Evidence-Based Health Services Management for Nurse Leaders: An Intracampus Partnership and Curriculum

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ABSTRACT

OBJECTIVE: In 2008, the New York University Graduate School of Public Service and NYU Libraries faculty partnered to offer a credit course to prepare nurse managers in a graduate program to use the evidence-based paradigm as a framework for locating and filtering best quality evidence to support decision making in the workplace.

METHODS: Using lecture, demonstration, hands-on exercises, online tutorials, and readings, the students gained a theoretical basis for framing answerable research questions and exploiting the structure of bibliographic databases to retrieve evidence for management challenges such as medication administration, patient safety, reducing nursing turnover, among many research topics focused on healthcare quality, cost, and access. Critically appraising the literature in the context of the evidence pyramid is introduced along with sources for both free and fee-based data, statistics, and government information.

RESULTS: Nurse managers gained competence in navigating, citing, and communicating; they demonstrated an understanding of the evidence hierarchy, assessing methodological quality, and the social and ethical issues related to the provision, dissemination, and sharing of information.

CONCLUSIONS: Nurse leaders, in their critical role in contemporary healthcare organizations, have a pressing need to locate evidence-based research. Information literacy embedded in a framework of evidence empowers nurse managers with strategies to retrieve research to support decision making and practice changes in the workplace. A credit course dedicated to an evidence-based approach to the profusion of available information provides a foundation for lifelong professional competence in the use of health services management research.
Introduction

As evidence based healthcare practice provides practitioners with a framework for decision-making, the revolution in scholarly communication and end user access to published evidence has propelled academic libraries’ information literacy initiatives, ideally embedded in course curricula. An intracampus collaboration among faculty in the NYU Wagner Graduate School of Public Service and the NYU Libraries launched a for-credit, information-seeking course to prepare nurse managers in a masters program to locate and use best external evidence. Students who are employed nurses, most of whom graduated with a BSN ten or more years ago, encounter an increasingly complex yet accessible virtual information landscape. At the same time, a paradigm shift to a culture of evidence-based practice is taking place, with information literacy as prerequisite. As identified in the principles set forth by the Institute of Medicine’s Crossing the Quality Chasm: A New Health System for the 21st Century, efforts to redesign the health system include ten rules, including decision making that is “evidence-based” (1). Information literacy, along with basic computer competencies and information management are cited by the Tiger Initiative as components of the competencies for all nurses as we move toward an increasingly virtual environment that will include electronic health records (2, 3).

A comprehensive and integrative approach to information literacy competency is essential for locating external evidence to support workplace decision making. The implementation of a 2-credit course: “Locating Evidence,” was proposed as a curricular component with the idea that librarian-supported evidence-based practice would go beyond covering the mechanics of selecting and using specialized bibliographic databases and accessing full text of articles. Course organizers deemed the traditional librarian “one-shot” guest lecture/orientation to database searching insufficient in the context of this nurse leaders masters curriculum. The NYU Health Sciences Librarian and the Librarian for Public Administration & Government Information, as adjunct professors in the Wagner School of Public Service, developed the curriculum and taught the course, aimed at “research literacy,” to support what Ciliska calls “a culture of reflection on practice” (4, 5). The implementation of this course promotes the NYU Libraries mission of “building, preserving, interpreting, and providing access to rich and diverse collections; teaching the effective use and critical evaluation of information resources; developing creative and responsive services for individual user communities; and capitalizing on innovative information technologies to foster intellectual growth” (6). For the Wagner Graduate School of Public Service, the course will help produce managers who can solve their own research questions or work collaboratively with researchers and translate management challenges into research questions. Understanding and using specialized tools to locate and retrieve evidence empowers nurses to make informed management decisions on the job, and positions them for lifelong learning.

This paper outlines the development of a librarian-supported, for-credit course: “Locating Evidence,” embedded in a masters program to prepare nurse managers to engage in a culture of information seeking and evidence-based practice.
Definitions
The evidence-based paradigm has been adapted from its initial use in medicine to other disciplines and settings, among them allied health, social work, education, consumer health, management, nursing and health services research. Sackett’s widely cited definition of evidence based medicine, “integration of best research evidence with clinical expertise and patient values” (7) is modified in the definition of evidence-based nursing to include: “available resources,” in addition to components of patient preferences and circumstances (8). Muir Gray applies the approach to decision making for groups of patients and populations, “evidence based policy-making, purchasing or management”(9). Evidence based health services management, is defined as the "systematic application of the best available evidence to the evaluation of managerial strategies for improving the performance of health services organizations” (10).

Competency in information literacy, defined as a set of abilities to: "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information,” (11) provides the foundation for locating external evidence. Evidence consists of published research, including consensus of national experts (“external evidence”), as well as the local data, circumstances, resources, experience of clinicians, (“internal evidence”) (12) and patient preferences. While decision-making based in health services management is based on a consideration of all the evidence, the focus of “Locating Evidence,” is identifying the external evidence and situating and evaluating it in the context of the larger information landscape.

Background
In September 2007, the Wagner Graduate School of Public Service (NYU/Wagner) inaugurated the “Master of Science in Management with a Concentration for Nurse Leaders,” a collaboration among New York University and New York-Presbyterian Hospital (NYPH), the University Hospital of Columbia and Cornell (13).

The program requires 36 credits, four electives and five core courses: the health care delivery system, health care management, service excellence, finance, accounting and budgeting, and a Capstone: Advanced Project for Nurse Leaders. A “capstone” is the stone in the middle of an arch and the focus of this requirement is to give students the opportunity for experiential learning that bridges the academic curriculum and the world of practice. As a team, students apply the skills and experience they have learned to a management challenge or opportunity that cuts across academic disciplines and that serves a client organization. Key features of the required Capstone course at NYU/Wagner include: partnership with a sponsoring institution, use of evidence-based management, and a partnership with the NYU Library and librarians to support the evidence based paradigm.

The Capstone syllabus uses an evidence-based approach to design and implement a management intervention (14). This includes 6 steps:
1. Framing the question
2. Finding sources of information
3. Assessing the accuracy of the information
4. Assessing the applicability of the information
5. Assessing the actionability of the information
6. Determining whether the team has adequate information

It was determined that nurse managers needed more than cursory attention to the first three steps of the evidence-based process: 1) Framing the Question; 2) Finding Sources of information; and, 3) Assessing the accuracy of the information; to achieve the Capstone goals. “Locating Evidence” is timed to prepare students for the Capstone course in evidence-based management.

In nursing education, at both the undergraduate and graduate level, there has been a traditional focus on one-semester “research courses” that prepare students for the both conduction of research as well as the identification of external evidence, and the critique of studies. Yet this type of course, using academic questions and assignments, has been described as leading to “misperceptions that EBP is not feasible” in the real world environment”(15). These courses are typically supported by a guest lecture or two by a campus librarian; but this was deemed insufficient for the nurse leaders MS students, in an environment increasingly more focused on linking research to practice. At New York University, the health sciences librarian has been well integrated into College of Nursing curricula for both undergraduates and masters students. Since 2001, information literacy modules have been integrated into each of the four core masters courses’ objectives and assignments, based on a larger plan to encompass information literacy competencies related to nursing research across the student’s years of masters education (16). The NYU College of Nursing’s TREAD EBP model describes how faculty development and a curriculum-embedded approach to both locating and appraising evidence is the foundation for moving toward the goal of creating nurses who are good “consumers” of research (4, 17). This experience of librarian-faculty collaboration and instruction shaped the development of an expanded curriculum for nurse managers.

Course Description and Learning Objectives

The inaugural class of MS Nurse Leaders could enroll in this 2-credit hour elective course, “Locating Evidence,” in the 2008 summer session. The second cohort could take it in Spring 2009. It supports the evidence-based approach, emphasizing the first steps of the Capstone objectives: “Framing the question behind the intervention” and “Finding sources of information.” The curriculum is based on the following Course Learning Objectives:

1. Demonstrate an understanding of information architecture, the scholarly process, and the context of information in the hierarchy of research evidence.
2. Use the evidence-based paradigm to select databases, frame an answerable research question, develop an effective search strategy, locate, retrieve, and critically appraise the literature of healthcare management.

3. Demonstrate competence in organizing, effectively communicating, and citing the published and non-published evidence.

4. Demonstrate an understanding of the social issues and ethical concerns related to the provision, dissemination, and sharing of information.

5. Demonstrate an understanding of a conceptual framework of evidence and information seeking that can be applied to a variety of research questions and environments.

In addition to defining learning objectives to achieve information literacy to use the evidence-based paradigm is the need to dispel misperceptions of what constitutes a comprehensive literature search. Federated search engines (google, other internet search tools, meta search tools such as TRIP, and aggregated point-of-care resources) provide selected results but may mask the structure, functionality, and comprehensiveness of specialized databases, particularly for naïve users of these tools.

**Curriculum**

Both in its timing and content, course activities focused on preparing students for the forthcoming Capstone course. Through the use of readings, class lecture, hands-on exercises, and assignments, online tutorials (both locally produced and others)(18-20) and course management software, the curriculum positions students in the virtual environment and provides a theoretical basis for framing answerable research questions and exploiting the structure of bibliographic databases to retrieve evidence. Students translate a management challenge into a researchable question. For example, “reducing nosocomial infection” becomes “Does hand washing among healthcare workers reduce hospital acquired infections.” Locating the evidence to support a handwashing intervention involves mapping key concepts to indexed terms to execute a database search, for example: handwashing AND cross infection.

Students considered the “anatomy of a database record,” understanding a sample PubMed record and its metadata, as a prelude to construction of a search strategy to translate terms of the research question into searchable terms. Using the PICO (or PICOT) formula for framing a searchable question has become standard instructional practice when teaching EBP, particularly for questions of therapy or intervention (21-23). In the initial literature search students focused on the Patient/Problem/Participants and the Intervention or management strategy. The metadata (descriptors, publication types, and other attributes of the database record) are depicted as “breadcrumbs” to lead students to relevant results.
The PICO formula has limitations, particularly for interdisciplinary fields like nursing and health services research, in which the RCT is not the optimal study design for many questions for which observational data and other methodologies are more suitable to qualitative aspects of healthcare (9, 24). Pre-appraised sources of external evidence, such as the Cochrane Database of Systematic Reviews, DARE, and abstract journals with appraised individual articles such as Evidence Based Nursing, along with the pre-aggregated bundled resources and search tools such as BMJ Clinical Evidence and more complex hedges such as PubMed and CINAHL clinical queries, NLM Health Services...
Research (HSR) Queries (25) are introduced later, presented in the context of the evidence pyramid.

Following two course sessions focused on database searching a class section is devoted to bibliographic management software with a Refworks workshop. At this point the students learn how to employ this organizational tool for aggregating evidence they have located; it provides an opportunity to reinforce course objectives #3 and #4 above.

Limiting and Leveling.
Hands-on assignments involve creating an answerable research question, developing a search strategy, exercises in applying categorical limits to filter results for publication type, leveling evidence according to a hierarchical scheme such as that suggested by Fineout-Overholt and Johnston (22). Many libraries have downloaded and modified the valuable Dartmouth EBM Page Generator to depict hierarchical levels of evidence in a pyramid schematic and link them to locally licensed resources, both for ease of access and to depict that evidence is hierarchical and relative to the broader context (26, 27).

NYU Libraries Evidence Pyramid [http://tinyurl.com/nyupyramid](http://tinyurl.com/nyupyramid)

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Once students are comfortable searching the key bibliographic databases in the health sciences, they are introduced to major health surveys (both U.S. and international), and other sources for locating major statistical sources in health services management.
Required reading included chapters from Greenhalgh’s *How to Read a Paper: The Basics of Evidence Based Medicine*, selected as the course textbook for its readable summaries of research methods and for its accessibility via the library’s electronic collection (24). The class session content situates data and statistics within the evidence-based paradigm as foundational primary sources that infuse the literature at every level of the evidence pyramid. Appendix 1: Hierarchy of Statistical Publications summarizes the key types of statistical sources and access points, including “Search Environments,” which encompass databases and web access points for data from single studies and “The Literature,” encompassing journals, book chapters, statistical reports and single study documentation. This model is a road map for identifying key national health studies. Instructors also introduced methods for finding data using web and licensed database tools, with major U.S. data collections that support analysis in health management and example citations for numeric data sources. Students worked through two National Institute of Medicine online tutorials: “Using Published Reports from the Internet and HCUP” and the “National Health Care Survey,” to guide explorations into the routes for identifying statistical sources as a follow up assignment to the in-class lecture (28, 29).

**Appraisal of Evidence**

Returning to the evidence based management steps, the course then re-focuses on the next steps: 3) Assessing the accuracy of the information; and, 4) Assessing the applicability of the information. An advanced session on critical appraisal includes background readings that overview research methodologies for clinical and nonclinical aspects of healthcare; and an introduction to critical appraisal tools. Strength of external evidence is evaluated both at the level of the meta-data describing the methodology in the database record as well as critical appraisal of the study.

Instructors tasked students with a final assignment based on the initial search strategy and additional feedback. Students returned to the search question, refined the search strategy based on MeSH/descriptors and/or key words, set limits, leveled and evaluated articles that supply the best evidence to answer the research question. In addition to writing a final paper, they made a short presentation to the class, detailing database selection, the search strategy, the pitfalls, appropriate critical evaluation tools, and a general discussion of the iterative search process.

**Discussion**

As a pilot project, Locating Evidence was taught over a three-week period, in 3 four-hour sessions in summer 2008. Student feedback on course content and program relevance was overwhelmingly positive. Students suggested that the course be taught earlier in the program, over a longer time period, interspersed with more “practice time.” Based on these comments, librarians taught the course again in Spring 2009, this time over seven weeks with shorter class sessions, timed at the beginning of the spring semester of the student’s first year in the MS program.

As a diagnostic aid, instructors administered a twelve-question exercise at the beginning and conclusion of the course to spring 2009 students. Student responses provide one
measure of how each individual’s knowledge advanced along the five learning objectives. Overall, students, many of whom had significant professional experience, entered the class with basic information seeking and evaluation skills, but gained experience with selecting specialized databases in the NYU environment, forming search strategies, and evaluating evidence based on the evidence-based information model.

On the whole, students came in already savvy about broader issues associated with evaluating Internet content. This cohort was also reasonably knowledgeable at the outset about issues addressed in the first learning objective: understanding information architecture, the scholarly process, and the context of information in the hierarchy of research evidence. However, the course curriculum increased their ability to select appropriate starting places and sources. Larger differences in correct pre- and post-quiz responses associated with understanding the evidence based paradigm (learning objective 5 in the course) suggest substantive change in student knowledge associated with information architecture. Next steps will be to propose expansion of Locating Evidence to 4 credits to allow adequate time to conduct comprehensive critical appraisal training and to integrate the competencies gained into the masters curriculum, concurrent with other courses to support and empower students to apply information retrieval skills to the evidence-based management process and workplace decision making.

**Conclusion**
Nurse leaders, in their critical role in contemporary healthcare organizations, have a pressing need to locate evidence-based research. Information literacy embedded in a framework of evidence empowers nurse managers with strategies to retrieve research to support decision-making and practice changes in the workplace. The challenge is daunting, particularly for a population of users who were educated in a time prior to the increasingly electronic environment, utilization of powerful online search tools, and a growing culture of evidence-based practice.

Implementation of evidence-based practice requires both awareness and value for research evidence as well as the skills to use the retrieval tools. Nurses need preparation to become empowered and effective managers to influence the management of patient care units as often they are closest to the situation, and with the right training (and senior management support), they can put together evidence in a compelling way leading to eventual managerial interventions. The need for organizations to promote and support a culture of evidence based practice has been identified, with time, knowledge of EBP, and organizational support as major barriers to overcome (30, 31). A masters program with administrative and academic support as such this reinforces that masters preparation in an evidence-based environment is what Pravikoff refers to as an “organizational priority.” This information-seeking course, dedicated to an evidence-based approach, contributes to the process of cultural change needed to advance the use of evidence in nursing practice. As an intra-campus collaboration among library and graduate faculty it provides a model for library initiatives, for curricular components in other masters programs in both the Wagner Graduate School of Public Service and other masters programs for health
professionals, and provides the students with a foundation for lifelong professional competence in the use of health services management research.

Appendix 1: Search Environments

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<tbody>
<tr>
<td>WEBSITES OR DATABASES</td>
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<tr>
<td>Databases (by subscription) that provide search/access to <strong>multiple statistical reports OR multiple datasets</strong></td>
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| Web sites/pages that aggregate reports or provide search/access to **multiple data sources** | National Center for Health Statistics [http://www.cdc.gov/nchs/](http://www.cdc.gov/nchs/)
Healthcare Cost & Utilization Project (HCUP) [http://www.ahrq.gov/data/hcup/](http://www.ahrq.gov/data/hcup/) |
| THE LITERATURE |
| JOURNALS / BOOK CHAPTERS |
| Journal articles that use the source data from the original study as a component for **original research** | Tsai, James; Floyd, Louise R.; O'Connor, Mary J.; Velasquez, Mary M., "Alcohol use and serious psychological distress among women of childbearing age." *Addictive Behaviors*. Feb 2009, 34, (2), 146 - 153. (NHIS) |
| REPORTS |
| Statistical reports that have statistics about **multiple studies** | Health, United States [http://www.cdc.gov/nchs/hus.htm](http://www.cdc.gov/nchs/hus.htm) |
| Statistical reports on the **single study** | Vital and Health Statistics, Series Reports (including Summary Health Statistics Reports) [http://www.cdc.gov/Nchs/products/series.htm](http://www.cdc.gov/Nchs/products/series.htm) |
| THE ORIGINAL RESEARCH / DATA / THE RAW MATERIALS! |
| Research Study and the Data collection/source | National Health Interview Survey (NHIS) [http://www.cdc.gov/nchs/nhis.htm](http://www.cdc.gov/nchs/nhis.htm) |

References


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