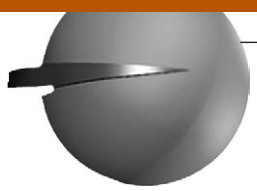

Evidence Review

The Second Triennial Systematic Literature Review of European Nursing Research: Impact on Patient Outcomes and Implications for Evidence-Based Practice

David A. Richards, PhD, BSc (Hons), RN • Tove Aminda Hanssen, PhD, RN, • Gunilla Borglin, PhD, MSc, RN

Keywords
evidence-based practice, nurse-midwifery, research methods, systematic review, health care reform, international health

ABSTRACT

Background: European research in nursing has been criticized as overwhelmingly descriptive, wasteful and with little relevance to clinical practice. This second triennial review follows our previous review of articles published in 2010, to determine whether the situation has changed.

Objective: To identify, appraise, and synthesize reports of European nursing research published during 2013 in the top 20 nursing research journals.

Methods: Systematic review with descriptive results synthesis.

Results: We identified 2,220 reports, of which 254, from 19 European countries, were eligible for analysis; 215 (84.7%) were primary research, 36 (14.2%) secondary research, and three (1.2%) mixed primary and secondary. Forty-eight (18.9%) of studies were experimental: 24 (9.4%) randomized controlled trials, 11 (4.3%) experiments without randomization, and 13 (5.1%) experiments without control group. A total of 106 (41.7%) articles were observational: 85 (33.5%) qualitative research. The majority (158; 62.2%) were from outpatient and secondary care hospital settings. One hundred and sixty-five (65.0%) articles reported nursing intervention studies: 77 (30.3%) independent interventions, 77 (30.3%) interdependent, and 11 (4.3%) dependent. This represents a slight increase in experimental studies compared with our previous review (18.9% vs. 11.7%). The quality of reporting remained very poor.

Linking Evidence to Action: European research in nursing remains overwhelmingly descriptive. We call on nursing researchers globally to raise the level of evidence and, therefore, the quality of care and patient outcomes. We urge them to replicate our study in their regions, diagnose reasons for the lack of appropriate research, identify solutions, and implement a deliberate, targeted, and systematic global effort to increase the number of experimental, high quality, and relevant studies into nursing interventions. We also call on journal editors to mandate an improvement in the standards of research reporting in nursing journals.

INTRODUCTION

During the last decade and a half, the nursing and applied health services research community has acknowledged that research into interventions to improve health care and patient well-being requires considerable methodological innovation (Bleijenberg et al., 2018). In two highly influential publications (Craig et al., 2008; Medical Research Council, 2000), the UK Medical Research Council (MRC) posited the idea that most if not all healthcare interventions are "complex" (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) and that their investigation requires equally complex research methods. Whilst designs that reduce the influence of potential biases, such as the randomized controlled trial (RCT) are strongly recommended, the MRC suggested that prior to such trials being undertaken, more attention should be paid to intervention development and feasibility and pilot testing, and that after trials have been conducted, there is a need to focus on implementation science research to ensure the widespread adoption of newly effective interventions (Craig et al., 2008).

One of the drivers behind this initiative has been a recognition that very often experimenters' prior expectations are dashed when interventions are tested in clinical trials, and shown to be less effective than expected, or in the worst cases totally ineffective (Dent & Raftery, 2011). The absence of sound intervention development and feasibility testing is cited as major reasons for these failures. Consequently, in a

parallel movement, senior members of the health research community have also suggested that around 85% of research activity is "waste" (Chalmers & Glasziou, 2009). One analysis (Chalmers & Glasziou, 2009) of medical research found that problems are caused by researchers 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 nonprogrammatic, uncoordinated, and unnecessarily repetitive.

These arguments are critical for nursing, the "quintessentially complex intervention" (Richards & Borglin, 2011). Nursing interventions not only have a significant effect on objective and patient-reported health outcomes (Aiken et al., 2014; Ball, Murrells, Rafferty, Morrow, & Griffiths, 2014) but can also be subject to criticism for poor standards (Department of Health, 2013). Indeed, there have been numerous calls by nurse researchers to concentrate research activity on improving the evidence for nursing interventions of direct relevance to practising nurses and their patients (Hallberg, 2006, 2009; Mantzoukas, 2009; Yarcheski, Mahon, & Yarcheski, 2012) in order to put nursing on a sounder scientific footprint.

In response to these movements and critiques, the REFLECTION network (http://www.reflection-network.eu/), funded by eight European research councils and academies under the auspices of the European Science Foundation, was set up in 2011 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 through summer schools and masterclasses. To establish a baseline against which the network could be judged, in 2010, we undertook the first of three triennial reviews of research undertaken by European researchers in nursing, as evidenced by publications during 2010 (the year before the network was established) in the top 20 English-language nursing journals, selected according to published impact factor criteria (Richards, Coulthard, & Borglin, 2014).

Our review was sobering reading. As we noted in our 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. (Richards et al., 2014, p.154)

These results concurred with many previous and contemporary assessments of research in nursing (Hallberg, 2006, 2009; Mantzoukas, 2009; Yarcheski et al., 2012) that have drawn attention to the lack of relevance and experimentation in published nursing research.

This new manuscript therefore describes our second triennial review of research published by European nursing researchers during 2013 in the top 20 nursing journals, at the halfway point of the REFLECTION network's life.

OBJECTIVE

To identify, appraise, and synthesize reports of European nursing research published during 2013 in the top 20 nursing research journals as categorized by impact factor ratings, to identify the source, focus, and setting, the frequency of research methods used, the degree to which studies investigate nursing interventions, and to report any differences from our previous review of the 2010 European research literature.

REVIEW QUESTIONS

1. How many reports published during 2013 in the top 20 nursing research journals describe European nursing research and which countries do these reports originate from?
2. What are the characteristics of these research reports in terms of study participants' age, health category studied, and study setting?
3. What are the proportions of different primary and secondary research methods used in these studies?
4. What proportion of research reports are focussed on investigations into nursing actions or interventions?
5. What are the main differences between European research publications in 2013 compared to 2010?

METHODS

We conducted a systematic review with descriptive narrative synthesis of results.

Search Strategy

We obtained electronic copies of all issues from the top 20 rated nursing journals using impact factors reported by Clarivate Analytics, accessed from the Web of Science-Core Collections https://clarivate.com/products/web-of-science/databases/) from 2013.

Inclusion Criteria

We included all English-language clinical research articles published in 2013 that described the collection, analysis or reporting of primary or secondary data and that were conducted by researchers from one of the 47 European states as

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defined by the Council of Europe (*47 Member States*, n.d.). We included studies where data were collected from nurses, or the consumers or potential consumers of nursing care. We included study protocols meeting these criteria, but not yet collecting data. We defined consumers to include patients, members of the public and carers of people in receipt of nursing care, and defined nurses to include people with the broad spectrum of professional qualifications such as nursing, mental health nursing, midwifery, health visiting, community, and family nursing together with care delivered by members of nursing teams without professional qualification.

Exclusion Criteria

We excluded editorials, commentaries, book reviews, case reports, nonsystematic literature reviews, or other studies that had not collected, analyzed, or reported primary or secondary data. We excluded studies evaluating methods for educating nurses; studies investigating issues of nurse employment, burnout, or working conditions; studies testing medical equipment and any other study that did not investigate an aspect of nursing practice, were conducted solely by researchers from a non-European country or were not reported in the English language.

Procedure

We screened all article titles and abstracts to exclude those that did not obviously meet our inclusion criteria, particularly regarding country of origin. We obtained all the remaining full texts of articles for data extraction and appraisal against our inclusion criteria. Data from each article were extracted by one member of the core team (DAR, TAH, GB) and one other independent reviewer from a wider international group of 44 members of the European Academy of Nursing Science. Data extraction sheets were compiled and compared between reviewers. Where differences in inclusion and exclusion or data categorization were apparent, these were addressed by another member of the core team reading the paper and resolving the dispute. Where resolution was not immediately possible, the core team discussed the paper and came to a consensual decision on both study inclusion and exclusion and individual data categorization.

Data Extraction

We extracted data on the country of origin of all the authors, characteristics of the population studied, the category of health issue studied using the UK Clinical Research Collaboration (UKCRC) Health Research Classification system (Medical Research Council on behalf of the UK Clinical Research Collaboration, 2018), study setting, research method(s) used, and the extent to which the researchers used integrated mixed methods, whether the study was part of a larger program of study, if it was defined by the authors as a complex intervention, if it investigated nursing actions or interventions, and if so, what type of intervention.

Research Classification System: In terms of research methods, we categorized these initially into primary and secondary. We used a similar categorization system to our previous review.

Methods of primary research were experimental, observational, or qualitative plus subcategories:

- Experimental: Type 1 involving the measurement of dependent variables before and after the implementation of an intervention, manipulation of an independent variable, randomization, and the presence of experimental and comparison groups; type 2 as type 1 but with no randomization; type 3 as type 1 but with no randomization or comparison group.
- 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.
- Qualitative studies divided into 1. research with no reported established philosophical theoretical underpinnings and 2. those guided by an explicit set of philosophical assumptions (Caelli, Ray, & Mill, 2003). Of the latter, we categorized studies into: 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 behavior relevant to informants; ethnographic studies examining meanings, patterns, and experiences of a defined cultural group in a holistic fashion; narrative research as approaches that rely on the written or spoken words or visual representation of individuals as told through their own stories; case study research aiming to investigate a contemporary phenomenon within its real-life context; critical theory research aiming to critique existing social structures and involve collaboration with participants to lead to increased self-knowledge; action research as studies carried out in the course of an activity or occupation to improve the methods and approach of those involved; other explicitly cited philosophies not covered by the previous

qualitative categories.

Methods of secondary research were as follows:

- Systematic literature reviews where the study follows an explicit, systematic, and replicable process of primary research study identification, appraisal, and synthesis; meta-analyses where the study combines data from a number of primary research studies using a statistical method; meta-syntheses of primary qualitative data which bring together the findings from studies to produce second-order interpretations and develop theories.
- Secondary, including retrospective, analysis of data gathered for a different study, which addresses new questions from an alternative perspective.
- 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.

We defined a mixed-methods study as one in which more than one research method was used and data were combined in an integrated analysis. For studies that merely used different methods alongside each other without analytical integration, we classified these as multimethods studies.

In terms of nursing interventions, we used the classification system described by Wilkinson (2011) to categorize studies into those that investigated nursing interventions/actions either that were 1. independent (i.e., those that nurses are licensed to prescribe, perform, or delegate based on their knowledge and skill, are nurse-initiated treatments and autonomous actions); 2. dependent (i.e., those that are prescribed by the principal care provider and carried out by the nurse such as medical orders like medications, IV therapy, and diagnostic tests where nurses are responsible for explaining, assessing, and administrating these); or 3. interdependent (i.e., those carried out in collaboration with other health team members and which reflect the overlapping responsibilities of and collegial relationships among health personnel).

Data Synthesis

We synthesized the extracted data by summing up and then calculating the percentage of studies we had allocated into each extraction category, reporting raw data, and percentages. We compared these results narratively against those reported in our previous review (Richards et al., 2014).

RESULTS

A total of 2,220 articles were published in 2013 in the eligible journals. After reviewing authors' addresses and after reading title and abstract, a total of 1,710 papers were excluded. We assessed 510 full-text papers and excluded a further 256, so that 254 remained for analysis (Figure 1).

Country of Origin

We included articles from 19 of a potential 47 European countries (Table 1). The most numerous contributions were from the UK (74 manuscripts; 29.1% of included articles), Sweden (38; 15.0%), the Netherlands (35; 13.8%), Turkey (15; 5.9%), and Spain (14; 5.5%). Authors from all the other countries published no more than 11 (<5%) articles each with France, Greece, Poland, and Cyprus represented by only one or two manuscripts each. Thirteen (5.1%) articles reported studies involving European, and seven (2.8%), international collaborations.

Participant or Patient Population

We found that the most frequent age group studied was adults aged 19–64 years (74 studies; 29.1%), followed by studies including both adults and older adults (51; 20.1%), older adults aged 65 years and above only (13; 5.1%), both children and adults (9; 3.5%), and children aged 0–18 years (8; 3.1%). In 86 studies (33.9%), age was not specifically relevant to the research question (e.g., where data were collected from health professionals). Age was not defined in 13 (5.1%) of manuscripts.

Health Category

Using the 21 health categories HRC framework in descending order of frequency, we found studies investigated issues in the area of reproduction (67 studies; 26.4%), cancer (58; 22.8%), nonspecific/generic disorders (36; 14.2%), other/nonclassified disorders (32; 12.6%), cardiovascular (18; 7.1%), mental health (10; 3.9%), respiratory (7; 2.8%), skin (6; 2.4%), musculoskeletal (4; 1.6%), neurological (3; 1.2%), infection (3; 1.2%), inflammation (2, .8%), renal (2; .8%), stroke (2; .8%), congenital problems (1; .4%), injuries (1; .4%), metabolic issues (1; .4%), and oral and gastric areas (1; .4%). There were no studies reported into areas categorized as relating to blood, ear, or eye conditions.

Setting

We found the majority of articles (158 manuscripts; 62.2%) reported research from hospital settings including outpatient and secondary care, with lesser numbers from a residential community care or primary care setting (47; 18.5%) and 46 (18.1%) from nonspecific settings, with three (1.2%) reporting studies in other settings.

Type of Research Methods Used

Of the included articles, we classified 215 (84.7%) as primary research only, 36 (14.2%) as secondary research only, and three (1.2%) that were a mix of primary and secondary research reported in the same manuscript (Table 1).

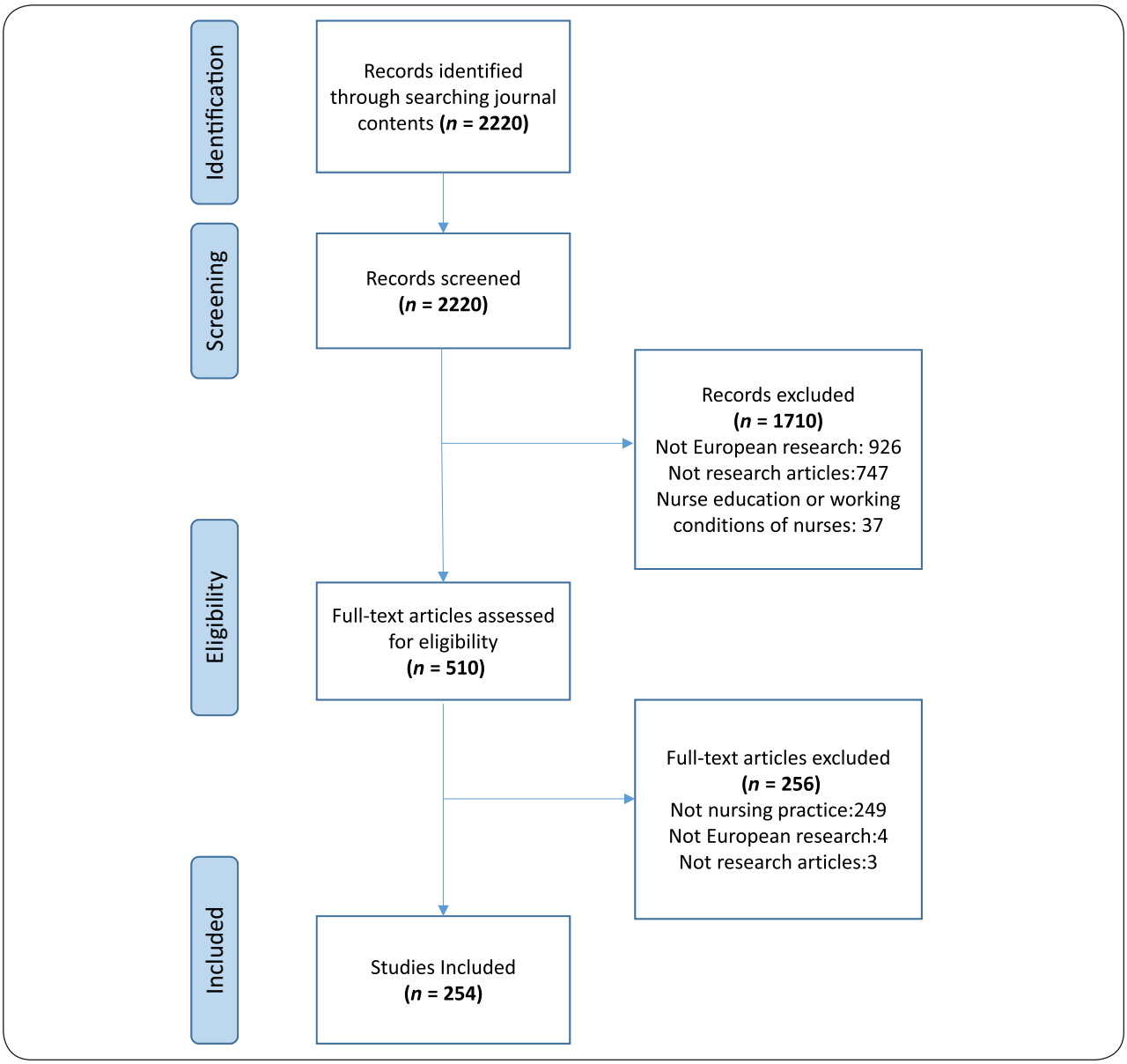

Figure 1. PRISMA diagram.

We categorized 48 (18.9%) of the reported studies as experimental, 24 (9.4%) of which were randomized controlled trials, 11 (4.3%) experiments without randomization, and 13 (5.1%) experiments without control group. We found that 106 (41.7%) articles reported observational studies, of which the majority (88 studies; 34.6%) were cross-sectional designs, 14 (5.5%) had a prospective correlational design, and four (1.6%) other descriptive designs. No articles reported the use of retrospective longitudinally research designs or case–control studies.

We identified 85 (33.5%) articles reporting data from studies using qualitative research methods. Around a third of these (29 studies; 11.4% of the total dataset) described how the study was guided by an established set of philosophical assumptions in the form of the known qualitative methodologies. These were as follows: phenomenology (n = 7; 2.8%), grounded theory (n = 6; 2.4%), ethnography (n = 5; 2.0%), case study methods (n = 3; 1.2%), action research (n = 2; .8%), and other defined methods (n = 6; 2.4%) including critical realism, hermeneutics, phenomenography, Q-methodology, and personal construct theory. No articles reported the use of narrative or critical research or theory methodologies and the remaining studies (n = 56; 22.0%) did not

Table 1. Manuscripts and Primary Research Design Characteristics by Countries

	Manuscripts included	Experimental designs	Observational designs	Qualitative designs	Multi-methods	Mixed methods	Programmatic research	Nursing intervention
Countries	***n* (%)**	***n* (%)**	***n* (%)**	***n* (%)**	***n* (%)**	***n* (%)**	***n* (%)**	***n* (%)**
Austria	3 (1.2)	0 (0)	2 (1.9)	0 (0)	0 (0)	0 (0)	0 (0)	1 (.6)
Belgium	10 (3.5)	3 (6.3)	5 (4.7)	2 (2.4)	2 (4.8)	0 (0)	2 (4.5)	7 (4.2)
Cyprus	2 (.8)	0 (0)	2 (1.9)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Denmark	9 (3.7)	3 (6.3)	2 (1.9)	4 (4.7)	3 (7.1)	0 (0)	1 (2.3)	8 (4.8)
Finland	4 (1.6)	0 (0)	3 (2.8)	1 (1.2)	0 (0)	0 (0)	0 (0)	2 (1.2)
France	2 (.8)	1 (2.1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (.6)
Germany	7 (2.8)	3 (6.3)	4 (3.8)	0 (0)	0 (0)	0 (0)	2 (4.5)	5 (3.0)
Greece	1 (.4)	0 (0)	1 (.9)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Iceland	5 (2.0)	2 (4.2)	2 (1.9)	1 (1.2)	0 (0)	0 (0)	1 (2.3)	4 (2.4)
Italy	6 (2.4)	1 (2.1)	4 (3.8)	0 (0)	0 (0)	0 (0)	0 (0)	3 (1.8)
Ireland	11 (4.3)	0 (0)	7 (6.6)	4 (4.7)	2 (4.8)	1 (6.7)	6 (13.6)	5 (3.0)
Netherlands	35 (13.8)	6 (12.5)	23 (21.7)	6 (7.1)	10 (23.8)	3 (20.0)	6 (13.6)	25 (15.2)
Norway	10 (3.9)	3 (6.3)	2 (1.9)	4 (4.7)	0 (0)	0 (0)	0 (0)	7 (4.2)
Poland	1 (.4)	0 (0)	1 (.9)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Spain	14 (5.5)	3 (6.3)	5 (4.7)	5 (5.9)	2 (4.8)	0 (0)	1 (2.3)	9 (5.5)
Sweden	38 (15.0)	10 (20.8)	13 (12.3)	15 (17.6)	3 (7.1)	1 (6.7)	8 (18.2)	23 (13.9)
Switzerland	7 (2.8)	0 (0)	6 (5.7)	0 (0)	0 (0)	0 (0)	1 (2.3)	3 (1.8)
Turkey	15 (5.9)	6 (12.5)	6 (5.7)	2 (2.4)	0 (0)	0 (0)	0 (0)	5 (3.0)
United Kingdom	74 (29.1)	7 (14.6)	18 (17.0)	41 (48.2)	20 (47.6)	10 (66.7)	16 (36.4)	57 (34.5)
Total	254 (100)	48 (100)	106 (100)	85 (100)	42 (100)	15 (100)	44 (100)	165 (100)

identify the authors' theoretical assumptions behind the research.

We also found four (1.6%) protocols for planned studies which not yet had been conducted, one each (.4%) of an experimental, an observational, a qualitative, and a combination of qualitative and experimental designs. A total of 15 (5.9%) of the articles described a study aimed at testing or validating a questionnaire in which 13 (5.1%) had an observational design and two (.8%) used a combination of observational and qualitative methods.

In terms of the 39 (15.4%) articles containing reports of secondary research, 12 (4.7%) were systematic reviews without meta-analysis or synthesis, ten (3.9%) with meta-synthesis, and three (1.2%) with meta-analysis. We classified other studies as analysis of routine collected data (n = 9; 3.5%) and secondary analysis of data collected for another study (n = 5; 2.0%).

Of the total study dataset, 42 studies (16.5%) were multimethod studies of which 15 (5.9%) were fully integrated mixed-methods studies. We classified 44 studies (17.3%) as part of programmatic research. In 12 (4.7%) of the articles, the authors defined their study as a complex intervention study with eight (3.1%) explicitly referring to the MRC guidance in the text or in the reference list. Regarding the stage of the MRC Guidance, authors in four studies (1.6%) reported that the study lay within the development stage, two (.8%) within the feasibility or pilot stage, one (.4%) within the evaluation stage, and one (.4%) in more than one of the stages.

Finally, we identified 165 (65.0%) of the included articles as reporting studies into nursing actions or interventions. Of these, 77 (30.3%) manuscripts reported studies into interventions that were independent, 77 (30.3%) interdependent, and 11 (4.3%) dependent.

DISCUSSION

In this second triennial review of European research in nursing published in the top 20 nursing journals by impact factor during 2013, we found 254 manuscripts authored by European nursing research teams. This number is not dissimilar to our previous review (254 vs. 223; Richards et al., 2014). Although the pattern of research reported was very similar to our previous review, we did find that in 2013 there was a greater proportion of experimental studies being reported compared to 2010 (18.9% vs. 11.7%),

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including twice as many reports of randomized controlled trials (9.4% vs. 4.5%). We found that the majority (41.7%) of the remaining manuscripts described observational studies, similar to the findings in our previous review (44.8%), or qualitative studies, in this case a number somewhat fewer than we reported previously (33.5% vs. 39.0%).

We observed a similar pattern in terms of secondary research. There were more of these studies overall compared to our previous review (15.4% vs. 9.4%), although in this case, we did not observe much difference in the numbers of methodologically superior reviews such as meta-syntheses or meta-analyses (5.1% vs. 4.5%). In terms of mixed methods, although 16.5% of studies reported using more than one method, a similar and very small number of studies (5.9%) met our criteria for fully integrated mixed methods compared to the 2010 dataset (4.9%).

Whilst the greater number of experimental research reports from European researchers might be construed as encouraging to those who have called for an increase in studies that can be used to make inferential or causal statements about nursing actions (Borglin & Richards, 2010; Hallberg, 2009; Melnyk, 2012; Richards & Borglin, 2011; Richards, Hilli, Pentecost, Goodwin, & Frost, 2018), we advise caution when interpreting these figures. These numbers are still very small with only 9.4% of published reports describing research using randomized controlled designs, that is, those best equipped to reduce experimental biases. The vast majority of primary research, and most secondary research, published in the top 20 nursing journals by European researchers remains resolutely descriptive.

Sadly, in the case of manuscripts reporting qualitative studies, despite our previous calls for improvement in this area, we observed little change in the labeling of the theoretical approaches underpinning these studies. In both reviews, we found that around two-thirds of authors failed to report the philosophical basis for their methodological stance. Likewise, there were many other examples of inconsistent methodological labeling of all study designs in titles, abstracts, and even full texts, which left our team of reviewers struggling at times to categorize the methods reported by study authors.

Very few study authors cited the MRC Complex Interventions Research Framework (Craig et al., 2008), even less than in our previous review (3.1% vs. 8.1%). We also found only a minority (17.3%) of studies reported being part of integrated research programmes, despite repeated calls in the literature for nurse researchers to cease the highly wasteful practice of undertaking multiple small and disconnected research studies.

However, possibly as a consequence of our using a different and more satisfactory definition (Wilkinson, 2011) of "nursing interventions" in this review (essentially broadening our definition), we categorized 64.5% of included studies as nursing intervention studies. In contrast, our previously narrow definition—which we had found extremely difficult to operationalize—had used Naylor's, 2003 definition (Naylor, 2003) which emphasized interventions shaped by "nursing's values" and "strong theoretical basis," and had resulted in 34.1% of studies being so classified. Interestingly, our previous figure accords well with our findings in this new review that 30.3% of studies reported research into independent nursing actions. We categorized the remaining interventions as interdependent and dependent, research which we would not have included in our previous review as specifically investigating nursing interventions.

Despite the very significant demographic changes and political restructuring of health care away from acute environments in most European states, more than 60% of research reported was undertaken in hospitals. In a surprising manner, in studies where age was a relevant factor, only around 25% of research reported concerned studies involving older adults. The balance of research appears weighted toward nursing of acute healthcare conditions in secondary care environments, with cancer care being the most common condition studied (apart from reproductive health, predominantly reported in midwifery journals).

Although the size of the populations of some countries like the UK might go some way to explaining their large contribution to the research record (UK = 29% of all included papers), other countries with long established academic nursing traditions contributed more studies than might be predicted from their population size alone. It might be possible to make educated guesses about the academic traditions of different countries from the greater preponderance of different research designs they contribute.

To illustrate this, Sweden—a relatively small country in terms of population—contributed 15% of included reports compared to large countries such as Germany and France that contributed very few (Table 1). Based on the exploration of these descriptive results, we observed some interesting differences between countries, in that some reported a larger proportion of certain methods compared to their overall representation in our dataset. For example, almost 50% of all qualitative studies were from the UK, from a country that represented just 29% of the manuscripts in total. In contrast, Sweden reported almost 21% of the experimental studies, although only 15% of the published manuscripts came from that country. The Netherlands (14% of the total manuscripts) published 22% of the observational studies and research reported from the Netherlands was more likely to include multimethods (10 of their 35 reported studies; 29%) compared to Sweden (three of 38; 8%). In terms of programmatic research, more than half of Irish manuscripts described programmatic research (six of 11; 55%), compared to 22% (16 of 74) in the UK and Sweden (eight of 38) and 17% in the Netherlands (six of 35).

Strengths and Limitations

In this review, we replicated and built on the methods of our previous review (Richards et al., 2014), and

as such, this work is subject to the same strengths and limitations as that. In brief, our journal population is unlikely to have captured all the research outputs from nursing researchers in Europe, given that researchers may have chosen to publish their work in generic health- or disease-specific journals, rather than those categorized as "nursing" for the purposes of impact factor calculation. However, we defend this decision on the same grounds as previously—that a practicing nurse enquiring about her clinical uncertainties in the local library might not unreasonably search nursing journals before all others. Furthermore, the journal inclusion criteria are not arbitrary, nor formulated by our research team. Rather, they are a set of objective criteria and a matter of independent public record.

Our methods remained largely the same as previously, although some procedures changed slightly as a result of that experience. In this review, we retained greater control over full-text decision making in the central coordinating team as we had previously found that this team had had to read almost all the manuscripts anyway to reconcile differences between non-core team reviewers of varying levels of knowledge and skills. Our methods this time paired independent reviewers with one member of the core team and allocated dispute resolution to another member of the core team. This was a more efficient procedure.

Likewise, we changed the criteria for some variables, most noteworthy for our definition of nursing interventions. This significantly increased our classification of studies into those about nursing interventions, as the new definition allowed us to include actions regularly undertaken by nurses as part of their multiprofessional activities, or as part of advanced practice or medical substitution activities, rather than merely activities according to the rather narrow previous definition. Although the two reviews are therefore less comparable, we believe that the studies classified in this latest review now represent a fuller account of nursing activity research.

In conclusion, our denominator was defined as the number of manuscripts. Very occasionally, we came across more than one paper reporting different types of analyses from the same study, for example, clinical and health economic reports. Our results therefore may slightly over estimate the number of European nursing research studies, although this was only observed on a handful of occasions.

IMPLICATIONS FOR RESEARCH AND PRACTICE

The principal implication seems to be that little changed in the world of European nursing research using evidence derived from publications in the top 20 nursing journals between 2010 and 2013. Although slightly more experimental studies were published, these remain a small minority in the overall research record. Worse still, in the observational studies, the numbers of prospective studies were tiny (5.5%) and there were no retrospective studies at all. Even the observational studies therefore were not designs that might even hint at a causal temporal relationship between different variables.

Similar to our previous review, there was little mention of complexity, or research frameworks to address this, so that qualitative or other descriptive studies were not situated in a programme of research to improve the evidence base for nursing practice. Fully integrated mixed-methods studies were rare and secondary research did not very often include methodological synthesis, either of narrative or numerical data. Although one could argue that this is a result of the quality of primary studies, given the preponderance of qualitative studies compared to clinical trials one might expect there to be ample room for meta-ethnographies or meta-syntheses of qualitative studies. We did not observe this in our review.

Once again, we are left suggesting that nursing researchers in Europe do not seem to engage in research that might have more than an a purely aspirational impact on real nursing practice, and are in some way constrained by either methodological knowledge or culture. Whilst it is heartening that two-thirds of research concerns nursing action, this focus needs to be married to research designs that can do far more than describe phenomena and behavior, and move to inferential, longitudinal and experimental research that might give solid grounds for advice and guidance.

With very significant demographic changes and many people now living with increased frailty, suffering from chronic long-term conditions, and surviving to a greater age in community environments, the overwhelming focus of research in nursing should change from acute hospital care to address these key 21st century health issues. Multimorbidity is now the norm, and as we have shown in a previous review (Richards et al., 2018) successful nursing interventions are not likely to be those that focus on narrow diagnostic conditions but on complex multiple interventions to address the multimorbid states that many of us will experience in our older age. We recommend that nurses make much greater use of research frameworks such as that proposed by the MRC (Craig et al., 2008) and developed by others (Bleijenberg et al., 2018; Richards & Rahm-Hallberg, 2015) to assist them in designing studies in these areas.

Despite our intention to compare publications in 2010 and 2013, it is probably somewhat unrealistic of us to expect that European nursing research reports could have changed significantly in 3 years. Many studies being reported in 2013 will have been planned well before the REFLECTION network became active, and given the example from implementation science where it is estimated to take 17 years to implement clinical research results in

practice (Morris, Wooding, & Grant, 2011), it is likely that our network will require considerably more time before research practice changes. However, adding to the slight evidence of change from this review are data from a recent survey of participants from the European Academy of Nursing Science Summer (EANS) school, a sister organization to the REFLECTION network, in which 29% of participants report having used experimental research designs in the postdoctoral research studies (Hanssen & Olsen, 2017). The EANS summer schools are for PhD students in nursing and are structured around the MRC complex interventions research framework and thus are more likely to affect practice directly.

As a consequence of this and our previous review, we include a call to action to improve the nature, quality, and relevance of research in nursing globally.

1. All countries and global regions should conduct similar reviews to compare and contrast the position of nursing research globally and to highlight examples of, and reasons why, some countries may be able to undertake research of better quality and relevance. We would welcome approaches from researchers elsewhere to use our databases of studies for these purposes.
2. Undertake in depth studies to discover the potential reasons why so many studies are of such poor quality and relevance to practice, investigating the potential causal influences of, for example, different cultures of enquiry, educational standards of research courses, the current knowledge base for existing and early-stage researchers, and the influence of funding agencies on motivation to undertake relevant experimental intervention studies.
3. Use the diagnostic analyses above to direct a deliberate, targeted, and systematic global effort to increase the number of experimental, high quality, and relevant studies into nursing interventions to raise the level of evidence and, therefore, the quality of care and patient outcomes.
4. The editors of nursing research journals should require their contributing authors to apply the relevant methodological and standardized reporting criteria as listed on the EQUATOR website in order to make life substantially easier for readers of all persuasions—scientists, clinicians and members of the public—and improve the quality of the nursing research record per se.

CONCLUSIONS

European research in nursing reported in the leading 20 nursing journals remains overwhelmingly descriptive. Despite a slight increase in reported experimental studies compared to 2010, research that is able to infer causal conclusions about the effectiveness or otherwise of nursing interventions was rarely reported in these journals during 2013. The enquiring nurse, looking to find answers to her clinical uncertainties, must look elsewhere for information to aid her practice. This is disappointing, given international acknowledgement of the relationship between nursing quality and care outcomes (Aiken et al., 2014; Ball et al., 2014; Bureau of Health Information, 2014; Department of Health, 2013; Garling, 2008; Kalisch, 2006). Now, more than ever, European researchers in nursing should give strong leadership to a step change in the quality and nature of research undertaken by their departments. Whether this requires additional education programmes such as that undertaken by the European Academy of Nursing Science (https://european-academy-of-nursing-science.com/) and the REFLECTION network (https://www.reflection-network.eu/), a mere change in stance from supervisors and research leaders, or a root and branch reform of research departments is open to debate. It is likely a combination of all these elements is needed. **WVN**

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Author information

David A. Richards, Professor of Mental Health Services Research and Head of Nursing University of Exeter, College of Medicine and Health, St Luke's Campus, Heavitree Road, Exeter, EX1 2LU, UK and Hogskulen pa Vestlandet, Faculty of Health and Social Sciences, Bergen, Hordaland, Norway; Tove Aminda Hanssen, Associate Professor, Universitetssykehuset Nord-Norge, Department of Heart Disease, and University of Tromsø-The Arctic University of Norway, Cardiovascular Research Group, Institute of Clinical Medicine, Tromsø, Norway; Gunilla Borglin, Reader in Nursing, Department of Care Science, Faculty of Health and Society, Malmo University, Malmo, Sweden.

Written on behalf of the European Academy of Nursing Science REFLECTION review group: José Amendoeira, Polytechnic Institute of Santarem, Santarem, Portugal; Konstantinos Antypas, University Hospital of North Norway, Tromsø, Norway; Odete Araújo, University of Minho, Braga, Portugal; Connie Bøttcher Berthelsen, Aarhus University, Emdrup, Denmark; Carol Bugge, University of Stirling, Stirling, United Kingdom; Patrick Callaghan, University of Nottingham, Nottingham, United Kingdom; Anna Castaldo, Don Gnocchi Foundation, Milan, Italy; Marco Clari, University of Rome Tor Vergata, Rome, Italy; Wladyslava Czuber-Dochan, King's College London, London, United Kingdom; Luis González de Paz, University of Barcelona, Barcelona, Spain; Mieke Deschodt,

KU Leuven, Leuven, Belgium; Cécile Marie Dupin, School of Health Sciences, HES-SO University of Applied Sciences and Arts Western Switzerland, Geneva, Switzerland; Angela Durante, University of Rome Tor Vergata, Rome, Italy; Anne Eskes, Academic Medical Centre, University of Amsterdam, Amsterdam, The Netherlands; Roelof Ettema, University of Applied Sciences Utrecht, Utrecht, The Netherlands; Jane Evely, Liverpool John Moores University, Liverpool, United Kingdom; Paz Fernandez-Ortega, University of Barcelona, Barcelona, Spain; Sónia Ferrão, Escola Superior de Enfermagem de Lisboa, Lisboa, Portugal; Pernilla Garmy, Lund University, Lund, Sweden; Edith Roth Gjevjon, Lovisenberg Diaconal College, Oslo, Norway; Bruna Raquel Gouveia, Saint Joseph of Cluny Higher School of Nursing, Funchal, Madeira, Portugal; Maria Adriana Henriques, Escola Superior de Enfermagem de Lisboa, Lisboa, Portugal; Daniela Holle, German Centre for Neurodegenerative Diseases, Witten, Germany; Bente Høy, Randers Regional Hospital, Randers, Denmark; Lisa Jeffers, Belfast Health and Social Care Trust, Belfast, United Kingdom; Marlène Karam, Université Catholique de Louvain, Brussels, Belgium; Marit Leegaard, Oslo and Akershus University College, Oslo, Norway; Tove Lindhardt Damsgaard, Copenhagen University Hospital, Herlev, Denmark; Edward McCann, Trinity College Dublin, Dublin, Ireland; Melanie Messer, Bielefeld University, Bielefeld, Germany; Ralph Möhler, Cochrane Germany, Faculty of Medicine and Medical Centre - University of Freiburg, Freiburg, Germany; Hugo Neves, Escola Superior de Saúde de Leiria - Instituto Politécnico de Leiria, Leiria, Portugal; Cecilia Olsson, Karlstad University, Karlstad, Sweden; Alvisa Palese, Udine University, Udine, Italy; Rebecca Palm, German Centre for Neurodegenerative Diseases (DZNE), Witten, Germany; Gareth Parsons, University of South Wales, Pontypridd, United Kingdom; Martina Roes, German Centre for Neurodegenerative Diseases (DZNE), Witten, Germany; Rafaela Rosário, University of Minho, Braga, Portugal; Tomáš Sollár, Constantine the Philosopher University, Nitra, Slovakia; Sonia Sunny, University of Gothenburg, Gothenburg, Sweden; Styliani Tziaferi, University of Peloponnese, Sparti, Greece; Betsie van Gaal, Radboud University Medical Center, Nijmegen, The Netherlands; Filipa Ventura, Nursing School of Coimbra, Coimbra, Portugal; Sarah Vollam, University of Oxford, Oxford, United Kingdom.

Address correspondence to Professor David A. Richards, College of Medicine and Health, University of Exeter, St Luke's Campus, Heavitree Road, Exeter, EX1 2LU, UK; d.a.richards@exeter.ac.uk

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