

ROLE OF INFORMATION LITERACY IN EFFECTIVE EVIDENCE-BASED PRACTICE

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Abstract

The healthcare sector is a dynamic and expanding area that is replete with numerous new developments, resulting in explosion of literature and information overload. An adequate level of information literacy is required to benefit from the growing healthcare literature. Concurrently, there also has been an emphasis on Evidence-Based Practice (EBP), as a thoughtful integration of the best available evidence for solving clinical problems and providing quality patient care. EBP requires that healthcare professionals are able to assess current and past researches, clinical guidelines and other information resources. Information literacy skills will support EBP by providing opportunity to learn about information architecture and enhancing the ability to navigate, access, search, and critically evaluate appropriate resources. This paper reviews the fundamentals of EBP and highlights the role of information literacy in effective EBP. Current information literacy programs for nurses are identified and suggestions are made for surveys of existing information literacy among healthcare professionals with an emphasis on nurses in four Singapore hospitals.

Keywords: Information Literacy, Evidence Based Practice (EBP), Nurses, Singapore

INTRODUCTION

Extensive medical research and development activities the world over are resulting in the generation of enormous amount of healthcare literature, published in a variety of sources, and at a rate that is impossible for individual medical professionals to keep up with. It is estimated that over 7800 articles relevant to family practice published monthly, and a family medicine practitioner would need to dedicate approximately 20 hours a day to stay abreast of new evidence (Alper *et al* 2004). Due to lack of time, lack of accessible information resources and weak search skills, health practitioners' information needs are often not fully met. As a result, research findings are often delayed in being implemented into clinical practices. On the average, it takes 17 years for clinical research to be fully integrated into everyday practice (Balas 2001). This delay may result in limited exposure to clinical evidence by healthcare professionals. One group of healthcare professional that requires are the nurses, the largest group of medical professionals. They spend considerable time and efforts providing health care and medical treatment for patients. Advances in information technology have had a radical impact on health care delivery and nursing education. The convergence of information and technology provides faster access, but not necessarily better control for searchers of the healthcare literature. Evidence-based practice, as a method for assessing and utilizing a variety of information resources, could enable medical professionals to address healthcare questions with an evaluative and qualitative approach, and make evidence-based decisions in a focused and timely manner.

FUNDAMENTALS OF EBP

The majority of healthcare practitioners would like to think that they are following the best practice and their practice is based on reliable knowledge. However, evidence-based practice means more than practicing with an awareness of research evidence. According to Sackett *et al* (1997, p.5), evidence-based practice is “the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients”. This is reflected in Figure 1, which depicts clinical decisions taking account of research evidence, clinical expertise and patient preference (Haynes *et al* 1996). Silagy and Haines (1998) describe evidence-based health care as an approach that takes account of evidence at a population level as well as encompassing interventions concerned with the organisation and delivery of health care. This is reflected in Figure 2, which shows different types of evidence on the effects of care feeding into policies and health care decisions. Gibbs (2003) takes these ideas further, stating, “Placing the client’s benefits first, evidence-based practitioners adopt a process of lifelong learning that involves continually posing specific questions of direct practical importance to clients, searching objectively and efficiently for the current best evidence relative to each question, and taking appropriate action guided by evidence”.



Figure 1: EBP Model
Adapted from Haynes *et al* (1996)

Historically, care of the patient was influenced by the opinions and experiences of those involved with providing treatment (Kania-Lachance *et al* 2006). EBP does not rely on intuitions, opinions, or unsystematic observations; instead, it emphasizes the use of research and evidence to guide clinical decision-making. EBP encourages using the best available evidence without eliminating the requirements of critical thinking. It does not mean taking an article or clinical guideline at face value, even if the article or guideline appears in a peer-reviewed journal. The consistent point with these definitions of EBP is that research evidence is a component of the decision-making process, but it is not the only component. Other aspects, such as clinical expertise, patient preference, needs, priorities and resources, are also important considerations. In EBP, the nurse practitioner could obtain information for management of usual concerns and newly encountered problems presented by patients daily, which allows the patient and nurse practitioner to enter into a relationship using research-guided best evidence for decision making.

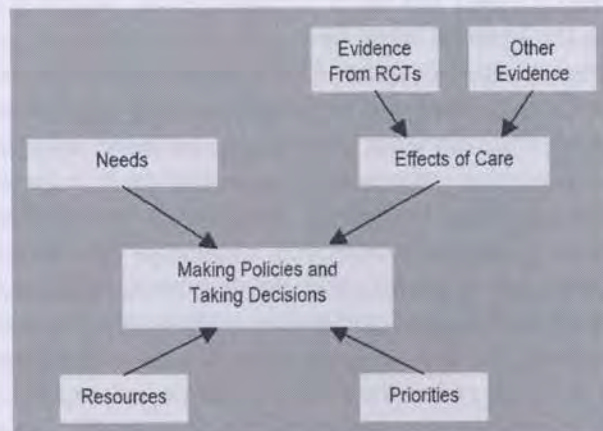


Figure 2: EBP in Health Care
Adapted from Silagy and Haines (1998)

Steps Involved in EBP

EBP is a multi-step, dynamic process that incorporates the best external data and best clinical judgement, and the number of steps may vary in a particular situation. One individual may complete the process; however, a multidisciplinary team approach allows for various perspectives on the same clinical problem and provides a more manageable workload (ONS 2008). Sackett *et al* (1997) identified 5 steps in the process of EBP, which is most commonly used:

- Step 1: Identify and develop a clear and answerable question derived from the client's need or problem. Such questions may be about diagnosis, treatment, side effects as well as benefits and costs of care, within the context of individuals, communities, or populations.
- Step 2: Search the literature and acquire the best available evidence to help answer the question.
- Step 3: Conduct a critical appraisal of the retrieved information and rank the evidence for its validity and applicability to the client's need and situation, along with the professional's competencies.
- Step 4: Formulate and apply an intervention based on the most relevant and applicable evidence by engaging in collaborative health decision-making with the affected individuals and groups.
- Step 5: Re-evaluate the application of evidence and areas of improvement for future decision-making, store and disseminate the results, and identify new informational needs.

Newhouse *et al* (2005) simplified the EBP process as PET, i.e. practice question, evidence and translation. ONS (2008) identified 6 steps as problem identification, finding the evidence, critique, summarizing the evidence, application to practice, and evaluation. Both of the two descriptions neglected the importance of sharing results with others and improving the quality of available evidence after evaluation. Social worker Len Gibbs (2003) looked at the EBP process from a more comprehensive perspective. He pointed out that the first step is to become motivated to do EBP, as being forced to do EBP by management could create considerable resentment.

ROLE OF INFORMATION LITERACY IN EBP

Information Literacy as the Foundation of EBP

EBP demands an underlying understanding of the architecture of information and the ability to navigate among a variety of print and electronic tools to effectively access, search, and critically evaluate appropriate resources. Therefore, adequate integration of information literacy training into the nursing undergraduate curriculum is a prerequisite for effective evidence-based nursing practice. Improved competency in information literacy would provide nursing professionals with the skills and knowledge to access nursing and medical databases for their professional growth and development, enables them to be literate consumers of information, both in print and electronic formats, and keep abreast of evolving new healthcare techniques. On the contrary, lack of such competencies could result in information overload, retrieval of irrelevant or inaccurate information, missing out certain critical information, and wastage of precious time of nursing professionals.

Information Literacy Skill Development for EBP

Most importantly, EBP hinges on the ability to identify, obtain, and evaluate information, which comes in many different forms and formats. The latter stages of EBP as planning and conducting the implementation, monitoring and evaluation of changes in practice made on the basis of new evidence would be well served by participation in the research process. However, for the initial identification and evaluation of best available evidence, practitioners may need to develop additional skills to meet the requirements. Previous studies, carried out by French (1998) and Council for Training in EBBP (2008), analyzed the required competencies for EBP based on each step of its process, and some of them are related to information literacy skills and knowledge. The level of information literacy particularly plays a key role in the first three steps of EBP, namely defining questions, accessing information and critical appraisal of the evidence. The following sections elaborate how adequate information literacy can help in undertaking the following steps.

(a) Defining the Question

Before starting an information search, a rationale for undertaking a review helps focus attention on the types of questions that research can answer. It also helps to identify the requirement for specific types of questions of clinical effectiveness arising from variation or uncertainty in practice. The practitioner has to make concrete decisions about what information is required, rather than relying on what information is available. Reliance on currently available answers in published sources may not meet the requirements of current practice. Also, it does not encourage a questioning approach relating to the effectiveness of alternative management strategies available to the practitioner, and does not recognize or value innovation stemming from practice.

In order to achieve a better definition of the question, first of all, health practitioners must have the ability to translate information needs into well-formulated, answerable questions. Secondly, they are required to be able to distinguish between different types of questions, e.g., assessment, intervention, prognosis, harm and cost-effectiveness. Besides, knowledge of health care language terms used in indexing and classification systems can be useful in exploring the availability of information on the full range of variables that may affect patient outcome.

(b) Accessing Information

After defining the question, practitioners should be able to identify the sources of information to be used and the data to be extracted. Most importantly, practitioners should have an initial appreciation of size of the research base and previous key papers, which may help them to consider the size and focus of the review in relation to the amount of evidence and the resources available. They are required to have the ability to access and use a wide variety of information sources. They should be able to appreciate the strengths and limitations of individual databases based on different targets. Moreover, the practitioners should have the skills to use electronic information searching, such as CD-ROMs, online databases, and the web, in a structured and rigorous way to explore a subject efficiently and ensure that no relevant information has been missed. Updated knowledge of research relevant to their questions is helpful in this process.

(c) Critical Appraisal and Comparative Analysis

With the large amount of information retrieved, the practitioners must have the ability to identify and compare the relevance for each piece of information. It would be essential for them to know the strengths and weakness of different kinds of research evidence for answering different kinds of behavioural health questions. They should be able to evaluate the quality and strength of evidence in systematic reviews or practice guidelines. Currently, the identification of specific types of research relevant to questions of clinical effectiveness could be greatly assisted by available critical appraisal tools that assess study design and study execution. It would be helpful for practitioners to possess the knowledge and skills for using these tools or strategies.

ASSESSMENT OF INFORMATION LITERACY SKILLS OF NURSES

Despite the theoretical support there is enough testimony to suggest that in reality there remains a gap between what evidence is available and what is practiced. As documented in nursing and library science literature, some studies discover that nurses rarely use digital information sources such as online databases, electronic journals and WWW. In general, there is a lack of awareness of information literacy concepts and skills for developing effective search strategies.

Experience suggests that most nurses are unaware of new sources of health information as well as evidence-based healthcare publications (French 1998). Moreover, they may not have used established sources of healthcare information or be aware of good sources of grey literature or unpublished materials (French 1998).

Studies also reveal that most healthcare practitioners only have a basic understanding of electronic information searching and may only be able to find part of the relevant information, as they may be unaware of the significance of the database field indexes and thesaurus, and their use in exploring terms (French, 1998). Several researchers have reported that a high proportion of nurses are uncomfortable and inexperienced with the use of information technology at their work place, and some of them are even anxious about IT and did not regard it as an aid to patient care (Marasovic *et al* 1997; Large 1994).

Information Literacy Programs

To address the missing link between EBP and information literacy competencies in practice, several information literacy programs have been launched since the late 1980s, in collaboration with librarians and nursing faculty. The primary objective of such initiatives was to strengthen competency in evidence based practice and to provide nursing professionals with the skills to be information-literate consumers in an electronic environment (Jacobs *et al* 2003).

As early as 1988, nursing faculty and librarians started integrating information literacy competencies into undergraduate nursing programs. Fox and Weston (1993) focused on students' skills related to accessing the nursing literature in a library setting. Shorten *et al* (2001) developed a curriculum-integrated program designed to address nursing students' awareness of the professional literature as well as enhance their ability to locate and retrieve vital information. It was noted that students were better equipped when they receive training in information literacy skills. Most commonly, with the presumption that students increase their search skills one step at a time, a multilevel curriculum strand was used as the teaching strategy to build on existing competencies. For example, Verhey's (1999) curriculum strand approach examined user comfort levels and learner empowerment, and concluded that even as students are exposed to information literacy concepts and tools, they may not experience an increased confidence level. Besides, it was evident that active learning, including hands-on experience, is critical to the process (Francis & Kelly 1997). In other words, the learning curve for information literacy competencies should be steep, with patience on both student and instructor sides.

Courey *et al* (2006) designed and implemented an information literacy program for first-semester associate degree nursing students in conjunction with a foundation course in nursing. The effectiveness of the program was evaluated using a questionnaire, both prior to the course and immediately after it. A control group, comprising students who did not receive the intervention, was also tested at both points. Data analysis revealed that the information literacy program had both a positive effect on students' information literacy skills and a negative effect on their attitude towards the need of using these skills in nursing practices.

Although efforts have been focused on undergraduate curricula, comparable needs for graduate students exist as well. According to Staggers *et al* (2001), master's students preparing for careers that include increased administrative, clinical, and research responsibilities must possess a higher level of information literacy. Nurses with baccalaureate degrees (BS) are expected to understand basic research process and to review and use research findings in their own daily practice, while nurses with graduate degrees (MS) are expected to critique research and implement changes in practice based on research data (American Association of Colleges of Nursing 1999).

The New York University launched a graduate nursing information literacy initiative in the spring of 2001 (Jacobs *et al* 2003). This program included an orientation session focusing on the structure of information, and a modular content deliver approach enabling the students to acquire information literacy competencies according to their needs and preferences. Information literacy skills, such as database search, evidence-based searching, strategies for finding statistical information and using web search engines, directories, meta-sites were

highlighted in these modules.

Some studies have been done to evaluate the relationship between the length and type of the programs and students' success with information literacy. Layton and Hahn (1995) identified the need to incorporate the information literacy program throughout the duration of a nursing course rather than as a brief orientation session or an optional subject for nursing students. Moreover, collaboration between nurse faculty and librarians was demonstrated as necessary for their respective areas of expertise (Dorner *et al* 2001).

INFORMATION LITERACY OF NURSES IN SINGAPORE

Realizing the importance of information literacy, Wee Kim Wee School of Communication & Information, NTU has formed an Information Literacy Research Cluster to undertake research on different aspects of this vital area. In addition to other information literacy-related research initiatives, a joint research study is underway in collaboration with four hospitals in Singapore. The basic purpose of this survey is to investigate nurses' perceptions of EBP and their level of information literacy. The study is expected to identify the gap between required and existing information skills of nurses in implementing EBP, and suggest steps for better training programs to improve the effectiveness of EBP. The questionnaire that we intend to use for this study includes 18 questions divided into four sections focusing on seeking feedbacks regarding perceptions and knowledge about EBP, use of information resources and literature searching skills, barriers and training needs. The data collection phase is expected to be completed by the first week of November 2008. Part of the data gathered through this survey will be used for designing a comprehensive training plan for improving information literacy skills of nurses which will in turn help them to successfully implement their EBP initiatives.

CONCLUSION

It is worth noting that EBP is quickly gaining popularity and now considered as one of the innovative ways for handling clinical issues and providing quality patient care. For the successful implementation of EBP, healthcare professionals need to know how to frame a clinical question (information needs identification); identify, access and use relevant and reliable information sources; and critically appraise the evidence (information evaluation). Healthcare professionals can undertake these tasks with confidence if they possess adequate level of information literacy competencies. Our literature review revealed that only a few nursing training schools have fully integrated information literacy skills in their curriculum. Besides their obtaining of necessary technical skills and development of positive attitudes, to help nursing students develop an appreciation of the nursing literature, information literacy education should be integrated into nursing education programs. The need for such understanding is not only crucial for nursing students but also for practicing nurses. Similarly, most of the in-service EBP training courses often provide a superficial treatment to information literacy aspects of EBP. It is probably because many training providers themselves are not knowledgeable in this area. One way to overcome this problem is to involve medical information professionals in EBP training and implementation programs. Only in this way nurses will have access to quality evidence, which will help solve clinical problems as well as to provide better patient care. Adequate information literacy skills will allow nurses to begin their lifelong journey toward the development of true evidence-based professional nursing practice.

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