Rural and Remote Health
MEDLINE listed
ARHEN
FRAME
ISSN 1445-6354
The International Electronic Journal of Rural and Remote Health Research, Education, Practice and Policy

ORIGINAL RESEARCH

Access to and use of research by rural nurses

CA Winters[1], HJ Lee[1], J Besel[1], A Strand[2], R Echeverri[1], KP Jorgensen[3], JE Dea[1]

[1]*Montana State University College of Nursing, Missoula, MT, USA*

[2]*United States Air Force, Willford Hall Medical Center, Lackland Air Force Base, TX, USA*

[3]*Planned Parenthood of Montana, Great Falls, MT, USA*

Submitted: *31 March 2007;* ***Resubmitted:*** *14 August 2007;* ***Published:*** *24 August 2007*

Winters CA, Lee HJ, Besel J, Strand A, Echeverri R, Jorgensen KP, Dea JE

Access to and use of research by rural nurses
***Rural and Remote Health* 7: 758. (Online), 2007**

Available from: http://www.rrh.org.au

ABSTRACT

Introduction: The use of relevant research findings to inform clinical practice is important for nurses, regardless of setting. Although there have been studies addressing the use of research among various practitioners, little is known about how nurses in rural areas access health information (specifically research findings), nor how such findings are incorporated into daily practice. The purpose of this study was to explore rural nurses' access, use and perceived usefulness of research for rural practice.

Methods: The study was conducted in a sparsely populated state located in the western part of the USA. An ethnographic method was chosen to answer the research questions for this descriptive study. Semi-structured interviews were conducted with 29 rural nurses from nine communities by graduate nursing students enrolled in a rural nursing course following in-class instruction and practice. Field notes taken by the students supplemented the interview data. The students' notes included a windshield survey or description of the context and location within which the participants lived and/or practiced as well as the interviewers' observations, thoughts and impressions about the research project. Interviews were audiotaped and transcribed verbatim. Once transcribed, the interview narratives, windshield data and field notes were analyzed by the students for common themes; the students then wrote and submitted papers to the faculty addressing the themes that emerged from their interviews. The analysis conducted by the faculty members included four sources of data: transcriptions of interviews; field notes; windshield data; and students' papers. The process of identifying themes was facilitated by using the software program NUD*IST (QSR International;

Melbourne, VIC, Australia). Demographic information was entered into the Statistical Package for Social Scientists (SPSS Inc; Chicago, IL, USA) to compile descriptive information about the sample.

Findings: Twenty-seven female and two male nurses participated in the study. The nurses' ages ranged from 31-72 years and their experience in nursing spanned 3-50 years with a range of 1 to 35 years in rural nursing. The interviews revealed that most of the nurses used the term 'research' to mean 'gathering information'. When asked how often they used 'research' the responses ranged from 2-3 times per day to 2-3 times per month. The preferred means of obtaining information was asking a colleague. Additional resources included work-place journals, books, in-services, conferences and the internet. Twenty-three of the nurses reported having internet access at work; 25 had internet access at home. Supportive supervisors and articles in general nursing journals were identified as helpful. Barriers to using research included: lack of knowledge of research methods; lack of time at work or at home to look up information; and the lack of computers and internet access on the nursing units. When computers were available, the nurses reported that poor computer literacy decreased their ability to quickly find and evaluate information. Additional barriers included diminishing financial support from employers and the long travel distances required to attend conferences. The nurses reported finding little clinical research specifically related to rural practice.

Conclusions: Education and mentorship is needed about how to evaluate the types and strength of evidence, access research using the internet, interpret findings, and incorporate evidence in clinical practice. Interventions that foster the appreciation and use of research by staff nurses and managers are needed in order to build an evidence based culture. Research is needed, specifically as related to rural clinical practice.

Key words: evidence based practice, nursing, research, rural communities, USA.

Introduction

The use of relevant research findings to inform clinical practice is a concern for nurses, regardless of setting. The translation of research findings to clinical practice has been explored for the last 30 years. Much of the recent impetus to address knowledge translation has risen from advocates of evidence based practice. At the policy level, the importance of research findings to healthcare delivery is highlighted by the emphasis given to it by the Institute of Medicine[1] and the Agency for Healthcare Research and Quality[2]. Equally important is whether rural nurses obtain current and accurate knowledge based on research to help them make decisions regarding their practice.

Although there have been studies addressing the use of research among various practitioners, little is known about how nurses in rural areas access health information (specifically research findings), nor how such findings are incorporated into daily practice. Geographic isolation is assumed to impact on the availability and accessibility of research findings but, with widespread use of the internet, is this assumption true? This study addressed whether research is accessible, applicable and useable for nurses who practice in rural settings. For the purposes of this study, 'rural' was defined as communities and rural areas with populations of 3000 or less and 80 km outside urban centers. Selecting these areas would help us access nurses who were working in critical access hospitals (CAH) which are required to be at least 56 km from another hospital, and reduce the number of nurses in our sample who lived in rural areas on the outskirts of urban centers.

History

Incorporating research findings into practice (also known as research utilization) has been of concern to the nursing profession since the movement of nursing education out of the hospital and into the collegiate setting. With the change,

research courses were incorporated into basic nursing curricula; masters and doctoral level education for nurses expanded so that nurses were equipped to conduct research. Initially focused on practitioners of nursing and practices within nursing education, nursing research has become more clinically based. In specific areas of study, multiple studies have been conducted and summarized to justify changes in nursing practice (eg reducing bed rest in invasive cardiology patients; music intervention in the intensive care unit; oral care for mechanical ventilated patients; sedation management for mechanical ventilated patients; cannula change protocol for peripheral intravenous lines)[3]. Within the last decade the concept of evidence based practice has evolved and been embraced by nurses across a variety of roles and positions in locations in USA, Canada, United Kingdom and Australia[3].

Evidence based practice

Evidence based nursing practice refers to the integration of activities that provide the basis for giving quality nursing care to patients. These activities include the synthesis of evidence gathered from broad ranging sources: clinical nursing expertise, the values and preferences of individuals, families and communities, and a synthesis of the latest research evidence[4,5]. Ideally, the synthesis of all the available evidence should guide clinical decision-making.

Along with the evolution of evidence based nursing practice, our understanding of disease etiology and the determinants of health have grown exponentially[6,7]. Furthermore, with the aging of society and the increased acuity level of patients, nurses must remain current and versed in relevant research findings to safely practice[8]. Accompanying the growth in knowledge has been a rapid growth in ways to access knowledge. Through the internet, nurses now have access to a wide variety of sources of healthcare information.

While evidence based nursing practice is being used in benchmark academic institutions such as University of Iowa (USA), McMaster University (Canada), University of York (UK), and the University of Adelaide (Australia)[3], it is generally accepted, but not well documented, that most nurses do not use research as one of the bases for their practice[9]. Multiple studies have been conducted exploring the barriers to research utilization in practice; findings include lack of time, lack of awareness of the available research literature, inadequate skills to access research bases and to critically appraise research studies, and lack of organizational support to implement changes in nursing practice[10-12].

Relevance to rural health professionals

Consistently found in the rural health literature are accounts of the geographical and professional isolation experienced by health professionals practicing in rural and remote settings[13,14]. Professionals in rural settings are required to be multi-skilled generalists with a wide-range of practice knowledge[13-16]. Despite the breadth of knowledge needed, rural nurses often have reduced or limited resources available to them compared with their urban counterparts. At the time this research was conducted, only one study reported in the literature specifically addressed the use of research among rural nurses[17,18]. Barriers in rural areas may also include distance to resources and the lack of internet service or, if available, very slow access over phone lines.

Clearly, baseline data on the availability of research, as well as its use in rural clinical practice settings is needed. Hutchinson and Johnston[19] recommended the use of qualitative research studies to allow a deeper examination of experiences, perceptions and issues faced by nurses in the use of research in their practice.

The study environment

The study was conducted in a sparsely populated state located in the western part of the USA. According to 2005 estimates, the state contained a population of just over 900 000[20]; the average number of persons per square mile was 6.2 as compared with the US average of 79.6 (10 and 128 persons per square kilometer, respectively).

Citizens are served by healthcare resources in seven major cities with populations ranging from 95 200 to 17 381[20]. The largest hospital in the state is licensed for fewer than 300 beds.

The remainder of the state is served by 43 CAH, located in 14 small (<1000 population), 13 medium (1001 to 2500 population), and 16 large (2501 to 10 000 population) incorporated rural towns. Critical access hospitals are rural hospitals located at least more than a 56 km drive from another hospital or CAH or 15 min in mountainous areas or areas served by secondary roads[21]. These hospitals contain a range of 2 to 25 beds and provide 24 hour emergency services to their community. Additional required services include inpatient care (limited to 96 hour length of stay), laboratory and radiology. The hospitals must network with larger hospitals for communication, patient referral and transfer, transportation services, credentialing and quality assurance. For many CAH, the nearest network facility may be more than 322 km away.

A total of 9416 nurses are licensed in the state; of these, 7914 are employed[22]. While the number of nurses classified as 'rural' is unknown, the number of nurses on duty at a CAH on any given day ranges from one to five. Typical responsibilities for a staff nurse on any given shift might include caring for a laboring mom, recovering an elderly man following abdominal surgery, monitoring a pediatric trauma patient, and staffing the emergency department. Nurse anesthetists, nurse midwives, nurse practitioners and psychiatric clinical nurse specialists provide services in CAH and larger urban hospitals across the state. Clinical nurse specialists of other specialties are employed in small numbers at the larger urban hospitals.

Available health resources: All licensed nurses in the state receive a periodic publication of the state's nursing association. What is unknown is the extent of individual subscriptions to other health-related journals, the availability of print-based materials at rural worksites, or the nurses' accessibility to the internet.

Continuing education is not required for licensure as a registered nurse in the state. However, most professional nursing organizations offer continuing education services and internet accessibility to their members. If rural nurses have internet access, the availability of state, regional, national and international websites is virtually unlimited. In addition, some urban healthcare centers provide outreach to rural hospitals and practitioners for educational purposes.

Methods

Overview of study design

An ethnographic method was chosen to answer the research questions for this descriptive study because it offered the opportunity to explore the issue from the participants' perspectives. Unique to ethnography is the focus on culture or the study of individuals who are members of a particular group. In this study, nurses working in rural areas constituted a unique culture[15]. The goal of ethnography is to comprehend the emic, or insiders' perspectives of the phenomenon in contrast to the etic or outsiders' point of view[23].

The physical context in which the nurses live, work and interact was an essential component of the study. In an ethnographic study, researchers triangulate information from various sources and collection methods. Listening to what is said in interviews, observing, asking questions, and keeping field notes that incorporate the physical and cultural context where nurses practice were part of the process.

Sample and setting

The sample included English-speaking registered nurses working in rural communities and areas with populations of 3000 or less and 80 km outside major urban centers. The nine communities in the study are characterized by small business centers located on one main street, surrounded by residential districts that quickly give way to fields or

timbered areas. The primary economies that support the communities are farming, ranching, tourism, outdoor recreation and the local healthcare facilities.

To facilitate access to rural nurses (eg the emic perspective), participants were initially identified through personal contacts and resources and with the assistance of key informants. Additional participants were obtained using the snowball technique whereby initial interviewees were asked to identify other potential participants[24].

Data collection

Semi-structured interviews with rural nurses, field notes and windshield surveys of the communities where the participants practiced were the methods used to collect the study data. Interviews were conducted either in person or via telephone by graduate nursing students enrolled in a rural nursing course following in-class instruction and practice. The interviews were audiotape recorded and transcribed verbatim. A sample of questions is provided (Fig1). Each interview ranged from 60 to 90 min and was conducted at a time and place suitable for the participants.

Field notes and windshield surveys taken by the students supplemented the interview data. Field notes are the interviewers' observations, thoughts and impressions about the research project. Windshield surveys are a description of the location within which the participants lived and/or practiced (distance from referral centers, geography, auxiliary resources such as emergency medical technicians and other health professionals) and provided context for the students while collecting data.

Data analysis

Once transcribed, the interview narratives, windshield data and field notes were analyzed by the students for common themes. The students then wrote and submitted papers to the faculty, addressing the themes emerging from their interviews. In addition, the transcripts and field notes were emailed via attachment on WebCT (distance education web browser) to the faculty. Using the WebCT browser provided more security for the transmission of data than the regular internet email.

The analysis conducted by the faculty members included reading student papers, followed by a review of interview transcription, field notes and windshield data. The process of identifying themes was facilitated by using the software program NUD*IST (QSR International; Melbourne, VIC, Australia). Transcripts of the audiotaped interviews and field notes were entered into the software program. Working separately, the faculty carried out first-level coding consisting of a line-by-line analysis of transcripts. Categorizing and re-categorizing of the coding then was undertaken followed by clustering of codes based on similar content. It is at this point that themes began to emerge from the data. The faculty then met to compare their findings with those identified by the students. Discussions continued until the faculty arrived at a consensus on the findings. Demographic information was entered into the Statistical Package for Social Scientists (SPSS Inc; Chicago, IL, USA) to compile descriptive information about the sample.

Scientific rigor

Scientific rigor was achieved through establishing trustworthiness of the study by demonstrating credibility, dependability, confirmability and neutrality of the findings[25-28]. Credibility was developed through the use of trained student interviewers and rigorous review of the transcripts and field notes. An audit trail (a record of decisions and steps in the analysis) was kept so that others can follow the decisions, deliberations and approaches of the investigators, to provide confirmability and dependability[29]. The use of direct quotes from participants to illustrate the findings helped maintain neutrality in presenting the study. Saturation (the point at which no new data are found) occurred prior to the conclusion of analyzing all the interviews. However, the process continued until all interviews were analyzed.

- What resources are available to you?
- In an ideal world what type of resources would you like to have?
- When you get information, how do you decide what is useful or valuable?
- Over the past year can you identify research that you have used to influence your practice?
- Are you aware of ways to access research that you are currently unable to do?
- As health care providers, how has your practice been affected by your access to current research?

Figure 1: Sample questions from interview.

Ethics

Human subject approval was obtained from the university. Full explanation of the ethnographic study was provided to all participants, including potential risks and benefits of participation. Study participants and communities were assigned identification numbers to assure anonymity. All study materials, including consents, tapes and transcribed interviews and field notes, were stored in locked file cabinets when not in use. Electronic data were stored on password-protected computers accessible only to the research team.

Findings

Sample

Twenty-nine nurses ($n = 29$) from nine rural communities participated in the study (27 female; 2 male). The nurses' ages ranged from 31-72 years and their experience in nursing spanned 3 to 50 years with a range of 1-35 years in rural nursing. Educationally, 11 had baccalaureate degrees, 8 had associate degrees, 3 were diploma prepared, and seven did not report their educational level. The nurses worked as directors of nursing ($n = 5$), staff nurses ($n = 16$), supervisors ($n = 5$), charge nurses ($n = 1$), and managers ($n = 2$). Most worked in CAH ($n = 21$), while others reported their primary place of employment to be public health ($n = 2$), home health ($n = 1$) or hospital ($n = 5$). Although staff nurses working in rural CAH are considered 'generalists' and care for a variety of patients on any one shift, several nurses held certification or special training in surgical, obstetrical, emergency, medical or long-term care nursing.

Common themes

Research means gathering information: The interviews revealed that most of the nurses used the term 'research' to mean 'gathering information'. When asked how often they accessed 'research' the responses ranged from '2-3 times per day' to '2-3 times per month'. They believed that accessing research was an activity to be carried out 'while at work' rather than at home or in their free time. Their *primary* sources of information were colleagues (managers, staff nurses and physicians), and the internet; their most *available* resources were knowledgeable colleagues, work-place journals and books, on-site workshops or teleconferences and off-site conferences.

Professional isolation: Although colleagues were identified as the primary sources as well as the most available sources of information, the nurses acknowledged the professional isolation common in rural settings and its affect on access to other healthcare professionals. One commented that talking with a colleague might mean calling a nurse in another community. Another nurse stated:

> *In a rural setting you have to be self reliant. You don't always have someone to turn to or call on.... When you want to find something out you use the resources* [available] *and you try to figure it out the best you can.*

And another commented that she had 'telephone access to a pharmacist' whom she contacted when she had drug-related questions. Overall, the nurses believed that in rural areas, all

healthcare professionals 'should all be networking with each other'.

Common resources: Twenty-three of the nurses reported having internet access at work; 25 had internet access at home. One participant indicated that the closest library was reported as 'one block' from work, while another commented: 'Because we don't have a library, the internet becomes my library'.

Even though the internet was cited as a primary source for information gathering, several of the nurses commented that access was restricted either by location (in a manager's office rather than at the nursing station), lack of time to search for information, and lack of 'computer savvy'. As one nurse shared:

> *If I could have anything, you know I tell you, I would like the internet access to be maybe faster and more easily accessed so that people who aren't really versed on computers…because it seems like you have to go through so many things to get to one little piece of information that you are really looking for. You know if you're not on it everyday all the time it's kind of difficult to use I guess. I don't know if that makes any sense. But that's kind of how it is with me. I mean, you know, you kind of struggle with the internet.*

Work-place journals and text books were available to most nurses. The nurses preferred journals that were clinically focused and specifically related to direct nursing care. One nurse stated, 'I like the easy readability of RN magazine 'cause it is easy and I don't have to flip in my research book and find things' to explain what she read. The nurses commented that there was 'very little information specifically related to rural nursing practice'.

On-site inservices were available to the nurses working at CAH. The inservices were usually provided by the director of nursing. One nurse commented that, due to budget cuts, there are much fewer than there used to be. Also available were teleconferences originating from one of the hospitals in a larger urban area in the state. However, with the 'nursing schedule, they're never convenient. When you're trying to balance a nurse's schedule and a family life, they never really jive [fit]'. For many of the nurses, travel to an urban center was required for continuing education or certification classes (eg advanced cardiac life support).

Facilitators and barrier: In general, use of research was facilitated by the presence of supervisors or managers who supported its use, unit access to the internet, practical and easy-to-read work site journals with information that was directly related to patient care, and financial support to attend conferences. Barriers to using research included lack of knowledge of research methods, lack of time at work or at home to look up information, and the lack of computers and internet access on the nursing units. When computers were available, the nurses reported that poor computer literacy decreased their ability to quickly find and evaluate information. Additional barriers included diminishing financial support from employers and the long travel distances required to attend conferences.

Discussion

Without providing the nurses a definition of research, these rural nurses operationalized the term 'research' to mean 'information gathering' from other healthcare professionals, journals, books and the internet, as well as from past clinical experiences. This approach is consistent with a broad definition of research as evidence that can include clinical nursing expertise, the values and preferences of individuals, families and communities, and a synthesis of the latest research evidence[4,5]. However, the nurses did not understand the types and strength of evidence available to them, nor did they feel confident in their ability to find, evaluate and retrieve relevant information from the internet. Reviewing the research process, discussing the strength of evidence available to them, and providing demonstrations on how to find and evaluate information on the internet is recommended.

Similar to the findings of Kosteniuk et al.[30], we found that the work environment influenced rural nurses' access to and use of research. In our study, supervisors and managers who supported access and use of research positively influenced the nurses with whom they worked. Therefore, we suggest making use of evidence an expectation of practice. Because the nurses believed that accessing research findings was a workplace activity, capitalizing on this by including scholarly activities, such as a monthly journal club or grand rounds, might increase the nurses' use of evidence.

Because they valued the expertise of colleagues, we support formal and informal resource and knowledge sharing[17,30] by pooling resources among small rural facilities and linking rural nurses with research experts. Consulting with clinical nurse specialists and other healthcare providers in larger hospitals and settings (such as urban medical centers and colleges of nursing) via distance technologies (such as telemedicine network, internet and conference calls) is feasible.

Lastly, the findings support increasing access to the internet by having computers on the nursing units in addition to the manager's office. Providing instruction during staff orientation on how to access and evaluate information on the internet is recommended.

Conclusion

In summary, the findings support the barriers and facilitators identified in other studies. The practice environment, role models and expectations of supervisors influenced rural nurses' access and use of research. The lack of understanding of the strength of evidence (eg talking to a colleague vs the results from a randomized controlled research trial) and the research process as a whole influenced nurses' access and use of research in their practice. Lastly, the nurses considered accessing research or the literature an activity to be carried out only while at work.

Implications

Expected outcomes of this study include knowledge on what and how current research findings are incorporated into practice by rural nurses. Dependent on the findings, governmental bodies, health authorities, academics and researchers could develop methods of dissemination and integration of their research outcomes geared to resource availability in rural communities. Findings from this study could promote ways to more efficiently and effectively utilize technologies currently available to assist all rural nurses in obtaining and incorporating up-to-date research for improved consumer health and health care.

Further research is needed to explore rural nurses' belief that gathering information effecting clinical practice is a 'work-based' activity and not something to be done in off-duty hours. Furthermore, information is needed about the effectiveness of education (eg basic courses in research/evidence-based practice) to develop skills and behaviors related to accessing and use of research in rural practice. Lastly, an increase in the amount of clinical research specific to rural nursing practice is needed.

References

1. Committee on Quality of Health Care in America. *Crossing the quality chasm: a new health system for the 21st century*. Washington, DC: National Academy Press, 2001.

2. Agency for Healthcare Research and Quality. *Evidence-based practice centers*. (Online) 1997. Available: http://www.ahrq.gov/clinic/epc/ (Accessed 1 September 2003).

3. Prevost S. Finding the resources to support evidence-based practice. In: *Proceedings, Center for Research on Chronic Health Conditions in Rural Dwellers* meeting. November 2005; Bozeman, MT, USA.

4. Sackett DL, Rosenberg WMC, Gray JAM, Haynes RB, Richardson WS et al. Evidence based medicine: what it is and what it isn't. *BMJ* 1996; **312(7023):** 71-72.

5. Sigma Theta Tau International. *Position statement on evidence-based nursing*. (Online) 2005. Available from: http://www.nursing society.org/research/main.html#ebp (Accessed 6 July 2005).

6. Barnett S, Roderick P, Martin D, Diamond I. A multilevel analysis of the effects of rurality and social deprivation on premature limiting long term illness. *Journal of Epidemiology and Community Health* 2001; **55:** 44-51.

7. Daniel M, Green LW, Marion SA, Gamble D, Herbert CP, Hertzman C et al. Effectiveness of community-directed diabetes prevention and control in a rural Aboriginal population in British Columbia Canada. *Social Science and Medicine* 1999; **48:** 815-832.

8. McGuire DB, Harwood KV. Research. In: *Advanced nursing practice.* AB Hamric, JA Spross, CM Hanson (Eds). Philadelphia, PA: WB Saunders, 2000; 245-279.

9. Scott-Findlay S, Golden Biddle K. Understanding how organizational culture shapes research use. *Journal of Nursing Administration* 2005; **35:** 359-365.

10. Maljanian R. Supporting nurses in their quest for evidence-based practice. Research utilization and conduct. *Outcomes Management in Nursing Practice* 2000; **4:** 155-158.

11. Maljanian R, Caramanica L, Taylor SK, MacRae JB, Beland DK. Evidence-based nursing practice, Part 2: Building skills through research roundtables. *Journal of Nursing Administration* 2002; **32:** 85-90.

12. Morin KH, Bucher L, Hayes E, Mahoney P, Armiger L. Using research to establish protocols for practice: a statewide study of acute care agencies. *Clinical Nurse Specialist* 1999; **13:** 77-84.

13. MacLeod M, Browne AJ, Leipert B. Issues for nurses in rural and remote Canada. *Australian Journal of Rural Health* 1998; **6:** 72-78.

14. Martin S. The rural and urban realities of family medicine. *Canadian Medical Association Journal* 2001; **164:** 1611.

15. Scharff JE. *The distinctive nature and scope of rural nursing: philosophical basis. In: Conceptual basis for rural nursing*. Lee HJ (Ed). New York: Springer, 1998; 19-38.

16. Wellard S, Bethune E. Learning issues for nurses in renal satellite centres. *Australian Journal of Rural Health* 2000; **8:** 322-326.

17. Olade RA. Evidence-based practice and research utilization activities among rural nurses. *Journal of Nursing Scholarship* 2004; **36:** 220-225.

18. Olade RA. Attitudes and factors affecting research utilization. *Nursing Forum* 2003; **38(4):** 5-15.

19. Hutchinson AM, Johnston L. Bridging the divide: a survey of nurses' opinions regarding barriers to, and facilitators of, research utilization in the practice setting. *Journal of Clinical Nursing* 2004; **13:** 304-315.

20. United States Census Bureau. *Montana QuickFacts*. (Online) 2000. Available: http://quickfacts.census.gov/qfd/states/30000.html (Accessed 22 June 2006).

21. Rural Assistance Center. *Critical access hospitals*. (Online) 2006. Available: http://www.raconline.org/info_guides/hospitals/cah.php (Accessed 26 April 2007).

22. Bureau of Health Professionals. *The registered nurse population: findings from the 2004 National Sample Survey of Registered Nurses*. (Online) 2004. Available: http://bhpr.hrsa.gov/healthworkforce/rnsurvey04/appendixa.htm (Accessed 22 June 2006).

23. Spradley JP. *The ethnographic interview*. New York: Holt Rinehart Winston, 1979.

24. Miles MB, Huberman AM. *Qualitative data analysis*, 2nd edn. Thousand Oaks, CA: Sage, 1994.

25. Lincoln YS, Guba EG. *Naturalistic Inquiry*. Beverly Hills, CA: Sage,1985.

26. Patton MQ. Enhancing the quality and credibility of qualitative analysis. *Health Services Research* 1999; **34:** 1189-208.

27. Sandelowski M. The problem of rigor in qualitative research. *ANS Advanced Nursing Sciences* 1986; **8(3):** 27-37.

28. Sandelowski M. Rigor or rigor mortis: the problem of rigor in qualitative research revisited. *ANS Advanced Nursing Sciences* 1993; **16(2):** 1-8.

29. Schensul L, Schensul JJ, LeCompte MD. *Essential ethnographic methods*. Walnut Creek, CA: Altamira Press, 1999.

30. Kosteniuk JG, D'Arcy C, Stewart NJ, Smith B. Central and peripheral information source use among rural and remote registered nurses. *Journal of Advanced Nursing* 2006; **55(1):** 100-114.