

USE OF RESEARCH BY STAFF NURSES:
ORGANIZATIONAL SUPPORT AND EXPECTATIONS

by

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Abstract

This descriptive correlational study was designed to describe British Columbian staff nurses' reports of organizational expectations and support for research use, nurses' own expectations of their use of research, and actual research use by staff nurses. The study was further designed to investigate relationships between nurses' use of research and their expectations of themselves, their employers' expectations, and their reports of organizational support for research utilization. The study compared the levels and relationships between these research predictor and outcome variables for groups of diploma and baccalaureate prepared nurses working in hospitals of different sizes. Crane's (1989) conceptual framework for research utilization guided this study.

A stratified random sample (n=450) of nurses with diploma and baccalaureate education was selected from staff nurses working in medical-surgical and critical care areas of hospitals of different sizes in British Columbia. A questionnaire modified from the work of Clarke (1991) was mailed. Responses were obtained from 183 nurses (42%), a sample comprised of 45% diploma educated nurses and 54% baccalaureate educated nurses. The sampling strategy also resulted in representation from hospitals of different sizes which were categorized as small (<250 beds), medium (250-499 beds) and large (>500 beds).

The nurses in the sample had very positive attitudes toward research and had high expectations of themselves to use research in practice. There were no differences between educational groups regarding interest in research and expectations, but the baccalaureate nurses held a significantly higher value for research and had more research experience than the diploma nurses.

The nurses' opinions of their organizations varied considerably with organizational size, with the support and expectations for research utilization generally increasing with hospital size. Opinions of the research climate were generally low and the number of infrastructures reported

per hospital was low. The staff nurses believed that nursing department value for research was reasonably high, but not as high as the nurses' own value for research using the same scale. The staff nurses reported that the head nurse and director expectations to use research were fairly high, but not as high as the nurses' own expectations.

The nurses reported moderate levels of general use of research and of use of specific findings, indicating that their practice was not predominantly research-based. There were no differences in research use between educational levels or between nurses from hospitals of different sizes. General use of research was correlated with all of the nurses' individual characteristics and change factors ($r=0.41-0.51$) but was not correlated with any of the organizational characteristics or change factors. In contrast, the use of specific findings had a significant positive correlation with the organizational change factor of research climate ($r=0.33$) and the number of research-related infrastructures ($r=0.31$), but was not correlated with any of the individual characteristics or change factors. There was a low significant correlation between the general use of research and use of specific findings ($r=0.38$). Although the organizational factors varied by hospital size and correlated with the use of specific findings, the use of specific findings did not vary by hospital size.

The relationships between the organizational and individual factors and research utilization outcomes were generally as predicted, providing support for Crane's conceptual framework. The study suggests that nursing practice is not predominantly research-based and that organizational factors influence the use of specific research. The study offers understanding of factors influencing research use that may serve as the basis for strategies that build on nurses' positive attitudes and values for research and modify organizational barriers to research-based practice.

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CHAPTER ONE

Introduction

Background to the Problem and Problem Statement

We can't give our patients any narcotics for fifteen minutes before they leave the recovery room. By the time they get to the ward, they are really in pain and that's when they have to move onto the bed. Then the ward nurse, you know, has to get report and admit the patient and then maybe get the patient something for pain. So, sometimes it's an hour or so before they get something for pain.

Why? Oh, because. The guidelines and our unit policy... which is crazy, because the peak effect of the IV narcotics we use is about seven and a half minutes... and we know that once the patient really gets in pain, then it's hard to get control of the pain again.

Recovery Room Nurse, 1992

Research-based practice is a professional hallmark to which nursing aspires. Although it is difficult to ascertain the degree of use, research is not thought to be widely used in nursing practice (Bircumshaw, 1990; Bock, 1990; Brett, 1987; Briones & Bruya, 1990; Champion & Leach, 1989; Hunt, 1987; MacGuire, 1990; Mercer, 1984; Winter, 1990). Efforts to deal with this difficult problem have included research utilization development projects (e.g., Conduct and Utilization of Research in Nursing Project, 1980-1983; King, Bernard & Hoehn, 1981). They have also included empirical studies of the use of specific practices (Brett, 1987; Coyle & Sokop, 1990; Ketefian, 1975; Kirchoff, 1980; Linde, 1989, Winter, 1990) and empirical studies of the factors influencing dissemination, communication and use of findings (Champion & Leach, 1989; Crane, 1989; Funk, Champagne, Wiese & Tornquist, 1991b).

The factors affecting the use of research in nursing practice are not clearly understood. The categories of influential factors that have been considered are: 1) characteristics of research findings, 2) characteristics of individual research users, 3) characteristics of organizations, and 4) characteristics of the nursing profession. In the utilization research, these characteristics have

been treated as discreet and disconnected variables, with most studies focusing on the characteristics of individuals and limited attention to the study of organizational factors.

The focus on the characteristics of individuals assumes the problem to be due to failure of individual nurses. The results have been mixed regarding the influence of individual characteristics. To date, the individual characteristics that have received empirical support as influential on research utilization include attitudes toward research, reading specific journals, attending research conferences, learning practice through nursing school or continuing education, and research responsibilities at work. Other characteristics such as the type of education, number of degrees, participation in continuing education, research experience and courses, and years of nursing experience were not supported as influential.

This investigator has observed that nurses base their practice on organizational policies and are not encouraged to question or change those practices. Further, nurses seem to encounter considerable opposition when attempting to change their practice. During interviews, nurses practising in a recovery room said that they question many of their practices but that the rules are hard to change. This investigator began to wonder if research-based practice is really expected within organizations and whether or not the influence of the organizations within which nurses work is more powerful than the characteristics of the individual nurse.

The influence of organizational factors has had limited attention and has been dealt with as a secondary concern within studies that focus on the characteristics of individual nurses (e.g., Brett, 1986; Champion and Leach, 1989; Coyle & Sokop, 1990; Crane, 1989; Funk et al., 1991b; Kirchoff, 1982; Linde, 1989). Most factors have been considered in single studies. Researchers have studied organizational characteristics of hospital size and research support mechanisms, but results were inconclusive. The influence of expectations on research-based practice has not been published prior to this study. Organizational support and expectations for research use requires

investigation. Specifically, the influence of organizations on the use of research findings in nursing practice requires further study; also, the interaction between organizational characteristics and the characteristics of individual users of research should be examined.

Nursing research aims to improve the quality of patient care and to make nursing care more cost-effective. Research-based practice is essential for professionalism, accountability, the delivery of quality patient care, and cost-effectiveness of nursing practice (Bircumshaw, 1990). If nursing practice is to become research-based, the influential factors must be understood. If organizations are highly influential, then strategies for organizational change must be added to strategies aimed at improving the quality of research and improving the individual nurse's ability to use research. Understanding the influence of organizational support and expectations will assist the nursing profession to develop organizational strategies.

Purpose of the Study

The purpose of this study was to describe the levels of organizational expectations and support for research use according to the nurse, levels of nurses' expectations of themselves, and levels of research use by diploma and baccalaureate prepared nurses working in hospitals of different sizes in British Columbia. An additional purpose was to investigate the relationships between nurses' use of research and their expectations of themselves, their perspectives of their employers' expectations, and organizational support for research utilization.

Conceptual Framework

In the following section, the conceptual models which have been used in studies of research utilization will be discussed. Crane's conceptual model, is emphasized because of the direction it provides for this study.

Only two models have been used in the reported empirical investigations of research utilization (see Table 1). Kirchoff (1982), Brett (1987), Coyle and Sokop (1990), Linde (1989)

and Winter (1990) used Roger's (1983) diffusion model; Crane (1989) used a model developed for the Conduct and Utilization of Research in Nursing (CURN) project (1980-1983) based on the work of Havelock (1969). Research utilization projects, including the CURN project and the Nursing Child Assessment Satellite Training (NCAST) project, have also used models based on the work of Rogers or Havelock (Crane, 1985a; Crane 1985b; Stetler, 1985).

Table 1

Conceptualizations Used in Nursing Research Utilization Studies

PUBLICATION YEAR	AUTHOR	CONCEPTUALIZATION
1975	Ketefian	not specified
1982	Kirchoff	Rogers
1986/87/89	Brett	Rogers
1989	Linde	Rogers
1989	Champion & Leach	not specified
1989	Crane	Havelock
1990	Coyle & Sokop	Rogers
1990	Winter	Rogers
1991	Funk et al.	not specified

Rogers (1983) specifically focuses on the diffusion of innovations or "ideas which are perceived as new" (p. 13). His five-step innovation-decision process, in which an individual decides to adopt or reject an innovation, corresponds to the phases identified by Lewin's (1952) change theory (Reinhard, 1988; Welch, 1990). The individual begins to understand an innovation and develops attitudes toward it. In this process, a decision to accept or reject the innovation is made and implementation follows; finally, the individual confirms whether the decision was correct and may choose to reverse the decision. The innovation is communicated over time to

members of the social system.

While Rogers acknowledges the organizational context and includes both individual and collective decisions, the adoption of an innovation is conceptualized as an individual decision and thus, the model does not emphasize organizational factors. Referring to the use of Rogers' model in the study of nursing research utilization, Romano (1990) noted that "the classical diffusion model, although helpful in some respects, is inappropriate to the study of the complexity of multi-faceted health care organizations. Previous studies may have resulted in inconclusive findings because the 'wrong' questions were asked using the 'wrong' organizational perspective" (p. 20).

The findings from several studies illustrate the limitations of the classical diffusion approach. Brett (1987) interpreted Kirchoff's (1982) findings as supporting the notion that "nurses aware of the innovation were also more likely to be in the persuasion or implementation stages" (1987, p. 344). However, Kirchoff actually found that "reading or being aware did not affect how important the nurses thought the (coronary) restrictions were or how frequently they reported practising the restrictions" (p. 200). Both Brett (1987) and Coyle and Sokop (1990) found nurses who used innovations were not necessarily persuaded that the innovation should be used. Brett estimated that 23% of the nurses adopted practices without persuasion. These findings suggest that the decision to implement an innovation in practice is more complex than can be explained by the diffusion model.

During work with the Conduct and Utilization of Research in Nursing (CURN) project (1980-1983), Crane used Havelock's (1969) linkage model that incorporated organizational change factors, individual change factors and the organizational context. In her 1989 study of factors affecting the use of research-based knowledge, Crane also used this model. She concluded that organizational factors are more influential predictors of research use than individual factors,

and modified the framework to denote a direct relationship between organizational factors and outcomes (see Figure 1). She removed the direct path between individual change factors and outcomes that had existed in the original version of the framework, concluding that "individual change factors affect research utilization outcomes only as they are mediated by organizational change factors" (1989, p. 196).

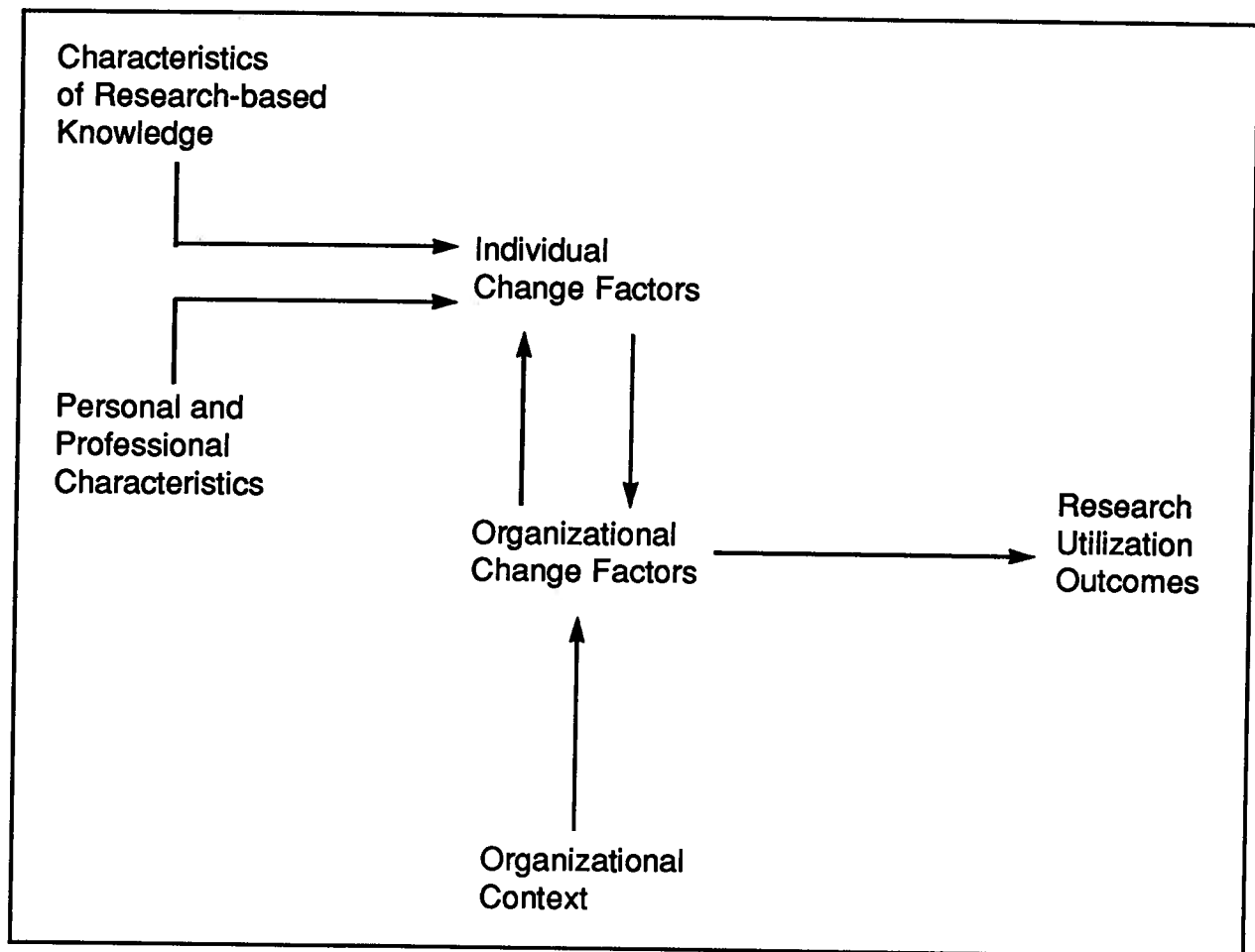


Figure 1: Conceptual Framework of Variables Associated with Research Utilization in Nursing. *From Crane (1989)*

Crane's framework provides a basis for the current study because it uses the categories of influencing factors suggested in the literature, suggests relationships between those factors, and emphasizes the importance of the organization. A brief review of the components of Crane's framework illustrates their relationship to the categories in the literature and explains how they have guided this study.

The characteristics of research-based knowledge in this model correspond to the "characteristics of research findings" category of influential factors cited in the literature. Crane defines these characteristics as including the innovation itself as well as instruction related to the use of the innovation, means for communicating knowledge about the innovation, and support and consultation regarding the use of the innovation. The characteristics of research-based knowledge were not the focus of this study. However, innovations selected and studied by others (Brett, 1986; CURN, 1980-1983; Coyle & Sokop, 1990) were used in the current study to explore the use of specific research findings.

The personal and professional characteristics represent the attributes of the individual nurse that might influence the way in which research-based knowledge is used. Crane studied personal and professional attributes which included 1) age, 2) education, 3) cosmopolitaness (the degree to which the person is oriented outside of the immediate social system), 4) extent of opinion leadership (the ability to influence other's opinions), and 5) work-related research experience and experience with change. Although personal and professional characteristics were not the focus of this study, the nurse's age, education and research experience were examined.

The individual change factors are attitudes and behaviours that are expected to change as a result of the interaction between the research-based knowledge and the personal and professional characteristics of the individual. Crane states that these change factors are related to the individual's awareness of a need for research-based knowledge, readiness to use research-based

knowledge, assessment of and willingness to use available resources, and willingness to change. In the current study, the individual's awareness of a need for research-based knowledge and readiness to use research-based knowledge were conceptualized as the individual's perceptions of the value of research, interest in using research and expectations of self for using research in practice. The individual's assessment of available resources was also considered.

Organizational change factors are similar to individual change factors except that they are characteristics of the organization. Crane views these factors as representing a general state within the organization or as representing the views of a few key individuals within the organization. Therefore, for the purposes of this study, two change factors (the value of research and expectations of staff nurses to use research as viewed key individuals in the organization) were considered as reported by the staff nurse. In addition, the general research climate within the organization was measured. These organizational change factors were studied as reported by the staff nurse.

Organizational context is viewed by Crane as those organizational variables that are not amenable to change through the level of effort associated with practice change. According to Crane, the organizational context encompasses specific strategies to increase the use of research such as the integrative mechanisms studied by Brett (1986). For the current study, the organizational infrastructure for research utilization was the major variable considered within the organizational context. As infrastructures may be related to the size of the organization (Horsley and Crane, 1986) different sizes of hospitals were considered.

Finally, Crane defines the outcomes of research utilization to be at both the individual and the organizational level. The individual-level outcomes are defined as including both cognitive and behavioral use of research-based knowledge, the diffusion of knowledge to others, and discontinuation of outdated practices. In the current study, the research utilization outcomes

considered were general use of research and use of specific findings at the individual level.

In summary, Crane's model provides a framework which describes the relationships among the variables of interest in this study by focusing on the organization as well as on the individual nurse and therefore will be used to guide this research. Figure 2 summarizes the specific variables considered in this study within the context of the conceptual framework.

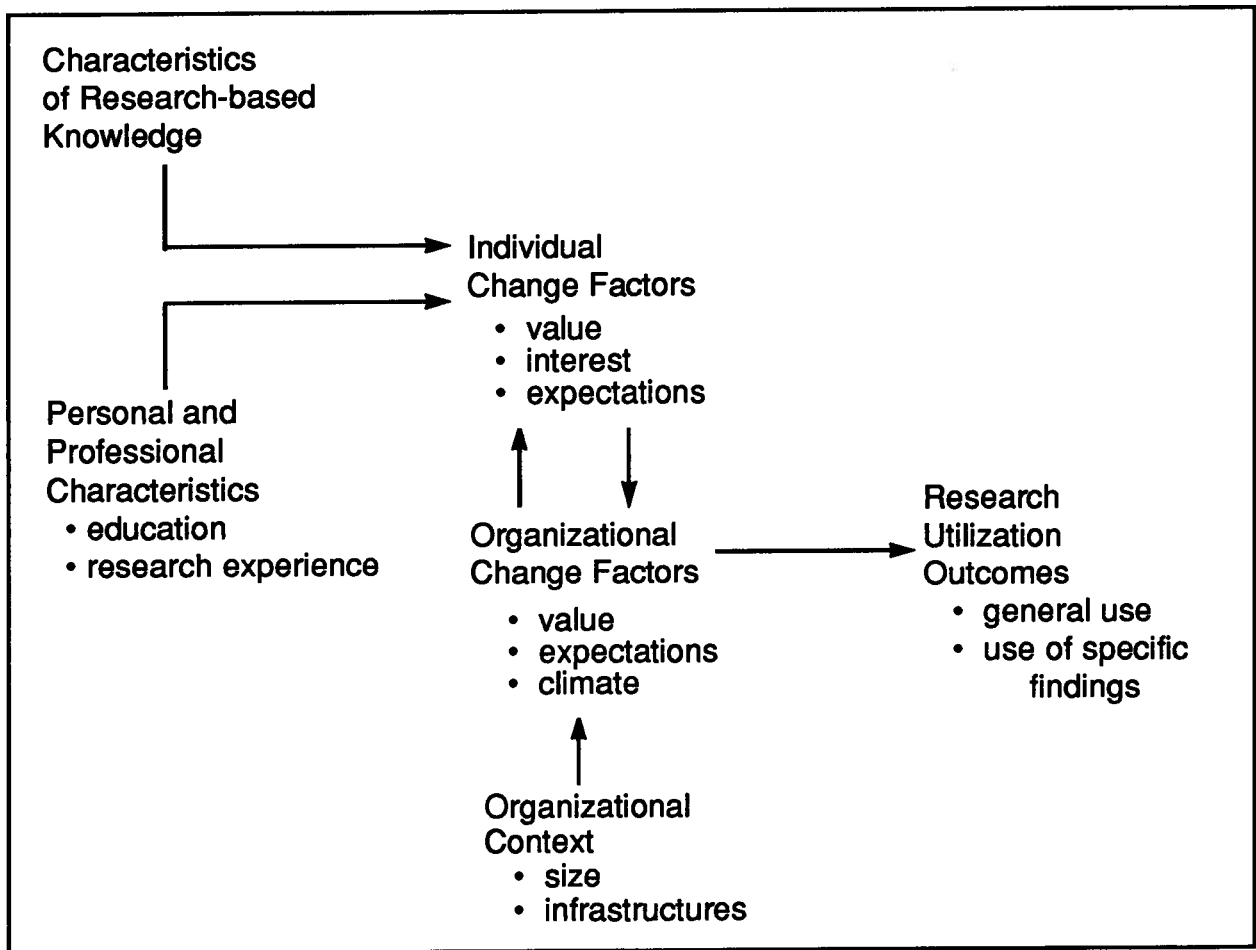


Figure 2: Current Study Variables within the Conceptual Framework.

Research Questions

For the purposes of the study, eight research questions were posed.

Among staff nurses with different educational backgrounds working in adult critical care or medical-surgical units in British Columbia acute care hospitals of different sizes:

1. What are the nurses' values for, interests in and experiences with research?
2. What are the nurses' expectations of themselves for using research findings in practice?
3. What are the perceived organizational expectations to use research findings in practice?
4. What is the perceived level of organizational support for using research findings in nursing practice?
5. What is the reported level of research utilization?
6. What is the difference between perceived organizational expectations and staff nurses' expectations of themselves for use of research findings in nursing practice?
7. What is the relationship between perceived organizational expectations and staff nurse expectations of themselves and the use of research findings?
8. What is the relationship between the nurses' perceptions of organizational support for research utilization and use of research findings?

Definition of Terms

For the purposes of this study, the following definitions are used:

Research Utilization: "A process directed toward the transfer of specific research-based knowledge into practice for the purpose of solving an identified nursing care problem" (Crane, 1985, p. 262). The process of research utilization is the process of using the findings (products) of research, and as such is distinguished from the process of conducting research. The term research utilization will be used interchangeably with the phrase "use of research in practice".

Innovation: An innovation is a change that is perceived as new (Rogers, 1983). Roger's thinking

has been highly influential in the nursing research literature and the term innovation is commonly used as equivalent to research-based change. Within this study, research utilization is equated with adoption of an innovation because research utilization implies a change in thinking (cognitive application) or practice (behavioral application) based on research (Crane, 1989).

Infrastructures: Organizational features which support research-based nursing practice including structures (positions, committees), services (space, secretarial, computers), time, communication systems and consultation (Clarke & Joachim, 1993).

Expectations: The behaviour that is anticipated and required in a specific role by the person fulfilling that role or by others (Hardy & Hardy, 1988).

Own Expectations: The behaviour that a nurse anticipates and requires of herself or himself when fulfilling the staff nurse role.

Organizational Expectations: The behaviour that is anticipated and required of the staff nurse by those holding superior work relationships with the nurse. In this study, these expectations are measured from the perspective of the staff nurse.

Value For Research: The attitudes regarding the usefulness and worth of research to nursing.

Research Interest: Attitudes regarding participating in the research process and using research findings.

Significance of the Study

The results of this study add to understanding of the factors influencing research use in nursing and offer direction regarding strategies and further study to promote research-based practice. Specifically, this study examines the influence of expectations for using research, which has not been previously examined, and organizational support for research use, which has received limited attention.

This study contributes to understanding the relationship between nurses and the organizations

in which they practice. It furthers understanding regarding the effect of that relationship on the use of research findings in practice and increases understanding of organizational barriers to research utilization. Because random sampling was used to select participants from the population of staff nurses working in British Columbia (B.C.), the results are generalizable to staff nurses in medical, surgical or critical care areas in B.C. Because of the similarity of health care across Canada, the results also should be useful to nurses in other provinces.

Theoretical Significance

The theoretical understanding of the use of research and theory in nursing practice has focused on the individual nurse. This study contributes to an understanding of the problem from the perspective of the context of practice. The results of this study can be used as a basis for further study of the influence of organizational factors on research utilization.

Practical Significance

This study offers individual nurses a better understanding of the factors that may influence their own practice. It also provides direction for educators and organizations to enhance the use of research findings in practice.

Organization of Thesis Content

This first chapter has introduced the background and purpose of the study and the reasons for selecting the problem for study. Crane's (1989) conceptual framework and the rationale for its selection has been outlined. The research questions have been stated and the significance of the study, assumptions, limitations and ethical considerations described.

In the second chapter, a review of the literature is presented to describe research utilization and to describe previous investigations of research utilization in nursing and their findings regarding levels of research use and influencing factors.

The third chapter describes the methods used, including the design, the sampling strategy,

the survey instrument, the data collection procedures, and data analysis. The limitations, assumptions and ethical considerations are also discussed.

The results are presented in the fourth chapter. The sample characteristics are described in general and in relation to each of the research questions. Ancillary findings are also presented. The findings are then discussed in relation to the conceptual framework, the methods and previous research.

Finally, in chapter five the study is summarized, conclusions are drawn and implications for practice, education and further research are offered.

CHAPTER TWO

Literature Review

The literature is reviewed in three sections. First a general description of research utilization is provided. Second, investigations of research utilization in nursing and the level of research use found in the studies are described. Third, the conceptual literature and empirical findings regarding factors influencing research use in nursing are discussed.

What is Research Utilization?

Research utilization is a specific form of knowledge utilization (Loomis, 1985). Carper (1978), Chinn (1985) and Belenky, Clinch, Goldberger and Tarule (1986) propose that there are several ways of knowing, only one of which is through empirically validated research. Consideration of this led Stetler (1985) to argue that nursing should not assume that all practice can be based on research findings. Nursing should, however, seek to understand how and when research "can most effectively promote scientific practice within the framework of the broader concept of knowledge and its utilization" (p. 44).

Loomis (1985) differentiates between three utilization processes. Knowledge-driven processes occur when information is generated and a use is sought for that information. In problem-driven processes, a need is identified in practice and a solution is sought. Finally, there are utilization processes that involve a "reciprocal dialogue" between users who generate problems and the resource system that generates the solutions.

The term research utilization has been used variously to encompass the use of research findings in practice, the use of the research process in practice (i.e. the conduct of research), or both (Horsley, Crane & Bingle, 1978; Stetler, 1985). As this study focuses on the use of research findings in practice, but not on the conduct of research, the more limited meaning is used and research utilization is considered to be the use of research-based knowledge in practice.

The influence of Rogers' theory of diffusion of innovation on understanding nursing research utilization can be seen throughout the nursing literature in the frequent use of the term "innovation" as interchangeable with "research finding". Crane (1989) argues that because research utilization implies a change in thinking (cognitive application) or practice (behavioral application) based on research, research utilization can be equated with adoption of an innovation.

In summary, research utilization is a specific form of knowledge utilization in which findings from research are implemented in practice. Research utilization processes involve interaction between research generation and research use. Research utilization may result in cognitive or behavioral change in practice and such change has been equated with adoption of an innovation.

Investigations of Research Utilization in Nursing

Many nursing authors have decried the gap between research findings and practice (Bircumshaw, 1990; Bock, 1990; Brett, 1987; Briones & Bruya, 1990; Champion & Leach, 1989; Hunt, 1987; MacGuire, 1990; Mercer, 1984; Winter, 1990). The nature of this gap was illustrated by Davis and Simms (1992) who examined two common nursing practices: changing intravenous (IV) tubing and Z-track injection technique. Although the research findings related to the optimal frequency of changing IV tubing were well substantiated and replicated, the findings were not implemented in practice. In contrast, the results of a single study concerning the Z-track injection technique had received widespread dissemination in textbooks and implementation in practice. These cases exemplify the complex, sometimes unquestioned relationship between practice and research in nursing. In some instances validated practices have not been implemented; in other instances dubious research findings have been used (e.g., Hunt, 1987).

Literature on the use of research findings in nursing is largely conceptual. To date, twelve empirical investigations have been published (see Table 2, p. 18). Of these, eight (Brett, 1987, 1989; Coyle & Sokop, 1990; Crane, 1989; Ketefian, 1975; Kirchoff, 1982; Linde, 1989; Winter,

1990) explored the relationship between the use of specific research findings and influencing factors. The remaining four (Alcock, Carroll & Goodman, 1990; Champion & Leach, 1989; Funk, Champagne, Wiese & Tornquist, 1991b; Miller & Messenger, 1978) surveyed the opinions of nurses regarding their perceptions of influencing factors. With the exception of Linde's (1989) pre-test/post-test design, all studies were cross-sectional, descriptive surveys, characterized by moderate to large sample sizes. Six of the twelve studies used random selection. It is important to examine reports about the levels of research use and the factors that influence them.

Levels of Research Use in Nursing

Studies that report levels of research utilization confirm the suspicion that research findings are not widely used in nursing practice. Ketefian (1975) is cited as completing the first empirical study regarding the gap between nursing research and practice (Brett, 1987; Coyle & Sokop, 1990; Polit & Hunger, 1991). She studied the extent to which one validated and widely reported research finding (correct placement time for oral temperatures) was used by nurses in practice. She found that only one out of 87 nurses knew the correct placement time.

In a second study conducted in 1982, Kirchoff examined the discontinuation of coronary precautions among practising nurses. Although earlier research was conclusive that precautions were not necessary, Kirchoff found that the majority of nurses continued to use the two precautions studied. Kirchoff also found that reading about coronary precautions and awareness of research did not affect how important the nurses thought the restrictions were or how frequently they used them.

Table 2

Summary of Studies of Research Utilization in Nursing

DATE	AUTHOR	PURPOSE	SAMPLE	FINDINGS
1975	Ketefian	to determine extent to which one research finding (correct placement time for oral thermometers) impacted practice	n=87 convenience sample of R.N.s from many settings	<ul style="list-style-type: none"> •only one nurse knew the correct placement time •education, years since graduation, and frequency of performing the practice did not make a difference.
1978	Miller & Messenger	to identify problems nurses encounter when trying to use research findings	n=215 randomly selected from professional association	<ul style="list-style-type: none"> •ability to obtain findings was most important •organizational problems were the other top three
1982	Kirchoff	to assess the impact of the published studies on the practices of restricting ice water and measurement of rectal temperatures with coronary patients	n=524 stratified sample randomly selected from 202 hospitals of various sizes	<ul style="list-style-type: none"> •contrary to research, restrictions were commonly enforced (ice water 76.3%; rectal temp. 64.7%) •unit policy was the most frequent origin of the restriction •years since graduation, reading journals and hospital type and size correlated with awareness of research •reading or awareness of research did not affect how important the nurses thought the restrictions were or frequency of use.
1987/ 1986	Brett	to determine nurses awareness of, persuasion about, and use of, 14 nursing research findings	n=216 random sample of medical/surgical and ICU staff nurses selected from a larger (n=274) stratified sample from hospitals of different sizes	<ul style="list-style-type: none"> •34-95% were aware of different innovations •28-92% were persuaded innovations should be used •31-93% used innovations at least sometimes •specific journals and hours reading correlated with use

Table 2: Summary of Studies of Research Utilization in Nursing (continued).

DATE	AUTHOR	PURPOSE	SAMPLE	FINDINGS
1989/ 1986	Brett	to explore the relationship between organizational integrative mechanisms (activities and structures that potentially increase information flow) and nurses adoption of innovations	n=216 randomly selected sample of medical/ surgical and ICU staff nurses selected from a larger (n=274) stratified sample from small, medium and large hospitals	<ul style="list-style-type: none"> •neither hospital size nor integrative mechanisms had a significant effect on adoption, but interaction did •innovation adoption scores were higher in large, then small, then medium hospitals •in small hospitals, conducting research and exposure to publications were positively related to adoption •in large hospitals, all mechanisms were negatively correlated to adoption
1989	Crane	to identify key factors associated with clinical use of research-based knowledge disseminated by means of two methods and to explore the influence of personal and professional characteristics, the nature of knowledge, individual and organizational change factors	n=74 convenience sample of 34 nurses who attended research conferences in 1981-1982 and 40 nurses who read publications of research at approximately the same time	<ul style="list-style-type: none"> •the publication group engaged in behavioral use of knowledge more than the conference group; for cognitive and general use, groups did not differ •position-related research experience was related to cognitive use of new knowledge •none of the other 24 possible correlations between personal and professional characteristics and the use of knowledge were significant •individual needs and resources were the only individual characteristics associated with use •28 of 30 possible correlations between organizational change factors and research use were significant •of all the predictor variables, only organizational change factors were significantly correlated with use of knowledge in patient care
1989	Champion & Leach	to identify variables which were perceived as related to the use of research in a clinical area	n=59 convenience sample of nurses from various clinical areas in a community hospital	<ul style="list-style-type: none"> •attitude, availability of findings, and support of key administrators were related to the use of research

Table 2: Summary of Studies of Research Utilization in Nursing (continued).

DATE	AUTHOR	PURPOSE	SAMPLE	FINDINGS
1989	Linde	to determine which of three levels of communication about a specific practice innovation (deep breathing and coughing before pain medication) created change in nursing practice	n=185 purposive sample of nurses from three general surgery units at each of two hospitals	all three levels of communication (reading; reading and in-service; reading, in-service and administrative support) were significantly associated with change in nursing practice
1990	Winter	to identify sources of research knowledge, to determine if a relationship existed between sources of findings and use of findings in practice and to examine the influence of individual characteristics on use of findings related to relaxation therapy	n=186 convenience sample of nurses from diverse clinical areas in nine different hospitals who knew about relaxation therapy	<ul style="list-style-type: none"> •56.5% of nurses used relaxation therapy in practice •learning about findings in nursing school or continuing education programs correlated with use; learning through journals, mass media or peers did not •age, experience, education level, clinical area and socioeconomic status were not significant.
1990	Coyle & Sokop	to determine the extent of adoption of 14 research-based practices	n=113 random sample of medical surgical and ICU nurses from 10 medium sized hospitals	<ul style="list-style-type: none"> •28-94% were aware of the different innovations •7-91% were persuaded •28-90% used the innovation at least sometimes
1990	Alcock, Carroll & Goodman	to describe staff nurses' research-related value, interest, expectations, experience & perceptions of organizational climate	n=178 proportional random sample of staff nurses from teaching and non-teaching hospitals, public health and home care	<ul style="list-style-type: none"> •nurses valued research and were interested in research, but had little research experience •nurses had low opinions of organizational climate •most nurses expected themselves to use research, but not to be involved in data collection or doing research
1991b	Funk, Champagne, Wiese & Tornquist	to determine clinicians' perspectives of the barriers to using research findings in practice and to solicit input regarding factors that would facilitate research use	n=924 stratified random sample from each of five educational strata (diploma, AD, BSN, MSN and PhD)	<ul style="list-style-type: none"> •greatest barriers were nurses feeling that they did not have enough authority to change patient care and insufficient time to implement new ideas •all eight organizational items were among top 10 barriers •administrative support was most frequently identified as facilitating research use

More recently, Brett (1987) studied the diffusion of 14 innovations reported in the literature, including the innovations identified through an earlier project (CURN, 1980-1983). Using Roger's (1983) stages of diffusion, Brett found that nurses' awareness of innovations varied (34%-95%) depending on the innovation. Nurses also varied in the extent to which they were persuaded that the innovations should be used (28-92%) and the extent to which they used the innovations (31-93%). For example, 31% of nurses used deliberate nursing interventions for pain, whereas 93% used closed sterile urinary drainage. On average, the innovations were used by 61% of the nurses at least some of the time. Five of the innovations were used at least sometimes by 70% of the nurses, which Brett interpreted as well diffused. She interpreted four innovations, which were used by less than 40% of nurses, as poorly diffused.

Coyle and Sokop (1990) studied the 14 innovations previously examined by Brett (1987) and obtained similar results. They found that the extent to which nurses used the innovations varied from 28-90% depending on the innovation.

Crane (1989) compared the use of findings by two groups of nurses who learned about the CURN project innovations by attending conferences or reading research-based publications. Overall, the groups were similar in cognitive use of new knowledge, but the group who read the research-based publications had higher behavioral use of new knowledge. However, the research utilization scores were unique to her study, preventing comparison with the percentages reported in other studies.

Winter (1990) studied the use of relaxation therapy research and found that 56.5% of the nurses used the findings in practice. She interpreted this as being distinctly higher than the findings of others. However, the percentage is remarkably similar to the 61% average found by Brett (1987), whom she cited, and the 54% average found by Coyle & Sokop (1990). It is also interesting that Winter excluded all nurses who did not already know about relaxation therapy

from her study, effectively including only those who were already at the awareness stage of diffusion. When Coyle and Sokop excluded nurses who were not aware of findings, they found that 71-100% used the innovations under study.

The few studies that report levels of research utilization use different approaches so that comparisons can be made only with caution. However, these studies illustrate that well-documented and published findings are not widely used in practice.

Factors Influencing Research Utilization in Nursing

Studies of research utilization in nursing have focused on describing the levels of research use and the factors influencing different levels of use. As noted earlier, influential factors have been categorized as being related to the characteristics of 1) the innovation, 2) the individual user, 3) organizations (Champion & Leach, 1989; Horsley & Crane, 1986) and 4) the profession of nursing (Polit & Hunger, 1991). Crane (1989) applied Havelock's (1969) change theory to nursing research utilization to incorporate these factors within a model and to suggest relationships between the factors. As noted earlier, Crane reformulates the categories as being 1) characteristics of the research-based knowledge, 2) personal and professional characteristics, 3) individual change factors, and 4) organizational context and change factors. The conceptual literature and empirical results are reviewed within these categories.

Characteristics of Research-Based Knowledge. The first category of factors are those related to the research that generates the findings. It has been suggested that the availability, quality, suitability, and communication of research findings influence the extent to which research will be used in practice. Various nursing authors have speculated about and researched the influence of these characteristics.

Hunt (1981) states that the first problem in nursing research utilization is that much of the research required to substantiate practice simply has not been done. Hunt and others (e.g., Bock,

1990; Chinn, 1985; MacGuire, 1990) argue that even in areas where research has been done, the work is fragmented, replication is rare, and small sample sizes limit generalizability. Hunt (1987) states that it is ethically unsound to think that nurses should change practice based on one research article and that some traditional practices and "old wives tales" have sound rationales while some research may be erroneous (and even fraudulent). Even when valid research results are available, they may not be suitable for application to practice. Suitability depends on the relative advantage compared to existing practice, the complexity of the innovation, compatibility with the practice setting, the possibility of reversing the change, and the observability of the innovation and its consequences (Horsley & Crane, 1986).

Another set of factors pertains to the dissemination of research to potential users. Mercer (1984) and Bock (1990) note that literature aimed at clinicians is fragmented and focuses on technical skills; whereas, journals that report research aim at academics. Further, these authors and Briones and Bruya (1990) note that research reports are not always written in an easily understood manner and implications are not always clear or even presented. Finally, the time from research to publication may be lengthy, requiring up to three years for journal publication and up to ten years for publication in books.

Two reported studies that investigated the influence of the characteristics of innovations on research utilization examined the availability and communication of research. In their survey of nurses, Champion and Leach (1989) found that nurses' reports of the availability of findings were significantly related to self-reported use of research findings. Linde (1989) used three different methods to communicate findings related to a specific innovation and found that all three methods resulted in significant change in nursing practice.

Miller and Messenger (1978) found that the most frequently cited obstacle to using research in practice was that of obtaining research findings. In addition, the finding of significant

relationships between the type of journals read and research utilization (Brett, 1986, 1989; Coyle & Sokop, 1990) supports the idea that dissemination methods are influential. However, the findings of Brett (1987), Coyle and Sokop (1990) and Kirchoff (1982) illustrate that knowing about research does not determine use and that individuals can use research findings without being persuaded of their value.

In summary, the characteristics of research-based knowledge which influence research utilization arise from limitations in the availability and communication of useful research findings. These variables are related to the production and dissemination phases of the research process and, according to Kirchoff (1991), are primarily the responsibility of researchers. While these characteristics seem to be important, the relationship between knowing about research findings and using findings does not appear to be simple or straightforward. The characteristics of research-based knowledge are not sufficient to explain the levels of use of research in nursing.

Personal and Professional Characteristics. If researchers generate useful findings and communicate understandably, then the next factors to consider are those related to the ability of the nurse to use research findings. Individual personal characteristics have received the most attention in nursing research (see Table 3, p. 25), with the attitudes, knowledge and behaviour of individual nurses being examined.

There are three reasons that studies of research use in nursing have focused on the individual: 1) categories of factors influencing research have been discussed as discrete divisions, 2) the conceptual model commonly used is the diffusion model, which focuses on the individual, and 3) most innovations studied have been within the control of the individual nurse.

Criteria used to select the innovations studied by Brett (1986, 1989), Crane (1989), Coyle and Sokop (1990), and Winter (1990) specified that the innovations had to be suitable for implementation by the individual nurse. Those studied by Ketefian (1975) and Linde (1989) also

were within the control of the nurse. The study of such innovations purposely focuses on the individual nurse but limits study of the influence of organizational factors. It is interesting that the one study which investigated innovations (discontinuation of coronary precautions) that were under multi-disciplinary control identified an organizational factor (hospital policy) as the major source of influence (Kirchoff, 1982). Kirchoff also found that physicians had more influence on nursing practice than did nurses with regard to discontinuing one of the two precautions studied.

The specific personal and professional characteristics are thought to include the attitudes, education, research education and research experience of individual nurses. Each of these characteristics has been explored in two or more studies. In addition, single studies examine methods of learning about research findings, sources of knowledge, and other miscellaneous characteristics.

Attitudes of individual nurses are thought to influence the use of research. Grinspun, MacMillan, Nichol, and Shields-Poe (1992) suggest that negative attitudes toward research limits the use of research in nursing. Hunt (1987) speculates that a major barrier to research use is that nurses tend to view themselves as victims rather than initiators of change; others (Crane, 1989; Polit & Hunger, 1991) concur that perceptions of self are barriers to research-based practice among nurses. Hunt (1981) suggests that nurses do not use research findings for five reasons: 1) they don't know about them; 2) they don't understand them; 3) they don't believe them; 4) they don't know how to apply them; and 5) they are not allowed to use them.

Several studies have described nurses attitudes toward research. Alcock et al. (1990) surveyed 178 staff nurses in Ontario and found 70-92% agreement with statements regarding the value of research to nursing. Using a similar scale, Clarke (1992) surveyed B.C. hospitals and asked key individuals responsible for research to express their level of agreement with statements regarding the value of research for nursing. All of the statements received over 85% agreement.

Clarke and Joachim (1993) used the same scale to survey schools of nursing in B.C. and found similar support for the value of research. In all three studies the most supported statements were related to the value of research in solving practice problems, while the value of enhancing cost-effectiveness received least support.

To date, only one study has specifically examined the relationship between attitudes of nurses toward research and the use of research. Champion and Leach (1989) surveyed 59 nurses working in a community hospital. Using a Likert scale, they found that attitude toward research related significantly to self-reported use of research findings. There have been no other investigations of attitude reported, although the findings regarding persuasion about innovations (Brett, 1987; Coyle & Sokop, 1990) may be related to attitudes toward research.

The educational background of nurses is the personal characteristic which has been most studied. Of five studies which examined the relationship between type of education and the use of research in practice, none found a significant relationship (Brett, 1987; Coyle & Sokop, 1990; Crane, 1989; Ketefian, 1975; Winter, 1990). Similarly, participation in continuing education or study toward a degree were not found to have a significant relationship to research use (Brett, 1987; Coyle & Sokop, 1990; Kirchoff, 1982). In addition, Brett (1987) found no relationship between the number of degrees held and the level of research use. Studies of the influence of the number of years since graduation has yielded conflicting results (Ketefian, 1975; Kirchoff, 1982; Brett, 1987).

Table 3

Summary of Empirical Support for the Influence of Personal and Professional Characteristics on the Use of Research

CHARACTERISTIC		SUPPORTED AS INFLUENCING RESEARCH USE	NOT SUPPORTED AS INFLUENCING RESEARCH USE
ATTITUDE	To Research	Champion & Leach (1989)	
EDUCATION	Type of Education		Ketefian (1975) Brett (1987) Crane (1989) Coyle & Sokop (1990) Winter (1990)
	Number of Degrees		Brett (1987)
	Years Since Graduation	Kirchoff (1982)	Ketefian (1975) Brett (1987)
	Continuing Education		Kirchoff (1982) Brett (1987) Coyle & Sokop (1990)
	Study Toward a Degree		Brett (1987) Coyle & Sokop (1990)
RESEARCH	Research Experience		Crane (1989) Champion & Leach (1989)
	Research Course		Brett (1987) Coyle & Sokop (1990)
	Research in Work	Crane (1989)	

Table 3: Summary of Empirical Support for the Influence of Personal and Professional Characteristics (continued).

CHARACTERISTIC		SUPPORTED AS INFLUENCING RESEARCH USE	NOT SUPPORTED AS INFLUENCING RESEARCH USE
LEARNING ABOUT FINDINGS	Reading Specific Journals	Kirchoff (1982) Brett (1987) Coyle & Sokop (1990)	
	Hours Spent Reading	Kirchoff (1982) Brett (1987)	Coyle & Sokop (1990)
	Attendance at Research Conferences	Coyle & Sokop (1990)	
SOURCE OF KNOWLEDGE	Nursing School	Winter (1990)	
	Continuing Education	Winter (1990)	
	Journals, Mass Media or Peers		Winter (1990)
PERSONAL/ PROFESSIONAL	Years of Nursing Experience		Champion & Leach (1989) Coyle & Sokop (1990) Winter (1990)
	Professional Membership		Kirchoff (1982)
	Change Experience		Crane (1989)
	Influence over Others		Crane (1989)
	Age		Winter (1990)
	Socioeconomic Status		Winter (1990)
	Clinical Specialty		Winter (1990)
	Cosmopolitaness		Crane (1989)

Nurses' limited knowledge of research is also thought to be a possible barrier to the use of research in practice. The findings of Brett (1987) and Coyle and Sokop (1990) suggest that research courses and research experience do not influence the use of research in practice. Various authors offer discussions that may illuminate the relationship between research education and research utilization. Grinspun et al. (1992) speculate that a lack of education regarding research utilization per se is a barrier to research use. Hunt (1987) argues that the practice of treating research as a specialized subject is compartmentalized, mechanistic, inappropriate and ineffective. Mercer (1984) notes that research training focuses on identifying weaknesses so that nurses may not be educated to evaluate the usefulness of findings. These authors suggest in different ways that it is the nature of research education which may explain the lack of use of research findings in practice.

Sources of research-related knowledge, other than formal education, appear to have a greater effect. Coyle and Sokop (1990) found that attending research conferences was significantly related to the use of research and Crane (1989) found that nurses who had research responsibilities in their work used more research findings.

Brett (1987), Coyle and Sokop (1990) and Kirchoff (1982) found that reading specific journals such as Nursing Research and RN had a significant relationship with the use of findings. This is congruent with Bock's (1990) suggestion that nurses' lack of reading and the types of journals read are barriers to research utilization. However, the importance of this finding is obscured by the conflicting findings regarding influence of the amount of time spent reading (Brett, 1987; Coyle & Sokop, 1990; Kirchoff, 1982) and by the finding that less than 71% of nurses were interested in reading research (Alcock et al., 1990). In addition, Winter's (1990) study of the use of relaxation research found that learning about relaxation therapy in nursing school or through continuing education was significantly associated with its use, whereas learning

through journals, peers or mass media was not.

The relationship between the number of years of nursing experience and the use of research findings has been examined in three separate studies and found to be not significant (Champion & Leach, 1989; Coyle & Sokop, 1990; Winter, 1990). In addition, single studies have considered a wide variety of professional and personal characteristics. Professional membership (Kirchoff, 1982) experience of change, cosmopolitaness and influence over others (Crane, 1989), age, socioeconomic status and clinical specialty (Winter, 1990) were studied and found not significant in their relationship to research use (see Table 3).

Polit and Hunger (1991) state that some issues are broader than the characteristics of the individual nurses that comprise the nursing profession. Like others (e.g., Crane, 1989; Hunt, 1987), they cite poor professional self-concept as a barrier to research-based practice. Further, they speculate that the lack of appropriate role models, relationships between researchers and practitioners characterized by minimal opportunity for collaboration and communication, and infrequent attention by researchers to issues of importance to clinical practice are barriers to research utilization in nursing. To date, research has not addressed these factors.

In summary, while nurses' attitudes and knowledge are thought to influence individual behaviour regarding research utilization, only positive attitudes toward research, having research responsibilities at work, and attending research conferences are supported by the research cited. Study of the influence of reading journals has produced conflicting results. The majority of personal and professional characteristics, such as type of education, participation in continuing education, and research education have not explained levels of research use.

Individual Change Factors. Crane (1989) specifies the individual change factors that she thinks are important to the use of research in nursing. These are the attitudes and behaviours that are expected to change as a result of the interaction between the research-based knowledge and

the personal and professional characteristics of the individual. Crane states that these change factors are related to the individual's awareness of a need for research-based knowledge, readiness to use research-based knowledge, assessment of and willingness to use available resources, and willingness to change.

Several studies have described nurses' interest in research. Bostrom, Malnight, MacDougall and Hargis (1989) surveyed 720 nurses at a large teaching hospital and found that both diploma and baccalaureate educated nurses were interested in conducting research. Alcock et al. (1990) found that staff nurses were interested in research, especially in finding answers to specific questions, knowing the results of workplace studies and changing practice based on findings. Studies by Clarke (1992) and Clarke and Joachim (1993) described interest in research from the perspective of personnel responsible for research in health care agencies and in schools of nursing. In health care agencies, nurses were perceived to be most interested in finding answers to practice problems, knowing the results of research in their areas and in using results in practice. Nurses in hospitals were perceived to be less interested than nurses working in community health or home care. Similar patterns of response and levels of interest were found in schools of nursing.

Crane (1989) studied individual change factors and found a significant correlation between the individual's need for new knowledge, readiness to use research and resources and the use of knowledge and research utilization activities. Individual resistance to change was negatively correlated with the use of new knowledge, as was expected. However, she found that these factors accounted for very little of the variance in use of knowledge and suggested that organizational factors overwhelm individual change factors. Although further study of individual change factors is warranted, it is clear that research utilization is complex and that individual factors alone provide insufficient explanation.

Organizational Characteristics. If the nature of research findings and the characteristics of the individual users of research do not explain the use of research findings in nursing practice, then the organizations in which nurses practice must be considered. Hunt's (1987) statement that nurses do not use research findings because "they are not allowed to use them" reflects the perception that nurses work in organizations in which they have limited control over their practice (p. 193). The organizational characteristics that researchers have considered include general perceptions of support (Champion & Leach, 1989; Crane, 1989; Funk et al., 1991b); levels of communication of innovation with and without organizational support (Linde, 1989); hospital size, type and location (Brett 1986, 1989; Kirchoff, 1982); organizational change factors (Crane, 1989), organizational personnel and integrative mechanisms for research (Brett, 1986, 1989); and policies (Brett, 1987; Coyle & Sokop; Kirchoff, 1982). These factors will be discussed in terms of theoretical perspectives and empirical findings (see Table 4, p. 33).

Mercer (1984) theorized that the organization was a critical factor influencing research utilization and noted that "when few resources are available and when nurses have no voice in policy for the delivery of care, creativity and testing of ideas are rarely visible. There is no incentive for 'bucking the system' and certainly there are few rewards" (p. 47). This suggests that there is a discrepancy between the professional ideal of research-based practice and organizational structure and goals.

Alcock et al. (1990) surveyed staff nurses regarding the research climate and found that only 41% of nurses thought that they were encouraged to question practice, 44% found nursing administration supportive and 48% thought they were encouraged to develop effective and efficient practice. Clarke (1992) described the research climate in health care agencies from the perspective of personnel responsible for research and found perceptions of greater support. For example, 96% of hospital personnel thought that staff nurses were encouraged to question

practice. However, the presence of infrastructures and strategies to support research-related activities received low levels of agreement from respondents in all settings.

Surveying a convenience sample of community hospital nurses, Champion & Leach (1989) examined the relationship of attitude toward research, availability of findings, and organizational support to research utilization. They found that while attitude and availability of findings were significantly related to research utilization, organizational support was not. However, further analysis revealed that support from specific administrators (e.g., nursing director and unit director) was significantly related. This supports assertions that attitudes of key people in the organization are critical (Bircumshaw, 1990; Horsley & Crane, 1986).

Funk, Champagne, Wiese, and Tornquist (1991b) surveyed 924 nurses using the Barriers to Research Utilization Scale (Funk, Champagne, Wiese & Tornquist, 1991a) and found that nurses perceived organizational characteristics to be the greatest barriers to research use. Insufficient time on the job and nurses' lack of authority to change patient procedures were the two greatest barriers identified. All eight items related to the organization were rated among the top ten barriers to research use. These barriers included a lack of cooperation and support from physicians, administrators and other staff, and inadequate facilities to implement change. This supports others' earlier speculations that power is an influential organizational factor and that the lack of control of nursing practice is a major barrier to the use of research in practice (Briones & Bruya, 1990; Hunt, 1981; Mercer, 1984).

In her 1987 action research study of research utilization, Hunt illustrated that the implementation of valid research findings requires an organizational rather than an individual approach. Her description of the attempt to change preoperative fasting times offered a classic example of the organizational barriers to the use of research findings. In spite of conclusive research and agreement from medical staff, innovations could not be implemented due to factors

Table 4

Summary of Empirical Support for the Influence of Organizational Factors on the Use of Research Findings in Nursing Practice

ORGANIZATIONAL FACTORS	SUPPORTED AS INFLUENCING USE OF FINDINGS	NOT SUPPORTED AS INFLUENCING USE OF FINDINGS
GENERAL CHARACTERISTICS:	Funk et al (1991b)	
CHANGE FACTORS:	Crane (1989)	
KEY ADMINISTRATOR SUPPORT:	Champion & Leach (1989)	
HOSPITAL CHARACTERISTICS:		
• Hospital Size	Kirchoff (1982)	Brett (1987, 1989)
• Hospital Type and Location	Kirchoff (1982)	Brett (1987, 1989)
• Nursing School Affiliation		Brett (1987, 1989)
PERSONNEL CHARACTERISTICS:		
• # of CNS, BSN, MSN and non-nursing Masters	Brett (1987) - weak correlation	
• # of Diploma, AD, and non-nursing bachelors		Brett (1987)
• Education of director		Brett (1987)
INTEGRATIVE MECHANISMS:		
• Exposure to publications	Brett (1989) - positively correlated in small hospitals; negatively correlated in large hospitals	
• Doing research	Brett (1989) - positively correlated in small hospitals; negatively correlated in large hospitals	
• Conferences & presentations	Brett (1989) - negatively correlated in large hospitals	
• Research duties in work	Brett (1989) - negatively correlated in large hospitals	
• Inducements to learn	Brett (1989) - negatively correlated in large hospitals	
POLICY:		
• Unit policy		Brett (1987)
• Perception of unit policy	Kirchoff (1982) Brett (1987) Coyle & Sokop (1990)	

such as perceived unpredictability in the operating room slate, change in duties related to food trays, and inadequate food preparation resources.

In a study of nurses who learned about innovations through journals or attending conferences, Crane (1989) found that organizational factors were more influential than individual factors on the use of new knowledge in patient care and the generalized use of new knowledge. In fact, as noted, Crane concluded that the organizational factors overwhelm individual characteristics and she consequently modified her model to illustrate that individual characteristics were only influential to the extent that they were mediated by organizational characteristics.

Linde (1989) examined the effects of three different levels of communication about a specific innovation related to post-operative deep breathing and coughing: Level 1) written material, Level 2) written material plus in-service education and Level 3) written material, in-services, and administrative commitment to use the protocol. Although all types of communication were associated with a significant change in nursing practice, there was no significant difference between levels two and three. However, as the nurses in both hospitals studied had a quite positive attitude toward the administration, the addition of support for the specific innovation studied may not have had an appreciable effect.

Horsley and Crane (1986) predicted that organizational factors would be related to the goals, structure, and size of the organization. They proposed that organizations that would be associated with innovation would be those in which clear goals were written, but that employees would determine the means of goal achievement. However, studies reported to date have not examined organizational goals in relation to research use.

Horsley and Crane speculated that decentralized structures would be more innovative in implementing change, although centralized structures would be more effective. However, researchers have not considered organizational structure in the studies reviewed. Horsley and

Crane also theorized that the extent to which the organizational structure legitimized innovation (through position descriptions, goals and objectives) would determine the degree of innovation. In her 1986 study of integrative mechanisms, Brett (1987, 1989) considered some of these legitimizing mechanisms. However, Brett found no clear relationship between the hypothesized integrative mechanisms (attending conferences, having a research resource person and committee, incentives for using research, availability of research publications, and conducting research) and the use of research in practice. Furthermore, actual hospital policies were not related to use of research findings, but nurses' perception of the existence of a policy was significantly related to use! Coyle and Sokop (1990) confirmed these findings.

Although Horsley and Crane (1986) theorized that innovativeness would be related to organizational size, they pointed out that factors such as financial, human, and material resources vary with size of facility and are likely to be influential. Kirchoff (1982) considered the organizational variable of hospital size by stratifying her sample by the number of hospital beds (<100 beds, 100-199, 200-299, 300-399, 400-499 and >499 beds). She found a weak but significant correlation between large urban hospitals (>499 beds) and cessation of specific coronary precautions. Brett (1986, 1989) focused her study on the organizational integrative mechanisms for research utilization. Using a sample of hospitals stratified by size (<250 beds, 250-500 and >500 beds), she compared the level of integrative mechanisms and use of research in nursing practice. Brett found that although it was not statistically significant, larger hospitals (>500 beds) had a higher percentage of nurses adopting innovations, followed by small hospitals (<250 beds), and then medium hospitals (250-500 beds).

Additional organizational factors have been suggested as influential. Polit and Hunger (1991) propose that organizational resistance to change, organizational climate, and resources for research projects or implementation would influence research utilization. Briones and Bruya

(1990) also suggest that organizational resources such as leave and release time, journal clubs, focused grand rounds, in-service education, and hiring of nurses active in clinical research, would influence nursing research utilization. Briones and Bruya (1990) theorized that positive sanctions, including recognition, rewards, and clinical ladders, are possible organizational influences. Polit and Hunger (1991) also propose that the reward system (recognition and evaluation) influences research use. Alcock et al.(1990) and Clarke (1992) have described levels of some of these factors from the perspective of the staff nurse and nurses responsible for research, and the work of Crane (1989) suggests that levels of organizational factors may influence research use.

Studies of organizational integrative mechanisms and general support for research, levels of communication and hospital size have yielded conflicting and inconclusive results. Organizational factors are influential, but the specific factors and the strengths of their influences remain unknown. The influence of organizational resources and expectations for research are suggested as important, but their influence on research use has not been studied.

Interaction of Organizational and Individual Factors. The factors influencing research utilization have been described in the literature and discussed by researchers as discrete categories. Evidence is surfacing that there is interaction between the categories that may help explain utilization practices. Specifically, the relationship between the nurse and the organization in which the nurse practices may be influential.

The observation that nurses view themselves as victims of change and are "not allowed" to use findings suggests that barriers to research use are related to the organizational context in which nurses practice. Although the innovations studied by Brett (1986, 1989) and Coyle and Sokop (1990) were purposely selected to be within the control of the individual nurse, the individual's perception of hospital policy significantly correlated with persuasion about and use of innovations, supporting the idea that organizational factors are important. That support from

key individuals within the organization influenced the use of research findings (Champion & Leach, 1989) further suggests an interaction between the organization and the individual. Crane's (1989) conclusion that organizational factors overwhelm individual factors is the strongest indicator that study of research utilization in nursing must include examination of the interaction between the organization and the individual.

Summary

The literature demonstrates that there is a gap between the research-based knowledge generated in nursing and the use of that knowledge in practice. The factors influencing research utilization are identified as being related to the characteristics of research findings, individual users, and organizations. However, the limited research has yielded mixed results regarding both individual and organizational characteristics. To date, the individual-related characteristics that have received empirical support include attitudes toward research, reading specific journals, attending research conferences, learning practice through nursing school or continuing education, and research responsibilities at work. Researchers have studied organizational characteristics of hospital size and research support mechanisms, but results are inconclusive. Although the literature suggests that the organization is a significant determinant of research utilization, the nature of the relationship between organizational variables and research utilization is unknown. Furthermore, the effect of the relationship between the individual and the organization on research utilization is not understood. Since the specific influence of organizational and individual expectations for the use of research-based knowledge in nursing practice has not been explored, this study focuses on expectations as well as organizational support in exploring the relationships between organizational and individual factors and research use.

CHAPTER THREE

Methods

This chapter describes the study designed to explore the relationships between organizational and individual factors and research utilization. The design is followed by a description of the sampling procedure, the instrument used, the data collection procedures and the data analysis. The assumptions, limitations and ethical considerations are also described.

Study Design

A descriptive correlational design was used because this area of investigation is undeveloped and relationships are being questioned. A 2 x 3 factorial design controlled for education and hospital size (see Table 5). A sample size of 30 nurses per cell was desirable to provide adequate power for analysis (Cohen, 1988).

Table 5

Factorial Study Design with Groups by Education and Hospital Size

	Small Hospitals (<250 beds)	Medium Hospitals (250-500 beds)	Large Hospitals (>500 beds)
Diploma R.N.	n=30	n=30	n=30
Baccalaureate Degree	n=30	n=30	n=30

Sample

It was anticipated that the survey would yield a return rate of less than 50% and that the return would not be equal from the different groups. Therefore, it was estimated that 75 nurses per group should be surveyed. A stratified random sample of 450 registered nurses was selected from the population of all staff nurses currently employed in adult critical care or medical-surgical areas of acute care hospitals in British Columbia (B.C.). To limit the possible effect of

differences between types of health care organizations, only nurses employed in acute care hospitals were surveyed. In order to use the specific innovations studied by Brett (1986), Crane (1989) and Coyle & Sokop (1990), the sample was selected from nurses employed in adult critical care or medical-surgical areas. Therefore, the inclusion criteria were:

1. The nurse must be currently registered as a practising nurse with the Registered Nurses Association of British Columbia (R.N.A.B.C.).
2. According to the 1993 R.N.A.B.C. registration data, the nurse must be working in a staff nurse position in a medical-surgical or adult critical care area of an acute care hospital.

It is noteworthy that earlier studies (Brett, 1987; Coyle & Sokop, 1990; Crane, 1989; Ketefian, 1975; Winter, 1990) did not find differences in research use between educational levels. However, unlike earlier reported studies, this study was based on a Canadian sample for whom educational experience and the influence of education may be different. Also, Alcock et al. (1990) found significant differences in the value for research, interest in research, expectations and research experience between nurses with baccalaureate degrees and nurses with diploma education. Therefore, it was important to control for educational level and to ensure that there were sufficient nurses with baccalaureate degrees in the final sample. Because approximately 12% of nurses in British Columbia have baccalaureate degrees, the sample was stratified.

While the findings of Kirchoff (1982) and Brett (1986, 1989) were not conclusive regarding the relationship of hospital size to research utilization, there is sufficient interest in the literature regarding this variable to consider it potentially important. Therefore, the sample was also stratified to control for hospital size. It was not possible to identify hospitals by size, but it was possible to identify R.N.A.B.C. districts in which different sizes of hospitals predominate. Because there are fewer nurses working in small hospitals, the greatest challenge was to sample nurses from small hospitals and more especially baccalaureate nurses from small hospitals.

In order to obtain the stratified sample using the specified criteria within the limitations of the demographics of the population of nurses in B.C., four populations were initially identified:

1. R.N.s with diploma education living in R.N.A.B.C. districts where smaller hospitals predominate (North Vancouver Island, Powell River, and Gulf Islands District; Northeast District; Northwest District; and Kootenays District - see R.N.A.B.C. Electoral District Structure, Appendix A).
2. R.N.s with baccalaureate degrees living in R.N.A.B.C. districts where smaller hospitals predominate (as above).
3. R.N.s with diploma education living in all other R.N.A.B.C. districts, which include large, medium and small-sized hospitals.
4. R.N.s with baccalaureate degrees living in all other R.N.A.B.C. districts (as above).

Table 6

Sampling Strategy Using Four Stratified Populations

POPULATION	POPULATION SIZE	SAMPLE SIZE
R.N.s with diploma education in districts where smaller hospitals predominate.	1,135	60
R.N.s with diploma education living in all other districts.	5,492	165
R.N.s with baccalaureate degrees in districts where smaller hospitals predominate.	60	60
R.N.s with baccalaureate degrees living in all other districts.	585	165
TOTAL	7,272	450

As shown in Table 6, a random sample of 450 nurses was drawn from each of these populations. This strategy was employed to sample a sufficient number of nurses with

baccalaureate degrees working in small hospitals while sampling other populations evenly. The total of the four populations represent the number of nurses who met the sample criteria out of the 32,554 nurses in all districts of B.C.

Instrumentation

For the purpose of this study, the investigator adapted the Nursing and Research in Clinical Practice (NRCP) questionnaire (Clarke, 1991). The original questionnaire will be described, followed by a description of the changes. Finally, a description of the final instrument and estimates of internal consistency for each of the scales for this sample will be provided.

The Original Instrument

The NRCP was chosen for the present study because 1) a review of reported empirical studies revealed that the NRCP is the only previously used instrument that addresses the variables of interest, 2) other published instruments were tailored to and used in single studies, 3) there were few measures of reliability and validity for any of the previously used instruments, and 4) the NRCP has been used with organizations in the same geographical locations as the current study, providing a basis for future comparisons.

Based on the questionnaires by Alcock, Carroll and Goodman (1990), Thurston, Tenove & Church (1987), Davies & Eng (1991), and the R.N.A.B.C. position statement on nursing research, Clarke developed the NRCP to survey nurses with primary responsibility for research in agencies throughout British Columbia. The questionnaire was developed to 1) identify the characteristics of the organizational research climate, 2) identify infrastructure supports for research, 3) identify future directions for research and, 4) identify current research activities in nursing. The questionnaire focuses on a broad range of research-related activities in clinical nursing practice. Questions address both organizational support for research and expectations of staff nurses, attitudes toward research and responsibilities for research. Of primary relevance to the current

study were the sections of the questionnaire developed by Alcock et al.

The five scales developed by Alcock et al. from the literature were subjected to expert review and pilot tested with 19 nurses. They reported high internal consistency for the five scales (value of nursing research, expectations, interest in nursing research, research experience and organizational climate) with alpha coefficients of 0.81, 0.71, 0.87, 0.79 and 0.78, respectively. Clarke's modification of these scales and the other portions of the questionnaire were reviewed by a panel of experts for face and content validity. Although the questionnaire has been used in data collection throughout the province (Clarke, 1992; Clarke & Joachim, 1993), estimates of validity and reliability are not yet available.

Modifications to the Instrument

The instrument was adapted again for the purposes of this study (see Appendix B). The modifications involved dividing any questions that contained two ideas, making wording appropriate to the staff nurse perspective and eliminating any sections not applicable to staff nurse positions. Questions in the original instrument regarding expectations of staff nurses to use research were expanded to ask what staff nurses expected of themselves and what they thought others in the organization expected of staff nurses regarding the use of research in practice. In the original instrument, general questions regarding the use of research findings were in several different sections throughout the instrument. These questions were reorganized into a single section to obtain the staff nurse's perspective. Similarly demographic and hospital data were reorganized and items specific to the staff nurse were added (e.g., education level).

The Clarke version operationalized all of the study variables except for the use of specific findings. The modifications adapted the wording for use with nurses in staff positions, added specific findings as a measure of research use and added the appropriate demographic questions. Table 7 summarizes the comparison between the Clarke version and its modification. The

relationships between the variables of the current study and the questions on the modified questionnaire and the Cronbach alpha for each sub-scale are shown in Table 8.

Table 7

Modifications of Instrument by Section

Section	Content	Modification
1	perceived value of research in nursing	none
2	perceived role in research (expectations)	none
3	perceived organizational research climate	none
4	interest in research	none
5	research experience	none
6	use of research findings in practice	questions reorganized from other sections of the original questionnaire
7	use of specific findings	questions added from Brett (1986)
8	infrastructure support for research	none
9/10	hospital/ demographic data	questions reorganized from other sections of the original questionnaire and from literature

Use of Research Findings. A final major modification was made to include questions regarding the use of specific findings in practice. The questions were taken from the instrument developed by Brett (1986). Ten specific research findings were chosen from the fourteen innovations initially studied by Brett (1986). Two innovations (changing intravenous sites and lactose-free tube feedings) eliminated because recent technological and practice changes or research have made these innovations redundant or questionable. Using communication skills to ascertain patient pain seemed very general and was not used. The question regarding closed urinary drainage was also not included because the findings of Brett (1986) and Coyle and Sokop (1990) suggest that this practice is well diffused and probably can no longer be considered an

innovation.

For her original study, Brett selected the innovations by reviewing refereed research journals, published between 1978 and 1983, for practices that met the following inclusion criteria:

- 1) results could be implemented by individual nurses;
- 2) innovations were relevant to medical-surgical or critical care areas;
- 3) at least one other publication replicated or corroborated the initial study;
- 4) the original study or the replication was conducted on clinical subjects.

Brett assumed the validity of the research results by virtue of publication in a refereed journal. In spite of using these liberal criteria, Brett found only nine practices which met the criteria and added research-based protocols developed through the CURN project.

During a pilot test, Brett obtained a Cronbach's alpha coefficient of 0.82 as a measure of internal consistency for the total scale. The test-retest reliability was established by obtaining a Pearson's correlation of 0.83 for the total scale. During the main study, the coefficient was 0.95 for the total scale. The Cronbach's alpha for the sub-scales (one for each practice) ranged from 0.67 - 0.97. While Brett examined the stage of diffusion (awareness, persuasion, and use) for each innovation, the current study asked only the extent to which each innovation was used by the nurse in his or her practice. Therefore, in the current survey, the nurses were only asked to respond to the question from Brett's scale which asked about the extent of use of each finding.

The instrument was formatted in a visually appealing manner with large boxes for responses. The instrument was presented in a booklet format for easy reading and given a bright blue cover. The modified instrument was pilot tested using a convenience sample of eight nurses who work in critical care areas. Feedback on the content and appearance of the questionnaire was very positive. The average time for completion was 18 minutes. Suggestions about clarity of the questions were used to create the final version of the survey.

The Final Instrument

The final instrument consisted of 10 sections or sub-scales. During the current study, Cronbach alphas for the scales ranged from 0.79-0.92, indicating satisfactory internal consistency. Each of the sub-scales of the final instrument will be briefly described.

Section 1: Value of Research. The nurses' value for the use of research in nursing practice was measured by asking the nurses to express their level of agreement with six statements regarding the value of research to nursing. Statements regarding the value of research to the effectiveness of nursing decisions and interventions, public accountability, responding to new developments in health care and using resources were included. The minimum possible score was six (strong disagreement with all value statements); the maximum possible score was 24 (strong agreement with all value statements). The Cronbach's alpha for this scale was 0.85.

The statements regarding the value of research were also used to determine the nurses' perception of their nursing department value for research. The minimum possible score was 6 (strongly disagree with all value statements); the maximum possible score was 24 (strongly agree with all statements). For this scale, the Cronbach alpha was 0.92.

Section 2: Perceived Role in Research (Expectations). The nurses were asked to express their level of agreement with six statements regarding expectations that they held regarding their own use of research in nursing practice. They were also asked to express their level of agreement with the same questions to indicate their opinion regarding the expectations of the staff nurse held by key nursing personnel. Therefore, there were sub-scales for the expectations of self, and expectations thought to be held by the head nurse, clinical instructor, clinical nurse specialist and nursing director. The minimum score possible for each sub-scale was 6 (strong disagreement with all expectations) and the maximum score possible was 24 (strong agreement with all expectations). The Cronbach's alphas for the sub-scales were as follows: self 0.79, head nurse

0.85, clinical instructor 0.85, clinical nurse specialist 0.79 and nursing director 0.89.

Section 3: Research Climate. The 11 statements regarding the research climate included questions about encouragement and recognition for nurses and interest in research by others. The minimum score possible was 11 (strong disagreement with all statements) and the maximum score possible was 44 (strong agreement with all statements). The Cronbach alpha for this scale was 0.90.

Section 4: Interest in Research. The nurse's interest in research was measured by requesting the nurses to express their level of agreement with ten statements regarding interest in research-related activities. The minimum score possible was 10 (strong disagreement with all interest statements); the maximum score possible was 40 (strong agreement with all interest statements). The Cronbach alpha for this scale was 0.91.

Section 5: Research Experience. The nurses were asked to indicate whether or not they had any of 18 different research experiences. They were asked to respond "yes" or "no" to each of the experiences that ranged from taking research courses, to using findings to change practice, to being a principal investigator. The minimum score possible was zero (no experiences) and the maximum score possible was 18 (all experiences).

Section 6: General Use of Research. The nurses were asked to rate each of 10 statements related to general use of research on a four-point scale from "not at all" to "always". The minimum score possible was 10 ("not at all" for all statements); the maximum score possible was 40 ("always" for all 10 statements). The Cronbach alpha for this scale was 0.87.

Section 7: Use of Specific Research Findings. The nurses were asked to rate whether they used ten specific findings "never"=1, "sometimes"=2, or "always"=3. Because it was anticipated that all practices would not be used in all settings, they were asked to indicate when practices were not applicable. The ten specific findings chosen for the final instrument included 1) giving

Table 8

Relationship of Study Variables and Modified Instrument

VARIABLE	SECTION	SUB-SCALE	# of ITEMS	ALPHA
Personal and Professional Characteristics	5	• Own research experiences	11	
Individual Change Factors	1 4 2	• Own value of research in nursing • Own interest in research • Own expectations to use research	6 10 6	0.85 0.91 0.79
Organizational Context	8	• Organizational infrastructures for research	27	
Organizational Change Factors	1 3 2	• Perceived organizational value of research • Organizational research climate • Perceived role in research: expectations of head nurse, clinical instructor, clinical nurse specialist, director of nursing.	6 11 6 6 6 6	0.92 0.90 head nurse=0.85 instructor=0.85 CNS=0.79 director=0.89
Research Utilization Outcomes	6 7	• General use of research findings • Use of specific findings	10 10	0.87 0.87
Demographics	9 10	• Hospital size and unit type • Age, gender, education & work of nurse	2 4	

sensory information to patients before diagnostic procedures, 2) mutual goal setting with patients, 3) giving patients sensory information pre-operatively, 4) providing planned preoperative teaching, 5) monitoring oral temperature electronically during oxygen administration, 6) correct urine testing technique, 7) using knowledge of activities which increase intracranial pressure, 8) using preoperative relaxation techniques, 9) using dorsogluteal injection technique and 10) catheter clamping prior to removal of urinary catheters. The Cronbach's alpha for this scale was 0.87.

Section 8: Organizational Infrastructure for Research. The infrastructures for research within the organization were measured by asking the nurses to identify those infrastructures such as policies, job descriptions, committees, resources and personnel available in their hospitals to support research. They were asked to respond "yes", "no", or "don't know" to indicate whether or not 27 different aspects of infrastructure existed. "Yes" responses were counted to calculate the infrastructure score. The minimum score possible was 0 (no supports); the maximum score was 27 (all supports).

Sections 9 & 10: Hospital and Demographic Data. The nurses were asked to indicate the size of hospital and type of unit they worked in to ensure that the selection criteria were met for each respondent. Demographics including gender, age, education and years since graduation were also collected.

Data Collection Procedures

The R.N.A.B.C. generated a stratified random sample of nurses using the inclusion criteria. To preserve the anonymity of the respondents, staff at R.N.A.B.C. labelled and mailed the survey packages. A letter was enclosed explaining the purpose of the study, how the sample was obtained, and the use of the data (see Appendix C). The letter also emphasized provisions for confidentiality and the importance of the participant's responses. A self-addressed, stamped

envelope was included. The package also contained an optional form to indicate that the participant would like to receive a summary of results (Appendix D). To maintain anonymity, directions on this form indicated that it could be returned separately by mail or fax, or that it would be separated from the questionnaire if mailed. The form was copied in bright yellow to facilitate separation.

A second mailing was done using strategies suggested by Gordon and Stokes (1989) to increase the return rate. Four weeks after the initial mailing, the return rate declined and a reminder was mailed by the R.N.A.B.C. to the entire sample except for those who had returned the optional form with their name and address completed. The reminder also thanked those who had already responded. Six weeks after the reminder and ten weeks after the initial mailing a third mailing was done. At this time, the return rate had declined again and there was a lower return rate from nurses with diploma education. Therefore, letters were sent only to the nurses with diploma education who had not returned the optional form.

Data Analysis

Data from the questionnaires were coded and entered into the computer program SYSTAT for analysis. The data were "cleaned" by hand and by running bar graphs of each variable to identify erroneous coding. Eleven of the 183 nurses who responded specified areas such as the recovery room, chemotherapy, medical diagnostics and acute gerontology. These nurses were re-coded into the specified categories. One nurse was eliminated from the sample as she worked in obstetrics.

Missing data were handled in the following manner. For six item Likert scales, if a nurse had not responded to more than two items in a scale, the scale for that nurse was excluded from analysis. If the nurse had not responded to one or two items, a neutral score (2.5) was assigned to those items. For all remaining scales, if a nurse had not responded to 80% of the items, the

scale was excluded from analysis for that nurse. Again, neutral scores were assigned to missing data for scales that were retained for analysis.

Scores for each variable were computed for each respondent. Total scores and subgroup scores were computed for each variable. Descriptive statistics including the mean, standard deviation, and range of the scores for staff nurses of different educational levels and hospital sizes were used to analyze all variables and the first five research questions. Factorial analysis of variance was used to compare the groups on each of the research question variables. For each variable, multiple analysis of variance (MANOVA) was used to identify the effect of 1) educational level, 2) hospital size, and 3) the interaction effect of education and hospital size. The significance level for MANOVA was set at 0.05.

The sixth question was tested using a t-test to compare the difference between organizational expectations and the staff nurses' expectations of themselves. Because this area of research is undeveloped, a two-tailed test was used (Munro & Page, 1993). The seventh research question was tested using a Pearson Correlation Coefficient to describe the relationship between expectation scores and the use of research findings. Similarly, for determining the relationship between the nurses' perceptions of organizational support for research use and use of research findings, a Pearson Correlation Coefficient was computed. For all statistical tests a significance level of 0.05 was used.

The analysis was carried out as planned, but additional bivariate correlations were computed to examine relationships that were not addressed by the research questions.

Assumptions

This study was based on the assumption that the respondents would answer truthfully. In addition, it was assumed that the respondents would ascribe similar meanings to the survey questions as the researcher.

In using the innovations previously identified and studied by Brett (1986) and studied by Coyle and Sokop (1990), it was assumed that the innovations were still relevant to current nursing practice. The innovations were originally selected as being within the control of the individual nurse and as being appropriate to practice in medical, surgical or critical care areas and it was assumed that this continued to be true.

Limitations

Although a strong design and random sampling were employed, a limitation of this study was that non-responders might differ from responders. Responders might have been motivated to respond because they were more interested in research. Furthermore, health care is currently undergoing significant reform and change in B.C., with moves toward regionalization, a lack of security in senior nursing management positions, and contention between physicians and government being a few of the influencing factors. This climate of change might have influenced responders and non-responders in unknown ways.

Although it was assumed that respondents would answer truthfully, the study was limited by the extent to which it is reasonable to draw inferences from what people say in a survey to what they do in real life.

Because it was assumed that nurses in leadership positions would have influence on staff nurses, the study only examined the expectation of nurses and did not examine the expectations of other potentially influential people such as peers, physicians or non-nursing administrators. The study did not attempt to examine who controls nursing practice and focused on innovations within the control of individual nurses.

Although nurses who work part-time may differ from nurses who work full-time in ways that would affect the use of research in practice, both full-time and part-time nurses were surveyed. Nurses who work part-time might have less access to existing organizational supports, less

contact with key personnel and less personal commitment to the profession. Conversely, nurses who work part-time might be engaged in more study and have a greater commitment to the profession. However, these possible differences were not controlled in this study, other than identifying those who are employed full or part-time.

A further limitation was presented by the selection of innovations to serve as a measure of the use of specific research findings. Although the innovations selected were assumed to be relevant to the current practice of most nurses in medical, surgical and critical care areas, they were limited to ten innovations. This prevented study of more specialized or recent innovations.

Ethical Considerations

The study was approved by the researcher's committee, the R.N.A.B.C., and the University of British Columbia's Behavioral Sciences Screening Committee for Research and Other Studies Involving Human Subjects. Participants were informed about the purpose of the study in a letter which stated that participation was voluntary and that the completion and return of the questionnaire indicated consent to participate (Appendix C, p. 154). The letter further stated that individual replies were confidential and that the respondent was anonymous to the investigator. Information regarding the respondent's identity or the name of employer was not requested. Because the R.N.A.B.C. mailed the surveys and subsequent reminders, the respondents remained anonymous to this investigator.

In this chapter the design of the study has been described. The strong descriptive design and use of random sampling add strength to the study. In its third revision, the instrument is a valid and reliable measure of the factors under investigation. The data collection procedures insure confidentiality and enhance the return rate. In the next chapter, the research findings are presented and discussed.

CHAPTER FOUR

Results

In this chapter, the sample characteristics are described and discussed in terms of the participants' representation from educational levels and hospital sizes, gender, age, and employment. The results are presented in relation to each of the research questions and discussed in relation to the conceptual framework, the methods, previous research, and the limitations inherent in the study.

Sample Characteristics

The initial sample was comprised of 450 nurses, but eight surveys were undeliverable and four were returned uncompleted. Of the 442 delivered surveys, 184 (42%) were returned completed. One response was not used because the nurse was not working on a medical-surgical or critical area and thus did not meet the sample criteria. The final sample was therefore comprised of 183 nurses.

The sample was stratified to obtain responses from an equal number of nurses with baccalaureate and diploma education working in hospitals of different sizes. Table 9 illustrates the sample composition by group.

Table 9

Sample by Education and Hospital Size

	Small Hospitals (<250 beds)	Medium Hospitals (250-500 beds)	Large Hospitals (>500 beds)	Not Reported	Total (%)
Diploma	n=25	n=33	n=24	1	83 (45%)
BSN	n=33	n=33	n=30	2	98 (54%)
Not Reported	1	1			2 (1%)
Total	59	67	54	3	183

The response rate for nurses with diploma education was 37%; the response rate for nurses with baccalaureate education was 44%. The response rate by hospital size is not known because the composition of the initial sample by hospital size was not known. The response rate provided groups of unequal size, but as the largest to smallest group size ratio was less than 1.5 ($33/24=1.38$), analysis of variance could be used (Stevens, 1990).

Education and Years Since Graduation

Of the 181 nurses who specified their educational level, a total of 83 nurses indicated that they had diploma education only; 98 nurses indicated that they had a baccalaureate degree in nursing. Of the nurses with baccalaureate degrees, 41 had received a diploma prior to their degree. Five nurses had baccalaureate degrees in other disciplines. Of these five, two were diploma nurses, two were baccalaureate nurses and one did not specify nursing educational level. One nurse with a baccalaureate degree in nursing also had a masters degree in nursing. The years since graduation from diploma programs ranged from 0-34 years with a mean of 13.9 years (see Table 10). The years since graduation from baccalaureate programs ranged from 0-36 years, with a mean of 8 years. The majority of the sample graduated less than ten years ago.

Employment

As shown in Table 9, the sample contained nurses employed in small (59), medium (67) and large (54) hospitals. Of those who indicated the amount they worked, 49% (88) worked full-time and 51% (93) worked part-time. The breakdown of part and full-time employment by educational level is shown in Table 11.

Table 10

Years Since Most Recent Graduation

Years	Frequency Diploma	Frequency Diploma & BSN	Frequency BSN only	Total (%)
0 - 5	22	25	13	60 (33%)
6 - 10	15	6	22	43 (23%)
11 - 15	6	4	7	17 (9%)
16 - 20	9	2	7	18 (10%)
21 - 25	6	0	2	8 (4%)
26 - 30	7	0	1	8 (4%)
31 - 36	5	0	1	6 (3%)
Not Specified	13	4	4	21 (12%)
Total	83	41	57	181(100%)*

Table 11

Part and Full-time Employment by Educational Level

Education Level	Full-time Employment (%)	Part-time or Casual Employment (%)	Total
Diploma	35 (42%)	48 (58%)	83
Baccalaureate	53 (54%)	45 (46%)	98
Total	88	93	181*

*sample total of 181, due to 2 participants who did not report education

The survey was sent to nurses who indicated on RNABC data that they were employed in adult critical care or medical-surgical areas. In the final sample, 55 (30%) of the nurses indicated that they worked in medical areas, 33 (18%) in surgical areas, 27 (15%) in medical/surgical areas and 66 (36%) in critical care areas. One nurse did not specify unit type.

Gender and Age

Of the 182 nurses who reported their gender, 179 were female, 3 were male. In terms of age the range was 22-57 years and the mean age was 36 years, with the majority between 22 and 42 years of age for both diploma and baccalaureate nurses. The diploma nurses tended to be older (mean=38.0) than the baccalaureate nurses (mean=34.5).

Table 12

Age Distribution by Educational Level

Age (Years)	Education Not Specified	Diploma (%)	BSN (%)	Total(%)
Not Specified	1	3 (1.6%)	1 (0.5%)	5 (3%)
22-28	1	15 (8.0%)	20 (11.0%)	36 (20%)
29-35		18 (10.0%)	35 (19.0%)	53 (29%)
36-42		21 (11.0%)	29 (16.0%)	50 (27%)
43-49		13 (7.0%)	11 (6.0%)	24 (13%)
50-57		13 (7.0%)	2 (1.0%)	14 (8%)
Mean(SD)[Range]		38.0(9.3)[22-57]	34.5 (6.8)[23-56]	
Total	2	83	98	183(100%)

In summary, the final sample was comprised of 183 staff nurses working in medical-surgical or critical care areas of acute care hospitals in B.C. The nurses in the sample were predominantly female and were between 22 and 57 years of age, with the majority being under 35 years of age. The nurses were almost evenly divided between part time and full time work. The stratified random sampling strategy yielded similar sized subgroups of nurses with baccalaureate and diploma education working in small, medium and large hospitals.

In the following section the results related to each research question will be presented and analyzed using descriptive and parametric statistics.

Research Question 1: What are the Nurses' Values for, Interest in and Experience with Research?

The staff nurses' value for research, interest in research and research-related interests were measured using separate sub-scales.

Value For Research

Value for the use of research in nursing practice was measured by asking the nurses to express their level of agreement with six statements regarding the value of research in enhancing the nursing profession. The minimum score possible was six (strong disagreement with all value statements); the maximum score possible was 24 (strong agreement with all value statements).

For five statements regarding the value of research in enhancing nursing decisions, interventions and public accountability, 89 - 98% of the nurses agreed or strongly agreed. The sixth statement regarding the value of research in enabling nurses to use resources more efficiently received less support, with only 77% of nurses agreeing.

The scores for the sample ranged from 12-24, with a mean of 20.3 and standard deviation (SD) of 2.99. The distribution of scores were different for diploma and baccalaureate degree nurses as baccalaureate nurses tended to have higher scores (see Tables 13 and 14). Multiple analysis of variance (MANOVA) identified a significant difference in value scores between educational levels ($F=5.11$; $p=0.03$), with baccalaureate nurses having higher value scores than diploma nurses. No significant differences were detected between hospital sizes ($F=0.43$; $p=0.65$) and no interaction effect was noted ($F=1.33$; $p=0.27$).

Table 13

Value of Research Scores by Education

Value Score	Diploma	BSN	Total (%)
12/13	2	2	2 (1%)
14/15	5	3	8 (4%)
16/17	16	11	27 (15%)
18/19	19	15	34 (19%)
20/21	18	20	38 (21%)
22/23	16	23	39 (22%)
24	9	24	33 (18%)
Total	83	98	181 (100%)*

*sample total of 181, due to 2 participants who did not report education

Table 14

Value of Research by Education and Hospital Size

	Small Hospitals Mean (SD) [range]	Medium Hospitals Mean (SD) [range]	Large Hospitals Mean (SD) [range]	Total Mean (SD)[Range]
Diploma	19.5 (3.2) [14-24]	19.5 (3.2) [14-24]	19.8 (2.9) [15-24]	19.7 (2.9) [14-24]
BSN	21.4 (2.8) [15-24]	20.1 (3.1) [13-24]	20.6 (3.1) [12-24]	20.7 (3.0) [12-24]
Total	20.5 (3.1) [14-24]	20.0 (2.9) [13-24]	20.2 (2.9) [12-24]	20.3 (3.0) [12-24]

Interest in Research

Interest in research was measured by requesting the nurses to express their level of agreement with ten statements regarding their interest in research-related activities. The minimum score possible was 10 (strong disagreement with all interest statements); the maximum score possible was 40 (strong agreement with all interest statements).

For the entire sample, the scores ranged from 10 to 40, with a mean of 30.7 (SD=5.9). Very

few nurses had a score of less than 24 (see Table 15) suggesting a high level of agreement by most nurses. Most individual statements also received a high level of agreement (see Table 16). Interests directly related to nursing practice, such as finding answers to specific nursing problems and using research results to change practice, received the highest agreement. The least supported area of interest was conducting research outside of work assignments.

As shown in Table 17, the interest scores by group were very similar. MANOVA was conducted to compare the groups regarding their interest in research. There were no significant differences between the groups by hospital size ($F=0.33$; $p=0.72$) or education ($F=0.01$; $p=0.93$).

Table 15

Distribution of Interest Scores by Education and Hospital Size

Research Interest Score	Diploma			Baccalaureate			Total(%)
	Small	Medium	Large	Small	Medium	Large	
10-14	0	1	0	0	0	0	1 (0.5%)
15-19	0	0	0	0	0	0	0
20-24	0	0	3	2	2	4	11 (6.0%)
25-29	8	10	10	12	7	7	54 (31.0%)
30-34	11	13	6	9	11	9	59 (34.0%)
35-40	6	8	4	10	13	10	51 (29.0%)
Total	25	32	23	33	33	30	176 (100%)

Table 16

Percentage of Agreement with Research Interest Statements*

Rank	Interest in:	Disagree/ Strongly Disagree	Agree/ Strongly Agree
1	using the results of research to change practice	3%	97%
2	finding answers to specific problems	3%	96%
2	knowing results of research projects conducted in my area of practice	3%	96%
3	knowing the results of research projects conducted in my organization	5%	91%
4	determining what differences research-based practice makes	10%	89%
5	reading research studies	15%	83%
6	participating in research projects of others	17%	82%
7	discussing research studies	22%	76%
8	conducting research as part of a work assignment	26%	73%
9	conducting research even if it is not part of a work assignment	41%	57%

* Percentages do not total 100% due to missing data

Table 17

Interest in Research by Education and Hospital Size

	Small Hospitals Mean (SD) [range]	Medium Hospitals Mean (SD) [range]	Large Hospitals Mean (SD) [range]	Total Mean
Diploma	31.3 (3.7) [25-38]	30.8 (5.7) [10-40]	29.9 (5.0) [20-40]	30.8
BSN	31.5 (5.2) [20-40]	32.3 (5.2) [21-40]	31.4 (5.1) [22-40]	31.7
Total Mean	31.3	31.5	30.7	31.2

Research Experience

The nurses were also asked about their experience with research. They were asked to respond "yes" or "no" to 18 different research experiences that ranged from taking research

courses, to using findings to change practice, to being a principal investigator. The minimum score possible was zero (no experiences) and the maximum score possible was 18 (all experiences).

Overall, the nurses did not have a great deal of research-related experience. For the entire sample, the scores ranged from 0 to 17, with a mean of 5.8 (SD=3.3). The most common experience was completing questionnaires for research. The frequency distribution for the top five experiences is shown in Table 18. The remaining 13 experiences were indicated by less than 50% of the nurses. For all but one experience, the baccalaureate nurses had more experience than the diploma nurses. Five diploma nurses and three baccalaureate nurses indicated that they had obtained funding from non-hospital sources to conduct research. The summary statistics by group are provided in Table 19.

Table 18

Research Experience by Education for Five Most Frequent Experiences

Rank	Experience	Diploma (% diploma)	BSN (% BSN)	Total (% total)
1	Completed questionnaires for research project	60 (72%)	94 (96%)	154 (84%)
2	Attended conferences where research findings were included in presentations	52 (63%)	74 (76%)	126 (69%)
3	Attended conferences where research studies were presented	45 (54%)	66 (67%)	111 (61%)
4	Taken a course in statistics	14 (17%)	87 (89%)	101 (55%)
5	Taken a course in research methods	12 (14%)	87 (89%)	99 (54%)

Analysis of variance revealed a significant difference in experience between diploma and baccalaureate nurses ($F=40.05$; $p=0.00$), with baccalaureate nurses having more research experience. There was no significant difference by hospital size ($F=1.10$; $p=0.30$) and no interaction effect was noted (see Table 19).

Table 19

Research Experience by Education and Hospital Size

	Small Hospitals Mean (SD) [range]	Medium Hospitals Mean (SD) [range]	Large Hospitals Mean (SD) [range]	Total Mean
Diploma	4.5 (3.4) [0-12]	3.6 (2.4) [0-10]	4.6 (2.7)[1-10]	4.2
BSN	7.2 (3.7) [0-17]	6.8 (2.3) [2-13]	7.4 (3.2) [2-16]	7.1
Total Mean	6.0	5.1	6.2	5.8

In summary, the first research question was answered by examining the responses to questions regarding the nurses' value for research, interests in research and research experience. Overall, the nurses expressed considerable value for and interest in research, but did not have a great deal of research experience. Baccalaureate nurses had significantly higher value for research and more research experiences than diploma nurses, but there were no differences in research interest between educational levels. There were no statistically significant differences in interest, value or experience between nurses from hospitals of different sizes.

Research Questions 2: What are Staff Nurses' Expectations of Themselves
for Using Research Findings in Practice?

The nurses were asked to express their level of agreement with six statements regarding expectations that they held regarding their own use of research in nursing practice. The minimum score possible was 6 (strong disagreement with all expectations) and the maximum score possible was 24 (strong agreement with all expectations). The range for the sample was 6-24 with a mean of 18.2 (SD=3.6). As shown in Table 20, few nurses had scores below 12 and the distribution of scores by education was similar, suggesting a moderately high level of expectation by most nurses.

Table 20

Distribution of Own Expectations to Use Research by Education

Own Expectation Score	Diploma	BSN	Total (%)
6-12	3	2	5 (3%)
13-18	42	44	86 (50%)
19-24	36	47	83 (47%)

Table 21

Expectations of Self by Education and Hospital Size

	Small Hospitals Mean (SD) [Range]	Medium Hospitals Mean (SD) [Range]	Large Hospitals Mean (SD) [Range]	Total Mean (SD) [Range]
Diploma	18.2 (2.6) [12-24]	18.8 (3.0) [14-24]	17.6 (3.3) [10-24]	18.3 (3.0) [10-24]
BSN	19.6 (2.5) [15-24]	18.1 (3.7) [6-24]	18.9 (3.0) [13-24]	18.8 (3.1) [6-24]
Total	18.9 (2.6) [12-24]	18.4 (3.3) [6-24]	18.3 (3.2) [10-24]	18.2 (3.6) [6-24]

As shown in Table 21, the group scores were similar. Analysis of variance demonstrated that there was no significant difference in expectations of self between the groups by education ($F=2.01$; $p=0.16$) or by hospital size ($F=0.66$; $p=0.52$).

The six expectations received varying degrees of agreement. Most nurses agreed or strongly agreed that they expected themselves to "critically question the effectiveness of daily nursing practice" (90%) and that they "apply research findings to clinical practice" (93%). Promoting a climate that supports colleagues' research received 85% agreement (agree/strongly agree) and being involved with collecting data for nursing research studies received 87% agreement. However, conducting research and being involved with collecting data for non-nursing research received less agreement; 50% and 56%, respectively.

In summary, the nurses generally had high expectations of themselves to use research,

although there was variability in the scores. There was no difference by educational level or hospital size, but individual nurses varied and responses to specific expectations varied.

Research Question 3: What are the Perceived Organizational Expectations
to Use Research Findings in Practice?

Organizational expectations were measured by asking the nurses to express their level of agreement with six statements of expectations held by key individuals within nursing in their organization. The statements were the same as those used to rate expectations of self. The nurses were asked their level of agreement about the degree they thought their head nurse, instructor, clinical nurse specialist (CNS) and nursing director held particular expectations.

Table 22 shows the expectation scores for the key individuals for the entire sample. The number of responses varied as many indicated "Not Applicable" for CNS and/or instructors, and a few respondents indicated "Not Applicable" for head nurses or nursing directors. In addition, some nurses did not complete the expectations of others; leaving blanks, inserting question marks, and occasionally adding explanations. For example, one nurse wrote "we rarely see our nursing director, and I really don't know what her expectations are". As noted earlier, missing data were handled by excluding the scales in which the individual nurse had not responded to more than two items in a scale and by assigning a neutral score when the nurse had not responded to one or two items. Because of the small number of responses regarding the CNS and instructor, these items were excluded from further analysis.

Most of the nurses responded to the statements regarding the expectations of their head nurse (88%) and nursing director (82%). Fewer nurses (56%) responded regarding their view of expectations held by instructors. Very few nurses (31%) responded regarding clinical nurse specialists. Those who responded were mostly from large hospitals.

Table 22

Expectation Scores of Key Individuals as Viewed by the Staff Nurse

	Number Responding (% sample)	Expectation Score		
		Mean	SD	Range
Head Nurse	161 (88%)	17.8	3.4	6-24
Director	149 (82%)	17.7	4.1	6-24
Instructor	100 (56%)	19.3	3.4	6-24
CNS	56 (31%)	18.8	3.1	11-24

Tables 23, 24 and 25 presents the distribution, group scores and analysis of variance of the expectations that the staff nurses believed their head nurses held; Tables 26 and 27 present the distribution and group scores for expectations the staff nurses believed their nursing directors held. The nurses perceived the expectations of the head nurses and the director of nursing to be similar, as illustrated by the mean and distribution. Analysis of variance detected a statistically significant difference between the perceived expectations of head nurses from hospitals of different sizes ($F=3.03$; $p=0.05$) and an interaction effect between hospitals and level of education ($F=3.39$; $p=0.04$). There were no differences between educational levels ($F=0.59$; $p=0.45$). This demonstrated that the baccalaureate nurses thought that their head nurses' expectations were higher in medium and large hospitals, but that diploma nurses thought their head nurse expectations were highest in medium hospitals.

For the perceived expectations of nursing directors, analysis of variance also detected a significant difference between nurses from hospitals of different sizes ($F=5.20$; $p=0.01$). However, there was no interaction effect ($F=1.54$; $p=0.22$), or difference between educational levels ($F=0.47$; $p=0.87$).

Table 23

Distribution of Staff Nurse Perceptions of Head Nurse Research Expectations*

Expectation Score	Diploma			Baccalaureate			Total
	Small	Medium	Large	Small	Medium	Large	
6	0	0	0	2	0	0	2
7-12	2	0	2	3	1	1	9
13-18	11	12	15	15	18	14	85
19-24	8	17	5	5	13	12	61
Mean (SD) [Range]	17.9 (3.9) [8.5-24]	18.9 (3.0) [13-24]	17.0 (2.7) [12-23]	15.9 (4.4) [6-23]	18.1 (3.0) [11-23]	18.5 (3.0) [11-24]	
Total Mean	18.1			17.6			17.8

* partial sample used due to missing data

Table 24

Staff Nurse Perceptions of Head Nurse Expectations by Education and Hospital Size

	Small Hospitals Mean (SD) [range]	Medium Hospitals Mean (SD) [range]	Large Hospitals Mean (SD) [range]	Total Mean (SD) [Range]
Diploma	17.9 (3.9) [8.5-24]	18.9 (3.0) [13-24]	17.0 (2.7) [12-23]	18.1 (3.2) [8.5-24]
BSN	15.9 (4.4) [6-23]	18.1 (3.0) [11-23]	18.5 (3.0) [11-24]	17.6 (3.6) [6-23]
Total	16.8	18.5	17.8	17.8 (3.4) [6-24]

Table 25

Summary of MANOVA for Staff Nurse Perceptions of Head Nurse Expectations by Group

Source	Sum of Squares (SS)	Degrees of Freedom (DF)	Mean Squares	F-ratio	P value
Education	6.68	1	6.68	0.59	0.45
Hosp.Size	68.77	2	34.38	3.03	0.05
Hosp*Educ	77.02	2	38.51	3.39	0.04
Error	1715.48	164	11.36		

Table 26

Staff Nurse Perceptions of Nursing Director Expectations by Education and Hospital Size*

Expectation Score	Diploma			Baccalaureate			Total
	Small	Medium	Large	Small	Medium	Large	
6	2	0	0	2	0	0	4
7-12	4	2	1	2	1	1	11
13-18	6	8	11	12	17	9	63
19-24	6	15	9	6	9	17	62
Mean (SD) [Range]	15.5 (5.0) [6-22]	18.9 (4.2) [7-24]	18.1 (3.4) [10-23]	16.4 (2.7) [6-24]	17.4 (2.7) [11-22]	19.0 (3.2) [11-24]	
Total Mean	17.8			17.7			17.6

* partial sample used due to missing data

Table 27

Staff Nurse Perceptions of Nursing Director Expectations by Education and Hospital Size

	Small Hospitals Mean (SD) [range]	Medium Hospitals Mean (SD) [range]	Large Hospitals Mean (SD) [range]	Total Mean (SD) [Range]
Diploma	15.5 (5.0) [6-22]	18.9 (4.2) [7-24]	18.1 (3.4) [10-23]	17.8 (4.4) [6-24]
BSN	16.4 (2.7) [6-24]	17.4 (2.7) [11-22]	19.0 (3.2) [11-24]	17.7 (3.9) [6-23]
Total	15.9	18.1	18.6	17.6 (4.1) [6-24]

In summary, the nurses thought that the expectations of head nurses and directors were similar, with differences in expectations between nurses from hospitals of different sizes. Interestingly, with regard to head nurse expectations, there was a significant interaction effect with a difference in the perception of nurses of different educational levels from hospitals of different sizes. For perceptions of nursing director expectations there were no significant differences between nurses of different educational levels.

**Research Question 4: What is the Perceived Level of Organizational Support
for Using Research Findings in Nursing Practice?**

Organizational support for research was measured in three ways. First, the nurses were asked to express their level of agreement with six statements regarding the value of research within the nursing department. Second, they were asked to express their level of agreement with 11 statements regarding the research climate in their organization. Third, they were asked to identify the research-related infrastructures available in both their organizations and their nursing departments.

Value of Research

The statements regarding the value of research within the nursing department were the same statements as those that the nurses responded to when rating their own value for research. The minimum score possible was 6 (strongly disagree with all value statements); the maximum score possible was 24 (strongly agree with all statements). For the sample, the scores ranged from 8-24, with a mean of 19.5 (SD=3.3). Most of the nurses agreed or strongly agreed with most statements (see Table 28).

Table 28

Distribution of Perceived Nursing Department Value for Research by Education and Hospital Size

Nursing Department Value Score	Diploma			Baccalaureate			Total
	Small	Medium	Large	Small	Medium	Large	
8-11	0	1	0	2	0	0	3
12-15	3	0	1	7	3	1	15
16-19	11	11	10	13	15	10	70
20-24	9	20	11	10	13	17	80
Total	23	32	22	32	31	28	168

* partial sample used due to missing data

Table 29

Nursing Department Value for Research by Education and Hospital Size

	Small Hospitals Mean (SD) [range]	Medium Hospitals Mean (SD) [range]	Large Hospitals Mean (SD) [range]	Total Mean (SD) [Range]
Diploma	18.7 (3.4)[12-24]	20.6 (2.9) [11-24]	20.1 (2.9) [15-24]	19.8 (3.1) [11-24]
BSN	18.2 (4.3) [8-24]	19.4 (2.9) [14-24]	20.6 (3.2) [12-24]	19.3 (3.6) [8-24]
Total	18.3 (3.9) [8-24]	19.9 (2.9) [11-24]	20.3 (3.1) [12-24]	19.5 (3.3) [8-24]

The scores were lower in small hospitals, larger in medium hospitals and largest in large hospitals (see Table 29). Analysis of variance indicated a significant difference in the perceived nursing department value for research between hospital sizes ($F=4.96$; $p=0.01$). There was no difference between educational levels ($F=0.58$; $p=0.45$) and no interaction effect noted ($F=0.70$; $p=0.50$).

Research Climate

The 11 statements regarding the research climate included questions about encouragement and recognition for nurses and interest in research by others. The minimum score possible was 11 (strong disagreement with all statements) and the maximum score possible was 44 (strong agreement with all statements). For the overall sample, the scores ranged from 11-44 with a mean of 25.9 ($SD=6.8$). Most of the scores were between 21-30 (see Table 30). Any disagreement with all statements would produce a score of 22, suggesting a low opinion of the research climate.

The climate scores were higher for medium hospitals than for small hospitals and highest for larger hospitals (see Table 31). Multiple analysis of variance illustrated that there was a significant difference in climate score between hospitals of different sizes ($F=2.41$; $p=0.00$), but no significant difference between educational levels ($F=0.06$; $p=0.30$). No interaction effect was detected (see Table 32).

Table 30

Distribution of Research Climate Scores by Education and Hospital Size

Research Climate Score	Diploma			Baccalaureate			Total(%)
	Small	Medium	Large	Small	Medium	Large	
11-15	3	3	0	7	1	1	15 (9)
16-20	5	2	0	6	5	0	18 (11)
21-25	6	7	5	9	10	8	45 (27)
26-30	2	11	6	6	7	13	45 (27)
31-35	2	7	9	4	9	4	35 (21)
36-40	0	2	2	0	0	3	7 (4)
41-44	0	0	1	0	0	1	2 (1)
Total	18	32	23	32	32	30	167 (100)

Table 31

Research Climate by Education and Hospital Size

	Small Hospitals Mean (SD) [Range]	Medium Hospitals Mean (SD) [Range]	Large Hospitals Mean (SD) [Range]	Total Mean (SD) [Range]
Diploma R.N.	22.0 (6.1) [11-34]	26.6 (6.8) [11-36]	30.7 (5.6) [21-42]	26.8 (7.0) [11-42]
BSN	21.7 (6.8) [11-34]	26.0 (5.6) [15-34]	28.5 (6.0) [14-44]	25.2 (6.70) [11-44]
Total	21.4	25.5	29.1	25.9 (6.8) [11-44]

Table 32

Summary of MANOVA for Research Climate by Group

Source	Sum of Squares (SS)	Degrees of Freedom (DF)	Mean Squares	F-ratio	P value
Education	41.03	1	41.03	1.07	0.30
Hosp.Size	1558.70	2	779.35	20.30	0.00
Hosp*Educ	28.03	2	14.01	0.37	0.70
Error	6295.16	164	38.39		

Organizational Infrastructure

The infrastructures for research within the organization were measured by asking the nurses to identify those infrastructures such as policies, job descriptions, committees, resources and personnel available in their hospitals to support research. They were asked to respond "yes", "no", or "don't know" to indicate whether or not 27 different aspects of infrastructure existed. "Yes" responses were counted to calculate the infrastructure score. The minimum score possible was 0 (no supports); the maximum score was 27 (all supports).

Over 33% of all responses were "don't know" responses. For the sample, the scores ranged from 0-27, with a mean of 7.2 (SD=6.3). Over half of the nurses reported that fewer than 6 of the 27 possible infrastructures were present (see Table 33). The most frequently identified infrastructures were library supports and ethics committees, which were identified by 119 and 112 nurses, respectively. However, the ethics committees identified were not necessarily related to research as only 64 nurses identified research review committees and only 18 nurses identified combined research and ethics committees. All remaining infrastructures were identified by fewer than half of the nurses.

Analysis of variance illustrated that there was a significant difference in the number of infrastructures between hospitals of different sizes ($F=2.41$; $p=0.00$), with larger hospitals having significantly greater support for research than medium or small hospitals (see Tables 34 and 35). There was a tendency for the BSN group to report higher organizational support ($p=0.08$).

Table 33

Distribution of Organizational Infrastructure Scores by Education and Hospital Size*

Organizational Infrastructure Score	Diploma			Baccalaureate			Total (%)
	Small	Medium	Large	Small	Medium	Large	
0	6	3	2	10	1	0	22 (12)
1-6	13	16	6	14	14	6	69 (39)
7-11	5	11	8	4	11	7	46 (26)
12-16	1	1	3	2	3	11	21 (12)
17-21	0	2	5	3	2	6	18 (10)
22-27	0	0	0	0	2	0	2 (1)
Total	25	33	24	33	33	30	178 (100)

* partial sample used due to missing data

Table 34

Mean Number of Organizational Infrastructures by Education and Hospital Size

	Small Hospitals	Medium Hospitals	Large Hospitals	Total
Diploma	3.5	6.2	10.0	5.7
BSN	5.1	7.8	11.5	8.0
Total Mean	4.4	7.0	10.9	7.3

Table 35

Summary of MANOVA for Organizational Infrastructure by Group

Source	Sum of Squares (SS)	Degrees of Freedom (DF)	Mean Squares	F-ratio	P value
Education	108.58	1	108.58	0.06	0.08
Hosp.Size	1114.00	2	557.15	2.41	0.00
Hosp*Educ	0.01	2	0.00	0.00	1.00
Error	5785.60	171	33.83		

In summary, from the staff nurses' perspective, the nursing department's value for research, the research climate within the organization and the infrastructures available to support research were significantly different by hospital size. Nursing department value was fairly high, opinions of organizational climate were low and few infrastructures were identified in most hospitals. Value, climate and infrastructure were lowest in small hospitals, higher in medium hospitals and highest in large hospitals. There were no differences in the nurses' perceptions by educational level, although there was a tendency for baccalaureate nurses to report more infrastructures.

Research Question 5: What is the Reported Level of Research Utilization?

The level of research utilization was measured in two ways. First, the nurses were asked to rate their general use of research. Second, they were asked about the use of specific research findings.

General Use of Research

The nurses were asked to rate each of 10 statements related to general use of research on a four-point scale from "not at all" to "sometimes" to "frequently" to "always". The minimum score possible was 10 ("not at all" for all statements); the maximum score possible was 40 ("always" for all 10 statements). For the entire sample, the scores ranged from 10-38, with a mean of 22.7 (SD=4.91). All of the statements were rated at least "sometimes" by at least 80% of the nurses (see Table 36). The most strongly supported statement was regarding communication of concerns about the effectiveness of practices to colleagues. The use of research articles to support questioning practice and the identification of hospital policies based on research were the least supported statements.

Table 36

Percentage of Responses Regarding General Use of Research

Rank	Item	Not At All	Sometimes	Frequently or Always
1	I communicate concerns about the effectiveness of practices to colleagues	2%	41%	57%
2	I critically question daily practices for effectiveness	2%	55%	43%
3	I implement nursing care on the basis of current research findings	10%	51%	39%
4	I am familiar with current research relevant to my area of nursing	10%	65%	25%
5	I change practice based on research	11%	58%	31%
6	I evaluate the results of changed practice	13%	44%	43%
7	I can identify the research basis for my common daily practices	16%	58%	26%
8	I can identify hospital policies/procedures that are not based on current research	18%	55%	26%
9	I can identify hospital policies/procedures that are based on current research	20%	51%	29%
10	I use research articles to support my questioning of daily practices	20%	54%	26%

The distribution of scores for general use of research by the nurses' education is illustrated in Table 37. Table 38 illustrates the mean scores by education and hospital size. MANOVA was used to test the differences in use of research between the groups. There were no significant differences between the groups by education ($F=1.85$; $p=0.67$) or hospital size ($F=0.29$; $p=0.75$).

Table 37

Distribution of General Use of Research by Education

General Use of Research Score	Diploma	BSN	Total (%)
10-15	5	4	9 (5%)
16-20	22	28	50 (28%)
21-25	30	41	71 (39%)
26-30	19	17	36 (20%)
31-35	6	6	12 (7%)
36-40	0	2	2 (1%)
Total	82	98	180 (100%)

Table 38

General Use of Research by Education and Hospital Size

	Small Hospitals Mean (SD) [range]	Medium Hospitals Mean (SD) [range]	Large Hospitals Mean (SD) [range]	Total Mean (SD) [Range]
Diploma	22.5 (5.0) [15-33]	22.5 (5.6) [12-35]	22.8 (4.0) [15-29]	22.6 (4.9) [12-35]
BSN	23.8 (6.3) [10-38]	22.7 (4.1) [16-32]	22.3 (4.1) [17-33]	22.9 (4.9) [10-38]
Total	23.2 (5.7) [10-38]	22.5 (4.9) [12-35]	22.5 (4.0) [15-33]	22.7 (4.9) [10-38]

Use of Specific Research Findings

The nurses were asked to rate whether they used 10 specific findings "never"=1, "sometimes"=2, or "always"=3. Because it was anticipated that all practices would not be used in all settings, they were asked to indicate when practices were not applicable. Three of the findings were rated as "not applicable" by over 30% of nurses. The "not applicable" practices were then excluded when calculating the percentage of use and the overall scores. The score for the use of specific findings was the average score of applicable practices.

As shown in Table 39, the use of specific findings varied. With one exception (catheter

clamping), each finding was used at least sometimes by 50% of the nurses. Giving sensory information prior to diagnostic tests was used most frequently (at least sometimes by 96% of nurses for whom the practice was applicable). Giving sensory information prior to surgical procedures and mutual goal setting were also used at least sometimes by 95% of nurses. An average of 77% of nurses used the findings at least sometimes.

Table 39

Distribution of Use of Specific Research Findings

Rank	Research Area	Not Applicable (%) A	Never(%) B	Sometimes(%) C	Always(%) D	Total Use (C+D/B+C+D= % of applicable)
1	sensory information before diagnostics	10 (5%)	7 (4%)	65 (36%)	101 (55%)	166 (96%)
2	mutual goal setting	10 (5%)	9 (5%)	101 (55%)	63 (34%)	164 (95%)
3	sensory information pre-operatively	35 (19%)	8 (4%)	59 (32%)	81 (44%)	140 (95%)
4	planned preop. teaching	61 (38%)	20 (11%)	35 (23%)	67 (37%)	102 (84%)
5	electronic oral temperature during oxygen	32 (17%)	29 (16%)	37 (20%)	85 (46%)	122 (79%)
6	urine testing	66 (36%)	25 (14%)	51 (28%)	41 (22%)	92 (79%)
7	activities which increase intracranial pressure	54 (30%)	34 (19%)	36 (20%)	59 (32%)	95 (74%)
8	preop. relaxation	36 (20%)	45 (25%)	69 (38%)	33 (18%)	102 (69%)
9	dorsogluteal injection technique	34 (19%)	69 (38%)	46 (30%)	34 (19%)	80 (54%)
10	catheter clamping	21 (15%)	83 (45%)	58 (32%)	21 (15%)	79 (49%)

For the sample, the scores ranged from 1.0-3.0, with a mean of 2.15 (SD=0.36). Table 40 presents the scores by group. When tested with analysis of variance, there were no significant differences between groups by education ($F=0.06$; $p=0.67$) or hospital size ($F=2.4$; $p=0.09$).

Table 40

Use of Specific Findings by Education and Hospital Size

	Small Hospitals Mean (SD) [range]	Medium Hospitals Mean (SD) [range]	Large Hospitals Mean (SD) [range]	Total Mean (SD) [Range]
Diploma	2.1 (0.37) [1.4-2.9]	2.1 (0.04) [1.0-2.7]	2.3 (0.28) [1.9-2.9]	2.2 (0.36) [1.0-2.9]
BSN	2.1 (0.34) [1.6-3]	2.2 (0.36) [1.4-3.0]	2.2 (0.36) [1.5-3.0]	2.2 (0.35) [1.4-3.0]
Total	2.1 (0.35) [1.4-3]	2.1 (0.38) [1.0-3.0]	2.2 (0.32) [1.5-3.0]	2.2 (0.35) [1-3.0]

The levels of research utilization did not differ by hospital size or educational level when measured as general use of research or as use of specific findings. There was considerable variation in the level of support for different statements regarding general use of research and variation in the use of different findings.

Research Question 6: What is the Difference Between Perceived Organizational Expectations and Staff Nurses' Expectations for Use of Research Findings in Nursing Practice?

The difference between the organizational expectations and the nurses' expectations of themselves was tested using t-tests. The mean difference between head nurse expectations (M=17.8) and the nurses' own expectations (M=18.2) was 0.87. There was a significant difference between these expectation scores ($t=2.381$, $p=0.02$). Similarly, the mean difference between nursing director expectations (M=17.7) and the nurses' expectations was 0.77. This difference was also statistically significant ($t=2.60$, $p=0.01$). The nurses' expectations of themselves were significantly higher than the expectations of the key individuals in the employing hospitals.

Research Question 7: What are the Relationships between Perceived Organizational Expectations, Staff Nurse Expectations of Themselves, and the Use of Research Findings?

Pearson's Correlation Coefficients were calculated to describe the relationships between the

expectations of self and the expectations of the key individuals. To describe the relationship between the expectations and use of research, correlations were calculated between expectations (head nurse, director and self) and use of research (general and specific). Table 41 provides the correlations for each of these relationships.

Table 41

Pearson Correlation Matrix between Expectations and Use of Research

	Head Nurse Expectations	Director Expectations	Own Expectations	General Use of Research	Use of Specific Findings
Head Nurse Expectations	1.00				
Director Expectations	0.67***	1.00			
Own Expectations	0.42***	0.26***	1.00		
General Use of Research	0.16**	0.13	0.51***	1.00	
Use of Specific Findings	0.08	0.24**	0.24***	0.48***	1.00

** p<0.01

*** p<0.001

As shown, all relationships among the expectations perceived to be held by different individuals were statistically significant. In interpreting the strength of the correlations and judging the practical significance of the correlations, Munro and Page's (1993) classification was used in which 0.26-0.49 is considered a low correlation, 0.50-0.69 is considered moderate, 0.70-0.89 is considered a high correlation and 0.90-1.00 is very high. Although they may be statistically significant, correlations below 0.26 are not considered to indicate any correlation of practical significance and therefore were not included in the interpretation. All of the correlations above 0.26 were statistically significant at the 0.001 level or higher.

The relationship between the perceived expectations of the head nurse and the director was

moderate ($r=0.67$). The relationship of the nurse's own expectations to perceived head nurse expectations was moderate ($r=0.42$), and to perceived director expectations was low ($r=0.26$).

The relationship between the nurses' reported general use of research and use of specific findings showed a moderate, statistically significant correlation ($r=0.48$). The relationships between expectations and the use of research were not as strong as the relationships among the expectations perceived to be held by various people or between the two measures of research utilization. There were no correlations between the perceived expectations held by head nurses and the general use of research ($r=0.16$) or the use of specific findings ($r=0.08$). There were also no correlations between the perceived expectations of nursing directors and the general use of research ($r=0.13$) or the use of specific findings ($r=0.24$). The nurses' own expectations correlated moderately with their own reported general use of research ($r=0.51$). The nurses' expectations did not correlate with their reported use of specific findings ($r=0.24$).

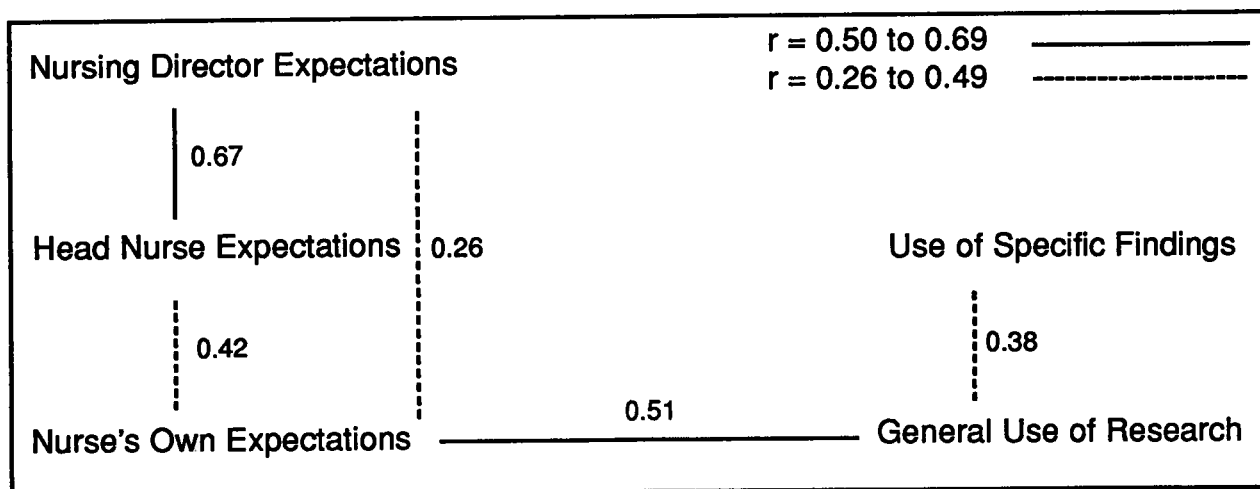


Figure 3: Relationships Between Expectations and Research Use

In summary, as shown in Figure 3, the organizational expectations (head nurse and nursing director expectations) were moderately inter-correlated and had low correlations with the nurses'

own expectations. The nurses' own expectations were moderately correlated with the general use of research but not with the use of specific findings. The general use of research had a low correlation with the use of specific findings.

Research Question 8: What is the Relationship Between the Nurses' Perceptions of Organizational Support for Research Utilization and Use of Research Findings?

To describe the relationship between organizational support and the use of research, correlations were also calculated. All of the relationships were statistically significant except for those between the nursing department's perceived value for research and the use of research findings (general and specific). However, using the categories offered by Munro and Page (1993), it can be seen that there were correlations of practical significance among the measures of organizational support (nursing department value for research, research climate and organizational infrastructures). Two measures of support (climate and infrastructures) correlated with the use of specific findings, but none correlated with general use of research. There was also a moderate correlation between the two measures of research use.

Table 42

Pearson Correlation Matrix for Organizational Support and Use of Research

	General Use of Research	Use of Specific Findings	Perceived Nursing Department Value	Organizational Climate
General Use of Research	1.00			
Use of Specific Findings	0.48***	1.00		
Perceived Nursing Department Value	0.06	0.15	1.00	
Organizational Climate	0.18*	0.34***	0.49***	1.00
Infrastructures	0.20**	0.36***	0.31***	0.63***

* $p < 0.05$

** $p < 0.01$

*** $p < 0.001$

Ancillary Findings

Other analyses were performed to identify relationships among variables not addressed by the research questions. Relationships among the demographics and between the demographics and the study variables were examined. Relationships among the individual characteristics, among the organizational characteristics and between individual and organizational characteristics and the research utilization outcomes were also examined. The correlations are summarized in Table 43. Again, interpretation of the strength of the correlations was done using Munro and Page's (1993) classification. Furthermore, all of the correlations above 0.26 were statistically significant at least at the 0.001 level or higher.

Demographics

Age correlated strongly with years since graduation for both diploma nurses ($r=0.88$) and moderately for baccalaureate nurses ($r=.60$). However, as shown in Table 43, age and years since graduation did not correlate with any of the other study variables.

Relationships Among Research-related Characteristics of the Individual Nurse

The research related characteristics of the nurse included the nurses' interest in, value for and experience with research and the nurses' expectations to use research in practice. As shown in Figure 4, there were significant correlations between most of these characteristics. Expectations of self were moderately correlated with research interest and the nurses' own value for research, and showed a low correlation with research experience. The nurses' own value for research was also moderately correlated with research interest. Research experience showed a low correlation with research interest and with expectations to use research.

Table 43

Correlation Matrix for Study Variables

	AGE	YEARS	EXSELF	INTEREST	EXPER.	OWN VALUE	CLIMATE	INFRA.	NDEPT. VALUE	EXP. HEAD NURSE	EXP. DIRECTOR	GENERAL USE
AGE	1.00											
YEARS	0.84***	1.00										
EXSELF	-0.11	0.14	1.00									
INTEREST	-0.06	-0.02	0.60***	1.00								
EXPER.	-0.10	-0.08	0.29***	0.31***	1.00							
OWN VALUE	-0.10	-0.00	0.52***	0.46***	0.14	1.00						
CLIMATE	0.01	-0.10	0.20*	0.09	0.06	0.16	1.00					
INFRA.	-0.01	-0.01	0.14	0.11	0.27***	0.05	0.63***	1.00				
NDEPT. VALUE	0.01	0.02	0.06	0.05	-0.12	0.23**	0.49***	0.29***	1.00			
EXP. HEAD NURSE	-0.06	0.13	0.42***	0.11	-0.07	0.01	0.49***	0.30***	0.47***	1.00		
EXP. DIRECTOR	0.04	-0.01	0.26***	0.04	-0.15	0.02	0.56***	0.35***	0.56***	0.67***	1.00	
GENERAL USE	0.02	0.01	0.51***	0.50***	0.37***	0.41***	0.18*	0.24***	0.05	0.16	0.13	1.00
USE OF FINDINGS	0.11	0.21	0.25**	0.23**	0.15*	0.13	0.33***	0.31***	0.14	0.06	0.24***	0.38***

* p<0.05
 ** p<0.01
 *** p<0.001

AGE= Nurses' age
 YEARS= Years since graduation
 EXSELF= Nurses' own expectations to use research
 INTEREST=Nurses' interest in research
 EXPER.=Nurses' research experience
 OWN VALUE= Nurses' own value for research

CLIMATE=Organizational Climate
 INFRA.=Organizational Infrastructures
 NDEPT. VALUE=Nursing department value for research
 EXP HEAD NURSE=Head nurse expectations of staff nurse
 EXP DIRECTOR=Nursing director expectations of staff nurse
 GENERAL USE=General use of research
 USE OF FINDINGS=Use of specific findings

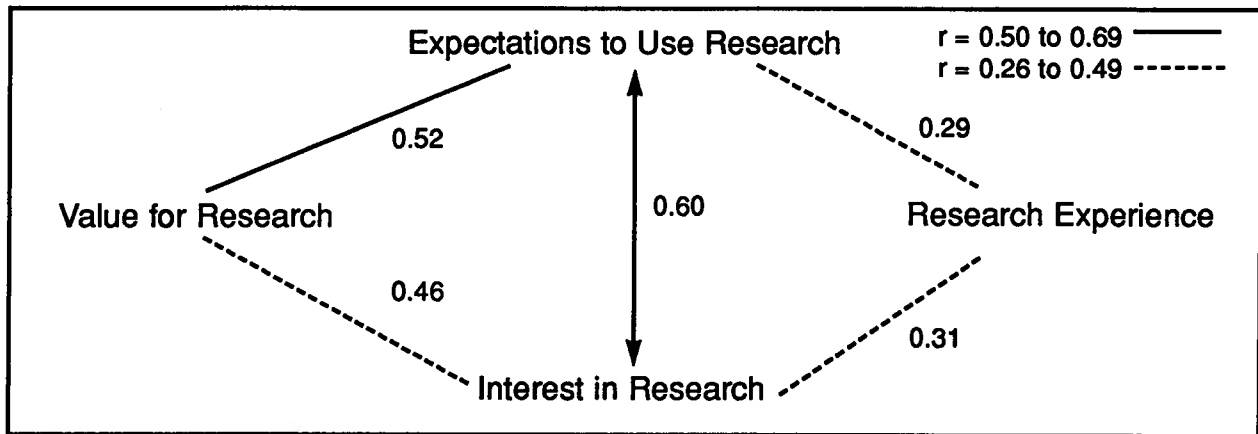


Figure 4: Correlations ($r > 0.26$) Between Individual Characteristics

Relationships Among Organizational Characteristics

The organizational characteristics that were measured included the expectations of key individuals and organizational support as identified by the research climate, the nursing department value for research and the research infrastructures. Relationships among these variables were examined and are illustrated in Figure 5. The perceived expectations of the nursing director correlated moderately with the expectations of the head nurse, the nursing department value for research and the research climate. A low correlation was found between the nursing director value for research and the research climate. A low correlation was found between the nursing director expectations and infrastructure. The perceived head nurse expectations showed a low correlation with the nursing department value for research and the research climate. There was a low correlation between the nursing department value for research, the research climate and infrastructures.

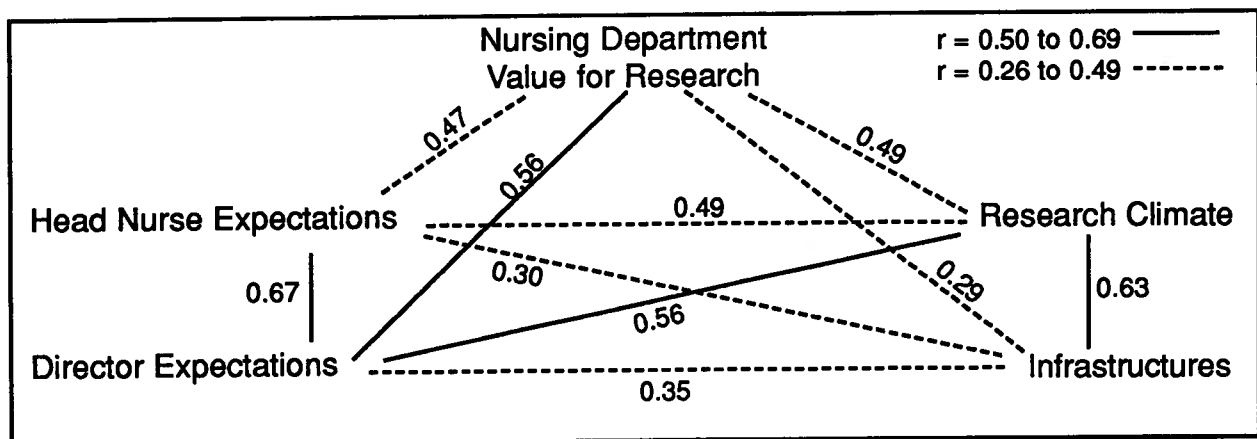


Figure 5: Correlations ($r > 0.26$) Between Organizational Characteristics

Relationships Between Individual and Organizational Characteristics and Research Utilization

The relationships between the characteristics described above and the research utilization outcomes were also examined using correlations (see Figure 6). Only two organizational characteristics (research climate and infrastructure) showed a low correlation to the use of specific findings. None of the individual factors correlated significantly with use of specific findings. None of the organizational characteristics but all of the individual characteristics correlated with general use of research. Interest in research and expectations for using research in practice were moderately correlated with general use; the nurses' value for research and research experience showed a low correlation with general use.

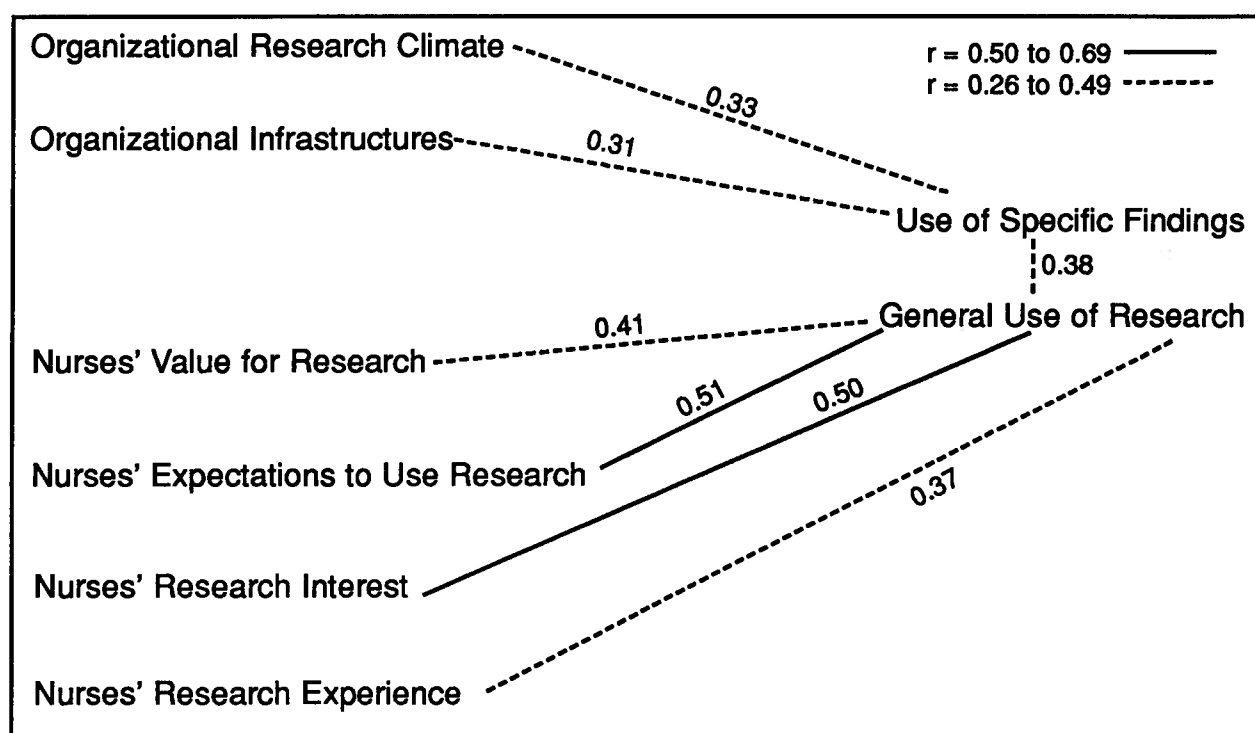


Figure 6: Correlations ($r > 0.26$) Between Individual and Organizational Characteristics and Research Utilization Outcomes

In summary, the personal and professional characteristics and individual change factors were inter-related and correlated with the general use of research as reported by the nurses. The organizational characteristics and change factors were also inter-related and correlated with the use of specific findings. The organizational factors were not related to the individual staff nurse factors, except for the correlation between the nurses' own expectations to use research and the perceived expectations of head nurses and nursing directors, and the correlation between research experience and reported organizational infrastructures. The use of specific findings were related only to organizational factors, whereas the second measure of research utilization (general use of research) was related only to individual factors. These two measures of research utilization were also correlated. These correlations are summarized in Figure 7.

Finally, correlations between educational level and hospital size and the study variables were obtained. These correlations are summarized in Appendix E (p. 157). As anticipated from earlier analyses, educational level only correlated significantly with research experience and the nurses' own value for research. Hospital size only correlated significantly with research climate, the number of infrastructures, and the perceived expectations of the nursing directors.

The results of this survey were intriguing and in many ways unexpected. However, close examination of earlier research reveals that this study builds significantly toward a better understanding of the factors influencing the use of research in nursing practice.

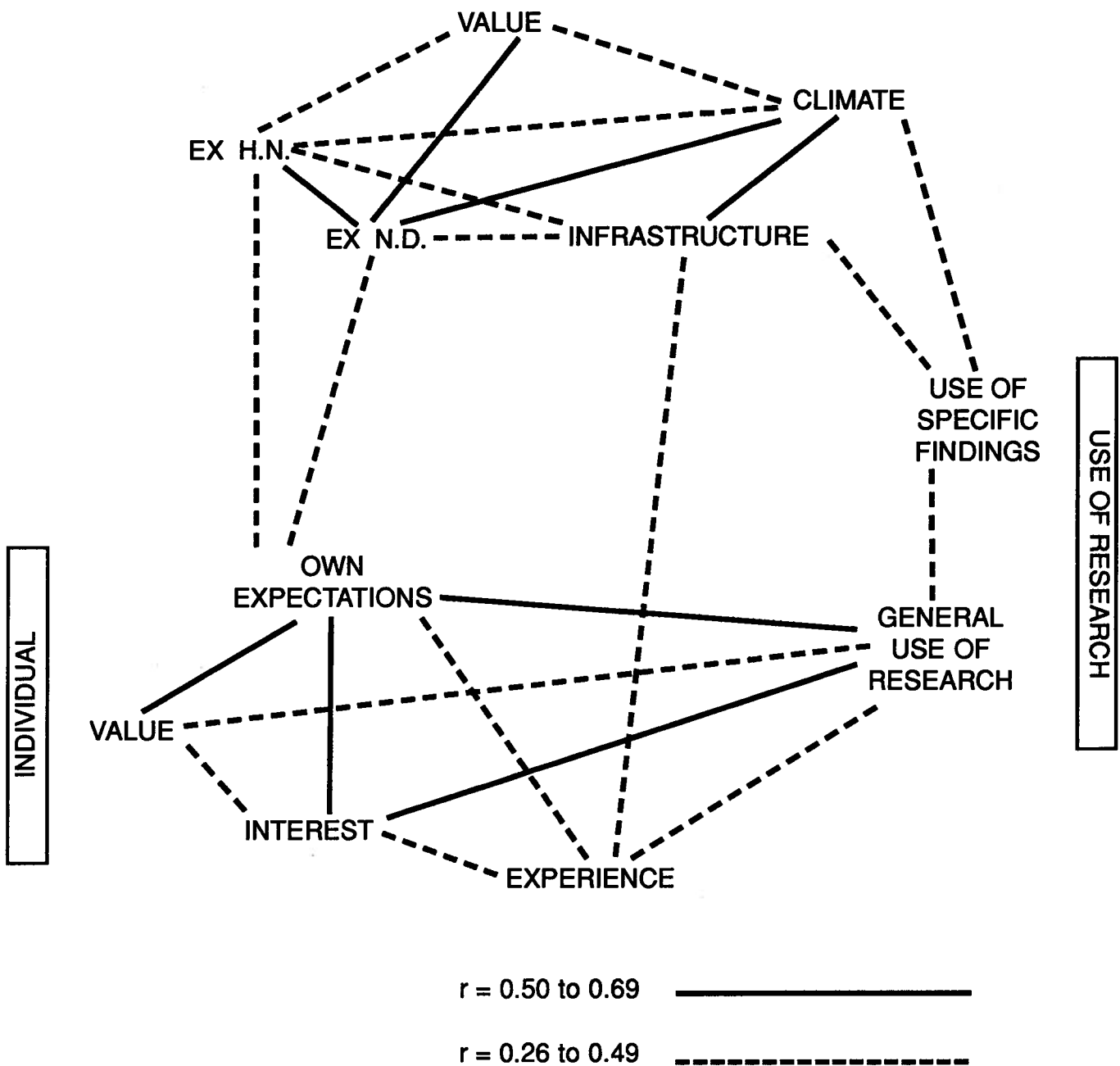


Figure 7: Correlations among organizational and individual factors and research utilization outcomes.

Discussion

In this section, the results are discussed in relation to the theoretical framework, other research studies and methodological problems inherent in the study. First, the characteristics of the sample are discussed. The remainder of the discussion is organized by the conceptual framework. Each component of the framework is discussed under the headings of individual factors, organizational factors and research utilization outcomes. The levels of each factor and the relationships within each component are discussed. After the results have been discussed in relation to each of the components, the relationships between the components are discussed.

Sample Characteristics

Because the sample was purposefully stratified by educational level and hospital size the sample likely represents, in a reasonable way, nurses with both diploma and baccalaureate education and nurses who work in hospitals of varying sizes. Because of the stratification, a greater proportion of the sample than would be found in the target population were nurses with baccalaureate education. In the sample, 54% of the nurses had baccalaureate degrees. In 1991, 15% of nurses in British Columbia held baccalaureate degrees, while only 8.5% of nurses working in B.C. hospitals as staff nurses held baccalaureate degrees (Statistics Canada, 1991). Statistics were not available for the proportion of nurses working in hospitals of different sizes. However, Kazanjian, Pulcins and Kerluke (1992) found that 37% of nurses working in Canadian acute care hospitals worked in non-urban areas. This compares reasonably with the 32% of nurses in the sample who worked in small hospitals and supports the assumption that the sample is representative of nurses working in hospitals of varied sizes.

Although the response rate was higher for baccalaureate nurses (44%) than diploma nurses (37%) despite a third mailing to diploma nurses only, the overall response rate was satisfactory. The return rate of 42% was similar to the 44% return rate obtained by Alcock et al. (1990) in

a similar survey in Ontario. The return rate may indicate a lack of interest in research on the part of the non-respondents. The number of non-respondents causes concern and limits the generalizability of the findings as it is not possible to know how the non-responders differed from the responders or how the non-responders in each educational level differed. The difference in response rates may reflect a difference in the attitudes of baccalaureate nurses and diploma nurses toward research. This is partially supported by the finding of a significant difference between the educational groups in their reported value for research, although reported interest in research was not significantly different.

Clarke (1992) reported that telephone interviews conducted to increase the response rate for her survey regarding research in clinical practice revealed that nursing administrators did not participate because of a lack of time, resources and a lack of knowledge regarding the research process. In the current survey, written comments suggested that these factors were also barriers to participation for the staff nurses. Three of the four nurses who returned their surveys incomplete added letters explaining that they did not know enough about research to respond.

The employment status of the current sample was that 49% of the nurses worked full time and 51% worked part time or casual. Kazanjian, Pulcins and Kerluke (1992) estimated the employment status of nurses in British Columbia using data from nine groupings of hospitals. They found that 79% of nurses worked full time in urban areas and 62% worked full time in non-urban areas. The lower levels of full time employment in the current sample than in the findings of Kazanjian et al. may be due to the fact that they did not use a random sample, the fact that there were nearly two years between their data collection and the current survey or the possibility that the non-respondents in the current study worked full time. The respondents in this sample may be different by employment; nurses working part time may have more time or be more willing to respond to a survey. Finally, the stratified approach in the current study may

have resulted in greater representation from small hospitals in non-urban areas, although this would not account for all of the difference. The employment status of the nurses in the current study was remarkably different from those in the study by Alcock et al. (1990). They found that only 9.6% of respondents were working part-time compared to national estimates of 38% part-time employment at that time.

Kazanjian et al. (1992) reported 1.4 times as many nurses were employed in medical and surgical areas than in critical care areas. In the current sample, 1.7 times as many nurses were employed in medical-surgical areas. This likely reflects differences in responders and non-responders and differences between the studies as described above.

In terms of other major demographic factors, the sample was reasonably representative. In the sample, 1.6% were male while 2.9% of registered nurses in B.C. are male (Canadian Centre for Health Services and Policy Research, 1993). Comparing the age distribution of the sample with the age distribution of registered nurses in B.C. indicates that the sample distribution is similar but that the respondents are younger than the general population of B.C. nurses. In the sample, 38% of the nurses were 25-34 years of age, whereas only 24% of the nursing population in B.C. is in that age range. The sample had similar numbers of nurses in the 35-44 year category (37% compared to 35%). There were only 15 (8%) respondents 50 and over and there were no respondents over 57, whereas 12% of B.C registered nurses are 55 and over. Although the sample is younger than the overall nursing population, it is likely representative of medical-surgical and critical care nurses practising in acute care. The data from the Canadian Centre for Health Services and Policy Research (1993) included the ages of nurses working in all areas as well as nurses who were unemployed or who were not employed in nursing. There were no data available regarding years since graduation to use for comparison.

Although a random sample was used in the current study, stratification and differences

between responders and non-responders led to a final sample that was more representative of baccalaureate nurses, nurses who work part time and nurses working in medical-surgical areas than of the population of staff nurses working in B.C. acute care hospitals. The sample was similar in gender and age to the underlying population.

Individual Factors

The individual factors include personal and professional characteristics and individual change factors. In addition to the demographic characteristics, the professional characteristics of research experience and the individual change factors of the nurses' own value for research, interest in using research, and expectations of self for using research in practice were considered. The individual nurse's assessment of available resources was also considered, but will be discussed under organizational change factors.

Research Experience. Although the research-related experience of baccalaureate nurses was significantly greater than that of diploma nurses, the experience of the overall sample was low. As noted earlier, most of the difference between educational levels could be accounted for by the fact that most of the baccalaureate nurses had taken research and statistics courses (89%), whereas diploma nurses had not (14% and 17%, respectively). Most of the nurses had five or fewer research experiences. It was discouraging to note that the most frequently reported research experience was completing questionnaires, meaning that the nurses had more experience with being the subjects of research than with learning about, participating in or implementing research findings. However, it is possible that the experience of completing questionnaires was frequently reported because the nurses included participating in the current study as an experience.

These findings are similar to those of Alcock et al. (1990) who surveyed nurses in Ontario. They found the same rank order among the experiences but found lower levels for all experiences. The lower levels of experience may be explained because Alcock et al. used a

sample comprised of 26% baccalaureate nurses.

These findings are also very similar to the findings of Clarke and Joachim (1993) in their survey of B.C. schools of nursing. A key individuals with research responsibility in each school gave his or her opinion of faculty in relation to research. Using a tool derived from the instrument which was the basis of the current study, Clarke and Joachim found that the most frequently reported research experiences of faculty were completing questionnaires, followed by courses in research or statistics and attending conferences. Very few schools reported that faculty had other research experiences such as being a principal investigator, being a research assistant, writing proposals or obtaining funding for research.

The findings of the current study are, however, quite different from those of Clarke (1992) who used the same items to survey key hospital personnel regarding nurses' research related experience. Only "a few" nurses were perceived to have each of the research experiences, with the exceptions of completing questionnaires and changing practice based on research, which were estimated to have been experienced by more than a few, but still less than a quarter of nurses.

The differences between the low levels of staff nurse research experience perceived by key hospital personnel in Clarke's study and the higher levels reported by the staff nurses in the current study may be partially due to differences between responders and non-respondents. It may be that the respondents to this survey were different from non-responders in their level of research experience. However, even if none of the non-respondents had any research experience, more than one quarter of the diploma nurses surveyed would have had experience completing questionnaires and attending conferences. Therefore, the differences in experience between Clarke's study and the current study must also be partially explained as a difference between the key hospital personnels' perception of staff nurses and the staff nurses' perception of themselves.

Staff Nurses' Value For Research. While the baccalaureate nurses had a significantly higher value for research than the diploma nurses, value for both groups was high, with the means being 20.7 and 19.7 on scores with a possible range of 6-24. Alcock et al. (1990) found a similar rank order of support for statements, with value for solving patient care problems receiving 92% support and cost-effectiveness receiving 73%, compared to 98% and 77% in the current study. However, they found a slightly lower level of support for all value statements, most notably 70% support for public accountability compared to 89% in the current study. As in the current study they also found that baccalaureate nurses had significantly higher value for research. The differences between the studies are not remarkable and may be due to slight provincial variations, elapsed time between studies, increased media attention to public accountability, different sample composition or chance.

The support for value statements in the current survey is very similar to the findings of Clarke's (1992) study. Clarke surveyed nurses responsible for research in hospitals and found that the value statements related to enhancing nursing decisions, effectiveness, and interventions and public accountability received agreement from over 90% of those surveyed. In the current survey, these same statements received 92-98% agreement. The statement regarding enabling nurses to use resources efficiently was also the least supported statement, although it received 86% agreement from those responsible for research in Clarke's study compared to 77% agreement from staff nurses in the current study.

These findings are also very similar to the findings regarding faculty value for research as reported by Clarke and Joachim (1993). They found that the strongest agreement (mean=3.9; range=1-4) was with the statement that research improves the effectiveness of nursing and the least supported statement (mean=3.6) was that "research-based knowledge assists nurses to use scarce resources more efficiently". The findings are also similar to those of Bostrom, Malnight,

MacDougall, and Hargis (1989), who found that the most supported statement was that research findings that are advantageous to patient care can be implemented.

In the current survey, the statement "research findings enable nurses to use scarce resources more efficiently" was frequently commented upon. One nurse wrote "nursing does not have control of health care practices" and others circled the word "scarce" and/or put question marks beside the statement. This indicates that the statement itself was problematic and open to different interpretations. Responses to this statement, intended to measure the nurse's value for research, were confounded by questions of whether or not resources were actually scarce and to what extent nursing had control over resource utilization.

The nurses in this sample valued research, with baccalaureate nurses having greater value for research than diploma nurses. The findings are comparable to the value for research expressed by staff nurses in other surveys and by key personnel in hospitals and schools of nursing in B.C.

Interest in Research. All the nurses' interest in research was high, with no significant difference between baccalaureate and diploma nurses. The nurses were most interested in using research in practice, in solving specific problems, and in their own areas of practice. The results were also encouraging because the nurses had a reasonably high interest in reading and discussing research and in participating in research. They were least interested in conducting research themselves, which seems reasonable given their level of educational preparation and experience with research.

The results are very similar to the findings of Alcock et al. (1990). The percentages of support reported by Alcock were within 10 percentage points of the current study on all interest statements, with the exception of interest in reading research studies and conducting research as part of work (see Table 44). Alcock reported that 71% were interested in reading compared to 83% in the current study, and that 85% were interested in conducting research compared to 73%

in the current study. Alcock et al. found a significant difference between educational levels, which was not found in the current study. Again, the differences may be due to provincial differences, different economic conditions, and differences in the sample composition.

Table 44

Comparison of Staff Nurse Research Interests from the Perspective of Staff Nurses and Key Hospital Personnel

Interest in:	Percent Agreement (Agree + Strongly Agree) by Staff Nurses		Percent Interested estimated by Key Hospital Personnel
	Current Study	Alcock et al. (1990)	Clarke (1991)
using results to change practice	97%	88%	25%-50%
finding answers to specific problems	96%	94%	25%-50%
knowing results (own area/ own organization)	96%/91% *	96%	25%-50%
determining differences research-based practice makes	89%		25%
reading/discussing research studies	83%/76%*	71%	<25%
participating in research projects of others	82%	84%	25%
conducting research as part of work	73%		<25%
conducting research not as part of work	57%	45%	few

*two separate items were used in the current survey; one item in Clarke (1992)

The results are also remarkably similar to the reported interests of faculty (Clarke & Joachim, 1993). Clarke and Joachim found that key individuals in nine schools of nursing reported that three quarters or more of their faculty were interested in using research results to change practice, but only four schools reported that the same number of their faculty were interested in conducting research, even when it was part of their work assignment. It appears that the staff nurses in this sample are more interested in using research, and almost as interested in conducting research, as nursing faculty in B.C., as perceived by the heads of their schools.

However, the interest level among faculty might be considerably higher if the faculty themselves self-reported rather than the report being from the perspective of a single individual within their school.

In Clarke's (1992) survey, respondents from hospitals used the same scale to estimate the proportion of staff nurses who held various research-related interests. The research interest results are compared in Table 44. It is evident that this sample of staff nurses reported a higher level of interest than key hospital personnel perceived staff nurses to have. Hospital personnel may underestimate the research interest of staff nurses or the staff nurses may have responded in a more socially desirable direction than their true interests indicate, or both. Again, differences between the research interests of respondents and non-respondents are not known.

Interest in research among nurses in this sample was encouragingly high and similar to earlier estimates. It is especially remarkable that although the diploma nurses had less research experience and lower value for research, their interest was as high as the interest of baccalaureate nurses. The staff nurses compare favourably with available estimates of the research interests of faculty and compare reasonably with hospital respondents' perceptions of staff nurse interest.

Expectations for Using Research. Overall, the nurses in this sample had high expectations of themselves to use research regardless of their educational level or the size of hospital they worked in. Again it is interesting that diploma nurses had as high expectations of themselves as the baccalaureate nurses. Clearly expectations directly related to practice were more strongly supported than the conduct of research. This was congruent with the expressed interest statements in which direct practice statements were most strongly supported. However, it is remarkable that over half of the nurses expected themselves to actually conduct research. This finding seemed surprisingly high.

It is of particular interest that while 93% of nurses expected themselves to use research

findings to change practice, only 80% agreed that they use research articles to support practice change. These findings are congruent with the conclusion based on a research review that research publications have a limited effect on physicians's use of research (Lomas, 1993).

The expectations to use research reported by nurses in this study are again very similar to those of Alcock et al. (1990). They found similar high levels of expectation and strongest support for practice-related expectations. However, unlike the current study, they found differences between education levels.

Despite little research experience, the nurses' value for research, interest in using research and expectations of self for using research were high in this sample regardless of educational level and hospital size. Ancillary findings illustrate that these individual factors are also inter-correlated, which seems reasonable. Although it might be argued that these responses were socially desirable, the range and standard deviation suggest wide variability in individual scores and the lower responses to specific items and to items regarding the actual use of research suggest that social desirability was not a significant concern in this study.

Organizational Factors

The organizational factors included the infrastructures to support research and the organizational change factors of organizational research climate, nursing department value of research and key individuals' expectations of staff nurses to use research. One of the anticipated limitations of this study was the fact that the organizational change factors would be reported only from the perspective of staff nurses. Fortunately, the survey by Clarke (1992) used the same items and scaling to obtain the opinions of key nursing personnel in health care organizations and provides an excellent comparison to the opinions of the staff nurses regarding the organizational change factors.

Infrastructures. The organizational infrastructures such as research related policies, committees, personnel, and resources, varied significantly by hospital size, with the number of supports increasing by an average of 2.6 between small and medium hospitals and by an average of 3.9 between medium and large hospitals. There was a statistically significant correlation ($r=0.40$) between hospital size and the presence of research-related infrastructures. This seems reasonable as hospital resources are likely to increase with size.

It was disappointing that the most commonly identified supports (library services, ethics committees, and mission statements) are general supports that are not specific to research activities. Overall, 33.4% of the responses were "Don't Know", indicating that the staff nurses' awareness of infrastructures was low. Over 26% of the nurses did not know whether there was a separate nursing research department, division, or council in their organization or whether their own job descriptions contained research responsibilities.

Although the difference was not significant, baccalaureate nurses tended to report a higher number of organizational infrastructures. This tendency may be related to an increased awareness of the infrastructures due to greater research experience or might be related to a different attitude toward research by baccalaureate nurses as indicated by their higher value for research. Another possibility is that the baccalaureate nurses might be attracted to hospitals that have more research-related infrastructures regardless of hospital size.

The number of infrastructures did not correlate with any of the personal or professional characteristics or change factors, except for a low correlation with research experience. This supports the earlier suggestion that increased experience with research made the nurses more aware of what organizational supports were available. This correlation also highlights one of the major methodological limitations of the study: all variables are measured from the perspective of the staff nurse. In this case, the organizational infrastructures reported are only those that are

known to the staff nurse. However, this limitation is also a strength because the infrastructures that are unknown to the staff nurse are unlikely to impact practice.

Nursing Department Value of Research. The value for research that the staff nurses reported as being held by the nursing department was reasonably high (mean=19.5; range=8-24), but not as high as the nurses' own value for research (mean=20.3; range=12-24). The nursing department value for research was significantly different by hospital size, with the scores increasing from small to medium hospitals and from medium to large hospitals. This contrasts with the nurses' own value for research in which there were no differences between hospital sizes. Again, the significant difference between hospital sizes is reasonable given that resources for research and associations with universities are likely to increase with hospital size, and the difference is congruent with the differences in infrastructures found between hospitals of different sizes.

The high levels of support for the nursing department's value for research in enhancing nursing's effectiveness, accountability, decision-making, interventions and responsiveness were similar in emphasis to the findings of regarding the value statements of those responsible for research in hospitals (Clarke, 1992). The statement regarding enabling nurses to use resources efficiently was also the statement least supported by respondents to Clarke's survey, although it received 86% agreement (see Table 45).

The degree of agreement with value statements tended to be lower when reported by the staff nurse than when reported by hospital personnel, but otherwise the similarity is remarkable. This suggests that both the staff nurses and the key hospital nursing personnel have a high value for research. The nurses seemed to think that their nursing departments have a fairly high value for research and the perception of this value increases with hospital size.

Table 45

Comparison of the Value of Nursing Research from Three Perspectives

Statement About Value of Research	Mean Score (% agreement)		
	Nurses' Own Value	Nursing Department Value Reported by Staff Nurse	Value Reported by Key Nursing Personnel (Clarke, 1992)
improve effectiveness	3.57 (98%)	3.32 (92%)	3.55 (95%)
enhance accountability	3.47 (95%)	3.31 (92%)	3.49 (93%)
validate practice decisions	3.43 (93%)	3.29 (90%)	3.55 (96%)
create innovative, scientific interventions	3.32 (89%)	3.21 (87%)	3.51 (94%)
respond to developments	3.40 (93%)	3.24 (90%)	not surveyed
use resources efficiently	3.04 (77%)	3.05 (76%)	3.25 (86%)

Expectations of Staff Nurses Perceived to be Held by Key Individuals. The staff nurses in this sample believed that expectations held by their head nurses and nursing directors were similar. As agreement with all expectation statements would have resulted in a score of 18, the mean of 17.8 for head nurses and 17.7 for nursing directors suggests that there was both agreement and disagreement with the statements. The nurses' own expectations were significantly higher than those perceived to be held by the head nurses and directors. Inspection of the scores for instructors (mean=19.3) and clinical nurse specialists (mean=18.8) indicate that the scores were also higher than perceived expectations by head nurses and directors, and may have been higher than the nurses' expectations, but the small number of respondents precluded analysis.

There were no differences in the reported expectations by the educational level of the nurses reporting. However, there was a difference between the perceived expectations of head nurses from hospitals of different sizes and an interaction effect between hospitals and level of

education. The apparent relationship between the perceived level of expectation and hospital size was not simple. From baccalaureate nurses, head nurse expectations for small hospitals received the lowest scores, followed by medium, then large hospitals. However, from diploma nurses, large hospitals received the lowest scores and medium hospitals received the highest scores. This indicates that the staff nurses' perception of head nurse expectations in hospitals of different sizes vary by educational level. For baccalaureate nurses, the perceived expectations increase with hospital size; for diploma nurses, the perceived expectations are highest in medium sized hospitals, lower in small hospitals and lowest in large hospitals. The pattern for baccalaureate nurses follows the pattern of other organizational factors. The pattern for diploma nurses is more difficult to explain. It may be that larger hospitals have more baccalaureate nurses resulting in a greater perceived or actual contrast between nurses from different educational levels.

For the nurses' reported expectations of nursing directors, there was also a significant difference between hospitals of different sizes. Although no interaction effect was detected, the pattern of reported expectation of the nursing directors was similar for baccalaureate nurses as expectation scores increased with hospital size. For diploma nurses, nursing director expectation scores were again highest for medium-sized hospitals. However, this was followed by large hospitals and then small hospitals. Because the interaction effect was not statistically significant, it can only be concluded that nursing director expectations are reported higher as hospital size increases by both diploma and baccalaureate nurses. The increase in perceived expectations seems reasonable and is congruent with the increase in research infrastructures and climate by hospital size.

Although the expectations were reported by the staff nurses, the pattern of response is similar to the expectations reported by key nursing personnel (Clarke, 1992). Because the same scale was used, the reported expectations from the current study can be compared with the

expectations reported by Clarke (see Table 46).

The rank order of research expectations is different and the mean scores of the staff nurses' perceptions of the expectations of key individuals are lower than the expectations as reported to Clarke by key individuals. However, there is a greater similarity between the staff nurses' perceptions of themselves and the expectations reported by Clarke than between the other sets of expectations. Inspection of these scores suggests that the staff nurses' perceptions of nursing directors expectations are lower than, but similar to those reported by hospital personnel. It also suggests that the expectations of nursing personnel are more similar to the nurses' own expectations than the nurses think.

Table 46

Comparison of Expectations from Current Study and from Clarke (1992)

Expectation Statement	Mean Item Score (Rank)			
	Own Expectations	Head Nurse Expectations Reported by Staff Nurse	Nursing Director Expectations Reported by Staff Nurse	Expectations Reported by Key Hospital Personnel (Clarke, 1992)
apply findings to practice	3.40 (1)	3.21 (1)	3.10 (2)	3.29 (2)
critically question practice	3.39 (2)	3.19 (2)	3.04 (4)	3.35 (1)
promote research climate	3.28 (3)	3.13 (3)	3.14 (1)	3.20 (3)
collect data for nursing research	3.18 (4)	3.10 (4)	3.05 (3)	not surveyed
collect data for non-nursing research	2.69 (5)	2.63 (5)	2.62 (6)	not surveyed
conduct research	2.58 (6)	2.63 (6)	2.72 (5)	2.38 (4)

The staff nurses perceive the expectations of the head nurses and nursing directors to be lower than their own expectations. This finding is corroborated by Clarke's report of expectations which are also lower than the staff nurses' own expectations. Expectation scores vary with

hospital size, and educational level appears to affect perception of expectations, especially with regard to head nurse expectations. The perceived head nurse and nursing director expectations were correlated with the nurses' own expectations, but not with any other individual characteristic or change factor. Both perceived head nurse and nursing director expectations correlated with all of the organizational variables.

Research Climate. The low opinion of research climate and significant difference between hospital sizes are consistent with the low estimates of infrastructure and the lower levels of other organizational factors reported by nurses from smaller hospitals. Crane (1989) measured organizational climate and organizational resources and reported the mean scores for nurses using two different dissemination methods. However, she did not report the range of scores and did not compare hospital sizes.

The climate statements in the current study were ranked in a similar manner as the same statements in Clarke's (1992) survey of B.C. hospitals. In the current study, 74% of nurses agreed that they are encouraged to question their nursing practices and three other statements received over 50% agreement. However, the seven remaining statements received less than 50% agreement. The climate scores tended to be higher and there was a higher percentage of agreement with all statements when reported by key personnel in Clarke's study than when reported by staff nurses in the current study or in the study by Alcock et al. (1990).

A comparison of staff nurses opinions of climate in the current study and the study by Alcock et al. with Clarke's findings is summarized in Table 47. This comparison indicates that Clarke's nursing department leaders tended to have higher estimates of the climate with regard to staff nurses (encouragement to question, use findings, conduct research and recognition) than the staff nurses themselves. Conversely, the staff nurses seem to give higher estimates of the available supports (support strategies, interest from other staff nurses and students) than do the

personnel responsible for those supports. It seems that nurses in these samples tended to be more critical of areas with which they were most familiar.

Table 47

Comparison of Response to Research Climate Statements by Staff Nurses and Key Nursing Department Personnel

Research Climate Statement	Staff Nurse Mean Score (Percent Agreement)	Staff Nurse Percent Agreement (Alcock, 1990)	Organizational Personnel Mean Score (Percent Agreement) Clarke, 1992
Nurses are encouraged to question nursing practices	2.90 (74%)	41%	3.51 (97%)
Nurses are encouraged to use research findings	2.70 (62%)	48%	3.21 (85%)
There are strategies to support research activities	2.57 (58%)	*	2.21 (36%)
Other staff nurses are interested in research	2.54 (57%)	*	2.28 (34%)
Other disciplines are interested in research collaboration	2.31 (46%)	69%	2.52 (53%)
Nurses who participate in research receive recognition	2.32 (43%)	38%	2.63 (56%)
Nurses are encouraged to conduct research studies	2.32 (42%)	*	2.72 (60%)
Students conduct research studies	2.27 (42%)	*	2.12 (32%)
Professors conduct research studies	2.16 (35%)	*	2.06 (27%)
Physicians support nursing research	2.15 (35%)	38%	2.19 (30%)
Professors are available to consult, advise, collaborate	2.03 (29%)	41%	2.03 (25%)

*Statements not comparable

The responses were very similar in both B.C. studies regarding support from nursing professors and physicians. However, the responses regarding nursing professors are likely to be related to the fact that most of the hospitals (especially small hospitals) were not likely to have

nursing professors associated with them. The similarity in the mean scores of the two statements about nursing professors, in both the current study and the study by Clarke, suggests that nursing professors who are seen to conduct research are also seen to be available for consultation. This conclusion is different from that of Clarke (1992) who concluded that professors who conduct research are not necessarily seen by those responsible for research in hospitals as available for consultation.

The research climate scale was somewhat problematic as it contained items that overlapped with items covered under infrastructures (e.g. strategies for support, professors to consult). Furthermore, items such as the two regarding nursing professors automatically gave a larger score to larger hospitals which were more likely to be associated with nursing schools.

In summary, staff nurses' reported the research climate to be low, with the scores being lowest in small hospitals. The climate scores tended to be lower than, but similar to, scores obtained from hospital personnel regarding staff nurses and from personnel in schools of nursing regarding faculty.

The fact that all of the organizational factors increased with hospital size supports the assumption that research resources, supports and expectations increase as hospital size increases. The fact that all of the organizational factors were inter-correlated suggests that the staff nurse's view of nursing within the organization is cohesive. It may also reflect real cohesiveness and interrelationships with regard to research within nursing organizations. The relationships between these factors also support the conceptual framework, as anticipated relationships were supported.

Research Utilization Outcomes

Research utilization outcomes included the nurses' opinions of their own general use of research and their ratings of their frequency of using specific research based practices. Previous studies have used specific practices as measures of research use.

General Use of Research. As rating all statements as "sometimes" would result in a score of 20, the mean of 22.7 for this sample suggests that the nurses thought they used research to some extent. One of the limitations of this study is the fact that it is difficult to interpret what "sometimes" meant to the nurses and impossible to know to what extent nurses were biased toward giving a socially favourable response. The distribution of the scores illustrates that the scores of most nurses were clustered around this mean and that, as only 8% had scores higher than 30, few nurses responded "always" to any of the statements. There was no reported difference between respondents from different educational levels or different sizes of hospital, but there was considerable variation in the responses to different items.

The fact that statements regarding the actual implementation and evaluation of practice based on research were less well supported than statements regarding questioning practice and communication of concerns suggests that **assessment** of research-based practice is done more than **implementation** of research-based practice. It was discouraging to note that the least well supported statement was about the use of research articles to support questioning of practice. One of the limitations of this study (as with any survey) was that the nurses' perceived basis for questioning practice was not identified.

The statements regarding the identification of hospital policies were also problematic. It was impossible to know if the nurses could or could not identify policies based on research because the policies themselves were or were not based on research, or because the nurse did not **know** the research support well enough to evaluate the basis of the policies. These statements therefore may reflect the nurses' knowledge or the status of policies.

The response to the use of research in general appears to be more favourable than the response to the use of specific findings. This may be partially due to the fact that, as Lomas (1993) points out, research-based practice is not the "black and white" implementation of findings

but rather decisions in grey areas. Lomas criticized research on medical decision-making for focusing on the use of clear and unambiguous findings. Similarly, research on the use of findings in nursing practice has focused on unambiguous findings and therefore may not have accurately portrayed research-based nursing practice. Measuring general use of research may capture conviction about application in general, or cognitive application of research, rather than specific behavioral change. Alternatively, the statements about use of research in general ask the nurse to make broad generalizations about practice and might be expected to be more positive. This measure may simply be another measure of the nurses' attitudes toward research rather than an actual estimate of practice behaviour.

The general use of research seemed to be similar regardless of the nurses' educational level or hospital size. The nurses reported using research to some extent and tended to focus on questions and concerns about practice rather than on the actual use of research to improve practice. General use of research correlated with the use of specific findings and with all of the individual factors but none of the organizational characteristics.

Use of Specific Research Findings. Of the ten specific findings that were used as a measure of the use of research in practice, nine were used at least sometimes by over half the nurses. The findings were used at least sometimes by 49% - 96% (average of 77%) of nurses. This level of use is comparable to the findings of Brett (1987) who found that 31% - 93% (average of 61%) of nurses used the 14 findings she studied, and Coyle and Sokop (1990) who found that 26%-93% (average of 54%) used the same 14 findings. It is important to note that the ten findings used in this study were the same as those used by Brett and by Coyle and Sokop.

One explanation for the higher percentage of use in the current study is that the number of years between studies may have allowed the findings to become more well known. In addition, four of the practices were eliminated, which may have resulted in findings which are more well

known or more appropriate to current practice. Another explanation is the fact that neither Brett nor Coyle and Sokop identified whether or not practices were applicable to the nurses' practice. When Coyle and Sokop excluded nurses who were not aware of findings, they found that 71-100% used the innovations under study. Similarly, Winter (1990) found that 56.5% of nurses who knew about relaxation therapy research used the findings in practice. Although the nurses in the current study were not asked if they were aware of the specific findings, the opportunity to indicate that the findings were not applicable may have partially served the same purpose.

Interpreting the practical significance of the level of use of specific findings is difficult, partially because of the limitations of the study. The survey approach did not permit identification of the reasons for non-use of findings. There was no possibility of finding out whether nurses did not use a particular finding because of a lack of knowledge or lack of persuasion on the part of the nurse, or for some other reason. Other possible reasons for non-use of findings include 1) the findings might not be applicable to a specific patient, 2) organizational policy may preclude use, 3) norm or job descriptions may preclude use, or 4) more recent innovations may have made the innovation out-dated. Given these possibilities, it may be that an average use of 77% could be considered high. Although other studies have measured use in a similar manner, none of the authors have attempted to establish what an ideal level of use might be.

The percentage of nurses who found that the specific research findings were not applicable was interesting. Urine testing was rated "Not Applicable" by 36%, and comments that blood glucose monitoring had replaced urine testing were frequently added to the survey. Although some nurses may not nurse preoperative patients, it is difficult to explain why three items related to preoperative preparation (relaxation, teaching, and giving sensory information) were rated "Not Applicable" at different rates (20%, 38% and 19%, respectively). It was also difficult to understand why 5% of nurses considered mutual goal setting and giving sensory information

before diagnostic procedures "Not Applicable". The survey approach limited obtaining explanations for these findings.

This measure of specific research utilization was similar to the general use of research in terms of there being no differences between nurses of different educational levels or in hospitals of different sizes. The two measures of research utilization were correlated, although weakly. It seems that the nurses' individual characteristics and change factors influenced their general use of research which may have moderated the organizational influences on the use of specific findings.

Comparison of Findings by Nurses' Educational Level

Education was a major professional characteristic on which all other research utilization predictor and outcome variables were compared. Nurses with baccalaureate degrees had significantly more research related experience and had significantly higher scores on their value for research. Most of the difference in research experience was due to the large number of baccalaureate nurses who had taken statistics and research methods courses. It may be that the greater research experience of baccalaureate nurses provided opportunities for those nurses to develop more value for research. The difference in value for research may also account for the higher response rate from baccalaureate nurses regarding the use of research. However, there were no significant differences between the groups on the other individual change factors of research interest or expectations to use research.

Bostrom, Malnight, MacDougall and Hargis (1989) report similarities and differences between baccalaureate and diploma nurses in terms of interest and attitudes toward research and preparedness for conducting research. However, because their group sizes were greatly unequal (only 13% baccalaureate degrees) and no statistical analysis of the findings was reported, their findings cannot be compared with the current sample.

Alcock et al. (1990) found that baccalaureate nurses reported higher research experience and valuing of research. However, these authors additionally found that baccalaureate nurses had higher interest in research and higher research expectations, not confirmed in the current study. Again, Alcock et al. used greatly unequal group sizes: 74% diploma nurses and 26% baccalaureate nurses and had a different sample composition in terms of variety in place of employment and part and full time employment.

The two groups in the current survey also reported similar views of their organizations, as there were no differences by educational level in nursing department value for research, organizational climate, or organizational expectations to use research. Although the baccalaureate group tended to report higher organizational infrastructures, the difference was not significant.

There were also no differences between educational level in the reported general use of research or use of specific findings. Champion and Leach (1989) measured nurses' self reported general use of research and also did not find education to be significant predictor. These concur with Brett (1987), Crane (1989), Coyle and Sokop (1990), Ketefian (1975) and Winter (1990). Overall there was little difference between baccalaureate and diploma nurses in this study in research utilization predictor or outcomes variables. The only differences noted between educational levels were in research experience, which may be a direct consequence of educational experiences, and value for research, which may be related to greater research experience. This study supports earlier findings that educational level is not a significant predictor of research utilization.

Comparison of Findings by Hospital Size

It was anticipated that the organizational characteristic of hospital size would influence other organizational characteristics and change factors. Differences between hospital sizes were found for all of the organizational change factors and the organizational infrastructures. The perceived

nursing department value of research, the research climate, infrastructures and expectations by key individuals for staff nurses to use research were all significantly different by hospital size. All of these variables increased as hospital size increased from small, to medium, to large. There were, however, no differences in any of the personal or professional characteristics, or individual change factors between nurses working in hospitals of different sizes. There were no differences in the value for research, interest in research, research experience or expectations of self. There were also no differences in general use of research or use of specific findings between nurses from hospitals of different sizes. This suggests that while increased organizational resources result in more support and higher expectations for research, the research-related attitudes, values and behaviours of nurses practising in those hospitals are not significantly affected.

Previous studies have presented conflicting results regarding the influence of hospital size on the use of research. Kirchoff (1982) found a difference in hospital sizes related to the use of coronary precautions, whereas Brett (1987, 1989) did not find a difference between hospital size and the use of 14 specific findings. Kirchoff also found a difference in the use of the specific finding and the hospital type (state, private) and location (urban, rural), whereas Brett did not. These studies classified hospital sizes differently, with Kirchoff having six categories and Brett having three. The categories used by Brett were used in this current study, but the type and location of hospitals were not considered. It may be that differences would have been found in the current study if finer categories were used. There may have been differences among respondents within the small hospital category in the current study, as responses indicated that these nurses were from hospitals as small as 14 beds and as large as 250 beds. As infrastructures and climate increases with hospital size, it could be anticipated that even greater variation would be seen if smaller categories were used.

None of the personal or professional characteristics or research utilization outcomes were

significantly different by hospital size; all of the organizational factors were significantly different by hospital size.

Relationships Between Individual and Organizational Factors and Research Utilization

The factors within the three components of individual factors, organizational factors and research utilization outcomes were seen as interrelated. The relationships between these components are discussed in this final section.

Individual Factors. The individual factors assessed the demographics as well as the personnel and professional factors that served as study variables. While the demographic variables did not correlate with any of the study variables, all individual factors were interrelated and correlated with the general use of research. The nurses' own expectations also correlated with reported head nurse expectations, and research experience correlated with reported infrastructures.

The age of the nurses did not correlate with any of the study variables except with the years since graduation. To date, only Winter (1990) has reported on the relationship of age to research utilization. She did not find any significant differences related to age.

It was also noted that the years since graduation did not correlate with any of the study variables. Thirteen of the diploma nurses and eight of the baccalaureate nurses did not report their years since graduation. As these nurses were in a wide variety of age categories and reported their ages, the omission of this information did not seem to be related to age. Previous studies that considered years since graduation have produced conflicting results. Kirchoff (1982) found a significant relationship between years since graduation and the use of coronary precautions whereas Ketefian (1975) found no difference in the use of correct temperature technique and Brett (1987) found no difference in the use of 14 specific findings by years since graduation. It is also relevant to note that previous studies (Champion & Leach, 1989; Coyle & Sokop, 1990; Winter, 1990) have not found significant differences in research utilization in relation to years

of nursing experience.

The lack of significant relationships between age and years since graduation and research utilization outcomes questions the influence of both education and experience. One possible explanation for the lack of a relationship is that because the majority of nurses in the sample graduated within the past 10 years, variation in the time since graduation and thus, variation in the quality and content of education, may not have been sufficient to show differences in research utilization variables. However, it seems that the range in years should have been sufficient to demonstrate a difference if experience as an important time-related predictor of research utilization. Another explanation is that education has a lasting effect or little effect on research utilization, either of which would result in little difference in research use over time. This study adds to growing evidence that age and years since graduation are not predictors of research use.

In the current study, research experience had a low correlation with the nurses' expectations of themselves to use research, interest in research, and general use of research findings, but did not correlate significantly with any of the other study variables. As noted earlier, although they had higher research experience, the baccalaureate nurses did not have higher expectations or interest in research or higher reported use of research. Baccalaureate nurses had higher value scores, but value and research experience did not correlate for the sample or for the subgroups by educational level.

Alcock et al. (1990) found significant low correlations between research experience and research interest ($r=0.41$). However, in contrast to the current study, Alcock et al. did not find a correlation between experience and expectations, but did find a low correlation with research value ($r=0.36$). Other studies (Crane, 1989; Champion & Leach, 1989) have considered research experience only in relation to the use of specific findings, and have found no significant relationships. In the current study, there was no significant correlation between research

experience and the use of specific findings. Crane (1989) found a significant relationship between having specific research responsibilities at work and the use of specific findings. However, in the current study, few nurses had any experience with research beyond courses or attending conferences, so this comparison could not be made. The findings of this study suggest that research experience is related to increased expectations to use research, interest in research and reported general use of research but, in agreement with earlier studies, is not related to the use of specific findings.

The nurses' value for research had a moderate correlation with expectations to use research; a low but significant correlation with interest in research; a low correlation with general use of research findings; but no relationship with the use of specific findings. Alcock et al. (1990) found that value for research correlated with experience ($r=0.45$), research interest ($r=0.54$) and expectations ($r=0.36$). Champion and Leach (1989) also found a significant correlation ($R=0.65$) between attitudes toward research and self-reported general use of research and found that attitude accounted for 42% of the variance in general research use.

Interest in research was moderately correlated with expectations to use research and showed a low correlation with value for research and research experience. All of these correlations were also found by Alcock et al. (1990). The nurses' own expectations were moderately correlated with value for and interest in research and showed a low correlation with experience. The strongest correlations with research utilization outcomes were those between the nurses' interest and expectations and general use. Again these findings are congruent with those of Champion and Leach (1989) regarding the relationship of attitude and general use of research. This study adds to evidence that attitude is positively related to the use of research.

The personal and professional characteristics of education and age did not seem related to other research-related characteristics or to research utilization outcomes. However, the nurses'

research experience appeared to be related to individual change factors and general use of research. The individual change factors of interest, value and expectations were inter-correlated and correlated with research experience. These four factors are related to general use of research findings, but not to the use of specific findings.

Organizational Factors

The nurses' assessment of the expectations of head nurses and nursing directors correlated with their own expectations, but none of the other organizational factors correlated with individual factors. None of the organizational factors correlated with general use of research, but two of the organizational factors, infrastructure and research climate, correlated with the use of specific research findings.

The correlations between expectations suggests that the nurses have cohesive views of their practice and to some extent think that their practice is congruent with the expectations of others. Neither their assessment of nursing director expectations nor head nurse expectations correlated directly with research utilization outcomes suggesting that the perceived expectations of key individuals may not have a direct effect on practice. Champion and Leach (1989) also found no correlation between the nurses' reported use of research and their opinions of others until they did correlations with specific administrators. However, because they studied a single community hospital, their results pertain to specific key individuals rather than key roles. The current survey detected a difference between organizational expectations and nurses' expectations of themselves, but did not clarify the complex relationship between expectations and research utilization outcomes. It did, however, add to understanding and show the complexity of the situation.

Infrastructures were related to other organizational characteristics and change factors and seemed to be related to research utilization outcomes, especially the use of specific findings. The number of infrastructures were correlated with all of the organizational variables and with the use

of specific research findings. The correlation between infrastructures and the general use of research was too low to be considered ($r=0.24$). However, correlations by hospital size revealed that the correlation became stronger as hospital size increased from small ($r=0.09$; $p=0.49$), to medium ($r=0.36$; $p=0.00$), to large ($r=0.42$; $p=0.00$). This suggests that research-related infrastructures may affect the use of specific practices more strongly than they affect the nurses' opinions of their general use of research.

Brett (1989) found conflicting relationships when examining specific infrastructures. She found that in small hospitals, mechanisms to support nurses doing research and exposure to publications was positively correlated with the use of findings. However, she found that in large hospitals these same infrastructures and those intended to promote attendance at conferences and presentations, performing research duties in work and inducements to learn were negatively correlated with the use of specific findings. It is also relevant to note that Brett (1987) and Coyle and Sokop (1990) all indicated that perception of hospital policy was related to the use of specific findings. It is therefore not surprising that the nurses' perceptions of organizational infrastructures were related to the use of specific findings.

Similarly, the research climate correlated with all of the organizational characteristics and change factors and with the use of specific research findings, but did not correlate with general use of research. The research climate had a fairly high correlation with infrastructure ($r=0.63$) and several of the items seemed to overlap with infrastructure, suggesting that the research climate and infrastructures are closely related and may be defining the same construct.

The low correlation of infrastructures and climate and the absence of a correlation between the other organizational factors and research utilization outcomes does not mean that the organizational context is not influential. The nurses who responded to the survey added revealing comments. One nurse stated, "Our hospital is very rigid and backwards in regards to

administration. The new head nurse is trying hard to develop (a research climate), but it's like banging your head against a brick wall". Another nurse made the comment, "Don't make waves attitude" referring to research climate. Another nurse wrote, "If my hospital involved more research it would improve nursing and patient care 100%".

Several nurses commented on the difficulty of using research-based practice within the current practice setting. For example, a nurse wrote, "As an RN who works on a ward I find it difficult to answer these questions. Being short staffed, we don't have time for research in our work day". Others suggested that the context of practice was broader than the context addressed by the study. For example, one nurse commented that "people in this town won't accept it (referring to changing nursing practice based on research)", and several other respondents made comments on the lack of nursing control over resources and decisions.

There was a wide range and considerable variability in the research climate and infrastructure scores, suggesting a wide range of opinion and a wide range of organizational support for research. The nurses' individual characteristics may mediate the influence of the organization on research practice, thus obscuring the relationship.

Research Utilization Outcomes

The two measures of research use were correlated. General use of research correlated with all of the personal and professional characteristics and change factors but none of the organizational characteristics. The use of specific findings was correlated with two of the organizational variables (organizational infrastructure and research climate), but did not correlate to any of the personal or professional variables. Although research climate and infrastructures varied by hospital size and correlated with the use of specific findings, the use of specific findings did not vary by hospital size. It seems that both individual and organizational characteristics are related to the use of research, but that individual factors influence how nurses

perceive their general use of research, whereas organizational factors influence the use of specific practices. The relationship between the nurses' individual factors and general use suggests that the nurses' values, attitudes and expectations are congruent with their perceived behaviour. In other words, the nurses see themselves generally practising as they expect themselves to and in congruence with their values and interests. The relationship between the organizational factors and the use of specific findings suggests that the organizational infrastructure and climate is more influential in the use of specific findings than individual factors are. This finding is congruent with the findings that the perception of hospital policy influences the use of specific findings (Brett, 1987; Coyle & Sokop, 1990). Previous lack of attention to organizational variables may explain the inconclusive findings regarding the predictors of use of specific findings. Finally, the fact that the use of specific findings did not vary with hospital size but correlated with research climate and infrastructures which did vary by hospital size, suggests that the individual factors may mediate the influence of the organizational factors on the use of specific findings.

Theoretical and Methodological Considerations

These research results support the components and relationships proposed in the conceptual framework. The findings support Crane's (1989) conclusion that individual factors are not directly related to the use of specific findings. Rather, organizational factors have a direct influence on the use of specific findings and individual factors mediate the influence of organizational factors. However, the findings also suggest a relationship between individual factors and general research use, which was not proposed in the model by Crane. Previous studies, including Crane's, have examined the use of specific findings, but not the general use of research.

The results of this study confirm, complement, and extend previous research findings. The level of research use is similar to that of previous studies. The influence of individual factors such as education, attitude and experience were similar to previous studies. The findings

regarding the influence of organizational factors supports the work of Crane (1989), Clarke (1992) and Clarke and Joachim (1993) in clarifying the understanding of the importance of organizational value, climate and infrastructure. The findings regarding the influence of expectations extends understanding of the influence of both individual and organizational factors.

This study has inherent limitations common to survey research. Specifically the differences between respondents and non-respondents was not known and the organizational expectations and supports were reported from the perspective of the staff nurse. However, the impact of these limitations is lessened by the stratified random sample, reasonable sample size and the opportunity to compare the findings with those of Alcock et al. (1990), Clarke (1992) and Clarke and Joachim (1993) obtained using a similar instrument and comparable geographical areas.

Additional limitations were related to hospital size categories, the measurement of research use and problems with individual items on the survey. The categories of hospital sizes were broad, possibly limiting the detection of differences in research use between sizes. This problem may have been especially important regarding the small hospital category. The measurement of research utilization was also problematic. First, research use was measured from the perspective of the nurse. Second, the general use of research may have only been another measure of attitude. Third, measurement of the use of specific findings was limited to practices which have varying applicability and there was no means of clarifying the meaning of responses or the reasons for non-use. Finally, the survey had some items that were clearly difficult to interpret and there was no way to clarify responses.

Summary

In this study, the sample consisted of 183 staff nurses working in medical-surgical and critical care areas of hospitals of different sizes in British Columbia. The stratified sampling resulted in a sample which consisted of 45% diploma educated nurses and 54% baccalaureate

educated nurses. The representation from educational levels and hospital sizes yielded subgroups that were sufficiently similar in size to permit the use of analysis of variance. The sample was similar to the population of nurses in B.C. in terms of gender and age, but was purposefully stratified to over represent baccalaureate educated nurses and nurses working in medical-surgical or critical care settings.

While the response rate (42%) was adequate for a mail survey, the response rate differed by educational level and it was not known how the non-respondents differed from respondents.

Overall, the nurses in the sample had very positive attitudes toward research and had high expectations of themselves. There was little difference between educational preparation, with only research experience and value for research showing significant differences. Individual factors and research utilization outcomes did not vary with hospital size; however, the nurses' opinions of their organizations varied considerably with organizational size and with organizational support, and expectations for research utilization generally increasing with hospital size. The nurses reported moderate general use of research and of use of specific findings at levels that are comparable to or better than previous findings. Education does not seem to significantly influence research utilization. Individual factors seem to influence general use of research whereas organizational factors influence the use of specific findings. Organizational size influences the research-related organizational characteristics but does not influence the use of specific research findings.

The relationships between the individual factors, organizational factors and research utilization outcomes had a definite pattern. All of the organizational factors varied with hospital size, whereas none of the individual factors did. None of the organizational factors varied with the nurses' educational levels whereas the individual factors of value for research and research experience were higher for baccalaureate nurses. All of the individual factors were inter-related

and all of the organizational factors were inter-related, however, there was little correlation between individual and organizational factors. The only correlations between individual and organizational factors were the correlation between respondents' reports of head nurse expectations and their own expectations to use research and the correlation between the nurses' research experience and perception of organizational infrastructures. In terms of research utilization outcomes, the general use of findings was related to individual factors and the use of specific findings was related to organizational factors. All of the individual factors were related to general use of research and there were no differences between nurses of different educational levels or hospital sizes. Only two organizational characteristics (research climate and infrastructure) and none of the individual characteristics correlated with the use of specific findings.

This study supports the conceptual framework proposed by Crane (1989) and suggests merit in adding the concept of general use of research. The results confirm previous findings regarding levels of research use and the influence of individual factors such as education, attitude, and experience. The findings about the influence of organizational factors increases understanding of the importance of organizations communicating value, setting climate and providing infrastructure support for research, and offers new understanding regarding the influence of nurses' expectations in this regard.

The major limitations of this study include the unknown differences between respondents and non-respondents and the fact that organizational factors were reported from the perspective of the staff nurse. However, the stratified random sample, reasonable sample size and the opportunity to compare the findings with similar studies strengthened the validity and generalizability of the study.

In this chapter, the survey results have been presented, analyzed and discussed. In the next

chapter, the study will be summarized and the implications for nursing practice, education and research that arise from this study's conclusions will be presented.

CHAPTER FIVE

Summary, Conclusions, and Implications

This study was designed to describe the levels of organizational expectations and support for research use, levels of nurses' expectations of themselves to use research, and levels of research use by staff nurses. The study was further designed to investigate the relationships between nurses' use of research and their expectations of themselves, how they perceived their employers' expectations and organizational support for research utilization. The study compared the levels and relationships between these research predictor and outcome variables for groups of randomly selected diploma and baccalaureate prepared nurses working in hospitals of different sizes. In this final chapter, the study is summarized and the conclusions are presented. The implications for nursing practice, education and research are also presented.

Summary of the Research Project

A review of the literature revealed that previous studies had focused on the influence of the characteristics of individual nurses on the use of specific research-based practices (Brett, 1987; Coyle & Sokop, 1990; Ketefian, 1975; Kirchoff, 1980; Linde, 1989, Winter, 1990) and on the factors influencing dissemination, communication and use of findings (Champion & Leach, 1989; Crane, 1989; Funk, Champagne, Wiese & Tornquist, 1991b). Most investigations of the influence of organizational factors on the use of research were limited to secondary consideration within studies that focused on the characteristics of individual nurses (Brett, 1986; Champion & Leach, 1989; Coyle & Sokop, 1990; Crane, 1989; Funk et al., 1991b; Kirchoff, 1982; Linde, 1989). The organizational characteristics of hospital size

(Brett, 1987; Kirchoff, 1980) and research support mechanisms (Brett, 1989; Crane, 1989) were studied, but results were inconclusive. Other studies (Champion & Leach, 1989; Coyle & Sokop, 1990; Funk et al., 1991b; Linde, 1989) each considered different organizational characteristics, and thus their findings were not confirmed. The only organizational characteristic which was consistently shown to influence the use of research in practice was the perception of unit policy (Brett, 1986; Coyle & Sokop, 1990; Kirchoff, 1982). These researchers found a relationship between the perception that a policy existed regarding a specific practice and the use of that practice, regardless of whether there was an actual policy in existence.

More recently, organizational infrastructures and expectations for research have been described from the perspective of key individuals responsible for research activities in health care organizations and schools of nursing (Clarke, 1992; Clarke & Joachim, 1993) and from the perspective of staff nurses (Alcock et al., 1990). However, no research has been reported regarding the influence of organizational support or expectations on research-based practice. The purpose of this study was to investigate the organizational support and expectations for research and their influence on the use of research findings in nursing practice from the perspective of the staff nurse.

Crane's (1989) conceptual framework guided this study to focus on the influence of the organizational context, organizational change factors, individual characteristics, and individual change factors on research utilization outcomes. The contextual variables considered were hospital size and research-related infrastructures. The organizational change factors included the nursing department's value for research, the expectations for research-based practice

perceived to be held by key nursing personnel, and the organization's research climate. The individual characteristics included demographics and the nurses' education and research experience. Finally, individual change factors included the nurses' own value for research, interest in research and expectations to use research in practice. This researcher viewed these variables as predictors of research utilization outcomes. The research outcomes considered were the nurses' views of their general use of research and their use of ten specific findings identified in earlier studies (Brett, 1987; Coyle & Sokop, 1990).

This descriptive correlational survey was conducted using a stratified random sample of staff nurses working in British Columbia. The sample was stratified by educational level (diploma and baccalaureate) and by district to obtain responses from nurses working in hospitals of different sizes. Four hundred and fifty (450) nurses were surveyed by mail. All participants completed the Research Use in Nursing Practice instrument modified from Clarke (1991). Consent to participate was assumed by the nurses returning the completed survey. Descriptive and parametric statistics were used to analyze the data.

Responses were obtained from 183 staff nurses (42%) who worked in medical-surgical and critical care areas of hospitals of different sizes in British Columbia. The stratified sampling resulted in 45% diploma educated nurses and 54% baccalaureate educated nurses. The sampling strategy also resulted in representation from hospitals of different sizes which were categorized as small (<250 beds), medium (250-499 beds) and large (>500 beds). The representation from educational levels and hospital sizes yielded subgroups that were sufficiently similar in size to permit comparisons between groups and the use of analysis of variance.

The sample was similar to the population of nurses in B.C. in terms of gender, but was purposefully stratified to over-represent baccalaureate nurses and to limit the study to nurses working in medical-surgical or critical care settings. The sample was also more representative of nurses working part-time than of the population of staff nurses working in B.C. acute care hospitals. The sample was younger than the overall population of nurses in B.C., but was likely similar in age to nurses currently employed, especially those employed in acute care hospitals. While the response rate (42%) was adequate for a mail survey, the response differed by educational level. It was not known how the non-respondents differed from respondents. This posed the greatest limitation for the study.

The nurses in the sample had very positive attitudes toward research and had high expectations of themselves to use research in practice. The nurses had high value for research (mean=20.3; SD=2.99; possible range=6-24), high but varied interest levels (mean=30.7, SD=5.9; possible range=10-40) and high expectations of themselves to use research (mean=18.2; SD=3.6; possible range=6-24). There were no differences between educational groups with regard to interest and expectations, but the baccalaureate nurses held a significantly higher value for research. There was also a difference in research-related experience, with the baccalaureate nurses having significantly more experience than diploma nurses. Overall, the nurses had little research experience (mean of 5.8 experiences per nurse; SD=3.3) and most of the difference was due to courses taken by baccalaureate nurses.

Despite little research experience, the nurses' values for research, interests in research and expectations of self for using research were high in this sample regardless of educational level and hospital size. Although Alcock et al. (1990) found greater differences between

educational levels, the findings regarding individual factors in the current study were otherwise remarkably similar to previous research (Clarke, 1992; Clarke & Joachim, 1993; MacDougall & Hargis, 1989).

The nurses reported moderate levels of general use of research (mean 22.7; SD=4.91; possible range 10-40) and of use of specific findings (average of 77% use at least "sometimes") that were comparable to or better than previous findings (eg. Brett, 1987; Coyle & Sokop, 1990; Winter, 1992) but difficult to evaluate in terms of adequacy. As with previous studies (Brett, 1987; Crane, 1989; Coyle & Sokop, 1990; Ketefian, 1975; Miller and Messenger, 1978; Winter, 1990) there were no differences in research utilization outcomes between educational levels and no differences were found between nurses from hospitals of different sizes.

General use of research was correlated with all of the nurses' individual characteristics and change factors ($r=0.37-0.51$) but was not correlated with any of the organizational characteristics or change factors. In contrast, the use of specific findings had significant low positive correlations with the organizational change factor of research climate ($r=0.33$) and the number of research-related infrastructures (0.31), but was not correlated with any of the individual characteristics or change factors. There was a low significant correlation between the general use of research and use of specific findings ($r=0.38$). These findings were interpreted as indicating that general use did not measure the same behaviour as the use of specific findings. Nurses' opinions regarding their general use of research may be useful, or may simply be another estimate of attitude toward research rather than an estimate of research-related behaviour.

The nurses' opinions of their organizations varied considerably with organizational size, with the support and expectations for research utilization generally increasing with hospital size. The value for research that the staff nurses believed was held by the nursing department was reasonably high (mean=19.5; SD=3.3; possible range 6-24), but not as high as the nurses' own value for research on the same scale (mean=20.3). The value for research was significantly different by hospital size, with value scores increasing from small to medium hospitals and from medium to large hospitals. This contrasted with the nurses' own value for research where there were no differences between hospital sizes.

The staff nurses reported that the head nurse and director expectations to use research were fairly high (mean=17.7 and 17.8), but not as high as the nurses' own expectations (mean 18.2). The perceptions of nursing director expectations reported by the staff nurses were lower than, but similar in distribution and order of importance, to those reported by key individuals in hospital settings (Clarke, 1992). The nurses' own expectations correlated with their perceived head nurses' expectations, but not with the directors' expectations. The reported organizational expectations were lowest in small hospitals and highest in large hospitals, with the perception of expectations held by head nurses being influenced by the nurses' educational level.

The research climate was generally reported as low (mean=25.9, SD=6.8, possible range=11-44) and the number of infrastructures reported was low (mean=7.2 infrastructures per organization). Opinions of the research climate were consistent with the findings of other studies by Alcock et al. (1990), Clarke (1992) and Clarke and Joachim (1992). The research climate and infrastructures were lowest in small hospitals and highest in large hospitals.

Organizational climate and infrastructures seemed to be the strongest factors influencing the use of specific findings. This finding is congruent with earlier findings (Brett, 1986; Coyle & Sokop, 1990; Kirchoff, 1982) that perceptions of unit policy were influential on practice. As with the other organizational factors, the climate and infrastructure were correlated with all of the organizational characteristics ($r=0.49-0.56$ and $r=0.29-0.56$, respectively). In addition, both the climate and infrastructures were inter-correlated ($r=0.63$) and correlated with the research utilization outcome of use of specific findings ($r=0.33$ and 0.31 , respectively). However, although these organizational factors varied by hospital size and correlated with the use of specific findings, the use of specific findings did not vary by hospital size. Whereas Crane thought that organizational factors overwhelmed individual factors, the findings of the current study were interpreted as suggesting that nurses' individual characteristics mediate the influence of organizational factors.

The relationships between organizational and individual factors and research utilization outcomes were as predicted by Crane's (1989) conceptual framework. The individual change factors were inter-related ($r=0.46-0.60$) and correlated with the general use of research as reported by the nurses ($r=0.41-0.51$). The organizational change factors were also inter-related ($r=0.47-0.67$) and climate correlated with the use of specific findings. The organizational factors were not related to individual factors, except for the correlation between the nurses' own expectations to use research and the perceived head nurses' expectations, and the correlation between research experience and reported organizational infrastructures. The use of specific findings was only related to organizational factors, whereas the second measure of research utilization (general use of research) was only related to individual factors. The

two measures of research utilization outcomes were also correlated. These findings were interpreted as providing support for Cranes' conceptual framework.

The major factors limiting the study were methodological concerns with the survey instrument, the fact that organizational factors were measured from the perspective of the staff nurse and the low response rate. The internal validity of the study was limited by the fact that the organizational characteristics and change factors were reported from the perspective of the staff nurse. However, this can be viewed as a strength in that perceptions of organizational supports and expectations are likely to be more influential on research-related behaviour than the presence of supports or expectations as perceived by others. Furthermore, comparison with the work of Clarke (1992) reveals that the perceptions of the staff nurses were reasonably similar to those of key individuals in hospitals.

The generalizability of this study is limited by the potential differences between respondents and non-respondents. The non-respondents may have been significantly different than respondents in attitudes and expectations toward research and in levels of research use. However, the random selection, reasonable sample size and similarity of the sample to the population of staff nurses makes it reasonable to generalize the patterns of relationships observed in the study. The random selection makes it reasonable to generalize to staff nurses working in medical surgical or critical care areas of hospitals in B.C. Given the similarity of health care systems in Canada, it is also reasonable to generalize to other provinces. Because the sample was stratified, it is also reasonable to generalize to both baccalaureate and diploma educated nurses. Therefore, in the following section, conclusions which arise from this study are presented.

Conclusions

Based on the limitations, the following conclusions seem reasonable. The first set of conclusions that can be reached from this study pertain to the individual nurses' characteristics: their value for, interest in, experience with and expectations for using research. Nurses' interests in research and expectations of themselves to know and use research findings seem to be similar regardless of educational level or hospital size. Nurses are especially interested in knowing research results relevant to their area of practice, finding answers to specific nursing problems and using research results to change practice. Nurses expect themselves to use research, especially to critically question practice and to apply findings to practice. Nurses who have baccalaureate education seem to hold higher value for research and have more research experience than nurses with diploma education.

A second set of conclusions can be reached regarding the influence of individual factors on the use of research in practice. Nurses' values for, interests in, experiences with and expectations to use research seem to influence nurses' perceived general use of research. These characteristics do not seem to directly influence the use of specific findings, but may mediate the influence of the organization on the use of specific findings. Educational level does not appear to make a significant difference to the levels of general use of research or the use of specific findings.

This study also permits conclusions regarding nurses' perceptions of organizational change factors. Nurses perceive the organizational climate and support for research to be low, especially in small hospitals. However, nurses perceive the organizational expectations for the use of research to be fairly high but this varies with hospital size and lower than nurses'

expectations of themselves.

Conclusions regarding the impact of the organizational context and change factors are not easily drawn. While organizational size does not seem to influence nurses' individual characteristics or use of research, organizational supports and expectations are higher in larger hospitals. Organizational climate and support do not appear to be related to general use of research, but are related to the use of specific findings. These organizational variables were the only factors which correlated with the use of specific findings. The results suggest that organizational climate and support are the strongest factors influencing the use of specific findings.

Conclusions regarding research utilization outcomes are also difficult to reach. Nurses' opinions of their general use of research appear to be related to the values, interests, experiences and expectations they hold regarding research. Nurses' use of specific findings are related to the presence of positive organizational factors. Neither general use nor use of specific findings were as high as would be ideal for a profession which aspires to be research-based. The findings suggest implications for the promotion of research-based nursing practice.

Implications for Nursing Theory, Practice and Education

This study builds upon earlier research which has shown that nursing practice is not predominantly research-based. However, this study reveals that both diploma educated and baccalaureate educated nurses value, are interested in, and expect themselves to use research in practice. This study also illustrates that the organizational context in which nurses practice is influential. Theory, practice and education could be enhanced by the understandings offered

by this study.

First, theory about research-based practice should be based on a more complex understanding of research, practice, and organizations. Nurses from education, research, and practice need to understand that the factors influencing research-based practice are not limited to the characteristics of the individual nurse. This study has demonstrated that organizational influences need to be considered and modified to enhance research-based practice. Therefore, research-based practice must be thought of as a complex, multi-factorial situation that is influenced by the organizational practice setting as well as by the individual practitioner. The conceptual framework used in this study could be used as a basis for understanding practice and for educating nurses as well as for guiding future research. In addition to considering the generation, communication and evaluation of research findings, theories of research utilization need to focus on the implementation of research findings in practice.

Second, nurses need to be educated to enhance the use of research in practice. The fact that education has not been shown to have a significant impact on research-based practice should not be interpreted as meaning that research-related education is not valuable. It may be that the amount of research education that nurses receive is insufficient to have an impact or that the methods of teaching and/or the focus of research education have not been effective. It could also be that research utilization is not or has not been taught (H. Clarke, personal communication, April 6, 1994). It may also be that organizational factors limit the impact of the individual nurse and his or her education. However, the findings that nurses are especially interested in research activities that are directly related to their practice and specific practice areas suggest that an integrated approach to teaching research (in addition to or rather

than the separate course approach) would likely be beneficial. These findings also support recent emphasis on research utilization in baccalaureate education. The findings further suggest that nursing education at both diploma and baccalaureate levels should build practice-related research activities into curriculum. For example, the research related to basic nursing interventions should be introduced to beginning level students. The findings also suggest that more emphasis on research utilization in graduate programs is warranted. In introductory nursing courses and throughout their education, nurses should be required to evaluate the findings from research to guide their practice. As noted by Akinsanya (1994), research should be brought to the centre of basic nursing education.

Third, practice environments need to promote research-based practice. As argued by Spence (1994), changes in education are unlikely to have an impact unless there are changes in practice organizations. The findings of this study illustrate that nurses are interested in research activities that are directly related to their practice. This suggests that expectations for research-based practice could be built formally into clinical practice requirements through job descriptions and performance appraisal systems, and that research activities directly related to practice would be expectations that are acceptable to staff nurses. Additional supports, such as in-service education or consultative services, in the environment could target enhancing research-based practice.

The low perceptions of climate and support for research could be enhanced, especially in smaller hospitals. Although different supports for research in different sizes of hospitals would be reasonable, hospital administrators could evaluate what their expectations are and how their expectations will be supported. If a hospital is committed to research-based nursing

practice, the extent of that commitment should be reflected in the communication of those expectations and the support available.

The variation and discrepancies between organizational expectations and nurses' expectations for research use suggest that organizations could make expectations explicit and communicate expectations clearly. The frequency with which the nurses did not know what research supports were available suggests that organizations could focus on communicating the available supports to staff nurses.

Implications for Further Research

The findings of this study suggest implications regarding instrumentation, conceptual frameworks and methods to be used in further studies of research utilization. The findings also suggest further research that needs to be done.

In terms of instrumentation, the results suggest that measuring general use of research provides different information than that obtained by measuring the use of specific findings. Although general use of research may only be another measure of the nurse's attitude toward research, this suggests that the measurement of research-based nursing practice should not be limited to the implementation of specific findings. The scale measuring general use of research should be further developed and refined.

The high percentage of nurses who found the specific research findings "not applicable" to their practice indicates that methods of measuring research utilization must be more current and specific to the nurses area of practice. Research findings in more specific areas of practice should be reviewed to identify research that is ready for implementation. This would provide a better measurement of research utilization outcomes. The current study used

specific findings that were considered to be clearly appropriate for implementation as a measure of research use. Further work also needs to be done to measure the use of research where findings are not clear or are ambiguous. Research needs to explore how nurses can and do incorporate research findings in making decisions about nursing practice. Finally, studies to date have focused on reported use of research, but have not explored the relationship between these reports and actual behaviour. Methods of measuring the actual implementation of research findings in practice must be sought. Triangulation through multiple data collection methods, such as observation and interviews, would be useful.

Crane's conceptual model guided the study in a useful and productive manner. The results support the framework and suggest that further work using it would be valuable. The model could now be tested using techniques such as LISREL. The data obtained in this study may be useful for such testing.

The survey approach used in this study prevented follow-up with the nurses to clarify and understand responses to questions and to explore the organizational context in which the nurses practice. For example, the influence of different levels of congruence between nurses' expectations and their perceptions of employer expectations or between their own expectations and their use of research could not be explored. The survey approach also prevented identification of factors influencing the use of research utilization from the perspective of the nurse. Further study using qualitative approaches would allow a deeper understanding of the complex problem of factors influencing research-based practice.

Study of nurses' value for, interest in, and expectations to use research should be replicated with other samples. The impact of these characteristics needs further study to

identify why such high value, interest, and expectations do not result in research-based practice. The results of this study suggest that further exploration of organizational factors would be valuable and might help to explain differences between nurses' individual characteristics and levels of research-based practice. Further study of the impact of organizational climate, support and expectations is required. These variables should be measured from the nurses' and employers' perspectives simultaneously and measurements of congruence between organizational and staff nurse perspectives should be obtained. In addition, similar studies should be completed in a variety of contexts, including other provinces, states or countries.

This study supports the conclusion of earlier work that educational level does not influence research use. This surprising and interesting conclusion warrants investigation to determine why the additional research experience and education about research did not result in increased research use in practice. Further study to compare specific approaches to research education are needed. The impact of courses focusing on research utilization and models of integrated research education should be evaluated.

The strong support for research activities that are directly related to practice implies that nursing research should continue to strive toward addressing research questions which are relevant to practice and which answer specific practice problems.

Some discrepancy between nurses' expectations of themselves, organizational expectations and the use of research has been shown. However, further study is required to understand this complex relationship. The responses showed variation in the congruence between the expectations of the nurse and key individuals in the organization. However, the

survey approach prevented follow-up with the nurses to understand the influence of different levels of congruence. The survey approach also prevented identification of factors influencing the use of research utilization from the perspective of the nurse. Further study using qualitative approaches would allow a deeper understanding of the complex problem of promoting research-based practice.

This study focused on the relationship between organizational expectations and support for the use of research in nursing practice. While expectations were not shown to directly affect research utilization, organizational infrastructure and climate were found to be influential. The conceptual framework directed the study to consider the problem of research-based practice within an organizational context, but only examined that context in a limited fashion. Lomas (1993) suggests that the use of research findings must consider the practitioner as embedded in "a powerful network of influences" that include influences of the economic environment, the media and other professionals (p. 10). Further study of research-based practice should consider nursing practice within a broader context and should examine the control of nursing practice within that broader context. Specifically, the influence of the economic context of practice and the influence of physicians should be examined. Finally, the question of who controls nursing practice should be addressed. Nurses are only able to implement the findings of nursing research to the extent that they have control over their practice. Ultimately, nursing care of clients can only be improved through application of knowledge generated and refined through research.

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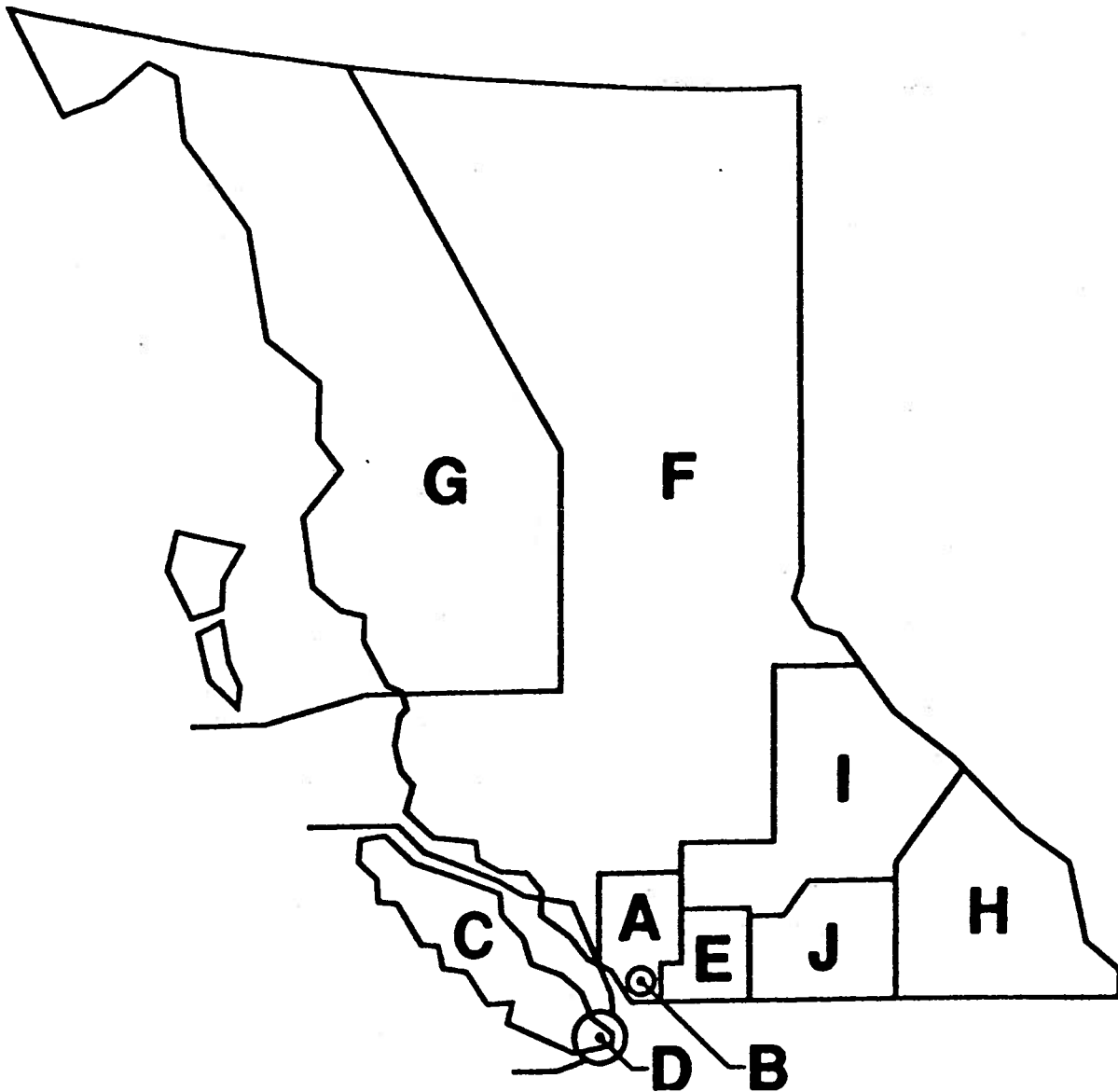
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Appendix A:
R.N.A.B.C. Electoral District Structure

RNABC ELECTORAL DISTRICT STRUCTURE

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A - Mainland-Coastal District
Chapters: North Shore, Sunshine Coast, Richmond/Delta

B - Vancouver Metropolitan District
Chapters: Vancouver Metropolitan

C - North Vancouver Island, Powell River & Gulf Islands District
Chapters: Campbell River, Comox Valley, Duncan, Gulf Islands, Long Beach, Mt. Arrowsmith, Nanaimo, North Island, Port Alberni, Powell River

D - Greater Victoria District
Chapters: Greater Victoria

E - Fraser Valley District
Chapters: Central Fraser Valley, Fraser-Cheam, Maple Ridge-Pitt Meadows, Mission, New Westminster, South Fraser

F - Northeast District
Chapters: Bella Coola Valley, Central Cariboo, Chinook, Fort Nelson, Misinchinka, Nechako Valley, North Cariboo, North Peace, Prince George, South Cariboo, South Peace, Stuart lake

G - Northwest District
Chapters: Houston, Kitman, Omineca, Prince Rupert, Queen Charlotte Islands, Rocher, Smithers, Terrace

H - Kootenays District
Chapters: Castlegar, Cranbrook, Creston, Fernie, Golden & District, Invermere & District, Kimberley & District, Nelson, Trail

I - Thompson-Columbia District
Chapters: Kamloops, Nicola Valley, North Thompson, Revelstoke & District, Salmon Arm, Lillooet Area

J - Okanagan District
Chapters: Kelowna, Penticton, Spallumcheen, South Okanagan, Summerland, Vernon

Appendix B
Research Utilization in Nursing Practice Questionnaire

Research Use in Nursing Practice

**Colleen M. Varcoe,
MSN Student
University of British Columbia
School of Nursing**

Phone:469-8400

August, 1993

Research Use in Nursing Practice

This survey asks questions about the value of using research in nursing practice, support for using research and use of research findings in practice. Please answer each question as completely as possible. Your responses are important to understanding the factors that influence the use of research in nursing practice.

1. Perceived value of research in nursing

On a scale of 1-4, indicate the response that reflects your own values and the response that reflects your understanding of the philosophy, mission statement, goals or objectives of your nursing department/division. Please put the appropriate number in the boxes on the right.

- 1 = strongly disagree
2 = disagree
3 = agree
4 = strongly agree

	OWN VALUES	NURSING DEPT. VALUES
1. Research based knowledge assists the nurse to improve the effectiveness of nursing.	<input type="checkbox"/>	<input type="checkbox"/>
2. Research enhances the profession's accountability to the public.	<input type="checkbox"/>	<input type="checkbox"/>
3. Research findings provide "the facts" needed to validate clinical practice decisions.	<input type="checkbox"/>	<input type="checkbox"/>
4. The research process is essential for creating innovative, scientific nursing interventions.	<input type="checkbox"/>	<input type="checkbox"/>
5. Research enhances nursing's effectiveness in responding to new developments affecting health.	<input type="checkbox"/>	<input type="checkbox"/>
6. Research findings enable nurses to use scarce health care resources more efficiently.	<input type="checkbox"/>	<input type="checkbox"/>

2. Perceived Role in Research

On a scale of 1-4, please indicate the response that best reflects the research activities *you expect of yourself* and those activities that *are expected of you by others*. Please put the appropriate number in the boxes under the correct columns on the right. If there is no clinical instructor or clinical nurse specialist, please put "N/A" (not applicable) in the appropriate box.

- 1 = strongly disagree
2 = disagree
3 = agree
4 = strongly agree

Expectations of:

Self Head Clinical Nursing
Nurse Instruct. Director

1. critically question effectiveness of daily nursing practice.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. promote a climate that supports my colleague's research endeavours.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. be involved in collecting data for nursing research studies.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. be involved in collecting data for non-nursing research studies.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. conduct research studies.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. apply research findings to clinical practice.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Perceived research climate in your organization.

Please indicate that which best describes the climate of inquiry in your organization.

1 = strongly disagree
2 = disagree
3 = agree
4 = strongly agree

In my organization:

1. nurses are encouraged to question their nursing practices. ☐

2. nurses are encouraged to conduct research studies to develop more effective methods of practice. ☐

3. nurses are encouraged to utilize research findings to develop more effective methods of practice. ☐

4. there are strategies (eg. committees, plans, people) specific to support research-related activities. ☐

5. other staff nurses are interested in research related activities. ☐

6. physicians support nursing research. ☐

7. other disciplines are interested in research collaboration. ☐

8. nursing professors are available to act as research advisors, consultants or collaborators. ☐

9. nursing professors conduct research studies. ☐

10. students conduct research studies. ☐

11. nurses who participate in the research process receive recognition for their involvement. ☐

4. Your interest in research

For each statement, please indicate the response that best describes your interest in NURSING research-related activities.

1 = strongly disagree
2 = disagree
3 = agree
4 = strongly agree

I am interested in:

1. finding answers to specific nursing problems. ☐

2. reading research studies. ☐

3. discussing research studies. ☐

4. participating in research projects of others. ☐

5. knowing the results of research projects conducted in my organization. ☐

6. knowing the results of research projects conducted in my area of practice. ☐

7. using the results of research to change practice. ☐

8. determining what differences research-based nursing practice makes. ☐

9. conducting research as part of a work assignment. ☐

10. conducting research even if it is not part of a work assignment. ☐

5. Your research experience

For each statement, please indicate whether or not you have done any of the following:

Please check one only (✓)

YES NO

- | | | |
|--|--------------------------|--------------------------|
| 1. taken a course in research methods. | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. taken a course in statistics. | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. completed questionnaires for a research project. | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. conducted interviews for a research project. | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. collected specimens for a research project. | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. been a principal investigator of a research project. | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. been a co-investigator of a research project. | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. been a research assistant. | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. assisted with the writing of a grant proposal. | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. written a grant proposal. | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. received funds from my organization to conduct research. | <input type="checkbox"/> | <input type="checkbox"/> |

5. Your research experience (continued)

For each statement, please indicate whether or not you have done any of the following:

Please check one only (✓)

YES NO

- | | | |
|--|--------------------------|--------------------------|
| 12. received funds from other sources to conduct research. | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. attended conferences where research studies were presented. | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. attended conferences where research findings were included in presentations. | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. published research results. | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. presented research results. | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. changed nursing practice based on research findings. | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. evaluated the results of the changed practice. | <input type="checkbox"/> | <input type="checkbox"/> |

6. Your use of research

Please indicate the extent to which you do each of the following:

- 1 = not at all
2 = sometimes
3 = frequently
4 = always

- | | |
|--|--------------------------|
| 1. I am familiar with current research relevant to my area of nursing. | <input type="checkbox"/> |
| 2. I can identify the research basis for my common daily practices. | <input type="checkbox"/> |

- ☐
3. I critically question daily practices for effectiveness.
- ☐
4. I use research articles to support my questioning of daily practices.
- ☐
5. I can identify hospital policies/procedures that are based on current research.
- ☐
6. I can identify hospital policies or procedures that are not based on current research.
- ☐
7. I implement nursing care on the basis of current research findings.
- ☐
8. I communicate concerns about the effectiveness of practices to colleagues.
- ☐
9. I change practice based on research.
- ☐
10. I evaluate the results of changed practice.

7. Your use of specific research findings

Please indicate the extent to which you do each of the following:

- 1 = no, never
 2 = yes, sometimes
 3 = yes, always
 N/A = not available
 in my area of practice

1. Internal rotation of the femur during injection into the dorso-gluteal site, in either the prone or side-lying position, results in reduced discomfort from the injection.

Do you use this method when giving an injection into the dorsogluteal site? ☐

Please indicate the extent to which you do each of the following:

- 1 = no, never
 2 = yes, sometimes
 3 = yes, always
 N/A = not available
 in my area of practice

2. Prior to removal of a catheter which has been in a patient for at least 36 hours, the catheter is intermittently clamped and released. Bladder tone is believed to be increased, resulting in an earlier return to normal micturition patterns.

Do you use this method when caring for patients who have had a bladder catheter for at least 36 hours? ☐

3. Sensory information about what is to be felt, seen, heard, tasted and/or smelled during a diagnostic procedure has resulted in patients experiencing less distress during the procedure.

Do you provide sensory information to patients when preparing them for diagnostic procedures? ☐

4. Sensory information about what is to be felt, seen, heard, tasted and/or smelled in relation to a surgical procedure has been associated with improved patient outcomes postoperatively.

Do you provide sensory information to patients when preparing them for surgical procedures? ☐

5. Preoperative training in relaxation techniques reduces pain distress and increases comfort in post-operative patients.

Do you teach your preoperative patients relaxation techniques? ☐

6. Testing the urine of patients for glycosuria and acetone can be done with equal accuracy on either the first or second voided specimens.

Do you routinely use the first voided specimen for sugar and acetone testing?

☐

7. A formally planned and structured preoperative patient education program preceding elective surgery results in improved patient outcomes.

Do you provide a formally planned and structured preoperative education program for your elective surgery patients?

☐

8. Accurate monitoring of oral temperatures can be achieved on patients receiving oxygen therapy by using an electronic thermometer placed in the sublingual pocket.

Do you use the oral method to electronically monitor the temperature of a patient receiving oxygen therapy?

☐

9. While passive range of motion activities do not seem to be related to increased intracranial pressure, other activities are, such as changing the patient's position by rotating the head or turning the patient.

Do you use this knowledge when you provide care to your patients?

☐

10. The process of mutual goal setting (where patient and nurse collaboratively define a set of patient goals) leads to more effective goal achievement and increases patient and staff satisfaction.

Do you use mutual goal setting in your interactions with patients?

☐

8. Organizational Overview

Please indicate whether or not your organization has the following supports for nurses to be involved in research related activities.

Please check one only (✓) (Yes, No, Don't Know)

YES NO DK

My organization has:

1. a hospital mission statement with priorities for research

☐☐☐

2. an established research policy/protocol

☐☐☐

3. a research review committee.

☐☐☐

4. if yes, is there nursing representation on the committee?

☐☐☐

5. an ethics review committee.

☐☐☐

6. if yes, is there nursing representation on the committee?

☐☐☐

7. a combined research and ethics review committee.

☐☐☐

8. if yes, is there nursing representation on the committee?

☐☐☐

9. experienced researchers who can act as consultants.

☐☐☐

10. secretarial services (e.g., for submitting proposals, transcribing audiotapes).

☐☐☐

11. library search services.

☐☐☐

12. computer facilities for data processing. ☐ ☐ ☐
13. data analysis consultants. ☐ ☐ ☐
14. funding/budget for pilot, feasibility or facilitation studies ☐ ☐ ☐
15. release time for nurse involvement in research related activities. ☐ ☐ ☐

Our Nursing Department has:

16. a nursing philosophy which explicitly refers to research and nursing ☐ ☐ ☐
17. a definition of nursing research which guides the development of our nursing research program ☐ ☐ ☐
18. a separate nursing research department, division or council ☐ ☐ ☐
19. a nursing research committee as part of the organizational structure ☐ ☐ ☐
20. an informal nursing research committee or interest group ☐ ☐ ☐
21. job descriptions for nurse administrators that include research responsibilities ☐ ☐ ☐
22. job descriptions for middle management that include research responsibilities ☐ ☐ ☐
23. job descriptions for clinical instructors that include research responsibilities ☐ ☐ ☐
24. job descriptions for clinical nurse specialists that include research responsibilities ☐ ☐ ☐
25. job descriptions for staff nurses which include research responsibilities ☐ ☐ ☐

26. nurse research assistants/associates working on nursing research studies as part of the nursing department ☐ ☐ ☐

27. nurse research assistants/associates working on non-nursing research studies as part of the nursing department ☐ ☐ ☐

9. Hospital Data

The following provides information about the hospital in which you are employed:

1. In what size of hospital are you employed?

☐ < 249 beds

☐ 250-499 beds

☐ > 500 beds

2. What type of unit do you work on most of the time ?

☐ Medical

☐ Surgical

☐ Medical/Surgical

☐ Critical Care

Other (please specify) _____

10. Personal Data

The following provides information about yourself.

1. What is your age in years? _____

2. What is your gender?

Male

☐

Female

☐

3. What is your educational preparation?

Check
if earned

years
since
graduation

R.N. Diploma

☐☐

Baccalaureate degree (Nursing)

☐☐

Baccalaureate degree (Other)

☐☐

Master's degree (Nursing)

☐☐

Master's degree (other)

☐☐

4. How much do you work? Check one only, please.

Full time

☐

Part time

☐

Thank you for your participation in this survey. Your time and interest are greatly appreciated.

Colleen Varcoe

Appendix C:
Letter to Participants



School of Nursing
T. 206-2211 Westbrook Mall
Vancouver, B.C. Canada V6T 2B5
Fax: (604) 822-7466

Dear Registered Nurse

I am a student in the Master's in Nursing program at the University of British Columbia. I am writing to invite you to participate in a study investigating how nursing practice changes. In particular, this study will explore how nursing knowledge is used among nurses and how organizations can facilitate the use of research in practice. Because of the current emphasis on research in nursing and research-based practice, this study should provide valuable information regarding how an organization can facilitate practice change. The title of my project is "The Relationship of Support and Expectation for Research Utilization to Research Use in Practice".

Your name was selected from the list of nurses registered with the Registered Nurses Association of B.C. In order to preserve your anonymity, I paid the R.N.A.B.C. to select a random sample of nurses for this study, label and mail this package to you on my behalf. No person, nursing unit or institution will be identifiable in the results of the survey. In addition, all responses will be completely confidential, to be used only for the purposes of this study. I have enclosed a stamped, self-addressed envelope for your convenience in returning the questionnaire. Instructions for completing the form are included on the questionnaire.

I have also asked R.N.A.B.C. to generate and keep an extra set of mailing labels for all nurses selected for this study for a follow up letter.

The results from this survey will be used as part of my thesis. If you are interested, when the results are complete I will send you a summary of the results. For that reason, I have enclosed a separate form for you to indicate that you would like a summary of results. This form can be mailed separately or will be separated from the survey when it is received.

Since your name was selected as part of a scientific sampling technique, in order for my results to be valid, it is important that all participants complete and return the questionnaire. Could you please take some time today, or at your earliest convenience, to complete the questionnaire and return it? The questionnaire should take about 15 minutes to complete.

Your participation in this research is entirely voluntary and your response will be greatly appreciated. You have the right not to participate. Return of the questionnaire will indicate your consent to participate in the study. Please do not hesitate to contact me if you have any questions regarding this research. Questions can also be directed to the chair of my thesis committee, Dr. Ann Hilton at 822-7498.

Thankyou for your participation!

Sincerely

A handwritten signature in black ink, appearing to read 'Colleen Varcoe'.

Colleen Varcoe R.N., M.Ed.
469-8400

Appendix D:
Optional Form to Receive Summary of Results

Optional: Please complete only if you would like to receive a summary of results when available

This sheet will be separated from the questionnaire when it is received, or you may mail it separately or fax it to 469-7178.

Name _____

Address _____

Postal Code _____

Appendix E:
Correlations Between Educational Level and Hospital Size and Study Variables

Table 48

Correlation Matrix for Study Variables

	EDUC	HOSP SIZE	EXSELF	INTEREST	EXPER.	OWN VALUE	CLIMATE	INFRA.	NDEPT. VALUE	EXP. HEAD NURSE	EXP. DIRECTOR	GENERAL USE
EDUC	1.00											
HOSP SIZE	0.01	1.00										
EXSELF	0.07	-0.08	1.00									
INTEREST	0.09	-0.05	0.60***	1.00								
EXPER.	0.44***	-0.01	0.29***	0.31***	1.00							
OWN VALUE	0.17*	-0.03	0.52***	0.46***	0.14	1.00						
CLIMATE	-0.11	-0.44	0.20*	0.09	0.06	0.16	1.00					
INFRA.	0.12	0.39***	0.14	0.11	0.27***	0.05	0.63***	1.00				
NDEPT. VALUE	-0.08	0.02	0.06	0.05	-0.12	0.23**	0.49***	0.29***	1.00			
EXP. HEAD NURSE	-0.09	0.10	0.42***	0.11	-0.07	0.01	0.49***	0.30***	0.47***	1.00		
EXP. DIRECTOR	-0.02	0.26**	0.26***	0.04	-0.15	0.02	0.56***	0.35***	0.56***	0.67***	1.00	
GENERAL USE	0.03	-0.06	0.51***	0.50***	0.37***	0.41***	0.18*	0.24***	0.05	0.16	0.13	1.00
USE OF FINDINGS	-0.02	0.16*	0.25**	0.23**	0.15*	0.13	0.33***	0.31***	0.14	0.06	0.24***	0.38***

* p<0.05

** p<0.01

*** p<0.001

AGE= Nurses' age

YEARS= Years since graduation

EXSELF= Nurses' own expectations to use research

INTEREST=Nurses' interest in research

EXPER.=Nurses' research experience

OWN VALUE= Nurses' own value for research

CLIMATE=Organizational Climate

INFRA.=Organizational Infrastructures

NDEPT. VALUE=Nursing department value for research

EXP. HEAD NURSE=Head nurse expectations of staff nurse

EXP. DIRECTOR=Nursing director expectations of staff nurse

GENERAL USE=General use of research

between responders and non-responders led to a final sample that was more representative of baccalaureate nurses, nurses who work part time and nurses working in medical-surgical areas than of the population of staff nurses working in B.C. acute care hospitals. The sample was similar in gender and age to the underlying population.

Individual Factors

The individual factors include personal and professional characteristics and individual change factors. In addition to the demographic characteristics, the professional characteristics of research experience and the individual change factors of the nurses' own value for research, interest in using research, and expectations of self for using research in practice were considered. The individual nurse's assessment of available resources was also considered, but will be discussed under organizational change factors.

Research Experience. Although the research-related experience of baccalaureate nurses was significantly greater than that of diploma nurses, the experience of the overall sample was low. As noted earlier, most of the difference between educational levels could be accounted for by the fact that most of the baccalaureate nurses had taken research and statistics courses (89%), whereas diploma nurses had not (14% and 17%, respectively). Most of the nurses had five or fewer research experiences. It was discouraging to note that the most frequently reported research experience was completing questionnaires, meaning that the nurses had more experience with being the subjects of research than with learning about, participating in or implementing research findings. However, it is possible that the experience of completing questionnaires was frequently reported because the nurses included participating in the current study as an experience.

These findings are similar to those of Alcock et al. (1990) who surveyed nurses in Ontario. They found the same rank order among the experiences but found lower levels for all experiences. The lower levels of experience may be explained because Alcock et al. used a

sample comprised of 26% baccalaureate nurses.

These findings are also very similar to the findings of Clarke and Joachim (1993) in their survey of B.C. schools of nursing. A key individuals with research responsibility in each school gave his or her opinion of faculty in relation to research. Using a tool derived from the instrument which was the basis of the current study, Clarke and Joachim found that the most frequently reported research experiences of faculty were completing questionnaires, followed by courses in research or statistics and attending conferences. Very few schools reported that faculty had other research experiences such as being a principal investigator, being a research assistant, writing proposals or obtaining funding for research.

The findings of the current study are, however, quite different from those of Clarke (1992) who used the same items to survey key hospital personnel regarding nurses' research related experience. Only "a few" nurses were perceived to have each of the research experiences, with the exceptions of completing questionnaires and changing practice based on research, which were estimated to have been experienced by more than a few, but still less than a quarter of nurses.

The differences between the low levels of staff nurse research experience perceived by key hospital personnel in Clarke's study and the higher levels reported by the staff nurses in the current study may be partially due to differences between responders and non-respondents. It may be that the respondents to this survey were different from non-responders in their level of research experience. However, even if none of the non-respondents had any research experience, more than one quarter of the diploma nurses surveyed would have had experience completing questionnaires and attending conferences. Therefore, the differences in experience between Clarke's study and the current study must also be partially explained as a difference between the key hospital personnels' perception of staff nurses and the staff nurses' perception of themselves.

Staff Nurses' Value For Research. While the baccalaureate nurses had a significantly higher value for research than the diploma nurses, value for both groups was high, with the means being 20.7 and 19.7 on scores with a possible range of 6-24. Alcock et al. (1990) found a similar rank order of support for statements, with value for solving patient care problems receiving 92% support and cost-effectiveness receiving 73%, compared to 98% and 77% in the current study. However, they found a slightly lower level of support for all value statements, most notably 70% support for public accountability compared to 89% in the current study. As in the current study they also found that baccalaureate nurses had significantly higher value for research. The differences between the studies are not remarkable and may be due to slight provincial variations, elapsed time between studies, increased media attention to public accountability, different sample composition or chance.

The support for value statements in the current survey is very similar to the findings of Clarke's (1992) study. Clarke surveyed nurses responsible for research in hospitals and found that the value statements related to enhancing nursing decisions, effectiveness, and interventions and public accountability received agreement from over 90% of those surveyed. In the current survey, these same statements received 92-98% agreement. The statement regarding enabling nurses to use resources efficiently was also the least supported statement, although it received 86% agreement from those responsible for research in Clarke's study compared to 77% agreement from staff nurses in the current study.

These findings are also very similar to the findings regarding faculty value for research as reported by Clarke and Joachim (1993). They found that the strongest agreement (mean=3.9; range=1-4) was with the statement that research improves the effectiveness of nursing and the least supported statement (mean=3.6) was that "research-based knowledge assists nurses to use scarce resources more efficiently". The findings are also similar to those of Bostrom, Malnight,

MacDougall, and Hargis (1989), who found that the most supported statement was that research findings that are advantageous to patient care can be implemented.

In the current survey, the statement "research findings enable nurses to use scarce resources more efficiently" was frequently commented upon. One nurse wrote "nursing does not have control of health care practices" and others circled the word "scarce" and/or put question marks beside the statement. This indicates that the statement itself was problematic and open to different interpretations. Responses to this statement, intended to measure the nurse's value for research, were confounded by questions of whether or not resources were actually scarce and to what extent nursing had control over resource utilization.

The nurses in this sample valued research, with baccalaureate nurses having greater value for research than diploma nurses. The findings are comparable to the value for research expressed by staff nurses in other surveys and by key personnel in hospitals and schools of nursing in B.C.

Interest in Research. All the nurses' interest in research was high, with no significant difference between baccalaureate and diploma nurses. The nurses were most interested in using research in practice, in solving specific problems, and in their own areas of practice. The results were also encouraging because the nurses had a reasonably high interest in reading and discussing research and in participating in research. They were least interested in conducting research themselves, which seems reasonable given their level of educational preparation and experience with research.

The results are very similar to the findings of Alcock et al. (1990). The percentages of support reported by Alcock were within 10 percentage points of the current study on all interest statements, with the exception of interest in reading research studies and conducting research as part of work (see Table 44). Alcock reported that 71% were interested in reading compared to 83% in the current study, and that 85% were interested in conducting research compared to 73%

in the current study. Alcock et al. found a significant difference between educational levels, which was not found in the current study. Again, the differences may be due to provincial differences, different economic conditions, and differences in the sample composition.

Table 44

Comparison of Staff Nurse Research Interests from the Perspective of Staff Nurses and Key Hospital Personnel

Interest in:	Percent Agreement (Agree + Strongly Agree) by Staff Nurses		Percent Interested estimated by Key Hospital Personnel
	Current Study	Alcock et al. (1990)	Clarke (1991)
using results to change practice	97%	88%	25%-50%
finding answers to specific problems	96%	94%	25%-50%
knowing results (own area/ own organization)	96%/91% *	96%	25%-50%
determining differences research-based practice makes	89%		25%
reading/discussing research studies	83%/76%*	71%	<25%
participating in research projects of others	82%	84%	25%
conducting research as part of work	73%		<25%
conducting research not as part of work	57%	45%	few

*two separate items were used in the current survey; one item in Clarke (1992)

The results are also remarkably similar to the reported interests of faculty (Clarke & Joachim, 1993). Clarke and Joachim found that key individuals in nine schools of nursing reported that three quarters or more of their faculty were interested in using research results to change practice, but only four schools reported that the same number of their faculty were interested in conducting research, even when it was part of their work assignment. It appears that the staff nurses in this sample are more interested in using research, and almost as interested in conducting research, as nursing faculty in B.C., as perceived by the heads of their schools.

However, the interest level among faculty might be considerably higher if the faculty themselves self-reported rather than the report being from the perspective of a single individual within their school.

In Clarke's (1992) survey, respondents from hospitals used the same scale to estimate the proportion of staff nurses who held various research-related interests. The research interest results are compared in Table 44. It is evident that this sample of staff nurses reported a higher level of interest than key hospital personnel perceived staff nurses to have. Hospital personnel may underestimate the research interest of staff nurses or the staff nurses may have responded in a more socially desirable direction than their true interests indicate, or both. Again, differences between the research interests of respondents and non-respondents are not known.

Interest in research among nurses in this sample was encouragingly high and similar to earlier estimates. It is especially remarkable that although the diploma nurses had less research experience and lower value for research, their interest was as high as the interest of baccalaureate nurses. The staff nurses compare favourably with available estimates of the research interests of faculty and compare reasonably with hospital respondents' perceptions of staff nurse interest.

Expectations for Using Research. Overall, the nurses in this sample had high expectations of themselves to use research regardless of their educational level or the size of hospital they worked in. Again it is interesting that diploma nurses had as high expectations of themselves as the baccalaureate nurses. Clearly expectations directly related to practice were more strongly supported than the conduct of research. This was congruent with the expressed interest statements in which direct practice statements were most strongly supported. However, it is remarkable that over half of the nurses expected themselves to actually conduct research. This finding seemed surprisingly high.

It is of particular interest that while 93% of nurses expected themselves to use research

findings to change practice, only 80% agreed that they use research articles to support practice change. These findings are congruent with the conclusion based on a research review that research publications have a limited effect on physicians's use of research (Lomas, 1993).

The expectations to use research reported by nurses in this study are again very similar to those of Alcock et al. (1990). They found similar high levels of expectation and strongest support for practice-related expectations. However, unlike the current study, they found differences between education levels.

Despite little research experience, the nurses' value for research, interest in using research and expectations of self for using research were high in this sample regardless of educational level and hospital size. Ancillary findings illustrate that these individual factors are also inter-correlated, which seems reasonable. Although it might be argued that these responses were socially desirable, the range and standard deviation suggest wide variability in individual scores and the lower responses to specific items and to items regarding the actual use of research suggest that social desirability was not a significant concern in this study.

Organizational Factors

The organizational factors included the infrastructures to support research and the organizational change factors of organizational research climate, nursing department value of research and key individuals' expectations of staff nurses to use research. One of the anticipated limitations of this study was the fact that the organizational change factors would be reported only from the perspective of staff nurses. Fortunately, the survey by Clarke (1992) used the same items and scaling to obtain the opinions of key nursing personnel in health care organizations and provides an excellent comparison to the opinions of the staff nurses regarding the organizational change factors.

Infrastructures. The organizational infrastructures such as research related policies, committees, personnel, and resources, varied significantly by hospital size, with the number of supports increasing by an average of 2.6 between small and medium hospitals and by an average of 3.9 between medium and large hospitals. There was a statistically significant correlation ($r=0.40$) between hospital size and the presence of research-related infrastructures. This seems reasonable as hospital resources are likely to increase with size.

It was disappointing that the most commonly identified supports (library services, ethics committees, and mission statements) are general supports that are not specific to research activities. Overall, 33.4% of the responses were "Don't Know", indicating that the staff nurses' awareness of infrastructures was low. Over 26% of the nurses did not know whether there was a separate nursing research department, division, or council in their organization or whether their own job descriptions contained research responsibilities.

Although the difference was not significant, baccalaureate nurses tended to report a higher number of organizational infrastructures. This tendency may be related to an increased awareness of the infrastructures due to greater research experience or might be related to a different attitude toward research by baccalaureate nurses as indicated by their higher value for research. Another possibility is that the baccalaureate nurses might be attracted to hospitals that have more research-related infrastructures regardless of hospital size.

The number of infrastructures did not correlate with any of the personal or professional characteristics or change factors, except for a low correlation with research experience. This supports the earlier suggestion that increased experience with research made the nurses more aware of what organizational supports were available. This correlation also highlights one of the major methodological limitations of the study: all variables are measured from the perspective of the staff nurse. In this case, the organizational infrastructures reported are only those that are

known to the staff nurse. However, this limitation is also a strength because the infrastructures that are unknown to the staff nurse are unlikely to impact practice.

Nursing Department Value of Research. The value for research that the staff nurses reported as being held by the nursing department was reasonably high (mean=19.5; range=8-24), but not as high as the nurses' own value for research (mean=20.3; range=12-24). The nursing department value for research was significantly different by hospital size, with the scores increasing from small to medium hospitals and from medium to large hospitals. This contrasts with the nurses' own value for research in which there were no differences between hospital sizes. Again, the significant difference between hospital sizes is reasonable given that resources for research and associations with universities are likely to increase with hospital size, and the difference is congruent with the differences in infrastructures found between hospitals of different sizes.

The high levels of support for the nursing department's value for research in enhancing nursing's effectiveness, accountability, decision-making, interventions and responsiveness were similar in emphasis to the findings of regarding the value statements of those responsible for research in hospitals (Clarke, 1992). The statement regarding enabling nurses to use resources efficiently was also the statement least supported by respondents to Clarke's survey, although it received 86% agreement (see Table 45).

The degree of agreement with value statements tended to be lower when reported by the staff nurse than when reported by hospital personnel, but otherwise the similarity is remarkable. This suggests that both the staff nurses and the key hospital nursing personnel have a high value for research. The nurses seemed to think that their nursing departments have a fairly high value for research and the perception of this value increases with hospital size.

Table 45

Comparison of the Value of Nursing Research from Three Perspectives

Statement About Value of Research	Mean Score (% agreement)		
	Nurses' Own Value	Nursing Department Value Reported by Staff Nurse	Value Reported by Key Nursing Personnel (Clarke, 1992)
improve effectiveness	3.57 (98%)	3.32 (92%)	3.55 (95%)
enhance accountability	3.47 (95%)	3.31 (92%)	3.49 (93%)
validate practice decisions	3.43 (93%)	3.29 (90%)	3.55 (96%)
create innovative, scientific interventions	3.32 (89%)	3.21 (87%)	3.51 (94%)
respond to developments	3.40 (93%)	3.24 (90%)	not surveyed
use resources efficiently	3.04 (77%)	3.05 (76%)	3.25 (86%)

Expectations of Staff Nurses Perceived to be Held by Key Individuals. The staff nurses in this sample believed that expectations held by their head nurses and nursing directors were similar. As agreement with all expectation statements would have resulted in a score of 18, the mean of 17.8 for head nurses and 17.7 for nursing directors suggests that there was both agreement and disagreement with the statements. The nurses' own expectations were significantly higher than those perceived to be held by the head nurses and directors. Inspection of the scores for instructors (mean=19.3) and clinical nurse specialists (mean=18.8) indicate that the scores were also higher than perceived expectations by head nurses and directors, and may have been higher than the nurses' expectations, but the small number of respondents precluded analysis.

There were no differences in the reported expectations by the educational level of the nurses reporting. However, there was a difference between the perceived expectations of head nurses from hospitals of different sizes and an interaction effect between hospitals and level of

education. The apparent relationship between the perceived level of expectation and hospital size was not simple. From baccalaureate nurses, head nurse expectations for small hospitals received the lowest scores, followed by medium, then large hospitals. However, from diploma nurses, large hospitals received the lowest scores and medium hospitals received the highest scores. This indicates that the staff nurses' perception of head nurse expectations in hospitals of different sizes vary by educational level. For baccalaureate nurses, the perceived expectations increase with hospital size; for diploma nurses, the perceived expectations are highest in medium sized hospitals, lower in small hospitals and lowest in large hospitals. The pattern for baccalaureate nurses follows the pattern of other organizational factors. The pattern for diploma nurses is more difficult to explain. It may be that larger hospitals have more baccalaureate nurses resulting in a greater perceived or actual contrast between nurses from different educational levels.

For the nurses' reported expectations of nursing directors, there was also a significant difference between hospitals of different sizes. Although no interaction effect was detected, the pattern of reported expectation of the nursing directors was similar for baccalaureate nurses as expectation scores increased with hospital size. For diploma nurses, nursing director expectation scores were again highest for medium-sized hospitals. However, this was followed by large hospitals and then small hospitals. Because the interaction effect was not statistically significant, it can only be concluded that nursing director expectations are reported higher as hospital size increases by both diploma and baccalaureate nurses. The increase in perceived expectations seems reasonable and is congruent with the increase in research infrastructures and climate by hospital size.

Although the expectations were reported by the staff nurses, the pattern of response is similar to the expectations reported by key nursing personnel (Clarke, 1992). Because the same scale was used, the reported expectations from the current study can be compared with the

expectations reported by Clarke (see Table 46).

The rank order of research expectations is different and the mean scores of the staff nurses' perceptions of the expectations of key individuals are lower than the expectations as reported to Clarke by key individuals. However, there is a greater similarity between the staff nurses' perceptions of themselves and the expectations reported by Clarke than between the other sets of expectations. Inspection of these scores suggests that the staff nurses' perceptions of nursing directors expectations are lower than, but similar to those reported by hospital personnel. It also suggests that the expectations of nursing personnel are more similar to the nurses' own expectations than the nurses think.

Table 46

Comparison of Expectations from Current Study and from Clarke (1992)

Expectation Statement	Mean Item Score (Rank)			
	Own Expectations	Head Nurse Expectations Reported by Staff Nurse	Nursing Director Expectations Reported by Staff Nurse	Expectations Reported by Key Hospital Personnel (Clarke, 1992)
apply findings to practice	3.40 (1)	3.21 (1)	3.10 (2)	3.29 (2)
critically question practice	3.39 (2)	3.19 (2)	3.04 (4)	3.35 (1)
promote research climate	3.28 (3)	3.13 (3)	3.14 (1)	3.20 (3)
collect data for nursing research	3.18 (4)	3.10 (4)	3.05 (3)	not surveyed
collect data for non-nursing research	2.69 (5)	2.63 (5)	2.62 (6)	not surveyed
conduct research	2.58 (6)	2.63 (6)	2.72 (5)	2.38 (4)

The staff nurses perceive the expectations of the head nurses and nursing directors to be lower than their own expectations. This finding is corroborated by Clarke's report of expectations which are also lower than the staff nurses' own expectations. Expectation scores vary with

hospital size, and educational level appears to affect perception of expectations, especially with regard to head nurse expectations. The perceived head nurse and nursing director expectations were correlated with the nurses' own expectations, but not with any other individual characteristic or change factor. Both perceived head nurse and nursing director expectations correlated with all of the organizational variables.

Research Climate. The low opinion of research climate and significant difference between hospital sizes are consistent with the low estimates of infrastructure and the lower levels of other organizational factors reported by nurses from smaller hospitals. Crane (1989) measured organizational climate and organizational resources and reported the mean scores for nurses using two different dissemination methods. However, she did not report the range of scores and did not compare hospital sizes.

The climate statements in the current study were ranked in a similar manner as the same statements in Clarke's (1992) survey of B.C. hospitals. In the current study, 74% of nurses agreed that they are encouraged to question their nursing practices and three other statements received over 50% agreement. However, the seven remaining statements received less than 50% agreement. The climate scores tended to be higher and there was a higher percentage of agreement with all statements when reported by key personnel in Clarke's study than when reported by staff nurses in the current study or in the study by Alcock et al. (1990).

A comparison of staff nurses opinions of climate in the current study and the study by Alcock et al. with Clarke's findings is summarized in Table 47. This comparison indicates that Clarke's nursing department leaders tended to have higher estimates of the climate with regard to staff nurses (encouragement to question, use findings, conduct research and recognition) than the staff nurses themselves. Conversely, the staff nurses seem to give higher estimates of the available supports (support strategies, interest from other staff nurses and students) than do the

personnel responsible for those supports. It seems that nurses in these samples tended to be more critical of areas with which they were most familiar.

Table 47

Comparison of Response to Research Climate Statements by Staff Nurses and Key Nursing Department Personnel

Research Climate Statement	Staff Nurse Mean Score (Percent Agreement)	Staff Nurse Percent Agreement (Alcock, 1990)	Organizational Personnel Mean Score (Percent Agreement) Clarke, 1992
Nurses are encouraged to question nursing practices	2.90 (74%)	41%	3.51 (97%)
Nurses are encouraged to use research findings	2.70 (62%)	48%	3.21 (85%)
There are strategies to support research activities	2.57 (58%)	*	2.21 (36%)
Other staff nurses are interested in research	2.54 (57%)	*	2.28 (34%)
Other disciplines are interested in research collaboration	2.31 (46%)	69%	2.52 (53%)
Nurses who participate in research receive recognition	2.32 (43%)	38%	2.63 (56%)
Nurses are encouraged to conduct research studies	2.32 (42%)	*	2.72 (60%)
Students conduct research studies	2.27 (42%)	*	2.12 (32%)
Professors conduct research studies	2.16 (35%)	*	2.06 (27%)
Physicians support nursing research	2.15 (35%)	38%	2.19 (30%)
Professors are available to consult, advise, collaborate	2.03 (29%)	41%	2.03 (25%)

*Statements not comparable

The responses were very similar in both B.C. studies regarding support from nursing professors and physicians. However, the responses regarding nursing professors are likely to be related to the fact that most of the hospitals (especially small hospitals) were not likely to have

nursing professors associated with them. The similarity in the mean scores of the two statements about nursing professors, in both the current study and the study by Clarke, suggests that nursing professors who are seen to conduct research are also seen to be available for consultation. This conclusion is different from that of Clarke (1992) who concluded that professors who conduct research are not necessarily seen by those responsible for research in hospitals as available for consultation.

The research climate scale was somewhat problematic as it contained items that overlapped with items covered under infrastructures (e.g. strategies for support, professors to consult). Furthermore, items such as the two regarding nursing professors automatically gave a larger score to larger hospitals which were more likely to be associated with nursing schools.

In summary, staff nurses' reported the research climate to be low, with the scores being lowest in small hospitals. The climate scores tended to be lower than, but similar to, scores obtained from hospital personnel regarding staff nurses and from personnel in schools of nursing regarding faculty.

The fact that all of the organizational factors increased with hospital size supports the assumption that research resources, supports and expectations increase as hospital size increases. The fact that all of the organizational factors were inter-correlated suggests that the staff nurse's view of nursing within the organization is cohesive. It may also reflect real cohesiveness and interrelationships with regard to research within nursing organizations. The relationships between these factors also support the conceptual framework, as anticipated relationships were supported.

Research Utilization Outcomes

Research utilization outcomes included the nurses' opinions of their own general use of research and their ratings of their frequency of using specific research based practices. Previous studies have used specific practices as measures of research use.

General Use of Research. As rating all statements as "sometimes" would result in a score of 20, the mean of 22.7 for this sample suggests that the nurses thought they used research to some extent. One of the limitations of this study is the fact that it is difficult to interpret what "sometimes" meant to the nurses and impossible to know to what extent nurses were biased toward giving a socially favourable response. The distribution of the scores illustrates that the scores of most nurses were clustered around this mean and that, as only 8% had scores higher than 30, few nurses responded "always" to any of the statements. There was no reported difference between respondents from different educational levels or different sizes of hospital, but there was considerable variation in the responses to different items.

The fact that statements regarding the actual implementation and evaluation of practice based on research were less well supported than statements regarding questioning practice and communication of concerns suggests that **assessment** of research-based practice is done more than **implementation** of research-based practice. It was discouraging to note that the least well supported statement was about the use of research articles to support questioning of practice. One of the limitations of this study (as with any survey) was that the nurses' perceived basis for questioning practice was not identified.

The statements regarding the identification of hospital policies were also problematic. It was impossible to know if the nurses could or could not identify policies based on research because the policies themselves were or were not based on research, or because the nurse did not **know** the research support well enough to evaluate the basis of the policies. These statements therefore may reflect the nurses' knowledge or the status of policies.

The response to the use of research in general appears to be more favourable than the response to the use of specific findings. This may be partially due to the fact that, as Lomas (1993) points out, research-based practice is not the "black and white" implementation of findings

but rather decisions in grey areas. Lomas criticized research on medical decision-making for focusing on the use of clear and unambiguous findings. Similarly, research on the use of findings in nursing practice has focused on unambiguous findings and therefore may not have accurately portrayed research-based nursing practice. Measuring general use of research may capture conviction about application in general, or cognitive application of research, rather than specific behavioral change. Alternatively, the statements about use of research in general ask the nurse to make broad generalizations about practice and might be expected to be more positive. This measure may simply be another measure of the nurses' attitudes toward research rather than an actual estimate of practice behaviour.

The general use of research seemed to be similar regardless of the nurses' educational level or hospital size. The nurses reported using research to some extent and tended to focus on questions and concerns about practice rather than on the actual use of research to improve practice. General use of research correlated with the use of specific findings and with all of the individual factors but none of the organizational characteristics.

Use of Specific Research Findings. Of the ten specific findings that were used as a measure of the use of research in practice, nine were used at least sometimes by over half the nurses. The findings were used at least sometimes by 49% - 96% (average of 77%) of nurses. This level of use is comparable to the findings of Brett (1987) who found that 31% - 93% (average of 61%) of nurses used the 14 findings she studied, and Coyle and Sokop (1990) who found that 26%-93% (average of 54%) used the same 14 findings. It is important to note that the ten findings used in this study were the same as those used by Brett and by Coyle and Sokop.

One explanation for the higher percentage of use in the current study is that the number of years between studies may have allowed the findings to become more well known. In addition, four of the practices were eliminated, which may have resulted in findings which are more well

known or more appropriate to current practice. Another explanation is the fact that neither Brett nor Coyle and Sokop identified whether or not practices were applicable to the nurses' practice. When Coyle and Sokop excluded nurses who were not aware of findings, they found that 71-100% used the innovations under study. Similarly, Winter (1990) found that 56.5% of nurses who knew about relaxation therapy research used the findings in practice. Although the nurses in the current study were not asked if they were aware of the specific findings, the opportunity to indicate that the findings were not applicable may have partially served the same purpose.

Interpreting the practical significance of the level of use of specific findings is difficult, partially because of the limitations of the study. The survey approach did not permit identification of the reasons for non-use of findings. There was no possibility of finding out whether nurses did not use a particular finding because of a lack of knowledge or lack of persuasion on the part of the nurse, or for some other reason. Other possible reasons for non-use of findings include 1) the findings might not be applicable to a specific patient, 2) organizational policy may preclude use, 3) norm or job descriptions may preclude use, or 4) more recent innovations may have made the innovation out-dated. Given these possibilities, it may be that an average use of 77% could be considered high. Although other studies have measured use in a similar manner, none of the authors have attempted to establish what an ideal level of use might be.

The percentage of nurses who found that the specific research findings were not applicable was interesting. Urine testing was rated "Not Applicable" by 36%, and comments that blood glucose monitoring had replaced urine testing were frequently added to the survey. Although some nurses may not nurse preoperative patients, it is difficult to explain why three items related to preoperative preparation (relaxation, teaching, and giving sensory information) were rated "Not Applicable" at different rates (20%, 38% and 19%, respectively). It was also difficult to understand why 5% of nurses considered mutual goal setting and giving sensory information

before diagnostic procedures "Not Applicable". The survey approach limited obtaining explanations for these findings.

This measure of specific research utilization was similar to the general use of research in terms of there being no differences between nurses of different educational levels or in hospitals of different sizes. The two measures of research utilization were correlated, although weakly. It seems that the nurses' individual characteristics and change factors influenced their general use of research which may have moderated the organizational influences on the use of specific findings.

Comparison of Findings by Nurses' Educational Level

Education was a major professional characteristic on which all other research utilization predictor and outcome variables were compared. Nurses with baccalaureate degrees had significantly more research related experience and had significantly higher scores on their value for research. Most of the difference in research experience was due to the large number of baccalaureate nurses who had taken statistics and research methods courses. It may be that the greater research experience of baccalaureate nurses provided opportunities for those nurses to develop more value for research. The difference in value for research may also account for the higher response rate from baccalaureate nurses regarding the use of research. However, there were no significant differences between the groups on the other individual change factors of research interest or expectations to use research.

Bostrom, Malnight, MacDougall and Hargis (1989) report similarities and differences between baccalaureate and diploma nurses in terms of interest and attitudes toward research and preparedness for conducting research. However, because their group sizes were greatly unequal (only 13% baccalaureate degrees) and no statistical analysis of the findings was reported, their findings cannot be compared with the current sample.

Alcock et al. (1990) found that baccalaureate nurses reported higher research experience and valuing of research. However, these authors additionally found that baccalaureate nurses had higher interest in research and higher research expectations, not confirmed in the current study. Again, Alcock et al. used greatly unequal group sizes: 74% diploma nurses and 26% baccalaureate nurses and had a different sample composition in terms of variety in place of employment and part and full time employment.

The two groups in the current survey also reported similar views of their organizations, as there were no differences by educational level in nursing department value for research, organizational climate, or organizational expectations to use research. Although the baccalaureate group tended to report higher organizational infrastructures, the difference was not significant.

There were also no differences between educational level in the reported general use of research or use of specific findings. Champion and Leach (1989) measured nurses' self reported general use of research and also did not find education to be significant predictor. These concur with Brett (1987), Crane (1989), Coyle and Sokop (1990), Ketefian (1975) and Winter (1990). Overall there was little difference between baccalaureate and diploma nurses in this study in research utilization predictor or outcomes variables. The only differences noted between educational levels were in research experience, which may be a direct consequence of educational experiences, and value for research, which may be related to greater research experience. This study supports earlier findings that educational level is not a significant predictor of research utilization.

Comparison of Findings by Hospital Size

It was anticipated that the organizational characteristic of hospital size would influence other organizational characteristics and change factors. Differences between hospital sizes were found for all of the organizational change factors and the organizational infrastructures. The perceived

nursing department value of research, the research climate, infrastructures and expectations by key individuals for staff nurses to use research were all significantly different by hospital size. All of these variables increased as hospital size increased from small, to medium, to large. There were, however, no differences in any of the personal or professional characteristics, or individual change factors between nurses working in hospitals of different sizes. There were no differences in the value for research, interest in research, research experience or expectations of self. There were also no differences in general use of research or use of specific findings between nurses from hospitals of different sizes. This suggests that while increased organizational resources result in more support and higher expectations for research, the research-related attitudes, values and behaviours of nurses practising in those hospitals are not significantly affected.

Previous studies have presented conflicting results regarding the influence of hospital size on the use of research. Kirchoff (1982) found a difference in hospital sizes related to the use of coronary precautions, whereas Brett (1987, 1989) did not find a difference between hospital size and the use of 14 specific findings. Kirchoff also found a difference in the use of the specific finding and the hospital type (state, private) and location (urban, rural), whereas Brett did not. These studies classified hospital sizes differently, with Kirchoff having six categories and Brett having three. The categories used by Brett were used in this current study, but the type and location of hospitals were not considered. It may be that differences would have been found in the current study if finer categories were used. There may have been differences among respondents within the small hospital category in the current study, as responses indicated that these nurses were from hospitals as small as 14 beds and as large as 250 beds. As infrastructures and climate increases with hospital size, it could be anticipated that even greater variation would be seen if smaller categories were used.

None of the personal or professional characteristics or research utilization outcomes were

significantly different by hospital size; all of the organizational factors were significantly different by hospital size.

Relationships Between Individual and Organizational Factors and Research Utilization

The factors within the three components of individual factors, organizational factors and research utilization outcomes were seen as interrelated. The relationships between these components are discussed in this final section.

Individual Factors. The individual factors assessed the demographics as well as the personnel and professional factors that served as study variables. While the demographic variables did not correlate with any of the study variables, all individual factors were interrelated and correlated with the general use of research. The nurses' own expectations also correlated with reported head nurse expectations, and research experience correlated with reported infrastructures.

The age of the nurses did not correlate with any of the study variables except with the years since graduation. To date, only Winter (1990) has reported on the relationship of age to research utilization. She did not find any significant differences related to age.

It was also noted that the years since graduation did not correlate with any of the study variables. Thirteen of the diploma nurses and eight of the baccalaureate nurses did not report their years since graduation. As these nurses were in a wide variety of age categories and reported their ages, the omission of this information did not seem to be related to age. Previous studies that considered years since graduation have produced conflicting results. Kirchoff (1982) found a significant relationship between years since graduation and the use of coronary precautions whereas Ketefian (1975) found no difference in the use of correct temperature technique and Brett (1987) found no difference in the use of 14 specific findings by years since graduation. It is also relevant to note that previous studies (Champion & Leach, 1989; Coyle & Sokop, 1990; Winter, 1990) have not found significant differences in research utilization in relation to years

of nursing experience.

The lack of significant relationships between age and years since graduation and research utilization outcomes questions the influence of both education and experience. One possible explanation for the lack of a relationship is that because the majority of nurses in the sample graduated within the past 10 years, variation in the time since graduation and thus, variation in the quality and content of education, may not have been sufficient to show differences in research utilization variables. However, it seems that the range in years should have been sufficient to demonstrate a difference if experience as an important time-related predictor of research utilization. Another explanation is that education has a lasting effect or little effect on research utilization, either of which would result in little difference in research use over time. This study adds to growing evidence that age and years since graduation are not predictors of research use.

In the current study, research experience had a low correlation with the nurses' expectations of themselves to use research, interest in research, and general use of research findings, but did not correlate significantly with any of the other study variables. As noted earlier, although they had higher research experience, the baccalaureate nurses did not have higher expectations or interest in research or higher reported use of research. Baccalaureate nurses had higher value scores, but value and research experience did not correlate for the sample or for the subgroups by educational level.

Alcock et al. (1990) found significant low correlations between research experience and research interest ($r=0.41$). However, in contrast to the current study, Alcock et al. did not find a correlation between experience and expectations, but did find a low correlation with research value ($r=0.36$). Other studies (Crane, 1989; Champion & Leach, 1989) have considered research experience only in relation to the use of specific findings, and have found no significant relationships. In the current study, there was no significant correlation between research

experience and the use of specific findings. Crane (1989) found a significant relationship between having specific research responsibilities at work and the use of specific findings. However, in the current study, few nurses had any experience with research beyond courses or attending conferences, so this comparison could not be made. The findings of this study suggest that research experience is related to increased expectations to use research, interest in research and reported general use of research but, in agreement with earlier studies, is not related to the use of specific findings.

The nurses' value for research had a moderate correlation with expectations to use research; a low but significant correlation with interest in research; a low correlation with general use of research findings; but no relationship with the use of specific findings. Alcock et al. (1990) found that value for research correlated with experience ($r=0.45$), research interest ($r=0.54$) and expectations ($r=0.36$). Champion and Leach (1989) also found a significant correlation ($R=0.65$) between attitudes toward research and self-reported general use of research and found that attitude accounted for 42% of the variance in general research use.

Interest in research was moderately correlated with expectations to use research and showed a low correlation with value for research and research experience. All of these correlations were also found by Alcock et al. (1990). The nurses' own expectations were moderately correlated with value for and interest in research and showed a low correlation with experience. The strongest correlations with research utilization outcomes were those between the nurses' interest and expectations and general use. Again these findings are congruent with those of Champion and Leach (1989) regarding the relationship of attitude and general use of research. This study adds to evidence that attitude is positively related to the use of research.

The personal and professional characteristics of education and age did not seem related to other research-related characteristics or to research utilization outcomes. However, the nurses'

research experience appeared to be related to individual change factors and general use of research. The individual change factors of interest, value and expectations were inter-correlated and correlated with research experience. These four factors are related to general use of research findings, but not to the use of specific findings.

Organizational Factors

The nurses' assessment of the expectations of head nurses and nursing directors correlated with their own expectations, but none of the other organizational factors correlated with individual factors. None of the organizational factors correlated with general use of research, but two of the organizational factors, infrastructure and research climate, correlated with the use of specific research findings.

The correlations between expectations suggests that the nurses have cohesive views of their practice and to some extent think that their practice is congruent with the expectations of others. Neither their assessment of nursing director expectations nor head nurse expectations correlated directly with research utilization outcomes suggesting that the perceived expectations of key individuals may not have a direct effect on practice. Champion and Leach (1989) also found no correlation between the nurses' reported use of research and their opinions of others until they did correlations with specific administrators. However, because they studied a single community hospital, their results pertain to specific key individuals rather than key roles. The current survey detected a difference between organizational expectations and nurses' expectations of themselves, but did not clarify the complex relationship between expectations and research utilization outcomes. It did, however, add to understanding and show the complexity of the situation.

Infrastructures were related to other organizational characteristics and change factors and seemed to be related to research utilization outcomes, especially the use of specific findings. The number of infrastructures were correlated with all of the organizational variables and with the use

of specific research findings. The correlation between infrastructures and the general use of research was too low to be considered ($r=0.24$). However, correlations by hospital size revealed that the correlation became stronger as hospital size increased from small ($r=0.09$; $p=0.49$), to medium ($r=0.36$; $p=0.00$), to large ($r=0.42$; $p=0.00$). This suggests that research-related infrastructures may affect the use of specific practices more strongly than they affect the nurses' opinions of their general use of research.

Brett (1989) found conflicting relationships when examining specific infrastructures. She found that in small hospitals, mechanisms to support nurses doing research and exposure to publications was positively correlated with the use of findings. However, she found that in large hospitals these same infrastructures and those intended to promote attendance at conferences and presentations, performing research duties in work and inducements to learn were negatively correlated with the use of specific findings. It is also relevant to note that Brett (1987) and Coyle and Sokop (1990) all indicated that perception of hospital policy was related to the use of specific findings. It is therefore not surprising that the nurses' perceptions of organizational infrastructures were related to the use of specific findings.

Similarly, the research climate correlated with all of the organizational characteristics and change factors and with the use of specific research findings, but did not correlate with general use of research. The research climate had a fairly high correlation with infrastructure ($r=0.63$) and several of the items seemed to overlap with infrastructure, suggesting that the research climate and infrastructures are closely related and may be defining the same construct.

The low correlation of infrastructures and climate and the absence of a correlation between the other organizational factors and research utilization outcomes does not mean that the organizational context is not influential. The nurses who responded to the survey added revealing comments. One nurse stated, "Our hospital is very rigid and backwards in regards to

administration. The new head nurse is trying hard to develop (a research climate), but it's like banging your head against a brick wall". Another nurse made the comment, "Don't make waves attitude" referring to research climate. Another nurse wrote, "If my hospital involved more research it would improve nursing and patient care 100%".

Several nurses commented on the difficulty of using research-based practice within the current practice setting. For example, a nurse wrote, "As an RN who works on a ward I find it difficult to answer these questions. Being short staffed, we don't have time for research in our work day". Others suggested that the context of practice was broader than the context addressed by the study. For example, one nurse commented that "people in this town won't accept it (referring to changing nursing practice based on research)", and several other respondents made comments on the lack of nursing control over resources and decisions.

There was a wide range and considerable variability in the research climate and infrastructure scores, suggesting a wide range of opinion and a wide range of organizational support for research. The nurses' individual characteristics may mediate the influence of the organization on research practice, thus obscuring the relationship.

Research Utilization Outcomes

The two measures of research use were correlated. General use of research correlated with all of the personal and professional characteristics and change factors but none of the organizational characteristics. The use of specific findings was correlated with two of the organizational variables (organizational infrastructure and research climate), but did not correlate to any of the personal or professional variables. Although research climate and infrastructures varied by hospital size and correlated with the use of specific findings, the use of specific findings did not vary by hospital size. It seems that both individual and organizational characteristics are related to the use of research, but that individual factors influence how nurses

perceive their general use of research, whereas organizational factors influence the use of specific practices. The relationship between the nurses' individual factors and general use suggests that the nurses' values, attitudes and expectations are congruent with their perceived behaviour. In other words, the nurses see themselves generally practising as they expect themselves to and in congruence with their values and interests. The relationship between the organizational factors and the use of specific findings suggests that the organizational infrastructure and climate is more influential in the use of specific findings than individual factors are. This finding is congruent with the findings that the perception of hospital policy influences the use of specific findings (Brett, 1987; Coyle & Sokop, 1990). Previous lack of attention to organizational variables may explain the inconclusive findings regarding the predictors of use of specific findings. Finally, the fact that the use of specific findings did not vary with hospital size but correlated with research climate and infrastructures which did vary by hospital size, suggests that the individual factors may mediate the influence of the organizational factors on the use of specific findings.

Theoretical and Methodological Considerations

These research results support the components and relationships proposed in the conceptual framework. The findings support Crane's (1989) conclusion that individual factors are not directly related to the use of specific findings. Rather, organizational factors have a direct influence on the use of specific findings and individual factors mediate the influence of organizational factors. However, the findings also suggest a relationship between individual factors and general research use, which was not proposed in the model by Crane. Previous studies, including Crane's, have examined the use of specific findings, but not the general use of research.

The results of this study confirm, complement, and extend previous research findings. The level of research use is similar to that of previous studies. The influence of individual factors such as education, attitude and experience were similar to previous studies. The findings

regarding the influence of organizational factors supports the work of Crane (1989), Clarke (1992) and Clarke and Joachim (1993) in clarifying the understanding of the importance of organizational value, climate and infrastructure. The findings regarding the influence of expectations extends understanding of the influence of both individual and organizational factors.

This study has inherent limitations common to survey research. Specifically the differences between respondents and non-respondents was not known and the organizational expectations and supports were reported from the perspective of the staff nurse. However, the impact of these limitations is lessened by the stratified random sample, reasonable sample size and the opportunity to compare the findings with those of Alcock et al. (1990), Clarke (1992) and Clarke and Joachim (1993) obtained using a similar instrument and comparable geographical areas.

Additional limitations were related to hospital size categories, the measurement of research use and problems with individual items on the survey. The categories of hospital sizes were broad, possibly limiting the detection of differences in research use between sizes. This problem may have been especially important regarding the small hospital category. The measurement of research utilization was also problematic. First, research use was measured from the perspective of the nurse. Second, the general use of research may have only been another measure of attitude. Third, measurement of the use of specific findings was limited to practices which have varying applicability and there was no means of clarifying the meaning of responses or the reasons for non-use. Finally, the survey had some items that were clearly difficult to interpret and there was no way to clarify responses.

Summary

In this study, the sample consisted of 183 staff nurses working in medical-surgical and critical care areas of hospitals of different sizes in British Columbia. The stratified sampling resulted in a sample which consisted of 45% diploma educated nurses and 54% baccalaureate

educated nurses. The representation from educational levels and hospital sizes yielded subgroups that were sufficiently similar in size to permit the use of analysis of variance. The sample was similar to the population of nurses in B.C. in terms of gender and age, but was purposefully stratified to over represent baccalaureate educated nurses and nurses working in medical-surgical or critical care settings.

While the response rate (42%) was adequate for a mail survey, the response rate differed by educational level and it was not known how the non-respondents differed from respondents.

Overall, the nurses in the sample had very positive attitudes toward research and had high expectations of themselves. There was little difference between educational preparation, with only research experience and value for research showing significant differences. Individual factors and research utilization outcomes did not vary with hospital size; however, the nurses' opinions of their organizations varied considerably with organizational size and with organizational support, and expectations for research utilization generally increasing with hospital size. The nurses reported moderate general use of research and of use of specific findings at levels that are comparable to or better than previous findings. Education does not seem to significantly influence research utilization. Individual factors seem to influence general use of research whereas organizational factors influence the use of specific findings. Organizational size influences the research-related organizational characteristics but does not influence the use of specific research findings.

The relationships between the individual factors, organizational factors and research utilization outcomes had a definite pattern. All of the organizational factors varied with hospital size, whereas none of the individual factors did. None of the organizational factors varied with the nurses' educational levels whereas the individual factors of value for research and research experience were higher for baccalaureate nurses. All of the individual factors were inter-related

and all of the organizational factors were inter-related, however, there was little correlation between individual and organizational factors. The only correlations between individual and organizational factors were the correlation between respondents' reports of head nurse expectations and their own expectations to use research and the correlation between the nurses' research experience and perception of organizational infrastructures. In terms of research utilization outcomes, the general use of findings was related to individual factors and the use of specific findings was related to organizational factors. All of the individual factors were related to general use of research and there were no differences between nurses of different educational levels or hospital sizes. Only two organizational characteristics (research climate and infrastructure) and none of the individual characteristics correlated with the use of specific findings.

This study supports the conceptual framework proposed by Crane (1989) and suggests merit in adding the concept of general use of research. The results confirm previous findings regarding levels of research use and the influence of individual factors such as education, attitude, and experience. The findings about the influence of organizational factors increases understanding of the importance of organizations communicating value, setting climate and providing infrastructure support for research, and offers new understanding regarding the influence of nurses' expectations in this regard.

The major limitations of this study include the unknown differences between respondents and non-respondents and the fact that organizational factors were reported from the perspective of the staff nurse. However, the stratified random sample, reasonable sample size and the opportunity to compare the findings with similar studies strengthened the validity and generalizability of the study.

In this chapter, the survey results have been presented, analyzed and discussed. In the next

chapter, the study will be summarized and the implications for nursing practice, education and research that arise from this study's conclusions will be presented.

CHAPTER FIVE

Summary, Conclusions, and Implications

This study was designed to describe the levels of organizational expectations and support for research use, levels of nurses' expectations of themselves to use research, and levels of research use by staff nurses. The study was further designed to investigate the relationships between nurses' use of research and their expectations of themselves, how they perceived their employers' expectations and organizational support for research utilization. The study compared the levels and relationships between these research predictor and outcome variables for groups of randomly selected diploma and baccalaureate prepared nurses working in hospitals of different sizes. In this final chapter, the study is summarized and the conclusions are presented. The implications for nursing practice, education and research are also presented.

Summary of the Research Project

A review of the literature revealed that previous studies had focused on the influence of the characteristics of individual nurses on the use of specific research-based practices (Brett, 1987; Coyle & Sokop, 1990; Ketefian, 1975; Kirchoff, 1980; Linde, 1989, Winter, 1990) and on the factors influencing dissemination, communication and use of findings (Champion & Leach, 1989; Crane, 1989; Funk, Champagne, Wiese & Tornquist, 1991b). Most investigations of the influence of organizational factors on the use of research were limited to secondary consideration within studies that focused on the characteristics of individual nurses (Brett, 1986; Champion & Leach, 1989; Coyle & Sokop, 1990; Crane, 1989; Funk et al., 1991b; Kirchoff, 1982; Linde, 1989). The organizational characteristics of hospital size

(Brett, 1987; Kirchoff, 1980) and research support mechanisms (Brett, 1989; Crane, 1989) were studied, but results were inconclusive. Other studies (Champion & Leach, 1989; Coyle & Sokop, 1990; Funk et al., 1991b; Linde, 1989) each considered different organizational characteristics, and thus their findings were not confirmed. The only organizational characteristic which was consistently shown to influence the use of research in practice was the perception of unit policy (Brett, 1986; Coyle & Sokop, 1990; Kirchoff, 1982). These researchers found a relationship between the perception that a policy existed regarding a specific practice and the use of that practice, regardless of whether there was an actual policy in existence.

More recently, organizational infrastructures and expectations for research have been described from the perspective of key individuals responsible for research activities in health care organizations and schools of nursing (Clarke, 1992; Clarke & Joachim, 1993) and from the perspective of staff nurses (Alcock et al., 1990). However, no research has been reported regarding the influence of organizational support or expectations on research-based practice. The purpose of this study was to investigate the organizational support and expectations for research and their influence on the use of research findings in nursing practice from the perspective of the staff nurse.

Crane's (1989) conceptual framework guided this study to focus on the influence of the organizational context, organizational change factors, individual characteristics, and individual change factors on research utilization outcomes. The contextual variables considered were hospital size and research-related infrastructures. The organizational change factors included the nursing department's value for research, the expectations for research-based practice

perceived to be held by key nursing personnel, and the organization's research climate. The individual characteristics included demographics and the nurses' education and research experience. Finally, individual change factors included the nurses' own value for research, interest in research and expectations to use research in practice. This researcher viewed these variables as predictors of research utilization outcomes. The research outcomes considered were the nurses' views of their general use of research and their use of ten specific findings identified in earlier studies (Brett, 1987; Coyle & Sokop, 1990).

This descriptive correlational survey was conducted using a stratified random sample of staff nurses working in British Columbia. The sample was stratified by educational level (diploma and baccalaureate) and by district to obtain responses from nurses working in hospitals of different sizes. Four hundred and fifty (450) nurses were surveyed by mail. All participants completed the Research Use in Nursing Practice instrument modified from Clarke (1991). Consent to participate was assumed by the nurses returning the completed survey. Descriptive and parametric statistics were used to analyze the data.

Responses were obtained from 183 staff nurses (42%) who worked in medical-surgical and critical care areas of hospitals of different sizes in British Columbia. The stratified sampling resulted in 45% diploma educated nurses and 54% baccalaureate educated nurses. The sampling strategy also resulted in representation from hospitals of different sizes which were categorized as small (<250 beds), medium (250-499 beds) and large (>500 beds). The representation from educational levels and hospital sizes yielded subgroups that were sufficiently similar in size to permit comparisons between groups and the use of analysis of variance.

The sample was similar to the population of nurses in B.C. in terms of gender, but was purposefully stratified to over-represent baccalaureate nurses and to limit the study to nurses working in medical-surgical or critical care settings. The sample was also more representative of nurses working part-time than of the population of staff nurses working in B.C. acute care hospitals. The sample was younger than the overall population of nurses in B.C., but was likely similar in age to nurses currently employed, especially those employed in acute care hospitals. While the response rate (42%) was adequate for a mail survey, the response differed by educational level. It was not known how the non-respondents differed from respondents. This posed the greatest limitation for the study.

The nurses in the sample had very positive attitudes toward research and had high expectations of themselves to use research in practice. The nurses had high value for research (mean=20.3; SD=2.99; possible range=6-24), high but varied interest levels (mean=30.7, SD=5.9; possible range=10-40) and high expectations of themselves to use research (mean=18.2; SD=3.6; possible range=6-24). There were no differences between educational groups with regard to interest and expectations, but the baccalaureate nurses held a significantly higher value for research. There was also a difference in research-related experience, with the baccalaureate nurses having significantly more experience than diploma nurses. Overall, the nurses had little research experience (mean of 5.8 experiences per nurse; SD=3.3) and most of the difference was due to courses taken by baccalaureate nurses.

Despite little research experience, the nurses' values for research, interests in research and expectations of self for using research were high in this sample regardless of educational level and hospital size. Although Alcock et al. (1990) found greater differences between

educational levels, the findings regarding individual factors in the current study were otherwise remarkably similar to previous research (Clarke, 1992; Clarke & Joachim, 1993; MacDougall & Hargis, 1989).

The nurses reported moderate levels of general use of research (mean 22.7; SD=4.91; possible range 10-40) and of use of specific findings (average of 77% use at least "sometimes") that were comparable to or better than previous findings (eg. Brett, 1987; Coyle & Sokop, 1990; Winter, 1992) but difficult to evaluate in terms of adequacy. As with previous studies (Brett, 1987; Crane, 1989; Coyle & Sokop, 1990; Ketefian, 1975; Miller and Messenger, 1978; Winter, 1990) there were no differences in research utilization outcomes between educational levels and no differences were found between nurses from hospitals of different sizes.

General use of research was correlated with all of the nurses' individual characteristics and change factors ($r=0.37-0.51$) but was not correlated with any of the organizational characteristics or change factors. In contrast, the use of specific findings had significant low positive correlations with the organizational change factor of research climate ($r=0.33$) and the number of research-related infrastructures (0.31), but was not correlated with any of the individual characteristics or change factors. There was a low significant correlation between the general use of research and use of specific findings ($r=0.38$). These findings were interpreted as indicating that general use did not measure the same behaviour as the use of specific findings. Nurses' opinions regarding their general use of research may be useful, or may simply be another estimate of attitude toward research rather than an estimate of research-related behaviour.

The nurses' opinions of their organizations varied considerably with organizational size, with the support and expectations for research utilization generally increasing with hospital size. The value for research that the staff nurses believed was held by the nursing department was reasonably high (mean=19.5; SD=3.3; possible range 6-24), but not as high as the nurses' own value for research on the same scale (mean=20.3). The value for research was significantly different by hospital size, with value scores increasing from small to medium hospitals and from medium to large hospitals. This contrasted with the nurses' own value for research where there were no differences between hospital sizes.

The staff nurses reported that the head nurse and director expectations to use research were fairly high (mean=17.7 and 17.8), but not as high as the nurses' own expectations (mean 18.2). The perceptions of nursing director expectations reported by the staff nurses were lower than, but similar in distribution and order of importance, to those reported by key individuals in hospital settings (Clarke, 1992). The nurses' own expectations correlated with their perceived head nurses' expectations, but not with the directors' expectations. The reported organizational expectations were lowest in small hospitals and highest in large hospitals, with the perception of expectations held by head nurses being influenced by the nurses' educational level.

The research climate was generally reported as low (mean=25.9, SD=6.8, possible range=11-44) and the number of infrastructures reported was low (mean=7.2 infrastructures per organization). Opinions of the research climate were consistent with the findings of other studies by Alcock et al. (1990), Clarke (1992) and Clarke and Joachim (1992). The research climate and infrastructures were lowest in small hospitals and highest in large hospitals.

Organizational climate and infrastructures seemed to be the strongest factors influencing the use of specific findings. This finding is congruent with earlier findings (Brett, 1986; Coyle & Sokop, 1990; Kirchoff, 1982) that perceptions of unit policy were influential on practice. As with the other organizational factors, the climate and infrastructure were correlated with all of the organizational characteristics ($r=0.49-0.56$ and $r=0.29-0.56$, respectively). In addition, both the climate and infrastructures were inter-correlated ($r=0.63$) and correlated with the research utilization outcome of use of specific findings ($r=0.33$ and 0.31 , respectively). However, although these organizational factors varied by hospital size and correlated with the use of specific findings, the use of specific findings did not vary by hospital size. Whereas Crane thought that organizational factors overwhelmed individual factors, the findings of the current study were interpreted as suggesting that nurses' individual characteristics mediate the influence of organizational factors.

The relationships between organizational and individual factors and research utilization outcomes were as predicted by Crane's (1989) conceptual framework. The individual change factors were inter-related ($r=0.46-0.60$) and correlated with the general use of research as reported by the nurses ($r=0.41-0.51$). The organizational change factors were also inter-related ($r=0.47-0.67$) and climate correlated with the use of specific findings. The organizational factors were not related to individual factors, except for the correlation between the nurses' own expectations to use research and the perceived head nurses' expectations, and the correlation between research experience and reported organizational infrastructures. The use of specific findings was only related to organizational factors, whereas the second measure of research utilization (general use of research) was only related to individual factors. The

two measures of research utilization outcomes were also correlated. These findings were interpreted as providing support for Cranes' conceptual framework.

The major factors limiting the study were methodological concerns with the survey instrument, the fact that organizational factors were measured from the perspective of the staff nurse and the low response rate. The internal validity of the study was limited by the fact that the organizational characteristics and change factors were reported from the perspective of the staff nurse. However, this can be viewed as a strength in that perceptions of organizational supports and expectations are likely to be more influential on research-related behaviour than the presence of supports or expectations as perceived by others. Furthermore, comparison with the work of Clarke (1992) reveals that the perceptions of the staff nurses were reasonably similar to those of key individuals in hospitals.

The generalizability of this study is limited by the potential differences between respondents and non-respondents. The non-respondents may have been significantly different than respondents in attitudes and expectations toward research and in levels of research use. However, the random selection, reasonable sample size and similarity of the sample to the population of staff nurses makes it reasonable to generalize the patterns of relationships observed in the study. The random selection makes it reasonable to generalize to staff nurses working in medical surgical or critical care areas of hospitals in B.C. Given the similarity of health care systems in Canada, it is also reasonable to generalize to other provinces. Because the sample was stratified, it is also reasonable to generalize to both baccalaureate and diploma educated nurses. Therefore, in the following section, conclusions which arise from this study are presented.

Conclusions

Based on the limitations, the following conclusions seem reasonable. The first set of conclusions that can be reached from this study pertain to the individual nurses' characteristics: their value for, interest in, experience with and expectations for using research. Nurses' interests in research and expectations of themselves to know and use research findings seem to be similar regardless of educational level or hospital size. Nurses are especially interested in knowing research results relevant to their area of practice, finding answers to specific nursing problems and using research results to change practice. Nurses expect themselves to use research, especially to critically question practice and to apply findings to practice. Nurses who have baccalaureate education seem to hold higher value for research and have more research experience than nurses with diploma education.

A second set of conclusions can be reached regarding the influence of individual factors on the use of research in practice. Nurses' values for, interests in, experiences with and expectations to use research seem to influence nurses' perceived general use of research. These characteristics do not seem to directly influence the use of specific findings, but may mediate the influence of the organization on the use of specific findings. Educational level does not appear to make a significant difference to the levels of general use of research or the use of specific findings.

This study also permits conclusions regarding nurses' perceptions of organizational change factors. Nurses perceive the organizational climate and support for research to be low, especially in small hospitals. However, nurses perceive the organizational expectations for the use of research to be fairly high but this varies with hospital size and lower than nurses'

expectations of themselves.

Conclusions regarding the impact of the organizational context and change factors are not easily drawn. While organizational size does not seem to influence nurses' individual characteristics or use of research, organizational supports and expectations are higher in larger hospitals. Organizational climate and support do not appear to be related to general use of research, but are related to the use of specific findings. These organizational variables were the only factors which correlated with the use of specific findings. The results suggest that organizational climate and support are the strongest factors influencing the use of specific findings.

Conclusions regarding research utilization outcomes are also difficult to reach. Nurses' opinions of their general use of research appear to be related to the values, interests, experiences and expectations they hold regarding research. Nurses' use of specific findings are related to the presence of positive organizational factors. Neither general use nor use of specific findings were as high as would be ideal for a profession which aspires to be research-based. The findings suggest implications for the promotion of research-based nursing practice.

Implications for Nursing Theory, Practice and Education

This study builds upon earlier research which has shown that nursing practice is not predominantly research-based. However, this study reveals that both diploma educated and baccalaureate educated nurses value, are interested in, and expect themselves to use research in practice. This study also illustrates that the organizational context in which nurses practice is influential. Theory, practice and education could be enhanced by the understandings offered

by this study.

First, theory about research-based practice should be based on a more complex understanding of research, practice, and organizations. Nurses from education, research, and practice need to understand that the factors influencing research-based practice are not limited to the characteristics of the individual nurse. This study has demonstrated that organizational influences need to be considered and modified to enhance research-based practice. Therefore, research-based practice must be thought of as a complex, multi-factorial situation that is influenced by the organizational practice setting as well as by the individual practitioner. The conceptual framework used in this study could be used as a basis for understanding practice and for educating nurses as well as for guiding future research. In addition to considering the generation, communication and evaluation of research findings, theories of research utilization need to focus on the implementation of research findings in practice.

Second, nurses need to be educated to enhance the use of research in practice. The fact that education has not been shown to have a significant impact on research-based practice should not be interpreted as meaning that research-related education is not valuable. It may be that the amount of research education that nurses receive is insufficient to have an impact or that the methods of teaching and/or the focus of research education have not been effective. It could also be that research utilization is not or has not been taught (H. Clarke, personal communication, April 6, 1994). It may also be that organizational factors limit the impact of the individual nurse and his or her education. However, the findings that nurses are especially interested in research activities that are directly related to their practice and specific practice areas suggest that an integrated approach to teaching research (in addition to or rather

than the separate course approach) would likely be beneficial. These findings also support recent emphasis on research utilization in baccalaureate education. The findings further suggest that nursing education at both diploma and baccalaureate levels should build practice-related research activities into curriculum. For example, the research related to basic nursing interventions should be introduced to beginning level students. The findings also suggest that more emphasis on research utilization in graduate programs is warranted. In introductory nursing courses and throughout their education, nurses should be required to evaluate the findings from research to guide their practice. As noted by Akinsanya (1994), research should be brought to the centre of basic nursing education.

Third, practice environments need to promote research-based practice. As argued by Spence (1994), changes in education are unlikely to have an impact unless there are changes in practice organizations. The findings of this study illustrate that nurses are interested in research activities that are directly related to their practice. This suggests that expectations for research-based practice could be built formally into clinical practice requirements through job descriptions and performance appraisal systems, and that research activities directly related to practice would be expectations that are acceptable to staff nurses. Additional supports, such as in-service education or consultative services, in the environment could target enhancing research-based practice.

The low perceptions of climate and support for research could be enhanced, especially in smaller hospitals. Although different supports for research in different sizes of hospitals would be reasonable, hospital administrators could evaluate what their expectations are and how their expectations will be supported. If a hospital is committed to research-based nursing

practice, the extent of that commitment should be reflected in the communication of those expectations and the support available.

The variation and discrepancies between organizational expectations and nurses' expectations for research use suggest that organizations could make expectations explicit and communicate expectations clearly. The frequency with which the nurses did not know what research supports were available suggests that organizations could focus on communicating the available supports to staff nurses.

Implications for Further Research

The findings of this study suggest implications regarding instrumentation, conceptual frameworks and methods to be used in further studies of research utilization. The findings also suggest further research that needs to be done.

In terms of instrumentation, the results suggest that measuring general use of research provides different information than that obtained by measuring the use of specific findings. Although general use of research may only be another measure of the nurse's attitude toward research, this suggests that the measurement of research-based nursing practice should not be limited to the implementation of specific findings. The scale measuring general use of research should be further developed and refined.

The high percentage of nurses who found the specific research findings "not applicable" to their practice indicates that methods of measuring research utilization must be more current and specific to the nurses area of practice. Research findings in more specific areas of practice should be reviewed to identify research that is ready for implementation. This would provide a better measurement of research utilization outcomes. The current study used

specific findings that were considered to be clearly appropriate for implementation as a measure of research use. Further work also needs to be done to measure the use of research where findings are not clear or are ambiguous. Research needs to explore how nurses can and do incorporate research findings in making decisions about nursing practice. Finally, studies to date have focused on reported use of research, but have not explored the relationship between these reports and actual behaviour. Methods of measuring the actual implementation of research findings in practice must be sought. Triangulation through multiple data collection methods, such as observation and interviews, would be useful.

Crane's conceptual model guided the study in a useful and productive manner. The results support the framework and suggest that further work using it would be valuable. The model could now be tested using techniques such as LISREL. The data obtained in this study may be useful for such testing.

The survey approach used in this study prevented follow-up with the nurses to clarify and understand responses to questions and to explore the organizational context in which the nurses practice. For example, the influence of different levels of congruence between nurses' expectations and their perceptions of employer expectations or between their own expectations and their use of research could not be explored. The survey approach also prevented identification of factors influencing the use of research utilization from the perspective of the nurse. Further study using qualitative approaches would allow a deeper understanding of the complex problem of factors influencing research-based practice.

Study of nurses' value for, interest in, and expectations to use research should be replicated with other samples. The impact of these characteristics needs further study to

identify why such high value, interest, and expectations do not result in research-based practice. The results of this study suggest that further exploration of organizational factors would be valuable and might help to explain differences between nurses' individual characteristics and levels of research-based practice. Further study of the impact of organizational climate, support and expectations is required. These variables should be measured from the nurses' and employers' perspectives simultaneously and measurements of congruence between organizational and staff nurse perspectives should be obtained. In addition, similar studies should be completed in a variety of contexts, including other provinces, states or countries.

This study supports the conclusion of earlier work that educational level does not influence research use. This surprising and interesting conclusion warrants investigation to determine why the additional research experience and education about research did not result in increased research use in practice. Further study to compare specific approaches to research education are needed. The impact of courses focusing on research utilization and models of integrated research education should be evaluated.

The strong support for research activities that are directly related to practice implies that nursing research should continue to strive toward addressing research questions which are relevant to practice and which answer specific practice problems.

Some discrepancy between nurses' expectations of themselves, organizational expectations and the use of research has been shown. However, further study is required to understand this complex relationship. The responses showed variation in the congruence between the expectations of the nurse and key individuals in the organization. However, the

survey approach prevented follow-up with the nurses to understand the influence of different levels of congruence. The survey approach also prevented identification of factors influencing the use of research utilization from the perspective of the nurse. Further study using qualitative approaches would allow a deeper understanding of the complex problem of promoting research-based practice.

This study focused on the relationship between organizational expectations and support for the use of research in nursing practice. While expectations were not shown to directly affect research utilization, organizational infrastructure and climate were found to be influential. The conceptual framework directed the study to consider the problem of research-based practice within an organizational context, but only examined that context in a limited fashion. Lomas (1993) suggests that the use of research findings must consider the practitioner as embedded in "a powerful network of influences" that include influences of the economic environment, the media and other professionals (p. 10). Further study of research-based practice should consider nursing practice within a broader context and should examine the control of nursing practice within that broader context. Specifically, the influence of the economic context of practice and the influence of physicians should be examined. Finally, the question of who controls nursing practice should be addressed. Nurses are only able to implement the findings of nursing research to the extent that they have control over their practice. Ultimately, nursing care of clients can only be improved through application of knowledge generated and refined through research.

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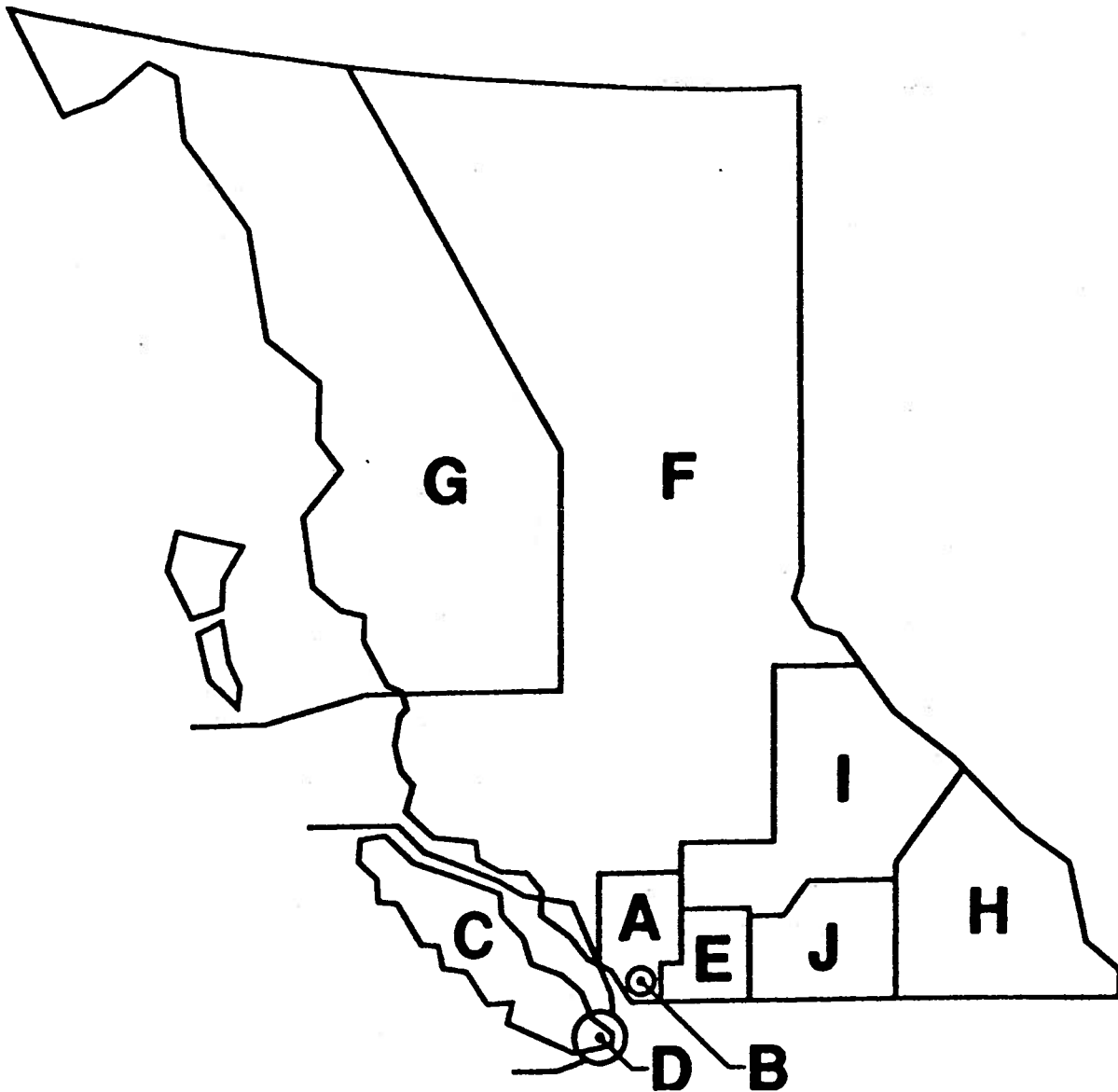
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Appendix A:
R.N.A.B.C. Electoral District Structure

RNABC ELECTORAL DISTRICT STRUCTURE

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A - Mainland-Coastal District
Chapters: North Shore, Sunshine Coast, Richmond/Delta

B - Vancouver Metropolitan District
Chapters: Vancouver Metropolitan

C - North Vancouver Island, Powell River & Gulf Islands District
Chapters: Campbell River, Comox Valley, Duncan, Gulf Islands, Long Beach, Mt. Arrowsmith, Nanaimo, North Island, Port Alberni, Powell River

D - Greater Victoria District
Chapters: Greater Victoria

E - Fraser Valley District
Chapters: Central Fraser Valley, Fraser-Cheam, Maple Ridge-Pitt Meadows, Mission, New Westminster, South Fraser

F - Northeast District
Chapters: Bella Coola Valley, Central Cariboo, Chinook, Fort Nelson, Misinchinka, Nechako Valley, North Cariboo, North Peace, Prince George, South Cariboo, South Peace, Stuart lake

G - Northwest District
Chapters: Houston, Kitmano, Omineca, Prince Rupert, Queen Charlotte Islands, Rocher, Smithers, Terrace

H - Kootenays District
Chapters: Castlegar, Cranbrook, Creston, Fernie, Golden & District, Invermere & District, Kimberley & District, Nelson, Trail

I - Thompson-Columbia District
Chapters: Kamloops, Nicola Valley, North Thompson, Revelstoke & District, Salmon Arm, Lillooet Area

J - Okanagan District
Chapters: Kelowna, Penticton, Spallumcheen, South Okanagan, Summerland, Vernon

Appendix B
Research Utilization in Nursing Practice Questionnaire

Research Use in Nursing Practice

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August, 1993

Research Use in Nursing Practice

This survey asks questions about the value of using research in nursing practice, support for using research and use of research findings in practice. Please answer each question as completely as possible. Your responses are important to understanding the factors that influence the use of research in nursing practice.

1. Perceived value of research in nursing

On a scale of 1-4, indicate the response that reflects your own values and the response that reflects your understanding of the philosophy, mission statement, goals or objectives of your nursing department/division. Please put the appropriate number in the boxes on the right.

1 = strongly disagree
2 = disagree
3 = agree
4 = strongly agree

	OWN VALUES	NURSING DEPT. VALUES
1. Research based knowledge assists the nurse to improve the effectiveness of nursing.	<input type="text"/>	<input type="text"/>
2. Research enhances the profession's accountability to the public.	<input type="text"/>	<input type="text"/>
3. Research findings provide "the facts" needed to validate clinical practice decisions.	<input type="text"/>	<input type="text"/>
4. The research process is essential for creating innovative, scientific nursing interventions.	<input type="text"/>	<input type="text"/>
5. Research enhances nursing's effectiveness in responding to new developments affecting health.	<input type="text"/>	<input type="text"/>
6. Research findings enable nurses to use scarce health care resources more efficiently.	<input type="text"/>	<input type="text"/>

2. Perceived Role in Research

On a scale of 1-4, please indicate the response that best reflects the research activities *you expect of yourself* and those activities that *are expected of you by others*. Please put the appropriate number in the boxes under the correct columns on the right. If there is no clinical instructor or clinical nurse specialist, please put "N/A" (not applicable) in the appropriate box.

1 = strongly disagree
2 = disagree
3 = agree
4 = strongly agree

Expectations of:

Self Head Clinical C.N.S. Nursing
Nurse Instruct. Director

1. critically question effectiveness of daily nursing practice.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
2. promote a climate that supports my colleague's research endeavours.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
3. be involved in collecting data for nursing research studies.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
4. be involved in collecting data for non-nursing research studies.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
5. conduct research studies.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
6. apply research findings to clinical practice.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

3. Perceived research climate in your organization.

Please indicate that which best describes the climate of inquiry in your organization.

1 = strongly disagree
2 = disagree
3 = agree
4 = strongly agree

In my organization:

1. nurses are encouraged to question their nursing practices. ☐

2. nurses are encouraged to conduct research studies to develop more effective methods of practice. ☐

3. nurses are encouraged to utilize research findings to develop more effective methods of practice. ☐

4. there are strategies (eg. committees, plans, people) specific to support research-related activities. ☐

5. other staff nurses are interested in research related activities. ☐

6. physicians support nursing research. ☐

7. other disciplines are interested in research collaboration. ☐

8. nursing professors are available to act as research advisors, consultants or collaborators. ☐

9. nursing professors conduct research studies. ☐

10. students conduct research studies. ☐

11. nurses who participate in the research process receive recognition for their involvement. ☐

4. Your interest in research

For each statement, please indicate the response that best describes your interest in NURSING research-related activities.

1 = strongly disagree
2 = disagree
3 = agree
4 = strongly agree

I am interested in:

1. finding answers to specific nursing problems. ☐

2. reading research studies. ☐

3. discussing research studies. ☐

4. participating in research projects of others. ☐

5. knowing the results of research projects conducted in my organization. ☐

6. knowing the results of research projects conducted in my area of practice. ☐

7. using the results of research to change practice. ☐

8. determining what differences research-based nursing practice makes. ☐

9. conducting research as part of a work assignment. ☐

10. conducting research even if it is not part of a work assignment. ☐

5. Your research experience

For each statement, please indicate whether or not you have done any of the following:

Please check one only (✓)

YES NO

- | | | |
|--|--------------------------|--------------------------|
| 1. taken a course in research methods. | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. taken a course in statistics. | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. completed questionnaires for a research project. | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. conducted interviews for a research project. | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. collected specimens for a research project. | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. been a principal investigator of a research project. | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. been a co-investigator of a research project. | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. been a research assistant. | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. assisted with the writing of a grant proposal. | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. written a grant proposal. | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. received funds from my organization to conduct research. | <input type="checkbox"/> | <input type="checkbox"/> |

5. Your research experience (continued)

For each statement, please indicate whether or not you have done any of the following:

Please check one only (✓)

YES NO

- | | | |
|--|--------------------------|--------------------------|
| 12. received funds from other sources to conduct research. | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. attended conferences where research studies were presented. | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. attended conferences where research findings were included in presentations. | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. published research results. | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. presented research results. | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. changed nursing practice based on research findings. | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. evaluated the results of the changed practice. | <input type="checkbox"/> | <input type="checkbox"/> |

6. Your use of research

Please indicate the extent to which you do each of the following:

- 1 = not at all
2 = sometimes
3 = frequently
4 = always

- | | |
|--|--------------------------|
| 1. I am familiar with current research relevant to my area of nursing. | <input type="checkbox"/> |
| 2. I can identify the research basis for my common daily practices. | <input type="checkbox"/> |

- ☐
3. I critically question daily practices for effectiveness.
- ☐
4. I use research articles to support my questioning of daily practices.
- ☐
5. I can identify hospital policies/procedures that are based on current research.
- ☐
6. I can identify hospital policies or procedures that are not based on current research.
- ☐
7. I implement nursing care on the basis of current research findings.
- ☐
8. I communicate concerns about the effectiveness of practices to colleagues.
- ☐
9. I change practice based on research.
- ☐
10. I evaluate the results of changed practice.

7. Your use of specific research findings

Please indicate the extent to which you do each of the following:

- 1 = no, never
 2 = yes, sometimes
 3 = yes, always
 N/A = not available
 in my area of practice

1. Internal rotation of the femur during injection into the dorso-gluteal site, in either the prone or side-lying position, results in reduced discomfort from the injection.

Do you use this method when giving an injection into the dorsogluteal site? ☐

Please indicate the extent to which you do each of the following:

- 1 = no, never
 2 = yes, sometimes
 3 = yes, always
 N/A = not available
 in my area of practice

2. Prior to removal of a catheter which has been in a patient for at least 36 hours, the catheter is intermittently clamped and released. Bladder tone is believed to be increased, resulting in an earlier return to normal micturition patterns.

Do you use this method when caring for patients who have had a bladder catheter for at least 36 hours? ☐

3. Sensory information about what is to be felt, seen, heard, tasted and/or smelled during a diagnostic procedure has resulted in patients experiencing less distress during the procedure.

Do you provide sensory information to patients when preparing them for diagnostic procedures? ☐

4. Sensory information about what is to be felt, seen, heard, tasted and/or smelled in relation to a surgical procedure has been associated with improved patient outcomes postoperatively.

Do you provide sensory information to patients when preparing them for surgical procedures? ☐

5. Preoperative training in relaxation techniques reduces pain distress and increases comfort in post-operative patients.

Do you teach your preoperative patients relaxation techniques? ☐

6. Testing the urine of patients for glycosuria and acetone can be done with equal accuracy on either the first or second voided specimens.

Do you routinely use the first voided specimen for sugar and acetone testing?

☐

7. A formally planned and structured preoperative patient education program preceding elective surgery results in improved patient outcomes.

Do you provide a formally planned and structured preoperative education program for your elective surgery patients?

☐

8. Accurate monitoring of oral temperatures can be achieved on patients receiving oxygen therapy by using an electronic thermometer placed in the sublingual pocket.

Do you use the oral method to electronically monitor the temperature of a patient receiving oxygen therapy?

☐

9. While passive range of motion activities do not seem to be related to increased intracranial pressure, other activities are, such as changing the patient's position by rotating the head or turning the patient.

Do you use this knowledge when you provide care to your patients?

☐

10. The process of mutual goal setting (where patient and nurse collaboratively define a set of patient goals) leads to more effective goal achievement and increases patient and staff satisfaction.

Do you use mutual goal setting in your interactions with patients?

☐

8. Organizational Overview

Please indicate whether or not your organization has the following supports for nurses to be involved in research related activities.

Please check one only (✓) (Yes, No, Don't Know)

YES NO DK

My organization has:

1. a hospital mission statement with priorities for research

☐☐☐

2. an established research policy/protocol

☐☐☐

3. a research review committee.

☐☐☐

4. if yes, is there nursing representation on the committee?

☐☐☐

5. an ethics review committee.

☐☐☐

6. if yes, is there nursing representation on the committee?

☐☐☐

7. a combined research and ethics review committee.

☐☐☐

8. if yes, is there nursing representation on the committee?

☐☐☐

9. experienced researchers who can act as consultants.

☐☐☐

10. secretarial services (e.g., for submitting proposals, transcribing audiotapes).

☐☐☐

11. library search services.

☐☐☐

12. computer facilities for data processing. ☐ ☐ ☐
13. data analysis consultants. ☐ ☐ ☐
14. funding/budget for pilot, feasibility or facilitation studies ☐ ☐ ☐
15. release time for nurse involvement in research related activities. ☐ ☐ ☐

Our Nursing Department has:

16. a nursing philosophy which explicitly refers to research and nursing ☐ ☐ ☐
17. a definition of nursing research which guides the development of our nursing research program ☐ ☐ ☐
18. a separate nursing research department, division or council ☐ ☐ ☐
19. a nursing research committee as part of the organizational structure ☐ ☐ ☐
20. an informal nursing research committee or interest group ☐ ☐ ☐
21. job descriptions for nurse administrators that include research responsibilities ☐ ☐ ☐
22. job descriptions for middle management that include research responsibilities ☐ ☐ ☐
23. job descriptions for clinical instructors that include research responsibilities ☐ ☐ ☐
24. job descriptions for clinical nurse specialists that include research responsibilities ☐ ☐ ☐
25. job descriptions for staff nurses which include research responsibilities ☐ ☐ ☐

26. nurse research assistants/associates working on nursing research studies as part of the nursing department ☐ ☐ ☐

27. nurse research assistants/associates working on non-nursing research studies as part of the nursing department ☐ ☐ ☐

9. Hospital Data

The following provides information about the hospital in which you are employed:

1. In what size of hospital are you employed?

☐ < 249 beds

☐ 250-499 beds

☐ > 500 beds

2. What type of unit do you work on most of the time ?

☐ Medical

☐ Surgical

☐ Medical/Surgical

☐ Critical Care

Other (please specify) _____

10. Personal Data

The following provides information about yourself.

1. What is your age in years? _____

2. What is your gender?

Male

☐

Female

☐

3. What is your educational preparation?

Check
if earned

years
since
graduation

R.N. Diploma

☐☐

Baccalaureate degree (Nursing)

☐☐

Baccalaureate degree (Other)

☐☐

Master's degree (Nursing)

☐☐

Master's degree (other)

☐☐

4. How much do you work? Check one only, please.

Full time

☐

Part time

☐

Thank you for your participation in this survey. Your time and interest are greatly appreciated.

Colleen Varcoe

Appendix C:
Letter to Participants



School of Nursing
T. 206-2211 Westbrook Mall
Vancouver, B.C. Canada V6T 2B5
Fax: (604) 822-7466

Dear Registered Nurse

I am a student in the Master's in Nursing program at the University of British Columbia. I am writing to invite you to participate in a study investigating how nursing practice changes. In particular, this study will explore how nursing knowledge is used among nurses and how organizations can facilitate the use of research in practice. Because of the current emphasis on research in nursing and research-based practice, this study should provide valuable information regarding how an organization can facilitate practice change. The title of my project is "The Relationship of Support and Expectation for Research Utilization to Research Use in Practice".

Your name was selected from the list of nurses registered with the Registered Nurses Association of B.C. In order to preserve your anonymity, I paid the R.N.A.B.C. to select a random sample of nurses for this study, label and mail this package to you on my behalf. No person, nursing unit or institution will be identifiable in the results of the survey. In addition, all responses will be completely confidential, to be used only for the purposes of this study. I have enclosed a stamped, self-addressed envelope for your convenience in returning the questionnaire. Instructions for completing the form are included on the questionnaire.

I have also asked R.N.A.B.C. to generate and keep an extra set of mailing labels for all nurses selected for this study for a follow up letter.

The results from this survey will be used as part of my thesis. If you are interested, when the results are complete I will send you a summary of the results. For that reason, I have enclosed a separate form for you to indicate that you would like a summary of results. This form can be mailed separately or will be separated from the survey when it is received.

Since your name was selected as part of a scientific sampling technique, in order for my results to be valid, it is important that all participants complete and return the questionnaire. Could you please take some time today, or at your earliest convenience, to complete the questionnaire and return it? The questionnaire should take about 15 minutes to complete.

Your participation in this research is entirely voluntary and your response will be greatly appreciated. You have the right not to participate. Return of the questionnaire will indicate your consent to participate in the study. Please do not hesitate to contact me if you have any questions regarding this research. Questions can also be directed to the chair of my thesis committee, Dr. Ann Hilton at 822-7498.

Thankyou for your participation!

Sincerely

A handwritten signature in black ink, appearing to read 'Colleen Varcoe'.

Colleen Varcoe R.N., M.Ed.
469-8400

Appendix D:
Optional Form to Receive Summary of Results

Optional: Please complete only if you would like to receive a summary of results when available

This sheet will be separated from the questionnaire when it is received, or you may mail it separately or fax it to 469-7178.

Name _____

Address _____

Postal Code _____

Appendix E:
Correlations Between Educational Level and Hospital Size and Study Variables

Table 48

Correlation Matrix for Study Variables

	EDUC	HOSP SIZE	EXSELF	INTEREST	EXPER.	OWN VALUE	CLIMATE	INFRA.	NDEPT. VALUE	EXP. HEAD NURSE	EXP. DIRECTOR	GENERAL USE
EDUC	1.00											
HOSP SIZE	0.01	1.00										
EXSELF	0.07	-0.08	1.00									
INTEREST	0.09	-0.05	0.60***	1.00								
EXPER.	0.44***	-0.01	0.29***	0.31***	1.00							
OWN VALUE	0.17*	-0.03	0.52***	0.46***	0.14	1.00						
CLIMATE	-0.11	-0.44	0.20*	0.09	0.06	0.16	1.00					
INFRA.	0.12	0.39***	0.14	0.11	0.27***	0.05	0.63***	1.00				
NDEPT. VALUE	-0.08	0.02	0.06	0.05	-0.12	0.23**	0.49***	0.29***	1.00			
EXP. HEAD NURSE	-0.09	0.10	0.42***	0.11	-0.07	0.01	0.49***	0.30***	0.47***	1.00		
EXP. DIRECTOR	-0.02	0.26**	0.26***	0.04	-0.15	0.02	0.56***	0.35***	0.56***	0.67***	1.00	
GENERAL USE	0.03	-0.06	0.51***	0.50***	0.37***	0.41***	0.18*	0.24***	0.05	0.16	0.13	1.00
USE OF FINDINGS	-0.02	0.16*	0.25**	0.23**	0.15*	0.13	0.33***	0.31***	0.14	0.06	0.24***	0.38***

* p<0.05

** p<0.01

*** p<0.001

AGE= Nurses' age

YEARS= Years since graduation

EXSELF= Nurses' own expectations to use research

INTEREST=Nurses' interest in research

EXPER.=Nurses' research experience

OWN VALUE= Nurses' own value for research

CLIMATE=Organizational Climate

INFRA.=Organizational Infrastructures

NDEPT. VALUE=Nursing department value for research

EXP. HEAD NURSE=Head nurse expectations of staff nurse

EXP. DIRECTOR=Nursing director expectations of staff nurse

GENERAL USE=General use of research