Teaching and Implementing Evidence-Based Practice in a Hospital Unit With Secondary Vocational Trained Nurses: Lessons Learned

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abstract

Evidence-based practice (EBP) was systematically implemented using the implementation model by Grol et al. Barriers and facilitators for change were diagnostically analyzed. Implementation strategies were directed at the barriers. The two main implementation interventions were (a) a tailored interactive outreach training course about EBP and (b) a patient case discussion based on EBP principles. The authors learned that it is important to simplify the five EBP steps to suit the level of education of the nurses by formulating PICO questions around major patient care topics such as pain, and having a search strategy focusing on (Dutch) clinical practice guidelines and other summarized evidence, such as systematic reviews and critically appraised topics. The authors advised the hospital management to appoint nurse practitioners or other nurses with a master’s degree to help the nurses on the ward with the EBP process steps, especially regarding efficiently searching the research literature and critically appraising the evidence.

This article describes the systematic approach used to teach and implement EBP in the pulmonary unit and the lessons learned.

**STRATEGY DESCRIPTION**

EBP was systematically implemented using the implementation model by Grol, Wensing, Eccles, and Davis (2013). Barriers and facilitators for change were diagnostically analyzed by semistructured interviews and by means of a questionnaire consisting of the EBP Barriers and Implementation Scales (Melnyk, Fineout-Overholt, & Mays, 2008). These barriers and facilitators were used as a basis for selecting different implementation strategies and interventions at individual, social (team), and organizational levels (Table 1). Educational, motivational, and organizational strategies were operationalized by developing two main implementation interventions: (a) a tailored interactive outreach training course about EBP and (b) a systems approach, described by Vermeulen, van Tellingen, Maaskant, and Simons (2009) as “the patient case discussion meeting based on EBP principles,” used as a vehicle to implement and embed EBP in daily practice. The development and content of the two interventions are described in more detail below.

### Tailored Interactive Outreach Training

The interactive outreach training course was developed using the EBP process steps as a common guideline (Table 2). The authors used the three modes of performing EBP proposed by Straus et al. (2004) to shape the train-
ing course. In the “doing” mode, nurses have the skills to perform the first four steps of EBP; in the “using” mode, the critical appraisal step is eliminated and the literature search is restricted to rigorously preappraised resources; in the “replicating” mode, the recommendations of respected EBP leaders are followed (abandoning at least the search for evidence and its detailed appraisal).

Because preceptor nurses, who are educators within a hospital, who have a bachelor’s degree, are important role models and facilitators in coaching and implementing EBP (Holly et al., 2014), the first aim was to train the preceptor nurses of the hospital (N = 10) to become EBP “doers,” and then train eight nurses of the pulmonary unit to become at least “users” of EBP, while the other nurses were intended to become followers. The training course for the preceptor nurses consisted of five 2-hour meetings.

The first meeting of the training course for the preceptor nurses included an introduction to EBP, with special attention for formulating answerable questions. The nurses were taught to distinguish between background and foreground questions. Background questions concern general information about a clinical issue (e.g., regarding the physiology of pain), whereas foreground questions focus on specific knowledge (e.g., a question regarding a valid pain instrument). Background questions need to be answered as a foundation for formulating answerable foreground questions (Melnyk & Fineout-Overholt, 2014). The preceptor nurses were taught to formulate all questions in the PICO format (Patient/problem, Intervention, Control, Outcome) because it supports formulating answerable questions.

In the second meeting, the preceptor nurses were asked to formulate a PICO question based on a patient case. The librarians gave basic PubMed® training, and the nurses searched the literature based on their PICO questions. The librarians helped them define search terms in English by looking up the English translation of Dutch terms on an online dictionary and by teaching them how to find medical subject headings (MeSH) in PubMed. Many EBP guidelines are available in English.

The third meeting provided the nurses with tools for critically appraising the literature by discussing the hierarchy of evidence of different research designs and by teaching the basic principles of different research designs. They were taught to use EBP guidelines and critically appraised topics, which are published in journals in the Netherlands (e.g., in the journal Nursing). They were also taught the basic questions to consider when appraising any study: (a) Are the results of the study valid? (validity); (b) How reliable are the results? (reliability); and (c) Will the results help me in caring for my patients? (acceptability). The nurses were provided with Dutch tool boxes with rapid critical appraisal questions for different research designs (Goossens, Vermeulen, & Ubbink, 2008; Leeflang, Hooff, & Vermeulen, 2008; Ubbink & Vermeulen, 2007; Vermeulen, Korevaar, & Ubbink, 2008; Vermeulen & Ubbink, 2009; Vermeulen, Ubbink, & Hooff, 2008a, 2008b). For example, one of the tool boxes provides a checklist to appraise the validity of randomized clinical trials by asking questions such as “Was the assignment of the patients to the intervention randomized?”

The fourth meeting discussed evidence-based clinical practice guidelines and systematic reviews. The appraisal of the literature reporting on original research designs was considered too difficult for the preceptor nurses, so in the fifth meeting, the nurses focused on practicing the critical appraisal of a guideline linked to a patient case, using the Appraisal of Guidelines for the Research and Evaluation II (AGREE) instrument (Brouwers, 2009). The fifth meeting also discussed barriers and facilitators to EBP implementation on the ward.

The results of an evaluation of the training course for preceptor nurses led to adjustments being made to the course for the nurses of the pulmonary unit. The teaching about the basic principles of different research designs was considered too difficult and was omitted. Reading English research literature was considered difficult, so the authors focused more on national (i.e., Dutch) evidence-based clinical practice guidelines and databases.

Eight nurses of the pulmonary unit attended the adjusted training course.

One problem that arose during the training of the nurses of the pulmonary unit was that in critically reflecting on care and formulating PICO questions, the nurses formulated many problems and PICO questions, which were specific on the details of care and were unsuitable for the literature

<table>
<thead>
<tr>
<th>Step</th>
<th>Process</th>
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<tbody>
<tr>
<td>Step 1</td>
<td>Formulate answerable questions.</td>
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<tr>
<td>Step 2</td>
<td>Search efficiently for the best research evidence.</td>
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<tr>
<td>Step 3</td>
<td>Critically appraise the research evidence.</td>
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<tr>
<td>Step 4</td>
<td>Integrate the research evidence, clinical expertise, and the patient’s values into actual practice.</td>
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<tr>
<td>Step 5</td>
<td>Evaluate the process and result.</td>
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search (e.g., Do you place the reservoir of the drain on the same side or the opposite side of the drain port?). To help them handle this problem, the authors discussed how to prioritize questions according to a sequence of criteria from the literature (Straus, Richardson, Glasziou, & Haynes, 2010): (a) urgency regarding the patient’s well-being; (b) relevance for learning needs; (c) feasibility of answering the question within the available time; (d) prevalence of the question; and (e) personal interest.

Patient Case Discussion to Implement EBP

After the outreach training course, patient case discussion meetings (Vermeulen et al., 2009) were organized as a vehicle to implement EBP into the pulmonary unit daily routines. The patient case discussion meeting is a systematic approach to implementing EBP. The meetings are systematically organized and facilitated on the ward (Vermeulen et al., 2009). In these discussions, nurses themselves selected a patient case from daily practice in which they experienced problems of care (Vermeulen et al., 2009). The nurses discussed and explored this patient case following the steps of EBP.

During the first meeting, the nurses formulated a PICO question about a problem they had experienced (Table 3). Next, two nurses who had attended the outreach training course searched PubMed. A nurse practitioner advised them on how to search for a national (i.e., Dutch) evidence-based clinical practice guideline related to their question. In a second meeting, nurses discussed the literature. In a third meeting, they again discussed the literature and formulated an implementation proposal.

### TABLE 3

**EXAMPLE OF A PATIENT CASE DISCUSSION**

<table>
<thead>
<tr>
<th>Evidence-Based Practice Steps</th>
<th>Elaboration</th>
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<tbody>
<tr>
<td>Formulate answerable questions</td>
<td>“Is the VAS (McCormack, Horne, &amp; Sheather, 1988) a valid instrument for assessing pain in an elderly patient with impaired communication?”</td>
</tr>
<tr>
<td></td>
<td>P: Assessing pain in an elderly patient with impaired communication.</td>
</tr>
<tr>
<td></td>
<td>I: VAS.</td>
</tr>
<tr>
<td></td>
<td>C: Another instrument to assess pain.</td>
</tr>
<tr>
<td></td>
<td>O: Measuring pain in a valid way.</td>
</tr>
<tr>
<td>Results</td>
<td>English literature and a Dutch evidence-based clinical practice guideline (Dutch Ministry of Health, 2009). The Dutch guideline recommended the Rotterdam Elderly Pain Observation Scale (REPOS) (Dutch Ministry of Health, 2009) as a pain observation scale for elderly persons with impaired communication. In addition, taking a multidimensional pain history is recommended for patients with moderate to severe pain.</td>
</tr>
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</table>

Note. VAS = visual analogue score.

During the interviews, the nurses mentioned several positive elements of the training and patient case discussions. Specifically, they reported being able to: (a) reflect critically on care, which the literature regards as a prerequisite for EBP (Melnyk, Fineout-Overholt, Stillwell, & Williamson, 2009); (b) formulate a PICO question based on a patient-care problem they had experienced; (c) find English literature and Dutch guidelines related to the problem; and (d) translate the guideline recommendations into routine practice. As mentioned in the description of the tailored interactive outreach training course, one problem was that nurses formulated large numbers of specific questions on details of care. By teaching them to prioritize questions, the authors got them to formulate more questions on major patient care topics.

Although nurses were able to search for English literature and guidelines, an efficient literature search remained difficult. Critically appraising the literature was considered too difficult for all nurses, even for those with a bachelor’s degree.

### LESSONS LEARNED

Although a systematic approach was used to implement EBP, and the interventions were based on barriers and facilitators, implementation of EBP proved difficult. At first, the authors were somewhat naïve in aiming for preceptor nurses to become “EBP doers” and eight nurses of the pulmonary unit to become at least...
“EBP users.” The authors learned that it is important to simplify the five EBP steps to suit the level of education of nurses by formulating PICO questions around major patient care topics, such as pain, and having a search strategy focusing on (Dutch) evidence-based clinical practice guidelines and other summarized evidence, such as systematic reviews and critically appraised topics. The authors advised the hospital management to appoint nurse practitioners or other nurses with a master’s degree to help the nurses on the ward with the EBP process steps, especially regarding efficiently searching the research literature and critically appraising evidence.

The current study findings were supported in a recent review (Saunders & Vehvilainen-Julkunen, 2016) regarding the state of readiness for EBP among nurses. It concludes that it is crucially important that nurse leaders and educators ensure that nurses working in daily practice have access to critically appraised and translated best evidence in a form that is relevant, practical, and adapted to the local clinical setting, such as evidence-based clinical practice guidelines (Saunders & Vehvilainen-Julkunen, 2016).

DISSEMINATION

The lessons learned led the authors to adjust the training of bachelor’s degree students in the nursing department of Zuyd University. Training in the first years will focus on finding and applying clinical practical guidelines for authentic patient cases. In the final years of training, students will learn to use PubMed and other English databases, such as CINAHL®. Schools that train secondary vocational nurses have been advised to focus on searching and applying Dutch clinical practice guidelines.

To promote the implementation of EBP within the hospital, the educational department plans to offer an outreach training course based on an e-learning module, in which the lessons learned are applied.

To disseminate the results outside the hospital, two symposia about EBP were organized, presenting the lessons learned in oral presentations and interactive workshops.

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