Teaching evidence-based practice (EBP) across a four-semester nursing curriculum

Barbara J. Dotson MSN, RN, CNEa, Lisa S. Lewis MSN, RN, CNEa, Julia W. Aucoin DNS, RN-BC, CNEb, Shirley Murray MSN, RNa, Donna Chapin MSN, RN, CNORa, Peggy Walters EdD, MSN, MEd, NEA-BCa

a Watts School of Nursing, Durham, NC 27705, USA
b Duke University Health System, Durham, NC 27710, USA

KEYWORDS:
Nursing education; Diploma; Evidence-based practice

Abstract
There is a consensus among nursing professionals that evidence-based practice (EBP) needs to be taught at all levels of educational preparation. A diploma-registered nurse program has integrated the teaching of EBP across a 4-semester curriculum. This article provides a roadmap for those preparing prelicensure nurses to navigate the process of teaching EBP in the clinical setting.

Health care providers of all professions are expected to provide care based on scientific evidence whenever possible. As the largest group of health care professionals, nurses must have a primary focus on evidence-based practice (EBP). The ability to provide EBP is a necessary competency for nurses at all levels of practice; therefore, teaching EBP is essential in all levels of nursing education (American Association of Colleges of Nursing, 2008; Institute of Medicine, 2003; National League for Nursing, 2013; Stevens, 2009).

In 2005, Stevens developed Essential Competencies for EBP in Nursing as the result of a 3-year research project. In a national consensus roundtable held in 2008, an expert panel was asked to comment on the comprehensiveness and essentialness of statements from these initial competencies in relation to the associate degree-prepared nurse. The result was the development of the associate degree nurse competencies presented in the second edition of the Essential Competencies for EBP in Nursing (Stevens, 2009). The identified competencies appear in Table 1. While these align with the Advancing Clinical Excellence (ACE)-STAR model for EBP (Stevens, 2009), the competencies also stand alone.

Given the national consensus on the importance of teaching EBP to nursing students, it is not surprising that many authors have identified best practices in this educational process. The target audience has been the advanced practice nurse and practicing nurse, and lesser attention has been given to the student-level learner (Levin & Feldman, 2013; Melnyk & Fineout-Overholt, 2005; Pierce, 2007). There is general agreement that the process of EBP is not one that can be taught in a single course or lesson but should be incorporated throughout the nursing curriculum. The incorporation of EBP skills in both clinical and didactic student learning experiences is recommended by Fineout-Overholt, Melnyk, and Schultz (2005). There is evidential support and guidance to encourage the nurse educator to teach students the process of EBP found in the Essentials document (American Association of Colleges of Nursing [AACN], 2008).
1. Literature Review

A review of the literature was completed, searching PubMed and CINAHL for various terms including EBP and nursing education. Results were filtered to include those from 2005 or later. After removing results that did not address associate degree or diploma nursing, references of pertinent articles were reviewed.

Moch, Cronje, and Branson (2010) reviewed the literature for pedagogies, strategies, and curriculum development related to teaching EBP to nursing students, finding a plethora of research and discussion on the topic. Interestingly, although greater than half of all nurses enter practice at the associate degree or diploma level (Institute of Medicine, 2011), almost all of the literature addresses this process in the baccalaureate program context. Many authors emphasize the importance of teaching EBP to associate degree and diploma nursing students (Cronenwett et al., 2007; Pierce, 2007; Profetto-McGrath, 2005), but there exist few reports in the literature of successful approaches for doing so. Two articles were found that inspired the practices reflected herein regarding EBP to nurse educators in the community college setting, although none was found addressing the diploma school population (Larmon & Varner, 2011; Lotz, 2010).

Lotz (2010) described a 4-week on-line course designed to teach associate degree nursing students the skills of EBP. By the end of the course, students were able to develop simple research questions, search the literature for applicable research studies, and create a document outlining how EBP could be applied to the research question or concern. This course, placed in the second year of the curriculum, was described in detail, including a theoretical basis and specific methods of teaching and evaluation. The student evaluations at the end of this course were positive, and the author concluded that the students would be more likely to use EBP in professional practice in the future.

A more comprehensive approach to teaching EBP in the associate degree nursing program was described by Larmon and Varner (2011). In this program, the students were introduced to EBP in the second semester of the first year. EBP skills were taught and emphasized in classroom and clinical settings throughout the remainder of the program. Students learned how to perform literature searches and how to critique an EBP article in the first year. In the second year, students performed a literature search and compiled the findings in a poster presentation shared with the school of nursing. In addition, students selected an EBP article that applies to a patient situation each semester in their clinical coursework.

At a hospital-based diploma program in the southeastern United States, nursing faculty are integrating EBP throughout the entire curriculum, in both didactic and clinical experiences. EBP has been incorporated into the students’ learning activities resulting in improved client outcomes and positive contribution to the health care organization.

2. The Diploma Program

The diploma nursing program is based at a community hospital in the southeastern United States that is a Magnet®-designated hospital and part of a Magnet®-designated health system. The diploma school is partnered with a local private university, which provides the prerequisite classes for the nursing students and gives degree credit for nursing courses. Graduates from the program earn a diploma in nursing from the nursing school and an associate degree in health science from the university. The nursing component of the program consists of four semesters, with EBP integrated in each semester.

As recommended in the literature (Pierce, 2007; Rolloff, 2010), the skills of EBP are taught in a systematic and progressive manner, starting with foundational skills in the first semester and moving toward application and analysis of evidence by the end of the program. Course outcomes include EBP at each level (see Table 2) and are used in student course

<table>
<thead>
<tr>
<th>Table 2</th>
<th>EBP-related course outcomes by semester level.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester</td>
<td>Course outcome addressing EBP principles</td>
</tr>
<tr>
<td>First</td>
<td>Identify knowledge from nursing and related disciplines relevant to safe, effective performance of basic nursing skills</td>
</tr>
<tr>
<td>Second</td>
<td>Use knowledge from nursing and related disciplines as a basis for safe, effective client/family-centered care</td>
</tr>
<tr>
<td>Third</td>
<td>Examine clinical decisions using critical thinking skills based on knowledge from nursing, scientific and humanistic disciplines to support the delivery of safe and effective client centered care</td>
</tr>
<tr>
<td>Fourth</td>
<td>Provide safe and effective evidenced-based nursing care developed from knowledge of nursing, scientific, and humanistic disciplines</td>
</tr>
</tbody>
</table>

1. Define EBP in terms of evidence, expertise, and patient values.
2. Recognize ratings of strength of evidence when reading literature, including Web resources.
3. Recognize clinical knowledge as primary research evidence, evidence summary, or evidence-based guideline.
4. Recognize advantages of systematic reviews as strong evidential foundation for clinical decision making.
5. Using specified databases, access clinical practice guidelines on various clinical topics.
7. Participate in the organizational culture of evidence-based QI in care.
9. Utilize agency-adopted clinical practice guidelines while individualizing care to client preferences and needs.
10. Participate in evidence-based QI processes to evaluate outcomes of practice changes (Stevens, 2009).
evaluations. A semester-by-semester description of EBP skill development demonstrates how the principles are woven throughout the curriculum (Fig. 1).

3. First Semester

As students enter into the first nursing course, it is important to educate and introduce the learner to how to access reliable sources. Wink (2009) stated that it is important to be able to access appropriate and credible literature/data/references. Conducting a library search is a foundational skill, and sufficient attention needs to be put into the development of this skill (Blazeck, Klem, & Miller, 2011; Levin & Feldman, 2013; Shorten, Wallace, & Crookes, 2001).

Students in the first semester course are introduced to EBP in class through lecture and discussion. The students have assigned reading to prepare for class. The didactic portion includes the meaning of EBP, the steps of EBP (Ace Star model), developing questions (population, intervention, comparison, and outcome), and the hierarchy of evidence to support EBP literature. Shortly after the introduction, a librarian from the medical library comes to the class for a 2-hour session. During this time, the students learn in more detail, about professional literature and how to differentiate between research and review literature. The librarian introduces the students to databases, specifically PubMed and CINAHL, which include the differences between each database. The last learning activity involves the students actually doing a search using a database. As the facilitator, the librarian helps the student form a question or statement and guides the student through determining key terms and, then, a search.

A group project provides the students the opportunity to apply some of the elements of EBP. The project consists of three components: an annotated bibliography, an 8- to 10-page paper, and a presentation. The project objectives include searching databases for professional literature, summarizing key ideas from the literature, applying the professional integrity concepts (EBP, the nurse’s role, client education, ethics, legal issues, and informatics) to current literature; and presenting information to peers. The due dates for each part of the project are distributed throughout the semester. The students must meet with the instructor at least once prior to submitting the annotated bibliography. Students are expected to schedule additional meetings to facilitate ongoing feedback, as the project continues to develop. The students are also provided with guidelines and grading rubrics for each portion of the project.

Students are divided into small working groups. As a group, students select a topic from a list provided by the instructor. Based on the topic selected, the students will search for appropriate literature (five to six journal articles, which should include two from EBP literature, three articles from a nursing journal (nursing articles), and one article with a focus on a specific age group (e.g., older adults, adolescents). The students then determine pertinent ideas that will be beneficial to practice for nursing students. The annotated bibliography should include key words used in the search, databases used, the type of articles that have been chosen, and a summary of the articles, including how they will be used to meet the project requirements. In the paper, the students must discuss the key ideas and how it relates with the other professional concepts.

---

Fig. 1  EBP activities by semester.

<table>
<thead>
<tr>
<th>1st</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Definition and theory of EBP</td>
<td></td>
</tr>
<tr>
<td>• Librarian guided literature search</td>
<td></td>
</tr>
<tr>
<td>• Application of literature acquisition skills in assignments and group project</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2nd</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Application of EBP strategies to clinical settings to group project on hospital unit</td>
<td></td>
</tr>
<tr>
<td>• Application of EBP strategies in classroom for:</td>
<td></td>
</tr>
<tr>
<td>• article critique assignment</td>
<td></td>
</tr>
<tr>
<td>• group project on culturally competent care</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3rd</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Application of EBP skills to Quality Improvement proposal</td>
<td></td>
</tr>
<tr>
<td>• includes identification of actual hospital policy or procedure need</td>
<td></td>
</tr>
<tr>
<td>• results in poster presentation to hospital stakeholders</td>
<td></td>
</tr>
<tr>
<td>• carries forward to Clinical Practice Council and influences policy development or revision</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4th</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Application of EBP skills in interprofessional Quality Improvement project</td>
<td></td>
</tr>
<tr>
<td>• nursing students work with geriatric medicine fellows</td>
<td></td>
</tr>
<tr>
<td>• carry out interventional quality improvement project</td>
<td></td>
</tr>
<tr>
<td>• results include policy changes, publications</td>
<td></td>
</tr>
</tbody>
</table>
Another activity used to teach EBP is assigning articles for the student to read after theoretical concepts have been taught. For example, after introducing the concept infection control, students are assigned an article about the impact of isolation on hospitalized patients (Abad, Fearday, & Safdar, 2010). Students are given specific questions to guide them to think about the type of article, the key points, and how this information will impact their practice as nursing students. The students often participate in this activity in small groups and then they share their responses with the class as a whole, facilitated by the instructor to further guide classroom discussion to analyze and critique the article.

4. Second Semester

In the second semester of the program, the students are introduced to the use of EBP in the clinical setting. Assignments allow the students to identify EBP guidelines that apply to client care situations and to begin critically evaluating information sources for use in client teaching.

On the medical–surgical hospital units, students are required to do a small group project to support staff education. In collaboration with the clinical instructor and/or the hospital unit nurse educator, students select a current clinical concern on the unit and seek out relevant literature on the topic. As a group, the students then compile a poster, presentation, or other resource for the nursing staff of the unit. In one example, a clinical unit needed to support staff to consistently use alarms provided on newly purchased beds. The students assigned to that unit found literature that highlighted the importance of using bed alarms, posted copies of the articles in the staff break room, and made laminated cards for the staff with simple instructions for using the bed alarms.

In the classroom setting, assignments are created to allow students to apply the learned EBP skills. In one written assignment, students are required to identify and analyze an article for evidence related to the concept of health promotion. Students also participate in a major semester-long group project focused on culturally sensitive client care. Using literature that notes evidence related to culture, groups are assigned to learn about a cultural group commonly seen in nursing practice in the geographical region of the school. The outcome of the assignment is a paper and an oral class presentation on how to provide nursing care across the spectrum of health to illness for the identified population in a culturally sensitive way. The project requires relevant literature to support information included in the required paper and oral presentation.

5. Third Semester

The focus of the third semester is transition to practice, with much emphasis placed on the role of the nurse, policy and procedure, and best practice in the clinical setting. Students are challenged to investigate current practice on the clinical units and policies of the organization; conduct a thorough literature search; and formulate a clinical question in the population, intervention, comparison, and outcome format (Roux & Halstead, 2009). Students must investigate current practice and compare the practice to the evidence. If there is a better recommendation from the evidence, the students develop a plan of action to address the recommendation. The students present their findings and recommendations for change every semester to faculty and staff at the community hospital. Results of these projects have led to institutional policy changes or have been presented to councils and committees for possible adoption. Examples of projects that were adopted are instituting a check-off system to ensure that clients with advance directives had correct identification bracelets, additions to the latex allergy policy, and formulating a policy to ensure accurate daily weights for all clients.

5.1. Fourth Semester

In the final semester of the program, the students utilize the information learned in previous semesters regarding EBP to engage in the development or refinement of a cooperative quality improvement (QI) project.

This collaborative QI project provides the nursing students the opportunity to work with geriatric fellows, administration and staff of long-term care facilities, and/or various personnel or units within the acute care setting (Dotson & Lewis, 2013). Some of these projects have been a direct result of the students work from the previous semester. Initially, there is a 4-hour class to introduce students to QI and the define, measure, analyze, improve, and control methodology (iSixSigma, 2014). This meeting provides the opportunity for the QI team to come together and identify the project and aim statement or to refine an existing project and aim statement. This class is followed by three 1 hour working sessions, spaced throughout the semester, with the QI project team and stakeholders. All QI team members are required to contribute to the project between meetings, as the meetings serve as a time to make decisions, review the current literature, and determine the next steps to be taken. The nursing students’ outside work includes a literature review for EBP articles/practices related to the QI project and potential interventions. Students are to include evidence related to the various disciplines involved in the project. Several of the QI projects have resulted in policy changes at the clinical site (Dotson & Lewis, 2013).

During this final semester, the students are also engaged in EBP activities in the classroom. While it is only a small part of the semester, students are charged with the evaluation of nursing research. The activity involves the selection of a “hot” topic in nursing or health care. The students explore the topic, looking at both the positive and negative aspects, and then determine the groups’ stand on the issue with identification of the evidence to support the group’s decision.
The evidence must be from reliable sources. The group then presents the topic and references to the entire class.

5.2. Application to Other Schools/Settings

Graduates of this diploma program have theory and experience in the use of evidence-based practice principles. Some graduates working as staff nurses have been instrumental in the creation or revision of policies (American Association of Critical-Care Nurses, 2014). Others have participated in research projects and have been published (Neville, Coe, & Thompson, 2013; Ridout, Aucoin, Browning, Piedra, & Weeks, 2014). Such outcomes support the effectiveness of the EBP component of the diploma school’s curriculum and suggest that integration of EBP theory and application throughout the curriculum provides graduate nurses with EBP knowledge related to expectation of the nursing profession.

6. Conclusion

The integration of EBP throughout the curriculum provides new graduate nurses with a solid foundation on the theory of EBP and its importance to the nursing profession. Having aspects of EBP throughout the curriculum allows the student the opportunity to become comfortable with the process. It encourages the new graduate nurse to be aware of what is happening on their units related to the practice of nursing and to step up and share their knowledge in order to provide the clients with the safest and best care possible.

References


Stevens, K. R. (2009). Essential competencies for evidence-based practice in nursing, 2nd ed. San Antonio, TX: Academic Center for Evidence-Based Practice (ACE) of University of Texas Health Science Center San Antonio.