

INCREASING RESEARCH SKILLS IN RURAL HEALTH BOARDS: AN EVALUATION OF A TRAINING PROGRAM FROM WESTERN NEWFOUNDLAND

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Abstract: Rural health boards face barriers to increasing evaluation skills, such as fewer opportunities for continuing education and limited access to training resources. In this project, we set out to develop and evaluate a research skills training program suitable for a rural health board. Participants attended five one-day workshops in their home region and completed a research project with on-going mentoring from their instructor. Post-workshop surveys found that the workshops were highly rated (mean: 4.5 out of 5). We surveyed participants before and after the training. We did not find an increase in participants' knowledge scores but found significant increases in self-rated ability to carry out research tasks. Qualitative data suggest that, while most staff were familiar with research terminology, application-focused training was beneficial.

Résumé : Des obstacles à l'amélioration des habiletés en évaluation se posent en milieu rural. Par exemple, il y a moins d'occasion pour l'éducation professionnelle continue, et l'accès aux ressources de formation est limité. Dans ce projet, nous avons développé et évalué un programme de formation pour améliorer les habiletés de recherche en milieu rural. Les participants ont assisté à cinq ateliers et réalisé un projet sous la supervision de leur formateur. Après chaque atelier, les participants ont évalué positivement les activités (moyen de 4.5 sur 5). Un sondage réalisé avant et après le projet montre qu'il n'y avait pas d'augmentation des scores concernant les connaissances en recherche. Néanmoins, la formation a amélioré la confiance des participants à réaliser

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des activités de recherche. De plus, après le projet, les participants estiment qu'ils ont accès aux ressources nécessaires pour réaliser une évaluation. Les données qualitatives suggèrent que les participants sont familiers avec la terminologie de recherche et montrent la pertinence des mises en situation.

For practitioners and managers alike, a substantial barrier to evidence-based decision making is the lack of basic research skills (Björkström & Hamrin, 2001; Bucknall, Copnell, Shannon, & McKinley, 2001; Cooke & Green, 2000; Estabrooks, 1998; Gardner, Rall, & Petersen, 2002; Gething & Boonseng, 2000; Lomas, 2000; Tranmer, Coulson, Holtom, Lively, & Maloney, 1998; Upton, 1999). For example, a survey of dieticians found that most had never conducted research and that the most frequently cited barrier was a lack of research skills (Gardner et al., 2002). Likewise, a study of nurses revealed that 42% of participants believed they were not adequately prepared to read research critically, and less than a third believed they were able to carry out studies (Bucknall et al., 2001). Studies suggest that, in addition to increasing confidence in their own skills, individuals who have research training are more likely to value research (Champion & Leach, 1989; Hicks, 1994; Pearcey, 1995).

Canadian funding agencies and research centres have also highlighted the need to increase research training in health regions (Casebeer, Hayward, MacKean, Matthias, & Hayward, 2006; Fransoo, 2005; Melis, 2005; Michael Smith Foundation for Health Research, 2005). Rural health boards face a greater challenge in fostering evidence-based management than do their urban counterparts (Taylor, Hughes, Petkov, & Williams, 2005). Since most published research articles are based on urban centres, generalizability of findings to rural communities may be limited. As a result, rural health boards must collect and analyze their own local data to guide decision making. However, there are fewer opportunities for rural health managers and practitioners to acquire the skills and experience to conduct research or evaluation studies. Rural health boards have limited access to graduate programs, conferences, or academic expertise that are readily available in urban centres. Moreover, the high costs related to travel limit staffs access to conferences and other educational activities.

Although there have been a number of studies that have evaluated the impact of research skills training, most of these training sessions focus on health professionals' ability to search databases and critically appraise research evidence (Bradley, Oterholt, Herrin, Nordheim, & Bjørndal, 2005; Bucknall et al., 2001; Camiletti & Huffman,

1998; Hicks, 1994; Jette et al., 2003; McCluskey & Lovarini, 2005; Pearcey, 1995; Tranmer et al., 1998; Upton, 1999). A smaller number of studies have evaluated training to improve research and evaluation skills (Adams, Schaffer, Lewin, Zwarenstein, & van der Walt, 2003; Berkowitz, 2000; Brandon & Higa, 2004; McCaffrey Consulting Health Research & Evaluation, 2004).

We developed and evaluated a participatory approach to increasing research skills for Health and Community Services Western (HCSW), a rural health board. HCSW is a regional health organization that provides community-based health and social services (such as communicable disease control, health promotion, continuing care, mental health and addiction services, environmental health, rehabilitative services, child welfare, and corrections services) on the west coast of the island of Newfoundland, Canada (Health and Community Services Western Region, 2005). The board serves a population of 81,595 located in 150 communities. The largest, and only urban, centre is Corner Brook, with a population of 28,650 (Community Accounts, 2005). The rest of the region's population resides in communities with populations less than 10,000. On April 1, 2005, HCSW amalgamated with the Western Health Care Corporation to form the Western Regional Integrated Health Authority.

This article presents the results of the evaluation of a research training program developed for a rural health region. Specifically, the article will present the impact of the training on participant knowledge, attitudes, and skills; perceptions of the training; and impact of the training on the organization. There are few systematic evaluations of research capacity building programs in Canada. This article addresses this gap in the literature and presents an example of a successful model developed for a rural setting. The article will be of use in planning and conducting future research capacity enhancement programs and their evaluations.

TRAINING PROGRAM

The training was initiated by HCSW in response to the need to evaluate recent changes in the organizational structure and to increase organizational research capacity. The training program and its evaluation were developed by the authors in consultation with the HCSW senior management. Notice of the training was circulated and interested staff were asked to apply to the site coordinator (AL) who, with senior management input, selected participants for the training.

In selecting participants, consideration was given to representation from all program areas and communities.

The training consisted of five one-day workshops held in Corner Brook over a one-year period. The workshops introduced participants to general research principles and covered the topics of posing a research question, searching and critically appraising literature, designing data collection (quantitative and qualitative approaches), ethics, data analysis and interpretation, report writing, and dissemination. Each workshop consisted of didactic teaching led by one of the authors (MM) and small group sessions. The instructor (MM) holds a faculty position at Memorial University, has experience in applied health services research and outcome evaluations, and had previously worked in a rural health region. Participants worked in groups to conduct a small study (e.g., staff survey or focus groups) that examined the impact of recent organizational changes at HCSW. Each group identified and developed its own project. At the final workshop, participants presented the study results to HCSW management. All costs of the training program, including travel and research project costs, were covered by HCSW.

Mentoring was an important feature of the training and was available during and in between the workshop sessions. During the small group sessions of each workshop, the instructor joined each group for a period of time to listen to the conversation, offer feedback, and answer any questions. Participants were asked to complete project milestones (e.g., identify research question, review literature, develop methods, collect and analyze data, and write report) and submit their work to the instructor prior to each workshop (except the first one). This allowed the instructor to monitor progress and identify issues for discussion with all participants (for common problems) or with a single group (for problems unique to the group). Participants were also provided with written feedback on submitted materials. Throughout their training project, participants were able to contact the instructor by e-mail and telephone for ongoing mentoring. The bulk of telephone and e-mail messages were received when participants were developing data instruments, analyzing and interpreting data, and preparing reports.

METHODS

We received ethics approval for this study from the Human Investigations Committee, Memorial University of Newfoundland, and the HCSW Ethics Committee.

The evaluation consisted of three components: (a) post-workshop participant surveys, (b) pre- and post-training surveys, and (c) key informant interviews and a focus group with participants and senior managers. The evaluation was developed with reference to Kirkpatrick's framework (1994) for evaluating training programs and assesses learner reactions (level 1), changes in knowledge, skills and attitudes (level 2), and application of learning to the workplace (level 3).

Post-Workshop Survey

Following each workshop, participants completed a short self-administered questionnaire asking them to rate individual aspects of the workshop organization and delivery on a four-point Likert scale, and the overall workshop on a five-point Likert scale. The survey instrument is used to evaluate continuing medical education programs offered by the Faculty of Medicine, Memorial University of Newfoundland. The survey data were entered into a database and analyzed using SPSS software. We used means and standard deviations to analyze the data.

Pre/Post Training Survey

Participants completed the pre-survey prior to the first workshop and the post-survey at the end of the final workshop. The surveys were anonymous and did not contain any identifiable information. To determine knowledge, the survey asked a series of short-answer and multiple-choice questions that assessed general evaluation and research knowledge. The questions related to the objectives for each workshop. Faculty members and HCSW senior management reviewed the questions for face validity.

To assess research skills, using a five-point Likert scale (where 1 was "not at all comfortable" and 5 was "very comfortable"), we asked participants to rate their comfort performing nine research activities. To assess attitudes, using a five-point Likert scale (where 1 was "disagree strongly" and 5 was "agree strongly"), we asked participants to rate their agreement with seven statements regarding the usefulness of research skills, research training, and organizational support for research. The items were based on a review of the literature.

Both the pre- and post-surveys included the same set of questions to assess knowledge, skills, and attitudes. In addition, the pre-survey

included questions on the participants' personal and professional characteristics and previous research training. The surveys were pre-tested by graduate students and senior managers at HCSW.

The data were entered into a database and analyzed using SPSS software (version 14.0). The knowledge questions were graded at the end of the training by the instructor who was blinded to whether the response was from a pre- or post-survey. Knowledge score was the total number of correct questions. Frequencies and means were used to describe the characteristics of the participants. *T*-tests were used to detect differences in knowledge, and multivariate analysis of variance was used to detect difference in skill and attitude scores.

Key Informant Interviews and Focus Group

In September 2003, four months after the final workshop, we conducted one focus group with workshop participants and five key informant interviews with senior managers to assess the impact of the staff development project on the health region. In each session, participants were asked to describe (a) their perceptions of the strengths and weaknesses of the training, (b) the impact of the training on the organization, and (c) how the training had changed participant behaviour.

Each session lasted between 20 and 40 minutes and was recorded and transcribed verbatim. We identified key words and emerging themes and, through this process of exploration, developed a coding and analysis template (Berg, 1995; Krueger & Casey, 2000). The transcripts were coded using NUD*IST (Non-numerical Unstructured Data—Indexing, Searching and Theorizing). The transcript of each interview was examined for similarities and differences.

RESULTS

Post-Workshop Participant Questionnaire

A total of 70 surveys (12 to 18 per workshop) were returned for an overall response rate of 83.3% (80.0% to 100% per workshop). Participants gave high ratings to the facilitator, the organization and delivery of the workshop and learning environment (on a four-point scale), and the training as a whole (on a five-point scale) (Table 1).

Table 1
Participants' Rating of the Organization and Delivery of the Workshops

Item	Mean <i>n</i> = 70	(Standard deviation)
Facilitator was prepared	3.9	(0.2)
Facilitator was responsive to questions	3.9	(0.2)
Facilitator simplified difficult points	3.9	(0.3)
Facilitator clearly presented materials	3.9	(3.3)
Facilitator was knowledgeable	4.0	(0.2)
Training objectives were clear	3.8	(0.4)
Training met the stated objectives	3.8	(0.4)
Small group activities were helpful	3.8	(0.4)
Assignments aided my learning	3.8	(0.5)
Visual aids were effective	3.7	(0.5)
Training was relevant to my work	3.8	(0.5)
Training prepared me to work more effectively	3.7	(0.5)
Environment was conducive to learning	3.4	(0.6)
Overall evaluation	4.5	(0.6)

Note. All items on four-point scale except overall evaluation, which used a five-point scale.

Pre/Post Surveys

Seventeen staff members (including senior managers, psychologists, mental health and addiction counsellors, public health nurses, social workers, dieticians, and rehabilitation therapists) participated in the training. Fourteen participants returned the pre-training survey and 15 participants returned the post-questionnaire for a response rate of 82.5% (pre) and 88.2% (post). Most training participants were female (85.7%), had some form of research training (64.3%), and worked as a clinician (76.9%) (Table 2). On average, participants were 40.5 years of age and had been working at HCSW for 10.1 years and in their profession for 13.3 years.

Training did not produce an increase in participants' knowledge scores (Table 3). Significant ($p \geq 0.05$) increases were seen in ratings for writing a research question, critically reading the research literature, developing a research study and a data collection tool, and writing a research report. Attitudes about research were generally rated highly in both the pre- and post-surveys, but none increased significantly.

Key Informant Interviews and Focus Group

The strengths of the project included the delivery of the workshops; the opportunity to apply research skills; and the support, from all lev-

Table 2
Characteristics of Training Participants

Characteristic	<i>n</i>	(%)
Sex		
Male	2	(14.3)
Female	12	(85.7)
Had previous research training		
Yes	9	(64.3)
No	5	(35.7)
Professional group		
Clinician	10	(76.9)
Manager	3	(23.1)
	Mean	(Standard deviation)
Age (years)	40.5	(4.6)
Years at HCSW	10.1	(4.5)
Years in profession	13.3	(5.6)

Note. Three participants did not return questionnaire.

Table 3
Knowledge, Skills, and Attitudes of Participants Before and After Training

	Pre-test Mean (SD)	Post-test Mean (SD)	<i>p</i> -value
<i>Knowledge</i>			
Knowledge score	9.3 (2.6)	9.3 (3.0)	0.986
<i>Skills</i>			
Writing a research question	2.5 (1.2)	3.9 (0.8)	0.003
Doing literature searches	3.0 (1.1)	3.9 (1.1)	0.067
Critically reading research literature	2.9 (1.1)	3.7 (0.8)	0.047
Developing an research study	2.5 (1.1)	3.5 (0.7)	0.008
Developing a data-collection tool	2.5 (1.4)	3.9 (0.8)	0.033
Analyzing data	3.1 (1.2)	3.0 (1.0)	0.854
Drawing conclusions from data	3.2 (1.1)	3.8 (0.7)	0.120
Writing a research report	2.8 (1.2)	3.9 (0.7)	0.015
Presenting findings to others	3.3 (1.3)	3.9 (0.8)	0.176
<i>Attitudes</i>			
Research skills are useful in my job	4.6 (0.7)	4.9 (0.4)	0.233
Conducting evaluations is important to HCSW	4.8 (0.6)	4.8 (0.4)	0.929
HCSW supports evidence-based decision making	4.0 (1.0)	4.2 (0.6)	0.623
I have access to all the resources I need to conduct an evaluation	2.5 (0.8)	3.0 (0.8)	0.136
Research training will prepare me to work more effectively	4.5 (0.7)	4.3 (0.6)	0.469
Research training is relevant to my work	4.6 (0.7)	4.3 (0.6)	0.300
Research training addresses a need in the workplace	4.6 (0.5)	4.2 (0.7)	0.178
Research training will positively affect the workplace	4.4 (0.9)	4.4 (0.5)	0.913

SD = standard deviation, all skills and knowledge items on five-point scale.

els of HCSW, for the participants and their projects. Participants felt the workshops were well organized and delivered. Many participants noted that they were initially exposed to research methods in undergraduate or graduate programs but that the project gave them an opportunity to use their skills to address issues in their workplace.

Participants also had the support of their managers and colleagues to devote time to the project. For many participants, finding time to attend workshops and complete their group project meant that they had to abandon their day-to-day duties. For many individuals, their colleagues covered their cases or their managers brought in casual workers to deliver services.

Other nurses had to cover for me, like when I was away like at a workshop, that type of thing. And that's teamed with working within our organization. It's their way for you know it's give and take. You know they were quite willing and helpful.

This sense of support extended to the organization as a whole, as seen by HCSW's willingness to allow groups to identify their own research topics and carry out their project without interference. Participants suggested that the initiative spoke to "the openness of the organization to give people the time to take on the projects and, you know, to act or to listen and then react to the results of the projects."

The project's principal weaknesses were the amount of time required from participants, the difficulty in scheduling group work time, and the limited number of staff who were able to participate in the training. For all participants, the amount of time dedicated to the project, though worthwhile, was greater than they had originally expected. Scheduling time for groups to work on the project was particularly challenging given that participants had busy workloads and were located in different communities throughout the region.

[J]ust from hearing staff talk that just the total amount of work and time necessary because the way it was set up. The geography sometimes—the groups had difficulty getting together in one place.

Although there were a large number of applicants for the workshops, 17 staff were invited to participate in the training. Participants said they would have liked to have had more people involved in the training. Some informants suggested that the workload may have been

less if there were more people in each group, but recognized that more group members would create greater group scheduling challenges.

Despite these challenges, the training project was felt to have made a number of positive impacts on HCSW. First, it increased the organization's capacity to conduct research. The project increased awareness of the decision-making process and the need for evidence to inform decisions. It lessened participants' fear of research and the research process and, as one individual noted, "I think it's going to be really good even for people within divisions or programs to do either program evaluation or to ask critical questions about programs and services." The informants cited examples of participants applying their skills to other aspects of their job, such as reading critically, incorporating evaluations into proposed programs, developing assessment tools, and beginning to evaluate existing programs. The project also encouraged some participants to consider further research training through graduate education.

Second, the participatory approach to evaluating the organizational restructuring added to the credibility of the results among staff. They felt that the evaluation was "participant driven in terms of identifying the question and the strategies and so on." The training was seen as a responsive way for senior management to acknowledge the staff's concerns and make them part of the decision-making process.

We had major organizational change and I think there was a lot of confusion as to whether or not this was a good thing. It seems to me that it brought the different divisions together and gave us control: "Okay, these are the issues that the staff have brought up, so what are we going to do research on and can we back up their issues based on research?" I think that that was really, really positive. I thought it was a very good way to handle all the changes that were going on.

The project also gave participants an opportunity to work with staff from other communities and programs areas.

I liked the opportunity to meet different people in different parts of the organization. There were people that I had never met and it gave the opportunity to meet different people and work within a group with those people, and also you learned a lot from each other.

In addition to being a positive social experience, the project allowed participants to learn about other programs areas and build linkages. This, along with the perceived strengths of the participatory approach, boosted staff morale.

DISCUSSION

Rural organizations have unique professional education needs. We designed a training program to address these challenges; specifically, we brought the training to the region rather than requiring staff to travel to a larger centre. We provided ongoing support and mentoring so that participants could work with the instructor to help resolve problems as they worked on their projects. This approach to research skills training, although developed with the needs of a rural health board in mind, has drawn substantial interest from urban-based health organizations in the province, suggesting that in-house, application-focused research training models featuring ongoing mentoring may have wide appeal.

The success of the training model stems from its incorporation of adult learning principles (Lieb, 1991), its participatory approach, and its strong organizational support. Other evaluations have also noted the importance of building adult learning principles into the organization and delivery of capacity building programs for health care providers (Gjerde, Kokotailo, Olson, & Hla, 2004; McCaffrey Consulting Health Research & Evaluation, 2004). In our training program, participants were involved in scheduling workshops and deadlines so that work and other demands could be accommodated. The training also highlighted application. We provided an opportunity for learners to apply their research skills in their own context by conducting a small-scale study. Health care staff are highly trained individuals who have been exposed to research during their training. Although most health care professionals are familiar with research terminology, they need specific training in how to apply research in their day-to-day decision making. Our study found that continuing education in research training increases organizational research capacity by increasing confidence in applying these skills. Similar increases in participants' confidence in applying their skills have been reported in other evaluations of research training programs (Adams et al., 2003; Berkowitz, 2000; Camiletti & Huffman, 1998; Pearcey, 1995). The training also addressed the desire to build social relationships and to escape work routines and try something new, two important motivations for adult learners (Lieb, 1991).

The training program incorporated a participatory approach by encouraging participants to select their own research topics. HCSW senior management undertook the training initiative, in part, to allow staff to investigate staff concerns related to recent organizational restructuring. The participatory approach to evaluation instilled a sense of credibility in the senior management's approach to staff's concerns as well as the results of the individual projects that examined the organizational changes. For example, contrary to their expectations, one group found that the reorganization had not led to poorer staff supervision. The results had greater credibility among the staff because staff themselves had conducted the study.

Strong support from all levels of the organization was a key component for the program's success. Senior managers championed the project. HCSW covered the costs of the training, and participants also had the support of their managers and colleagues to devote sufficient time to the project. Other evaluations have also noted the importance of the organization's support in the overall success of research capacity building programs (Adams et al., 2003; Berkowitz, 2000; McCaffrey Consulting Health Research & Evaluation, 2004).

The greatest barrier encountered by participants was scheduling time for groups together in between workshops and to complete the research project. Participants suggested holding two-day workshops, with the second day devoted to small groups for their project-related work. The second day would also give groups additional time to meet with the instructor in person. Participants also suggested additional training on data analysis and data presentation. The training did not attempt to teach detailed statistical methods. Rather, participants reviewed basic statistics and the instructor and her graduate students conducted the statistical analyses and gave test results to the participants. Lastly, participants suggested that there should be some official recognition or acknowledgement of their completion of the training, such as a certificate to include in their personnel file.

Limitations

Our evaluation is limited by a lack of a control group. Initially, we had given the pre- and post-survey to HCSW staff who did not participate in the staff development project. However, because of very small sample sizes and differences in the pre and post non-participant samples (we were unable to recruit the same individuals to complete both sets of surveys), we were not able to use these data. Triangulat-

ing the qualitative and quantitative data strengthens the credibility of our findings. Focus group participants and key informants were not provided the results of the post-workshop surveys or the pre-post survey, and the research assistant who conducted these discussions was not involved in the project. The qualitative data provide independent validation of the survey findings.

CONCLUSION

Our study confirms that, among health care staff, research training that is relevant to learners and emphasizes application of skills increases confidence in applying research skills and positively contributes to organizational capacity for research. The success of our training model stems from its incorporation of adult learning principles, a participatory research approach, and strong organizational support.

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