How can we maximize nursing students’ learning about research evidence and utilization in undergraduate, preregistration programmes?
A discussion paper

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Accepted for publication 25 February 2012

Abstract

Aim. This article presents a discussion on how to maximize nursing students’ learning about research for evidence-based practice in undergraduate, preregistration programmes.

Background. Evidence-based practice may use information from many sources, including research. Research utilization concerns the translation of research findings into practice. Thus, while evidence-base practice may not be solely research-based and hence more than research utilization, research remains an important ingredient in ensuring quality and cost-effective care and an academic requirement for nursing students undertaking a science degree-level qualification. Nevertheless, how educators can best support research-related learning and application remains uncertain and requires discussion.

Data sources. MEDLINE, CINAHL, Social Science Citation Index, British Nursing Index, and Intute were searched for papers published 1980–2011 using the following search terms: research, research utilization, evidence-based practice, learning, teaching, education, training, nursing, health, and social care.

Discussion. Nursing students need to be able to value the relevance, authority, and utility of nursing research for patient care through embedding research learning in both academic and practice-based settings. Students can be supported in learning how to access, understand, and appraise the authority of research through weaving these skills into enquiry-based learning. Furthermore, encouraging students to undertake research-based practice change projects can support research utilization and development skills.

Conclusion. Research should be fully embedded throughout nursing curricula beyond the confines of ‘research classes’, integrating learning in academic and practice-based settings. Although this requires synergistic and integrated support of student learning by nurse educators, managers, clinical practitioners, researchers and policymakers; nurse educators have a pivotal role.

Keywords: evidence-based practice, evidence-based nursing, nursing education, nursing research, research education, research utilization
Introduction

This article presents a discussion of how to maximize nursing students’ learning of research-evidence for use in practice through undergraduate, preregistration programmes. Evidence-based nursing requires that practitioners being aware and responsive to implementing research and other forms of evidence in practice (Rycroft-Malone et al. 2004). Although there is general acceptance by policymakers and practitioners that research findings should be widely used as evidence for practice (Parahoo 1999, McSherry et al. 2006, Dobbins et al. 2007), there is some indication of limited understanding and use of research in health care (Joseph Rowntree Trust 2000). It has been estimated that up to 76% of medical treatments are research-based (Imrie & Ramey 2000). Although many nurses use research-evidence at least once a month, only 64% of these nurses use such evidence at least weekly (Alspach 2006). This suggests that research has a limited impact on current practice, even though research-evidence can potentially support all nursing activities. Sitzia (2002) suggests that a combination of a lack of time and incentives and a nursing culture based on ritualism, task completion, and following orders rather than autonomous decision-making contributes to lack of practical application of research.

Nursing research is essential for cost-effective and quality care provision [International Congress of Nurses (ICN) 2007]. Although nursing is described as a ‘bedrock for health services’, it is acknowledged that this should be further strengthened through effective regulation, management, education, and research [World Health Organisation (WHO) 2002]. Furthermore, health systems should be transformed through fully collaborative education, research, and service delivery [World Health Organisation/PEPFAR (WHO/PEPFAR) 2009]. Thus, education, research, and service delivery can be better integrated so that the right research is conducted (research useful to practice) and in tandem, service supplies relevant questions that research might answer. Educators (a generic term indicating anyone who supports student learning) have a pivotal role in mediating between research and practice, ensuring that every nurse can access, understand, apply, and support research-evidence in practice. In addition, educators can support nurses’ skills in articulating and developing practice-focused and useful research questions. Nevertheless, how this can be achieved requires further consideration.

Background

Many national codes of nursing ethics or conduct emphasize the importance of evidence-based care or the application of relevant knowledge to practice [American Nurses Association (ANA) 2001], Australian Nursing and Midwifery Association [ANMC] (ANA 2001, ANMC/RCNA/ANF 2002, [Nursing and Midwifery Council (NMC) 2008a]). However, there are deep and historical tensions between ‘professional’ and ‘service’ visions of practice that limit discussion of how evidence-based practice (EBP) should be manifest (Taylor & Allen 2007). Jennings and Loan’s (2001) literature review of medical and nursing literature surmised that many nurses underestimate the implications of the evidence-based movement for their practice; for example, if rational, clinical decision-making based on scientific quantification of cost and effectiveness can be compatible with holistic-focused, personalized care (Holmes et al. 2006, Miles et al. 2007, 2008). It has been estimated that 64% of Registered Nurses have limited understanding of evidence-based nursing (Alspach 2006) and that nurse executives also have an inconsistent understanding of the term (Sredl 2008). Thus, despite professional imperatives to undertake EBP, there is some uncertainty about what it means in practice and this complicates any discussion about what and how students should be taught.

It is acknowledged that EBP is a basis for clinical decision-making (Sackett et al. 1996) and the development and growth of EBP is rooted in professional and societal demands for accountability, quality, and safety in healthcare (Stevens & Staley 2006). Evidence-based practice is a means of ensuring effective interventions are delivered (McSherry & Haddock 1999) yet, EBP does not merely mean ‘research use in practice’ (Jennings & Loan 2001) as research utilization is only the translation of research into practice (Polit & Beck 2012). Research is one form of evidence used by nurses (Rycroft-Malone et al. 2004); nurses also use information from their local environment, patient and clinical experience to inform their evidence-based decision-making. It has been acknowledged that research knowledge if ‘de-contextualised’ from theory is incomplete (Fawcett & Garity 2009) and if separated from other forms of knowing leads to distorted and partial understanding (Chinn & Kramer 2008). Furthermore, research-evidence should be interpreted and applied in light of local knowledge, professional experience (Proctor & Rosen 2004), and patient preference. Thus, educators need to facilitate students’ learning about how to interpret and apply research in the context of other forms of knowledge, i.e. they need to facilitate knowing the ‘relevance’ of research for practice.

Although research is not the sole basis of evidence-based decision-making (Rycroft-Malone et al. 2004), it remains an integral component. One of the cornerstones of EBP is a ‘hierarchy of evidence’ which indicates the authority of
Maximizing student nurses’ learning about research utilization

Evidence produced by research studies (Jennings & Loan 2001, Polit & Beck 2012). The emphasis and authority of Randomized Controlled Trial evidence in this hierarchy has been contested in nursing (Swinkels et al. 2002, McCourt 2005, Mantzoukas 2008); especially as such evidence encourages application of standardized knowledge rather than personalized care (Adib-Hajbaghery 2009). Nevertheless, it is important that educators support students to judge the ‘authority’ of research (its weight and quality) before it is applied to the care of individual people, clients or carers.

Historically, Hunt (1981) suggested nursing was traditional, ritualistic, and hierarchical; resulting in a division between those who had the authority to make changes in practice, but did not want to; and those who wanted to make changes but had no authority to do so. It has been stated that the clinical context may pose the greatest barrier to implementation of research-evidence in practice (Pallen & Timmins 2002), therefore, that management and leadership are integral to promoting research use. Current UK National Health Services care standards are rooted in a ‘clinical governance’ framework which holds organizations and staff accountable for improving standards and quality of care (DH 1999). Evidence-based practice has been linked to clinical governance as a mechanism to ensure that clinicians engage in safe and effective decision-making (McSherry & Pearce 2011). Clinical governance and EBP linkages are further supported by proposals to change from target driven performance to evidence-based service outcomes (DH 2010). Though this suggests that healthcare organizations should be supportive of research use in practice, evidence indicates that practitioners still lack power or managerial authority to make research informed changes (Parahoo 2000, Glacken & Chaney 2004, Hannes et al. 2007, Atkinson et al. 2008, Chau et al. 2008, Yava et al. 2009). Although there are initiatives that support research-based organizational change (for example: Stetler 2001, Rycroft-Malone 2004, Reigle et al. 2008), every healthcare organization has not adopted one of these approaches and often practitioners need to use research findings without integrated organizational supports. Thus, it is important that educators support students to learn how to apply research to practice; i.e. knowledge, understanding and skills in the ‘utility’ of research.

Degree education should make learners aware of the research process and appreciative of the value of research (Strum-Kenny et al. 1998, Quality Assurance Agency [QAA] Scotland 2001, QAA 2008), i.e. its relevance, authority, and utility. Internationally, nurse education has become more university-based to develop nursing workforce capability (Spitzer & Perrenoud 2006, Watson 2006). The ‘Tuning Project Group’ which aimed to standardize European Higher Education nursing competency definitions, proposed that practitioners who obtain a degree in nursing should be able to use research (Gobbi 2005). It has been argued that the Tuning Project was not a sufficient stimulus to create an ‘all graduate’ profession in the continent (Davies 2008), nevertheless, the UK is commencing graduate-only, preregistration nursing education [Nursing and Midwifery Council (NMC) 2010]. These new standards for nursing education (NMC 2010) indicate that all undergraduate programmes should include training in research methods and use of research-evidence.

As a qualified nurse is responsible and accountable for providing safe, person-centred, evidenced-based care (NMC 2008a); there is need to consider how to best develop research knowledge and utilization skills in undergraduate nursing students. Some authors indicate that lack of research knowledge during nurse training contributes to poor research utilization by qualified nurses (Rutledge et al. 1998, Closs et al. 2000, Marsh et al. 2001). As the amount of nursing relevant research knowledge increases exponentially (Estabrooks 1998), ineffectively managing the quantity of knowledge has become a barrier to research use in practice (Carrión et al. 2004) even among research active nurses (Adamsen et al. 2003). In consequence, accessing, understanding, and managing the volume of relevant and authoritative research-evidence are important career-long nurse competencies (Alien et al. 2008).

Research access and understanding are not sufficient to ensure that research is used in practice, Mattila and Eriksson (2007) state that undergraduates are under-committed to research due to little exposure to research use in clinical practice. Given that nursing students spend half their learning time in practice-based environments (Nursing and Midwifery Council 2010), practice-based educators have roles in enhancing students’ awareness and use of research [Nursing and Midwifery Council (NMC) 2008b]. Carrión et al. (2004) proposes that impracticality in applying some research findings to practice is another barrier. Thus, in clinical environment with time and resource pressures it is necessary to consider: when, how and which research findings should be used and to develop a sustainable mechanism for incorporating research into practice (WHO 2006). It is therefore, important to consider skills that nurses in practice require to effectively and appropriately use research-evidence.

The UK NMC (2010) Standards place responsibility on educators to teach and facilitate learning regarding interpreting and using research-evidence (R5.6.1) to inform and address areas of care (detailed in R5.6.2). They state:

All nurses must appreciate the value of evidence in practice, be able to understand and appraise research, apply relevant theory and research
findings to their work and identify areas for further investigation (Nursing and Midwifery Council 2010: Domain 1.9, p 14).

The Nursing and Midwifery Council (2010) requires that students are competent in providing evidence-based care before gaining entry to the nursing register; and that nurses maintain this competence after registration (NMC 2008a). Research-evidence knowledge and utilization competence therefore are important career-long skills and how this can be achieved requires wider debate and will be explored in this article using four headings, derived from Nursing and Midwifery Council (2010):

- Appreciating the value of research in practice
- Accessing, understanding, and appraising research
- Applying relevant research findings
- Identifying areas for further investigation.

Data sources

Five healthcare related databases (MEDLINE, CINAHL, Social Science Citation Index, British Nursing Index and Intute: Health and Life Sciences) were searched. Any relevant paper (research studies, discussion articles, editorials, literature, and systematic reviews) published in English from 1980 to 2011 were sought. The PIO (population, intervention, and outcome) framework was used to help structure the search. ‘Population’ search terms included: nursing, healthcare or social care students or practitioners; and ‘intervention’ terms included: learning, teaching, education, or training. ‘Outcomes’ included: research knowledge, research utilization, research appraisal or application of research to practice and evidence-based practice. Titles and abstracts (if available) from the searches were first screened for relevance to the discussion’s aim, then any publications deemed relevant were sourced for inclusion in this article.

Discussion

Appreciating the value of research in practice

Although nurses need to gain appreciation of the value of research-evidence during nurse education many clinical nurses are sceptical about research use in practice (Sitzia 2002). Therefore, educators should engage students’ commitment to research during educational socialization to the profession (Ahn et al. 2007). The educator has a key role in supporting and guiding students in: the nature of research-evidence (authority), the type of research required in clinical practice (relevance), the potential power of research to transform, and improve practice (utility).

One criticism of the evidence-based movement is that the ‘hierarchy of evidence’ is based on summary research-evidence from populations and groups (Bluhm 2005) and it does not, therefore, include consideration of the individual values of people (Tonelli 2001). In nursing, ‘evidence-based care’ has become synonymous with scientific, nevertheless, standardized knowledge-based care (Adib-Hajbaghery 2009). Thus, educators need to support students in applying research-based knowledge to personalized care. This can be undertaken through integrating a discussion of the authority of evidence through case-based learning (Ong & Narasimhan 2010) in both clinical and academic learning environments. Such learning can be strengthened by the use of written case-studies, clinically based skills and clinical oral examinations (viva) assessment methods with grading explicitly awarded for individualization of research-based care.

If the value of research-informed nursing knowledge is not uniformly valued or applied throughout an educational programme there is a risk of developing a ‘hidden curriculum’ through which students unintentionally learn that research is not relevant for practice (Coverdale & Weiss Roberts 2008). Immersion in the ‘value of research’ can be undertaken by embedding research throughout the curriculum (Chaboyer et al. 2004, Hawanik & Thorpe 2008). Thereby, all academic classes and practice-based experience, potentially present learning opportunities for discussing research to inform professional judgement and action (supporting value in the relevance of research).

Educators need to support students to appreciate the utility of research. This can be supported by the use of interactive learning strategies (group work and all forms of in class or online interaction) as favoured by many students (Halcomb & Peters 2009). Such strategies encourage students to appreciate and rehearse how research can be integrated into clinical decision-making. Furthermore, the use of problem-based learning (Bligh et al. 2000, Barrow et al. 2002) or enquiry-based learning (Price 2003, Horne et al. 2007) can help integrate research utility teaching throughout nursing curricula. These teaching methods can help students to develop information searching and accessing skills (Barnard et al. 2005). However, statistical knowledge (even in a rudimentary form that will allow an understanding of the results of positivistic research) and research training is often not integrated in problem-based learning approaches (Bland 2004, Horne et al. 2007). Thus, efforts should be made to ensure that all forms of research are fully integrated into curricula. It has been further suggested that helping students search and apply research about a practice issue that interests them can help students to develop research appreciation (Björkström & Hamrin 2003).
Accessing, understanding, and appraising research

Healthcare students who successfully complete research programmes may have positive attitudes towards evidence-based practice; however, they infrequently access research resources that facilitate application of research to practice (Caldwell et al. 2007). Although all practitioners will not undertake research, the practising nurse should be able to understand, critique, and assimilate research relevant to their field (Pankhurst & Zainal 1998). Nevertheless, some practitioners have difficulty accessing and critiquing research (Pravikoff et al. 2005, Birks et al. 2008, Mehrdad et al. 2008). Taylor and Allen (2007) suggest that this research-appraisal deficit may have arisen through pressures to educate large numbers of nurses with practical skills.

Many qualified nurses rely on their peers (including specialist nurses and educational facilitators) to keep their evidence-based knowledge up-to-date (Thompson et al. 2004, Winters et al. 2007). Peer-based learning may be insufficient to keep knowledge current as one study found that nurses in specialist practice posts had not undertaken enough continuing professional activity to facilitate development of advanced knowledge and skills (Drey et al. 2009). Given that many nurses base their practice on experience and knowledge learned in preregistration education (Estabrooks 1998), effective research teaching needs to empower learners to identify relevant research material (by addressing research access and understanding issues in programmes) and to establish the authority of relevant research-evidence (developing appraisal skills).

To identify relevant research for practice nurses need to have access to research resources (such as reports and databases) and know how to use these. Worldwide-web research resources have increased in importance (Bakken et al. 2004, Bond & French 2010). Some studies have identified that qualified nurses are hindered from accessing online research by purchasing costs (Edwards & Lockett 2004) and some find it difficult to manage the volume of resources available (Docherty 2003). Although there has been an increase in availability and access to research materials (Thompson et al. 2001); there has also been a growth in websites that are not sufficiently research-based for use in professional practice (Morris et al. 2001, Booth 2006). Thus, nursing students should learn how to effectively evaluate evidence from web-based resources (Billings 2005). This can be addressed during nursing programmes by encouraging use of reputable, research resources available to practising nurses e.g. NHS Health Information Resources (National Health Service Evidence 2011). In addition, educators should forge closer collaboration with information managers/librarians and build information literacy skills into education programmes (Barnard et al. 2005, Carlock & Anderson 2007, Tarrant et al. 2008).

Research needs to be communicated in a form that is understandable to practitioners (Isaac & Franceschi 2008). Educators may work with researchers to ensure that ‘user-friendly’ versions of research are available to students and practitioners. For example, the Cochrane Collaboration (2010) produces ‘user-friendly’ podcast summaries of Cochrane reviews. Educators can also ensure that learners can access, understand, and appraise research during nurse education (Thompson et al. 1999). Navarro (2005) argued that students often do not understand research principles; therefore, research lacks ‘meaning’ and this hinders application of relevant research knowledge to practice. Olade (2004) suggests this may be addressed through teaching critical appraisal skills and ensuring learning is linked between academic and practice-based settings. Clinical practitioners who facilitate nursing student learning in practice should help students identify relevant research for practice (NMC 2008b).

Practitioners need more skills in critically appraising research findings (Karina & Nooriah 2002, Veeramah 2004) thus, students need to learn skills in critically appraising evidence and what evidence to select (i.e. skills in establishing the authority of research-evidence). A ‘Hierarchy of evidence’ has been proposed for both qualitative (Daly et al. 2007) and quantitative studies National Health and Medical Research Council (1995) to support practitioners and policymakers evaluate the ‘authority’ or weight of evidence from various study designs. Mantzoukas (2008) suggests that limitations of this hierarchy hinders use of appropriate evidence in practice; nevertheless educators can support students’ understanding of the purpose, limitations and strengths of various research designs for practice-based decision-making. There is some evidence that teaching research appraisal can improve undergraduates’ skills in assessing the methodological rigour of a study (Norman & Shannon 1998). Critical appraisal skills can be developed through use of critical appraisal frameworks (Duffy 2005, Krainovich-Miller et al. 2009) and structuring educational sessions in three steps: a clinical question to be addressed, searching for evidence and appraising evidence (Ghali et al. 2000, Smith-Strom & Nortvedt 2008); wherever possible this process should be specific to a (real or simulated) patient (Bergus et al. 2004).

Nursing related studies often have small samples (Fahs & Kalman 2008, Griffiths et al. 2009) which do not form a strong evidence-base for practice (Griffiths et al. 2009). Solely sourcing and evaluating many small, lone studies
may be unfeasible for practitioners; furthermore given the increasing volume of healthcare research that nurses need to access, appraise and apply, it has been suggested that systematic reviews and meta-analyses offer nurses relevant, preappraised and synthesized material (Evans 2001, Houde 2009). A study (Ciliska et al. 1999) found that systematic reviews overcame both ‘perceived difficulties in appraising research’ and ‘lack of time barriers’ to research utilization. Polit and Beck’s (2012) hierarchy of evidence supports practitioners in valuing the potential authority of systematic reviews. Academic staff can assist students and practitioners understand the significance of appraisal and application of systematic reviews in practice (Krainovich-Miller et al. 2009). Research-based policies, protocols, guidelines, and pathways may help nurses identify what can (i.e. relevant research) or should be applied (i.e. usable or feasible research) in practice (Baily 2002, Doran & Sidani 2007). Not all practice protocols are research-based (Morin et al. 1999). Despite such problems it can be contended that preregistration students should be encouraged to access systematic reviews and research-based policies, protocols, guidelines, or pathways; therefore, such resources (if of sufficient quality) should be presented on module reading lists, learning materials, and teaching content in nursing curricula.

Applying relevant research findings

Whilst it has been argued that graduate nurses have the ability to critique research findings, barriers to research utilization remain in practice (Parahoo 2000, Gerrish & Clayton 2004) and junior nurses in particular feel that they lack the autonomy necessary to change care (Gerrish et al. 2008). A ritualistic care culture, poor team working, including lack of colleague support and multidisciplinary support (Bryar et al. 2003, Hutchinson & Johnston 2004), and no incentives for changing practice (Sitiza 2002, Schoonover 2009), have also been cited as barriers to research utilization. It has, therefore, been suggested that clinical context, culture, and leadership (Mattila et al. 2005, Meijers et al. 2006) needs to be transformed from ‘barriers’ to ‘levers’ to facilitate research application to practice. Therefore, education, managers, and policymakers through collaborative working need to develop a culture that supports research-based change and facilitates students to develop leadership skills in implementing new or revised practice informed by research findings.

Currently there is no universal agreement about how research for EBP is used, applied or evaluated in practice (Taylor & Allen 2007) therefore there is a need for educators to identify ways to support students’ research-use in clinical settings. For example, educational outreach roles (in which educational staff visit clinical areas and support practitioners’ decision-making), can potentially help reduce any practice-theory divide (Lambert & Glacken 2005) and change practitioners’ practices and may improve patient outcomes (O’Brien et al. 2007). Moreover, there is some evidence suggesting that students can be encouraged to undertake project work in which they can tackle a clinically relevant question, find evidence to support it and implement the findings into practice (Fawcett et al. 2003, August-Brady 2005). Nursing students should also be encouraged to consider research-evidence application to practice through reflective processes (Ireland 2008, Mantzoukas 2008).

Although education helps ‘nourish’ research use in practice, with a small impact on professional practice and patient outcomes (Forsetlund et al. 2009), it is suggested that leadership, clinical support, and reflective practice makes EBP ‘thrive’ (Vratny & Shriver 2007). Managerial support, colleague support, and education (Chau et al. 2008) can encourage research utilization; of these management (leadership) support may be most important (Yava et al. 2009). Nurses working in contexts in positive cultures and leadership report significantly more research utilization, staff development, and lower rates of patient adverse events than nurses working in less positive contexts (Cummings et al. 2007). Links between leadership, change management, and research can be made in nursing curricula by enhancing senior clinicians’ input into curriculum planning and delivery or by increasing partnership arrangements between clinical and academic settings. Pretorius et al. (2003) suggested that the use of practice-based research in an internship year would help to develop the new medical graduates’ use of research in practice. Therefore, nurse managers could consider supporting research utilization for newly qualified nurses (Ferguson & Day 2004).

Student nurses may also learn research appreciation through access to ‘champion role-models’ i.e. researchers, educators, managers, or practitioners who are enthusiastic about research or have demonstrated leadership in facilitating research use (Fineout-Overholt et al. 2004, Vratny & Shriver 2007). Practice-based learning facilitators may also explain any research activities that are ongoing in the clinical setting. It has been suggested that research utilization can be incorporated into hospital re-organizations (Pillar & Jarjoura 1999), research utilization projects, staff-led practice reviews (Vratny & Shriver 2007), journal clubs (Goodfellow 2004, Fink et al. 2005) or reflective groups (Joyce 2000).

‘Managing and leading’ classes can help students learn how to judge the feasibility of research use for practice and develop change management skills to overcome barriers to
research use. McSherry and Proctor-Childs (2011) suggest that educators could also address clinical barriers to research use through multi-professional care studies. Given the need for a team-based approach for research utilization, it may be possible to integrate learning with collaborative-based education approaches, such as Inter-Professional Education (Howarth et al. 2006). A small group team-based learning approach has been employed to help learners develop team-based skills necessary for successful implementation of research-based practice (Hunt et al. 2003). In educational contexts it is also possible to encourage students to develop collaborative working in research searching, appraisal, and evaluating through student journal clubs (Thompson 2006) or nursing research societies.

**Identifying areas for further investigation**

Sometimes practitioners are unable to apply research-evidence because relevant studies have not been undertaken (Veeramah 1995). In many areas there is no strong evidence-base (systematic review) resulting in clinical ‘uncertainties’ (United Kingdom Database of Uncertainties about the Effects of Treatments 2011) and, therefore, students need to learn how to manage decision-making in the face of research uncertainty. Where no strong research-evidence exists, it has been suggested that consensus decision-making (Minas & Jorm 2010) may be used. Educators can support students in using both consensus decision-making and reflective techniques to facilitate application of any evidence (research, locality data or expert opinion) especially where research-evidence is confusing, limited, or missing.

Furthermore, nurses need to be able to ‘identify areas for further investigation’ by the end of their preregistration education. Whilst there is no expectation that all newly Registered Nurses will independently conduct research, they need to be able to identify areas of ‘uncertainty’ that need to be addressed. For example, the James Lind Alliance (2011) aims to form partnerships between practitioners and people so that areas of evidence-uncertainty are researched and this work could be discussed during nursing education. Nurses may also choose to investigate an area of uncertainty through further education. The Finch Report (United Kingdom Clinical Research Collaboration [UKCRC] Subcommittee for Nurses in Clinical Research 2007) aimed to increase the number of research active nurses and clinical academic researchers engaged in high calibre investigations through investment in research training from Master’s degree level. Preregistration nurses could be informed of such research career opportunities and educators can empower nurses to identify potential research topics. McCoy (2008) suggests that research skills can be developed through undertaking a research project, which may in turn increase their use of research studies (Wainwright et al. 1999). It has also been suggested that group work can help students learn skills in devising or conducting research (Owen et al. 2008) particularly if this is a practice-based or focused activity (Fawcett et al. 2003, August-Brady 2005).

**Implications for practice**

The aim of this article was to facilitate discussion on how to maximize nursing students’ learning of research for evidence-base practice in undergraduate pre-registration programmes. Given that research valuing, searching, appraising, application, and investigation are also issues for qualified nurses (Parahoo et al. 2000, Pravikoff et al. 2003, Birks et al. 2008, Mehrdad et al. 2008); improving research skills in newly qualified nurses may ultimately improve workforce skills. All forms of nursing research are essential for worldwide cost-effective and quality care provision (ICN 2007), however, evidence suggests that there is limited use of research in healthcare practice (Joseph Rowntree Trust 2000). Academic literature indicates a wide range of barriers that contribute to lack of research use in practice (Parahoo & McCaughan 2001, Pallen & Timmins 2002, Gerrish & Clayton 2004). The WHO/PEPFAR (2009) advocates that nursing stakeholders should have an integrated approach in promoting research use; in consequence, educators, nurse managers, clinical practitioners, and researchers should be united in supporting nursing learners to become competent in research-evidence knowledge and use in practice. This is important if research-based knowledge is to be adequately applied in practice to support patient safety and quality care.

There is general acceptance that research findings should be used in practice (McSherry et al. 2006, Dobbins et al. 2007, Polit & Beck 2012); however, it remains less clear that the process of ensuring research-based practice starts with an evaluation of the authority, relevance, and utility of research. The first step is to ensure that research knowledge, skills, and values are embedded throughout the curriculum (Coverdale & Weiss Roberts 2008) in practice-based and academic education and integrated patient-centred clinical decision-making learning. Nursing students also need to learn to appraise research studies (evaluate the authority of evidence), consider the usefulness of the research during evidence-based clinical decision-making (evaluate the relevance of research) and learn leadership and management competencies that enable them to consider how or what is needed to apply research (evaluate the utility or feasibility of research application).
Conclusion

Ensuring appropriate application of research-evidence to practice requires concerted effort from educators, researchers, practitioners, managers, and policymakers (World Health Organisation/PEPFAR 2009), nevertheless, educators have a key role in uniting research and practice. Nurse educators should ensure that research is fully embedded throughout nurse curricula (Chaboyer et al. 2004, Hawanik & Thorpe 2008) to guide and socialize students in valuing the contribution of research to practice (Ahn et al. 2007). Educators may choose to employ inquiry or problem-based teaching methods (Price 2003, Barnard et al. 2005) or a practice-based project (Fawcett et al. 2003, August-Brady 2005); to encourage students to access, appraise, and use research-as-evidence for addressing clinical issues and personalizing the application of research-based care. In addition, it is important to equip students with reflective (Ireland 2008, Mantzoukas 2008) leadership and change management skills to enable them to make research-based changes in practice.

As nurse researchers, or working along with nurse researchers, educators may choose to provide student-friendly versions of their work. Furthermore, researchers may be encouraged to meet with undergraduate students to discuss research career opportunities, modelling enthusiasm for research and explaining how their work may impact clinical practice. In addition, nursing students should be given sufficient research knowledge and skills as foundation for a future research career, using individual or group project work (Fawcett et al. 2003, McCoy 2008, Owen et al. 2008).

Since much student learning occurs in practice settings (Nursing and Midwifery Council 2010) practice-based educators can support students to find and apply research, thereby modelling ‘research championship’. Managers may encourage staff and students to understand the link between quality and appropriate research application. This may be through facilitating cultural change (Cummings et al. 2007) and ensuring that staff and students have sufficient time to access up-to-date research resources, also supporting newly qualified nurses to consolidate their research application skills (Ferguson & Day 2004). Managers may also choose to facilitate integrated and strategic links with academia-based educators and researchers. Policymakers may set up mechanisms that encourage stakeholders to work together to support research learning (WHO 2002) and prioritize research commissioning for clinical relevance and utility, i.e. research that addresses ‘practice-uncertainties’.

Acknowledgements

We gratefully acknowledge the critical review of an earlier draft of this article by Dr Bob Price, Open University Director of Postgraduate Awards in Advancing Healthcare Practice.
Funding

This article received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflict of interest

No conflict of interest has been declared by the authors.

Author Contributions

All authors meet at least one of the following criteria (recommended by the ICMJE http://www.icmje.org/ethical_author.html) and have agreed on the final version:

- substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data;
- drafting the article or revising it critically for important intellectual content.

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