

Pain Management for Elderly Patients with Cancer at Home

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Background. Pain is an important problem for patients with cancer and is particularly important for elderly patients with cancer and their family care givers. Increasingly, cancer is managed on an outpatient basis with pain management responsibility assumed by the family at home. This study evaluated a structured pain education program that included three components: basic pain management principles and assessment, pharmacologic interventions, and nondrug treatments.

Methods. The pain education intervention was implemented across three home visits with two points of follow-up evaluation. Outcomes of the 66 elderly patients with cancer completing the educational program included measures of quality of life, patient knowledge and attitudes regarding pain, and use of a self-care log to document drug and nondrug interventions and their effectiveness.

Results. Repeated measurement analysis was used to evaluate the outcomes of the three-part education intervention. Results indicate an improvement in knowledge and attitudes regarding pain as well as the use of drug and nondrug interventions. Outcomes of the quality of life instrument suggest significant effect of pain on all aspects of quality of life, including physical well being, psychological well being, social concerns, and spiritual well being.

Conclusions. The investigators concluded that the pain education intervention provided important support to elderly patients with cancer and family members at home. Structured pain education based on an evolving science of pain relief should become a part of the standard health care for pain management. Improved pain management includes quality of life for the elderly patient

with cancer as well as for family care givers. *Cancer* 1994; 74:2139-46.

Key words: pain, elderly, cancer pain management, quality of life, symptom management, home care, terminal illness.

Cancer is a disease affecting older adults, and this trend will continue because of increased long term survival and an aging population. The need for pain research specific to the elderly is heightened by special characteristics of this population. Elderly patients suffer disproportionately from chronic painful conditions and have sensory impairments complicating pain assessment.¹ Older patients have multiple diagnoses and complex symptoms that may complicate the pain experience. This population is also known to have limited social and financial resources, thus reducing access to health care.

Chronic pain in the elderly represents a serious threat to maintaining functional status and independence.² Epidemiologic data demonstrate that elderly patients suffer disproportionately from chronic medical problems compared with younger patients¹ and that these chronic illnesses are frequently characterized by pain.

Conflicting reports are found in the literature regarding pain sensitivity and pain tolerance among the elderly. Some investigators have suggested that pain may decline with age.^{3,4} Results of elderly patients (75 and older) in the National Hospice Study suggested that although 77% experienced significant pain, age was negatively correlated with presence and severity of pain.⁴ The Nuprin Report noted an age-related association of pain in the elderly.⁴ Most discussion in the literature regarding the intensity of pain in the elderly is based on clinical experience rather than on empirical data.

The National Institutes of Health Consensus Development Conference (1986) identified the specific need

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for pain research in children and in the elderly.⁵ The elderly patient with cancer has physical, social, and psychological needs distinct from younger adults and present particular challenges for pain assessment and management. The purpose of the present study was to evaluate a pain education intervention for elderly patients with cancer and family care givers at home.

Conceptual Framework

The current study is based on the conceptual framework of Pain and Quality of Life. The model depicts four domains of pain to include physical well being, psychological well being, social concerns, and spiritual well being. This model has evolved from the investigator's (Betty Ferrell) research from 1984 to the present.⁶⁻¹⁰ For example, spiritual well being was originally encompassed in psychological well being but later developed into a separate domain, because issues of suffering, religiosity, and meaning of pain are common themes expressed by patients related to pain and quality of life. The social well being domain has also been developed and refined based on awareness of the important role of family members in relieving pain and the effect of pain on family care givers. The components of each of the domains and individual aspects of the quality of life domains have also been validated from previous studies.

The model was used in this intervention study to select the patient outcomes and care giver outcomes of interest. The study instruments were selected to measure outcomes and are consistent with the domains of the model.

Literature Review

Available research is singularly concerned with the management and experience of cancer pain in the inpatient setting. Health care providers control pain management in the hospital and are unfamiliar with the experience of pain outside this setting and the management of pain by patients themselves. This lack of understanding is of particular significance in light of the current trend toward outpatient management of cancer and use of home health services for much of cancer care.

The current study focused on pain in the elderly as an understudied and vulnerable population. The elderly and the poor have been recently cited as groups particularly at risk for undertreatment of pain.⁵ Chronic pain in the elderly represents a serious threat to maintaining functional status and independence.² Epidemiologic data demonstrate that elderly patients suffer dis-

proportionately from chronic medical problems compared with younger patients and that these chronic illnesses are frequently characterized by pain.¹

With the increase in awareness of the problem of cancer pain, authors have suggested strategies for improvement. Model programs described in hospice and palliative care literature exist in the form of inpatient and outpatient hospice teams^{11,12} and home care programs.^{13,14}

Leaders in the field of palliative care have demonstrated that pain can be effectively controlled and that dignified death can indeed be a reality.^{2,12,15} These programs serve as models for the health care system. Unfortunately, not all patients with cancer are recipients of care based on these principles. Most patients are managed within more traditional programs or are managed solely by family members at home.

Pain experts^{2,11,12,14-16} agree that the combination of drug and nondrug strategies provides the best pain management. Nonpharmacologic pain management strategies have also been implemented largely based on anecdotal reports. Nondrug strategies include a variety of methods, such as transcutaneous nerve stimulation, biofeedback, music therapy, hypnosis, and other nonpharmacologic treatments.¹⁷⁻²⁰ Most of these methods are untested for clinical efficacy in the elderly. Transcutaneous nerve stimulation units have shown promise in selected pain syndromes, although the duration of relief remains to be demonstrated.²¹ Relaxation has been used effectively in elderly patients with postoperative fractured hip pain,²² but little data exist regarding its use in chronic pain.

The physical interventions included in the current study are heat, cold, and massage. These techniques have been reported as beneficial for pain in chronic benign pain studies.^{21,23} Cognitive interventions included relaxation/distraction and imagery, which have been supported in other studies.²⁴⁻²⁶

Many of the nonpharmacologic interventions tested in research, such as biofeedback or hypnosis, require more extensive training and therefore have less applicability to traditional care. The interventions tested in the current study were designed to be applicable to clinical settings. The interventions selected also have limited expense and time required for teaching and implementation.

Methods

The study was approved by the Human Subjects committees of the participating institutions. Subject criteria were as follows: outpatients older than 60 years of age; presence of pain related to tumor or treatment with an

onset greater than 2 weeks and expected to continue for at least 3 months; an expected prognosis of at least 3 months; and those who lived within a 50-mile radius of the sites.

Subjects were given a three-part educational intervention for pain management. The teaching was conducted during home visits with the three visits scheduled over a 2-week time period. Part 1 included general information about pain. Topics included an overview of pain, assessment of pain, use of pain rating scales, and the need to relieve pain to promote overall comfort and quality of life. Part 2 focused on pharmacologic interventions, including principles of drug addiction and drug tolerance and prevention of pain through routine scheduling and treatment of associated symptoms such as constipation. Part 3 included information about nondrug management of pain and demonstration of nondrug pain management techniques, including heat, cold, massage, relaxation/distraction, and imagery. The nondrug interventions were presented as useful adjuncts to medications, with emphasis on the combined use of drug and nondrug interventions as providing optimum pain relief.

The patients were given an audiotaped reinforcement message for Parts 1 and 2 of the teaching session. Patients were given an audio cassette tape player to listen to the tapes and a \$50 allowance for the nondrug methods they selected, such as tapes, heating pads, or massage devices. Nineteen separate nondrug interventions were developed, and written information was provided for all nondrug treatments.²⁷

Family care givers were also included in the pain education intervention and evaluation. Care giver outcomes are reported separately. Care givers who were included in the study were asked to be present for the three intervention visits and were actively included in all nondrug interventions. Care givers were instructed about their role in supporting the patient to use routine analgesia for pain prevention and were coached to participate in massage or relaxation exercises.

Instruments

Four instruments were used to collect patient outcomes. A demographic and treatment data tool was used to describe the study subjects and their treatments. The Quality of Life tool was used to measure the outcomes in the quality of life domains of physical well being (i.e., fatigue, sleep, strength), psychological well being (i.e., happiness, worry over illness), social concerns (i.e., relationships, intimacy), and spiritual well being (i.e., worry about unfinished business). This 30-item visual analogue scale provides an efficient measure of multiple

variables. It also includes an item assessing perception of overall quality of life and items measuring pain distress and pain intensity. It has been developed and used extensively by the investigators over the past 8 years.^{6,28,29} Reliability and validity have been established with test-retest reliability greater than 0.70, internal consistency of subscales greater than 0.65, total alpha 0.88, and measures of construct validity, concurrent validity, and factor analysis.

Use of drug and nondrug interventions was measured by use of a Self-Care Log. This log is based on the extensive research conducted by Dodd,³⁰ who examined self-care related to chemotherapy. Subjects recorded pain intensity, pain distress, any actions taken to manage their pain including drug and nondrug interventions, and effectiveness of the pain relief measures used. The Self-Care Log includes a 5-point ordinal scale for measuring effectiveness of the intervention. Compliance with drug interventions was calculated using the amount of drug prescribed divided by the amount of drug taken. The nondrug interventions were calculated by the number and frequency of nondrug interventions used. Perceived effectiveness was based on the subject's rating, which was to be recorded 30 minutes after any action, either taking a medication or using a nondrug intervention such as relaxation. Reliability and validity of the self-care log have been previously reported by Dodd.

The Patient Pain Questionnaire was used to measure the knowledge and attitudes of the patient regarding pain. The tool is a 14-item visual analogue scale measuring knowledge and attitudes based on basic principles of pain management. It was adapted for the current study to measure patient outcomes from a family care giver version, the Family Pain Questionnaire,³¹ which we have used since 1987.

Results

Eighty patients were accrued to this study. Each patient received three education visits and two evaluation visits. The evaluations were conducted at 1 and 3 weeks after the education visits for a total of five home visits. More than 400 home visits were conducted during the course of the study. Of the 80 patients, 66 (82.5%) completed all five home visits. All data were analyzed using an SAS statistical program (SAS Institute, Inc., Cary, NC). Repeated-measures analysis of variance was used to analyze intervention outcomes. The instruments described above were used at the time of accrual to this study before providing the education and at the two evaluation points after the education intervention.

The demographic characteristics of the patients are

presented in Table 1. The average age of the patient was 67.7 years; 43.9% of the subjects were female; and 77.3% were white, with the remaining 22.7% consisting of other ethnic groups. The average time since cancer diagnoses was 31.9 months, and the average time since onset of pain was 17.3 months.

Table 2 presents the quality of life scores collected at the time of accrual to the study. The table includes mean and median scores of the individual items of the Quality of Life tool. All items have been transposed for analysis such that the anchors represent 0 as the worst outcome and 100 as the best outcome. The table lists items in descending order from highest to lowest, thus depicting the areas of best to worst aspects of quality of life. Results suggest that patients scored best in areas of basic function (i.e., ambulation, personal care) and symptoms. The worst outcomes were in areas such as life enjoyment, appetite, usefulness, pain, and fatigue. Similarly, patients showed the best outcomes in the social subscale, followed by physical well being and spiritual concerns and the worst scores in the psychological subscale. The mean total quality of life score was 55.5.

Table 3 presents outcomes of the Patient Pain Questionnaire. Again, the items have been transposed as described for the Quality of Life tool. Results suggest the highest areas of knowledge and appropriate attitudes related to the family's sense of helplessness, use of nondrug treatments, and belief in pain relief. Areas of lowest scores of knowledge and attitudes included fear of respiratory depression, pain distress, amount of pain over the week, and need to take low doses of medicines. The overall knowledge subscale score was 54.2 and the experience subscale was 51.7. Because the patient's knowledge and attitudes about pain was the primary outcome of interest of this pain educational intervention, repeated-measurement analysis was conducted to determine the effects of the teaching. The last column of the table indicates those individual items that did result in a significant improvement based on evaluation after education. Significant improvement ($P \leq .05$) was verified in 8 of the 14 individual items and in the total knowledge subscale as well as the total experience subscale.

Table 4 presents the outcomes of medication use across the five home visits. Data were extracted from the patient's Self-Care Log. All medications were standardized using equianalgesic conversion tables to calculate oral morphine equivalents for purposes of analysis. The table identifies the amount of medication ordered in oral morphine equivalents (omeqs) as well as the amount of medication taken. Medication orders were generally increased as a result of the nurse contacting the patient's physician. The amount of medica-

Table 1. Total Patient Demographics (n = 66)

	N	%
Age		
Mean = 67.7 yr		
Median = 67 yr		
SD = 8.1 yr		
Sex		
Female	29	43.9
Male	37	56.1
Income (\$)		
< 10,000	28	43.1
10,000-20,000	27	41.5
20,000-30,000	6	9.2
30,000-40,000	2	3.1
> 40,000	2	3.1
Ethnic		
White	51	77.3
Hispanic	11	16.7
Black	2	3.0
Asian	1	1.5
Other	1	1.5
Diagnosis		
Breast	12	18.5
Prostate	9	13.9
Colon	9	13.9
Lung	9	13.9
Myeloma	5	7.7
Other	21	36.9
Length of time since diagnosis		
< 1 yr	31	47.7
1-4 yr	15	23.1
5-8 yr	16	24.6
> 8 yr	3	4.6
Mean = 31.9 mo		
Time since onset of cancer pain		
< 1 yr	39	61.9
1-4 yr	21	33.5
> 5 yr	6	9.5
Mean = 17.3 mo		
Stage of disease		
New diagnosis	4	6.2
Active treatment	35	53.9
No treatment, in remission	3	4.6
No treatment, supportive care	23	35.3
Primary site of pain		
Thorax	16	24.2
Legs	15	22.7
Abdomen	13	19.7
Back	10	15.2
Arms	6	9.1
Head and neck	5	7.6
Hips	1	1.5
Primary type of pain		
Neuropathic	14	21.2
Visceral	27	40.9
Bone	25	37.9

Table 2. Patient Quality of Life*

Variable	Mean	Median	Standard deviation
Ability to ambulate	78.2	91.5	28.3
Able to tend to personal needs	72.6	85.0	29.0
Support from others	72.6	80.5	25.2
Problems with vomiting	70.9	77.0	28.1
Problems with nausea	69.4	72.5	26.8
Sense of control over life	67.3	71.5	26.0
Sufficient affection given/received	65.2	70.5	29.2
Ability to pay attention	63.0	68.5	29.0
Able to eat sufficient amount	62.7	67.5	29.6
Satisfied with appearance	60.6	61.5	26.7
Able to do leisure activities	60.3	61.5	29.5
Sufficient sleep	59.4	61.5	30.5
Worry over medical costs	57.0	61.0	34.4
Worried about unfinished business	55.9	51.5	32.7
Worry about weight	54.8	56.0	34.1
Changes in taste	53.8	55.5	33.4
Disrupted relationships from disease/treatment	52.4	54.5	34.9
Ability to adjust	51.7	50.0	26.4
Worry about outcome of disease	50.9	49.5	32.0
Feelings of happiness	50.6	47.5	26.8
Overall perception of quality of life	48.9	48.5	26.5
Ability to care for personal needs	48.4	48.0	32.5
Ability to enjoy life	46.6	49.0	28.3
Level of appetite	46.0	45.5	24.9
Satisfaction in life	45.6	45.0	26.5
Feelings of usefulness	44.5	42.0	29.3
Pain intensity	42.6	42.0	27.5
Pain distress to patient	40.6	40.0	22.8
Level of strength	40.5	38.0	24.0
Level of tiredness	31.3	25.0	26.8
Social subscale	61.6	61.6	17.7
Physical subscale	55.7	55.2	11.5
Spiritual subscale	53.4	55.0	26.3
Psychological subscale	51.7	49.9	17.5
Total quality of life	55.5	54.4	11.6

* All items were transposed for analysis such that anchors represent 0 = worst outcome to 100 = best outcome. All scores represent data from pretesting before implementation of the intervention. Items have been listed in descending order from the highest to lowest scoring items.

tion ordered increased steadily from 176 omeqs at the first visit to 291 omeqs at the fifth visit (60.48% increase). In addition, the amount of medication taken increased from 125 omeqs taken at the first visit to 226 omeqs taken at the fifth visit. Across all visits, there was a tendency for the patients to take only approximately 70% of the medication ordered. This underuse of medications is consistent with numerous published reports in the literature.

Pain log variables are depicted in Table 5, including the patient's rating of pain intensity, pain distress, and pain relief. A scale of 0 equals no pain to 10 equals worst pain was used. However, the table includes data which

have been transposed for analysis, such that 0 equals worst outcome to 10 equals best outcome for consistency with other study variables. Patients reported improvement in pain intensity and pain distress as well as an increase in pain relief across the points of evaluation.

The results of the nondrug interventions used in the study are presented in Table 6. The technique of heat was implemented using several forms, including heating pads, hot wraps, hot packs, and hot tub soaks. The percentage of patients using this technique increased from 22% to 68%, with an overall effectiveness rating of 3.2. Cold techniques, which included ice wraps, ice packs, and ice massage, increased in use from 5% to

Table 3. Patient Pain Questionnaire*

Variable/item	Mean	Median	Standard deviation	
Family sense of helpfulness	71.5	89.0	30.3	
Nondrug interventions effective	70.0	79.0	29.1	†
Level of pain relief	65.8	62.0	21.0	
Pain can be relieved	65.2	71.5	27.3	†
Routine medications versus PRN	60.7	77.0	38.1	†
Patient's pain at present time	56.2	53.0	29.8	†
Medication only for severe pain	54.2	55.0	39.7	†
Psychological addiction is inevitable over time	53.8	49.0	35.3	†
Patients often overmedicated	44.1	47.0	32.6	†
Fear of respiratory depression	42.9	45.0	33.4	†
Pain distress to patient	41.0	38.0	27.7	
Patient's pain in past week	38.8	38.0	27.0	
Pain distress to family	38.0	34.5	29.3	
Take as low a dose as possible	37.8	22.0	37.9	†
Knowledge subscale	54.2	55.9	18.1	†
Experience subscale	51.7	50.2	16.7	†

* All items were transposed for analysis such that anchors represent 0 = worst outcome to 100 = best outcome. All scores represent data from pretesting before implementation of the intervention. Items have been listed in descending order from the highest to lowest scoring items.

† Significant differences ($P < 0.05$) over time, repeated measurement analysis.

19%, with an effectiveness rating of 2.9. The use of massage, which included manual massage and use of electric massagers, increased from 11% to 64%, with an effectiveness rating of 2.9. Distraction techniques, such as listening to music, decreased from 64% to 47%. These techniques were rated highest in effectiveness, with an overall mean rating of 3.3. Imagery, which consisted of guided imagery instruction on cassette tape, was the least frequently selected technique. It was used by only 3% of subjects before the study and by 9% of subjects at the completion of the study. Imagery was also perceived as the least effective technique, with a rating of 1.0.

Table 4. Analgesics Ordered and Taken

Visit	omeq ordered	omeq taken	% of ordered taken
1	Mean 176 Median 108	Mean 125 Median 72	71.02
2	Mean 201 Median 131	Mean 149 Median 76	74.129
3	Mean 242 Median 128	Mean 183 Median 74	75.619
4	Mean 275 Median 144	Mean 206 Median 90	74.909
5	Mean 291 Median 144	Mean 226 Median 88	77.66

Omeq: oral morphine equivalents using standard equianalgesic conversion tables.

Discussion

The current study evaluated a structured pain education program for elderly patients with cancer at home. The problem of cancer pain was identified as having a major effect on quality of life. It is notable that the problem of pain is also chronic, as reflected in the time since onset of cancer pain of this sample as greater than 17 months. The pain education program was extremely well received by the patients and their families. Patients and

Table 5. Pain Log Variables

Week	Pain intensity*	Pain distress†	Pain relief‡
1 Mean	5.1	4.4	6.9
Median	5.2	5.0	7.5
2 Mean	5.5	5.6	7.4
Median	6.0	6.0	8.0
3 Mean	5.7	5.9	7.6
Median	6.0	6.0	8.3
4 Mean	6.1	5.8	7.9
Median	6.0	6.0	9.0
5 Mean	6.2	6.4	7.7
Median	6.7	7.5	8.5

Items have been transposed for analysis such that 0 = worst outcome to 10 = best outcome.

* 0 = worst pain to 10 = no pain.

† 0 = worst distress to 10 = no distress.

‡ 0 = no relief to 10 = complete relief.

Table 6. Nondrug Interventions

Variable	% Using before study	% Using at completion	Effectiveness*
Heat	22	68	Mean 3.2 Median 3.0
Cold	5	19	Mean 2.9 Median 3.0
Massage	11	64	Mean 2.9 Median 3.0
Distraction	64	47	Mean 3.3 Median 4.0
Imagery/relaxation	3	9	Mean 1.0 Median 1.0

* Effectiveness scale 0 = not helpful to 4 = very helpful.

their family care givers actively participated in the three-part pain education intervention. Each of the components was well received. The format of the pain education intervention, which included written materials designed for the elderly as well as the audiotaped reinforcement by cassette tape, was important in providing reinforcement of the pain education content.

The variables of the quality of life domains indicate that pain has a significant effect on physical well being, psychological well being, social concerns, and spiritual well being. The Quality of Life instrument did not reflect significant improvement in quality of life outcomes over time. This may be attributed primarily to the short evaluation period following the educational intervention as well as the declining status of many of the subjects. However, the instrument was useful in describing the overall effect of pain on quality of life. The instrument identified the effect of pain on aspects of function, physical symptoms, and its significant effect on the emotional and psychological aspects of quality of life.

The effectiveness of the pain education program was best captured in the outcomes of the Patient Pain Questionnaire. This relatively simple, low-cost education program resulted in improvement in 8 of 14 items of the knowledge and attitudes tool and in both knowledge and experience subscales. Improvement in knowledge and attitudes about pain are significant, because these have been identified throughout the literature as critical barriers in achieving improved pain management for patients with cancer. Study findings across the tools indicate that pain distress to both patients and their family care givers remains significant. Care of patients at home requires education for patients and their families as well as emotional and psychological support for the intense task of care giving.

The pharmacologic component of the pain educa-

tion program included consultation by the research nurse with the patient's primary physician. In all cases, some modification of analgesics was required. This often included a change in the medication prescribed, dose, or schedule. Pharmacologic intervention often required management of side effects, such as nausea, constipation, or sedation. The pharmacologic education included routine scheduling of a bowel regimen and antiemetic use. Although the amount of medications ordered and taken increased during the study, there remained a hesitancy for these patients to consume the full dose prescribed. This suggests our continued need to encourage patients to take required doses of analgesics and to overcome fears of addiction, tolerance, and respiratory depression that often interfere with adequate dosing. The use of a self-care log was found to be very helpful in recording pain intensity and in charting pain relief based on use of interventions. Additionally, the log was very useful in communicating information with the home care nurse and for evaluating outcomes.

The nondrug interventions were seen as an important addition to the patient's pain management regimen. Patients and families were very eager to use nondrug interventions. Family members saw these as an opportunity to be involved in the patient's pain relief program and as a means of decreasing their sense of helplessness in caring for the patient with pain. At the onset of this study, patients used only simple distraction techniques, such as listening to music or watching television, and rarely used any structured nondrug pain relief methods. Patients have seldom received any information regarding nondrug interventions from physicians or nurses. The interventions most often selected and of benefit to the patients were techniques of heat and massage. Cold was also useful and was particularly helpful for patients with nerve pain. The elderly patients did not seem to be interested in imagery or find it helpful for pain relief. Many patients commented that they had not used techniques such as imagery in their previous experiences and were not interested in such techniques at this time.

Overall, patients and their health care providers found the pain education program to be a very beneficial addition to the patients' care. The pain education program provided structure to care that was previously delivered only informally or inconsistently. We are pursuing opportunities to disseminate this pain education program in other clinical settings and in the community. Future research will evaluate the use of the pain education program in other community settings by clinical staff as opposed to only research staff. Similar to the routine education provided to the patient with diabetes, we believe that structured pain education should be

provided to all patients with cancer who experience this symptom. The combined approach of basic pain education and assessment, pharmacologic intervention, and use of nondrug treatments provides a global approach to the multidimensional problem of pain management.

Pain remains a important problem for patients with cancer and their family care givers. The problem of pain affects all aspects of quality of life and is particularly important to elderly patients with cancer. The use of pain education as a supportive care strategy is intended to improve quality of life. Many advances by such organizations as the Agency for Health Care Policy and Research and the World Health Organization are resulting in an improved standard of care for pain treatment. Use of structured education will extend these scientific advances into the home care environment for the elderly patient with cancer.

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