The state of European nursing research: Dead, alive or chronically diseased? A systematic literature review.

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ABSTRACT

Background: Reviews of nursing research have suggested that most is descriptive with no more than 15% of providing strong evidence for practice. No studies have examined this from the perspective of nursing research conducted in Europe.

Objectives: To review reports of European clinical nursing research in the top 20 nursing journals in 2010, in order to establish a baseline of nursing research activity in the year immediately prior to the launch of a European Science Foundation network to increase the proportion of intervention research in Europe.

Methods: We identified eligible reports that were then data-extracted by two independent reviewers, disagreements resolved through pair discussion and independent arbitration. We appraised and synthesised topics, methods and the extent to which studies were programmatic. We synthesised data as proportions of study reports meeting our *a priori* categorisation criteria.

Results: We identified 1995 published reports and included 223 from 21 European countries, of which 193 (86.6%) reported studies of primary research only, 30 (13.5%) secondary research and three (1.4%) a mix of primary and secondary. Methodological description was often poor, misleading or even absent. One hundred (44.8%) articles reported observational studies, 87 (39.0%) qualitative studies. We found 26 (11.7%) articles reporting experimental studies, ten (4.5%) were randomised controlled trials. We found 29 (13.0%) reports were located within a larger programme of research. Seventy-six (34.1%) articles reported studies into nursing interventions.

Conclusions: European research in nursing reported in the leading nursing journals remains descriptive and poorly described. Only a third of research reports concerned nursing interventions and a tiny proportion were part of a programmatic endeavour. Researchers in nursing must become better educated and skilled in developing, testing, evaluating and reporting complex nursing interventions. Editors of nursing journals should insist on systematic reporting of research designs and methods in published articles.

Keywords: Complex Interventions, Nursing Research, Europe, Research Methods

INTRODUCTION

Determining the effects of nursing interventions has been identified as a research priority in the United Kingdom (UK) and North America (Hinshaw 2000). Research is the primary mechanism to develop, test and evaluate nursing interventions. Studies that review evidence or test interventions in comparative designs are the essential building blocks of evidence-based practice (EBP). Without these, nursing care remains rooted in traditional ways of working without secure evidence of effect or harm. With nursing care in some countries coming under intense scrutiny, criticism, and demand for change (Francis 2013), it is now more pressing than ever that the care activities of practicing nurses should rest on a solid evidence base, guided by knowledge and evidence gathered and analysed through high quality research studies.

However, senior evidence-based commentators (Chalmers & Glasziou 2009) have suggested that 85% of research activity is 'waste.' They accuse the research community of asking the wrong questions, using unnecessary or poor quality research methods, failing to publish research promptly or not at all, and reporting research findings in a biased or unusable manner from studies that are often non-programmatic, uncoordinated and unnecessarily repetitive. They maintain that much research confers no discernible benefit to people in need of health care, carers and the professionals who deliver it. Although trials of nursing interventions have increased over the past decade (Melnyk 2012) and reportedly improved in quality (Whittmore & Grey 2002), in a similar critique, Hallberg has suggested that only 10-15% of nursing research carries 'strong evidence for practice' (Hallberg 2006 p.924). Similarly, Mantzoukas (2009) found very few studies that tested, rather than

observed, nursing interventions in 2547 studies published in the ten leading nursing research journals 2000 - 2006. Studies were mostly descriptive (47%) with few experimental (13%) or systematic reviews (5%), a finding echoed in a recent study of research reports from a random selection of 489 articles published in four nursing research journals from 1985-2010 (Yarcheski Mahon & Yarcheski 2012).

These studies may lead one to conclude that the accumulation of evidence from nursing research is slower than the challenges from health service and social care, developing technology and the needs of patients, all evolving at rapid velocity. The required change of pace is not without its difficulties, however. We have argued elsewhere (Richards & Borglin 2011) that nursing is a 'complex intervention', defined as an activity that contains a number of component parts with the potential for interactions between them which, when applied to the intended target population, produces a range of possible and variable outcomes (Medical Research Council 2008). When nurses intervene with their patients they do so within complex organisational structures using a range of psychological, social and physical behaviours (Richards & Borglin 2011; Seers 2007). This creates significant difficulties for the design and conduct of intervention studies. Consequently, in 2011 we initiated a European research network – REFLECTION (http://www.reflection-network.eu/) funded by eight European research councils and academies under the auspices of the European Science Foundation. The network aims to develop an interdisciplinary European Faculty of researchers in nursing, equipped to design, plan and implement programmatic, mixed methods and complex interventions research in nursing. One of our first activities was to lay down a benchmark on the state of European nursing research by conducting a systematic review covering the year before the network

began. Here we report the results of this review, identifying, appraising and synthesising reports of clinical nursing research conducted in Europe and published in the top 20-impact factor rated scientific nursing journals in 2010.

METHODS

We followed a method based on those established for systematic reviews (Centre for Reviews and Dissemination 2008; Higgins & Green 2011). We identified eligible papers, extracted and appraised data and synthesised the results of data extraction.

Review questions

For European nursing research reported in the top 20 nursing journals in 2010 what is:

(I) the clinical focus in terms of population, care orientation and setting;

(II) the frequency of different primary and secondary research methods;

(III) the extent of translational, mixed/multi-methods, complex intervention focussed and programmatic research;

(IV) the extent of research into the effects of nursing interventions?

Search Strategy

We obtained electronic copies of all issues from the top 20 rated nursing journals using impact factors (table 1) reported by Thompson Reuters Web of Knowledge Journal Citation Reports (http://thomsonreuters.com/web-of-knowledge/) for 2010.

--- Insert table 1 about here ---

Selection of studies

We included clinical research articles that described the collection, analysis or reporting of primary or secondary data and which were conducted in one of the 47 European states as defined by the Council of Europe (http://hub.coe.int/). We detail the inclusion and exclusion criteria in table 2.

--- Insert Table 2 about here ---

Procedure

Two reviewers at the coordinating centre in Exeter UK identified potential studies for inclusion by reading the titles and abstracts of all articles. At this stage we excluded only those articles that were clearly not research reports, investigated issues of nurse employment, burnout or working conditions, or where the research had been conducted outside Europe, recording these reasons for exclusion. In cases of uncertainty and/or disagreement we reached consensus by the involvement of a third reviewer. We retrieved all articles deemed potentially eligible and sent them to two independent reviewers in our European REFLECTION network for further eligibility checks and data extraction. Our review team consisted of 44 doctoral students or post-doctoral researchers, all members of the REFLECTION network, from 14 European countries who volunteered to join the project. All were able to read English to a scientific standard. We excluded further studies at this time according to the exclusion criteria, recording reasons.

Data Extraction

For each article, the two reviewers, blinded to their colleague, extracted data using a data extraction form developed for this purpose. We collated completed data extraction sheets at the Exeter centre where we identified any disagreements between the two reviewers, unblinded them and returned them for reviewers to discuss and reach consensus. Where no consensus was reached, third (DAR) and fourth reviewers (GB) reviewed the extraction sheets to come to a final decision. Finally, the third reviewer (DAR) reviewed all data extraction sheets against the original articles and checked for consistency of data extraction between multiple reviewers. Where inconsistency was highlighted, the fourth reviewer (GB) reviewed the relevant papers and extraction sheets and discussed them with the third reviewer until agreement was reached.

We extracted data from each article on the following elements.

1. Inclusion and exclusion criteria (Table 2)
2. Originating country of the research
3. Focus of the research:
    a. Participant or patient population: infants/children/adolescents; adults; older adults; perinatal women; non-specific population (e.g. pressure ulcers which could occur in any population)
    b. Care orientation: primary/community care or public health; acute physical care; chronic physical illness; mental health; maternal and infant health; non-specific orientation (e.g. care of pressure ulcers which could occur with any care orientation); other (e.g. healthy volunteers or recovered treatment survivors)
    c. Setting: home; hospital including outpatients; residential community

care; non-specific setting (e.g. care of pressure ulcers which could occur in any care setting); other

4. Type of research: primary or secondary
5. Methods of primary research: experimental, observational or qualitative plus sub categories
    a. Experimental: type 1 involving the measurement of dependent variables before and after the implementation of an intervention, manipulation of an independent variable, randomisation and the presence of experimental and comparison groups; type 2 as type 1 but with no randomisation; type 3 as type 1 but with no randomisation or comparison group
    b. Observational studies collecting numerical data where no attempt was made to manipulate independent variables, including: correlational retrospective studies linking observed phenomena in the present to past phenomena; correlational prospective linking observed phenomena in the present to future phenomena; cross sectional studies studying the prevalence of phenomena or relationships between concurrent phenomena; case control studies comparing the differences between participants with certain illness conditions with a matched group of people without the condition; other studies including articles reporting questionnaire development or not fitting into previous observational categories.
    c. Qualitative studies divided into: ethnographic studies examining meanings, patterns and experiences of a defined cultural group in a holistic fashion; phenomenological research to determine the essence and meaning of a phenomenon experienced by people; grounded theory research to

generate a theory from data to explain a pattern of behaviour relevant to informants; critical theory research aiming to critique existing social structures and involve collaboration with participants to lead to increased self-knowledge; feminist research with a similar background to critical theory but focussed on the effects of gender and discrimination for women; other research not covered by the previous qualitative categories.

6. Methods of secondary research:
    a. systematic literature reviews where the study follows an explicit, systematic and replicable process of primary research study identification, appraisal and synthesis;
    b. meta-analyses where the study combines data from a number of primary research studies using a statistical method;
    c. meta-syntheses of primary qualitative data which bring together the findings from studies to produce second order interpretations and develop theories;
    d. secondary, including retrospective, analysis of data gathered for a different study, which addresses new questions from an alternative perspective;
    a. analysis of routine data that is collected for other purposes (e.g. mortality rates in hospitals) that was not intended to be collected for the study being reported.
7. Mixed methods research: whether the study used a combination of research methods. We classified studies encompassing the use of both qualitative and quantitative methods as *mixed-methods research*. Where one type of method alone was used we classified it as single method.

8. Whether the article reported a study as part of a programme of research which aimed to build knowledge in an iterative process of development, testing and evaluation of nursing interventions.
9. If the article was reporting research which could be classed as translational by turning appropriate theories or pilot interventions into nursing interventions to be used in a widespread way for the care of patients, people or carers.
    a. Phase 1: studies that take prior theoretical or empirical knowledge and use it to construct a nursing intervention to transform non-clinical research results into clinical applications and test their safety and efficacy;
    b. Phase 2 studies that take potential nursing interventions shown to be efficacious and safe from phase 1 translational research and test them in a clinical population to see how they function when they are applied to practice environments;
    c. Phase 3 studies that take proven nursing interventions and investigate their uptake in routine nursing environments to convert treatments and prevention strategies, shown to be effective and/or cost-effective in Phase 2 translational research, into sustainable nursing solutions.
10. If the study was explicitly reported by the authors as fitting within one of the sequential stages in the MRC complex intervention framework as part of a programme of nursing intervention development, testing evaluation and implementation.
    a. Development studies that review evidence, develop theory and model potential interventions;
    b. Pilot and feasibility studies that address necessary procedural, methodological and clinical uncertainties before full clinical testing;

c. Evaluation studies that test interventions for clinical and cost effectiveness;

d. Implementation studies that test the conversion of effective interventions into practice through dissemination, routine monitoring and long-term surveillance.

11. If the article was reporting a study on a nursing intervention, defined as "*studies either questioning existing care practices or testing innovations in care that are shaped by nursing's values and goals, guided by a strong theoretical basis, informed by recent advances in science, and designed to improve the quality of care and health of individuals, families, communities and society*" (Naylor 2003, p382).

Data Synthesis

We synthesised the extracted data by calculating the percentage of studies in each of the extraction categories, reporting raw data and percentages. During data synthesis, we identified that almost 70% of qualitative studies did not fit into one of our *a priori* categories, being categorised as 'other'. Therefore, we reanalysed the qualitative methods studies using two new categories: a) generic qualitative studies; b) qualitative studies guided by an explicit set of philosophical assumptions in the form of one of the known qualitative methodologies (Caelli et al. 2003). We present both analyses.

RESULTS

We identified 1995 articles published in 2010 in the eligible journals. We excluded 1729 articles from reading titles and abstracts. We assessed 266 full text articles and

excluded a further 43, leaving 223 studies in the review for data extraction (Figure 1). For our complete list of included papers in this review please contact the authors.

---Insert Figure 1 about here---

Study characteristics

Country of origin: we found articles reporting research from 21 out of a potential 47 European countries, two thirds of which reported research conducted in one of four countries: the United Kingdom (n=64, 28.7%), Sweden (n=36, 16.1%), Norway (n=27, 12.1%) or the Netherlands (n=21, 9.4%). Belgium (n=14, 6.3%), Turkey (n=11, 4.9%) and Ireland (n=10, 4.5%) were the next most numerously contributing countries. The remaining 13 countries contributed seven (Finland: 3.1%), six (Denmark, Germany: 2.7%), four (Italy, Spain: 1.8%), three (Greece: 1.4%), two (France, Switzerland: 0.9%) and one (Austria, Cyprus, Iceland, Lithuania, Poland, Portugal: 0.5%) articles. We found 29 (13.0%) articles reporting research that included additional country collaborations. The most frequent of these were intra-European collaborations (n= 29, 13.1%), with the remainder being joint projects with the United States US (n=10, 4.5%) plus one each (0.5%) for Japan and New Zealand.

Participant or patient population: we found 111 (49.8%) articles reporting studies including working age adults, 48 (21.5%) including older adults, 32 (14.4%) concerning perinatal women, 19 (8.5%) infants, children or adolescents, and 48 (21.5%) reporting research for a non-specific population. Thirty-five (15.7%) studies

reported research on more than one population, most researching adults and older adults together.

Care orientation: we found 72 (32.3%) articles reporting studies in chronic physical illness, 36 (16.1%) in primary, community care or public health, 36 (16.1%) in acute physical illness, 35 (15.7%) in mental health, 28 (12.6%) maternal and infant health, three (1.4%) for other care orientations, and 16 (7.2%) in non-specific care orientations. Three (1.4%) studies had more than one care orientation.

Setting: we found 89 (39.9%) articles reporting studies in hospital settings including outpatients, 23 (10.3%) in home settings, 10 (4.5%) in residential community care, four (1.8%) in other settings and 99 (44.4%) in non-specific settings. Two (0.9%) described studies in more than one setting.

Type of research: we found 193 (86.6%) articles reporting studies of *primary research* only, 30 (13.5%) reporting *secondary research* and three (1.4%) reporting a primary and secondary research mix. We categorised 26/223 (11.7%) articles as reporting experimental studies: ten (4.5%) of which reported type 1, four (1.8%) type 2 and 12 (5.4%) type 3 experimental designs. We identified 100 (44.8%) articles reporting observational studies, of which one (0.5%) was retrospective, 13 (5.8%) prospective, 62 (27.8%) cross-sectional, one (0.5%) a case control study and 23 (10.3%) other observational studies including 17 (7.6%) questionnaire development. We categorised 87 (39.0%) articles as reporting qualitative studies. We identified five (2.2%) studies as ethnographic, ten (4.5%) as phenomenological, 14 (6.3%) as grounded theory and 58 (26.0%) as 'other' – 67% of the total qualitative studies. No

studies reported critical theory or feminist research. When we re-categorised the qualitative studies, 60 (26.9%) articles reported generic qualitative research designs and 27 (12.1%) reported qualitative studies guided by an explicit set of philosophical assumptions in the form of one of the known qualitative methodologies.

With regard to *secondary research methods*, we identified 21/221 (9.4%) systematic literature reviews, 10 (4.5%) of these including a meta-synthesis, five (2.2%) secondary analyses of data gathered for another study and nine (4.0%) routine data studies. Two studies (0.9%) used a combination of data sources. There were no articles reporting meta-analyses.

We identified 11 (4.9%) articles, which reported *mixed methods research* and 29 (13.0%) reporting research located within a larger *programme* of research. We categorised ten (4.5%) studies as translational, one (0.5%) phase 1, eight (3.6%) phase 2 and one (0.5%) phase 3. We identified twelve (5.4%) evaluation studies within the MRC complex interventions framework, and two (0.9%) each for development, feasibility/piloting and implementation. Finally, we classified 76 (34.1%) articles as reporting studies into *nursing interventions*.

DISCUSSION

Our review has demonstrated that the vast majority of clinical nursing research conducted in Europe and reported in the top 20 nursing journals in 2010 was descriptive. A mere third of published reports concerned nursing interventions. We found less than 5% of articles reporting randomised controlled trials into the effects of nursing interventions. Including non-randomised studies, less than 12% of reports

were classified as experimental. Our findings concur with reviews by Yarcheski et al. (2012) and Mantzoukas (2009), albeit our sample is more recent, drawn from a larger number of journals and confined to European research. Although some authors have reported that researchers in nursing now conduct more intervention research than previously (Whittmore & Grey 2002; Melnyk & Morrison-Beady 2012), non-experimental studies still dominate the published literature and few articles report research that is situated within a coordinated programme of knowledge development and testing. Researchers seem more inclined to conduct cross sectional snap-shots of reality rather than experimental testing of interventions.

In terms of secondary research, it is plausible that the low number of systematic reviews and meta-analyses we found is a result of the paucity of primary experimental research to synthesise. However, despite the high prevalence of qualitative reports (39%) this was also not reflected by a large number of meta-syntheses. With the significant numbers of qualitative study reports in nursing it is vital that findings from studies with small sample sizes and limited transferability to other contexts are synthesised to inform evidence-based nursing practice (Kent & Fineout-Overholt 2008). We did not detect much of this important activity in our review.

We made various attempts to classify research as mixed, translational, programmatic, or organised using a progressive framework, but were unable to categorise many studies in this way. Although many authors included aspirational statements promising that research results would aid nursing care, very few reports situated research within a sequential, programmatic and evidence-based process of

reviewing, developing, evaluating and implementing interventions. We found most of our included studies focussed on understanding important phenomena and yet were disconnected from direct efforts to improve care. Although phenomenological understanding is a critical part of the research process, often best conducted using qualitative methods, our findings support Melnyk (2012) and others who have highlighted that there are many areas where descriptive work exists *en masse*, but researchers have not moved on to testing and evaluating interventions in experimental designs. We would argue similarly, that combining qualitative and quantitative methods to develop, test and understand how interventions work (or not) is where qualitative insights can significantly aid nursing care development. That we found only around one third of reports that described the results of studies into nursing interventions means that, sadly, for many areas the lack of a programmatic mixed methods approach leaves only low-level evidence to guide nursing practice and nursing decision-making.

The reporting of research methods left much to be desired. This was most obvious in our difficulties classifying qualitative designs, where many researchers used words such as ‘thematic analysis’ rather than details of the explicit specific philosophical assumptions guiding their work. Generic qualitative designs dominated and it was worrying that some authors did not cite any methodological references. Other study designs were often just as difficult to classify. We found many examples of undefined terms like ‘exploratory comparative design’ and one notable example entitled ‘longitudinal evaluation’ which described an experimental uncontrolled before after study. Such inconsistency required us to review papers multiple times before our reviewers could reach agreement on classifying designs.

Strengths and limitations

We chose the top 20 impact factor rated 'nursing' journals because we might assume that a curious nurse wishing to enquire about her practice could reasonably be expected to look first in her professional research literature. We concede that this might mean we have under-represented the output of researchers in nursing who choose to publish their results in general health or medical journals. However, one might justifiably argue that the content of journals dedicated to nursing research should provide a barometer to the field. We were also constrained by the classification system itself. Some journals in our list had a clear biomedical leaning. However, we defend our choice as being entirely objective, unbiased and uninfluenced by the review team's beliefs and prejudices.

We had difficulty classifying interventions as 'nursing' using Naylor's (2003) definition. Consequently, we adopted a liberal interpretation and included all interventions that might contribute to the care of an individual, including activities not unique to nursing. For example, as a nursing intervention we included a systematic review of walking and blood pressure control conducted by a nursing research team, given that nurses could support patients in undertaking exercise as a means to reduce hypertension. There were many similar examples and we admit that some purists might accuse of us being too inclusive. We also found it difficult to apply the essentially biomedical concept of 'translational research' to the cohort of nursing research studies and our data extractions on this topic should be treated cautiously.

Our review team was large and there were many examples where reviewers disagreed with each other. Reviewers came from very divergent European cultures, language groups and research backgrounds and their initial data extractions sometimes varied considerably. Consequently, we had to adopt a strict moderation procedure to iron out inconsistencies in study data extraction and appraisal.

Linking Evidence to Action

- Researchers in nursing should design, undertake and report fewer descriptive studies and more experimental research into the effectiveness of nursing interventions to ensure a more balanced proportion of intervention and descriptive research in nursing
- In order to reduce the potential amount of 'research waste' researchers should first identify, appraise and meta-synthesise the often large numbers of existing qualitative studies to ascertain if further primary qualitative studies are warranted
- Researchers in nursing should structure their studies to explicitly link the development, testing, evaluation and implementation of nursing interventions in coherent programmes of research activity rather than as stand-alone projects
- Nursing researchers should consider using the UK Medical Research Council's 'Complex Interventions Research Framework' to organise studies that will deliver an increased evidence base for nursing interventions
- Editors of nursing journals should come to an urgent agreement that they

require authors of submitted articles to report their findings using standardised formats for all types of research designs – for example PRISMA and CONSORT, but in particular to use COREQ guidelines for qualitative designs

- Doctoral education programmes for nurses should encourage students to undertake experimental work into the effectiveness of nursing interventions

Implications for research and practice

Previously, we have suggested that the low prevalence of programmatic, experimental research designs is due to the fact that 'research supervisors are the children of the old paradigm' (Richards & Borglin 2011 p. 532). Others have likewise suggested that 'many professors themselves have not conducted interventions studies and are not comfortable in designing and implementing them´ (Melnyk 2012 p.63). The implications are that we must prepare the next generation of researchers in nursing to have a very different set of skills. PhD students should not be discouraged from conducting experimental work. Masters and doctoral education programmes should be orientated towards these deficits, the explicit focus of our European Science Foundation REFLECTION network, with its aim to enable researchers to become better equipped in undertaking complex intervention research.

The influential MRC (2008) guidance on adapting research methods to complex interventions provides much needed advice on developing research programmes across all health care areas, including nursing. Although nursing is a diverse subject

area of research there is no reason to suppose that well designed clinical intervention studies in nursing could not be competitive for research funding using this framework. The fact that only 12 studies referenced their place within the MRC framework (2008) is partly evidence that the framework has not had time to bed down in the nursing research community and make an impact on research published in 2010. Indeed, research reports published in 2010 are likely to reflect work planned and undertaken from 2000-2009. We will, therefore, repeat our review tri-annually to assess any development in this and our other review variables including the proportion of intervention studies reported.

Editors of scientific nursing journals should be encouraged to use standard criteria for reporting all research designs, similar to CONSORT criteria for reporting randomised controlled trials (Schulz, Altman & Moher, 2010). Standard descriptions of methods should be required for article titles. Structured abstracts with a PICO (participants, interventions, comparison, and outcome) (Boudin et al., 2010), a SPIDER (Sample, Phenomenon of Interest, Design, Evaluation, Research type) (Cooke, Smith & Booth, 2012) or similar structure should be required, providing reviewers with clear indications for inclusion, and curious nurses help in selecting reading appropriate to their enquiries. Editors should also make it clear in their instructions to contributors that they wish to receive more reports of research into the effectiveness of nursing interventions.

CONCLUSION

European research in nursing reported in the leading nursing journals remains

overwhelmingly descriptive and poorly described. Little more than a third of research reports concerned nursing interventions and a tiny proportion were part of a programmatic endeavour to improve the evidence base for nursing care. For the enquiring nurse, curious about a problem in her practice life, research published in these journals is unlikely to provide robust evidence to guide her, even if she could find her way past the opaque titles and abstracts. The current and future generations of researchers in nursing must become educated, skilled and comfortable in researching the complex interventions that comprise nursing care and should collaborate together to design coherent programmes of mixed methods research which address the needs of nursing, society and people, and counter the rising wave of criticisms of our professional practice. Whilst we acknowledge that important knowledge can be derived from a range of research methods, currently the relative proportions of study methods reported are less than helpful for the development of evidence-based nursing practice.

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Table 1 Overview of included journals

Journal	Impact	Journal	Impact
International Journal of Nursing Studies	2.103	Heart & Lung	1.508
Cancer Nursing	2.065	Journal of Nursing Administration	1.500
Birth: Issues in Perinatal Care	1.821	Journal of Nursing Management	1.452
Nursing Research	1.785	Journal of Cardiovascular Nursing	1.444
Oncology Nursing Forum	1.779	Worldviews on Evidence-Based Nursing	1.429
Research in Nursing & Health	1.736	International Journal of Mental Health Nursing	1.427
Journal of Family Nursing	1.689	Advances in Nursing Science	1.407
Nursing Outlook	1.653	Journal of Nursing Scholarship	1.392
American Journal of Critical Care	1.593	European Journal of Cardiovascular Nursing	1.348
Journal of Advanced Nursing	1.540	Journal of Obstetric Gynecologic & Neonatal Nursing	1.221

Table 2. Criteria for study inclusion

Criteria	Included	Excluded
Participants	Studies where data is collected from nurses, the consumers or potential consumers of nursing care; consumers including patients, members of the public and carers of people in receipt of nursing care.	All other.
Time and Place	Studies published by authors reporting research conducted in any of Europe's 47 countries during year 2010. No restrictions on environments such as hospital, community, primary care etc.	Non-European countries.
Type of studies	All studies where *data* is collected from research involving clinical nursing practice. All types of methodology.	Editorials, commentaries, book reviews, study protocols, case reports, non-systematic literature reviews or other studies that have not collected, analysed or reported primary or secondary data. Studies evaluating methods for educating nurses. Studies investigating issues of nurse employment, burnout or working conditions. Studies testing medical equipment. Studies not investigating an aspect of nursing practice.
Language	Studies published in one of the top 20 English language nursing journals listed in the Thompson Reuters Web of Knowledge Journal Citation Reports 2010	All other journals. All other languages.

Figure 1: Review Flow Diagram