the problem investigated. A review of the relevant literature is presented in the second chapter, and the research methodology employed in the conduct of the study are described and explained in the third chapter. The

findings of the research performed are presented in the fourth chapter, while the conclusions drawn from the research findings, together with a summary of the study, are presented in the final, fifth, chapter of the study. As indicated above, the review of the literature relevant to the problem to be investigated in the study is presented in the following chapter.

CHAPTER 2

REVIEW OF THE LITERATURE

Introduction

The purpose of this study was to measure the level of quality management awareness among military health care professionals, military health care administrators, other military health care personnel, and technicians at military health care institutions. The goals of such measurement were the identification of perceptions of the role of quality management in military health care delivery settings, and the development of recommended strategies to facilitate the integration of quality management concepts into military health care environments.

Literature relevant to the problem investigated in this study is reviewed in this chapter. Literature is reviewed in relation to quality management concepts, organizational decision making, and consumer satisfaction.

Quality Management Concepts

There are a variety of quality improvement concepts and strategies in vogue in the 1990s. Three of the more significant of these concepts and strategies are TQM (total quality management), CQI (continuous quality improvement), and team building. These three approaches to seeking quality are reviewed in the discussions that follow.

Total Quality Management

TQM requires the involvement of every facet of a company's operation and every company employee in the effort to promote high product quality (Atkinson, 1990). TQM, therefore, tends to produce incremental quality gains, as opposed to dramatic, one-shot improvements. TQM is a logical outgrowth of the quality control strategy promoted for years by the late Edwards Deming. Deming's (1986) quality control strategy was developed with manufacturing processes in mind. TQM, however, may be applied in the production of services, such as health care, as well as goods.

Deming insisted that true quality control began with a real commitment from top management. The reason that many quality improvement programs fail is that CEOs (chief executive officers) all too often fail to provide "unwavering leadership" in the area of quality improvement (Hammonds & DeGeorge, 1991). Conflicting goals and priorities often mean that quality takes a back seat, once the big announcement is made of a company's renewed emphasis on quality.

While the Deming system of quality control demands a commitment from the highest management levels, it depends upon the participation of personnel from all levels of the organization involved in the production process. Participation means more than input from production

workers. It also means that managers must be a part of the production process, as opposed to being separated from it.

In the early 1990s, Edwards Deming continued to preach effective quality control as a salvation for beleaguered American companies. The 14 points in the strategy Deming offered in the 1990s were quite close to the strategy he proposed in late 1940s. Deming's latest 14 points are as follows (Walton, 1986):

1. Organizations should create constancy of purpose for the improvement of product. Constancy in organizational goals with respect to product quality is of utmost importance. This point is a part of TQM, and the concept is appropriate for the health care environment (Gerber, 1992).

2. Organizations should adopt a new philosophy, which has as its objective superior product quality. This point is a part of TQM, and the concept is appropriate for the health care environment (Jablonski, 1992).

3. Organizations should cease dependence on mass inspection. Procedures for precise testing in conjunction with sampling procedures are required. This point is a part of TQM, but is not particularly relevant to the health care environment.

4. Organizations should end the practice of awarding business on the basis of price tag alone. Instead,

organizations should minimize total cost by working with a single supplier. This point is not a part of TQM, although many companies employing TQM also observe this practice. The concept has relevance for the health care environment; however, competitive bidding requirements might cause the concept to be inappropriate for military health care institutions.

5. Organizations should improve constantly and forever every process for planning, production, and service. This point is a part of TQM, and the concept is appropriate for the health care environment (Siwicki, 1992).

6. Organizations should institute training on the job--training that is directed toward the production of products of superior quality. This point is a part of TQM, and the concept is appropriate for the health care environment (Zablocki, 1993).

7. Organizations should adopt and institute leadership. Leadership must devolve from the top of an organization; however, it is required at all organizational levels. This point is a part of TQM, and the concept is appropriate for health care environments.

8. Organizations should drive out fear. All members of the organization must be willing to be innovative, and not fear for their jobs because of failure. It has been estimated that "70% of American workers are afraid to speak

up with suggestions or to ask for clarification" (Hammonds & DeGeorge, 1991, p. 38). This point is a part of TQM, and the concept is appropriate for the health care environment.

9. Organizations should break down barriers between staff areas. It is essential for an organization to function as a coordinated entity, as opposed to several separate fiefdoms. This point is a part of TQM, and the concept is appropriate for health care environments (Hamilton, 1993).

10. Organizations should eliminate slogans, exhortations, and targets for the work force. This point is not a part of TQM, although some companies employing TQM also observe this practice. This concept is appropriate for health care environments; however, slogans and targets for the work force are ingrained in health care environments, particularly so in military health care environments.

11. Organizations should eliminate numerical quotas for the work force and numerical goals for management. This point is not a part of TQM, although some companies employing TQM also observe this practice. This concept is appropriate for health care environments; however, numerical quotas for the work force and numerical quotas for management are ingrained in health care environments, particularly so in military health care environments.

12. Organizations should remove barriers that rob people of pride of workmanship, including the annual rating or merit system. This point is not a part of TQM, although some companies employing TQM also observe this practice. This concept is appropriate for health care environments (Davis, 1992).

13. Organizations should institute a vigorous program of education and self-improvement for everyone in the organization. This point is a part of TQM, and the concept is appropriate for health care environments (Jeffer, 1991).

14. Organizations should put everybody in the company to work on accomplishing the desired transformation. This point is a part of TQM, and the concept is appropriate for health care environments.

Few service companies, such as health care delivery organizations, have a formal quality control program--TQM or other strategy. While only 10% of service companies had such programs in the early 1990s, however, the estimate is that 70% of service companies employing 500 or more persons will have formal quality control programs by the year 2000 (Armstrong & Symonds, 1991).

In the production of services, "the hard part of improving quality . . . is the fleeting nature of the product" (Armstrong & Symonds, 1991, p. 100). The service product cannot be inspected before it is delivered, and it cannot be brought back for repair later. Employees

"create" the product, "and then it disappears" (Armstrong & Symonds, 1991, p. 100). It is, thus, important for service providers to understand that it is the employees, not the managers, who are in charge of quality at service companies. Therefore, an effective application of TQM in service companies requires high levels of employee job satisfaction, and greater discretionary authority for employees interacting with customers (Armstrong & Symonds, 1991). High quality in service industries means, among other things, that the employee interacting with a customer can solve the customer's problem then and there, as opposed to telling a customer that "We'll get back to you" (Armstrong & Symonds, 1991, p. 100).

The effective application of TQM in service firms requires that great care be exercised in employee selection; that superior training be provided to employees; that effective job-related support services be provided for employees; and that firms retain employees. Service companies must also remember that traditional

> MBA programs and accounting systems don't cut it in the service game. In a service business, knowledge and information are the raw materials, and the assets are loyal customers and employees. Accounting systems don't measure those. Career paths and compensation schemes fight against them. (Armstrong & Symonds, 1991, p. 102)

Defining quality in health care environments is a difficult process (Nevers, 1993). Quality in health care environments is best pursued through programs that target

higher levels of patient satisfaction (Holleran, 1992). Patient satisfaction is best attained through addressing patient needs (Koska, 1992).

Continuous Quality Improvement

CQI is based on the work of Genichi Taguchi (1987). Taguchi was the principal developer of the CQI concept. Taiichi Ohno, former vice president of Toyota Motor Corporation, was quoted as saying that: "Whatever an executive thinks the losses of poor quality are, they are actually six times greater" (Taguchi & Clausing, 1990, p. 65). Quality is achieved primarily through design, because quality "is a virtue of design" (Taguchi & Clausing, 1990, p. 65).

Customers are not interested in the extent to which a product meets production specifications (Taguchi & Clausing, 1990). Thus, the "zero defects" approach to quality employed by most American manufacturers fails to address directly the concerns of the customer (Taguchi & Clausing, 1990). By contrast with meeting production specifications, the customer is interested in product quality as quality is reflected in "a product's . . . performance when rapped, overloaded, dropped, and splashed" (Taguchi & Clausing, 1990, p. 65). The Taguchi approach to product quality begins with the interests of the customer.

Taguchi methods are intended to reduce variations stemming from the characteristics of both production processes and product design (Taguchi & Clausing, 1990). Taguchi methods are said to focus on the customer, or end user of a product, because the end outcome of Taguchi methods is to reduce the level of societal loss attributable to product quality level (Kackar, 1986). A focus on the customer is particularly appropriate for health care delivery organizations.

In the application of Taguchi methods, societal loss attributable to the level of product quality is stated in monetary units, to assure that both upper-level management and production management understand the concept. Thus, loss in the Taguchi context refers to product performance as a deviation from target performance (Atkinson, 1990). The emphasis in quality improvement is on product design, process design, and tolerance design (Atkinson, 1990). Product design should seek to satisfy end user requirements, while minimizing susceptibility to production process variations (Taguchi & Clausing, 1990). Process design depends upon the application of the findings of statistical experiments to identify the production parameters that will cause the least variation in product performance (Kackar, 1985). Tolerance design requires (a) the identification of those factors that most affect product performance, and (b) the determination for such

factors of the tolerance levels that will assure product performance at the required level (Schmidt & Meile, 1989). The performance of these statistical experiments depends upon the application of factor analysis and orthogonal arrays.

The theoretical framework of the Taguchi (1987) methods generally and CQI specifically include seven concepts. These seven concepts are as follows:

1. The total loss to society caused by a product is an essential measure of the level of the product quality of a good or service.

2. Continuous improvement in product quality is necessary to the continued viability of a profit-oriented organization.

3. Continuous reduction in the variation of product performance is the central feature of a continuous quality improvement program.

4. The loss to an end user resulting from product performance is proportional to the square of the deviations of performance characteristics from target performance for a product.

5. Product quality is primarily a function of product design and production process.

6. Performance variations may be reduced by addressing the effects of both product design and production process on product performance characteristics.

7. Statistically-based experiments may be used effectively to identify product design and production process changes that will lead to a reduction in the variations between performance characteristics and the target characteristics of a product.

Dr. Genichi Taguchi studied classical statistics while attending university in England. Taguchi determined, however, that classical statistics were too theoretical for use in manufacturing (Walton, 1988). Taguchi, thus, developed "a more practical approach for use in the design engineering phase to counteract . . . problems that were expensive and difficult to eliminate" (Walton, 1988, p. 123). Taguchi's statistical experiments rely heavily on factor analysis and the use of orthogonal arrays (Ealey, 1988; Taguchi & Clausing, 1990).

Factor analysis permits the defining of the appropriate orthogonal arrays (Ealey, 1988). Orthogonal arrays, in turn (Taguchi and Clausing, 1990)

1. Define the specific objective. In defining the specific objective, the most appropriate signal and the estimated concomitant noise are either selected or developed. Signal is defined as what a product is attempting to deliver to the customer. Noises are defined as the interferences that degrade product performance.

2. Define the feasible options for critical design values. These critical options include dimensions, electrical characteristics, and so forth.

3. Select the option that provides the greatest robustness. The greatest robustness is equivalent to the highest signal-to-noise ratio.

Taguchi identified nine imperatives that must be addressed in the application of his methods (Taguchi, 1990). These imperatives for the effective application of the Taguchi method generally and CQI specifically are as follows (Taguchi, 1990):

1. Quality losses result primarily from product failure after sale. Thus, product robustness is a function of product design more than it is of on-line control of the production process.

2. Robust products provide a strong signal to the buyer that aggravations, or noise, will be minimal. A strengthening of design, therefore, increases the signal-to-noise ratio, thus increasing product robustness.

3. Production targets must seek an objective of a maximum signal-to-noise ratio. By using this process, "average effects may be most efficiently discerned by means of 'orthogonal arrays'" (Taguchi, 1990, p. 66).

4. The manufacture of robust products requires the setting of ideal target values followed by the minimization of the "average of the square of deviations for combined

components, averaged over the various customer-use conditions" (Taguchi, 1990, p. 66). The minimization of the average of the square of deviations for combined components, averaged over the various customer-use conditions, requires the application of factor analysis by manufacturing or service organizations (Taguchi & Clausing, 1990).

5. Tolerances must be established before products are committed to the manufacturing process.

6. No significant gain is derived by shipping a product that barely satisfies corporate standards, as opposed to shipping a product that barely fails to meet corporate standards. The goal should be to meet target tolerances, rather than to meet minimum specifications.

7. A major goal should be the development of product designs that permit and facilitate consistency in manufacture. "Catastrophic stack-up is more likely from scattered deviation within specification than from consistent deviation outside. Where deviation from target is consistent, adjustment to the target is possible" (Taguchi, 1990, p. 66).

8. A "concerted effort to reduce product failure in the field will simultaneously reduce the number of defectives in the factory" (Taguchi, 1990, p. 66). The reduction of variances in components will lead to a

reduction in variances in the overall production system. The reduction of variances is essential to CQI.

9. Competing proposals for capital equipment, as well as competing proposals for on-line interventions, "may be compared by adding the cost of each proposal to the average quality loss" (Taguchi, 1990, p. 66). The average quality loss is determined by the deviations from target expected from the use of a piece of equipment or a particular on-line intervention.

The application of the Taguchi method results in an approach to manufacturing known as quality function deployment, or QFD (Hauser & Clausing, 1988). The house of quality is a "conceptual map that provides the means for interfunctional planning and communications. People with different problems can thrash out design priorities while referring to patterns of evidence on the house's grid" (Hauser & Clausing, 1988, pp. 63-64). The essential steps in creating a house of quality are based on Taguchi's imperatives for the attainment of quality. These essential steps are as follows (Hauser & Clausing, 1988):

1. Find out what the customer wants. Development of the house of quality begins with what the customer wants. This concept is appropriate for health care environments (Mahlen, 1993).

2. All preferences are equally important. One customer preference should not be accorded preference

over another. All must be considered. This concept is appropriate for health care environments (Barrett, 1993).

3. Determine the extent to which the delivery of a perceived need will result in a competitive advantage. This step requires an analysis of the product characteristics in the context of customer preferences of both a company and its competitors. This concept is appropriate for health care environments (Buterbaugh, 1992).

4. Determine how a product can be changed. Once the customer preferences are determined, a determination must be made of how the product can be changed to meet the customer preferences. This concept is appropriate for health care environments (Horine, 1993).

5. Determine the extent to which engineering affects customer preferences. This process facilitates the development of target product values. This concept is not especially applicable to health care environments.

6. Determine the interrelationship between engineering changes and product characteristics. This step requires a determination of how an engineering change made to deal with one product characteristic affects all other product characteristics. This concept is not particularly applicable to health care environments.

Managerial leadership is critical to the success of a CQI program (Haney & Beaman, 1993). Team building is also valuable in a CQI program (Eubanks, 1992).

Team Building

Team development promotes the idea that individuals who have working relationships with one another within an organizational structure can be trained to work as a team (Larson & LaFasto, 1989). Participants in a team building process learn to build good relationships with other team members, to engage in joint problem solving, and to reduce interpersonal friction.

Successful implementation and execution of the team-development technique leads to improved communication, enhanced creativity, more effective decision making, and higher levels of organizational performance (Larson & LaFasto, 1989). One of the most important manifestations of the team organization decision-making technique is the quality circles concept that was pioneered in Japanese manufacturing organizations, and which, in the 1990s, is found in a number of major American organizations. The team organizational structure is also an essential ingredient in a total quality management (TQM) program.

As an inclusive and holistic approach to management, a TQM program, if it is to be successful, affects all aspects of the functioning of an organization. TQM has burst upon

the organizational scene with an intensifying fury, as an ever increasing number of firms race to develop and adopt quality programs. Unfortunately, in all too many cases, considerations of organizational structure and human resource management issues are given short shrift in TQM programs (Hart & Schlesinger, 1991). Ironically, such an approach diminishes the TQM process which is intended to be inclusive, relegates human resource management to a subordinate status, and compromises the potential of a TQM program by not incorporating human resource performance and reward into the TQM program structure, and by not adapting the organizational structure to the requirements of the TQM program (Hart & Schlesinger, 1991).

Most organizational structures are product/process- or functional-based (Gortner, Mahler, & Nicholson, 1989). Mixed organizational structures, however, have long been common. The hybrid organizational structure attempts to combine the advantages of both product/process-based and functional-based structures "while avoiding the weaknesses of each" (Gortner, Mahler, & Nicholson, 1989, p. 110). The matrix organizational structure groups staff into functional areas, with temporary assignments to special project groups, or teams (Gortner, Mahler, & Nicholson, 1989). Such special project teams are multifunctional in character (Gortner, Mahler, & Nicholson, 1989). This approach to the team concept "produces a matrix in which

the columns represent projects and the rows represent functional departments" (Gortner, Mahler, & Nicholson, 1989, p. 110). The matrix is "a fairly complex form of organization and is generally both costly and time consuming to administer because of all of the crosscutting of lines of authority and accountability that must be coordinated" (Gortner, Mahler, & Nicholson, 1989, p. 110).

Team-based organization is another form of structure "in which members of different functional departments work together in small, but more or less permanent, teams headed by the member from the most professional prestigious specialty" (Gortner, Mahler, & Nicholson, 1989, p. 111). Team members "maintain their ties to functional departments for personnel, training, promotion, and other such matters, but they work face to face principally with members of other departments to achieve the level of coordinated expertise demanded by their tasks" (Gortner, Mahler, & Nicholson, 1989, p. 111). The self-directed or self-managing work team places such matters as personnel, training, and promotion in the hands of the team, causing the team, in effect, to become almost a separate company within a company (Owens, 1991).

The self-managed work team (SMWT) tends to affect three aspects of organizational structure. The affected aspects of structure are (a) lines of managerial authority within an organization, (b) responsibility

and accountability within the organization, and (c) the informal organization within the organizational structure. The development of an effective team-based organization depends on the addressing of issues related to each of these characteristics of an organization.

Strong leadership is necessary for the effective functioning of SMWTs (Barton, 1991). Such leadership is essential if SMWTs are to hire, train, and assign new employees, determine work schedules, provide instruction in various skills, and make decisions related to bonus compensation and employee terminations (Barton, 1991). To foster strong leadership in SMWTs, organizational management must relinquish control over details, concrete problems, and day-to-day activities (Barton, 1991). Organizational management then devotes its energies to broader responsibilities, such as planning, and providing direction and support for SMWTs (Barton, 1991). Within such an organizational environment, management retains authority over strategy, while the SMWTs assume authority for tactics within a framework of goals established by management (Owens, 1991).

Responsibility and accountability are major issues affecting the effectiveness and acceptability of SMWTs ("Is Your Team Just a Fad?", 1992). Without clear lines of responsibility and authority, work teams are not truly

self-managing, nor are they ever likely to be fully accepted within the organization. Rather, they simply become a manifestation of the latest management fad ("Is Your Team Just a Fad?", 1992).

The informal organization within a firm reflects the patterns of activity through which the work of a firm is actually accomplished (Galagan, 1992). Such informal organizations reflect a phenomenon in which natural hierarchies assert themselves whenever human beings organize to work (Ross, 1992).

The creation or development of work teams within an organization structure is, in essence, a reflection of the informal organization of the firm (Denton, 1992). When such work teams are voluntarily formed, they represent little departure from the traditional functioning of a firm's informal organization (Jin, 1993). When work teams are formally created by the firm, however, the organizational structure is changed as the informal organization becomes a part of the formal structure (Banner, 1992).

Team building is especially appropriate for military health care institutions in the pursuit of quality (Horak, Guarino, Knight, & Kweder, 1991). This approach has been implemented at the Walter Reed Army Medical Center.

The Implementation and Application of Quality Management Programs

Deming insisted that true quality control begins with a real commitment from top management. What Deming sought was a mathematical means of controlling the level of quality by seeking ever-finer manufacturing tolerances. While this system of quality control demanded a commitment from the highest management levels, it depended upon the participation of personnel from all levels of the organization involved in the production process. Participation means more than input from production workers. It also means that managers must be a part of the production process (Scherekenbach, 1991).

Recent studies indicate the presence of a positive correlation between manufacturing productivity and production worker involvement in the plant floor decision-making processes. A popular name applied to this type of group decision-making process is Quality Circles. The quality circles concept brings workers into the organizational decision-making process, a requirement of TQM, CQI, team building, and most other quality-seeking procedures. Similar outcomes have occurred under similar circumstances in health care environments (Sibben, 1992).

Organizational Decision Making

Decision making in organizations has been described as a process of behavior with the economic model (or total rationality) at one extreme, and with the social model (or complete irrationality) at the other extreme (Kimberly & Rottman, 1987). This description implies that only irrational decision making accords human values precedence over economic values. In organizational environments, some middle ground between these extremes must be found, for it is evident that neither set of values can be ignored. In many organizations, managers have been confronted with the tasks of making severe, undesirable, and unpleasant cuts of personnel and services in a hasty manner, because, in part, they failed to heed economic values in earlier decisions. Similarly, organizations have often been forced to retract decisions and to act in confusing manners in chaotic situations because, in part, they failed to heed human values in reaching earlier decisions. A better approach to decision making is obviously required by many organizations.

The practice of decision making in American organizations is far from standard. Decision-making practices range from the outmoded directive decision-making behavior to a full embracing of the concept of participative decision making. The most effective decision-making behavior for organizations will include

participation by organizational subordinates in the process, while, at the same time, preserving the ultimate responsibility and authority of the leader. The basic decision-making model has been defined as being of two parts: a core group at the center, invested by the rules with formal authority to legitimize decisions, and a constellation of satellite groups seeking to influence the core group (Nutt, 1990). Group decision making, a requirement of both TQM and CQI, may be applied in either part of the model.

In most organizations, it is a rare event for a single individual to complete an entire decision-making process without functioning at least part of the time as a member of a group (Nutt, 1990). Group participation in an organizational decision-making process assumes even greater significance when it is considered that the effective execution of an organizational decision requires a commitment on the part of many people. Commitment will be both stronger and more easily developed if those individuals of whom it is required are participants in the decision-making process.

There are, however, both advantages and disadvantages associated with group decision making. A significant advantage to the process is that the potential range of knowledge among a group of individuals is much greater

than that for a single decision maker (Nutt, 1990). Additionally, group participation in the decision-making process typically results in a better understanding of the decision reached.

The major disadvantage to group decision making results from the presence in an organization of social pressures (Nutt, 1990). Superior-subordinate relationships within an organization, as an example, may result in no meaningful participation on the part of a subordinate. The quality of group decisions has also been questioned because, often, consensus is viewed as a substitute for a thorough evaluation of the quality of the decision. The group decision-making process may also be subverted by the dominance of a single individual and the development of a competitive win-lose culture among participants. While not being a cause of the elimination of group decision making in organizational settings, the problems that may affect group decision making must be addressed if effective decisions are expected to derive from a group decision-making process.

With respect to decision making, quality circles are encompassed generally in the nominal group decision-making technique, and more specifically in the team-building approach to decision making (Ishikawa, 1991). The nominal group technique is a group decision-making process which seeks consensus within an environment of interdependence.

It is a participative technique applied typically in small groups.

The essence of any form of participative management is that the decision-making process is not authoritarian --those individuals who are affected by the decisions participate, to some extent, in the making of those decisions (Larson & LaFasto, 1989). The concept may legitimately be called a philosophy of management. It rests, in turn, on an analysis of the specific needs of the nominal group and the obstacles it faces. It rests, also, on a concept of human action, human behavior, and human motivation. It ensures performance by converting objective needs into personal goals. In nominal group decision making, there is an explicit attempt to state publicly the basic goals and quantifiable objectives of the organization. Priorities are then established for these goals and objectives, which are used as guides for allocating the organization's resources during the time for which the organizational goals apply.

The most important components of nominal group decision making are not, as might at first be thought, the objectives (Nutt, 1990). Rather, the most important components of such a technique are the participating individuals.

One prime characteristic of nominal group decision making is that objectives within an organization must

be established from the top down (Nutt, 1990). Such a procedure ensures that objectives for each organizational unit will be compatible with and will support the objectives of both the next higher organizational unit and the overall objectives of the total organization. The objectives established within a nominal group decision-making framework perform four essential functions within an organization. These functions are to provide direction by focusing the efforts of all members of an organizational unit on common goals as well as upon the goals of the overall organization; to serve as motivators by clearly establishing and defining the yardsticks by which performance at each organizational level is evaluated; to contribute to the process of management by enhancing the organizational planning process and by providing a set of realistically attainable goals, the accomplishment of which can easily be monitored; and to establish the basis for an organization's philosophy by providing for orderly progress toward organizational goals as opposed to the participation in crash programs to achieve such goals. An essential requirement for an effective implementation of a nominal group decision-making process is timely, accurate, and reliable information which can be and is disseminated to all to whom such information is applicable for nominal group decision making. Nominal group decision making is a form of participative management widely employed in TQM

and CQI organizations (Atkinson, 1990). In such companies, participative management means the involvement of all members of an organization in the decision-making process.

Most Japanese companies are TQM or CQI companies and, in contrast to their American counterparts, operate without an organization chart (Ishikawa, 1991). This low structure characteristic makes it easier to use the nominal group decision-making technique. Consensus is sought in Japanese organizations through application of nominal group decision making.

In American organizations, nominal group decision making is often found to be ineffective (Peters & Waterman, 1982). Collective decision making, to the Japanese, means extensive and extended consultations between all of the managers within an organization whose organizational units will be affected by the decision, until a true consensus is reached. In many American firms where collective decision making has been implemented, however, it is often more of a process of senior managers informing subordinate managers of the desired decision, and, in turn, obtaining concurrence without necessarily developing a true consensus. Most American managers, in those instances where the collective decision-making approach has been adopted by American firms, have not demonstrated the necessary willingness to take the time required to develop a true consensus. Most senior managers in American

organizations have not demonstrated a willingness to compromise with their organizational subordinate managers on decisions. Lastly, most subordinate managers in American organizations have not demonstrated a willingness to challenge their organizational superiors on decisions.

Team development, essential in a TQM or CQI system, promotes the idea that individuals who have working relationships with one another within an organizational structure can be trained to work as a team (Larson & LaFasto, 1989). Participants in a team maintenance process learn to build good relationships with other team members, to engage in joint problem solving, and to reduce interpersonal friction.

Successful implementation and execution of the team maintenance technique leads to improved communication, enhanced creativity, more effective decision making, and higher levels of organizational performance (Larson & LaFasto, 1989). One of the most important manifestations of the team maintenance decision-making technique is the quality circles concept, which was pioneered in Japanese manufacturing organizations, which, in the early 1990s, is found in a number of major American organizations, and which is an essential ingredient in a TQM or CQI system.

There are a number of other group decision-making techniques that may be used in a TQM or CQI system. Group decision making is a function of the social integration

of individuals into groups. Social integration refers to the integration of people into society in its many forms, and the ameliorative strategies designed to enhance or facilitate social integration. The integration of individuals into their society results from forces which place them within the system, and which govern their participation and patterned associations with others. The individual, in effect, becomes a part of a societal system. Such an organizational culture is essential for an effective TQM or CQI system (Atkinson, 1990).

Another approach that is often useful in quality management regimes is the Delphi procedure. The Delphi approach was developed at the Rand Corporation in the 1950s. The Delphi method is a combination of the brain-storming technique, in which the ideas of a variety of people are obtained in a face-to-face interchange and exchange, and Bayesian analysis, which permits a refinement of quantitative data on the basis of expert opinion.

The Delphi technique focuses on the reaching of a consensus in terms of goals, priorities, and objectives (Rowe, Mason, & Dickel, 1992; Sergiovanni & Carver, 1990). The technique requires extensive use of feedback. The strength of the Delphi technique lies in the informed judgment brought to the decision-making process by the participants.

In application of the Delphi technique, informed opinion is collected within an organization, without actually bringing individuals together in a group setting. This process permits the incorporation of large numbers of individuals into the decision-making process. Opinions are collected through the use of questionnaires, which are administered in a series, with each new questionnaire containing feedback from the responses to the previous questionnaire. The iterative procedure is continued until a consensus is attained.

The Delphi method is a quasi-qualitative technique for predicting possible future events. In this approach, a panel of experts is repeatedly queried about possible developments in a particular area. In between each two rounds of inquiries, the experts are provided with feedback on all the individual judgments, which then serves as input to the next round of assessments.

The Delphi technique is useful in decision making because it provides flexibility in the sampling of ideas and opinions from large numbers of individuals. The technique tends to maximize the "advantages of group dynamics while minimizing the problems caused by dominant personalities and silent experts" (Tersine, 1993, p. 445).

Expert forecasts are those that rely on people who are knowledgeable to estimate future human resource needs. The planner may survey managers, who are the experts

concerning the needs of their own departments, and the resulting centralization of this information permits formal plans that identify the organization's future demands. Additional sophistication may be desired, and the Delphi technique is a highly effective and well accepted method employed in such situations. The Delphi method solicits estimates from a group of experts, usually managers, following which personnel department planners, acting as intermediaries, summarize the various responses and report the findings back to the experts, where the procedure begins once again.

The Delphi approach may be effectively used in a wide variety of situations, including that of human resources needs planning. A brief general description of the Delphi method is as follows: (a) define the problem area which requires clarification; (b) select the sample to be surveyed--the panel of experts; (c) develop the initial questionnaire, which calls for opinions as to the probable developments in each facet or area of the problem being investigated; (d) summarize the results of the initial questionnaire; (e) provide the summary to each member of the sample being surveyed; (f) have the sample being surveyed rank the various opinions on each facet of the problem, according to their perceptions as to the probability of occurrence; (g) summarize the results of the second questionnaire; (h) provide the second summary

to each member of the sample being surveyed; (i) have the sample being surveyed reconsider their prior rankings of the various opinions on each facet of the problem; and (j) continue this sequence of activity--ranking, summary, and reconsideration--until a majority opinion is derived for one opinion on each separate facet of the problem being investigated (Sergiovanni & Carver, 1990).

In applications of the Delphi method, it is usual for a majority opinion to be reached quickly--typically on the third questionnaire. It is also common, when the Delphi approach is employed, for near unanimous opinions to be obtained from the panels of experts. The Delphi method is a useful decision-making tool, particularly because of the flexibility that it affords in sampling ideas and opinions from many sources.

Decision-making protocols are of exceptional importance in quality management regimes because the success of quality management programs depends upon the full participation and empowerment of all members of the organization. Participation in the organizational decision-making process is an essential ingredient in the empowerment process.

Consumer Satisfaction

The concept of consumer satisfaction is the basis of the concept of quality management. Quality is an

essentially meaningless term unless a perception of quality is attributed to a product--good or service--by the users of the product. In the health care environment, consumer satisfaction is patient satisfaction (Tokarski, 1989).

Consumer satisfaction is difficult to define and even more difficult to measure. Consumer satisfaction is, in many ways, a personal concept that is based on personal perceptions. Consumer satisfaction is significantly related to one's postpurchase feelings about that which was bought. In this context, consumer satisfaction is considered to be a function of (a) the purchaser's expectations concerning the product, and (b) the product's perceived performance. Consumers form expectations on the basis of messages and claims made about the product. The level of consumer dissatisfaction, thus, is the product of the difference between expectations and performance.

Synthesis of the Literature

The quality management concepts of greatest relevance to the problem that will be investigated in the proposed study are TQM (total quality management), CQI (continuous quality improvement), and team building. TQM requires the involvement of every facet of a company's operation and every company employee in the effort to promote high product quality. TQM, therefore, tends to produce

incremental quality gains, as opposed to dramatic, one-shot improvements.

The effective application of TQM in service organizations requires that great care be exercised in employee selection; that superior training be provided to employees; that effective job-related support services be provided for employees; and that firms retain employees. In a service activity, knowledge and information are the raw materials, and the assets are loyal customers and employees.

Defining quality in health care environments is a difficult process. Quality in health care environments is best pursued through programs that target higher levels of patient satisfaction. Patient satisfaction is best attained through addressing patient needs.

CQI is based the premise that quality is achieved primarily through design. Customers are not interested in the extent to which a product meets production specifications. Rather, the customer is interested in product quality as a reflection of performance. The CQI approach to product quality begins with the interests of the customer. CQI methods are intended to reduce variations stemming from the characteristics of both production processes and product design. CQI methods focus on the customer, or end user of a product, because the end goal of CQI methods is to reduce the level of

societal loss attributable to product quality level. A focus on the customer is particularly appropriate for health care delivery organizations.

Managerial leadership is critical to the success of a CQI program. Team building is also valuable in a CQI program. Team development promotes the idea that individuals who have working relationships with one another within an organizational structure can be trained to work as a team. Participants in a team-building process learn to build good relationships with other team members, to engage in joint problem solving, and to reduce interpersonal friction. Successful implementation and execution of the team-development technique leads to improved communication, enhanced creativity, more effective decision making, and higher levels of organizational performance.

Team-based organization is a form of structure in which members of different functional departments work together in small, but more-or-less permanent, teams headed by the member from the most professional prestigious specialty. Team members maintain their ties to functional departments for personnel, training, promotion, and other such matters, but they work face-to-face principally with members of other departments to achieve the level of coordinated expertise demanded by their tasks. The self-directed, or self-managing, work team, the latest

manifestation of the team-based organizational structure, places such matters as personnel, training, and promotion in the hands of the team, causing the team, in effect, to become almost a separate company within a company.

The self-managed work team (SMWT) tends to affect three aspects of organizational structure. The affected aspects of structure are (a) lines of managerial authority within an organization, (b) responsibility and accountability within the organization, and (c) the informal organization within the organizational structure. The development of an effective team-based organization depends on the addressing of issues related to each of these characteristics of an organization.

Strong leadership is necessary for the effective functioning of SMWTs. Such leadership is essential if SMWTs are to hire, train, and assign new employees, determine work schedules, provide instruction in various skills, and make decisions related to bonus compensation and employee terminations. To foster strong leadership in SMWTs, organizational management must relinquish control over details, concrete problems, and day-to-day activities. Organizational management then devotes its energies to broader responsibilities, such as planning, and providing direction and support for SMWTs. Within such an organizational environment, management retains authority

over strategy, while the SMWTs assume authority for tactics within a framework of goals established by management.

TQM, CQI, and team building are the quality management concepts that were incorporated into the research questions and hypotheses that were investigated and tested in this study. The research methodology is described and explained in the following chapter.

CHAPTER 3

METHODOLOGY

Introduction

The purpose of this study was to measure the level of quality management awareness among military health care professionals, military health care administrators, other military health care personnel, and technicians at military health care institutions. The goals of such measurement were the identification of perceptions of the role of quality management in military health care delivery settings, and the development of recommended strategies to facilitate the integration of quality management concepts into military health care environments.

The research methodology employed in the pursuit of the study purpose is described and explained in this chapter. This description and explanation is presented in the contexts of methodological approach (description of the methodology); study design; population and sample; instrumentation; data collection; and data analysis.

Methodological Approach

The research methodology employed in this study was exploratory in character. The level of quality management awareness and acceptance among military health care personnel was not known with any degree of certainty.

The research performed for this study made such a determination. This study was also statistical in character, and the study was conducted in a field setting. The research methodology employed was cross-sectional in that the perceptions of different classifications of military health care personnel were compared. Data required for the research performed were collected through the conduct of a survey. The research performed was ex post facto in character with descriptive relationships between variables.

Study Design

Operational classifications and categories of the variables included in the research hypotheses are identified in this discussion of the study design. Each variable operationalized is referenced to the appropriate hypothesis or hypotheses.

The independent variable in hypotheses number 1.1, 2.1, 3.1, 4.1, and 5.1 was the position classification of the respondent. Categories of the position classification variable were physician, registered nurse, other healing arts, medical technician, administrator, and other military health care personnel. Data for this independent variable were the responses to questionnaire item number 1.

The independent variable in hypotheses number 1.2, 2.2, 3.2, 4.2, and 5.2 was the age of the respondent.

Categories of the respondent age variable were 41 years old and older and 40 years old and younger. Data were collected for three age groups; however, the two younger age groups were collapsed into a single category to enhance the strength of the statistical analysis. Data for this independent variable were the responses to questionnaire item number 2.

The independent variable in hypotheses number 1.3, 2.3, 3.3, 4.3, and 5.3 was the gender of the respondent. Categories of the respondent gender variable were female and male. Data for this independent variable were the responses to questionnaire item number 3.

The independent variable in hypotheses number 1.4, 2.4, 3.4, 4.4, and 5.4 was the service status of the respondent. Categories of the respondent service status variable were civilian and uniformed. Data for this independent variable were the responses to questionnaire item number 4.

The independent variable in hypotheses number 1.5, 2.5, 3.5, 4.5, and 5.5 was the longevity of the respondent in the military health care system. Categories of the respondent longevity variable were 10 years or more of service with the military health care system and less than 10 years service with the military health care system. Data were collected for three longevity groups; however, the shorter service groups were collapsed into a single

category to enhance the strength of the statistical analysis. Data for this independent variable were the responses to questionnaire item number 5.

The dependent variable in hypotheses number 1.1, 1.2, 1.3, 1.4, and 1.5 was respondent awareness of specific quality management concepts. Categories of the respondent quality management awareness variable were total quality management (TQM), continuous quality improvement (CQI), and health care teams (HCT). Data for this dependent variable were the responses to questionnaire item number 6.

The dependent variable in hypotheses number 2.1, 2.2, 2.3, 2.4, and 2.5 was respondent perceptions of the appropriateness of the incorporation of quality management concepts into the delivery of military health care. Data for this dependent variable were the responses to questionnaire items number 7 through 11. Categories of the variable in relation to questionnaire items number 7, 8, and 9 were yes and no. Categories of the variable in relation to questionnaire items 10 and 11 were TQM, CQI, and HCT.

The dependent variable in hypotheses number 3.1, 3.2, 3.3, 3.4, and 3.5 was respondent perceptions of the potential benefits associated with the incorporation of quality management concepts into the delivery of military health care. Data for this dependent variable were the responses to questionnaire items number 12 through 17.

Categories of the variable in relation to questionnaire items number 12 and 15 were high, moderate, and low. Categories of the variable in relation to questionnaire items number 13 and 16 were yes and no. Categories of the variable in relation to questionnaire items 14 and 17 were TQM, CQI, and HCT.

The dependent variable in hypotheses number 4.1, 4.2, 4.3, 4.4, and 4.5 was respondent perceptions and attitudes of the importance of patient satisfaction in the delivery of military health care. Data for this dependent variable were the responses to questionnaire items number 18, 19, 23, and 26. Categories of the variable in relation to questionnaire items number 18 and 19 were highest, equal, subsidiary to desired medical outcomes, and subsidiary to desired medical outcomes and military objectives. Categories of the variable in relation to questionnaire items number 23 and 26 were strongly agree, agree, undecided, disagree, and strongly disagree.

The dependent variable in hypotheses number 5.1, 5.2, 5.3, 5.4, and 5.5 was respondent attitudes related to factors that would affect the incorporation of quality management concepts into the delivery of military health care. Data for this dependent variable were the responses to questionnaire items number 20 through 22, 24, 25, and 27 through 29. Categories of the variable in relation to

these questionnaire items were strongly agree, agree, undecided, disagree, and strongly disagree.

Population and Sample

The larger population for this study was comprised of all military health care personnel in the armed forces of the United States. Military health care personnel may be either uniformed personnel or civilian personnel. The more immediate population from which the research sample for this study were drawn were the military health care personnel assigned to the Madigan Army Medical Center located in Pierce County, Washington.

A cluster sample of 150 persons was selected from the Madigan Army Medical Center staff of 2117 persons through the application of random procedures. A total of 25 persons were selected from each of the following personnel classifications: (a) professional (physician); (b) professional (nurse); (c) professional (healing arts other than physician and nurse); (d) medical technicians; (e) administrators; and (f) other military health care personnel. Usable questionnaires were returned by 123 (82%) of the 150 personnel selected. The highest number of usable questionnaires received was from the other military health care personnel sample group, in which 24 (96%) of the 25 personnel returned usable questionnaires. The lowest number of usable questionnaires received was from

the administrators sample group, in which 16 (64%) of the 25 personnel returned usable questionnaires. Among the physicians sample group, 23 (92%) of the 25 personnel returned usable questionnaires, while 22 (88%) of the 25 personnel in the registered nurses sample group returned usable questionnaires, 20 (80%) of the 25 personnel in the medical technicians sample group returned usable questionnaires, and 18 (72%) of the 25 personnel in the other healing arts sample group returned usable questionnaires.

Instrumentation

The instrument used in the collection of data for this study was a survey questionnaire developed especially for use in this study. A copy of this questionnaire is included as an appendix to this study. A pilot test of the questionnaire was administered to 12 members of the research sample (two individuals from each sample group) to establish the reliability and the validity of the instrument. Validity refers to the extent to which data or a data collection instrument measures what it is actually desired to measure. Reliability refers to the accuracy and precision of a data collection procedure. Validity, thus, is the extent to which differences found through a particular data collection procedure reflect true differences among those variables being measured, while

reliability refers to the capacity of an instrument to yield similar measurements under similar conditions. The reliability of a data collection procedure is a contributor to the validity of that procedure, rather than the other way around. Further, an instrument cannot be valid if it is not also reliable; however, just because it is reliable it is not, of necessity, valid.

A validity coefficient is the correlation coefficient between a measuring procedure and an outside or independent measure of the function that the test was designed to measure. If those who stand high on a test, as an example, stand high on the outside criterion, and those who stand low on the test are low on the outside criterion, the test is valid. As a correlation coefficient, a perfect validity coefficient would be +1.00 and a complete absence of validity would be 0.00. A negative correlation, regardless of how high it was, would not be an indication of the validity of an instrument; for an instrument to be valid, its validity coefficient must be positive and it must be high. The obvious question which arises concerns how high a validity coefficient should be in order for a measurement procedure to be considered as valid. In most instances involving the social sciences, a coefficient of 0.70 or higher is necessary for a single test to show validity. As is true of validity coefficients, reliability

coefficients, as correlation coefficients, may range from +1.00 for perfect correlation, or reliability, to 0.00 for a completely unreliable instrument. Again, as was true for validity coefficients, reliability coefficients must be positive, as a negative reliability coefficient is not an indication of reliability, regardless of how high the negative coefficient may be. As is also true for validity coefficients, an obvious question concerns how high reliability coefficients should be for a procedure to be considered reliable. The general rule is that reliability coefficients should be 0.90 or higher in order for a measurement to be considered reliable in the social sciences.

To test the validity of the instrument used in this study, members of the pilot test sample were interviewed subsequent to the pilot test administration to determine the extent to which the responses to the questionnaire items represented congruity between researcher and sample members with respect to the intended meaning of each questionnaire item. A validity coefficient of $r = 0.9027$ characterized the pilot test, while the reliability coefficient was $r = 0.9991$.

Data Collection

The data required for this study were collected through the administration of the survey instrument to

the research sample. A minimum of 15 usable survey questionnaires were required from each sample cluster. The minimum number of usable questionnaires received from a sample cluster was 16 (administrators), while the maximum number of usable questionnaires received from a sample cluster was 24 (other military health care personnel); the mean number of usable questionnaires received from the six sample clusters was 20.5. The survey questionnaires were self-administered, and the procedure was conducted by mail.

Data Analysis

Chi square analysis procedures were used in the testing of hypotheses wherein the data were nominal in character. Chi square analysis is the quantitative procedure most often used to test the significance of relationships between data sets collected through the use of nominal scales (Emory, 1992). Statistical significance for these hypotheses tests was established at $p<.05$. The following hypotheses were tested through the application of chi square analysis:

1. Hypotheses number 1.1, 1.2, 1.3, 1.4, and 1.5. Data for the dependent variable in these hypotheses were the responses to questionnaire item number 6. These data were nominal in character.

2. Hypotheses number 2.1, 2.2, 2.3, 2.4, and 2.5 wherein data for the dependent variable were the responses

to questionnaire items number 7, 8, 9, and 11. These data were nominal in character.

3. Hypotheses number 3.1, 3.2, 3.3, 3.4, and 3.5 wherein data for the dependent variable were the responses to questionnaire items number 12, 14, 15, 16, and 17. These data were nominal in character.

The Kruskal-Wallis Test was used in the testing of hypotheses wherein the data were ordinal in character and where independent samples of more than two populations were involved (Summers, Peters, & Armstrong, 1993). The Kruskal-Wallis Test is a generalized version of the Mann-Whitney U Test (Emory, 1992). Statistical significance for these tests was established at $p<.05$. The following hypotheses were tested through the application of the Kruskal-Wallis Test:

1. Hypothesis number 2.1 wherein the data for the dependent variable were the responses to questionnaire item number 10. These data were at least ordinal in character and possessed some characteristics of interval scale measurement. Six independent samples were involved in this hypothesis.

2. Hypothesis number 3.1 wherein the data for the dependent variable were the responses to questionnaire item number 13. These data were at least ordinal in character and possessed some characteristics of interval scale

measurement. Six independent samples were involved in this hypothesis.

3. Hypothesis number 4.1 wherein the data for the dependent variable were the responses to questionnaire items number 18, 19, 23, and 26. The data reflected in the responses to questionnaire items number 18 and 19 were ordinal in character, while the data reflected in the responses to questionnaire items number 23 and 26 were nominal with origin in character. Six independent samples were involved in this hypothesis.

4. Hypothesis number 5.1 wherein the data for the dependent variable were the responses to questionnaire items number 20, 22, 24, 25, 27, 28, and 29. These data were ordinal with origin in character. Six independent samples were involved in this hypothesis.

The Mann-Whitney-Wilcoxen Rank Sum Test was used in the testing of hypotheses wherein the data were nominal in character and where independent samples of two populations were involved (Summers, Peters, & Armstrong, 1993). Statistical significance for these hypotheses tests was established at $p<.05$. The following hypotheses were tested through the application of the Mann-Whitney-Wilcoxen Rank Sum Test:

1. Hypotheses number 2.2, 2.3, 2.4, and 2.5 wherein the data for the dependent variable were the responses to questionnaire item number 10. These data were at least

ordinal in character and possessed some characteristics of interval scale measurement. Two independent samples were involved in these hypotheses.

2. Hypotheses number 3.2, 3.3, 3.4, and 3.5 wherein the data for the dependent variable were the responses to questionnaire item number 13. These data were at least ordinal in character and possessed some characteristics of interval scale measurement. Two independent samples were involved in these hypotheses.

3. Hypotheses number 4.2, 4.3, 4.4, and 4.5 wherein the data for the dependent variable were the responses to questionnaire items number 18, 19, 23, and 26. The data reflected in the responses to questionnaire items number 18 and 19 were ordinal in character, while the data reflected in the responses to questionnaire items number 23 and 26 were nominal with origin in character. Two independent samples were involved in these hypotheses.

4. Hypotheses number 5.2, 5.3, 5.4, and 5.5 wherein the data for the dependent variable were the responses to questionnaire items number 20, 22, 24, 25, 27, 28, and 29. These data were ordinal with origin in character. Two independent samples were involved in these hypotheses.

Presentation of Study Findings

The results of the hypotheses testing are presented in the following chapter. Data distributions related to

each of the questionnaire items are also presented in the following chapter. The results of the hypotheses testing were used to develop answers to the research questions investigated in this study. The answers to the research questions are presented in the final chapter of the study, along with a statement of the conclusions drawn.

CHAPTER 4

FINDINGS

Introduction

The purpose of this study was to measure the level of quality management awareness among military health care professionals, military health care administrators, other military health care personnel, and technicians at military health care institutions. The goals of such measurement were the identification of perceptions of the role of quality management in military health care delivery settings, and the development of recommended strategies to facilitate the integration of quality management concepts into military health care environments.

The findings of the research performed as a part of this study are presented in this chapter. The findings are presented in relation to each of the five research questions investigated. Results of hypotheses testing and other data relevant to the research questions are included in these presentations.

Awareness of Quality Management Concepts

Research question number 1 asked: Does awareness among military health care personnel of quality management concepts vary according to position classification, age, gender, status, or longevity with the military health care

system? Within the entire sample, 109 (88.6%) of the respondents were aware of TQM, while 88 (71.5%) were aware of CQI, and 56 (45.5%) were aware of HCT. Five hypotheses were tested in relation to this research question to assess the effects on this awareness of position classification, age, gender, status, and longevity with the military health care system. The results of this hypotheses testing are presented in the following discussions.

Position Classification

Awareness of the three quality management concepts in relation to the six position classifications is summarized in Table 4.1, which may be found on the following page. As the data presented in Table 4.1 indicate, variations in the awareness of quality management concepts as a function of respondent position classification were not statistically significant at $p<.05$. As the null could not be rejected, hypothesis 1.1 by inference was accepted.

Respondent Age

Awareness of the three quality management concepts in relation to respondent age is summarized in Table 4.2. As the data presented in Table 4.2 indicate, variations in the awareness of quality management concepts as a function of respondent age were not statistically significant at $p<.05$. As the null hypothesis could not be rejected, hypothesis 1.2 by inference was accepted. Awareness

of quality management concepts in relation to age and controlled for respondent position classification is summarized in Tables 4.3 through 4.8, which may be found on the next several pages.

Interestingly, older medical technicians were found to be unaware of the health care team concept within the context of quality management. This anomaly did not affect the overall relationship between awareness and age.

Table 4.1

Variation in Awareness of Quality Management Concepts in Relation to Respondent Position Classification Distribution and Chi Square Results

Position Classification	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
Physician	19	16	8	43
Registered Nurse	20	18	16	54
Other healing arts	16	11	8	35
Medical technician	18	12	6	36
Administrator	15	15	7	37
Other health care personnel	21	16	11	48
Total	109	88	56	253

Calculated chi square:	3.794
Degrees of freedom:	10
Critical value of chi square at p<.05:	18.307
Statistically significant:	No

Table 4.2

Variation in Awareness of Quality Management Concepts in Relation to Respondent Age Distribution and Chi Square Results

Respondent Age	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
41 years old and older	52	46	29	127
40 years old and younger	57	42	27	126
Total	109	88	56	253

Calculated chi square:	0.575
Degrees of freedom:	2
Critical value of chi square at p<.05:	5.991
Statistically significant:	No

Table 4.3

Variation in Awareness of Quality Management Concepts in Relation to Respondent Age among Physicians

Respondent Age	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
41 years old and older	11	11	5	27
40 years old and younger	8	5	3	16
Total	19	16	8	43

Table 4.4

Variation in Awareness of Quality Management Concepts in Relation to Respondent Age among Registered Nurses

Respondent Age	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
41 years old and older	10	9	8	27
40 years old and younger	10	9	8	27
Total	20	18	16	54

Table 4.5

Variation in Awareness of Quality Management Concepts in Relation to Respondent Age among Other Healing Arts

Respondent Age	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
41 years old and older	4	3	3	10
40 years old and younger	12	8	5	25
Total	16	11	8	35

Table 4.6

Variation in Awareness of Quality Management Concepts in Relation to Respondent Age among Medical Technicians

Respondent Age	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
41 years old and older	4	2	0	6
40 years old and younger	14	10	6	30
Total	18	12	6	36

Table 4.7

Variation in Awareness of Quality Management Concepts in Relation to Respondent Age among Administrators

Respondent Age	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
41 years old and older	9	9	4	22
40 years old and younger	6	6	3	15
Total	15	15	7	37

Table 4.8

Variation in Awareness of Quality Management Concepts in Relation to Respondent Age among Other Personnel

Respondent Age	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
41 years old and older	14	12	9	35
40 years old and younger	7	4	2	13
Total	21	16	11	48

Respondent Gender

Awareness of the three quality management concepts in relation to respondent gender is summarized in Table 4.9, which may be found on the following page. As the data presented in Table 4.9 indicate, variations in the awareness of quality management concepts as a function of respondent gender were not statistically significant at $p<.05$. As the null could not be rejected, hypothesis 1.3 by inference was accepted. Awareness of quality management concepts in relation to gender and controlled for respondent position classification is summarized in Tables 4.10 through 4.15, which may be found on the next several pages. Each of these six tables reports distribution according to age for one of the six position classifications as a means of assessing the interactive effect of these two independent variables on awareness.

Table 4.9

Variation in Awareness of Quality Management Concepts in Relation to Respondent Gender Distribution and Chi Square Results

Respondent Gender	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
Female	50	43	33	126
Male	59	45	23	127
Total	109	88	56	253

Calculated chi square:	2.419
Degrees of freedom:	2
Critical value of chi square at p<.05:	5.991
Statistically significant:	No

Table 4.10

Variation in Awareness of Quality Management Concepts in Relation to Respondent Gender among Physicians

Respondent Gender	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
Female	4	6	5	15
Male	15	10	3	28
Total	19	16	8	43

Variations in awareness of quality management concepts among physicians were significant when controlled for gender. These variations among physicians, however, did not affect the overall relationship between awareness and gender when all position classifications were considered.

Variations in awareness of quality management concepts among other healing arts were significant when controlled for gender. These variations among other healing arts, however, did not affect the overall relationship between awareness and gender.

Variations in awareness of quality management concepts among other military health care personnel were significant when controlled for gender. These variations among other military health care personnel, however, did not affect the overall relationship between awareness and gender.

Table 4.11

Variation in Awareness of Quality Management Concepts in Relation to Respondent Gender among Registered Nurses

Respondent Gender	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
Female	17	15	15	47
Male	3	3	1	7
Total	20	18	16	54

Table 4.12

Variation in Awareness of Quality Management Concepts in Relation to Respondent Gender among Other Healing Arts

Respondent Gender	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
Female	3	1	1	5
Male	13	10	7	30
Total	16	11	8	35

Table 4.13

Variation in Awareness of Quality Management Concepts in Relation to Respondent Gender among Medical Technicians

Respondent Gender	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
Female	4	3	2	9
Male	14	9	4	27
Total	18	12	6	36

Table 4.14

Variation in Awareness of Quality Management Concepts in Relation to Respondent Gender among Administrators

Respondent Gender	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
Female	7	7	4	18
Male	8	8	3	19
Total	15	15	7	37

Table 4.15

Variation in Awareness of Quality Management Concepts in Relation to Respondent Gender among Other Personnel

Respondent Gender	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
Female	15	11	6	32
Male	6	5	5	16
Total	21	16	11	48

Respondent Service Status

Awareness of the three quality management concepts in relation to respondent service status is summarized in Table 4.16, which may be found on the following page. As the data presented in Table 4.16 indicate, variations in

the awareness of quality management concepts as a function of respondent service status were not statistically significant at $p<.05$. As the null could not be rejected, hypothesis 1.4 by inference was accepted. Awareness of quality management concepts in relation to service status and controlled for respondent position classification is summarized in Tables 4.17 through 4.22, which may be found on the next several pages.

Table 4.16

Variation in Awareness of Quality Management Concepts in Relation to Respondent Service Status Distribution and Chi Square Results

Respondent Service Status	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
Civilian	52	45	26	123
Uniformed	57	43	30	130
Total	109	88	56	253

Calculated chi square:	0.291
Degrees of freedom:	2
Critical value of chi square at $p<.05$:	5.991
Statistically significant:	No

Variations in awareness of quality management concepts among physicians were significant when controlled for service status. These variations among physicians,

however, did not affect the overall relationship between awareness and service status when all position classifications were considered.

Table 4.17

Variation in Awareness of Quality Management Concepts in Relation to Respondent Service Status among Physicians

Respondent Service Status	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
Civilian	3	5	3	11
Uniformed	16	11	5	32
Total	19	16	8	43

Table 4.18

Variation in Awareness of Quality Management Concepts in Relation to Respondent Service Status among Registered Nurses

Respondent Service Status	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
Civilian	11	9	7	27
Uniformed	9	9	9	27
Total	20	18	16	54

Table 4.19

Variation in Awareness of Quality Management Concepts in Relation to Respondent Service Status among Other Healing Arts

Respondent Service Status	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
Civilian	9	6	4	19
Uniformed	7	5	4	16
Total	16	11	8	35

Variations in awareness of quality management concepts among medical technicians were significant when controlled for service status. These variations among medical technicians, however, did not affect the overall relationship between awareness and service status.

Table 4.20

Variation in Awareness of Quality Management Concepts in Relation to Respondent Service Status among Medical Technicians

Respondent Service Status	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
Civilian	4	3	1	8
Uniformed	14	9	5	28
Total	18	12	6	36

Table 4.21

Variation in Awareness of Quality Management Concepts in Relation to Respondent Service Status among Administrators

Respondent Service Status	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
Civilian	7	7	3	17
Uniformed	8	8	4	20
Total	15	15	7	37

Variations in awareness of quality management concepts among other military health care personnel were significant when controlled for service status. These variations among other military health care personnel, however, did not affect the overall relationship between awareness and service status.

Table 4.22

Variation in Awareness of Quality Management Concepts in Relation to Respondent Service Status among Other Personnel

Respondent Service Status	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
Civilian	18	15	8	41
Uniformed	3	1	3	7
Total	21	16	11	48

Respondent Longevity with the Military Health Care System

Awareness of the three quality management concepts in relation to respondent longevity with the military health care system is summarized in Table 4.23 below. As the data presented in Table 4.23 indicate, variations in the awareness of quality management concepts as a function of respondent longevity with the military health care system were not statistically significant at $p<.05$. As the null could not be rejected, hypothesis 1.5 by inference was accepted. Awareness of quality management concepts in relation to longevity and controlled for respondent position classification is summarized in Tables 4.24 through 4.29, which may be found on the next several pages.

Table 4.23

Variation in Awareness of Quality Management Concepts in Relation to Respondent Longevity with the Military Health Care System Distribution and Chi Square Results

Respondent Longevity	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
10 years and longer	58	49	31	138
Less than 10 years	51	39	25	115
Total	109	88	56	253

Calculated chi square:	0.083
Degrees of freedom:	2
Critical value of chi square at $p<.05$:	5.991
Statistically significant:	No

Table 4.24

Variation in Awareness of Quality Management Concepts in Relation to Respondent Longevity among Physicians

Respondent Longevity	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
10 years and longer	8	8	4	20
Less than 10 years	11	8	4	23
Total	19	16	8	43

Table 4.25

Variation in Awareness of Quality Management Concepts in Relation to Respondent Longevity among Registered Nurses

Respondent Longevity	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
10 years and longer	9	9	11	29
Less than 10 years	11	9	5	25
Total	20	18	16	54

Variations in awareness of quality management concepts among registered nurses, medical technicians, and other military health care personnel were significant when controlled for longevity with the military health care system. These variations among registered nurses, medical

technicians, and other military health care personnel, however, did not affect the overall relationship between awareness and longevity and thus had no effect on the hypothesis outcome.

Table 4.26

Variation in Awareness of Quality Management Concepts in Relation to Respondent Longevity among Other Healing Arts

Respondent Longevity	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
10 years and longer	11	8	4	23
Less than 10 years	5	3	4	12
Total	16	11	8	35

Table 4.27

Variation in Awareness of Quality Management Concepts in Relation to Respondent Longevity among Medical Technicians

Respondent Longevity	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
10 years and longer	7	4	1	12
Less than 10 years	11	8	5	24
Total	18	12	6	36

Table 4.28

Variation in Awareness of Quality Management Concepts in Relation to Respondent Longevity among Administrators

Respondent Longevity	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
10 years and longer	14	14	7	35
Less than 10 years	1	1	0	2
Total	15	15	7	37

Table 4.29

Variation in Awareness of Quality Management Concepts in Relation to Respondent Longevity among Other Personnel

Respondent Longevity	Quality Management Concepts of Which Respondents Are Aware			
	TQM	CQI	HCT	Total
10 years and longer	9	6	4	19
Less than 10 years	12	10	7	29
Total	21	16	11	48

Appropriateness of Quality Management Concepts for Military Health Care

Research question number 2 asked: Do perceptions among military health care personnel of the appropriateness of the incorporation of quality management concepts into

military health care delivery organizations vary according to position classification, age, gender, status, or longevity with the military health care system? Within the entire sample, 104 (84.6%) of the respondents believed that the incorporation of quality management concepts into the military health care system was appropriate, while only 19 (15.4%) believed such incorporation to be inappropriate. Five hypotheses were tested in relation to this research question to assess the effects on this appropriateness of position classification, age, gender, status, and longevity with the military health care system. The results of this hypotheses testing are presented in the following discussions.

Position Classification

Perceptions of the appropriateness of the incorporation of quality management concepts into the military health care system in relation to position classifications with respect to questionnaire items number 7, 8, 9, and 11 are summarized in Table 4.30, which may be found on the following page. As the data in Table 4.30 indicate, variations in perceptions of the appropriateness of the incorporation of quality management into military health care as a function of position classification were not statistically significant

at p<.05. As the null hypothesis could not be rejected, hypothesis 2.1 by inference was accepted.

With respect to the responses to questionnaire item number 10, hypothesis number 2.1 was tested by the Kurskal-Wallis Test. The calculated value of H was 10.43, while the critical value of H at p<.05, df5 was 11.070. Thus, the Kruskal-Wallis Test did not permit a rejection of the null.

Table 4.30

Variation in Perceptions of the Appropriateness of the Incorporation of Quality Management Concepts into the Military Health Care System in Relation to Respondent Position Classification Distribution and Chi Square Results

Position Classification	Incorporation Appropriate		
	Yes	No	Total
Physician	18	5	23
Registered Nurse	20	2	22
Other healing arts	18	0	18
Medical technician	14	6	20
Administrator	15	1	16
Other health care personnel	19	5	24
Total	104	19	123

Calculated chi square:	9.084
Degrees of freedom:	5
Critical value of chi square at p<.05:	11.070
Statistically significant:	No

Respondent Age

Perceptions of the appropriateness of the incorporation of quality management concepts into the military health care system in relation to respondent age with respect to questionnaire items number 7, 8, 9, and 11 are summarized in Table 4.31, which may be found below. As the data presented in Table 4.31 indicate, variations in perceptions of the appropriateness of the incorporation of quality management concepts into military health care as a function of respondent age were not statistically significant at $p<.05$. As the null could not be rejected, hypothesis 2.2 by inference was accepted.

Table 4.31

Variation in Perceptions of the Appropriateness of the Incorporation of Quality Management Concepts into the Military Health Care System in Relation to Respondent Age Distribution and Chi Square Results

Respondent Age	Incorporation Appropriate		
	Yes	No	Total
41 years old or older	49	11	60
40 years old and younger	55	8	63
Total	104	19	123

Calculated chi square:	0.997
Degrees of freedom:	1
Critical value of chi square at $p<.05$:	3.841
Statistically significant:	No

With respect to the responses to questionnaire item number 10, hypothesis number 2.2 was tested by the Mann-Whitney-Wilcoxen Rank Sum Test. The W value was in the acceptance region at $p<.05$, df5. Thus, the test did not permit a rejection of the null. This result, therefore, did not alter the outcome of the test of the hypothesis by chi square analysis.

Respondent Gender

Perceptions of the appropriateness of the incorporation of quality management concepts into the military health care system in relation to respondent gender with respect to questionnaire items number 7, 8, 9, and 11 are summarized in Table 4.32, which may be found on the following page. As the data presented in Table 4.32 indicate, variations in perceptions of the appropriateness of the incorporation of quality management concepts into military health care as a function of respondent gender were not statistically significant at $p<.05$. As the implied null hypothesis could not be rejected, hypothesis 2.3 by inference was accepted.

With respect to the responses to questionnaire item number 10, hypothesis number 2.3 was tested by the Mann-Whitney-Wilcoxen Rank Sum Test. The W value was in the acceptance region at $p<.05$, df5. Thus, the test did not permit a rejection of the null. This result, therefore,

did not alter the outcome of the test of the hypothesis by chi square analysis.

Table 4.32

Variation in Perceptions of the Appropriateness of the Incorporation of Quality Management Concepts into the Military Health Care System in Relation to Respondent Gender Distribution and Chi Square Results

Respondent Gender	Incorporation Appropriate		
	Yes	No	Total
Female	47	11	58
Male	57	8	65
Total	104	19	123

Calculated chi square:	0.999
Degrees of freedom:	1
Critical value of chi square at p<.05:	3.841
Statistically significant:	No

Respondent Service Status

Perceptions of the appropriateness of the incorporation of quality management concepts into the military health care system in relation to respondent service status with respect to questionnaire items number 7, 8, 9, and 11 are summarized in Table 4.33, which may be found on the following page. As the data presented in Table 4.33 indicate, variations in perceptions of the appropriateness of the incorporation of quality management concepts into military health care as a function of

respondent gender were not statistically significant at $p<.05$. As the null could not be rejected, hypothesis 2.4 by inference was accepted.

With respect to the responses to questionnaire item number 10, hypothesis number 2.4 was tested by the Mann-Whitney-Wilcoxen Rank Sum Test. The W value was in the acceptance region at $p<.05$, df5. Thus, the test did not permit a rejection of the null.

Table 4.33

Variation in Perceptions of the Appropriateness of the Incorporation of Quality Management Concepts into the Military Health Care System in Relation to Respondent Service Status Distribution and Chi Square Results

Respondent Service Status	Incorporation Appropriate		
	Yes	No	Total
Civilian	50	9	59
Uniformed	54	10	64
Total	104	19	123

Calculated chi square:	0.255
Degrees of freedom:	1
Critical value of chi square at $p<.05$:	3.841
Statistically significant:	No

Respondent Longevity with the Military Health Care System

Perceptions of the appropriateness of the incorporation of quality management concepts into the military health care system in relation to respondent

longevity with the military health care system with respect to questionnaire items number 7, 8, 9, and 11 are summarized in Table 4.34, which may be found below. As the data presented in Table 4.34 indicate, variations in perceptions of the appropriateness of the incorporation of quality management concepts into military health care as a function of respondent gender were not statistically significant at $p<.05$. As the null could not be rejected, hypothesis 2.5 by inference was accepted.

Table 4.34

Variation in Perceptions of the Appropriateness of the Incorporation of Quality Management Concepts into the Military Health Care System in Relation to Respondent Longevity Distribution and Chi Square Results

Respondent Longevity	Incorporation Appropriate		
	Yes	No	Total
10 years or longer	56	10	66
Less than 10 years	48	9	57
Total	104	19	123

Calculated chi square:	0.254
Degrees of freedom:	1
Critical value of chi square at $p<.05$:	3.841
Statistically significant:	No

With respect to the responses to questionnaire item number 10, hypothesis number 2.5 was tested by the Mann-Whitney-Wilcoxen Rank Sum Test. The W value was in the

acceptance region at $p<.05$, df5. Thus, the test did not permit a rejection of the null.

Other Findings

Although the sample as a whole overwhelmingly perceived the incorporation of quality management concepts into the military health care system as being an appropriate action at a general level, opinion tended to be more equally divided when the concept was broken down for application in military hospital (near civilian) situations, as opposed to operational situations. As indicated above, 104 (84.6%) of the members of the total sample believed that quality management incorporation was appropriate as a general concept. When considering only hospital situations, 113 (91.9%) of the sample thought that incorporation was appropriate. When considering only operational situations, however, only 66 (53.7%) of the respondents thought incorporation was appropriate. The disagreement over the appropriateness of incorporating quality management concepts into military health care in operational situations varied according to several of the independent variables, as follows:

1. Position classification:
    a. Physicians: 43.5% approve/56.5% disapprove.
    b. Registered nurses: 63.6% approve/36.4% disapprove.

c. Other healing arts: 50.0% approve/50.0% disapprove.

d. Medical technicians: 40.0% approve/60.0% disapprove.

e. Administrators: 62.5% approve/37.5% disapprove.

f. Other military health care personnel: 62.5% approve/37.5% disapprove.

2. Gender:

a. Female: 62.1% approve/37.9% disapprove.

b. Male: 46.2% approve/53.8% disapprove.

3. Service status:

a. Civilian: 61.0% approve/39.0% disapprove.

b. Uniformed: 46.9% approve/53.1% disapprove.

Benefits Associated with the Incorporation of Quality Management Concepts into Military Health Care

Research question number 3 asked: Do perceptions among military health care personnel of the potential benefits associated with the incorporation of quality management concepts into military health care delivery organizations vary according to position classification, age, gender, status, or longevity with the military health care system? Within the entire sample, 89 (72.4%) of the respondents believed that the incorporation of quality management concepts into the military health care system

would improve both quality and efficiency, while 34 (27.6%) believed such benefits would not occur. Five hypotheses were tested in relation to this research question to assess the effects on these perceptions of position classification, age, gender, status, and longevity with the military health care system. The results of this hypotheses testing are presented in the following discussions.

Position Classification

Perceptions that benefits would accrue from the incorporation of quality management concepts into the military health care system in relation to the six position classifications with respect to questionnaire items number 12, 14, 15, 16, and 17 are summarized in Table 4.35, which may be found on the following page. As the data presented in Table 4.35 indicate, variations in perceptions of the benefits of the incorporation of quality management concepts into military health care as a function of respondent position classification were not statistically significant at $p<.05$. As the null could not be rejected, hypothesis 3.1 by inference was accepted.

With respect to the responses to questionnaire item number 13, hypothesis number 3.1 was tested by the Kurskal-Wallis Test. The calculated value of H was 10.20, while the critical value of H at $p<.05$, df5 was 11.070. Thus,

the Kruskal-Wallis Test did not permit a rejection of the null.

Table 4.35

Variation in Perceptions of the Benefits Accruing from the Incorporation of Quality Management Concepts into the Military Health Care System in Relation to Respondent Position Classification Distribution and Chi Square Results

Position Classification	Benefits Would Accrue		
	Yes	No	Total
Physician	15	8	23
Registered Nurse	16	6	22
Other healing arts	13	5	18
Medical technician	13	7	20
Administrator	14	2	16
Other health care personnel	18	6	24
Total	89	34	123

Calculated chi square:	2.672
Degrees of freedom:	5
Critical value of chi square at p<.05:	11.070
Statistically significant:	No

Respondent Age

Perceptions that benefits would accrue from the incorporation of quality management concepts into the military health care system in relation to respondent age with respect to questionnaire items number 12, 14, 15, 16, and 17 are summarized in Table 4.36 on the following page. As the data presented in Table 4.36 indicate, variations

in perceptions of the benefits of the incorporation of quality management concepts into military health care as a function of respondent position classification were not statistically significant at $p<.05$. As the null could not be rejected, hypothesis 3.2 by inference was accepted.

Table 4.36

Variation in Perceptions of the Benefits Accruing from the Incorporation of Quality Management Concepts into the Military Health Care System in Relation to Respondent Age Distribution and Chi Square Results

Respondent Age	Benefits Would Accrue		
	Yes	No	Total
41 years old or older	44	16	60
40 years old and younger	45	18	63
Total	89	34	123

Calculated chi square:	0.000
Degrees of freedom:	1
Critical value of chi square at $p<.05$:	3.841
Statistically significant:	No

With respect to the responses to questionnaire item number 13, hypothesis number 3.2 was tested by the Mann-Whitney-Wilcoxen Rank Sum Test. The W value was in the acceptance region at $p<.05$, df5. Thus, the test did not permit a rejection of the null.

Respondent Gender

Perceptions that benefits would accrue from the incorporation of quality management concepts into the military health care system in relation to respondent gender with respect to questionnaire items number 12, 14, 15, 16, and 17 are summarized in Table 4.37 below. As the data presented in Table 4.37 indicate, variations in perceptions of the benefits of the incorporation of quality management concepts into military health care as a function of respondent position classification were not statistically significant at $p<.05$. As the null could not be rejected, hypothesis 3.3 by inference was accepted.

Table 4.37

Variation in Perceptions of the Benefits Accruing from the Incorporation of Quality Management Concepts into the Military Health Care System in Relation to Respondent Gender Distribution and Chi Square Results

Respondent Gender	Benefits Would Accrue		
	Yes	No	Total
Female	44	14	58
Male	45	20	65
Total	89	34	123

Calculated chi square:	0.652
Degrees of freedom:	1
Critical value of chi square at $p<.05$:	3.841
Statistically significant:	No

With respect to the responses to questionnaire item number 13, hypothesis number 3.3 was tested by the Mann-Whitney-Wilcoxen Rank Sum Test. The W value was in the acceptance region at $p<.05$, df5. Thus, the test did not permit a rejection of the null. This outcome did not affect the hypothesis testing by chi square analysis.

Respondent Service Status

Perceptions that benefits would accrue from the incorporation of quality management concepts into the military health care system in relation to respondent service status with respect to questionnaire items number 12, 14, 15, 16, and 17 are summarized in Table 4.38, which may be found on the following page.

As the data presented in Table 4.38 indicate, variations in perceptions of the benefits of the incorporation of quality management concepts into military health care as a function of respondent position classification were not statistically significant at $p<.05$. As the null could not be rejected, hypothesis 3.4 by inference was accepted.

With respect to the responses to questionnaire item number 13, hypothesis number 3.4 was tested by the Mann-Whitney-Wilcoxen Rank Sum Test. The W value was in the acceptance region at $p<.05$, df5. Thus, the test did not

permit a rejection of the null. This outcome did not affect the hypothesis testing by chi square analysis.

Table 4.38

Variation in Perceptions of the Benefits Accruing from the Incorporation of Quality Management Concepts into the Military Health Care System in Relation to Respondent Service Status Distribution and Chi Square Results

Respondent Service Status	Benefits Would Accrue		
	Yes	No	Total
Civilian	44	15	59
Uniformed	45	19	64
Total	89	34	123

Calculated chi square:	0.000
Degrees of freedom:	1
Critical value of chi square at p<.05:	3.841
Statistically significant:	No

Respondent Longevity with the Military Health Care System

Perceptions that benefits would accrue from the incorporation of quality management concepts into the military health care system in relation to respondent longevity with the military health care system with respect to questionnaire items 12, 14, 15, 16, and 17 are summarized in Table 4.39 on the following page. As the data presented in Table 4.39 indicate, variations in perceptions of the benefits of the incorporation of

quality management concepts into military health care as a function of respondent position classification were not statistically significant at $p<.05$. As the null could not be rejected, hypothesis 3.5 (the perception of the benefits of quality management as a function of respondent longevity) by inference was accepted.

Table 4.39

Variation in Perceptions of the Benefits Accruing from the Incorporation of Quality Management Concepts into the Military Health Care System in Relation to Respondent Longevity Distribution and Chi Square Results

Respondent Longevity	Benefits Would Accrue		
	Yes	No	Total
10 years or longer	51	14	65
Less than 10 years	38	20	58
Total	89	34	123

Calculated chi square:	2.700
Degrees of freedom:	1
Critical value of chi square at $p<.05$:	3.841
Statistically significant:	No

With respect to the responses to questionnaire item number 13, hypothesis number 3.5 was tested by the Mann-Whitney-Wilcoxen Rank Sum Test. The W value was in the acceptance region at $p<.05$, df5. Thus, the test did not permit a rejection of the null.

Perceptions of the Importance of Patient Satisfaction in Military Health Care

Research question number 4 asked: Do perceptions and attitudes among military health care personnel in relation to the importance of patient satisfaction in the delivery of health care vary according to position classification, age, gender, status, or longevity with the military health care system? Within the entire sample, 58 (47.2%) of the respondents believed that patient care should be accorded the highest priority in hospital situations, while only 35 (28.5%) believed that the highest priority should be accorded to patient satisfaction in operational situations. Conversely, only four (3.3%) believed that patient satisfaction should be subordinated to professional assessments of desired medical outcomes and military objectives in hospital situations, while 18 (14.6%) believed such subordination was appropriate in operational situations. Five hypotheses were tested in relation to this research question to assess the effects on these perceptions of position classification, age, gender, status, and longevity with the military health care system. The results of this hypotheses testing are presented in the following discussions.

Position Classification

Hypothesis number 4.1 was tested by the Kurskal-Wallis Test. The calculated value of H was 10.54, while the critical value of H at $p<.05$, df5 was 11.070. Thus, the Kruskal-Wallis Test did not permit a rejection of the null, and the hypothesis by inference was accepted.

Respondent Age

Hypothesis number 4.2 was tested by the Mann-Whitney-Wilcoxen Rank Sum Test. The W value was in the acceptance region at $p<.05$, df5. Thus, the test did not permit a rejection of the null, and the hypothesis by inference was accepted.

Respondent Gender

Hypothesis number 4.3 in relation to perceptions of the priority that should be assigned to patient satisfaction in hospital situations with respect to respondent gender was tested by the Mann-Whitney-Wilcoxen Rank Sum Test. The W value was in the acceptance region at $p<.05$, df5. Thus, the test did not permit a rejection of the null, and the hypothesis by inference was accepted.

Hypothesis number 4.3 in relation to perceptions of the priority that should be assigned to patient satisfaction in operational situations with respect to respondent gender was tested by the Mann-Whitney-Wilcoxen Rank Sum Test. The W value was in the acceptance region

at p<.05, df5. Thus, the test did not permit a rejection of the null, and the hypothesis by inference was accepted.

Respondent Service Status

Hypothesis number 4.4 in relation to perceptions of the priority that should be assigned to patient satisfaction in hospital situations with respect to respondent service status was tested by the Mann-Whitney-Wilcoxen Rank Sum Test. The W value was in the acceptance region at p<.05, df5. Thus, the test did not permit a rejection of the null, and the hypothesis by inference was accepted.

Hypothesis number 4.4 in relation to perceptions of the priority that should be assigned to patient satisfaction in operational situations with respect to respondent service status was tested by the Mann-Whitney-Wilcoxen Rank Sum Test. The W value was not in the acceptance region at p<.05, df5. Thus, the test did permit a rejection of the null, and the hypothesis by inference was rejected.

Respondent Longevity with the Military Health Care System

Hypothesis number 4.5 in relation to perceptions of the priority that should be assigned to patient satisfaction in hospital situations with respect to respondent longevity was tested by the Mann-Whitney-Wilcoxen Rank Sum Test. The W value was in the acceptance

region at p<.05, df5. Thus, the test did not permit a rejection of the null, and the hypothesis by inference was accepted.

Hypothesis number 4.5 in relation to perceptions of the priority that should be assigned to patient satisfaction in operational situations with respect to respondent longevity was tested by the Mann-Whitney-Wilcoxen Rank Sum Test. The W value was in the acceptance region at p<.05, df5. Thus, the test did not permit a rejection of the null, and the hypothesis by inference was accepted.

Perceptions of the Importance of Patient Satisfaction in Military Health Care

Research question number 5 asked: Do attitudes among military health care personnel in relation to factors that would affect the incorporation of quality management concepts into military health care delivery organizations vary according to position classification, age, gender, status, or longevity with the military health care system? Within the entire sample, 50 (40.7%) indicated a willingness to work in a mutually reinforcing teamwork situation, while 45 (36.6%) indicated an unwillingness, and the remaining 28 (22.7%) were undecided. Five hypotheses were tested in relation to this research question to assess the effects on these perceptions of

position classification, age, gender, status, and longevity with the military health care system. The results of this hypotheses testing are presented in the following discussions.

Position Classification

Hypothesis number 5.1 was tested by the Kurskal-Wallis Test. The calculated value of H was 10.98, while the critical value of H at $p<.05$, df5 was 11.070. Thus, the Kruskal-Wallis Test did not permit a rejection of the null, and the hypothesis by inference was accepted.

Respondent Age

Hypothesis number 5.2 was tested by the Mann-Whitney-Wilcoxen Rank Sum Test. The W value was in the acceptance region at $p<.05$, df5. Thus, the test did not permit a rejection of the null, and the hypothesis by inference was accepted.

Respondent Gender

Hypothesis number 5.3 was tested by the Mann-Whitney-Wilcoxen Rank Sum Test. The W value was in the acceptance region at $p<.05$, df5. Thus, the test did not permit a rejection of the null, and the hypothesis by inference was accepted.

Respondent Service Status

Hypothesis number 5.4 was tested by the Mann-Whitney-Wilcoxen Rank Sum Test. The W value was in the acceptance region at $p<.05$, df5. Thus, the test did not permit a rejection of the null, and the hypothesis by inference was accepted.

Respondent Longevity with the Military Health Care System

Hypothesis number 5.5 related to respondent longevity was tested by the Mann-Whitney-Wilcoxen Rank Sum Test. The W value was in the acceptance region at $p<.05$, df5. Thus, the test did not permit a rejection of the null, and the hypothesis by inference was accepted.

Chapter Summary

A total of 25 hypotheses were tested. Each of the five hypotheses associated with research questions number one, two, three and five were rejected. Acceptance of the hypotheses related to research question number four occurred in relation to operational situations with respect to respondent classification and respondent service status, but the hypotheses were rejected in relation to hospital situations.

The general rejection of the research hypotheses does not compromise the usefulness of this research. What the rejection of these hypotheses indicates is that

most attitudes and perceptions among military health care personnel toward quality management concepts are relatively universal regardless of organizational or demographic differences among these individuals.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to measure the level of quality management awareness among military health care professionals, military health care administrators, other military health care personnel, and technicians at military health care institutions. The goals of such measurement were the identification of perceptions of the role of quality management in military health care delivery settings, and the development of recommended strategies to facilitate the integration of quality management concepts into military health care environments.

Five research questions were investigated through the testing of 25 hypotheses. The research found that awareness of quality management concepts was widespread among the members of the research sample, and that this awareness was not conditioned on differences among military health care personnel associated with position classification, age, gender, service status, or longevity with the military health care system. The research also found that the perception that quality management concepts on a conceptual level were compatible with the delivery of military health care in hospital situations was widely

held among military health care personnel, and that this perception was not conditioned on differences among military health care personnel associated with position classification, age, gender, service status, or longevity with the military health care system. Important in this context, however, was the finding of a disagreement related to the compatibility of quality management concepts and the delivery of military health care in operational situations. Physicians and medical technicians tended to reject the compatibility of quality management concepts and the delivery of military health care in operational situations, while such compatibility was accepted by registered nurses, administrators, and other military health care personnel. Personnel classified as other healing arts split evenly on the issue. With respect to the issue of compatibility in operational situations, the perceptions of military health care personnel also varied in relation to gender (males tending to reject and females tending to accept compatibility in operational situations), and service status (uniformed personnel tending to reject and civilian personnel tending to accept compatibility in operational situations). The research also found that the perception was widely held among military health care personnel that the incorporation of quality management concepts by military health care organizations could lead to improvements in levels of patient care and organizational

efficiency, and that this awareness was not conditioned on differences among military health care personnel associated with position classification, age, gender, service status, or longevity with the military health care system.

The findings of the research in relation to the importance of the concept of patient satisfaction in the delivery of military health care tended to vary according to the venue within which such health care was delivered. While the primacy of patient satisfaction was widely supported in relation to hospital situations, such primacy tend to be rejected in relation to operational situations.

With respect to the attitudes toward factors that would facilitate the incorporation of quality management concepts into the delivery of military health care, the research performed in the conduct of this study found that less than one-half (40.7%) of the members of the research sample expressed positive attitudes toward these factors, while almost as many (36.6%) expressed negative attitudes toward these factors, and the remaining members of the research sample (22.7%) were undecided. These findings were not affected by differences among military health care personnel associated with position classification, age, gender, service status, or longevity with the military health care system.

Conclusions

Before stating the conclusions that were drawn from the findings of this study, it is necessary to discuss a methodological limitation associated with the study. The survey instrument employed in this study was somewhat brief when compared to the complexity of the investigation. Thus, it is prudent to state that the conclusions drawn from the findings of this study may not be generalizable beyond the participating organization from which the data were collected.

One important conclusion drawn from the findings of this study is that the knowledge base required for a successful implementation of quality management concepts into the delivery of military health care is sufficiently strong to facilitate such an implementation. Therefore, military health care organizations would not face enormous educational and training tasks and costs if a decision was made to incorporate quality management concepts into their operations.

Another important conclusion drawn from the findings of this study is that the incorporation of quality management concepts into the delivery of military health care in hospital situations would likely meet little resistance from military health care personnel, but that such an incorporation in operational situations would likely prove to be a highly divisive issue. The fact

that physicians tend to reject the compatibility of quality management concepts with the delivery of military health care in operational situations implies that such an effort would likely fail if it were attempted.

There is a finding that a substantial proportion of military health care personnel do not hold favorable attitudes toward factors that are necessary for the success of quality management programs (teamwork in all situations, and customer satisfaction in operational situations, as examples). This finding implies that, although a majority of military health care personnel may accept the relevance of quality management concepts for military health care at an intellectual level, these same personnel tend to reject such relevance in practice. Thus, the successful incorporation of quality management concepts into the delivery of military health care would likely fail in the absence of an intensive effort to persuade military health care personnel of the relevance of quality management to their own particular function.

Recommendations

Quality management concepts will likely prove to be beneficial in the delivery of military health care. It is recommended, however, that the incorporation of quality management concepts into the delivery of military health care be limited to hospital situations. Any attempt to

incorporate quality management concepts into the delivery of military health care in operational situations will likely meet resistance sufficiently strong to compromise such introduction in hospital situations as well. A further recommendation is that no effort be made to incorporate quality management concepts into the delivery of military health care in hospital situations in the absence of a program that develops a specific relevance between quality management and each functional area in the military health care system.

REFERENCES

Armstrong, L., & Symonds, W. C. (1991, October 29). Beyond "may I help you?". Business Week, pp. 100-103.

Atchison, T. A. (1992). TQM: The questionable movement. Healthcare Financial Management, 46(3), 15, 18.

Atkinson, P. E. (1990). Creating culture change: The key to successful total quality management. San Diego, CA: Pfeiffer & Co.

Banham, R. (1993). TQM helps hospitals improve care. Business and Health, 11, 14-15, 17, 19.

Banner, D. K. (1992). Self-managing work teams (SMWT) and the human resource function. Management Decisions, 30(3), 40-45.

Barrett, M. J. (1993). Continuous quality improvement as an organizational strategy. Healthcare Financial Management, 47, 20.

Barton, R. R. (1991). Group dynamics. CIO, 4(12), 58-59.

Bell, B. (1992). Quality in health care. Business Quarterly, 57, 132-136.

Buterbaugh, L. (1992). TQM: The quality care revolution. Medical World News, 33(6), 17-21.

Cleverly, W. O., & Harvey, R. K. (1992). Is there a link between hospital profit and quality? Healthcare Financial Management, 46(9), 40, 44.

Davis, V. S. (1992). Self-audits: First step in TQM. HRMagazine, 37, 39-41.

Deming, E. (1986). Out of crisis. Cambridge: Massachusetts Institute of Technology.

Denton, D. K. (1992). Multi-skilled teams replace old work systems. HRMagazine, 37(9), 48-56.

Ealey, L. A. (1988). Quality by design: Taguchi methods and U.S. industry. New York: ASI Press.

Emory, C. W. (1990). Research methods (5th ed.). Homewood, IL: Richard D. Irwin, Inc.

Eubanks, P. (1992, September 20). A hospital's teamwork and CQI advance shared vision. Hospitals, 66, pp. 57-58.

Feigenbaum, A. V. (1992, November 20). TQM: Health care can learn from other fields. Hospitals, 66, p. 56.

Galagan, P. A. (1992). Managing the white space. Training & Development Journal, 46(8), 26-30.

Gerber, B. (1992). Can TQM cure health care? Training, 29, 25-34.

Gilbert, G. (1993, January 4). Customer satisfaction measurement is core of firm's quality improvement. Marketing News, 27, p. 18.

Gortner, H. F., Mahler, J., & Nicholson, J. B. (1989). Organizational theory. Pacific Grove, CA: Brooks/ Cole Publishing Co.

Hamilton, J. (1993, January 5). Toppling the power of the pyramid: Team-based restructuring for TQM patient-centered care. Hospitals, 67, pp. 38, 40-41.

Hammonds, K. H., & DeGeorge, G. (1991, October 29). Where did they go wrong? Business Week, pp. 34-36.

Haney, R. W., & Beaman, C. D. (1993, January). Management leadership critical to CQI success. Hospitals, 66, p. 64.

Hart, C., & Schlesinger, L. (1991). Total quality management and the human resource professional. Human Resource Management, 30(4), 433-454.

Hauser, J. R., & Clausing, D. (1988). The house of quality. Harvard Business Review, 88(3), 63-73.

Holleran, M. (1992). Most hospitals measure satisfaction incorrectly. Healthcare Financial Management, 26, 4.

Horak, B. J., Guarino, J. H., Knight, C. C., & Kweder, S. L. (1991). Building a team medical floor. Health Care Management Review, 16(2), 55-71.

Horine, P. D. (1993). Healthcare financial managers and CQI. Healthcare Financial Management, 47, 34, 36-37.

Ishikawa, K. (1991). Guide to quality control. Tokyo: Asian Productivity Organization.

Is your team just a fad? (1992). Training, 29(8), 67-68.

Jablonski, R. (1992). Customer focus: The cornerstone of quality management. Healthcare Financial Management, 46, 17-18.

Jeffer, E. K. (1991). Total quality management and the Army health care system. Military Medicine, 156(10), 546-550.

Jin, P. (1993). Work motivation and productivity in voluntarily formed work teams. Organizational Behavior and Human Decision Processes, 54(2), 133-155.

Kackar, R. N. (1985). Off-line quality control, parameter design, and the Taguchi method. Journal of Quality Technology, 17(4), 176-209.

Kackar, R. N. (1986). Taguchi's quality philosophy: Analysis and commentary. Quality Progress, 19(12), 21-29.

Kimberly, J. R., & Rottman, D. B. (1987). Environment, organization and effectiveness: A biographical approach. Journal of Management Studies, 24, 596-619.

Koska, M. T. (1992, November 5). Surveying customer needs, not satisfaction, is crucial to CQI. Hospitals, 66, pp. 50, 52-53.

Larson, C. E., & LaFasto, F. M. (1989). Team work. Newbury Park, CA: Sage Publications.

Lester, R. H., Enrick, N. L., & Mottley, H. E., Jr. (1991). Quality control for profit (3rd ed.). New York: Marcel Dekker, Inc.

Mahlen, K. A. (1993). Achieving superior performance through process improvement. Healthcare Financial Management, 47, 45-46, 48-49.

Miller, A., & Camp, B. (1985, Winter). Exploring determinants of success in corporate ventures. Journal of Business Venturing, 87-105.

Nevers, R. L. (1993). Defining quality is difficult, but necessary. Healthcare Financial Management, 47, 18.

Nutt, P. C. (1990). Making tough decisions. San Francisco: Jossey-Bass Publishers.

Owens, T. (1991). The self-managing work team. Small Business Reports, 15(2), 53-65.

Peters, T., & Waterman, R. (1982). In search of excellence from America's best run companies. New York: Harper & Row.

Phipps, B. L. (1992). Accept the challenge of quality. Healthcare Financial Management, 46, 10.

Richards, D. T., & O'Donnell, J. F. (1993). Quality assurance. JAMA, 270(17), 2102-2103.

Ross, A. (1992). The long view of leadership. Canadian Business, 65(5), 46-51.

Rowe, A. J., Mason, R. O., & Dickel, K. (1992). Strategic management and business policy (3rd ed.). Reading, MA: Addison-Wesley Publishing Co.

Scherekenbach, W. W. (1991). The Deming route to quality and productivity. Washington, DC: Ceep Press Books.

Schmidt, M. S., & Meile, L. C. (1989). Taguchi designs and linear programming speed new product formulation. Interfaces, 19(5), 49-56.

Sergiovanni, T. J., & Carver, F. D. (1990). The new school executive (4th ed.). New York: Dodd, Mead and Co.

Sibben, M. T. (1992). Improving work processes improves productivity, quality. Healthcare Financial Management, 46, 17.

Siwicki, B. (1992). GOOD campaign generates ideas. Healthcare Financial Management, 46, 105, 107-108.

Solovy, A. T. (1993, March 5). Champions of change. Hospitals, 67, pp. 14-19.

Summers, G. W., Peters, W. S., & Armstrong, C. P. (1993). Statistics for business and economics (6th ed.). Belmont, CA: Wadsworth Publishing Co.

Taguchi, G. (1987). System of experimental design. Dearborn, MI: American Supplier Institute.

Taguchi, G. (1990). Taguchi's quality imperatives. Harvard Business Review, 90(1), 66.

Taguchi, G., & Clausing, D. (1990). Robust quality. Harvard Business Review, 90(1), 65-75.

Tersine, R. J. (1993). Production/operations management (3rd ed.). New York: North-Holland.

Tokarski, C. (1989). Multi-unit providers survey. Modern Healthcare, 19(21), 96, 98.

Walton, M. (1988). The Deming method of management. New York: Perigee Books.

Weinheimer, C. F. (1993). TQM is here to stay. Healthcare Financial Management, 47, 10.

Zablocki, E. (1993). Quality management targets health care. Nation's Business, 81, 40, 42-43.

Appendix

SURVEY QUESTIONNAIRE

This questionnaire is being administered as a part of a research study of the application of quality management techniques in the military health care environment. The population of interest in this study is comprised of all military health care personnel in the armed forces of the United States, both uniformed and civilian. The immediate population from which the research sample for the study was drawn are the military health care personnel assigned to the Madigan Army Medical Center.

You are a part of a sample of 150 persons selected through the application of random procedures. A total of 25 persons were selected from each of the following personnel classifications: (1) professional (physician); (2) professional (nurse); (3) professional (healing arts other than physician and nurse); (4) medical technicians; (5) administrators; and (6) other military health care personnel.

The confidentiality of your responses to the survey questionnaire will be both protected and respected. Name lists of persons surveyed will be destroyed once the survey questionnaires have been collected from respondents. No respondent names will appear on the survey questionnaires, and no coding system will be used that will permit a correlation of specific responses with specific individuals.

You are requested to respond to each questionnaire item. Response alternatives are provided. Please select the alternative that best describes your particular situation or that best reflects your knowledge, opinion, or perception.

1. Your military health care personnel classification is:

( ) Physician.

( ) Registered Nurse.

( ) Healing arts other than physician or RN.

( ) Medical technician.

( ) Administrator.

( ) Other.

2. Your age is:

   ( ) 40 years old or older.

   ( ) 30-39 years old.

   ( ) Under 30 years old.

3. Your gender is:

   ( ) Female.

   ( ) Male.

4. Your status is:

   ( ) Civilian.

   ( ) Uniformed.

5. Your longevity with the military health care system is:

   ( ) 10 years or longer.

   ( ) 5-9 years.

   ( ) Less than 5 years.

6. Indicate which of the following concepts with which you are familiar (multiple response OK).

   ( ) Total Quality Management.

   ( ) Continuous Quality Improvement.

   ( ) Health Care Teams.

7. In your opinion, are quality management concepts generally compatible with the delivery of health care in military settings?

   ( ) Yes.

   ( ) No.

8. On a conceptual level, do you believe that the integration of quality management concepts into military health care activities in hospital situations is appropriate?

( ) Yes.

( ) No.

9. On a conceptual level, do you believe that the integration of quality management concepts into military health care activities in operational situations is appropriate?

( ) Yes.

( ) No.

10. If you responded affirmatively to question number 8, indicate which quality management concepts you think are compatible with health care delivery in military hospitals.

( ) TQM.

( ) CQI.

( ) HCT.

11. If you responded affirmatively to question number 9, indicate which quality management concepts you think are compatible with health care delivery in military operational situations.

( ) TQM.

( ) CQI.

( ) HCT.

12. How do you rate the level of patient care delivered by your unit?

( ) High.

( ) Moderate.

( ) Low.

13. Do you think that the level of care delivered by your unit would be improved if a quality management program were implemented in your unit?

( ) Yes.

( ) No.

14. If you responded affirmatively to the preceding question, indicate which quality management concepts you think would lead to improvements in the level of care delivered by your unit.

    ( ) TQM.

    ( ) CQI.

    ( ) HCT.

15. How do you rate the efficiency of your unit in the use of available resources?

    ( ) High.

    ( ) Moderate.

    ( ) Low.

16. Do you think that the efficiency with which your unit uses available resources would be improved if a quality management program were implemented in your unit?

    ( ) Yes.

    ( ) No.

17. If you responded affirmatively to the preceding question, indicate which quality management concepts you think would lead to improvements in the efficiency of use of available resources by your unit.

    ( ) TQM.

    ( ) CQI.

    ( ) HCT.

18. What priority do you believe should be placed on patient satisfaction in the delivery of military health care in hospital situations?

    ( ) The highest priority.

    ( ) A priority equal to other objectives.

    ( ) Should be subsidiary to professional assessments of desired medical outcomes.

( ) Should be subsidiary to professional assessments of desired medical outcomes, and to professional assessments of other military objectives.

19. What priority do you believe should be placed on patient satisfaction in the delivery of military health care in operational situations?

( ) The highest priority.

( ) A priority equal to other objectives.

( ) Should be subsidiary to professional assessments of desired medical outcomes.

( ) Should be subsidiary to professional assessments of desired medical outcomes, and to professional assessments of other military objectives.

Please use the following scale to respond to each item. If you strongly agree with the statement, please write 1 on the line proceeding the statement, 2 if you simply agree, 3 if undecided, 4 if you disagree, and 5 if you strongly disagree. Please respond to each in an open and frank manner. Do not answer each item as you think it should be done or as you think it would be best--answer each item as you actually perform your job.

20. Every day I make an effort to meet the needs of other people in my organization.

21. As a rule of thumb I focus my work on my own department's needs.

22. I do not need input from others to do my job well.

23. I am able to determine what my "customers" want without asking.

24. I take time each week to determine if my work can be streamlined or simplified.

25. Efforts are being made throughout the entire hospital to reduce duplication of work.

26. Since patient needs are unique, patient care can not be standardized.

27. I have found that actually listing or drawing a diagram of potential causes has been helpful in identifying the real cause(s) of a problem.

28. My focus is that though there are numerous committees working to change things, few things ever truly change in my organization.

29. In a hospital it is too difficult to get people from other departments together to work on solving a problem.

Biography

John A. Fullinwider was born in Santa Ana, California in 1953. He graduated from Patrick Henry High School, San Diego, California in 1972. After graduation he traveled extensively following odd jobs in the western United States. He began his military career in 1978 as an Armored Vehicle crew member and later retrained as an Air Traffic Control specialist. During the course of his military enlistment, he attended Embry-Riddle Aeronautical University, Daytona Beach, Florida, graduating with a Bachelor of Professional Aeronautics degree in 1989. After a short respite he continued his education at the graduate level at Chapman University, Orange, California, earning a Master of Science degree in Human Resources and Systems Management in 1992. The culmination of his university experience is the completion of a Doctorate of Philosophy in Administration and Management at Walden University, Minneapolis, Minnesota.

John is currently serving the Department of the Army as a military representative in the Northwest Mountain Headquarters of the Federal Aviation Administration in Seattle, Washington. He is a faculty assistant for curriculum design at Chapman University, aiding in the developing curriculum in organizational leadership. He is also a part time instructor at the Northwest Indian College, Tacoma, Washington. Northwest Indian College is an accredited institution that belongs to a consortium of twenty-eight colleges throughout the country dedicated to serving Native American peoples. John is part Choctaw Indian and takes particular pride in his Native American heritage.