Conceptual and methodological issues in nurse case management research

Conceptual and methodological issues facing researchers who are studying the process and outcomes of nurse case management are identified. The evolution of a research program designed to understand and evaluate one model of nurse case management is described as an example of responding to these issues. The development of a body of knowledge around nurse case management is essential to assure the expansion of this role and to justify reimbursement through current and evolving insurance mechanisms.

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NURSE CASE MANAGEMENT has become an increasingly popular strategy for coordinating health care services to high-risk populations. Currently, nurse case managers may be found in every sector of health care, including acute care, long-term care, and community settings. Although the number of nurse case managers has increased dramatically in the past few years, there is relatively little research that supports their impact on quality and cost outcomes. The development of a scientifically credible body of knowledge on nurse case management will be essential to assure the expansion of this role and to justify reimbursement of nurse case management through current and evolving insurance mechanisms.

The purpose of this article is twofold: (1) to highlight the major conceptual and methodological issues in conducting and evaluating nurse case management research; and (2) to describe the evolution of a research

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program designed to understand and evaluate the impact of one model of nurse case management.

BACKGROUND

Nurse case managers trace their origins to public health nurses from the turn of this century and to models of case management that began within the discipline of social work. Prior to the current resurgence of nursing models of case management, there were numerous demonstration projects in which case managers from a variety of disciplines were used in an effort to modify hospital and nursing home use in the elderly,[1,2] to assist in transitional care from hospital to home,[3,4] and to increase the quality of care in community settings. The results of these demonstration projects showed little consistent impact on quality and costs of care.[5] The lack of consistent findings has been attributed to inadequate targeting of populations at highest risk for adverse outcomes[6] and to suboptimal allocation of professional nursing resources.[7]

Over the past 5 years, several different models of case management have emerged within nursing to respond to growing concerns about escalating costs of health care and high nursing turnover. These models often are categorized by the settings in which they are practiced. At present, there are at least three distinct models of nurse case management:

1. hospital-based models in which individual nurses or teams of nurses coordinate services for high-risk individuals and ease transitions across units within the hospital.[8,9] The nurse case managers in this model usually do not follow patients outside of the hospital;
2. hospital–to–community models in which nurse case managers work with high-risk people across acute care and long-term care settings[10,11]; and
3. community-based models in which nurse case managers work with individuals primarily in their homes and other community settings.[12]

Although these different models have received considerable attention and have been implemented in numerous settings, there has been limited evaluation of their impact on patient outcomes. For research in this area to advance and contribute to policy development, nurse researchers need to address several major conceptual and methodological issues complicating the study of nurse case management.

CONCEPTUAL ISSUES IN NURSE CASE MANAGEMENT RESEARCH

Currently, nursing's ability to understand the impact of nurse case management is hampered by several conceptual dilemmas. First, there is no clear agreement about the definition and component activities of nurse case management. In 1988, the American Nurses' Publishing defined nurse case management as a process of care that includes assessing, delivering, coordinating, and monitoring services and resources to assure service needs are met.[12] Based in the nursing process, this definition allows for wide latitude in the conceptualization and implementation of the nurse case manager role. At the present time, there is considerable confusion about the role both within and outside of nursing, and, nationally, a debate rages about whether nurse case managers should provide direct nursing services, such as monitoring and teaching, in addition to

the more widely accepted coordination functions.

Second, few of the models of nurse case management have been linked to any theoretical foundation, either within nursing or in related disciplines.[13] Exceptions to this may be found in the work by Forchuk et al[14] in which Peplau's theoretical framework is linked to nurse case management and in a recent article by Newman, Lamb, and Michaels[15] that draws striking parallels between the practice of nurse case management in one setting and Newman's model of health as expanding consciousness.

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The absence of a theoretical base for nurse case management is problematic, but not surprising. In the course of just a few years, the practice of case management expanded rapidly in response to strong external pressures to identify new methods of care delivery that would, among other things, improve the quality of patient care, save money, enhance nursing satisfaction, and reduce nursing turnover. When early experiences with various nurse case management models suggested improved nursing satisfaction and substantial cost savings for hospitals,[8,10,11] nurses were anxious to realize these benefits in their own settings. The lack of a theoretical framework to guide practice and research has not been an obstacle in the rapid move to implement nurse case management.

However, the absence of a clear definition and theoretical base for case management practice has contributed to the current state of the art of case management research, which can be best described as "black box" research. While most effort has been spent on documenting improved outcomes, especially improved fiscal outcomes, there has been minimal information gathered about the process of care needed to achieve these outcomes. Description of nursing interventions within case management research often consists of lists of nursing tasks and activities. These lists offer few insights about the context in which the nursing interventions are delivered or about the nurse–client relationship that enables clients to achieve improved health outcomes. In effect, the process of nurse case management largely has been left as an empty black box to be filled in after satisfactory outcomes have been demonstrated.

A more effective solution to advance the state of nurse case management practice and research would be to explore the practice of case management at the same time that its outcomes are investigated. Not only could nurse researchers strive to document the impact of nurse case managers on quality and cost outcomes using credible designs, but they also would contribute information to explain *how* nurse case manager interventions influence patient outcomes in order to refine the nursing practice inherent in the title "nurse" case manager. In this way, the needs of the discipline of nursing and its many audiences, including administrators and policy makers, will be best served.

Resolving the conceptual dilemmas associated with nurse case management will require that nurse researchers join nurse case managers to:

- identify shared themes across the various models of nurse case management;

- delineate unique and shared nursing functions of nurse case managers;
- relate nurse case manager interventions to relevant theories within and outside of nursing; and
- use these theories to create models that explain the relationship between nurse case manager interventions and quality and cost outcomes.

METHODOLOGICAL ISSUES IN NURSE CASE MANAGEMENT RESEARCH

Numerous methodological issues also impede nursing's ability to demonstrate the impact of nurse case managers on quality and cost outcomes. These issues relate to sample selection, research designs, and instrumentation for case management research.

In practice, nurse case managers typically work with high-risk populations that consist of vulnerable individuals with chronic and catastrophic illnesses. These populations are targeted specifically because of their high probability of experiencing adverse outcomes, such as hospital readmission or prolonged hospital or nursing home stays. The criteria used to identify individuals at high risk often vary from practice to practice, rely on clinical judgment calls, and rarely are quantified using reliable or valid instruments. Translating these criteria into meaningful sampling criteria for experimental and quasiexperimental nursing studies has been problematic and clearly influences the likelihood of finding significant differences between nurse case management groups and control groups.

To date, samples for nurse case management studies have been selected on the basis of one or two criteria, such as the patient's discharge diagnosis-related grouping (DRG) and age. Any single variable, such as a DRG, cannot be expected to embody the diverse array of individual and clinical characteristics that may trigger entry into nurse case management and affect the nurse case manager's ability to influence outcomes. For example, two individuals with chronic obstructive lung disease can differ substantially in their risk characteristics, their support systems, and subsequently in their responses to case management interventions. Inclusion of both individuals in the same intervention group without clear articulation and measurement of their characteristics relevant to nurse case management is likely to result in nonsignificant findings that are exceedingly difficult to interpret.

The studies of nurse case management that have incorporated comparison groups have created the comparison groups without the benefit of either matching or randomization, and thus have not been able to control for other potentially important differences between groups. Thus, it is difficult to ascertain whether these comparisons have been biased in favor of or against demonstrating positive impact of nurse case management. In light of the typically high-risk caseloads followed by nurse case managers, it seems likely that nonrandomized comparison subjects may be at lower risk of adverse outcomes and will demonstrate more positive outcomes than nurse case managed patients.

Creating sampling criteria that permit the establishment of a comparison group of equal or at least similar at-risk individuals is essential for demonstrating the impact of nurse case management. Clear explication and measurement of risk criteria for nurse

case management would seem to solve this problem. But the issue is potentially more complex. In order to design research that maximizes the likelihood of capturing the impact of nurse case management, it is necessary to ask: who is most likely to benefit from case management? To answer this question, researchers need to examine the practice of nurse case management, suggest why it will benefit certain populations more than others, and design additional studies that vary the populations served by case managers.

Most of the published studies have used weak designs for establishing a causal relationship between nurse case management and client outcomes. The most commonly reported design is the single group pretest posttest design in which clinical outcomes, such as length of hospital stay and cost of hospital stay, are compared before and after implementation of case management.[8,10,11] Although these preexperimental designs are useful in establishing a pattern of improved outcome and for building administrative support for case management for the short-term, they cannot be expected to withstand the standards of scientific credibility that will be necessary for long-term implementation and policy change.[16]

As noted earlier, the few quasiexperimental studies of nurse case management are limited by the lack of attention given to establishing comparability between the nurse case managed groups and control groups.[17] There are no published reports of research using a true experimental design to examine the outcomes of current nurse case management models.

The final methodological issue relates to instrumentation for nurse case management research. Selection of process and outcome indicators sensitive to nurse case manager interventions relies on a clear understanding of nurse case management practice, an expectation that may be premature in light of the current confusion about the role. In general, instruments used to measure process and outcomes of other nursing models will need to be reexamined for their reliability, validity, and sensitivity for the study of nurse case management. In our recent experiences designing research to study one model of case management, we have not found a good fit between the process and outcomes of case management described by clients of case managers and instruments indexing important nursing concepts such as self-care or symptom management. For example, we have found that popular instruments for measuring patient satisfaction with nursing care often do not contain items that capture the full domain of case management as described by nurse case managers and their clients. Addressing these problems will require further exploration of nurse case management practice and modification and/or development of instruments that are sensitive to nurse case management interventions.

In summary, future case management research needs to be characterized by a diversity of designs, both qualitative and quantitative, and improved sampling techniques. Research designs need to incorporate theoretical explanations for the outcomes of nurse case management and to use instruments that are reliable and valid with populations of interest for nurse case managers and sensitive to their outcomes. In the next section, the development of a research program that has attempted to respond to these conceptual and methodological issues is described.

THE EVOLUTION OF A NURSE CASE MANAGEMENT RESEARCH PROGRAM

In 1985, Carondelet St. Mary's Hospital & Health Center began a nurse case management program to assist high-risk elderly to manage their health care and to access needed services in a timely and effective way.[10] In this "Beyond the Walls" model, nurse case managers work with their clients across acute care and chronic care services and in their home settings. The intensity and duration of the service is mutually determined by nurse and client. The program has been supported through hospital funds and contracts with several different third party payors.[18]

For the first several years of the program, the emphasis was on service delivery rather than evaluation and research. Two small pilot projects were conducted to examine the impact of the nurse case managers on length of stay and hospital admission acuity for individuals with hip fractures and chronic obstructive pulmonary disease.[10] However, these projects were limited by small sample size and lack of control of important extraneous variables.

Over the last 3 years, a series of studies has been designed to describe the process of case management and evaluate its impact on quality and costs of care for high-risk patients. The research program has been designed to describe and evaluate a single model of nurse case management. Three questions guide the research:

1. Does this model of nurse case management influence quality and cost outcomes?
2. Which client populations are most likely to benefit from the nurse case management interventions?
3. What is the process by which clients benefit from this model of nurse case management?

A number of assumptions have influenced the sequence and design of studies in the research program. The following assumptions reflect an awareness of the major conceptual and methodological issues facing those who practice and attempt to study nurse case management:

1. It is important to look at the impact of nurse case management on both quality and costs of care. While several models of case management have emerged as strategies to reduce health care costs, reducing costs without maintaining or improving quality of patient care is not acceptable to nurses, their clients, nor to the health care system.
2. Quality and cost indicators must go beyond acute care outcomes. In this model, nurse case managers work with their clients across the care continuum. It is important to ask how they influence the use of all health care services, including the use of physicians, home health care, and skilled nursing facilities, if nurses and others are to get a true picture of how nurse case managers affect quality and costs of health care, rather than just acute care.
3. The selection of quality and cost indicators must reflect the interests and needs of the diverse audiences of nurse

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case management. There are numerous groups with a vested interest in case management, including consumers, nurses, hospital administrators, health services researchers, and policy makers. The results of nursing research must speak to and inform these groups according to their unique and shared perspectives.

4. Contrary to popular desire, no one study will meet all of the goals of nurse case management research. Only a sequential and mindful program of research across settings and models can strive toward greater understanding.
5. Both process and outcomes are important. Although the current national focus of health care is on outcomes, an understanding of process is critical if nurses are to refine nurse case management practice and target interventions to specific client goals.

The program of research that has evolved over the past 3 years incorporates both quality and cost indicators, addresses both process and outcomes of care, and has sought to respond to the differences in time-frames and interests of many different audiences. The program incorporates qualitative and quantitative research designs and has bridged from the elderly population to other chronically ill populations.

Much of the foundation for the quantitative studies has come from nurse case manager and client interviews. Using a qualitative dialectic process, Newman[15] interviewed 14 of the nurse case managers at Carondelet St. Mary's to identify key themes in their practices. Lamb and Stempel[19] used grounded theory to discover the process of working with a nurse case manager from the client's perspective. Both nurses and clients have provided extensive insights into the process of nurse case management and its impact for both the nurse and client. Both the nurse and client identify their ongoing relationship as pivotal to the client's subsequent changes in managing their health and using health services. They identify many outcomes of case management, including greater confidence in self-care, improved symptom management, and less frequent use of hospital and emergency department services.

Interviews and case studies from the qualitative work served as a guide for selecting relevant concepts and process and outcome indicators for subsequent studies. Often, as mentioned earlier, there has not been a good fit between available instruments and the themes and language from the interviews. To move ahead, instruments with the best fit have been used in the current quantitative studies with open-ended questions added to detect important changes for future instrument modification and/or development. It is anticipated that new instruments will be developed and tested using the extensive qualitative data collected on this nurse case management model as a base.

Quantitative study of this model started with a description of the clients of nurse case managers. Identification of frequently occurring DRGs in the nurse case managers' caseloads led to targeting of subjects for subsequent studies. Chapman[20] compared hospital admission acuity and length of intensive care unit stays for case managed and non-case managed individuals in two major diagnostic categories, cardiovascular and respiratory, found to include most case managed clients. To deal with the lack of

randomization in this quasiexperimental design, Chapman measured and compared the groups on variables, such as age, living situation, and frequency of recent hospital admissions, that reflect some of the risk criteria used to select clients for nurse case management.

When the nurse case managers at St. Mary's began to provide services for high-risk elderly within a capitated contract with a health maintenance organization, it provided an opportunity to add new outcome indicators and to explore the impact of nurse case management under a different payment system. Using the simple single group pretest posttest design, trends such as changes in hospital bed days, length of stay, hospital admissions, and emergency department visits for individuals before and after nurse case management were explored. Substantial before and after differences suggested that the trends were worth pursuing through more sophisticated and labor intensive analyses. Currently, a collaborative team of researchers is analyzing the data generated after one year's experience with the capitated contract to identify differences in service utilization patterns between nurse case managed and noncase managed patients. In this study, individuals also are looking at whether it is possible to use data readily accessible in the hospital information system to distinguish case managed from noncase managed clients in order to generate meaningful comparison groups for future studies of nurse case management.

At the same time studies examining the impact of nurse case management on quality and costs of care for high-risk elderly have been expanded, an experimental study of the effects of case management for younger adults with multiple sclerosis has been undertaken. This study integrates several process and outcome measures suggested by earlier qualitative work and continues to build the base of description of nurse case management practice through interviews, observation, and clinical records.

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In today's health care environment, the survival of innovative nursing delivery models, such as nurse case management, rests on clear and convincing demonstration of quality and cost-effectiveness. Although case management has expanded tremendously over the past few years, nurse researchers are just beginning to address the complex set of conceptual and methodological issues that are involved in understanding this new role and its impact on patient outcomes.

Coordinated and systematic programs of research are needed to respond to these issues using theory-based models and scientifically credible designs. These programs are emerging, as demonstrated in this article, and will require the combined talents and expertise of both researchers and practitioners of nurse case management. There is considerable work ahead if nurse case management is to expand and flourish.

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