Building capacity for nurse-led research

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Aim: To discuss factors that have influenced the development of research capacity among nurses in lower and middle-income countries (LMICs).

Background: Concerned health scientists have addressed the importance of building research capacity among health professionals. Strengthening capacity specifically among LMIC nurses has been infrequently discussed. Without the requisite educational preparation or an enabling environment for research, nurses are unlikely to either demand research capacity-building opportunities or initiate research examining nursing practice and health system challenges.

Methods: A scan was conducted of nine internationally funded research capacity-building initiatives to identify programme targeting and the proportion of nurse trainees. A literature review examined graduate and post-graduate training opportunities for LMIC nurses, and barriers and enablers to nurses’ involvement in research. Informal consultations were held with nurse leaders in 15 LMICs and leaders of eight LMIC nursing organizations.

Findings: The scan found a generic targeting of health professionals with a very low percentage of nurse trainees. Programmes specifically targeting nurses did attract and prepare a significant number of nurses. Factors limiting nurses’ involvement in research include hierarchies of power among disciplines, scarce resources, a lack of graduate and post-graduate education opportunities, few senior mentors, and prolonged underfunding of nursing research.

Conclusions: Fully engaging LMIC nurses in health services research may yield pragmatic and evidence-informed service delivery and policy recommendations. Investments in supports for nursing research capacity may enrich global health policy effectiveness and improve quality of care.

Keywords: Developing Countries, Health Systems, Nursing Research, Research Training

Introduction

Concerned health scientists have identified the importance of building research capacity generically among health professionals in lower and middle-income countries¹ (LMICs) (Costello & Zumla 2000; GFfHR 2004a; Lansang & Dennis 2004; Ramsay 2001; Sithi-amorn & Somrongthong 2000; Volmink & Dare 2005) as a means to tackle ‘the 10/90 gap’ in research funding. The Commission on Health Research for Development introduced the phrase ‘10/90 gap’ in 1990 following estimates indicating that less than 10% of the world’s resources for health research were directed towards the health problems of developing countries, which bear over 90% of the world’s disease burden (GFfHR, 2004a). This underinvestment in health research for LMICs remains a major concern with their double burden of chronic and communicable diseases within contexts of weak health systems further challenged by health human resource...
shortages (Daly et al. 2008; GFfHR 2004b; Ijsselmuiden et al. 2008).

Although there have been many calls for initiatives to build capacity for the design, implementation and utilization of health research (GFfHR 2004a), strengthening research capacity specifically among LMIC nurses has been infrequently discussed. However, the need for a more prominent nursing voice in health services and policy decision-making has been repeatedly noted, primarily through World Health Organization (WHO) forums (Antrobus & Kitson 1999; Pan-American Health Organization 2004; World Health Assembly 2006; WHO 2001). It has been suggested that investments to build nursing research and knowledge translation capacity, and steps to include nursing expertise in decision-making arenas, can potentially enrich health policy effectiveness and improve quality of care (WHO 2002). This paper identifies long-standing barriers to nurses’ engagement in research. This is followed by a discussion of strategies that would enable LMIC nurses to lead research of high relevance to local and international policy decisions affecting population health.

Methods
Several sources informed our perspectives. These included: a review of the literature, a scan of international organizations that have funded research capacity-building initiatives, and informal consultations with senior nurse leaders regarding research issues that we conducted in 2005 in 15 LMICs (Roelofs 2005; Webber et al. 2005) and with leaders of eight LMIC nursing organizations who were asked to identify sources of funding for nursing research in their countries in 2008.

The scan was conducted by searching postings of research training opportunities on development and global health websites such as Development Gateway, Global Health Council, Health Systems Trust, The Communications Initiative, WHO and healthtraining.org. Information was obtained through discussions with training programme officers and senior staff in the organization. Contact was made by email and telephone. We examined those training programmes that had been offered for at least 3 years, were open to developing country researchers including nurses, used English-language instruction, had a curriculum focused on health research training, and did not require applicants to have a USA-affiliated research partner.

Senior nurse leaders who we consulted were identified through the Director of International Policy and Development at the Canadian Nurses Association and as part of a programme of research we are leading in two Caribbean and three African countries (Edwards et al. 2007).

Engaging nurses as researchers: critical benefits to health-care systems
There are many compelling reasons to engage nurses in conducting collaborative, multidisciplinary research and in using research findings to strengthen practice. Innovative responses that address existing and future global health concerns call not only for more evidence but also for new sources of evidence (WHO 2002).

Increasingly around the world, registered nurses work across all sectors of the health system and are thus well positioned to identify and pursue highly pertinent health services and policy research questions. As frontline providers who have a 24/7 presence with patients and families, nurses’ work provides fertile ground for important clinical research questions. The investigation and adoption of evidence-informed approaches are highly relevant to nursing practice and patient outcomes, and to the quality and cost-effectiveness of health services (Forster et al. 2005; Kleinpell 2003; Palmer et al. 2001; Van den Hout et al. 2003). Nurses are pioneering innovative community health programmes, often in more remote and isolated settings where other health-care providers are rarely present. The full engagement of nurses in researching critical health services issues is likely to lead to service delivery and policy recommendations that are both pragmatic and evidence-informed.

This need for strong LMIC nursing research capacity extends to the policy environment, where nursing expertise is required to more effectively inform and guide national and international policy. For example, the introduction of ‘task shifting’ by the WHO (WHO 2008) as a mechanism to transfer or delegate skills through the health continuum in the face of critical shortages of health professionals in many countries, most significantly the continent of Africa, may exacerbate health system weaknesses. While task shifting is bringing considerable investments to the preparation of unregulated health providers, it is widely criticized for doing so without a balanced investment in optimizing and building upon existing cadres, and without ensuring the promotion of quality care and patient safety through regulatory provisions (ICN 2008).

Research capacity development programmes
Much has been written about the imperative of building research capacity among nurses generally (Franck 2003; Scott 2002; Segrott et al. 2006) and among LMIC health professionals specifically (Marshall-Lucette et al. 2007; Mony et al. 2005; Pang et al. 2004; Sitthi-amorn & Somrongthong 2000). However, in an extensive review of 47 studies examining strategies that could be used to develop nursing research capacity (Segrott et al. 2006), only seven authors addressed issues pertinent to LMICs (Crossley 2001; Nchinda 2002; Sitthi-amorn & Somrongthong...
practice subtle and direct examples of this social and practice norm. Nurses whose foundational training entrenched into their practice as physician-handmaiden has diminished, there are many traditionally present in clinical practice. While the perspective of nurses’ roles in research have often mirrored those persistently presented a serious barrier to nurses’ involvement in research. LMIC nursing leaders whom we consulted (Webber et al. 2005) repeatedly described nurses’ roles in research as primarily that of data collectors for clinical studies, when they frequently worked as research assistants on physician-led projects. It was noted that LMIC nurses had few opportunities for involvement in other elements of the research process such as data analysis and interpretation, presenting findings or writing publications. Furthermore, their contributions were rarely acknowledged in reports or publications of findings. While the role of nurses as research data collectors may be familiar and supported, their role as principal investigators may be thwarted by entrenched views about the relevance of nursing research, and the biomedical orientation of both funding agencies and publication venues (Alcock & Arthur 2002; Francis & Humphreys 1999; Montgomery 1999; Rafferty & Traynor 2002; Segrott et al. 2006).

**Factors limiting nurses’ involvement in research**

The lack of international research capacity-building opportunities for nurses is symptomatic of a wider failure to systematically strengthen research capacity in the nursing community (Segrott et al. 2006). Without the requisite training or an enabling environment to participate in or lead research, nurses are unlikely to either demand research training opportunities or initiate research examining nursing practice and health system challenges (Campbell et al. 1999; Cooke & Green 2000; Fyffe & Hanley 2002). In this section we consider some of the contributing factors.

**Hierarchies of power**

The hierarchies of power that exist among health disciplines have persistently presented a serious barrier to nurses’ involvement in research. Nurses’ roles in research have often mirrored those traditionally present in clinical practice. While the perspective of nurse as physician-handmaiden has diminished, there are many nurses whose foundational training entrenched into their practice subtle and direct examples of this social and practice norm (Sinclair 2000). The structure of health-care teams, with physicians typically designated as the ‘head of the team’, has reinforced this view of nurse as assistant to the physician. It is our contention that this perspective has extended into medical and societal views of the nurses’ role in research. LMIC nursing leaders whom we consulted (Webber et al. 2005) repeatedly described nurses’ roles in research as primarily that of data collectors for clinical studies, when they frequently worked as research assistants on physician-led projects. It was noted that LMIC nurses had few opportunities for involvement in other elements of the research process such as data analysis and interpretation, presenting findings or writing publications. Furthermore, their contributions were rarely acknowledged in reports or publications of findings. While the role of nurses as research data collectors may be familiar and supported, their role as principal investigators may be thwarted by entrenched views about the relevance of nursing research, and the biomedical orientation of both funding agencies and publication venues (Alcock & Arthur 2002; Francis & Humphreys 1999; Montgomery 1999; Rafferty & Traynor 2002; Segrott et al. 2006).

**Scarc resources**

Decisions to expand the range of fundable disciplines and topics of research by funding agencies may not be supported by those concerned about diverting limited funds to a broader research agenda. LMIC nurse leaders reported the existence of medical research or scientific councils in their countries with research funding considered available but generally unsubscribed to by nurses because of their lack of research capacity and the biomedical focus of funding agencies (Webber et al. 2005).

Nurse leaders also identified the external pressures to expand their educational programmes in order to meet human resource shortages. This in turn creates heavy demands on their time, limiting working hours available for research. Administrative support in universities to redistribute scarce space, research funds and training fellowships was described as limited. When research funding is scarce, shifting resources away from well-established and prolific biomedical research groups and into more formative nurse-led research teams presents a high-risk scenario for administrators.

Dissemination vehicles for research findings are critical. But here too, nursing leaders identified a scarcity of resources (Oulton & Caldwell 2007). National and regional health journals often reflect a biomedical orientation. Nurses, who are leading health services or policy research and appropriately using a wider range of qualitative or mixed methods, may have difficulty publishing their findings because of the predominant quantitative methodological orientation of many biomedical journals. Nursing journals may offer an alternative venue for publication,
Graduate education
As with other disciplines, graduate education prepares nurses to better use and conduct research. A lack of graduate training contributes to inadequate requisite knowledge and skills to initiate research, compete for funding and develop effective knowledge translation strategies. A limited number of masters and doctoral nursing programmes are available in LMIC countries (Ozsoy 2007), and few graduate-prepared nurses are in the workforce. According to a study published in 2002, sub-Saharan Africa had doctoral nursing programmes in only four countries, with master’s in nursing programmes in seven countries (Kopolo et al. 2005). International funding such as that from the Kellogg Foundation has enabled nurses in several African countries to pursue graduate training internationally; even so, the same study found that only a minority of nurse educators have graduate degrees (6% were PhD qualified and 12% were master’s qualified; Kopolo et al. 2005). In Zimbabwe in 2003, for example, there were only 10 doctoral-prepared nurses (all foreign-prepared) out of 17 000 nurses (Munodawafa 2003). Senior nursing leaders in LMICs explained that the lack of master’s and PhD programmes in nursing has driven nurses to pursue their degrees in other fields, sometimes leaving nursing entirely, thus further aggravating the shortage (Jairath 2007; Webber et al. 2005). The lack of graduate educational opportunities for nurses in lower income countries has become a critical factor that encourages nurses to migrate to other countries. This further exacerbates the repercussions of nurse migration that have been particularly devastating on the African continent (Kline 2004; Salmon et al. 2007). It is encouraging to see that foundational courses for nursing research are being put into place. For instance, in many LMIC countries, research courses and projects are being added into existing diploma, undergraduate and graduate programmes (Kopolo et al. 2005; Rafferty et al. 2003). However, as nurse educators strive to redress gaps in graduate programmes, heavy clinical and classroom teaching and administrative demands may significantly curtail their involvement in research (Clare & Hawes 2001; Feldman & Acord 2002).

Mentorship
The importance of mentoring is reflected in much of the current literature on strategies to support research excellence in any field (Byrne & Keefe 2002; Records & Emerson 2003; Segrott et al. 2006). Many well-established health research programmes and institutes have mentoring structures such as internships, post-doctoral fellowships, journal clubs, research practicums, and a cadre of researchers and research trainees at various stages of their research careers working on joint projects. However, as our nursing colleagues described, mentoring structures to support promising nurse researchers are still weak, slowing the development of more advanced research and grantsmanship skills among junior nurse researchers and compromising their ability to develop solid programmes of research (WHO 2002).

The lack of a strong tradition of nursing research and the paucity of senior LMIC nurse researchers mean that junior nurse researchers seldom have the benefit of tutelage from local mentors. Nurses may be hesitant to approach experienced researchers from other disciplines because of concerns about relevance or fit between their content foci or methods orientation, and uncertainty about negotiating a mutually satisfactory mentor–mentee relationship.

Research funding
The historical undervaluing of nursing has contributed to the perceived lack of importance given to nursing research and, consequently, its prolonged underfunding by national granting councils (ICN 2007; Rafferty et al. 2003). This situation is not unique to LMICs. Seventy-three per cent of research published by UK nurses between 1988 and 1998 was unfunded (Centre for Policy in Nursing Research et al. 2001). Furthermore, private sources of research funding (the pharmaceutical industry and companies developing medical technology) target biomedical scientists for laboratory studies, and physicians for efficacy and effectiveness trials. The latter have become increasingly major sources of funding in LMICs (Ijsselmuiden et al. 2008) but, for the most part, the areas of research inquiry for nurses do not fit within these funding envelopes. During informal consultations (Webber et al. 2005), nurse leaders in LMICs identified a lack of national research funding options accessible to nurse researchers and low rates of success in applying to existing funders.

Recommendations to strengthen and support nursing research capacity in LMICs
Nursing research capacity in LMICs remains fragile, and a long-term strategy to redress this capacity gap is needed.
Graduate and post-graduate preparation
Graduate-level training for nurses is critical, and more opportunities for nurses to obtain graduate preparation are essential. Research and policy practicums would support trainees to more fully develop the skills required for health services and policy research. Establishing nursing PhD programmes in LMICs with limited resources is a long-term process. We suggest that universities consider the development of interdisciplinary graduate programmes where nurses have the option of taking elective nursing courses from other universities (via distance education) including support for research projects with a policy, health services or clinical nursing focus. Thesis membership could be opened up to include senior nurse mentors from non-academic settings to model the engagement of decision-makers in research. The International Network for Doctoral Education in Nursing has developed a ‘Proposed Model for an International Collaborative Doctorate’ (Galvin & Courtney 2005) to address the imperatives of increasing opportunities for nursing graduate education. On a larger scale, the more recently formed Global Alliance for Nursing Education and Scholarship (Daly et al. 2008) is a collaborative effort to engage nursing education leaders to pursue priorities related to nursing scholarship.

Post-graduate training including post-masters and post-doctoral fellowships would provide mechanisms to help nurses successfully apply newly acquired research skills. Novel post-graduate distance training programmes such as the well-established Canadian nursing research internship (Smith & Edwards 2003) target essential research skills such as writing peer-reviewed publications, developing knowledge translation skills for a variety of stakeholders and honing grantsmanship abilities. This particular initiative has now been internationalized (Edwards & Roelofs 2007).

Mentoring strategies
Mentoring strategies are critical in helping nurses develop and operationalize mature programmes of research (Priest et al. 2007). Opportunities to work alongside senior researchers, both on-site and by distance, provide a venue for discussing ways to balance research with teaching, clinical and administrative demands, and developing supervisory skills for guiding graduate students and research staff. Formalized links to decision-makers would help ensure that research questions tackle priority health services and policy issues. Nurse researchers in other settings can offer support for nurse-led research initiatives and complement local guidance that may be available from senior researchers who are on-site but trained in other disciplines. Joint mentorship options should be considered with nurses co-mentoring nurses and other trainees alongside more experienced research mentors, achieving a dual agenda of strong mentorship for both trainees and junior mentors. In addition, opportunities for mentoring by senior nurse researchers are essential to ensuring strong role models for nurse-led research teams.

Research funding and environmental supports
Improving nurses’ access to funding for research projects and strengthening nursing research networks is critical. Nurses require access to basic research infrastructure (e.g. computers, databases, personnel support; Rafferty et al. 2003). There need to be explicit statements of nurse eligibility from research funding agencies. A review of resource allocation mechanisms may be required in some institutions to determine whether existing protocols bias resource distribution towards biomedical scientists and physicians rather than nurses. Private sources of funding also need to be tapped, and major funders of international health research need to be made aware of nurses’ rising capacity to undertake health services and policy-relevant research. Targeted funds for nursing research should be considered.

The ability to compete successfully for peer-reviewed research funds is fostered by relevant experience. Nurses must be actively recruited to participate as peer reviewers for granting agencies. Finally, it is essential that nurses are invited as advisors to, and members of, governing bodies where research funding priorities are determined. This may require revamping committee terms of reference to ensure nurses’ participation.

Conclusion
The call for action to strengthen and support LMIC nursing research capacity is not new. Realizing this priority depends upon political will, a long-term commitment and investments in critical supports. While there are no quick fixes, sustained gains in LMIC nurses’ research capacity will successfully harness their roles as knowledge providers who can address critical global health priorities. The nascent potential of nurse researchers must be realized to mount an adequate response to LMIC health systems and policy issues.

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Author contributions
Nancy Edwards conceived and drafted the original paper. All other authors contributed by adding content to this initial draft and by critically reviewing the content of the paper. June Webber and Susan Roelofs led the consultation with nursing leaders. All authors contributed to this consultation process. All authors have approved the final version submitted for publication.

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**Supporting Information**

Additional Supporting Information may be found in the online version of this article:

**Table S1.** Summary of nurse trainee participation in selected health research training opportunities.

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