Nurse Education Today 38 (2016) 82–87

Contents lists available at ScienceDirect

Nurse Education Today

journal homepage: www.elsevier.com/nedt

Effectiveness of an evidence-based practice (EBP) course on the EBP competence of undergraduate nursing students: A quasi-experimental study

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ARTICLE INFO

Article history:
Accepted 10 December 2015

Keywords:
Evidence-based practice
Nursing education research
Baccalaureate nursing education
Curriculum

SUMMARY

Background: International nursing institutions and experts recommend evidence-based practice (EBP) as a core component of the curriculum for nurses. However, the impact of EBP training on the competence of undergraduate nursing students remains unclear.
Objectives: To evaluate the effectiveness of an EBP course on the EBP competence undergraduate nursing students'.
Method: Design: Quasi-experimental study carried out in non-randomized intervention and control groups.
Settings: The study was conducted in a Spanish public university in 2010.
Participants: Out of 420 second- and third-year nursing students, 75 were enrolled in the EBP course, forming the intervention group, and 73 were not enrolled in this course were recruited as controls.
Procedure: The educational intervention was a 15-week course designed to teach EBP competence. The EBP Competence Questionnaire (EBP-COQ) was administered before and after the intervention. Repeated-measure ANOVA was used to compare intervention and control group scores before and at two months after the 15-week intervention period.
Results: At 2 months after the EBP course, mean EBP-COQ scores of the intervention group were significantly improved versus baseline in attitude (4.28 vs. 3.33), knowledge (3.92 vs. 2.82) and skills (4.01 vs. 2.75) dimensions, whereas little change was observed in control group scores over the same time period. Repeated-measures ANOVA revealed a significant effect of Time × Group interaction on global competence and all three EBP-COQ dimensions.
Discussions: Undergraduate nursing students experience positive changes in EBP competence, knowledge, skills, and attitude as the result of a 15-week educational intervention on EBP. This EBP course may provide nursing school educators and policymakers with a useful model for integrating EBP teaching within the nursing curriculum.

Introduction

Evidence-based practice (EBP) is an instrument of great utility in nursing care, helping to reduce health costs (McGinty and Anderson, 2008) and variability in clinical practice, furthermore to improve the quality of nursing care practice (Parker, 2002) and health outcomes (Meijers et al., 2006). It is also reported to increase the satisfaction of nursing professionals (Maljanian et al., 2002).

The acquisition of EBP competence is regarded as important to ensure that the decisions of healthcare practitioners are based on the best available evidence (Frenk et al., 2010). A consensus meeting of international EBP experts affirmed the need for all healthcare professionals to understand, recognize, and implement evidence-based policies and to have a critical attitude towards their own practice and toward evidence in order to deliver best practice (Dawes et al., 2005). EBP has been declared as a professional responsibility and central characteristic of the work of nurses by the International Council of Nurses (ICN, 2007).

Nevertheless, the incorporation of EBP into clinical nursing has been slow and remains a challenge to the profession. In a recent survey by the American Nurse Association, only 46.4% of nurses believed that EBP was routinely applied in their center (Melnyk et al., 2012), while a European study found that only 24% of nurses could be described as users of research (Wangensteen et al., 2011). It should be taken into account that many nurses were trained before the EBP paradigm was established and lack the skills for its application. Moreover, nurses have reported numerous difficulties in implementing EBP in their daily work (Sadeghi-Bazargani et al., 2014).

Melnyk et al., (2008) proposed two requirements for accelerating the adoption of EBP in clinical practice: (a) the acquisition by practicing

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http://dx.doi.org/10.1016/j.nedt.2015.12.012
0260-6917/

nurses of adequate EBP knowledge and skills and strong beliefs in the clinical value of EBP, and (b) the development by nursing students of life-long skills for EBP implementation and the motivation to deliver the highest quality of care. Also, Brown et al., (2010) showed that preparation of future nurses to engage in EBP is essential to provide the cost-effective, safe, and highest quality care and best outcomes for patients.

Hence, educators of nursing students have a major responsibility in this paradigm shift in nursing. On leaving university, nursing graduates are expected to be consumers of research, understand research procedures, identify relevant clinical problems in need of research, collaborate in research teams, and apply evidence-based research in clinical practice (American Association of Colleges of Nursing, 2006; American Nurses Association, 2010). Achievement of these objectives requires an improvement in the EBP competence of health science students, i.e., in their attitudes toward this practice and in their EBP knowledge and skills (Dawes et al., 2005).

Framework and Background

In this educational setting, competence is understood to be the capability to choose and use an integrated combination of attitudes, knowledge, and skills with the intention of developing a task in a given context (Korthagen, 2004). According to the Classification Rubric for EBP Assessment Tools in Education (CREATE), *attitudes* refer to the values ascribed by the learner to the importance and usefulness of EBP to inform clinical decision-making, *knowledge* refers to the learner's retention of facts and concepts about EBP (e.g., the ability to define EBP concepts, list the basic principles of EBP, and describe levels of evidence), and *skills* refer to the application of knowledge, ideally in a practical setting (Tilson et al., 2011).

Various strategies have been proposed for the incorporation of EBP into undergraduate nursing education. Burns and Foley (2005) suggested its inclusion in the first year to foster an EBP approach to clinical practice, while others supported its introduction at a later stage after training in research methods (Dawley et al., 2001). Fineout-Overholt et al., (2015) emphasized the importance of organizational support, the identification of barriers to EBP teaching, and the utilization of faculty EBP mentors. Approaches to EBP and the degree of its implementation vary among countries and educational settings, but there is wide consensus on the need for nursing students to become well equipped as effective consumers of research (Ciliska, 2005). Melnyk et al., (2010) described seven steps in the EBP process: (a) cultivation of a spirit of inquiry; (b) formulation of an answerable question; (c) systematic search for research evidence; (d) appraisal of the validity, relevance, and applicability of the evidence; (e) integration of the research evidence with the clinical expertise of the practitioner and the wishes and desires of the patient/family; (f) implementation of the evidence-based decision and evaluation of the outcomes; and (g) dissemination of the results.

Review of Literature

The literature on EBP in university nursing education has generally centered on teaching methodologies, mainly describing models developed in North America such as the ARCC-E (advancing research and clinical practice through close collaboration and education) (Fineout-Overholt et al., 2015); the TRADE EBP model (Krainovich-Miller et al., 2009), and the SON (School of Nursing) ladder for success in EBP (Bloom et al., 2013).

However, few studies have evaluated the most effective approach (Smith-Strøm and Nortvedt, 2008; Kim et al., 2009; Jalali-Nia et al., 2011; Zhang et al., 2012; Finotto et al., 2013). Although available data are inadequate to allow valid conclusions to be drawn, positive results have been reported with the utilization of interactive teaching (Kim et al., 2009) and self-directed learning (Zhang et al., 2012), although there was no control group in the latter study. Good results have also been claimed for curricular models developed in Norway (Smith-Strøm and Nortvedt, 2008), Iran (Jalali-Nia et al., 2011), and Italy (Finotto et al., 2013), although there was no control group in the studies in Norway or Italy, the questionnaire used in Norway was not validated, and those applied in Iran and Italy evaluated very specific aspects of the EBP course, limiting results generalization (Jalali-Nia et al., 2011, Finotto et al. 2013).

EBP teaching to healthcare professionals has mainly been documented in medical students and physicians (Young et al., 2014; Ilic and Maloney, 2014). There is a special need for further research on EBP teaching to undergraduate students of nursing (Moch et al., 2010), for whom the optimal approach remains under debate (Ilic and Maloney, 2014).

With the above background, the aim of this study was to evaluate the effectiveness of an EBP course for undergraduate nursing students on their EBP competence, measuring changes in their EBP attitudes, knowledge, and skills.

Methods

Design

A prospective, quasi-experimental study was performed in a non-randomized intervention group of nursing students who attended an EBP course and a control group of nursing students who did not. EBP competence scores were compared between the groups and between before and after the six-month study period in each group.

Sample/Settings

The target population comprised the 420 students enrolled in the second or third year of their nursing degree at a public university in Spain during the spring term in 2010. Based on the estimations of Bausell and Li (2002) for a two-way mixed ANOVA design (between-subject factor: EBP intervention yes/no, within-subject factor: repeated measures), a sample size of 53 students was required to achieve statistical power of 80% and 95% confidence to detect a standardized mean difference of 0.55 between intervention and control groups. Calculation of the standardized mean difference considered a minimum difference of 0.22 points in the EBP-COQ score and an estimated standard deviation of 0.40, taken from a study of the EBP-COQ in Spanish nursing students (Ruzafa-Martinez et al., 2015). The sample size was increased (see below) to cover possible losses to follow-up.

Procedure

It was not possible to randomly assign students to the groups, because the EBP course was offered to all second- and third-year students as one of the "free options" in the curriculum. The exclusion criterion for all study participants was an existing or previous enrolment in an EBP course. Out of the target population of 420 students, 75 eligible students were enrolled in the EBP course, forming the intervention group, while 73 eligible students agreed to participate in the control group.

In both groups, EBP competence (attitude, skills, and knowledge) was measured at baseline and again at 2 months after the 15-week intervention period using the Evidenced-Based Practice Competence Questionnaire (EBP-COQ). This was first completed by the students during the meeting in which they were enrolled in the study. The follow-up questionnaire was administered by e-mail; non-responders were contacted a maximum of three times.

The Educational Intervention

The 15-week educational intervention took place in the nursing school of a Spanish public university during the spring term in 2010; it comprised 60 h in class plus 90 h of student work, with a minimum attendance requirement of 80%. All students had already attended