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Review

Pedagogical strategies to teach bachelor students evidence-based practice: A systematic review

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SUMMARY

Aim: The aim of this study is to review international scientific articles about pedagogical strategies to teach nursing students at bachelor degree evidence-based practice (EBP).
Method: A literature review including peer reviewed, original, empirical articles describing pedagogical interventions aimed at teaching bachelor's degree nursing students EBP in the period 2004–2014. Theories of discretion, knowledge transfer and cognitive maturity development are used as analytical perspectives.
Results: The main challenge teaching evidence based practice is that the students fail to see how research findings contribute to nursing practice. The pedagogical strategies described are student active learning methods to teach the students information literacy and research topics. Information literacy is mainly taught according to the stages of EBP. These stages focus on how to elaborate evidence from research findings for implementation into nursing practice. The articles reviewed mainly use qualitative, descriptive designs and formative evaluations of the pedagogical interventions.
Conclusion: Although a considerable effort in teaching information literacy and research topics, nursing students still struggle to see the relevance evidence for nursing practice. Before being introduced to information literacy and research topics, students need insight into knowledge transfer and their own epistemic assumptions. Knowledge transfer related to clinical problems should be the learning situations prioritized when teaching EBP at bachelor level. Theoretical perspectives of cognitive maturity development, knowledge transfer and discretion in professional practice give alternative ways of designing pedagogical strategies for EBP. More research is needed to develop and test pedagogical strategies for EBP in light of these theories.

Introduction

The implementation of evidence-based practice (EBP) in health care is presented as the main response to the future challenges of the health care services. EBP is allegedly capable of solving the problems of ineffectiveness, the lack of patients' safety and quality in health care (Christie et al., 2012) leading to the conclusion that nursing should be evidence-based. The high expectations in turn tend to justify introducing EBP into the curricula of nursing. Although a considerable increase in effort on the part of nursing education to prepare students for EBP, nursing students still struggle to see the relevance of theory and evidence in their nursing activity (Bjorkstrom and Hamrin, 2001; Björkström et al., 2003; Christie et al., 2012; Kyrkjebø et al., 2002; Lechasseur et al., 2011). This review article aims to investigate how nursing education prepares students for EBP.

Theoretical Perspective

Professional practice involves making judgment based on a knowledge base specific for the actual profession. Professionals conclude in practical situations under circumstances of uncertainty, termed ill-structured problems (Molander and Grimen, 2010; Profetto-McGrath, 2005; Schön, 1991). Ill-structured problems are problems to which the solution is not given as they are characterized by uncertainty, ambiguity and *change*. Solving ill-structured problems requires capability for *practical reasoning* or *professional discretion*. Practical reasoning and discretion mean reasoning about what ought to be done in a real situation. Professional discretion is bounded practical reasoning that differs from free fantasy due to a *knowledge base* that is recognized as relevant for the specific professional practice (Molander and Grimen, 2010; Profetto-McGrath, 2005; Schön, 1991). The information suitable for professional knowledge is information that provides the ability to define the problem, identify the objectives, solve the problem and evaluate the result, e.g. the nursing problem solving process (Tanner, 2006). The knowledge base involves evidence derived from the theories and

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research, the actual clinical and organizational circumstances and the patients' situation and preferences (Melnyk and Fineout-Overholt, 2015; Scott and McSherry, 2009). EBP in nursing entails the use of the best evidence when concluding about the ill-structured problems of nursing practice (Rycroft-Malone et al., 2002). EBP means that discretion should be informed by evidence, and not by professionals' personal preferences, habitual routines, or opinion-driven decisions based on traditional practices (Profetto-McGrath, 2005). The term *evidence* embraces different forms of evidence one of which is research evidence (Aita et al., 2007, p. 146). Research utilization (RU) means to let research findings guide or underpin practice (Aita et al., 2007; C.A. Estabrooks, 1999; Profetto-McGrath, 2005). Thus, EBP is not the same as RU, but encompasses RU (Nickerson and Thurkettle, 2013; Scott and McSherry, 2009). RU might be instrumental or conceptual (C.A. Estabrooks, 1999). Instrumental use is the observable use of research findings in practice. Conceptual is the use of research findings to influence how individual practitioners think about the practice.

Knowledge transfer implies processes of applying knowledge gained in one situation to similar situations or the use of metacognitive strategies to make established knowledge relevant in new situations (Lauder et al., 1999). RU and EBP involve transfer of knowledge (Aita et al., 2007). *Knowledge transfer* can be conceptualized as a cognitive and interpersonal process (Aita et al., 2007). Knowledge transfer as an interpersonal process encompasses dissemination of knowledge while cognitive transfer implies to use knowledge as a tool for thinking (Aita et al., 2007). Cognitive transfer of knowledge is involved in critical thinking and discretion. Access, the ability to make available knowledge when this is required, is a prerequisite for knowledge transfer (Lauder et al., 1999). Knowledge needs to be elaborated by the learner to develop ability of access. This elaboration makes theories become *personal theories* (Griffiths and Tann, 1992), a part of the professionals' way of thinking. Lauder et al. (1999, p. 481) indicate that the ease by which knowledge transfer between different kinds of ill-structured problems is achieved has been oversimplified. Subsequently, nursing education ought to consider both the need of elaboration and the variation of ill-structured problems that students encounter.

Critical thinking is considered a prerequisite for EBP that is needed regardless of the nature of evidence, the source of evidence and the settings for its application (Profetto-McGrath, 2005). Critical thinking requires cognitive and intellectual resources (Aita et al., 2007; Lauder et al., 1999; Nickerson and Thurkettle, 2013). The reflective judgment model describes developmental faces through which students develop *cognitive maturity* and ability of critical thinking (King and Kitchener, 2004; Nickerson and Thurkettle, 2013). The students go through stages of *epistemic assumptions*. The less mature stage is based on the assumption that knowledge is certain and immediately present in the situation and that there are certain correct answers, usually provided by authorities, to all questions (King and Kitchener, 2004). At this stage, the students lack awareness of discretion and consider RU merely as something instrumental. At the next stage – the quasi-reflective thinking stage – the student becomes aware that problems might have many answers, and that answers need to be justified. The students at this stage usually chose evidence that fits an established belief (King and Kitchener, 2004). The students struggle to see the relevance of questioning and challenge their own prejudices. At the last stage, the reflective thinking stage, the student is able investigate the problem from different angles. The solutions are justified probabilistically based on a variety of interpretive considerations, that are judged to represent the best understanding based on available evidence (King and Kitchener, 2004). The students are aware that the answer might be challenged and re-evaluated by new evidence or perspectives. The personal process of advancement through the different stages may be facilitated by a learning milieu that supports reflection and questioning (King and Kitchener, 2004). Problem-based learning, reflective journals and journal clubs are examples of learning situations that promote critical thinking and cognitive judgment skills (Profetto-McGrath, 2005). The students need critical thinking abilities in order to see the relevance of evidence in their practice. Consequently, nursing education needs to facilitate the students' development of cognitive maturity and critical thinking. Discretion is conditioned by the ability to perform critical thinking and clinical judgment (Nickerson and Thurkettle, 2013; Tanner, 2006).

Aim

The overall aim of this study is to investigate how nursing bachelor's degree students learn EBP, as presented in international scientific articles about pedagogical interventions aimed at teaching students EBP. This is done by investigating 1) the problems related to teaching the students EBP, 2) the pedagogical interventions used aimed at teaching the students EBP and 3) the evaluations of education in terms of the students' ability to perform evidence-based practice.

Method

This review is based on a systematic search in Medline, Cinahl and SweMed + between September 2013 and January 2014. The search terms are clustered in two bundles: Keyword and Medical Subject Heading (MeSH) for nursing education at bachelor's level, and keyword and MeSH for EBP and RU. The search was limited to articles published between 2004 and 2014, using Scandinavian languages or English. The four-phased approach of Grove et al. (2012) for reviewing literature is used. This includes: Skimming, comprehension, analysis and synthesis of sources. Skimming involves reading the titles, abstract and keyword in order to decide whether to include or exclude the articles. The articles included are peer reviewed, original and empirical products that describe pedagogical interventions to teach bachelor's nursing students EBP and RU. The articles excluded are based on other disciplines than nursing that contain interventions which are not related to the teaching of EBP, theoretical articles and instrument validating articles. Comprehension takes place by critically reviewing the articles, grasping the content, taking notes about the content and main themes. Analysis implies categorizing the articles in relation to the research questions. The author repeated this stage several times. Synthesizing involved clarifying the meaning of the information gathered in light of the theoretical perspectives in order to answer the research questions. Following this process, 39 out of 286 articles were included in this review.

Results

The Problems Related to Teaching the Students EBP

The main problem addressed by the authors is the students' negative attitudes toward research topics (see Table 1). The students find it hard to understand how research findings can benefit nursing practice. The majority of the students do not have the eager and motivation needed to gather, evaluate and use information (Burns and Foley, 2005). They expect the right answer served from authorities like teachers, experienced nurses, physicians, and do not see themselves as active knowledge creators. Schams and Kuennen (2012) point to the same problem claiming that traditional education prevents students to see themselves as knowledge constructors, they are merely encouraged to view themselves as knowledge consumers expecting to find the right answer from either authorities or procedures (Schams and Kuennen, 2012). This may lead to that students continue to expect that practicing clinicians will provide answers to most of the clinically based questions (Leasure et al., 2009, p. 276). Unappropriate and old-fashioned views of learning amplify these problems of dependence and hamper development of critical thinking abilities (Burns and Foley, 2005; Heye and Stevens, 2009; Kim et al., 2009; Leasure et al., 2009; Liou et al., 2013; Mattila and Eriksson, 2007; Schams and Kuennen, 2012; Schmidt and