

# Evidence-based nursing: Blending the art and science

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## Abstract

*In this introductory article in the research section, an overview is provided of evidence-based practice and its potential value to emergency nurses. Nursing has been described as consisting of both art and science. This definition of science in nursing has caused some controversy in relation to evidence-based practice. Some view science in the traditional natural science view in which only randomized controlled trials count as evidence. This leaves out a substantial portion of research findings in nursing which contribute significantly to health care and best practices. In this article, the concept of evidence-based practice is explored and related to the art and science of nursing. Strategies to increase evidence-based practice are then suggested.*

In the past decade, there has been a noticeable increase in literature concerning evidence-based practice and research utilization by nurses. There is inconsistency in the use of the terms “evidence” and “research utilization”. To the medical community, “evidence-based practice” has generally been limited to implementing results of randomized controlled trials, also called RCTs. The Health Information Research Unit (HIRU) at McMaster University, which is closely linked to a large international research network known as the Cochrane Collaboration, has defined evidence-based practice more narrowly. It defines evidence-based health care as “the explicit, conscientious and judicious consideration and use of the best, most

up-to-date research evidence to guide health care decisions”. This is a restrictive definition which should be used cautiously in health care. Randomized controlled trials are limited in nursing, mainly due to the types of questions we ask, as well as the limits on some aspects of our autonomy. Most of our research is correlational or quasi-experimental, or uses qualitative methods. Restriction to evidence from RCTs would exclude an increasingly rich base of evidence nurses have amassed.

Health care professionals require a wider definition of evidence-based practice, one which includes not only quantitative data, but also qualitative and non-research-based evidence. While qualitative research data has been excluded by many medical evidence-based practice definitions, it is an extremely important source of information and evidence for health care professionals. In the past, research using qualitative methods was seen as a “stepping stone” leading to quantitative research methods. This is now unfounded, as many research questions are suited only to qualitative research and the findings can stand on their own. Examples may include studies of what the experience of loss has meant to families of trauma patients, what it feels like to be unable to breathe for patients with lung disorders, and what is involved in providing comfort in emergency. There have been concerns with the ability to generalize qualitative findings to other settings or populations, including issues of reliability and validity. It is now recognized that qualitative research can also be rigorous, considering aspects such as credibility, fittingness, applicability, confirmability, and

auditability. The utility of qualitative research findings beyond the study setting may also be enhanced if supported by other similar findings in similar studies. This can be done through a process called “metasynthesis” for qualitative data, or “meta-analysis” in quantitative studies. Groups of health care researchers have formed into specialty groups to perform systematic reviews of related research in various specialty groups. The most well-known of these is the Cochrane Collaboration group. They have, until now, exclusively conducted systematic reviews of randomized controlled trials, but are currently exploring ways to include systematic reviews of qualitative research findings as well.

Other non-research-based forms of evidence may also be important. We may also have evidence of the effectiveness of our interventions through sources such as experience, quality assurance data, descriptive reports, patient satisfaction questionnaires or individual observations/critical thinking by the practitioner. Evidence has also been critical in the development of clinical practice guidelines. It is important to remember that the guidelines must be flexible enough to allow for diversity of evidence. A guideline must be able to be adapted in relation to clients’ unique needs and the nurse’s observations. The nurse must also be able to explain the basis of the evidence used to change the guideline. We all recognize that no one patient presents in the same manner as another and all respond somewhat differently to the same treatment. It has been argued that a more flexible definition of evidence is also required due to the fluid/changing nature of knowledge. Even if an RCT is the

appropriate research design for a question, it takes time to develop and implement, and the findings do not stand on their own. As knowledge changes, it is not possible to keep pace with an equal amount of generalizable RCT findings. Furthermore, RCTs only reflect one aspect of our science and not our art.

## The art and science of nursing

Art is described as consisting of learned skills which have become creative and beautiful, whereas science is knowledge which has been systematically obtained and formulated. Watching an expert nurse weave measures into their care while attending to physiologic and social alterations in the client's condition is truly an art. Understanding and explaining this art, or generalizing it to broader contexts for more consistent or effective care, requires scientific observation and exploration. Traditionally, science has been seen as consisting of quantitative empirical knowledge (positivism), although other forms of systematic investigation are also important. Examples include interpretive science in which scientists seek to understand phenomena, and critical science in which the phenomena are explained and theories are developed to support change toward or away from the outcome. At least four different types of knowledge have been described, all of which are interrelated and interdependent. The four include: empiric knowledge, observing the actions of the nurse on the client (aesthetics or the art), knowledge of self (personal), and morality (ethics). This implies that empirical science is therefore only one way of gaining knowledge, and that science and art cannot be separated.

We need to be able to explain not only the quantitative aspects of our practice, but also the qualitative or social aspects of our client interactions. How can we argue for more time with clients outside tasks if we cannot demonstrate the importance of our interactions with them? If we have not explored their perceptions of our touch, our tone of voice, our

efforts to comfort, how do we know the effectiveness of our care? This is evaluated on a daily basis by each nurse with individual clients. An understanding of these aspects facilitates the development of the art in novice practitioners, provides a framework for theory development and practice guidelines, and justification for both our art and our science. So how do we increase the evidence base for our practice?

## Increasing evidence-based nursing practice

In order to increase evidence-based practice (EBP), we need to know about current research findings and observations, understand our own practices and contributions, and to communicate with each other about these. Two key aspects which will increase EBP include increased utilization of existing research and formation of partnerships to promote further research and documentation.

Research utilization is only a piece of EBP, but is critical. Much research goes unnoticed and practices do not change, even if published or presented at conferences. Nursing practice has been described as based on "tradition, rituals, or hunches rather than scientific knowledge or research". In a study of practices in one US state, it was found that while the majority of protocols were referenced, very few were research-based. It is unlikely that this state is atypical of other North American hospitals. In studies of nurses' knowledge of published research-based changes in practice, up to 70% were either unaware of the changes or had implemented six or more in their practice.

Research utilization has been defined as "the use of research findings to change or validate practice" (Fitzimmons et al., 1995). In this context, we are including qualitative and quantitative findings. How the prevalence of research utilization is measured is quite variable, however. Some only measure changes made to practice as a result of research findings. It may be argued that the review of research is equally important.

Many times, we review and interpret data and find it not suitable for practice changes, or for a particular patient circumstance. If changes are not made due to lack of sufficient evidence or generalizability of results, it is argued that this is an important aspect of research utilization.

Major reported barriers to research utilization by nurses include: (Carroll et al., 1997; Pettengill et al., 1994; Funk, Champagne, Wiese, & Tornquist, 1991; LeMay, Alexander, & Mulhall, 1998; Kajermo, Nordstrom, Krusebrant, & Bjorvell, 1998; Walsh, 1997; Kajermo, Nordstrom, Krusebrant, & Bjorvell, 2000; Walsh & Walsh, 1998):

- aspects of the organization - inadequate time to implement the new ideas, lack of authority to make the changes, inadequate facilities to implement, lack of support from administration, lack of support from other disciplines; workload; already experiencing too much change; lack of a culture which supports or understands research culture; and dominance of medical research and practice.
- aspects of the presentation - use of research jargon, unclear statistical explanations
- aspects of the research - accessibility of research findings, publications or computer databases, small sample sizes and/or lack of replication of studies, findings not generalizable or applicable to user's setting;
- aspects of the nurse - attitudes toward research, inconsistency between practice beliefs and research findings, inadequate time to locate or read the research, limited skills in critiquing research reports, inflexibility to change, lack of support from other nurses, limited professional relationships with colleagues/team members to support their research searches or implementation.

A large study of factors affecting Alberta nurses' research utilization revealed that experience and nursing school were the two most frequently used knowledge sources. These knowledge sources may be dated and potentially non-evidence based. Literature (texts and journals) was ranked in the bottom five sources of knowledge. The role of experience is supported by a qualitative study in the

area of decision-making by nurses. Experience may either be a positive influence predicting information use, or be negative in terms of increasing bias or potential for disbelief of research findings. If a particular method has worked for many years, why should the nurse believe it has to now be changed?

It has been shown that education is an important component of increased research utilization, but not just formal education. Inservice education was found to increase awareness of research findings and was found to influence utilization. This may be linked to the immediacy of our needs as adult learners to apply findings to clinical practice. It is also important for us to increase the breadth of our research methods and range of inquiry to reflect the diversity of our practice. Much of our work is not quantifiable with a randomized controlled trial, but we see the clinically significant impact our work has on our patients. We need to also document and communicate our findings with colleagues. Clinical practitioners are urged to publish and communicate their observations, questions, and nursing wisdom and to facilitate research. With the reality of cutbacks and “doing more with less”, however, this seems like a daunting task. At one time, there was a real push in nursing to educate staff on how to conduct their own research. This is no longer a reasonable expectation in such times of workload issues. What is possible, however, is ensuring that the research which is conducted is relevant to practice and that you find out the results. This suggests forming partnerships with nurses with specialized skills or additional resources in research, clinical skills or access to additional resources.

Nurses with additional training in research methods, philosophy and theory development may include nurse specialists, nurse practitioners, or those in academic institutions. These nurses have much to contribute to exploring, observing, and documenting the art and science. They also usually have access to resources and often have dedicated time to teach or conduct research. Unfortunately, often we see them as living in an “ivory tower” and producing

seemingly irrelevant work that is of no immediate clinical utility, or is not easily interpreted by the clinical staff. Partnerships between these nurses and clinical staff are critical bridges to build to increase our evidence base. Academic staff need to be aware of relevant issues and how to communicate their results in a format that is more immediately applicable. Academic researchers gain tenure in part by publishing in prestigious research journals rarely read by practitioners, using technical jargon. They are now being challenged to publish a second publication in the practice journals in a format that directly highlights the applicability of the results to practice. Some universities in Canada, such as University of Alberta, are seeking to establish “chair” positions for specialty clinical areas, such as neuroscience, emergency, critical care or medical/surgical nursing. The chair would be responsible for furthering research, theory, and practice in the specialty area and would have at least two scholars working with them – a research scholar and a clinical scholar. The research scholar would work predominantly on research and theory development with some responsibilities in the clinical specialty area. In a parallel manner, there would also be a clinical scholar who would work predominantly in the clinical area, with some research or teaching responsibilities. These positions are aimed at understanding and explaining nursing practice in these areas, and conducting research which is relevant to the practice. It is also a vehicle to communicate the findings in a timely manner to clinical staff and the community. These nurses can also seek support from funding and political agencies to further promote change.

The clinical nurse has equally important responsibilities. People who practise the art and science directly with the clients need to identify their information needs and questions and communicate these to the academic nurses and funding agencies. Much of what nurses do is taken for granted or is not explored due to time and energy constraints. We speak of the essential nature of nurses in emergency practice, but many areas have paramedics and aides working in

emergency. How do we identify our unique contributions and establish our professional identity? A patient knows when they have “good nursing”, but have we shown it or defined it? Current nursing workload measures tend to rely on observable tasks and measurable outcomes. So how do you define the question? One of the most valuable sources this writer has found is the staff lounge! When staff complain of the impact of a change on their care, or the poor function of a piece of equipment imposed due to budget cuts, these are potential research questions. When they share “tricks of the trade” with new graduates, these are wonderful examples of the art of nursing wisdom which need to be shared and established in the evidence-based literature. A common example is exploring what it is that nurses notice when they identify a client is “going sour” despite a lack of significant changes in physiologic indicators. Independent interventions such as distraction techniques for pain, or effectiveness of comfort measures with grieving family, also need exploration. We also need to question our practice “standards”. What is the reason behind having every patient take off their underwear for surgery, even for throat surgery? Why do we insist on sterile technique for endotracheal suctioning when there is no evidence linking poor technique to nosocomial pneumonia, and we use clean technique for tracheostomy suctioning (entering the same lungs)? Using staff as a base for questions underscores the vital need to have links between researchers and clinical areas. Partnerships can also be formed between clinical staff, with or without academic staff, to share research findings. Journal clubs are one way in which nurses can share findings. A number of relevant journals are monitored monthly, one per nurse, and nurses meet monthly to present, critique and discuss articles they feel are relevant to their practice.

## Conclusion


Nursing consists of both science and art. These are interdependent and both are necessary to expert practice. Any definition of EBP we accept in nursing has to reflect both aspects of our practice, and seek to explain both the empirical

aspects of nursing as well as our essence. Clinical practice guidelines need to reflect evidence from both natural and social science. Limiting ourselves to empiric evidence will only limit our value and diminish the important effects we know we have daily with our clients. Our challenge is to raise questions, seek literature, stimulate research and communicate our wisdom and research findings with each other. This is best achieved through partnerships and research utilization.

This column is devoted to the research utilization aspect of EBP. We will use a broad definition of evidence and hopefully serve to facilitate increased awareness of issues in critical appraisal of research findings using examples in the emergency literature. Future topics include discussions of research methods (qualitative and quantitative), statistical methods, systematic reviews, research funding and resources available. It is also hoped that the columns will stimulate discussion in your area and generate a means to compile our collective wisdom and research questions. The author of this column welcomes e-mails, calls and questions at the contact information provided. When possible, some of these will appear (hopefully with answers) in the subsequent issues of the journal. It is the hope that, through increased communication about research methods and findings in this column, we can begin some discussion of research questions, research priorities and begin to form networks of people with similar interests and diverse skills. Through these partnerships we may begin to blend the art with science in a culture of evidence-based practice.

### About the author

Cathy Carter-Snell is pleased to join the **Outlook** team as a research editor. She is a certified emergency nurse, currently coordinating two distance education programs at Mount Royal College, Calgary (the Advanced ACCN Emergency Nursing program and the Forensic Studies program). She is also a sexual assault nurse specialist, working with two teams in Alberta. Cathy is also completing her PhD studies at University of Alberta, focusing on post-traumatic

stress and acute stress disorders. Her dissertation work is on early detection in emergency of physiologic variables and event variables which increase risk for later development of these stress disorders in sexually assaulted women. Cathy encourages other nurses to communicate with her to share research or practice questions, information or contacts. She hopes to help build our capacity for research, networks and knowledge in emergency nursing. She can be reached by e-mail [ccartersnell@mtroyal.ab.ca](mailto:ccartersnell@mtroyal.ab.ca) or at work (403)240-6679. 

### References

- Brett, J.L. (1987). Use of nursing practice research findings. *Nursing Research*, **36**(6), 344-349.
- Carper, B. (1978). Patterns of knowing. *Advances in Nursing Science*, **1**(1), 13-23.
- Carroll, D.L., Greenwood, R., Lynch, K.E., Sullivan, J.K., Ready, C.H., & Fitzmaurice, J.B. (1997). Barriers and facilitators to the utilization of nursing research. *Clinical Nurse Specialist*, **11**(5), 207-212.
- Coyle, L.A., & Sokop, A.G. (1990). Innovation adoption behaviour among nurses. *Nursing Research*, **39**(3), 176-180.
- Estabrooks, C.A. (1998). Will evidence-based nursing practice make practice perfect? *Canadian Journal of Nursing Research*, **30**(1), 15-36.
- Estabrooks, C.A. (1999). Modelling the individual determinants of research utilization. *Western Journal of Nursing Research*, **21**(6), 758-772.
- Estabrooks, C.A., Field, P.A., & Morse, J.M. (1994). Aggregating qualitative findings: An approach to theory development. *Qualitative Health Research*, **4**(4), 503-511.
- Fitzsimmons, L., Shively, M., & Verderber, A. (1995). Focus on research utilization. *Journal of Cardiovascular Nursing*, **9**(2), 87-94.
- Funk, S.G., Champagne, M.T., Wiese, R.A., & Tornquist, E.M. (1991). Barriers to using research findings in practice: the clinician's perspective. *Applied Nursing Research*, **4**(2), 90-95.
- Health Information Research Unit (HIRU). (2001). **Definition of Evidence Based Practice.**
- Kajermo, K.N., Nordstrom, G., Krusebrant, A., & Bjorvell, H. (1998). Barriers to and facilitators of research utilization, as perceived by a group of registered nurses in Sweden. *Journal of Advanced Nursing*, **27**(4), 798-807.
- Kajermo, K.N., Nordstrom, G., Krusebrant, A., & Bjorvell, H. (2000). Perceptions of research utilization: comparisons between health care professionals, nursing students and a reference group of nurse clinicians. *Journal of Advanced Nursing*, **31**(1), 99-109.
- Kitson, A. (1997). Using evidence to demonstrate the value of nursing. *Nursing Standard*, **11**(28), 34-39.
- LeMay, A., Alexander, C., & Mulhall, A. (1998). Research utilization in nursing: barriers and opportunities. *Journal of Clinical Effectiveness*, **3**(2), 59-63.
- McWilliam, C.L., Desai, K., & Greig, B. (1997). Bridging town and gown: building research partnerships between community-based professional providers and academia. *Journal of Professional Nursing*, **13**(5), 307-315.
- Morin, K.H., Bucher, L., Plowfield, L., Hayes, E., Mahoney, P., & Armiger, L. (1999). Using research to establish protocols for practice: a statewide study of acute care agencies. *Clinical Nurse Specialist*, **13**(2), 77-84.
- Onyskiw, J. (1996). The meta-analytic approach to research integration. *Canadian Journal of Nursing Research*, **28**(3), 69-85.
- Pettengill, M.M., Gillies, D.A., & Clark, C.C. (1994). Factors encouraging and discouraging the use of nursing research findings. *Image - the Journal of Nursing Scholarship*, **26**(2), 143-147.
- Rose, P., & Parker, D. (1994). Nursing: An integration of art and science within the experience of the practitioner. *Journal of Advanced Nursing*, **20**, 1004-1010.
- Sandelowski, M. (1986). The problem of rigor in qualitative research. *Advances in Nursing Science*, **8**(3), 27-37.
- Thompson, C. (1999). Qualitative research into nurse decision making: Factors for consideration in theoretical sampling. *Qualitative Health Research*, **9**, 815-828.
- Tibbles, L., & Sanford, R. (1994). The research journal club: a mechanism for research utilization. *Clinical Nurse Specialist*, **8**(1), 23-26.
- Walsh, M. (1997). Perceptions of barriers to implementing research. *Nursing Standard*, **11**, 34-39.
- Walsh, M., & Walsh, A. (1998). Evidence-based practice: is patient satisfaction evidence? *Nursing Standard*, **12**(49), 38-42.
- Winter, J.C. (1990). Relationship between sources of knowledge and use of research findings. *Journal of Continuing Education in Nursing*, **21**(3), 138-140.