Published in final edited form as:

Nurs Forum. 2010 ; 45(1): 40–53. doi:10.1111/j.1744-6198.2009.00160.x.

Economic Theory and Nursing Administration Research—Is This a Good Combination?

Terry L. Jones, RN, PhD and

Assistant Professor Clinical Nursing, The University of Texas at Austin, Dallas, TX

Linda Yoder, RN, MBA, PhD, AOCN, FAAN

Associate Professor Nursing Administration & Healthcare Systems Management, The University of Texas at Austin, Dallas, TX

Abstract

TOPIC—Economic theory is used to describe and explain decision making in the context of scarce resources.

PURPOSE: This paper presents two applications of economic theory to the delivery of nursing services in acute care hospitals and evaluates its usefulness in guiding nursing administration research.

SOURCES OF INFORMATION—The description of economic theory and the proposed applications for nursing are based on current nursing, healthcare, and economic literature. Evaluation of the potential usefulness of economic theory in guiding nursing administration research is based on the criteria of significance and testability as described by Fawcett and Downs.

CONCLUSIONS—While economic theory can be very useful in explaining how decisions about nursing time allocation and nursing care production are made, it will not address the issue of how they should be made. Normative theories and ethical frameworks also must be incorporated in the decision-making process around these issues. Economic theory and nursing administration are a good fit when balanced with the values and goals of nursing.

Search terms

Economic theory; nursing administration; nursing care

Introduction and Background

Concern about the quality and safety of patient care in acute care hospitals has received widespread attention since the publication of the landmark Institute of Medicine (IOM) report, which estimated that over 98,000 Americans die annually as a result of errors in their care (IOM, 2000). The nature of the hospital work environment and workforce were subsequently identified as significant contributing factors to unsafe and poor quality care. Nursing services, representing the largest proportion of the hospital workforce and the provider patients spend the most time with, were recognized as being indispensable to

patient safety and quality (IOM, 2001). The research community has responded with a host of investigations exploring the effect of nursing services on healthcare outcomes. Much of this research, termed “nursing administration research” (Jennings, 2004), has involved secondary analyses of large administrative data sets. The yield from this approach is a body of evidence demonstrating an association between nurse staffing and selected adverse patient outcomes (Kane, Shamliyan, Mueller, Duval, & Wilt, 2007). Evidence sufficient to establish underlying causal mechanisms between nursing services and patient outcomes, however, has yet to be demonstrated. Despite the forward progress, historical approaches to nursing administration research have received criticism. One such criticism involves the absence of a clearly defined theoretical framework to guide inquiry (Mark, Hughes, & Jones, 2004).

The characterization of nursing administration research as largely atheoretical has validity and warrants thoughtful consideration. The world today is complex and dynamic. We understand this world through not one, but multiple theories from multiple disciplines including the physical, biological, and social sciences. This is no less true for the world of healthcare delivery and nursing administration. Rising costs, declining quality, rising demand, and declining personnel pools collectively cry for a better understanding of the world of health care to create sustainable solutions. Those interested in advancing the science in nursing administration and healthcare delivery must identify theories that best contribute to our current understanding of this environment and are useful guides for research. Gaps in our understanding can then be identified, and data on essential elements can be intentionally collected to help close those gaps.

It is important that nursing leaders from service and from academia engage in scholarly discourse around this issue. The purposes of this article are to contribute to this discourse and to evaluate the potential usefulness of economic theory as a guide for inquiry into the provision and study of nursing services in acute care hospitals. An overview of economic theory is provided, and two potential applications for nursing presented. Lastly, a discussion of the potential usefulness of these applications, guided by evaluative criteria established by the seminal work of Fawcett and Downs (1986), is presented.

Overview of Economic Theory

The discipline of economics is a branch of the social sciences concerned with how people make choices and why they make the choices they do. More specifically, economic theory is a decision-making model for how people allocate scarce resources (Scott, Solomon, & McGowan, 2001; Wessels, 2006). Economic theory is based on a model of human behavior that assumes rationality, a primary motivation to be happy, and the ability to calculate subtle differences between possible trade-offs. The goal of economic theory is accurate prediction of the choices people make regarding resource allocation. This is achieved through the development and testing of economic models. It is important to note that these models are designed to test positive (what is) rather than normative (what should be) statements. In this sense, economics is said to be an amoral science (Flynn, 2005). It is also important to note that these models have been designed to test decision-making from the perspective of various levels of decision-makers (economic agents), ranging from individuals and production firms to governments. The branch of economic study concerned with decision-

making by individuals and production firms is known as microeconomics (Depken, 2006). Microeconomic theory applied to individuals generally focuses on consumer decision-making—what individuals purchase when resources are limited. When applied to production firms the focus is on how much of a good or service to produce, what resources are required to produce the good or service, and how to maximize efficiency of production. Macroeconomics is the study of decision-making by national and global economic agents (Depken, 2006).

Economic theory is based on a model of human behavior that assumes rationality, a primary motivation to be happy, and the ability to calculate subtle differences between possible trade-offs.

Among the main elements of economic models are the concepts of scarcity, utility, cost, supply, demand, price, and marginal analysis. A good or service is said to be scarce when more is desired than can be satisfied with available resources—when demand exceeds supply. In the setting of scarcity, the need for choice is created. When the supply of a good or service is insufficient to meet all needs, decisions must be made regarding which needs would be met and which will remain unfulfilled. Decision-making is conceived as a three-step process: (a) an evaluation of how much happiness is associated with each possible option; (b) an assessment of the constraints and trade-offs limiting the options; and (c) choosing the option that maximizes overall happiness (Flynn, 2005). Conceptual models of this process from the perspective of individual consumers and production firms are provided in Figures 1 and 2, respectively.

The first step requires that happiness be measured and compared across all possible options. Given that happiness has many aspects, including, but not limited to, pleasure and satisfaction, economists conceived an all-inclusive concept of happiness called “utility” that allows for a comparison of happiness across vastly different things. High utility is placed on things one likes a lot. Low or even negative utility is placed on things one does not like. The second step requires a comparison of the cost or value of each option. In the setting of scarce resources, a choice for one option is a choice against another. Cost must therefore be assessed based not only on what was selected, but also on the consequences of not selecting another option. Opportunity cost is the value of the next best option that is not selected (Wessels, 2006).

The third step of the process is a cost–benefit analysis—do the benefits of selecting one option outweigh the consequences of not selecting another? From the perspective of a production firm, this cost–benefit analysis is said to include a marginal analysis. In the most simplistic form, cost traditionally reflects monetary expenditures on wages and supplies, and benefit reflects the price at which the good or service can be sold to produce profit. Firms must make decisions about the purchase of resources and how much of their good or service to produce. Marginal analysis involves an assessment of the cost of one unit of the resource to be purchased (marginal cost) and the derived benefit of one additional unit produced and sold (marginal benefit). The change in net benefits is the difference between marginal benefit and marginal cost. A positive net benefit equates to profit and theoretically, utility/happiness for the firm (Wessels, 2006).

The relationships between demand, supply, and price in the context of economic theory are based on the assumption of a free market. A market exists when buyers and sellers come together to trade currency (resources) for goods and services. A pure or free market exists when consumers and firms control allocation of resources and production, and the government plays a limited role (Carande-Kulis, Getzen, & Thacker, 2007; Depken, 2006; Scott et al., 2001; Wessels, 2006). Production of goods and services is said to be influenced by the costs of production factors and the market price for the good or service in accordance with the laws of supply and demand. The law of demand states that the demand for a good or service is inversely related to its market price—demand decreases when prices rise and increases when prices fall. The law of supply states that the supply (volume of production) of a good or service is directly and positively related to its market price (Depken, 2006; Wessels, 2006).

Market price for a good or service is thus a surrogate marker for the benefit of production. Firms will likely produce more of a good or service in response to an increase in benefit (market price) and less in response to a decrease in benefit (market price). A shortage in supply of production factors typically increases the cost of such factors. In the context of a good or service with high utility, the expected response is an increase in price to compensate for the increase in cost. In other words, goods and services with high utility have high demand. When consumers demand more of a good or service and are willing to pay a market price that exceeds costs, production firms are likely to increase the supply by way of increased production. The relationships between supply, price, and demand essentially create homeostatic feedback loops that regulate the production of goods and services. The outcome of this internal or “self”-regulation is said to be a state of market equilibrium—i.e., the price at which the quantity of goods and services demanded equals the quantity produced (Depken, 2006; Wessels, 2006).

Nursing as an Economy

Few would argue that scarcity of resources plagues our current healthcare environment. Reports of missed nursing care and rationing of nursing care because of inadequate staff now appear in the literature with increasing frequency (Kalisch, Landstrom, & Williams, 2009; Schubert, Glass, Clarke, Schaffert-Witvliet, & DeGeest, 2007). Decisions regarding allocation of nursing care significantly impact the financial performance of hospitals, the job satisfaction of nurses, and most importantly, the health outcomes of patients (Aiken, 2008; Aiken, Clarke, & Sloane, 2000; Aiken, Clarke, Sloane, Lake, & Cheney, 2008). A better understanding of how such decisions are made and the full spectrum of consequences associated with such decisions is needed. Following is a discussion of how economic theory, specifically, microeconomic theory, might be applied to nursing and contribute to a better understanding of nursing care production and allocation in acute care hospitals.

The Nurse as a Consumer

For an individual nurse, time is his or her currency, and nursing care activities are the services that must be purchased with the time available. Nurses can thus be conceived as consumers—they spend their time to buy services for their patients. In this context, nursing

time and nursing service are effectively synonymous. Each nurse begins a shift with a finite amount of time (typically a fixed income of 8 or 12 hr) that must be divided among assigned patients. Individual nursing activities are associated with variable costs relative to time. A simple peripheral intravenous dressing change takes less time to complete than a large abdominal dressing change, and teaching for a patient with a fresh limb amputation may take longer than the administration of a scheduled oral medication.

For an individual nurse, time is his or her currency, and nursing care activities are the services that must be purchased with the time available. Nurses can thus be conceived as consumers—they spend their time to buy services for their patients.

When the need for nursing care activities from assigned patients exceeds a nurse's available time, the condition of scarcity exists, and he or she must make a choice with respect to which services will be provided for which patients. A choice in favor of time spent on service for one patient may be a choice against time spent on service for another. The time spent completing a large dressing change may result in insufficient time left over for thorough patient teaching. In some circumstances, another option would be to increase the time available by working beyond a scheduled shift or working through meal and rest breaks. This is analogous to borrowing currency and incurring debt. Economic theory suggests that a nurse would evaluate the utility of all possible alternatives and then compare the relative costs and benefits of each option before making this choice (see Figure 1). The rational choice would be the option in which the expected benefits outweigh the opportunity cost. In the most simplistic form, such a cost-benefit analysis would involve consideration of the following questions: (a) does the benefit of completing the dressing change for one patient outweigh the cost of not providing thorough teaching for another patient?; (b) does the benefit of providing teaching to one patient outweigh the cost of not completing a dressing change for another patient?; and (c) does the benefit of completing both the dressing change and patient teaching outweigh the cost of working past the end of the shift or working through lunch?

The Nursing Unit as a Production Firm

Nursing units in acute care hospitals can be conceptualized as production firms. Production is defined as the conversion of production factors (land, labor, capital, materials, and technology) into goods and services. Nursing care is the primary service produced by these firms, and a nurse is the primary (but not exclusive) factor used to produce the service. Managers of the nursing production firm are faced with decisions regarding the volume and quality of care that is to be produced and the purchase of required resources. The goal of the firm in economic theory is profit (utility). Profit is achieved when revenue exceeds costs.

Decisions regarding the purchase of resources and production of services are interrelated. These decisions can be approached from two fundamentally different assumptions regarding what drives production. One perspective assumes that production will be driven by need or desire and addresses the question, "What resources must be purchased to provide the desired volume and quality of services?" This perspective assumes a desired volume, and quality of nursing care has been defined and is fixed. The decision to be made involves the number of nurses required to meet the desired volume and quality of nursing care. In other words, we

know how much nursing care is needed for the patients on the nursing unit and we want to know how many nurses are needed to produce that quantity of care.

The second perspective assumes that production will be driven by available resources and addresses the question, “Given the resources available, what volume and quality of service can be produced?” From this perspective, resources are considered fixed. The decision to be made relates to the volume and quality of service to be produced with those existing resources. In other words, we know how many nurses are budgeted and assigned to work on a given nursing unit, and we want to know how much nursing care they can produce and at what level of quality. For the nurse manager, these issues become apparent when collaborating with colleagues in the finance department during budget preparation. Will the volume and quality of nursing care needed by the given patient population drive or be driven by the budget? Will we increase resources (number of nurses) in order to produce the volume and quality of care desired, or will we limit the volume and quality of care produced based on a predetermined and fixed number of nursing staff? Economic theory offers no normative guidance regarding which approach would be preferred.

Economic theory suggests that nurse managers would incorporate marginal analysis (see Figure 2) when making decisions regarding resource input and production output (Depken, 2006; Scott et al., 2001; Wessels, 2006). Marginal analysis is most effective in the setting of an accurate and valid production possibility frontier (PPF) or curve. A PPF is a graphical display of the maximum production output for various combinations of inputs (Buerhaus, 2009; Depken, 2006). A simplified hypothetical PPF for production of nursing care on a nursing unit is illustrated in Figure 3. In effect, the PPF depicts the limit between what can and cannot be produced. Theoretically, a nurse manager could analyze the PPF and determine both the cost and benefit of a proposed change in resource inputs or production outputs. When the proposed change is an increase in the resource input, the cost and benefit of adding one additional nurse would be evaluated. When the proposed change is an increase in the production output, the cost and benefit of increasing production by one unit of nursing care would be evaluated. The rational decision would be to increase resource input only when the marginal benefit exceeds or at least equals the marginal cost. Based on the laws of supply and demand in a free nursing care market, an increase in the market price for nursing care (what buyers are willing to pay) would be expected to increase the benefit (profit) and ultimately, the production of nursing care. Likewise, a decreased supply of nursing care would be expected to increase the market price and ultimately, the production of nursing care.

The PPF would also allow the nurse manager to evaluate the efficiency of the nursing unit (see Figure 3). The PPF curve itself is said to represent maximum efficiency (Depken, 2006; Scott et al., 2001; Wessels, 2006). The area under the curve is considered below maximum efficiency, and production volumes beyond the curve are considered outside the realm of possibility. A nursing unit would therefore be considered inefficient if the volume of nursing care produced on a shift was below the PPF curve for the number of nurses on duty. Increasing the amount of nursing care produced beyond that defined by the curve is considered impossible without other changes in the production process.

Increases in production of nursing care may be achieved through concomitant changes in other production factors aimed at enhancing efficiency. Efficiency, sometimes conceived as productivity, is enhanced when one nurse becomes capable of producing more nursing care in a given amount of time (Finkler & McHugh, 2008). Production factor adjustments that may enhance efficiency include utilization of technology, skill mix changes that facilitate delegation of non-nursing tasks, and changes in policies and procedures that eliminate waste and non-value added activities (Buerhaus, 2009; Finkler, Kovner, & Jones, 2007; Storfjell, Omoike, & Ohlson, 2008; Upenieks, Akhavan, Kotlerman, Esser, & Ngo, 2007). If the need for nursing care falls outside the PPF for the number of nurses on duty for a given shift and additional nurses are not provided, a condition of scarcity is created. Allocation of the scarce resource of nursing care becomes the responsibility of the frontline staff nurse. As described previously and depicted in Figure 1, the outcome of this process may include negative consequences for both patients and nurses. Examples of such consequences include instances of missed care, decreased quality of care, and nurses working overtime and/or through breaks.

Allocation of the scarce resource of nursing care becomes the responsibility of the frontline staff nurse.

Theory and Research

The interdependent relationship between theory and research has been well-articulated in the literature (Fawcett, 1978, 1999; Fawcett & Downs, 1986; Silva, 1977). Theories function to describe, explain, and predict selected properties of reality. Theories bring clarity about phenomena of interest—what things are, how concepts are related, how phenomena happen, and why they happen. Theories provide the context through which we find meaning in our empirical world and are meant to guide selection of specific elements for inquiry. Two potential applications of economic theory for nursing have been presented. The issue at hand is whether or not these applications of economic theory are useful. Does economic theory add to our understanding of the world of nursing administration in a meaningful way? Can economic theory effectively guide nursing administration research to advance the science of nursing? Answers to these questions call for a thoughtful analysis.

The seminal work of Fawcett and Downs (1986) lends a measure of structured guidance for this arduous process and warrants review. Seven criteria to evaluate the relationship between theory and research were identified and described in their original work. The seven criteria fall into the categories of evaluating theory (significance, internal consistency, parsimony, testability), evaluating research design (operational adequacy), evaluating research findings (empirical adequacy), and evaluating utility of theory and research for practice (pragmatic adequacy). A comprehensive review of all seven criteria as applied to economic theory and nursing administration research is beyond the scope of this article. Therefore, this article is limited to an evaluation of the potential usefulness of economic theory in guiding nursing administration research based on two of the seven criteria, significance and testability.

Significance

The criterion of significance as described by Fawcett and Downs (1986) has three major requirements: relevance, precision in prediction, and explanatory power. The general consensus within the nursing community suggests that the phenomena of interest within the discipline of nursing include person, health, environment, and nursing (Fawcett, 1984). The same level of agreement regarding an explicit paradigm of nursing administration has yet to be reached. It has been suggested, however, that the paradigm of a discipline can be induced from an integrated review of its published science (Lynn & Layman, 1996). Reviews of nursing administration and health services science have been reported in the literature, and lists of research priorities have been identified (Hermansdorfer, Henry, Moody, & Smyth, 1990; Lynn & Cobb, 1994; McDaniel, 1990). Inferences regarding the phenomena of interest in nursing administration can reasonably be drawn from these published works as well as from explicitly stated nursing administration practice standards (Scott & Craig, 2008). Decision-making relative to allocation of nursing resources emerges from this literature as an important problem that warrants further study. The economic concepts of scarcity, cost, utility, supply, demand, and marginal analysis appear quite relevant to the discipline in the current healthcare environment.

The criteria of predictive precision and explanatory power as described by Fawcett and Downs are interrelated. Predictive precision refers to the ability of a theory to accurately predict various aspects of the phenomenon of interest including its occurrence and relationships with other phenomena. This requires some degree of objectivity and specificity or narrowness in scope. In contrast, explanatory power refers to the ability of a theory to contribute to general meaning and understanding about the phenomena of interest. This requires a breadth of scope sufficient for generalizability beyond singular individuals, events, or conditions (Fawcett, 1999).

The dynamic interplay between these criteria creates paradoxical situations. The precision paradox described by Fawcett and Downs (1986) is created when a theory precisely predicts outcomes without adding to the understanding of how it was achieved. The power paradox is created when a theory explains how things are related but at a level of abstraction that does not allow precise prediction of outcomes. The significance of a theory is thus tied to its level of abstraction. The hierarchical continuum of abstraction upon which theories exist has been described by Fawcett (2005) as the conceptual–theoretical–empirical structure. Conceptual models fall into the highest level of abstraction, followed by grand theories and then middle range theories. Empirical research methods reflect the lowest level of abstraction and are most concrete. An example of a grand theory that has been applied to nursing administration and health services research is the structure–process–outcome model by Donabedian (1966).

Middle range theories are considered to be most suitable for guiding research (Fawcett & Downs, 1986) because they are limited and concrete enough in scope to allow for prediction while maintaining sufficient generalizability. It is at this level of abstraction that description, understanding, explanation, and prediction are all attainable. Economic theory fits into the middle range theory continuum and provides a better balance of predictive precision and explanatory power than a grand theory on the scale of the Donabedian model. The scope of economic theory is limited to decision-making in the context of scarce resources. It does not

attempt to describe a global process of decision-making for all possible circumstances, or even all business circumstances.

Testability

The testability of a theory is closely related to its level abstraction and is considered by some to be the most important criterion of usefulness. The criterion of testability in the strictest form as described by Fawcett and Downs (1986) has three major requirements: empirically observable concepts, measurable propositions, and falsifiable hypotheses. Concepts are made empirically observable through operational definitions that create empirical indicators. Propositions, the declarative statements about concepts and/or relationships among concepts, must be measurable and refutable. A proposition becomes measurable to the extent that theoretical definitions of concepts are replaced with measurable empirical indicators and linked by a clear description of the nature of the relationship. Relationships between concepts should be described in terms of direction, shape, symmetry, sequence, probability, necessity, contingency, and sufficiency. Measurability and refutability are best achieved when propositions are stated as falsifiable hypotheses. Falsifiable hypotheses are those worded with a modicum of precision, sufficient to allow identification of incompatible results (Fawcett & Downs, 1986).

Usefulness of Economic Theory for Nursing

When applied to the traditional business world, economic theory receives high marks for significance and testability. While economic models do not have perfect predictive power, they have been used extensively in the traditional business world to successfully forecast resource, budget, and production needs. Empirical indicators for utility, supply, demand, price, cost, and production volume have been established for most industries. The nature of relationships among these concepts has been well-described and their associated hypotheses tested (Depken, 2006; Scott et al., 2001; Wessels, 2006). The predictive precision, explanatory power, and testability of economic theory when applied to nursing, however, will likely differ from that achieved in more traditional business environments because of the unique circumstances of the nursing work environment. Significant aspects of the nursing work environment that have an effect on the applicability and usefulness of economic theory for delivery of nursing services include the following: (a) nurses as economic agents must evaluate utility from multiple perspectives; (b) adequate empirical measures of the cost, quantity, and quality of nursing services have yet to be developed and widely implemented; and (c) nursing, such as health care in general, is not a completely free market economy.

The Issue of Utility

The concept of utility with respect to nurses and nursing care has not been sufficiently developed. Nurses allocate their time and services on behalf of themselves as well as others. Nurses are, at once, public servants, members of a professional discipline, and employees. As such, they act on behalf of multiple constituents—their patients, their discipline, and their employer. Other external influences on a nurse's perception of utility likely include various regulatory agencies and third-party payors. Doing good things for each of these constituencies, in turn, may bring personal satisfaction to an individual nurse. Evaluation of

utility in this context becomes complicated. The question of “utility for whom?” must be considered with each decision because definitions and priorities among these constituent groups are not synonymous. Utility from the employer perspective in today’s environment means standardization and efficiency. Utility from the nursing and patient perspective means individualized care. Utility from an individual nurse perspective may mean time for lunch and getting out on time to attend family activities. Nursing ethics and state nurse practice acts clearly guide the nurse to prioritize utility for patients above utility for self, discipline, and employer. However, how does a nurse prioritize utility for one patient over another? Economic theory does not currently address this issue. While economic theory could be adapted to address how nurses actually prioritize care, the issue of how they should prioritize care must be addressed by other normative theoretical and ethical frameworks.

The volume and nature of all of the possible alternatives to be considered by the nurse consumer also adds to the complexity of decision-making. Despite the recent focus on evidence-based practice, the costs and benefits of many nursing activities have not been adequately documented. At any given moment, a nurse must weigh the costs and benefits of numerous nursing activities needed by multiple patients. From an information processing perspective, one must wonder if there is a limit to the number of possible alternatives a human can adequately evaluate at a given time. Assuming there is a limit, and assuming that for some possible alternatives, the cost–benefit information is lacking, one must question the potential for rational decision-making in such an environment. The usefulness of economic theory to guide accurate prediction of nursing time allocation by individual nurses will depend on how the concept of utility for staff nurses evolves and how these issues are addressed in economic models.

Despite the recent focus on evidence-based practice, the costs and benefits of many nursing activities have not been adequately documented.

The Issue of Empirical Measures

Nursing care as a product and service is difficult to measure, and effective empirical indicators for many of the key economic concepts in the context of nursing have yet to be established. Absent these indicators, predictive precision, measurable propositions, and falsifiable hypotheses are challenging. Measurement of nursing care as a singular intervention or unit of service is problematic (Finkler & McHugh, 2008). Nursing care is composed of a host of individual nursing activities. Each patient requires a different combination of these activities on each shift. It is therefore difficult to conceive of a PPF that can account for all possible combinations of nursing activities generated by a single nurse and/or required for different combinations of assigned patients. Further, the volume and quality of nursing care produced by an individual nurse is very context-dependent. Production of nursing care is effected by various other aspects of the nursing work environment including available technology, physical design of the unit, patient acuity, available support staff, and collaborative relationships among providers. Given the variation in these factors across nursing units within and between hospitals, the benefit of a single nurse on production of nursing care has limited generalizability. Multiple economic models based on various assumptions regarding the presence of these factors will be needed to enhance predictive power across different types of nursing units. This has significant

implications for proponents of mandated patient ratios because failure to account for such contextual variation will result in both understaffed and overstaffed units (Buerhaus, 2009).

Lacking a reasonable PPF, marginal analysis to support effective decision-making becomes complicated and problematic. Current cost accounting systems and reimbursement structures are not conducive to determining the true cost and price of nursing care (Dall, Chen, Seifert, Maddox, & Hogan, 2009; Finkler & McHugh, 2008). The benefit of a single unit of nursing care cannot be adequately evaluated nor a monetary price reasonably determined.

Consequently, nursing care is not itemized in the current reimbursement system but, rather, is bundled together with room and board. In effect, the price of nursing care is the same for every patient every day within the same level of care (intensive care unit costs more than acute care medical surgical bed) regardless of the actual care delivered (Watson, 2009).

When the price for nursing care does not appear on the accounting ledger, the benefit of nursing care production may not be obvious or highly visible to colleagues in the finance department. The labor costs for nurses, however, do appear on the accounting ledger, which contributes to the conceptualization of nursing services as an expense rather than a revenue-generating department.

When the price for nursing care does not appear on the accounting ledger, the benefit of nursing care production may not be obvious or highly visible to colleagues in the finance department.

How, then, can a meaningful marginal analysis be accomplished? Surrogate markers for nursing care production volume such as hours of care, staffing ratios, skill mix, and full-time equivalents are insufficient for a truly meaningful analysis and do not result in an optimal level of predictive precision for the generation of safe and effective staffing plans in the acute care nursing environment (Finkler et al., 2007). Further refinement in the conceptualization and measurement of nursing care is needed to enhance the usefulness of economic theory to guide prediction of nursing resource requirements and nursing care production needs. The theoretical definitions of cost and benefit within the context of economic theory are broad enough to encompass more than the traditional monetary measures of price and wages. Adaptation of the model to more closely reflect all the benefits of nursing services is possible but will require development of valid and reliable empirical indicators. Examples of other benefits of nursing include cost avoidance through prevention of complications and readmissions.

The Issue of a Mixed Market Nursing Economy

The third-party reimbursement structure for health care in general, and nursing in particular, reflects a mixed market economy. Because of government regulations, effectively achieved through administration of the prospective payment system (PPS) for Medicare and Medicaid, price and production do not vary as predicted by the laws of supply and demand (Wessels, 2006). The PPS effectively creates a ceiling for the price of nursing care. In the context of price ceilings, hospitals cannot increase the price for nursing care in response to an increase in the cost of production, such as that driven by wage and technology expenditures. Likewise, a decrease in supply of nursing care will not result in an increase in the price for nursing care. In this context, there is no monetary incentive to increase

production of nursing care. On the contrary, it has been argued that declining revenue streams for hospitals imposed by the PPS are responsible for the myriad of restructuring strategies that lead to the downsizing of the nursing workforce and subsequent decrease in the production of care (Aiken, 2008; Aiken, Sochalski, & Anderson, 1996). This has resulted in increased emphasis on efficiency of nursing care production, which some argue has resulted in a decline in quality (Aiken et al., 2000).

Demand for nursing care is difficult to evaluate in the third-party payor system and mixed market economy. The recipients of nursing care, i.e., patients, are not the direct buyer of nursing care. From which perspective then should demand for nursing care be measured? Who determines how much nursing care is needed and desired—patients, nurses, or payors? Payors appear to be unwilling to pay a higher price for nursing care. Perhaps the more accurate statement is that payors appear unwilling to pay a higher price for hospital care since the actual price being paid for nursing care is not known. If nursing care was itemized, would patients and/or payors be willing to pay the cost for increasing the volume and quality of nursing care produced? That question is currently unanswerable because of the previously discussed measurement and accounting issues. In the current economy, it seems clear that regardless of need, production of nursing care will not likely increase in the absence of enhanced efficiency and lower production costs.

Summary and Conclusions

The volume and quality of nursing care has significant implications for the quality and safety of the entire healthcare system. Concerns about the quality and cost of health care require that we develop a better understanding of how nurses allocate their time and how to effectively regulate production of nursing care. Application of economic theory to these areas is potentially useful as a means of guiding future inquiry and enhancing our understanding of the world of nursing administration. The concepts of interest in economic theory are very relevant for nurse managers and administrators in today's environment. Nursing time is a scarce resource and the current approach in determining nursing resource requirements and nursing care production volume is not adequate.

The promise of economic theory as a means to understand the consequences of current practices or to generate better alternatives, however, is currently limited by measurement issues. The usefulness of economic theory can be further enhanced through development and refinement of empirical indicators for nursing care resources, nursing care costs, nursing care outcomes, nursing care price, and utility of individual nursing activities and interventions. Nursing care production models that account for the mediating and moderating effects of key factors such as technology, unit design, patient acuity, availability of support staff, and collaborative environment also are needed. Furthermore, economic theory alone may be insufficient to capture the decision-making process for bedside nurses with respect to allocation of nursing time and prioritization of nursing interventions. Information processing theories may prove to be useful supplements, and integration of these theories into economic models of individual nurse decision-making warrant further exploration.

Does this mean that economic theory completely fails the criteria of significance and testability when applied to nursing care? Certainly not. Fawcett and Downs (1986) suggested that circumstances exist that warrant a less strict application of the criterion of testability. These circumstances include situations in which direct empirical testing is limited by time, cost, ethics, technology, or unavailability of empirical indicators. The criterion of testability can be relaxed to stipulate that theories be potentially testable when it is reasonable to believe that empirical indicators can be developed over time. The criterion also can be relaxed to stipulate that theories be testable through imaginary or thought experiments through the use of logic. Testability should therefore be viewed on a continuous rather than dichotomous scale. Theories that meet the criterion of direct empirical testing may be most useful, but those that fall short of direct testability should not be automatically discarded. With respect to the application of economic theory to nursing, empirical indicators can and should be developed over time. As these indicators are refined, the theory will most certainly increase in testability. As a result, more precise economic nursing models can be developed to explain and predict nursing time allocation and nursing care production. In the interim, thought experiments and logic based on nursing knowledge and economic theory can and should be used to guide further inquiry and development of appropriate empirical indicators.

Finally, while economic theory can be very useful in explaining how decisions about nursing time allocation and nursing care production are made, it will not address the issue of how they should be made. In contrast to the field of economics, nursing is not an amoral science. Decisions about allocation of nursing resources should not be made within the isolated context of economics. Normative theories and ethical frameworks also must be incorporated in the decision-making process around these issues. Therefore, economic theory and nursing administration are a good fit when balanced with the values and goals of nursing.

References

- Aiken LH. Economics of Nursing. Policy, Politics & Nursing Practice. 2008; 9(2):73–79.
- Aiken LH, Clarke SP, Sloane DM. Hospital restructuring: Does it adversely affect care and outcomes? *Journal of Nursing Administration*. 2000; 30(10):457–465. [PubMed: 11045104]
- Aiken LH, Clarke SP, Sloane DM, Lake ET, Cheney T. Effects of hospital care environment on patient mortality and nurse outcomes. *Journal of Nursing Administration*. 2008; 38(5):220–226. [PubMed: 18469614]
- Aiken LH, Sochalski JS, Anderson GF. Downsizing the hospital workforce. *Health Affairs*. 1996; 15(4):88–92. [PubMed: 8991258]
- Buerhaus PI. Avoiding mandatory hospital nurse-staffing ratios: An economic commentary. *Nursing Outlook*. 2009; 57:107–112. [PubMed: 19318170]
- Carande-Kulis VG, Getzen TE, Thacker SB. Public goods and externalities: A research agenda for public health economics. *Journal of Public Health Management and Practice*. 2007; 13(2):227–232. [PubMed: 17299332]
- Dall TM, Chen YJ, Seifert RF, Maddox PJ, Hogan PF. The economic value of professional nursing. *Medical Care*. 2009; 47(1):97–104. [PubMed: 19106737]
- Depken, CA. *Micro-economics demystified*. New York: McGraw-Hill; 2006.
- Donabedian A. Evaluating the quality of medical care. *Milbank Quarterly*. 1966; 44(3):166–203.
- Fawcett J. The relationship between theory and research: A double helix. *Advances in Nursing Science*. 1978; 1(1):49–62. [PubMed: 110219]
- Fawcett, J. *The relationship of theory and research*. 3. Philadelphia, PA: F. A. Davis; 1999.

- Fawcett, J. Contemporary nursing knowledge: Analysis and evaluation of nursing models and theories. 2. Philadelphia, PA: F. A. Davis; 2005.
- Fawcett, J., Downs, F. The relationship of theory and research. Philadelphia, PA: F. A. Davis Company; 1986.
- Fawcett JH. The metaparadigm of nursing: Present status and future refinements. *Image—The Journal of Nursing Scholarship*. 1984; 16(3):84–87. [PubMed: 6565629]
- Finkler, SA., Kovner, CT., Jones, CB. Financial management for nurse managers and executives. 3. St. Louis, MO: Saunders; 2007.
- Finkler, SA., McHugh, ML. Budgeting concepts for nurse managers. St. Louis, MO: Saunders; 2008.
- Flynn, SM. Economics for dummies. Hoboken, NJ: Wiley Publishing, Inc.; 2005.
- Hermansdorfer P, Henry B, Moody L, Smyth K. Analysis of nursing administration research, 1976–1986. *Western Journal of Nursing Research*. 1990; 12(4):546–557. [PubMed: 2197783]
- IOM (Institute of Medicine). To err is human: Building a safer health system. Washington, DC: National Academy Press; 2000.
- IOM (Institute of Medicine). Crossing the quality chasm: A new health system for the 21st century. Washington, DC: National Academy Press; 2001.
- Jennings BM. The intersection of nursing administration research and health services research. *Journal of Nursing Administration*. 2004; 34(5):213–215. [PubMed: 15167417]
- Kalisch BJ, Landstrom G, Williams RA. Missed nursing care: Errors of omission. *Nursing Outlook*. 2009; 57:3–9. [PubMed: 19150261]
- Kane RL, Shamliyan TA, Mueller C, Duval S, Wilt TJ. The association of registered nurse staffing levels and patient outcomes. *Medical Care*. 2007; 45(12):1195–1204. [PubMed: 18007170]
- Lynn MR, Cobb BK. Changes in nursing administration research priorities. A sign of the times. *Journal of Nursing Administration*. 1994; 24(4S):12–18.
- Lynn MR, Layman E. The nature of nursing administration research. Knowledge building or fire stomping. *Journal of Nursing Administration*. 1996; 26(5):9–14.
- Mark BA, Hughes LC, Jones CB. The role of theory in improving patient safety and quality of health care. *Nursing outlook*. 2004; 52:11–16. [PubMed: 15014375]
- McDaniel C. Nursing administration research as a paradigm reflection. *Nursing & Health Care*. 1990; 11(4):191–193. [PubMed: 2330141]
- Schubert M, Glass TR, Clarke SP, Schaffert-Witvliet B, DeGeest S. Rationing of nursing care and its relationship to patient outcomes: The Swiss extension of the international hospital outcomes study. *International Journal for Quality in Health Care*. 2007; 20(4):183–190.
- Scott ES, Craig JB. Analysis of ANA's draft scope and standards of practice for nurse administrators. *Journal of Nursing Administration*. 2008; 38(9):361–365. [PubMed: 18791418]
- Scott RD, Solomon SL, McGowan JE. Applying economic principles to health care. *Emerging Infectious Disease*. 2001; 7(2):282–285.
- Silva MC. Philosophy, science, theory: Interrelationships and implications for nursing research. *Image—The Journal of Nursing Scholarship*. 1977; 9(3):59–63.
- Storffjell JL, Omoike O, Ohlson S. The balancing act: Patient care time versus cost. *Journal of Nursing Administration*. 2008; 38(5):361–365. [PubMed: 18791418]
- Upenieks VV, Akhavan J, Kotlerman J, Esser J, Ngo MJ. Valued-added care: A new way of assessing nursing staffing ratios and workload variability. *Journal of Nursing Administration*. 2007; 37(5): 243–252. [PubMed: 17479044]
- Warson CA. Using nursing intensity for billing and value based purchasing. *Journal of Nursing Administration*. 2009; 39(4):149–151. [PubMed: 19359883]
- Wessels, WJ. Economics. 4. Hauppauge, NY: Barron's Educational Series; 2006.

Figure 1.
Conceptual Model of Individual Consumer Decision-Making in a Free Economic Market

Figure 2.
Conceptual Model of Production Firm Decision-Making Process in a Free Economic Market

Figure 3.
Schematic Representation of a Production Possibility for Volume of Nursing Care Produced on a Nursing Unit