Nurses’ Information Appraisal Within the Clinical Setting

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Nursing has progressed from the days when research and research-based findings were left to scholars in academe. The increased emphasis on providing care based on evidence requires nurses to engage in evidence-based practice (EBP), although many nurses are unprepared to do so. Nurses must be able to appraise information to effectively apply evidence in practice. Information appraisal is a key to nurses providing healthcare based on evidence. For nurses to most effectively use evidence in the clinical setting, more must be understood about how nurses appraise information. For this reason, the purpose of this study was to define and describe the process of information appraisal by nurses in the clinical setting. This study used focus group data collection strategies to explore the following research questions:

1. What is information appraisal in the clinical setting?
2. How do nurses perform information appraisal in the clinical setting?

Nurses continuously work with information as part of patient care planning, implementation, and evaluation, and they seek information from a variety of sources, including colleagues, print, and electronic resources. It is known that information overload exists, with nursing information doubling every 5 years and 7 million pages of information added to the World Wide Web every day. Nurses at all levels must obtain the skills to find and evaluate information for the purpose of delivering quality nursing care and advancing nursing knowledge.

Information appraisal is one phase in the information literacy process and significant to providing care based on evidence. However, limited research has been conducted on the topic of information appraisal in nursing. Studies that are available often discuss the entire spectrum of information literacy, not information appraisal specifically. Thus, this research is well-timed to extend nursing knowledge related to the phase of information appraisal within the realm of information literacy in the clinical setting.
The concept of information literacy has been discussed in the nursing literature, but little emphasis is placed on the information appraisal steps, the hallmark of EBP.

Nursing informatics facilitates and supports information literacy with collaborative tools, online access to search engines and databases, and information storage tools. Activities associated with information literacy phases rely on information technology, research, and critical-thinking skills and are often studied within the specialty of nursing informatics.

The framework for this study is congruent with conceptual models and from and synthesizing information literacy research literature. The framework (as shown in Figure 1) supports the study by presenting and illustrating the relationship between multiple concepts and processes working together as information is appraised by nurses within the clinical setting.

**LITERATURE REVIEW**

Information appraisal, a key to EBP, is a process that is used to determine the clinical relevance and credibility of information being reviewed. Skills associated with information appraisal are often addressed through an academic program, research, and evidence-based textbooks,
workshops, or through a journal series discussing the specifics of information appraisal. Limited studies of practice context in conjunction with information seeking exist. In addition, few studies in the literature examine the outcomes of using information to support practice.14

The purpose of this literature review was to examine published studies that discuss information appraisal training and evaluation. Articles are categorized in two groups: research-based information appraisal skills development and Web-based information appraisal skills development.

**Research-Based Information Appraisal Skills Development**

Nurses need the ability to evaluate information as it influences decisions about patient care. Therefore, information appraisal skills are necessary to the application of best practices in modern healthcare settings that are more information-rich than ever before. The topic of information appraisal within the clinical setting is largely absent from the nursing literature. Although many authors use various terms to describe the information appraisal process, no common definition seems to exist.15

Literature discussing information appraisal programs discovered through this literature review was strongly heterogeneous.16-21 Variation existed in regard to the content, training techniques, delivery logistics, context, population, and outcome measures. In addition, there were inconsistencies in how these programs were reported in the literature. For example, some authors provided detailed information about study design, the number of times a program was offered, length of each program session, the program context, and the number and type of participants in each session, whereas others provided general information about their program schedule, participants, and the results. Furthermore, there were often disparities in the way program outcomes were discussed. Some programs offered very detailed information on pretest and posttest data, and others offered only general information about success or anecdotal comments from participants. These variations in reporting styles made comparisons across studies problematic.

Overall, the positive results reported by authors of these studies offer encouragement for the body of knowledge surrounding information appraisal and EBP. Information appraisal skills are valued by healthcare professionals, and results indicate that training can be helpful and effective. However, there is a lack of consensus on how information appraisal skills should be taught and addressed.

**Web-Based Information Appraisal Skills Development**

The information explosion presents challenges to the incorporation of evidence into practice.22 The Internet is used by physicians and nurses to find additional information in the clinical setting. However, Cullen23 reported that practitioners need more training in searching and evaluating Internet-based information.

Several organizations have developed criteria to assist in evaluating health-related information found online including HON Code, American Medical Association, Internet Health Care Coalition, Hi-Ethics, and MedCertain.24 These criteria vary in scope and are not generated or shared in a systematic way. Furthermore, many were designed to evaluate health and medical information but offer no specific criteria that relate to nursing.25

Nurses must be aware of the variation and characteristics of online information.26 Usher27 reported that general practitioners possess “limited knowledge” of what constitutes a reliable Web site27(=43) and added that healthcare practitioners must improve their own skills to help direct patients to reliable Web-based health information. Verhoeven et al28 found that nurses were weak in information-seeking skills as evidenced by the limited number of search terms and limited number of Web sites consulted.

The topic of information appraisal within the clinical setting is largely absent from the nursing literature. Although many authors use various terms to describe the information appraisal process, no common definition seems to exist.15 Findings from this review, although limited, have implications for nursing practice in the areas of academic and clinical education and EBP. Nurses have an obligation to provide the highest-quality care based on evidence and therefore should be mindful of the importance of developing their information appraisal skills when opportunities arise.

The appraisal technique should correspond with the type of information being evaluated.29 Checklists and criteria to evaluate research-based information exist, but without specific training in the area of research-based information appraisal, it is often difficult to know how to apply these tools to evaluate information. Because many nurses have not been taught information appraisal skills, there is a gap between finding information and implementing nursing practice based on evidence.30

**METHODS**

**Design**

Because little is known about how nurses appraise information, a qualitative, interpretive, descriptive design31 using focus group data collection strategies was used to explore this process within the clinical setting. Interpretive description guided the exploration of relationships among concepts articulated by focus group participants responding to questions asked in interviews. Interpretive description facilitates the explanation of patterns and themes that materialize with respect to clinical phenomena. This
method offers an opportunity to answer research questions and subsequently describe the process of information appraisal by nurses in the clinical setting. A descriptive exploratory method such as interpretive description was fitting for this research topic, about which little is known. Interpretive description is a purposeful and sound method that can be used by novice qualitative scientists. It is a qualitative methodological option that allows the researcher to use specific qualitative research techniques in practical situations, such as the clinical setting.

Focus groups were used to obtain general information about the information appraisal process among nurses. The focus groups allowed for further examination of nurses’ descriptions and discussions related to information appraisal and their perceptions about how they appraise information. Focus groups promoted further explanation by participants that may not have been gained through individual interviews.

Sample and Setting
Participants represented a purposeful sample of 44 RNs from a regional medical center in the Southeastern US. Most participants were middle-aged women who were licensed an average of 16 years. Inclusion criteria included being an RN providing direct patient care in the inpatient setting at the host facility.

The sample was recruited by delivering informational fliers to all RNs throughout the host facility’s designated inpatient and surgical areas. In addition, brief informative presentations about the study were provided at unit meetings in an effort to make contact with interested individuals.

The host facility was equipped with an information system used for patient care. The facility offered numerous current intranet information resources for nurses to access and information frequently in patient care situations.

Data Collection
There were six focus groups with one follow-up group. Groups consisted of an average of six participants, and sessions lasted an average of 56 minutes. An investigator-developed semistructured interview guide was used by the moderator during each focus group session. This guide facilitated discussion by asking participants to describe a time in which they needed additional information to care for a patient or patients. It included questions about how nurses knew they needed more information, where they sought it, and how they evaluated it. The interview guide ensured standardization of questioning and assisted the principal investigator in collecting common information from each group.

Ethics
Permission to conduct this study was solicited from three institutional review boards prior to implementation. The principal investigator obtained informed consent from each participant prior to the focus group. Information about the purpose of the study, as well as confidentiality issues, was provided.

Data Collection and Analysis
The principal investigator transcribed all audio recording from focus groups into word processor files; transcriptions from each focus group were stored in separate files. File names and metadata included the date of the session and an assigned focus group number. All focus group transcriptions were read to verify accuracy and completeness. The audio files were played and re-played while reading the transcriptions to verify the correctness of the typed text. Reading the transcripts multiple times forced the principal investigator to become familiar with the data and aided in analysis.

Transcripts were coded inductively, often based on emic accounts or examples of data. Analysis was first done by looking at responses to each question within individual groups, then among groups. Transcripts were read with the goal of coding data based on responses to primary questions and follow-up questions. Analysis was also facilitated by the use of an overview grid with brief summaries of the content discussed in groups. Following the recommendations of Knodel, all data were coded, placed into general themes, and then categorized. Using an open-coding technique, data were read and re-read and considered for relevance to the research questions. Those deemed relevant to the research questions were highlighted and given a code closely related to the original data. Codes were clearly defined in the code dictionary, and following Thorne et al., multiple coding of data was not done. In addition, ATLAS.ti software (ATLAS.ti GmbH, Berlin, Germany) was used to aid in data management.

Raw data audio files were kept and reviewed when questions arose about transcripts. This allowed for verification.
of statements by participants. Hypotheses and “hunches” were recorded throughout the data collection and analysis process. Details and rationale supporting changes in data collection tools were also recorded.

A follow-up focus group was conducted to ensure validity. In this group, participants were asked to discuss processes talked about in previous focus groups. The group validated and confirmed the data that had been synthesized at that point.

**RESULTS**

**Participants**

Of the 44 participants, three (7%) were male, and 41 (93%) were female. Participants were between the ages of 21 and 60 years (mean, 42.84 [SD, 10.8] years) and had been licensed as an RN anywhere from 1 year to 38 years (mean, 16.05 [SD, 10.2] years). Nineteen (43%) were prepared as a nurse by way of an associate’s degree, and six (14%) held graduate degrees (ie, at least an MSN or doctorate) in nursing. At the time of the study, five participants (12%) reported to be pursuing additional formal nursing education. Most participants reported spending the greater part of their work week in a general/specialty inpatient unit.

Results are reported based on the answers to two research questions. The first question sought to define what information appraisal is in the clinical setting. The second question pursued the answer to how nurses appraise information in the clinical setting.

**Nurses’ Description of Information Appraisal**

Information appraisal in the clinical setting is an individualized process, and it is described a number of ways by nurses; there does not seem to be an agreed-upon definition of the concept. Based on the descriptions offered by participants, information appraisal contains three dimensions: information gathering, information analysis, and information application. While similar situations often resulted in similar patterns of information appraisal, in most cases the process was influenced by the situation, surroundings, preferences of the nurse, and types of information resources being used.

Information gathering was a term used by many participants in describing information appraisal. The two terms, “information evaluation” and “gathering information,” were often used synonymously. Information gathering was described as the collection of information from one of three types of information resources: human, print, or electronic. One participant described information appraisal this way: “gathering information and making sure you have the correct information.”

Participants also described using various information-gathering methods to collect information, such as incorporating everything you’re hearing, you’re seeing, and using it to give the best care and improve the health of your patient.”

Other participants spoke of determining what information was needed, whereas others described the information gathering dimension as a way to help address a void in their knowledge base. One participant described information appraisal as “increasing your knowledge base with trustworthy, verifiable sources.”

Participants also described information appraisal as asking pertinent questions, determining whether information should be trusted, incorporating information from various resources, and getting answers to questions. In some cases, participants described finding validation of information from additional resources, such as Web sites that contained similar or exact information, which helped them confirm its accuracy. Some participants described information appraisal as corroborating evidence or looking to known sources. They also discussed considering the context or relevance that the information might have to a situation. One participant described information appraisal as “…adapting it [information] to the situation you’re in for what you’re looking for.”

In some cases, verifying information resulted in making a decision to use the information or apply it in the clinical setting. Participants discussed verification of information as part of information appraisal. One participant stated “…it’s verifying new things that are not completely understood, and you verify them to make sure that it’s correct.”

Another participant simply described information appraisal as “…whether or not you trust that information.”

The information application dimension of information appraisal was evident in some participants’ descriptions of information appraisal. One participant clearly described the interconnected nature of information appraisal and information application: “Looking for results from what I’ve done based on protocols and patient response to what I’ve done and looking at clinical values, BP, etc, and whether or not that particular drip made a difference.”

**Consistencies and Variations in Discussing Information Appraisal**

There were consistencies and variations in the definition of information appraisal among participants. Consistencies included participants within groups often struggling to articulate their understanding of information appraisal. Many participants stated that information appraisal was “information gathering.” In fact, this was stated from at least one participant in six of seven focus groups. Participants also clearly described information appraisal as a process. Their descriptions as a whole concluded that the process is iterative, and most considered it an integral part of their daily practices. Variations included the exact definition used to describe information appraisal. When discussing what
information appraisal means, participants usually described only one dimension: gathering, analyzing, or applying.

**Influences on Information Appraisal**

Information appraisal is influenced by the specific situation, surroundings, and the personal preferences of the nurse. Different situations required different types of information. In some situations, it was most efficient to discuss questions or an idea with a colleague, whereas in other situations, such as policy revisions, consulting with a colleague was not appropriate. Participants explained their insistence on using evidence-based information to provide updates to policies and procedure and described times when preferred resources were not available. For example, computer unavailability resulted in using an alternative resource such as a drug book. Personal preferences were also discussed. In some cases, nurses preferred to use resources they used in nursing school such as a medical-surgical textbook that had been available to them for many years. These influences suggest that there is no “one size fits all” in regard to information appraisal.

**Execution of Information Appraisal in the Clinical Setting**

Nurses perform information appraisal in the clinical setting by way of an unspoken algorithm with two major decision points. First, nurses determine the urgency of the situation. Next, they select the resource of choice based on the urgency of the situation and prior knowledge of available resources, not the content provided by the resource. Despite some instances when nurses may evaluate the content provided by the resource, in most cases, the trusted resource served as a proxy for evaluating the information that was provided by the resource.

Urgent situations, for example, situations in which a patient was deteriorating, most frequently called for human information resources to aid in providing information. The following is an example of an urgent situation: “...he was an alcoholic, but he came in with pancreatitis and esophageal varices... after I was doing his assessment, he just started vomiting; well he started doing like this [holding neck with hands], and I’m looking and I’m like “are you choking?” And he starts doing like this [holding neck with hands], and he was trying to get up, and I end up doing the Heimlich, and he had this big blood clot come out, and his throat just started bleeding....”

Nonurgent situations were those where more information was needed, but there was more time for accessing and evaluating additional information. Nonurgent situations predominantly described by participants involved situations characterized by unfamiliarity. These situations included unfamiliarity with a culture or language, procedures, equipment, diagnoses, age range, patient care situations, or medication questions. The following is an example of a nonurgent situation: “...we had a young lady, 21, had porphyria... I had no idea what it was... I needed to know what were some things, what was the disease process, what it did to her, how she ended up like this, what were some things we could do to teach her to be more compliant, find out why she was noncompliant to begin with and just to help her deal with being in the ICU because she was 21 years old....”

**DISCUSSION**

In analysis, it was determined that there was no difference between the focus groups’ descriptions or explanations offered in response to the interview questions. Participants described instances in which they needed more information, including how they located the information and in what format they found it. Responses indicated that participants were using information resources as proxies for evaluating information found in the clinical setting. In most cases, participants reported feelings of comfort regarding the resource and did not always talk about evaluating the information provided by the resource. Participants had few rules and guidelines they could articulate for determining whether they should use the information in their care for patients. This lack of elaboration about rules and guidelines suggested that participants did not use them in the information appraisal process.

Study participants also reported seeking additional information when they were not certain about a situation. Unfamiliar or new situations were the most frequent prompt for seeking more information. Examples included unfamiliar diagnoses, medications not previously administered or not allowed (eg, to a specific age group), and unfamiliar procedures. The majority of participants reported medication questions and questions about unfamiliar diagnoses prompted them to seek additional information. This is consistent with the study finding that routine activities and tasks in the clinical setting were generally not questioned by participants.

**Implications for Practice**

In this study, nurses’ most frequent source of information was a peer or colleague. This is noteworthy, considering colleagues often provide information on traditional practices and may not offer the most up-to-date information. The results of the current study gave insight into the value of colleagues during urgent clinical situations, when there are otherwise limited sources of information. However, more must be understood about the sharing and use of nurse colleague-based information within the clinical setting. Focus group participants discussed the dependence they have on coworkers regardless of the urgency of the situation.
In urgent situations, coworkers were viewed as helpful and valuable information resources. In nonurgent situations, there was also a strong reliance on obtaining information from coworkers. These results paralleled other studies whose authors found that nurses voice their preferences in obtaining information from experience and interactions with coworkers rather than journals and texts.38,39

The results from this study echoed the argument of Rycroft-Malone et al13 and Spenceley et al14 that evidence does not always come in the form of a research article or scientific study results. Rycroft-Malone and colleagues suggest four types of evidence in the delivery of care: patient experiences, clinical experiences, local context, and research. It was apparent that, in most cases, nurses did not turn to research-based articles or scientific study results for information. Instead, they sought information from the clinical setting, patients, and coworkers. More must be understood about the integration of all types of information resources in an effort to provide high-quality care. Most evidence-based care studies focus on using research-based evidence in the clinical setting. Other forms of evidence are not discussed in the literature, leaving the possibility for personal interpretation and judgment of nurses in the clinical setting.

When describing seeking information from coworkers, participants described looking to those having a particular level and specialty of experience, interdisciplinary knowledge, or certifications or credentials. For example, in the case of technology, some nurses preferred speaking with new nurses as the result of the presumed recent exposures of these new nurses to tools and advances related to information of which more experienced nurses were not aware. In other instances, such as caring for a deteriorating patient, a more experienced nurse was preferred. Specific genres of experience were preferred in some cases to assist with specialized assessments. For example, if a patient was admitted to a medical ICU and was found to be pregnant, nurses would seek advice and counsel from an experienced obstetric nurse about the immediate patient care needs. Furthermore, interdisciplinary involvement was valued when nurses needed more information. For example, when administering a medication, nurses often sought the guidance or counsel of a pharmacist. Participants reported that, in some cases, knowing the credentials of some healthcare providers made them feel more comfortable using the information. In these types of situations, information provided was typically taken at face value and not questioned further.

Results from this study also suggest that nurses place a higher value on certifications and credentials of the people from whom they receive information. In many cases, participants described feeling comfortable talking with someone they knew who had a special certification or credential and, as a result, possessed knowledge contributing positively to nursing situations. In addition, several participants spoke of turning to someone with specialty area experience (e.g., oncology or high-risk obstetrics) when encountering unfamiliar patient circumstances. The above instances suggest that “expert nurse” consulting is a valuable concept and may be viewed as an efficient resource by clinical nurses. Nurse educators should also consider preparing nurses to have specialty roles, such as clinical nurse leaders (CNLs), and credentials to increase the population of expert nurses within specific domains of care. At this time, the nursing discipline does not routinely promote the consultation of expert nurses as part of routine inpatient care.

The focus groups provided evidence that information appraisal is an individualized and unpredictable process. Information appraisal behavior is based on one’s comfort with the situation, experience, available resources, and preferences. Some participants commented that they chose resources often based on habit, familiarity, and preference. In most cases, nurses in the current study spoke less about appraising the content or information provided by resources but instead described their judgment about the resource they were using.

It can be inferred from this study that more experienced nurses are seeking evidence less and may not be basing their practice on the most current information. Participants reported having been in their position for some time and said they believed they had fewer questions than did newer nurses. Some newer nurse participants reported turning to more experienced nurses for answers to questions. Their stated reason for doing so was their perceived comfort with the information provided by more experienced professionals.

Patient-centered care emphasizes the preferences and individuality of the patient. Variations in perceptions about information appraisal could possibly result in inconsistencies in the application of evidence-based information in practice. Based on this research, the preferences and needs of the nurse will also influence patient-centered care.

Print and electronic resources were used in nonurgent situations by focus group participants. It was assumed that, if the hospital provided the resource, it was meant to be used for professional purposes and was trusted and reliable. Again, familiarity, habit, and preferences influenced the type of resource used by nurses. These results may reflect perceptions regarding nurses’ attitudes toward information resources. More research is needed related to the types of information resources that are useful in the clinical setting. Information resources provided to nurses by healthcare organizations vary greatly, and additional studies are needed to develop a minimum set of information resources that healthcare facilities should provide nurses.

Most professional nursing education programs have included courses in nursing research but often neglect the more meaningful and pragmatic quests of clinical scholarship. As healthcare changes and inpatient acuity increases, nurses are often faced with prioritizing care and have little time to seek, evaluate, and apply information that provides answers to their questions. White and Taylor40 questioned
the feasibility of a care model including nurses providing direct patient care in addition to the roles of independently seeking, appraising, and applying research evidence. They reported that these additional roles were so time consuming that should practicing nurses engage in them, they would not meet their clinical obligations. Nurses in leadership positions such as managers, CNLs, and care coordinators may play a vital role in disseminating knowledge to nurses and other members of the healthcare team.41

As patient care shifts to the outpatient and community setting through healthcare reform, information appraisal must once again be considered. Without the resources readily available to nurses providing care in an inpatient setting, information appraisal becomes very important. Where will nurses seek information, and how will they evaluate information provided? Equipping nurses to evaluate information in a variety of care contexts will help prepare them to care for patients in the future.42

**Implications for Nursing Education**

Exposure to information appraisal or information literacy skills, whether in a formal educational or clinical setting, does not guarantee proficiency.43 Further investigation is necessary to learn more about educational strategies and measuring competencies for information appraisal.

Nurses are rarely provided with a formal education regarding information appraisal. Programs focusing on information appraisal in nursing have focused primarily on evaluating research-based literature. Given the expansion of the information society and the variation of information resources, nurses must evaluate information of all types. Educational programs or courses focused on how to evaluate information such as patient experiences, clinical experiences, information from the local context, and research-based information encountered in the clinical setting should be offered. Teaching nurses where to go for information and how to evaluate its trustworthiness could prove to be beneficial in the clinical setting.

Nursing education must prepare nurses for the information society by teaching and developing methods for evaluating resources of all types—not just research-based resources. By knowing when to use certain types of information, more efficient, competent, and confident care can be provided. More research needs to be conducted to support policies allowing time for nurses to engage in seeking, evaluating, and applying information in the clinical setting.

Several organizations such as the Technology Informatics Guiding Education Reform44 and Quality and Safety Education for Nurses (QSEN)45 have developed competencies that guide nurse educators teaching students how to use information and technology to communicate, manage knowledge, mitigate error, and support decision making (QSEN). However, informatics competencies focus on applying technology and information management tools, not appraising information. Subsequently, findings from this study may influence expansion of nursing informatics competencies to include situated information appraisal competencies required in clinical nursing practice.

Study findings also suggest the importance of critical-thinking skills in information use. In an effort to overcome the deficiencies in an information age that requires nurses to evaluate the quality and accuracy of information stored for later use, critical-thinking skills are crucial. Nursing faculty must strive to promote critical-thinking skills in nursing students that will allow them to evaluate information that comes to them in multiple formats while working in various patient care settings.

**Limitations**

This study has several limitations. First, the stratified non-random sample represents mostly female nurses (93%) from one hospital in the southeastern US and does not necessarily represent nurses everywhere. This limitation means that the study findings may not be easily transferable to other healthcare settings. All eligible inpatient units were not represented. Of the units eligible for participation in the study, four units did not have representation. Personal and professional schedules kept some nurses from participating. Scheduling conflicts were thought to have affected unit representation.

**Recommendations for Future Research**

The results of this research provide a foundation for future research in the area of information appraisal. Information appraisal by nurses in the clinical setting needs further investigation to examine the influence of using designated “trusted resources” within the clinical setting. Nurses discussed using resources with which they had previous experience. More needs to be understood about the characteristics and vetting of trusted resources. Studies that explore why nurses reject or ignore certain types of information are also needed.

Participants spoke of not turning to specific types of information in certain situations. For instance, it was clear that nurses looked to research-based or scientific studies when updating or creating policies and procedures. Understanding more about why nurses may choose to not incorporate certain forms of acquired information in their decision making will build on understanding of information appraisal.

Research on educational intervention and training program strategies for promoting evaluation of multiple types of information formats used by nurses is also needed. Comparison studies are needed to explore the differences and consistencies in patient outcomes when trusted versus untrusted information is used during information appraisal by nurses.
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