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2005-06-01

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Original Publication Citation

Rushton, P., Nail, L., & Brown, S. (1997) Impact of continuing education on rural cancer nursing care. *Journal of Pharmaceutical Care of Pain and Symptom Control* 5(2): 37-59.

BYU ScholarsArchive Citation

Rushton, Patricia; Nail, Lillian; and Brown, Sherry, "Improved Cancer Care Through Increased Basic Cancer Education" (2005). *Faculty Publications*. 373.
<https://scholarsarchive.byu.edu/facpub/373>

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IMPROVED CANCER CARE THROUGH INCREASED BASIC CANCER EDUCATION

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ABSTRACT

Literature shows that nursing care in rural communities improves when the nurse has increased knowledge through continuing education. Specific oncology studies in areas of stress, pain assessment and documentation, and death and dying. (Hedman-1990, Camp-Sorrell-1991, Foglesong-1987, Webber-1991) demonstrate similar results. It is reasonable that continuing education in areas of the cancer process, standard therapies, and methods of symptom control would improve patient care. This project allowed nurses who had limited access to cancer education in rural areas of Utah to receive basic cancer education. The subjects of this education included: 1) the cancer process, 2) chemotherapy, 3) radiation therapy, 4) the use and care of vascular devices, 5) principles and methods of cancer pain control, and 6) issues of death and dying. The study tested whether a structured cancer nursing continuing education program enhanced the cancer nursing knowledge of nurses in rural and frontier health care agencies. It examined the effects of such a program on self-reported nursing practice with cancer patients in such rural agencies. Finally, it tested the extent to which nurses who participated in continuing education programs disseminated information from the program to other health care providers in their practice setting.

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Introduction

Nurses in rural and frontier areas deal with diverse client populations. When hospitals and home care agencies are small, address wide geographic areas and employ very few nurses, the opportunities for interacting with other nurses interested in a particular clinical specialty are limited. Resources, such as oncology clinical nurse specialists, are rare. One approach to bridging the gap between the knowledge needed to provide care to cancer patients in rural areas and the available resources is continuing education. Continuing education programs are most frequently offered in urban settings where the potential audience and the number of specialist resources is large. Nurses in rural areas use a variety of mechanisms, such as independent study, teleconference, videotapes, and interactive video to meet their continuing education needs. While these methods may be effective in some situations, they do not allow for interaction and networking between presenters and participants.

The purposes of this study were threefold. The study tested whether a structured cancer nursing continuing education program enhanced the cancer nursing knowledge of nurses in rural and frontier health care agencies. It examined the effects of such a program on self-reported nursing practice with cancer patients in such rural agencies. The study tested the extent to which nurses who participated in continuing education programs disseminated information from the program to other health care providers in their practice setting.

Literature Review

There appears to be little nursing literature dealing with the effectiveness of continuing education in the rural setting in improving patient care. Of course, only part of that limited literature deals with oncology continuing education or related subjects. Camp-Sorrell and Foglesong have studied continuing education in pain assessment and documentation (Camp-Sorrell,1991, Foglesong,1987). Hedman studied stress (Hedman,1990). Webber discussed continuing education in helping nurses deal with the dying patient (Webber,1991).

The available literature identified several factors that make continuing education for rural nurses difficult. These included geography, transportation costs, limited budgets for staff

education, and limited staffing resources (Bushy, 1990, P. 207). Anderson spoke of the effects of physical isolation and lack of collegial support on continuing education (Anderson, 1991, P. 34). Foglesong spoke of the effect of DRGs on resulting budget cutbacks

which press hospital administrations to justify the cost of staff continuing education (Foglesong, 1987, P. 168.).

It appears that there have been few scientifically studied continuing education projects in rural communities and that there are many obstacles to such continuing education. One limitation of the research on continuing education is the use of knowledge and satisfaction with the program as the only dependent variables (Meservey & Monson, 1987). Since the goal of education is to change behavior, research on the effects of continuing education programs must address practice as well as knowledge. Another problem inherent in studying rural continuing education is the small sample sizes which impose limitations on research design. However, those few studies that have been carried out have demonstrated success in improving patient care as a result of the continuing education. (See references 1,2, 4-8, 10-12)

The thrust of this project was to meet the education needs of the nurse in rural Utah in areas of basic oncology knowledge, so that the nurse could improve patient care for the cancer patient. The project used Knowles Adult Learning Theory, as has been widely discussed in the available literature. "Adult learners tend to have a problem-centered learning style and, therefore, perceive a relevant curriculum as having courses or classes organized around their work or evolving life roles" (Bushy, 1992, P. 208).

Method

The project attempted to incorporate the six keys to successful rural continuing education programs. These are as follows.

1. Administrative support for the CE offering - Contact was made with administrative people in each of six anticipated rural sites for the education. These contact people expressed an interest and excitement in having the proposed project brought to their practice areas.

2. Identification of appropriate program topics - Members of the American Cancer Society Nurse Subcommittee had been teaching inservices on the proposed topics for two years. These topics had been frequently requested and well received.

3. Attendance - The greatest possible attendance was facilitated by planning and publicizing the seminar at least two months in advance to allow nurses and facilities to schedule nurses and their coverage.

4. Number of those planning to attend known prior to conference - With early publicity and planning, an estimated number in each audience were known early. This allowed faculty to go prepared with appropriate amounts of teaching materials.

5. High faculty enthusiasm - Instructors were enlisted. Only those in agreement with the outlined proposal, able to commit the necessary time, and excited about the project were asked to volunteer. However, secondary to personal schedules, the same instructors did not necessarily teach all of the six seminars.

6. Soliciting feedback - The project evaluation instruments were designed to provide both immediate and long term feedback about the seminars. (Anderson, 1991, P.32)

Sample

The sample was a convenience sample consisting of those nurses in each geographic area who were able to participate in the proposed cancer education seminar, and who consented to participate in the outlined evaluation procedures.

Setting

The setting consisted of six geographic areas. These areas had been identified as being sufficiently distant from metropolitan areas to make receiving continuing education about cancer concepts difficult for nurses practicing in those areas. Seminars were held in facilities sufficiently large enough to handle participants, central enough to make travel expedient, and with an atmosphere conducive to learning.

Procedure

A one day seminar was taken to each site. Each seminar consisted of six one hour presentations on the topics of 1) the cancer process, 2) basic concepts of chemotherapy, 3) basic concepts of radiation therapy, 4) the use and care of vascular access devices, 5) principles and methods of cancer pain control, and 6) ethical issues of death and dying. Topics were chosen because these areas of cancer information contained a high quantity of technical information which was rapidly expanding. This rapid expansion made continuing education important in keeping nursing care providers current wherever they practiced. These topics had been commonly requested by nurses and nursing agencies. It was felt that nurses in the rural area needed similar opportunities for continuing education. The ethical issues of death and dying were chosen because this is a subject which is frequently uncomfortable for caregivers to address, but has so much influence on caregivers dealing with the terminally ill patient.

The continuing education program was designed to meet certain behavioral objectives in each area of instruction.

Instruments

Several instruments were used in this project to measure increase in knowledge and the ability to apply that knowledge in the care of the cancer patient.

1. TEST - The study utilized a pre-test/post-test design. This type of design had inherent

limitations, but is appropriate for use in this situation where the number of subjects in rural and frontier nursing positions was limited. It was appropriate because denying access to the program to those assigned to a "control" or "comparison" group was not acceptable given the barriers to continuing education encountered in rural areas. If nurses who were unable to attend the program were used as a control, several potential selection biases and compensatory opportunities would weaken the comparison. For example, control nurses could obtain course materials from the nurses who participate in the program as part of the dissemination efforts of program participants.

A 20 question pre and post test, each test consisting of the same questions, were given to subjects before and immediately after the seminar to measure immediate increase in knowledge base. Participants were asked to retake the test two months after the seminar to measure knowledge retention. The test was pilot tested on volunteers recruited from nurses practicing in the acute care setting. Items with unacceptable point biserial correlations were rewritten. Pilot subjects were asked to provide written comments about items they found confusing or difficult.

2. VIGNETTE - A short written patient situation in the area of each of the planned six topics were given to the subjects during the seminar and at a two month post-seminar date. Participants were asked to read the situation and comment on how they would handle the situation. This measured both immediate understanding of knowledge application and retention of that understanding.

3. CRITICAL INCIDENT - Two months after the seminar, each participant was asked to write a critical incident relating how they used the information gathered at the seminar to improve nursing care to the cancer patient. A critical incident is defined as a nursing experience which demonstrates one or more of the following:

- An incident in which the nurse feels that the intervention really made a difference in patient outcome either directly or indirectly (by helping other staff members).

- An incident that went unusually well

- An incident in which there was a breakdown, i.e., things did not go as planned

- An incident that is very ordinary or typical

- An incident that the nurse thinks captures the quintessence of what nursing is all about

- An incident that was particularly demanding
(Benner, 1984, P. 300)

4. DISSEMINATION - Two months after the seminar, each participant was asked to report how many times they had shared the information gained with peers, co-workers, patients, and families in the form of formal inservices or one-on-one encounters.

Data Analysis

Data Analysis and Interpretation

Data analysis was done separately for each major dependent variable. Pre and post-test scores on the knowledge test were compared using a dependent t-test and an alpha of .05.

The purpose of the vignettes was to determine if the student acquired an understanding of knowledge application from the material presented in the seminar, thus determining immediate understanding and retention of that understanding. Vignettes were examined by the PI to determine if the participant used information presented in the seminar to form a response. The score consisted of "yes" if information from the seminar was used or "no" if information from the seminar was not used. Paired t-tests were used to examine the difference between in-seminar and post-seminar responses to determine if a significant number of participants retained an understanding of knowledge application after the seminar was completed. Since there was a potential for 3600 responses, a simple form of evaluation was felt to be advisable. Therefore, only the PI reviewed the vignettes, instead of multiplying this factor by having the vignettes reviewed by other reviewers.

The critical incidents were read by the PI to ascertain whether information obtained at the seminar was perceived by the student as useful in managing the situation. These were rated as "yes" or "no". "Yes" indicated that information from the seminar was used and "No" indicated that information from the seminar was not used.

Results

One hundred twenty four registered nurses participated in the seminars. Only 55 of these nurses participated in the study. The mean scores for the total test score, as well as the subscores over time are found in Table 1. The perfect score for the total test was 100. The maximum scores for the subscores ranged from 2 for death and dying to 8 for symptom management. The mean score for the total test score was higher for post-test 1 than the pre-test, as would be expected. The mean dropped for the 2 month post-seminar test score, but was still higher than the pre-test. The subscores did not follow a predictable pattern. Some subscores actually dropped at post-test 1 (radiation therapy and death and dying) and then improved slightly for post-test 2, though still lower than the pre-test. Some subscores, predictably, increased with instruction, but decreased over time (chemotherapy, vascular access devices, pain and symptom management).

TABLE 1 Mean Subscores and Total Test Scores Over Time

	Test Group with SD	Pre-test with SD	Post-test 1 with SD	Post-test 2
Total Test Score	67.5±12.16	81.87±6.33	77.66±9.08	
Cancer Process	2.47±.76	2.47±1.01	2.47±1.05	
Radiation Therapy	2.22±.79	1.67±.69	2.05±1.08	
Chemotherapy	2.71±1.01	2.76±1.23	2.75±1.34	
Vascular Access Devices	2.11±1.16	2.4±1.19	1.93±1.27	
Pain	1.16±.88	2.56±1.17	2.05±1.16	
Death & Dying	1.93±.33	1.69±.69	1.65±.73	
Symptom Management	4.25±1.24	5.73±2.36	5.11±2.33	

Table 2 summarizes the paired t-test results for subscores and the total test, comparing pre-test scores with post-test 1 scores. Statistically significant values (P less than .05) were found for the total test scores, and for subscores in radiation therapy, pain, death and dying, and symptom management. Again, the direction of change for total test scores, and for subscores in pain and symptom management was expected. The direction of change for radiation therapy and death dying subscores was unexpected.

Table 2 Summary Table Paired T-Test Subscores and Total Test Scores for Pretest and Post-test 1

Test Group	Mean Difference	Standard Deviation	Standard Error	r	p	df	t	p
Total Test Score	-14.375	12.056	1.740	.277	.057	47	-8.26	.000
Cancer Process	.0000	1.171	.158	.160	.244	54	.00	1.00

Radiation Therapy	.5455	.899	.121	.269	.047	54	4.5	.000
Chemo-therapy	-.1455	1.57	.211	.033	.811	54	-.26	.797
Vascular access devices	-.2909	1.462	.197	.234	.086	54	-1.48	.146
Pain	-1.400	1.314	.177	.198	.148	54	-7.90	.000
Death& Dying	.2364	.693	.093	.228	.094	54	2.53	.014
Symptoms	-1.473	2.471	.333	.170	.214	54	-4.42	.000

Table 3 summarizes the paired t-test results for subscores and total test scores between pre-test and post-test 2, examining information retention over time. Statistically significant values (P less than .05) were found for the total test score and for subscores in pain, death and dying, and symptom management.

TABLE 3 Summary Table Paired T-Test Subscores and Total Test Scores for Pretest and Post-test 2

Test Group	Mean Difference	Standard Deviation	Standard Error	r	p	df	t	p
Total Test Score	-10.213	13.593	1.983	.218	.141	46	-5.15	.000
Cancer Process	.0545	1.161	.157	.210	.123	54	.35	.729
Radiation Therapy	.1636	1.102	.149	.335	.012	54	1.10	.275
Chemo-therapy	-.1455	1.704	.230	-.032	.818	54	-.63	.529
Vascular Access Devices	.1818	1.335	.180	.404	.002	54	1.01	.317

Pain	-.8909	1.242	.168	.282	.037	54	-5.32	.000
Death& Dying	.2727	.732	.099	.205	.132	54	2.76	.008
Symptom Management	-.8545	2.498	.337	.125	.362	54	-2.54	.014

TABLE 4 Application of Knowledge to Clinical Situations as Demonstrated in Vignette Format.

VIGNETTE Process	Therapy	Cancer Therapy	Rad. Dying	Chemo	VAD	Pain	Death
<u>Time 1</u>							
<u>Immedate Post-Seminar</u>							
Applied	27	27	37	20	19	52	
Not Applied	25	26	18	33	35	2	
Data Missing	2	2	0	2	1	1	
<u>Time 2</u>							
<u>2 month Post-Seminar</u>							
Applied	28	27	37	16	30	43	
Not Applied	20	18	10	31	16	2	
Data Missing	2	10	8	8	9	10	

The data in Table 4 is difficult to evaluate because there is data missing in the 2 month post-seminar evaluation information. The table demonstrates that there may have been application of principles of assisting dying patients. It shows there may be application of principles of managing cancer pain at the 2 month interval.

TABLE 5 Dissemination of Information in a Teaching Situation

	# of times type of teaching used	# of persons using type of teaching
Teaching done in formal seminar or inservice	0	41
	1	6
	2	2
Teaching done one on one with health care professional	0	13
	1	19
	2	5
	3	4
	4	1
	5	5
	6	1
	7	1
	missing	6
Teaching done with patient or family	0	18
	1	19
	2	5
	3	2
	4	0
	5	3
	6	2
	missing	6
Teaching done with personal family or friends	0	13
	1	21
	2	5
	3	6
	4	1
	5	1
	6	1
	7	1
	missing	6

Table 5 demonstrates that many of the seminar participants made the effort to share the information they learned with someone else, i.e., peers, patients, families, friends.

TABLE 6 Use of Information in a Critical Incident

Persons using information in a critical incident	24
Persons not using information in a critical incident	14
Missing data	17

Table 6 demonstrates that though more respondents chose not to respond to this question or did not use the information in a critical incident, some respondents did use the information in a situation where they felt it improved nursing care to the cancer patient.

Discussion

Some factors which effect the results of this study are the small sample size of 55. The test question pool was small with a maximum score of 20. The subgroup of test questions for each subject area consisted of only 3-4 questions. Sixty nine seminar participants did not respond. Within the pool of 55 participants who did respond, many of them left parts of their response blank producing "missing" data. All of these factors made data analysis difficult.

It should be noted that though the same teaching plan was used in each seminar, different faculty were involved in teaching each seminar. This was necessary due to the work and personal commitment of each faculty member. This may have had an effect on learning.

The large amount of missing data and failure to return data is notable. It is difficult to be certain of the reasons for the small participation.

It is important to remember the original purpose of the project. The project was done in order to provide information about aspects of cancer nursing care to nurses who have difficulty acquiring such information. They have such difficulty because they work in rural areas where distance and isolation, budgets and staffing prohibit their travel to more metropolitan areas where nursing continuing education is more available. The hope of the study was that even if a small number of nurses could improve their knowledge base, then the information would disseminated to more health care providers, patients, and families. It was felt that some learning was more important than no learning at all. The tables in the results section may not show numbers of significance. However, the fact that there was some learning, particularly about pain control, symptom management and managing death and dying, some application of information and some sharing of information in teaching situations is important. Also important is that some of the participants felt that what they had learned and were able to share made a difference in the outcome of situations. This is validated by results of the critical incidents. Though the actual data numbers are not significant, it is significant that some impact was experienced.

Conclusions

Conclusions reached as a result of this study are four fold. First, though numerical data are not significant, it is apparent that learning did take place on the part of some study participants

and that information was disseminated by study participants. Second, knowledge gained during the seminars seems to have had some effect on patient care as noted from the critical incident reports. Third, the areas of greatest learning and dissemination seem to be in pain and symptom management and in assisting with death and dying. Fourth, a larger return of data from seminar participants may have shown a higher level of statistical significance. Better education about the importance of nursing research and its effect on nursing practice, specifically in this study, may be of value in obtaining more data in this study and in nursing research in general.

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