Fall 2013

Barriers to Utilization of Nursing Research in a Magnet Designated Hospital

Sandra D. Copeland
Georgia College and State University

Barriers to Utilization of Nursing Research

in a Magnet® Designated Hospital

by

Sandra D. Copeland

A doctoral capstone project submitted in partial fulfillment

of the requirements for the degree of

DOCTOR OF NURSING PRACTICE

2013

Georgia College & State University

Milledgeville, Georgia

APPROVED BY:

Judith M. Malachowski, PhD, RN, Chair	1/15-14 Date
Jeanne Sewell, MSN, RN	1/14/14 Date
Margaret Orn, DNP, RN	12-11-13 Date

Barriers to Utilization of Nursing Research in a Magnet® Designated Hospital

Sandra D. Copeland

Georgia College & State University

Table of Contents

Abstract

Barriers to nurses' utilization of research in patient care are the epicenter of translating evidence into practice. Assessment of demographic variables such as age, service line, years of experience, and education level and their impact on nurses' perceptions of barriers to research utilization in practice details this project. No statistically significant differences exist in perceived barriers between any demographic group including certified nurses, service lines, or time since last research course. The Magnet® culture of the facility validates the low mean scores on the BARRIERS® tool. New knowledge gained from the project includes the impact of certification, assessment of time since last research course, advanced life support, and nursing as a first career on nurses perceptions of barriers to research utilization. Recommendations for further research on this topic center on delivery and retention of research content, comparison data on advanced life support versus other certifications, and qualitative analysis of findings atypical of previous studies.

Barriers to Utilization of Nursing Research in a Magnet® Designated Hospital

Background and Significance of Translational Research Project

Purpose Statement

The purpose of this project was to collect and critique data related to the barriers to utilization of nursing research perceived by registered nurses in a Magnet® facility utilizing Rogers' Diffusion of Innovations (DOI) conceptual framework.

Significance for Nurses/Nursing Care/Patients

For a quarter of a century, the nursing literature has discussed gaps in the process of conducting nursing research and utilizing this research to improve patient care or determine its implications to practice (considered translation into practice). The research also discussed the answers to why these gaps may be present. Thomson et al. (2003) cited that the majority of nurses rely on colleagues or patients as references to answer practice questions. Pravikoff et al. (2005) found that most nurses practice in accordance to what they learned in nursing school. Why is this even important to analyze? Magnet® philosophy, the Institute of Medicine, the Nursing Research Council of the Magnet® hospital, healthcare peer and regulatory climates all collectively continue to validate the need to improve bedside research utilization.

So, how are healthcare entities to determine if there is underutilization or need to improve nursing research in their organizations? Are there comparative databases or studies to compare themselves with to determine their status? How is utilization even determined? In order to ascertain if there is a documented

statistical analysis that identifies a dearth of research utilization in practice, a scoping review of the literature encompassing databases from MEDLINE/Pub Med, PsycINFO, CINAHL, EBSCO, grey literature (including thesis work, government healthcare repository sites, etc.), the Cochrane library and secondary references from primary articles were conducted. Several articles and reports identified the importance and need for nursing research in practice. However, there is a paucity of literature identifying how many hospital nurses utilize research in practice. Consequently, there is currently no data available to identify the quantitative measure of "underutilization" of nurses' use of research in practice concretely. In other words, there is no actual data to determine or define utilization or underutilization of nursing research in practice.

It has been estimated that the translation of research findings into practices averages seventeen years or more (Bemmel, 2000). It is important to analyze the barriers identified in the literature that keep research from being implemented (or translated) at the bedside. Barriers to research utilization, identified in the 1990s by Dr. Funk, and validated in subsequent literature reviews include:

- characteristics of the organization,
- lack of authority to change patient care,
- lack of time to read research,
- complexity of research reports,
- insufficient time to conduct research,
- lack of value for research in practice,
- feeling overwhelmed by the process,

- lack of knowledgeable mentors,
- lack of education about the research process,
- lack of awareness of related research,
- lack of administrative support (Funk, Champagne, Wiese, & Tornquist, 1991; Squires, Estabrooks, Gustavsson, & Wallin, 2011).

Perhaps the testimony submitted by The Joint Commission at the Robert Wood Johnson Foundation Initiative on the Future of Nursing, at the Institute of Medicine on February 23, 2010 provides some insight on the significance of addressing research utilization in nursing practice (Robert Wood Johnson Foundation, 2010). In its recommendation number eighteen of this report, The Joint Commission states:

More research is needed in the emerging areas of practice, including geriatrics, genomics, and continuum care management for chronic conditions, as well as contemporary teaching methods. Research is also needed into how to broaden the roles of nursing and to improve nursing processes to make them as efficient as possible. Importantly, knowledge gained from research needs to be quickly and effectively translated into practice (p. 22).

The report further suggests that the implementation of science research into nursing practice still lags by 14 to 17 years and that to improve patient care, there is a great need to translate scientific research into practice. This is accomplished when nurses know how to read the research, how to implement it and how to evaluate it (Robert Wood Johnson Foundation, 2010).

Utilization of research by direct-care nurses is an important common denominator in Magnet® hospitals. Identifying the barriers and specific nurse characteristics that may contribute to low numbers of direct-care nurses utilizing nursing research is essential to the successful implementation of evidence based practice and optimal patient care in Magnet® hospitals. Blegen (2012, p. 54) discussed several studies that looked at patient outcomes impacted by nurse characteristics (certification and bachelor degree nursing degree). She highlighted studies that showed decreases in fall rates, mortality in adult surgical patients, and failure to rescue (death from complications) (Blegen, 2012, p. 54).

Dr. Aiken and her team analyzed data from 564 hospitals and found that surgical patients in Magnet ® hospitals had 14% lower odds of inpatient death within 30 days and 12% lower odds of failure-to-rescue, compared with similar patients in non-Magnet hospitals (Kendall-Gallagher, Aiken, Sloane, & Cimiotti, 2011). Their study linked nursing attributes (significantly better work environments, investments in a more highly qualified and educated nursing workforce and practice settings supportive of high-quality nursing care) to lower mortality rates in Magnet® hospitals. The authors of the study suggest that the process of applying for and retaining Magnet® recognition identifies existing quality and stimulates positive organizational behavior and innovation that improve patient outcomes (Kendall-Gallagher et al., 2011).

All hospitals having Magnet® designation and those seeking Magnet® designation are required to submit data to the National Database of Nursing Quality Indicators (NDNQI). These indicators focus on priority areas of nursing

care such as prevention of falls, prevention of skin breakdown, nursing staffing, and nursing satisfaction and can serve as areas of focus for clinical research projects. As many hospitals are seeking Magnet® designation, the importance of conducting clinical research becomes a valued component of nursing practice in order to influence these nursing care indicators. The American Nurses Credentialing Center (ANCC) website also links clinical research activities to Magnet® Recognition criteria (Table 1).

Table 1

Linking clinical research activities to ANCC Magnet® Recognition criteria Retrieved from: www.nursecredentialing.org/Magnet/

Provide evidence of education and mentoring activities that have effectively engaged staff nurses in research and evidence-based practice activities
Provide evidence that nurses throughout the organization have access to the Internet, library, and/or other appropriate literature/data sources
Describe resources available to nursing staff to support participation in nursing research and nursing research utilization activities
Demonstrate how direct care nurses use available professional standards, literature, and research findings
To support control over nursing practice, independent decision making, and assertiveness/leadership in patient care management and practice
Provide examples and narratives describing nursing research projects initiated, completed, and ongoing
Provide evidence that research consultants are actively involved in shaping nursing research infrastructure, capacity, and mentorship
Provide evidence of education and mentoring activities that have effectively engaged staff nurses in research
Explain how the results of nursing research projects have been incorporated into the evidence-based practice

The new Magnet Program® Model (see appendix A) appropriately blends these concepts with Rogers' Diffusion of Innovations theory. The original 14 forces of Magnet® model were revised by the ANCC in 2007 after receiving input from stakeholders and a complex series of statistical analysis of applicant appraisal scores (American Nurses Credentialing Center, 2013). The final product of five components model reflects current research on organizational behavior and guides the transition of Magnet® principles to focus healthcare organizations on achieving optimal patient outcomes with evidence-based performance (American Nurses Credentialing Center, 2013). Additionally, the emphasis on seeking Magnet® designation from the ANCC has served to promote the use of research and evidence-based practice in the clinical setting. The significance of underutilized research at the bedside, consequently, is a problem for hospitals wishing to obtain or maintain Magnet® status. Several of the criteria for Magnet® designation directly relate to building research capacity; therefore, barriers to research (i.e. lack of time to read research, lack of awareness of related research, complexity of research reports, insufficient time to conduct research, and lack of value for research in practice) should not exist.

Project Opportunities/Feasibility

The nursing research council at the project hospital reported only four or five active nursing research projects per year for the last five years and most of them did not involve direct-care nurses. This means that only a small percentage of nurses are actively involved in conducting or disseminating nursing research in the hospital. One contributing reason could be that there are no journal clubs or

research activities involving direct-care nurses. There are biannual nursing research conferences in the hospital but attendance is usually less than 50 nurses and less than 10 who are direct-care nurses (out of 1200 direct-care nurses). Consequently, there exists a void of available research utilization opportunities within the Magnet® hospital.

The current year (2013) is the re-designation year for the Magnet® hospital to maintain their status from ANCC. This will be the third re-designation for the hospital. Less than 30% of Magnet® hospitals have managed to maintain their status through three re-designation attempts because they either withdraw from the program or file extensions to re-designate (American Nurses Credentialing Center, 2013). This makes the re-designation process for the hospital an important priority this year and gives the project a timely advantage.

Given the evidence of positive patient and nurse outcomes associated with Magnet® status, it is in the best interest of the hospital, its nurses, patients, and community to maintain its status successfully. In order to do so, the research climate must be robust. Consequently, the project identified the current state of nurses' perceived barriers to research utilization. The organization will now need to respond appropriately to reduce these barriers and increase research utilization by the direct-care nurse.

The feasibility of this project was evident in the Magnet® facility being a local facility, the researcher already having relationships to the nursing research council and administration, and the timing of a re-designation year. The costs of the project were not prohibitive and technology readily available for use.

Theoretical Framework

Much discussion has taken place in the nursing literature aimed at understanding the point at which a new knowledge or skill catches "fire" and spreads through an organization (Rogers, 2003). In fact, this idea has its origins in diffusion theory. Research on diffusion began as an attempt to understand human behavior change.

Diffusion is the process by which an innovation (in this case, nursing research) is communicated over time through a social system. The main elements include innovation, communication channels, time and the social system (Magnet® hospital). The process includes knowledge, persuasion, decision, implementation, and confirmation.

Everett M. Rogers was a social scientist in the 1960s whose research focused on human behavior and diffusion. He developed his model entitled "Diffusion of Innovation" or DOI and continued to refine it up to 1995. In 2000, *The Diffusion of Innovation* became the second-most-cited book in the social sciences (Bowen, Stanton, & Manno, 2012, p. 140-141). His research and work became widely accepted in communications and technology adoption studies, and found its way into a variety of other social studies.

Geoffrey Moore's *Crossing the Chasm* (1991 with revisions in 1999) drew from Rogers in explaining how and why technology companies succeed. Rogers was also able to relate his communications research to practical health problems, including hygiene, family planning, cancer prevention, and drunk driving. Everett Rogers' model, Diffusion of Innovations (DOI), describes this project.

Rogers describes the decision to adopt or reject the change as a five-stage process: knowledge, persuasion, decision, implementation, and confirmation. (Rogers, 1995). Individuals experience exposure to the innovation (research), gaining knowledge and understanding on how it works. They then form favorable or unfavorable attitudes towards the innovation in the persuasion stage. A decision is made by the individual to adopt or reject the innovation. In the implementation phase, the individual employs the innovation, makes a determination of its usefulness, and may seek additional information about the innovation. Finally, the process of confirmation reinforces the decision. Appendix B depicts the original and modified model used in this project.

Key Concepts

The inferred assumptions to the model are: a) diffusion is a communication process, b) uncertainty is inherent to the process of diffusion of innovation; and c) diffusion results in social change. Diffusion of Innovation seeks to explain how innovations are taken up in a population. Diffusion of Innovations offers three valuable insights into the process of social change:

- What qualities make an innovation spread successfully?
- The importance of peer-peer conversations and peer networks.
- Understanding the needs of different user segments.

These insights are validated in more than 6,000 research studies and field tests, so they are among the most reliable in the social sciences.

There are four main elements of diffusion: the innovation, communication channels, time, and the social system or organization. Rogers defines an

innovation as an idea that is perceived as new by an individual or organization (Rogers, 2003). The theory suggests that the innovation must contain the following characteristics in order to spread and adopted: relative advantage, compatibility, complexity, trialability, and observability to the individual or organization. According to Everett Rogers, these five qualities determine between 49-89% of the variation in the adoption of new products.

Relative advantage. Relative advantage is the degree to which an innovation is perceived as better than the idea it supersedes by a particular group of users, measured in terms that matter to those users, like economic advantage, social prestige, convenience, or satisfaction. The greater the perceived relative advantage of an innovation, the more rapid its rate of adoption is likely to be. There are no absolute rules for what constitutes "relative advantage." It depends on the particular perceptions and needs of the user group.

Compatibility. Compatibility with existing values and practices is the degree to which an innovation is perceived as being consistent with the values, past experiences, and needs of potential adopters. An idea that is incompatible with their values, norms or practices will not be adopted as rapidly as an innovation that is compatible.

Complexity. Simplicity and ease of use is the degree to which an innovation is perceived as difficult to understand and use. New ideas that are simpler to understand are adopted more rapidly than innovations that require the adopter to develop new skills and understandings.

Trialability. Trialability is the degree to which an innovation can be experimented with on a limited basis. A trialable innovation represents less uncertainty to the individual who is considering it.

Observability. The easier it is for individuals to see the results of an innovation, the more likely they are to adopt it. Observable results lower uncertainty, stimulate peer discussion of a new idea, and often request information about it from the adopter. This was validated in Thomson et al. (2003)'s study which cite that the majority of nurses rely on colleagues or patients as references.

Communication. Communication in Rogers's model is the process in which individuals create and share information with each other to achieve mutual understanding of the new idea. Mass media, chat rooms, email, and committees are just a few examples of communication channels. Most individuals evaluate an idea, not on evidence based practice or research, but through their peers who have already adopted the innovation as discussed previously.

Time. Time is associated with diffusion of ideas in three ways. Innovation- decision is the first process.

Innovation-Decision. It is the mental process from which an individual passes from initial knowledge of the innovation to forming an attitude about the idea, to a decision to adopt or reject the idea, and to confirmation of the decision (Rogers, 2003). This includes a five step process where knowledge (person becomes aware of the idea and how it works), persuasion (person forms positive or negative attitude), decision (person engages in activities that lead to adopting

or rejecting the idea), and confirmation (evaluation of the results from that decision) describe the processes an individual uses to process a decision.

Innovativeness. The second way that time is involved is in the innovativeness of the individual or organization. Innovativeness is the degree to which the individual is relatively earlier than others in adopting than the innovation. There are five classifications of adopters: innovators, early adopters, early majority, late majority, and laggards.

Social System. The fourth and final element in the DOI model is the social system. The social system is defined by Rogers as a set of interrelated persons or organizations that are involved in problem-solving activities to accomplish a mutual goal (Rogers, 1995). This system constitutes a boundary within which an innovation can diffuse. It develops a set of norms, stakeholders, and sacred cows for the group. Change agents or opinion (informal) leaders are needed for diffusion of a new innovation.

Literature Review of DOI Theory

A review of the literature encompassing databases from MEDLINE, CINAHL, EBSCO, and secondary references from primary articles conducted identified evidence-based studies that have used Rogers' theory of diffusion innovation. Keywords searched include diffusion of innovation, Rogers', and theory. Studies were identified that cited the theory as the conceptual model for change in protocols, programs, and even in evaluation of current information system applications.

The literature that integrates Rogers's theory for use in evidence base practice is also wide and varied. There are several studies previously mentioned that utilized the concepts of the model to frame their assessment and research on the barriers to research utilization in practice. Those studies adequately linked the context of the problem to particular points of Rogers's conceptual framework. The majority of them link their points utilizing the BARRIERS® to Research Utilization Scale developed by Funk et al., 1991 (Appendix C).

The DOI model continues to be versatile to multidisciplinary research (Gooder, 2011; Harting, Rutten, Rutten, & Kremers, 2009) including physical therapy and informatics. It has been applied to quantitative studies, such as the BARRIERS® described above, but also to patient care issues like cancer related fatigue and asthma severity scores (Jackson, 2009; Wilcox & Nursing, 2009).

DOI was the framework used by Dr. Funk to develop the BARRIERS® tool that was used in this project (Funk, 2013). This framework guided not only the tool, but also her data collection and interpretation. Consequently, the DOI and the BARRIERS® tool are key parts of this project as well.

The revised 2007 American Nurses Credentialing Center (ANCC) Magnet Recognition Program® model includes components of transformational leadership, structural empowerment, exemplary professional practice, new knowledge, innovation, and improvements, and empirical quality results (American Nurses Credentialing Center, 2013). The implications of Rogers's model components of exposure to the innovation, gaining knowledge, forming

opinions and ultimately accepting or rejecting the knowledge are very appropriately viewed in the context of a Magnet® facility.

It is easy to ascertain the significance to professional nursing practice of Rogers's theory. The previously reviewed studies using the theory outline patient care initiatives designed to deliver evidence based care and have shown positive results from their work. The theory also has significance to all Magnet® hospitals and those seeking to make changes in order to maximize production, research, reduction of adverse patient events, patient, and nurse satisfaction.

For the purposes of this project, the theory is compatible to the needs of the participants, organization and is a good fit for the tools because of its emphasis on the process of how a new concept (research/evidence based practice) is accepted or rejected by a group or organization over time. The data is constructive to determine the barriers and the perceptions of the organization to improve the utilization of nursing research and evidence based practice.

Definitions

Theoretical Definitions

(Rogers, 1995, 2003)

Characteristics of the adopter. The nurse's research values, skills, and awareness.

- The nurse does not see the value of research for practice.
- The nurse sees little benefit for self.
- The nurse is unwilling to change/try new ideas.
- There is not a documented need to change practice.

• The nurse feels the benefits of changing practice will be minimal.

• The nurse does not feel capable of evaluating the quality of the research.

• The nurse is isolated from knowledgeable colleagues with whom to discuss the research.

• The nurse is unaware of the research.

Characteristics of the organization. Setting, BARRIERS® and limitations.

- Administration will not allow implementation.
- Physicians will not cooperate with implementation.
- There is insufficient time on the job to implement new ideas.
- Other staff are not supportive of implementation.
- The facilities are inadequate for implementation.
- The nurse does not feel she/he has enough authority to change patient care procedures.
- The nurse does not have time to read research.
- The nurse feels results are not generalizable to own setting.

Characteristics of the innovation. Qualities of the research.

- The research has methodological inadequacies
- The conclusions drawn from the research are not justified.
- The research has not been replicated.
- The literature reports conflicting results.
- The nurse is uncertain whether to believe the results of the research.
- Research reports/articles are not published fast enough.

Characteristics of the communication. Presentation and accessibility of the research.

- Implications for practice are not made clear.
- Research reports/articles are not readily available.
- The research is not reported clearly and readably.
- Statistical analyses are not understandable.
- The relevant literature is not compiled in one place.
- The research is not relevant to the nurse's practice.

There are many terms currently used in healthcare and the profession of nursing that attempt to describe research, best practice, and quality outcomes. Sometimes terms are used synonymously although they do not have the same meaning. This creates confusion and potential bias in studying barriers to research utilization in practice. Nurses should not confuse evidence- based practice (EBP) with research utilization. While research utilization (RU) overlaps with some of the same philosophic threadworks of EBP, EBP goes beyond just the rigorous scientific research steps. The definition **of evidence-based practice** for this project was

A total process beginning with knowing what clinical questions to ask, how to find the best practice, and how to critically appraise the evidence for validity and applicability to the particular care situation. A clinician with expertise in considering the patient's unique values and needs must apply the best evidence. The final aspect of the process is evaluation of the effectiveness of care and the continual improvement of the process (DePalma, 2000).

Research utilization by comparison has been described as "a process of using findings from conducting research to guide practice" or "the process by which scientifically produced knowledge is transferred to practice (Barnsteiner & Prevost, 2002). In order to maintain continuity of concepts, the definition of research utilization for this study was: the review and critique of scientific research, and then the application of the findings to clinical practice (Estabrooks, 1998). These definitions illustrate the importance of not only incorporating multiple sources of evidence, but also including consideration of the context where the decision making is taking place, such as the availability of high-quality services and equipment, as well as the patient's preferences and circumstances (Cullum, 2008).

Outcomes are defined in the ANCC Magnet® Model Components and Sources of Evidence (2008) and in this project as quantitative and qualitative evidence directly related or correlated to the impact on the patient, nursing workforce, and organization (American Nurses Credentialing Center, 2008, p. 42). Outcomes, therefore, are measurable and can include reporting from various levels of data. For example, it is reportable from an individual nursing unit, department, population, or at an organization or system level. Examples of outcomes that are reportable and measurable include falls, patient satisfaction, patient safety, hospital acquired infections, mortality rates, and many other categories.

Nursing research. A systematic search for knowledge about issues of importance to the nursing profession (American Nurses Credentialing Center, 2008, p. 42).

Operational Definitions

Magnet® definitions. (American Nurses Credentialing Center, 2008)

Certification. A process by which a non-governmental agency or association certifies that an individual licensed to practice a profession (nursing) has met certain pre-determined standards specified by that profession for specialty practice (American Nurses Credentialing Center, 2008, p. 38). Its purpose is to ensure various publics that an individual has mastered a body of knowledge and acquired skills in a particular specialty. The certification rates of the participants were measured on the demographics portion of the electronic survey in which the respondents were asked if they were held any national certifications and if so, to list them.

Chief nursing officer. The nurse who participates in the management of healthcare services delivery by directing and coordinating the work of nursing and other personnel and representing nursing services (American Nurses Credentialing Center, 2008, p. 38).

Nurse. Generically, the registered professional nurse (American Nurses Credentialing Center, 2008, p. 41). This variable is measured on the demographic section of the electronic survey as registered nurse with a yes or no response. A "no" response on this question automatically ended the survey since it was a qualifying question for inclusion.

Direct- care nurse. The nurse providing care directly to patients at least 50% of the time, excluding the nurse manager and nurse executive (American Nurses Credentialing Center, 2008, p. 39). This variable was measured on the demographic portion of the electronic survey as a "yes "or "no" response. A "no" response on this question automatically ended the survey since it was a qualifying question for inclusion.

Magnet® designated hospital. A 637-bed full service, acute care Magnet ® hospital that serves an estimated population of 750,000 residents in central and south Georgia and is the second largest hospital in the state of Georgia (XXXX, 2013).

Barriers. A circumstance or obstacle that prevents communication or that keeps people or things apart. The BARRIERS® tool the participants answered on the electronic survey measured these.

BARRIERS®.A tool created by Funk used to assess barriers to research utilization (Funk et al., 1991). This tool measured the barriers identified by the nurses on the electronic survey.

Gender. Respondents were indicated gender on the demographic section of the electronic survey with response options of male, female, or other.

Age. Respondents indicated age on the demographic section of the electronic survey with a blank type- in response choice for years.

Employment status. Respondents were asked to indicate employment status on the demographic section of the electronic survey with response choices as full-time (36 or more hours per week), part-time (35 or less hours per week), or

contract/flex. The institutional guidelines of what constitutes full and part time for payroll purposes were the guidelines for this question in order to provide consistency and clarity for respondents.

Highest education level completed. Respondents indicated the highest education level completed (not specifically highest nursing education completed) on the demographic section of the electronic survey with response choices of diploma, ASN, bachelor's degree, master's degree, and DNP/PhD/EdD.

Nursing as first career. Respondents were asked to indicate nursing as their first career on the demographic section of the electronic survey with "yes" and "no" response options.

Years of experience as registered nurse. Respondents were indicated years of experience as a registered nurse on the demographic section of the electronic survey with a type-in response choice for number of years.

Time since last research collegiate course. Respondents indicated time since last research collegiate course on the demographic section of the electronic survey with a type-in response choice for number of years. Caveat instructions were to not include in services on research when answering this question and if no research course ever taken to indicate "zero" years.

Service line. Respondents indicated the service line the respondent felt most described their work area on the demographic section of the electronic survey with a type-in response choice for the service line identified.

Project Description

Review of Literature with Synthesis

A scoping review of the literature encompassing databases from MEDLINE/Pub Med, PsycINFO, CINAHL, EBSCO, grey literature, the Cochrane library and secondary references from primary articles was conducted to identify studies that critique this topic. Keywords searched include Magnet® hospitals, years since last research course, and BARRIERS® scores without research course, retention of research after research course, meta- analysis and synthesis of research utilization. In order to refine the search, the terms "nursing" or "nurse" were excluded. The data utilized from the searches included studies using the BARRIERS® scale and Magnet® hospitals. Studies were synthesizing analysis of research utilization and retention after exposure to a research course and the impacts of research utilization based on educational determinants (Table 2).

Table 2

Articles Addressing Research Utilization

Author	Title/Reference	Key Findings	Strength of Evidence
Rodgers, S.	A study of the utilization of research in practice and the influence of education. *Nurse Education Today, 20, 279-287. (2000)*	Nurses who read at least 1 journal regularly or had attended research courses also had higher levels of research utilization.	1++ to 1+
McCleary, and Brown, T.	Association between nurses' education about research and their research use. Nurse Education Today,23, 556-565.(2003)	Having completed a course about how to read and use research was not associated with self-reported research utilization.	2+ to 2-
Hazel, R., and Joyce, A.	The long term effects of undertaking a research course on clinical practice. *Nurse Education in Practice, 4, 12-19.(2004)*	Skills developed in the course transferred well into real life practice at least a year after completion of the course.	2+ to 2-
Harrison, L. L., Lowery, B., and Bailey, P.	*Journal of Advanced Nursing, 16, 807-812.*	Sharp decline in knowledge scores between completion of research course and end of program, suggesting they	2-

		do not retain enough to be able to critique and utilize research findings after graduation.	
McCloskey, D. J.	Nurses perceptions of research utilization in a corporate health care system. *Journal of* Nursing *Scholarship, 40, 39-45.*	BSN nurses scored higher than AD nurses in use of research.	2-

*Levels of Evidence were scored using the Scottish Intercollegiate Guidelines that were retrieved from www.sign.ac.uk/guidelines/fulltext/50/index.html

Over 30 research studies have been conducted in the last two decades to identify barriers to nursing research utilization (Atkinson, Turkel, & Cashy, 2008; Barta, 1995; Berggren, 1996; J. Boström & Suter, 1993; Camiletti & Huffman, 1998; Carroll et al., 1997; Egerod & Hansen, 2005; Estabrooks, 1999; Estabrooks, Floyd, Scott-Findlay, O'Leary, & Gushta, 2003; Fink, Thompson, & Bonnes, 2005; Funk, Champagne, Tornquist, & Wiese, 1995; Funk et al., 1991; K. Gerrish & Clayton, 2004; Glacken & Chaney, 2004; Hutchinson & Johnston, 2004; Kajermo et al., 2010; LaPierre, Ritchey, & Newhouse, 2004; McCleary & Brown, 2003; McKenna, Ashton, & Keeney, 2004; Morin et al., 1999; Olade, 2003, 2004; Omery & Williams, 1999; Parahoo & McCaughan, 2001; Pravikoff et al., 2005; Retsas, 2000; Rodgers, 2000; Rosamund et al., 2003; Walczak, McGuire, Haisfield, & Beezley, 1994; Walsh, 1997; Wells & Baggs, 1994).

Researchers have sampled nurses in a variety of settings including acute care, pediatrics, community, surgery, multiple site comparisons, Magnet® facilities, community hospitals, and academic medical centers. In addition to studies done in the United States, research locations have included Korea, Denmark, Sweden, Scotland, Ireland, the United Kingdom, Australia and other international sites.

A significant limitation in many of the studies is the lack of an explicit framework (A.-M. Boström, Kajermo, Nordström, & Wallin, 2008; Camiletti & Huffman, 1998; K. Gerrish & Clayton, 2004; Olade, 2003; Pravikoff et al., 2005; Rosamund et al., 2003; Wells & Baggs, 1994). Seven of the articles reviewed utilized Rogers's Diffusion of Innovations (Barta, 1995; Berggren, 1996; Fink et al., 2005; Funk et al., 1995; Funk et al., 1991; LaPierre et al., 2004; McCleary & Brown, 2003; Olade, 2003, 2004; Parahoo & McCaughan, 2001) . Another limitation to the studies was an inconsistent use of measurement tools (modifying the questions without rationale and mixing portions of tools and not the entire tool). Occasionally, researchers even failed to disclose the tool's reliability when utilizing a newly developed or modified tool (Camiletti & Huffman, 1998; K. Gerrish & Clayton, 2004; Olade, 2003; Rodgers, 2000; Wells & Baggs, 1994).

Despite the many studies to identify barriers to nursing research utilization, gaps in the literature remain. Smaller hospitals (defined as 200 beds or less) and Magnet® hospitals have just begun to surface in the research studies. Additionally, research has not focused on the following areas: years since last research course taken, presence of advanced life support certifications (Advanced Cardiac Life Support or Pediatric Advanced Life Support) versus national

certifications, average age of nurse in the assessments or interventions studies. Although there are no specific recommendations for the analysis of these topics, all potential avenues in the ever-changing healthcare climate are open to evaluation.

A single study was identified that attempted to measure the knowledge base of research in graduate nursing students (Oliver, 2011). The author found that students retained knowledge from their graduate research course for approximately twelve months. The implications of the findings in the Oliver study could lead to more accurate and evidence -based solutions, and assist in bridging the analysis gap. More research studies in these areas are necessary to add to the evidence in the body of literature for the gaps identified.

A longitudinal analysis conducted in Sweden studied factors that predicted the probability for research utilization among registered nurses from 2002-2010 cohorts two years after graduation (Forsman, Wallin, Gustavsson, & Rudman, 2012). Logistic regression modeling determined relationships between the research utilization two years after graduation and individual and organizational characteristics. Results from the bivariate analysis describe the statistical significance ($p < .05$) of each of the variables. Area of work (psychiatry, medical), staffing levels, and individual perceptions of work were analyzed (Forsman, Rudman, Gustavsson, Ehrenberg, & Wallin, 2012, p. 46). The male gender ($p = .002$), nurses who did not experience work as a positive challenge ($p = .000$), nurses working in psychiatric care ($p = .000$), and low student activity in undergraduate nursing classes ($p = .008$) were all predictors for low research

utilization two years after graduation. Although this study may not reflect American nursing preparation, the results highlighted in their findings certainly impact theories to improve the utilization of research after graduation and retention of content.

Squires, et al. (2011) conducted an update to previous (the 25 years prior to 2001) systematic literature reviews done on determinants of research utilization using twelve research databases and reviewed over one thousand articles (narrowed down from 42,000 titles identified during the 2001-2008 period) . The results of this second review served to validate further previous findings nurse and organizational characteristics, barriers to research utilization, and many others. Individual nurse characteristics were classified according to six categories: beliefs and attitudes, involvement in research activities, information seeking, education, professional characteristics, and socio-demographic/socio-economic characteristics (Squires et al., 2011, p. 6-7). These characteristics fit nicely into the four domains identified and studied by the BARRIERS® scale.

Oliver (2011) in a grey literature study submission evaluated the impact of prior involvement in the utilization and conduct of research on performance in a graduate nursing research course and to knowledge retention after completing a graduate nursing research course. The study used a convenience sample of masters' level nursing students with a pre-post test design. Of the sample, 84% had taken an undergraduate nursing research course. Years since taking the graduate research course ranged from 10 to greater than 15. Fifty- two percent of the sample had participated in research previously. The author found that graduate

students do increase their knowledge of nursing research after having taken a graduate nursing research course. Knowledge was retained at least 12 months after taking the course (Oliver, 2011, p. 4).

In a recent article by Bettger and Granger (2012), strategies to engage research partners to provide skills and expertise needed for a clinical inquiry project are discussed. The goal of this process is the rapid translation of new scientific evidence into practice. The authors' conclusions and the studies cited, advocate the use of clinical inquiry to increase research utilization (Bettger & Granger, 2012, p. 473). A potential solution for the barriers identified in the Bettger and Granger review of literature is now apparent.

Since the BARRIERS® scale was first published in the early 1990s, more than 30 national and international studies have been conducted using this scale (Atkinson et al., 2008, p. 2). Overall, identified barriers were consistent over time and across geographic locations, despite varying sample size, response rate, study setting, and assessment of study quality (Kajermo et al., 2010, p. 32). Earlier studies from 1997- 2005 identified organizational support, time to read research, difficulty understanding statistics, and insufficient authority to make changes as the top BARRIERS® (Fink et al., 2005; Parahoo & McCaughan, 2001; Walsh, 1997). Recent systemic reviews (see Table 3) of the BARRIERS® scale of 53 studies categorizing the BARRIERS® by the subscale and rank order (Kajermo et al., 2010, p. 32). It identifies the number of studies rating questions among the top ten of the BARRIERS scale, and gives an idea of the studies in the literature that have a greater than 50% of nurses rate the question as a three or

four (moderate to great barrier). Table 3 data illustrates previous findings identified in the literature as well as to describe how the literature has scored the subscale items as barriers.

Table 3

Rank order of BARRIERS® (n = 53 studies)

Subscale and Item	**Range in percentage of nurses rating the item as a moderate to great barrier**	**Number of studies with > 50% of nurses rating the item as a moderate to great barrier**	**Number of studies rating the item among the top ten of BARRIERS®**
Nurse Subscale: The nurse's research values, skills and awareness			
The nurse is unaware of the research	10-77	24	27
The nurse does not feel capable of evaluating the quality of the research	5-83	25	25
The nurse is isolated from knowledgeable colleagues with whom to discuss the research	16-89	20	16
The nurse is unwilling to change/try new ideas	3-59	6	2
The nurse sees little benefit for self	3-61	5	2
There is not a documented need to change practice	8-55	1	2
The nurse feels the benefits of changing practice will be minimal	5-57	6	1
The nurse does not see the value of research for practice	3-58	3	0
Setting Subscale: Setting BARRIERS®			

and limitations			
There is insufficient time on the job to implement new ideas	16-89	38	49
The nurse does not have time to read research	8-88	38	48
The nurse does not feel she/he has enough authority to change patient care procedures	22-85	33	43
The facilities are inadequate for implementation	16-88	32	36
Other staff are not supportive of implementation	13-79	29	31
Physicians will not cooperate with implementation	11-83	26	31
The nurse feels results are not generalizable to own setting	6-79	23	24
Administration will not allow implementation	9-71	8	7
Research Subscale: Qualities of the research			
The research has not been replicated	4-67	12	6
The literature reports conflicting results	1-72	7	5
The research has methodological inadequacies	5-67	4	5
Research reports/articles are not published fast enough	9-69	5	4

The nurse is uncertain whether to believe the results of the research	3-55	4	0
The conclusions drawn from the research are not justified	0-57	1	0
Presentation Subscale: Presentation and accessibility **of the research**			
The statistical analyses are not understandable	4-90	36	40
The relevant literature is not compiled in one place	8-86	33	37
Research reports/articles are not readily available	23-94	19	18
Implications for practice are not made clear	10-82	19	17
The research is not reported clearly and readably	3-83	18	15
The research is not relevant to the nurse's practice	5-60	3	0
Items not included **in any of the subscales**			
The amount of research information is overwhelming* (27 articles)	10-71	11	13
Research reports/articles are written in English** (15 articles)	18-89	6	11

*Did not load on any of the four factors (subscales) in Funk *et al.*'s factor