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Article

Qualitative Research in an International Research Program: Maintaining Momentum while Building Capacity in Nurses

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Abstract

Nurses are knowledgeable about issues that affect quality and equity of care and are well qualified to inform policy, yet their expertise is seldom acknowledged and their input infrequently invited. In 2007, a large multidisciplinary team of researchers and decision-makers from Canada and five low- and middle-income countries (Barbados, Jamaica, Uganda, Kenya, and South Africa) received funding to implement a participatory action research (PAR) program entitled "Strengthening Nurses' Capacity for HIV Policy Development in sub-Saharan Africa and the Caribbean." The goal of the research program was to explore and promote nurses' involvement in HIV policy development and to improve nursing practice in countries with a high HIV disease burden. A core element of the PAR program was the enhancement of the research capacity, and particularly qualitative capacity, of nurses through the use of mentorship, role-modeling, and the enhancement of institutional support. In this article we: (a) describe the PAR program and research team; (b) situate the research program by discussing attitudes to qualitative research in the study countries; (c) highlight the incremental formal and informal qualitative research capacity building initiatives undertaken as part of this PAR program; (d) describe the approaches used to maintain rigor while implementing a complex research program; and (e) identify strategies to ensure that capacity building was locally-owned. We conclude with a discussion of challenges and opportunities and provide an informal analysis of the research capacity that was developed within our international team using a PAR approach.

Keywords: capacity building, nurses, qualitative research, participatory action research, international, sub-Saharan Africa, Caribbean

Background to Research Program

Many nurse leaders and scientists have called for a critical examination of nurses' roles in enhancing effectiveness of healthcare practice, increasing equity of healthcare provision, and promoting development of the nursing profession (Goeppinger, Miles, Weaver, Campbell, & Roland, 2009; Potempa, Redman, & Anderson, 2008; Priest, Segrott, Green, & Rout, 2007). Nurses are knowledgeable about issues that affect quality and equity of care and are well qualified to inform policy, yet their expertise is seldom acknowledged and their input infrequently invited (Edwards, Kahwa, Kaseje, Mill, Webber, & Roelofs, 2007; Institute of Medicine, 2010). Similarly, nurses are capable of contributing to the design and implementation of research to improve health outcomes; however, particularly in low- and middle-income countries (LMICs), they require access to capacity building and training initiatives to build their research skills. In a recent Ugandan survey, 80% of nurses and midwives reported that they were interested in training opportunities to develop research skills (Zuyderduin, Obuni, & McQuide, 2010). The Institute of Medicine (2010) suggested that although nurses are well positioned to lead positive change and advance health, barriers such as the dearth of nurse researchers with doctoral-level training prevent nurses from effectively responding to rapidly changing health care settings and systems. This situation is of particular concern in resource-challenged regions where the investment in health research is low and the burden of disease is high, which is referred to as the "10/90 gap" (Global Forum for Health Research, 2004).

An international team of researchers and decision-makers came together in a program of research to explore and promote nurses' involvement in HIV policy development in LMICs with high HIV disease burden. A core element of the research program was the enhancement of the research capacity, and particularly qualitative capacity, of nurses through the use of mentorship, role-modeling, and the enhancement of institutional support. The program of research was guided by the principles of participatory action research (PAR) (Etowa, Bernard, Oyinsan, & Clow, 2007; Israel, Eng, Schulz, & Parker, 2005; McNiff & Whitehead, 2006; Minkler & Wallerstein, 2003; Rahman, 1991) and explored capacity building as a central tenet of the PAR process (Fournier, Mill, Kipp, & Walusimbi, 2007; Jagosh et al., 2012).

The purpose of this article is to describe the capacity building components that underpinned the PAR process for this international program of research. The data for this article is based on the on-going analysis of the personal reflections, team meetings, field notes, and progress, annual, and final reports for the research program. In this article we: (a) describe the PAR program and research team; (b) situate the research program by discussing attitudes towards qualitative research in the study countries; (c) highlight the incremental formal and informal qualitative research capacity building initiatives undertaken as part of this PAR program; (d) describe the approaches used to maintain rigor while implementing this complex research program; and (e) identify strategies to ensure that capacity building was locally-owned. We conclude with a discussion of challenges and opportunities and provide an informal analysis of the research capacity that was developed within our international team. In the preparation of this manuscript, investigators, research assistants (RAs), and collaborators involved with the research program were asked to reflect on their experiences related to qualitative capacity building; several quotations have been included in the article to highlight these experiences. These reflections were gathered from team members through the use of digital files and email, implying consent for participation in the analysis of the capacity building outcomes. Ethical review for the program of research was obtained from 16 research ethics boards in six countries.

Program of Research and the Research Team

In 2007, a large multidisciplinary team of researchers and decision-makers from Canada and five LMICs (Barbados, Jamaica, Uganda, Kenya, and South Africa) received funding to implement a PAR program entitled "Strengthening Nurses' Capacity for HIV Policy Development in sub-Saharan Africa and the Caribbean." One year after program funding was received Barbados withdrew from the program of research, with the four remaining partner countries continuing. A primary goal of the research program was to improve nursing practice in HIV care; the involvement of decision-makers was a strategic decision to influence policy, and ultimately change nursing practice. Decision-makers and national advisory committee members were involved not only as investigators, but also as members of leadership hubs. Leadership hubs were the primary PAR intervention in the research program, bringing together front-line nurses with managers and decision-makers and providing opportunities for nurses with less research experience to partner with more experienced researchers. The leadership hubs helped to situate qualitative capacity building initiatives throughout the research process with a goal of increasing the receptivity of decision-makers and front-line nurses to qualitative research evidence. Early in the research program leadership hub members were provided opportunities to enhance their research skills; as their skill and knowledge increased, they could apply for seed grants to initiate their own small projects. The seed grant program provides a powerful example of the alignment of the research program with the principles of PAR.

The five-year research program was funded through the Teasdale-Corti (TC) Global Research Program of the Global Health Research Initiative (GHRI), and involved four interrelated research projects, using 13 qualitative tools and three quantitative data collection instruments. The research program was developed with the full participation of investigators representing all of the participating countries and was made possible through a GHRI planning grant. Three co-principal investigators (one from each of the program's geographic regions) worked closely with project co-leads and country directors. Jointly these individuals comprised the executive committee. By the end of the research program in 2012, the team included 25 co-investigators and 16 collaborators. In addition, two post-doctoral fellows, seven graduate students, and one undergraduate student had worked with the team on different aspects of the program. Over the course of the research program, there was at least one primary project staff member and one to two part-time project staff in each of the study countries.

The Teasdale-Corti research program was conceptualized with the expectation that project teams would integrate capacity building into all elements of this PAR program (Edwards et al., 2007; Edwards, Webber, Mill, Kahwa, & Roelofs, 2009; International Development Research Centre, 2006). Consistent with PAR, we define research capacity building as "a context specific, dynamic process that goes beyond a technical or value-neutral transfer of skills" (Vogel, 2011, p. 12). The complex, global, and long-term nature of the research program necessitated the development of Principles for Research Collaboration (Edwards et al., 2013). These principles outlined how we worked together, the roles and responsibilities of each team member, and the guidelines for authorship. For example, we developed collaborator roles for individuals in our partner countries who were interested in joining one of the research projects. Front-line nurses, decision-makers, and junior researchers took advantage of this opportunity to receive mentorship from senior researchers on the team. After a minimum of six months, collaborators who had made a significant, ongoing contribution to the project were able to request a change of status to become a co-investigator. This opportunity set the stage for incremental capacity building and enabled less experienced researchers to develop skills and take increasingly responsible roles on the project teams. The development of principles to guide the research process is particularly

important when the research is implemented across large distances (Katz & Martin, 1997) and when a collaborative approach is undertaken.

In keeping with the tenets of PAR, the project teams were purposively designed to include researchers at various stages of their careers, with diverse areas and levels of expertise. In addition, we attempted to balance members from the different geographical regions of the project. Many members of the research team were practicing nurses. This research design created dynamic platforms for relationship building, co-learning, and the transfer of capacities among team members from different study sites and with different levels of experience (Edwards et al., 2007).

Attitudes to Qualitative Research: Is Qualitative Research Real?

The development and facilitation of research programs, and particularly those with an international component and a major qualitative focus, present both opportunities and challenges. The acceptance of qualitative and PAR research as scholarly, valid approaches to research took place as a "quiet methodological revolution" (Denzin & Lincoln, 1994, p. ix) during the late 1980s and early 1990s in North America (Morse, 1989, 1994). More than two decades ago, Lincoln (1992) argued that there was the potential for greater explanatory power through the use of qualitative and participatory research methods for health promotion research. Although qualitative and PAR research methodologies have a long tradition in the social sciences, they have only recently gained acceptance in health care and epidemiology (Mays & Pope, 2000; Silva & Fraga, 2012). Qualitative and PAR research skills are most often learned in graduate-level university courses; there are fewer opportunities to learn qualitative methods using workshop or experiential style formats (Machtmes et al., 2009). Furthermore, in some graduate programs research trainees may be exposed to more content in the quantitative than in the qualitative realms. This is true in Canada and other high-income settings, but may be even more so in LMICs. In the current study, all team members were familiar with qualitative and PAR approaches; however, some team members had limited experience conducting qualitative interviews, developing coding frameworks (either inductively or deductively) to guide the analysis, or analyzing interview and focus group data. Early in the implementation of the research program, some team members expressed skepticism about the value of qualitative, participatory research. This skepticism may have arisen from the emphasis placed on quantitative and "objective" research methodologies in nursing and epidemiological training and the values instilled by the team members' institutions; as a result, there were concerns that qualitative, participatory research would not be viewed as "real" research.

Team members cited many examples of quantitative findings being disseminated to decision-makers; these findings were viewed as credible evidence while qualitative results or the experiences gained in the leadership hubs were considered more anecdotal. The preference for and experience with quantitative data collection methods, that were considered under the purview of researchers, was also reflected by participants in our interviews and focus groups. The way RAs initially conducted interviews, their approach to questioning and using probes, and their expectations of the responses, were based on their previous experience and orientation to primarily quantitative research. Despite these early misgivings, over the course of the capacity building initiatives integral to the PAR process there was a growing appreciation and acceptance of qualitative data among the research team, staff, and knowledge users. Team members developed a better understanding of and respect for the depth and breadth of qualitative and participatory methodologies that involved practitioners and decision-makers in data interpretation, thereby stimulating the application of findings to inform practice and policy. In addition, as the

program evolved, members began to see that the quotations from the research tools provided a powerful technique to communicate findings to decision-makers.

Incremental Formal and Informal Capacity Building Initiatives

Formal Capacity Building

Formal training initiatives to build capacity among graduate students, collaborators, co-investigators, leadership hub members, and project staff were carried out in all of the study countries (see Table 1).

Table 1

A Summary of Formal, Qualitative Capacity Building Initiatives (November 2007 – April 2012)

Timing	Details	Location and format
November 2007; December 2007	Training to prepare research assistants (RAs) in each geographical area to implement research protocol in the field and to provide an overview of philosophical underpinnings of qualitative and quantitative research designs, data collection, and preparation of field notes.	Kenya (F); Jamaica (F)
January 2008 – November 2010	Project team meetings every 1-2 months to discuss issues related to data collection and to develop plans for data analysis.	All countries (V)
July 2008	Research internship including workshop on qualitative data collection, analysis, NVivo 8 software program.	Canada (F)
October 2008	Executive committee meeting including training on data analysis.	Uganda (F)
July-August 2009	Research internship including workshop on first level, descriptive qualitative analysis, NVivo 8.	Kenya (F)
June 2010	Workshop on advanced, conceptual qualitative analysis, NVivo 8.	Uganda (F)
June-July 2010	Research internship including workshop on advanced, conceptual qualitative analysis, NVivo 8.	Jamaica (F)
November 2010	Qualitative analysis training for RAs during project team meeting.	South Africa (F)
November 2010 – April 2012	Joint management team monthly meetings to discuss issues related to data collection and analysis.	All countries (V)

Note. This table reflects the major, formal qualitative capacity building initiatives during the research program. There were additional smaller, country-specific initiatives that were held during the program that are not listed in the table. V = virtual; F = face to face.

The executive committee deliberately rotated the location of the training sessions between regions, and among countries within the region, to maximize the possibilities for team members, including leadership hub members, to attend face-to-face sessions. This approach strengthened the participatory aspects of the research across the sites. Virtual training sessions between face-to-face sessions were also offered to increase access to training. These initiatives took many forms, including workshops, regular meetings within and between project teams, and an annual research internship. The objectives for the training sessions were to: provide an overview of philosophical underpinnings of quantitative, qualitative, and participatory research designs; discuss data collection methods for each tool, including sampling guidelines, eligibility criteria, and target population; discuss strategies to enhance rigor; provide hands-on opportunities to practice data collection and analysis techniques; and provide feedback on the quality of the data collected. A Ugandan RA commented on his experience with the formal training:

> The ability to practice by participating in the different qualitative activities within the project worked well to reinforce the skills gained from the formal training—like at the internship and online training which gave room for the use of these skills after acquiring them.

Each of these training sessions had a strong emphasis on qualitative research skill development, not only to address the needs of the current PAR program, but also to provide participants with the capacity to lead future health policy research in other areas.

The initial qualitative training sessions were part of intensive week-long project orientations held in Kenya and Jamaica for those individuals responsible for data collection. Two of the research program co-principal investigators (PIs) and the program manager carried out the workshop in Kenya for sub-Saharan Africa staff. Two co-PIs and two co-investigators conducted the training in Jamaica for project staff, team members, and other nursing leaders from the Caribbean region. During the Jamaica workshop, data from in-depth interviews and focus groups from previously completed studies were used to illustrate the relationship between the process of data generation and different approaches to interpreting and making sense of the data. In Kenya, mock qualitative interviews were conducted among team members and then with nurses who worked at a local hospital. Debrief sessions focused on critical differences between quantitative and qualitative interviewing and appropriate interview techniques such as the use of probes to elicit rich descriptions. Numerous practical examples of analysis were reviewed, from initial coding to the presentation of findings using basic data analysis methods such as thematic analysis and constant comparison (Boyatzis, 1998; Glaser & Strauss, 1967). In addition, emphasis was placed on the use of data in participatory discussions with leadership hub members to fuel participant interaction.

As the research program evolved, we moved from the development of basic qualitative research skills to training in more advanced skills, including the conceptual or theoretical analysis that is required with qualitative data as well as how to maximize the PAR process with leadership hub participants. Face-to-face training sessions provided opportunities for team members to initiate the more complex aspects of the data analysis and reporting. For example, an initial coding framework was developed for two qualitative tools during a meeting of the executive committee in Uganda in 2008. Further revisions to the coding framework were made during virtual project team meetings throughout the analysis process. The cognitive process model of comprehending, synthesizing, theorizing, and re-contextualizing as described by Morse (1994) was used as the framework to guide the conceptual analysis process. During the 2010 Jamaican workshop, one of the group activities was the development of briefing notes from the qualitative findings for use with decision-makers. This provided a real life example of how data are re-contextualized

depending on the audience. Anonymized verbatim transcripts from the program of research were used for this phase of training, which fostered familiarization with the project interview guide and key themes. Using transcripts for these training purposes received ethical approval at the outset of the study.

Software Training

The qualitative software program NVivo 8 was chosen to support the qualitative analysis process, and training with the software was carried out on several occasions and in incremental steps. During the initial stage of data analysis, when the LMIC sites were in the process of procuring the NVivo 8 software program and there was limited technical support for team members to learn the program, an alternative approach to coding data was required. Novice researchers in each LMIC used the track changes editing function of the word processor to carry out the initial coding of transcripts and sent the transcripts to an experienced team member. This enabled the experienced researcher to embed comments and suggestions for coding in the document and return it for consideration to the novice researcher. Once this process was complete, the RA uploaded the analyzed transcripts to the NVivo 8 project files. This process, although time consuming, provided opportunities for less experienced team members to develop their skills in qualitative analysis as early in the research process as possible. During a residential research training internship in 2008, an expert in the field of qualitative data analysis and three of the program co-investigators facilitated hands-on data analysis training using NVivo 8. This activity served as a capacity building initiative for all interns, many of whom were project staff, collaborators, and co-investigators, and ensured a shared understanding of NVivo 8. The same expert was also available for one-on-one consultations with anyone requiring further training support using NVivo 8. Once a core group of team members was trained in the use of NVivo 8, data analysis was carried out by all team members using the software program directly.

Undertaking a multi-year, multi-country, multi-site, and multi-project PAR program with more than 20 colleagues with a wide range of qualitative research skills and experience presented some challenges, particularly related to software use and analysis. Early in the implementation of the research program, it was difficult to find trainers to assist the local teams to orientate users to NVivo 8. Various strategies were used to mitigate these challenges. For example in Jamaica, several NVivo 8 training sessions were offered by faculty members familiar with the software but not involved with the project. In addition, training in the use of NVivo 8 was incorporated into the annual residential research training internships in Ottawa (2008), Kenya (2009), and Jamaica (2010) and provided by distance through eClass Live, a web-based meeting system used at the University of Alberta, which was one of the principal communication tools for the research team. Finally, an NVivo 8 resource manual was created by a Canadian RA and distributed to teams.

Informal Capacity Building

In addition to the formal workshops and training sessions undertaken during the five-year PAR program, there were also more informal examples of capacity building. There were a significant number of individual coaching and capacity building phone calls and emails between team members. For example, an experienced qualitative researcher on the team reviewed the initial qualitative interview transcripts and then spoke one-on-one with the RAs to discuss any challenges they might be having and to suggest ways to improve the quality of the interviews and focus groups. Small group and full team meetings occurred to discuss the qualitative interview schedules and consider how they might be modified for ease of administration in the field. There were phone calls to determine what qualitative software and expertise was locally available in the different study sites. In Uganda, there was a review of the RA job description in a process of

problem solving to determine how an RA with qualitative experience might be recruited. There were also numerous phone calls with RAs to discuss how leadership hubs were functioning, and how hub members were being engaged in reviewing and interpreting data. In addition, at most of the formal training times, there were opportunities for informal discussion and relationship building among team members, and hub members were invited to join annual team meetings, thus providing a critically important perspective on project implementation and giving input that informed planning.

Maintaining Rigor while Implementing a Complex Research Program

Maintaining Rigor: Data Collection Support

As the PAR process evolved and capacity building initiatives were undertaken, newly trained researchers began taking on more research responsibilities and generating research outputs. Particularly at the beginning of the program, the quality of these outputs varied, due in part to the different time schedules of the novice and experienced researchers. For example, an RA might travel to a rural site to complete several interviews to enhance efficiency of data collection; however, this often resulted in many interviews being completed before they were transcribed and sent to the experienced researcher for feedback on the novice researcher's interviewing skills. One of the Canadian team members commented on this challenge:

> I struggled to keep up with the qualitative training needs of our team members, particularly of our LMIC partners. I felt that I had somehow failed in my role to ensure high quality data when I was unable to provide feedback on interviews until late in the data collection process—sometimes after the majority of the interviews had been collected.

Although the experienced researchers realized that feedback on the quality of the interviews should be given early in the interview process to ensure high quality interviews, this was not always possible. The volume of the qualitative data, with 376 interviews and 76 focus groups generated across 13 different tools, at times made it challenging for more experienced researchers to provide timely feedback to RAs and for RAs to provide timely feedback to leadership hubs. There were also difficulties with internet communication and competing demands of research team members. As a result there were often fairly long gaps in time between when the data was gathered, transcribed, reviewed by the experienced team members, and communicated with leadership hub members. For example, as a result of delays in providing timely corrective guidance, during baseline data collection interview questions were sometimes asked in a more close-ended rather than open-ended way. In the completion of interviews subsequent to the base-line data collection however, it was apparent that the RAs had developed more confidence and skill in collecting qualitative data.

Maintaining Rigor: In-Depth Qualitative Analysis Skill Development

In order to meet the requirements of the evolving PAR program, the demand for qualitative skills increased rapidly. It was essential that the capacity development aspects of the research program were flexible and emergent and directly linked to the needs of the program itself as it progressed. We also had to ensure that there were a sufficient number and variety of informal and formal capacity building opportunities throughout the PAR process so that training could be somewhat tailored to each team member. As an initial approach, many members of the research team were trained in the basics of qualitative research and descriptive analysis. However, opportunities to develop the depth and expertise required to carry out the conceptual analysis of qualitative data

were limited. This challenge was exacerbated by a number of factors, including the variability in LMIC team members' initial understanding of qualitative research, levels of experience and interest, and the time required to gain this expertise. One of the strategies used to mitigate this challenge was to encourage, and provide opportunities for, team members to participate in the preparation of manuscripts based on the qualitative data. This enabled team members to participate in the conceptual analysis of qualitative data for publication.

One of the senior Canadian team members commented on the challenge of ensuring meaningful findings in a large, complex PAR program:

> It was quite an undertaking, to design and implement such a large scale, mostly qualitative, international program of research. It was obvious that in order to be successful and produce meaningful outcomes, capacity building around research design, implementation, analysis, and reporting had to be central in our work together. This had to be a thoughtfully designed process and it felt like we were forging much new ground.

Early training activities provided the basic knowledge and skills necessary for RAs in each country to implement the protocol in the field. In subsequent training sessions, some review and overlap in the learning activities from previous sessions were provided before moving on to more advanced concepts in qualitative research analysis. This was essential because the workshops typically included different groups of learners; the overlap helped to accommodate the learning needs of participants who had not attended the previous training session. Several of the team members commented on the gradual development of their capacity:

> When I started it was totally new but I have developed and learned about new things. I have collected data and analyzed. I worked on data collection and transcription. Now I am confident I can do it on my own. It has also helped me with my masters [program] because I read a lot of things from [the Canadian partners] on qualitative research and it has been useful. I have generally benefited from the program in terms of capacity building. (Kenyan collaborator)

> The team in Kenya participated in the workshops conducted in Kenya and have participated in data collection and transcription. Some have been part of analysis teams for some of the tools. Given the capacity we now have, we are taking the lead in the analysis of one of the tools. (Kenyan RA)

> The capacity building that occurred through participation in multiple qualitative workshops, consistent support from senior researchers during first level analysis (coding transcripts) and participation in team meetings where deeper level approaches to analysis were discussed, enabled local team members to contribute to analysis and manuscripts, which initially seemed an insurmountable task. (Jamaican RA)

One hurdle alluded to earlier was that there were many novice researchers in relation to the small number of experienced researchers on the team. This situation was, in part, the result of novice researchers joining the team as collaborators throughout the program of research, as well as the fact that one of the purposes of this PAR study was to involve researchers at many levels and across all research sites. The opportunity to become a collaborator was a strategic, planned initiative of the research team to enable interested individuals in partner countries to share their expertise, while at the same time enhance their research skills. This meant that progress was slow, especially at the beginning as experienced team members were called upon to assist in refining data collection tools (e.g., the interview and focus group guiding questions), provide feedback on

the qualitative data, and participate in formal and informal training exercises. There were also concerns about relying too heavily on only a few experienced qualitative analysts on the team, particularly if much of the data were ready for analysis at the same time.

Maintaining Rigor: Institutional Support

Attention to institutional support was foundational to our research program. For example, we worked with our LMIC partners to ensure that the necessary infrastructure and supports were in place as required during the research program. These supports included workspace, the procurement of computers, and access to the internet. As do nearly all researchers who study in under-resourced areas, we experienced challenges related to limitations in infrastructure and equipment, particularly new computer hardware and software, reliable access to the internet and communication lines, work and meeting space, and transportation issues. This resulted in some team members in our LMIC partners missing all or parts of meetings when they were unable to access the internet or a reliable phone line. As the research program progressed we developed strategies to overcome some of these issues. For example, although an eClass Live site made available by one of the Canadian partner universities was the primary mode to connect for team meetings, firewalls at some of our LMIC partner sites made it very challenging to access the site. Therefore on several occasions RAs in LMIC sites were connected through Skype to eClass by a Canadian RA. This enabled them to listen to meetings; however, it was still challenging for them to participate fully. An RA from Uganda shared his frustration:

> Keeping pace with the rest of the team members required being able to attend project and team meetings; however, difficulty with internet connections made access to these meetings problematic and often frustrating. This gap was bridged by inserting comments into meeting minutes and through alternate media such as Skype. This however limited the extent of participation.

Ensuring that the Capacity Building was Locally-Owned

Data analysis co-leads (usually one Canadian and one from a LMIC partner) facilitated project- and country-specific data analysis sessions to re-examine themes and re-sort categories where necessary. This helped to minimize possible misinterpretation of the cultural context of the data and provided another opportunity for co-leads to learn new skills related to the interpretation of data from contexts different than their own. The sharing of various perspectives on the interpretation of the data increased the capacity of team members and enhanced the rigor of the study. This level of active involvement and collective reflections motivated team members with various levels of research expertise to develop a sense of ownership of the PAR process. One of the South African RAs reflected:

> If I assess myself in terms of knowledge and skills, I can say with great confidence that I have gained capacity not only in qualitative research but also in doing qualitative research across different countries and cultures.

Although not all team members participated in conducting the interviews, most team members actively participated in data analysis meetings, another excellent forum for knowledge exchange, collective reflection, and capacity building. This also enhanced the research team's knowledge of the cultural context that was required to accurately interpret the data.

Leadership hub members played a key role in helping the research team to interpret and contextualize the data. In order to highlight the rich, in-depth qualitative findings, we shared

findings using a wide range of non-traditional formats for a variety of target audiences. These included lay summaries, policy briefs, and concise recommendations for decision-makers and front-line nurses. Because we also collected some quantitative data, we had to establish how to effectively communicate and discuss the complementary aspects of qualitative and quantitative research. As a large and well-funded international research program with four LMIC partners, the presence of the research program in the country and the involvement of the leadership hubs, including front-line practitioners, managers, and decision-makers, reinforced the importance of qualitative research and helped to ensure that the capacity building was locally-owned.

Once novice team members underwent the initial formal training sessions they were often called upon to mentor or train others. The ability of more junior team members to mentor others provided evidence that the qualitative capacity was not only locally-owned, but also sustainable following completion of the project. Two team members commented on their role in mentoring others:

> Most of the capacity building for qualitative research took place while building the capacity of others in qualitative research. Shortly after learning the NVIVO software, I was given the task to introduce it to the 2009 interns in Kenya! (Jamaican RA)

> At the university we have formed a small group of people (consisting of some of those involved in the TC project) who form the initial hub of qualitative researchers—thanks to the TC project. We teach qualitative research methods to our students and strive at continuously improving our skills in qualitative research methods. (Kenyan RA)

It was common for the RAs in each study country to join conference calls and gain support from a few more experienced members of the research team. The need for more junior team members to train others upon return to their home country was not only because of our need to expand the circle of those able to conduct qualitative data analysis but also because there were significant amounts of data to be collected, analyzed, reported, and discussed in the first two years of the research program. Many team members who began as novice qualitative researchers were considered more intermediate in their skills by the end of the program, and they went on to train others. This meant that the more experienced qualitative researchers were no longer required to do all of the tasks of data coding, descriptive analysis, and reporting.

Discussion

The development of transdisciplinary teams and the inclusion of both junior and senior researchers have been identified as key strategies to build research capacity (Kengeya-Kayondo, 1994). Capacity building is a key characteristic and central component of PAR whereby participants play an active role in the research process (Martin, 1996). In our case, participants included researchers from a variety of settings, levels of training, and disciplines as well as health policy decision-makers, community members, and practitioners (nurses and nurse managers) in leadership hubs. The current program of research was conducted by a team of more than 20 individuals in five partner countries; most of the members were nurses. The team composition was the result of a conscious choice to focus on the development of nurses' capacity. The team was comprised of people who began with levels of qualitative research capacity that ranged from novice to very experienced. Over the six-year period of the PAR program, there were multiple, incremental formal and informal capacity building initiatives. These included workshops, meetings, training seminars, internships, and informal discussion and relationship building. Skills were developed such as data collection, coding, analysis, writing for publication, translating

research for various audiences, and engaging end users in discussions about the data and emerging recommendations and action plans.

The current project provided opportunities for nurses not only to develop skills in the conduct of qualitative research, but also to increase their capacity to raise new questions and to design research projects to address them. This emphasizes the participatory nature of the work. For example, participants had opportunities to practice their research skills through activities such as the development and implementation of seed grants within the context and support of their leadership hubs (Edwards et al., 2013). The use of a PAR design also incorporated the opportunity for ongoing, deliberative collaboration between nurses and decision-makers. One of the lessons learned during our research program was that "participatory action research can create an environment where inquiry and learning are at the core of building capacity" (Edwards et al., 2013, p. 61).

Although there were many opportunities for participants to develop their individual research capacity, they were not always able to put their newly acquired skills into practice. For example, Davison and colleagues (2012) examined the ethical challenges and opportunities in Jamaica and reported that although leadership hub members felt obligated to act on the research findings in order to improve nursing care, they did not always have the formal mandate to influence change.

The technological challenges experienced by some LMIC team members have been reported elsewhere in relation to other international collaborations (Glew, 2008). Despite the challenges with technology, several team members suggested that there was growing institutional capacity for qualitative research as a result of the TC program. Research capacity building in LMICs requires intervening not only at the level of personal skills and training, but also at the broader level of system and institutional capacity development to create processes and environments that increase sustainability (Kitua et al., 2009; Nchinda, 2002; Potter & Brough, 2004). Similarly, Lansang and Dennis (2004) argued that an enabling environment that includes a systems and long-term perspective is critical to building health research capacity in LMICs. Glew (2008) highlighted the importance of including novice, junior team members and ensuring that the partnership is embedded in an institution, rather than an individual. Finally, the inclusion of policy and decision-makers is critical to the development of research capacity (Nchinda, 2002). Throughout the TC program there was evidence of increased institutional capacity to plan and conduct qualitative research. This highlights the effectiveness of the participatory design. There was partnership with, and inclusion of, decision-makers in the research program; use of qualitative research designs by leadership hub members in the seed projects; involvement of TC team members in the mentorship of colleagues; and teaching of qualitative methods by team members to students at project sites.

The issue of capacity building with LMIC partners is itself challenging. Several authors (Laabes, Desai, Zawedde, & Glew, 2011) have questioned the ongoing reliance on researchers and institutions in high income countries to develop research capacity in LMICs. Although this reliance is often needed to ensure adequate research funding, as was the case with our research program, Laabes and colleagues (2011) argued that it may be time for African researchers to look locally for funds to develop research capacity while others have called for governments to increase their investment in the infrastructure required to support research training (Nchinda, 2002; Tugwell et al., 2006). The current research design, emphasizing incremental training and participatory approaches in all phases of the process, linking less experienced researchers with more senior ones, and incorporating the role of collaborators on research teams, was in itself a strategy to ensure that the research capacity was locally-owned, the team was more equitable in terms of decision-making power, and individual and institutional capacity was increased. Of

primary importance was the leadership provided by colleagues from LMIC partners in decision making, from formulating the research questions and designing the program of research, developing the intervention for leadership hubs, and leading the national advisory committees to analyzing and disseminating the findings. This deliberative process helped to ensure that the research questions were congruent with the most pressing health concerns of our LMIC partners (Laabes et al., 2011; Rojas, Lozano, & Rojas, 2007; Wolffers, Adjei, & van der Drift, 1998). Coloma and Harris (2009) argued that the development of research capacity in low income countries is the best way to contribute to global health.

When considering the costs and benefits of PAR as an approach to foster capacity building, the perspectives of both the LMIC partners and the Canadian partners must be considered. A limitation of the research program was the primary focus on the capacity development of researchers in the LMICs with limited attention to the changes and benefits for the Canadian partners. This approach was congruent with the orientation of the funding opportunity, however, and was perhaps related to an underlying value that it was the LMIC partners, rather than the Canadian team members, who had more pressing needs related to the development of new research skills. The training opportunities were offered primarily to LMIC partners, and in a few instances, to Canadian graduate students. Similarly, the opportunities to travel to meetings and workshops to meet and work alongside the LMIC partners were primarily available to the members of the executive committee. This meant that some of the Canadian team members never met any of the partners in the LMICs during the research program, which made it more challenging to develop the relationships necessary to work across large geographical areas. The development and maintenance of relationships are essential to qualitative and participatory methodologies.

Despite our efforts to ensure that the PAR and accompanying capacity building initiatives were locally-owned, a number of structural and institutional research requirements may have perpetuated the "north-south" tension (Binka, 2005), post-colonial syndrome (Laabes et al., 2011), or paternalistic paradigm (Rojas et al., 2007) that have been described in international research projects. This tension refers to the challenges that may develop when the research collaboration that occurs between partners is, or is perceived to be, unequal (Binka, 2005). For example, Canadian ethics review boards typically have very stringent guidelines to ensure that the data is stored at the institution holding the funding, with the principal investigator at that institution being responsible to ensure that this requirement is met. In the current study, we obtained ethical approval to store the raw data in each of the study countries. In addition, many funders in high income countries require that the primary coordination of international studies be located in the country awarding the funding (Rojas et al., 2007). In the current research program, it was a requirement that the nominated principal investigator and the institution holding the funding be located in Canada. One strategy used by the research team to ensure shared leadership of the program was to have three co-principal investigators, one from Canada and one from each of the two geographical regions outside of Canada. Similarly, many of the more experienced investigators who were able to provide mentorship in the area of qualitative research were based at Canadian institutions.

Ultimately, the goal of international research collaboration between high-income countries and low-income countries is to achieve partnerships that are mutually beneficial (Binka, 2005). Laabes and colleagues (2011) have argued that despite the local benefits of international collaborative research, it is often the expatriate researchers who accrue greater benefit, particularly in relation to publications, promotion, or remuneration. In the current project, however, we attempted to strategically design small research teams to carry out the research and to work together on the publication of the findings. The Principles for Research Collaboration

(Edwards et al., 2013) adhered to in the TC program clearly outlined the authorship guidelines and helped to ensure that LMIC team members had the same opportunities to participate in publications as the Canadian team members did. In the current project, it appeared that the benefits to the LMIC partners outweighed the limitations. Team members described their increased confidence in qualitative and participatory research methodologies, with many members taking on teaching and mentoring roles in their own institutions by the end of the project, a clear indicator of the sustainability of the research capacity that has developed (Julie, Mikalsen, & Persens, 2005).

Conclusion

Increasingly, and likely in response to colonial or paternalistic structures of the past, global health research teams are encouraged to work within research paradigms that favour partnership, equity, and the balancing of power across team members. This means that a "north" dominant structure, where researchers from high-income settings dictate research structures and processes and where capacity lies and remains in the north, is inappropriate. We believe that our PAR experience provides a strong example of effectively building qualitative research capacity in the context of a large, international, multi-year program of research with a diverse team. We believe it is also a strong example of a global health research program that has engaged researchers, decision-makers, and practitioners in an equitable research partnership to encourage health and policy improvements.

In the implementation of PAR health research in a global context, research teams may face challenges with respect to cultural, geographic, technological, resource access, and research experience differences among team members. In the current program, there were limited challenges related to cultural difference, perhaps because many of the team members had experience working in settings unfamiliar to their own. Challenges related to geography, technology, resource access, and research experience were more common. Differences in qualitative research expertise may have been compounded by differences in the perception of the value of qualitative research by the research participants (whose experience may be in answering questions on quantitative tools) and decision-makers who favoured quantitative findings as well as investigators who had limited prior opportunities to enhance their qualitative research skills.

Throughout our TC research program the use of incremental approaches was an effective strategy to build capacity in qualitative research within the team. Our PAR approach was designed to augment the primarily quantitative experiences of both researchers and participants in our partner countries. Through a diverse set of learning experiences that involved different participants in different settings, nurses shared many examples of their increased research capacity. We encountered some challenges to maintaining the rigor of the research process; however, the initial PAR research design and the strategies to overcome the challenges helped to mitigate the impact of these challenges. Based on our experience, we believe that both individual and institutional qualitative research capacities were built. Despite early concerns, by the end of the research program there was a growing respect among research team members for the power of participatory approaches and the application of qualitative data to inform practice and policy.

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