

# The Effects of an Educational Intervention on Oncology Nurses' Attitude, Perceived Knowledge, and Self-Reported Application of Complementary Therapies

Rusti E. Hessig, RN, OCN®, Lori L. Arcand, PhD(c), MS, RN, BC, AOCN®,  
and Marlene H. Frost, PhD, RN, AOCN®

**Purpose/Objectives:** To evaluate the effects of an educational program on oncology nurses' attitude, perceived knowledge, and self-reported application of 10 complementary therapies (art, exercise, humor, imagery, journaling, massage, music, relaxation, spirituality, and touch).

**Design:** Quasi-experimental with a pre- and post-test design.

**Setting:** A large tertiary care medical center in the midwestern United States.

**Sample:** A convenience sample consisting of 44 RNs working on two hematology and oncology patient care units. Eleven nurses comprised the educational intervention group, and 14 nurses on the same unit served as one control group. A second control group was comprised of 19 nurses from a different unit.

**Methods:** The study approach consisted of the assessment of all participants' initial attitude toward, knowledge of, and application of complementary therapies. A researcher-developed questionnaire was completed before and at three and six months after the educational intervention.

**Main Research Variables:** Nurses' attitudes toward, knowledge of, and use of complementary therapies.

**Findings:** Nurses value complementary therapies but lack the knowledge regarding their application. In addition, a gap exists between self-reported knowledge and the actual application of therapies. An eight-hour educational intervention was useful in enhancing knowledge and, to some degree, increasing application of some of the therapies. According to participants, lack of time was the main deterrent impeding use of complementary therapies in their nursing practice.

**Conclusions:** Education can affect the knowledge and integration of complementary therapies in nursing practice.

**Implications for Nursing:** Further research is needed to evaluate outcomes and determine educational approaches that will produce positive changes in nurses' attitudes toward, knowledge of, and application of complementary therapies.

## Key Points . . .

- Complementary therapies can have a positive influence on quality of life and symptom control.
- Nurses value complementary therapies, but they often do not feel comfortable with their knowledge levels.
- Oncology nurses benefit from educational interventions; however, time constraints may continue to impede integration even after education.

Complementary therapies are supportive therapies that complement standard treatments (American Cancer Society Minnesota Division, 1996; Kane, 1997; National Center for Complementary and Alternative Medicine, 2002). Complementary therapies can be defined further as nonpharmacologic interventions that do not replace standard care (e.g., surgery, radiation, casting); instead, they are adjuncts (Wiseman, 1994). Many terms are used interchangeably throughout various written materials to reflect complementary therapies, such as alternative medicine, adjunct therapy, cognitive behavioral techniques, psychosocial interventions, complementary and alternative medicine (CAM), self-help therapy, coping techniques or skills, and holistic medicine (Wiseman).

CAM research at the National Cancer Institute (NCI) is gaining in visibility (NCI, 1998). In addition, presenters at the Oncology Nursing Society's Congresses in 1998 and 2000 spoke of the need for research on nurses' comfort and knowledge

Complementary and alternative therapies are more popular than ever. Patients seek out these treatments through the Internet, books, nontraditional healthcare providers, and nurses. Although nurses recognize that use of these therapies is common, clinicians, program planners, and patient educators who must respond to the growing interest among patients need current information about use, attitudes, and beliefs (Richardson, Sanders, Palmer, Greisinger, & Singletary, 2000).

*Rusti E. Hessig, RN, OCN®, is an outpatient chemotherapy staff nurse, Lori L. Arcand, PhD(c), MS, RN, BC, AOCN®, is a nursing education specialist, and Marlene H. Frost, PhD, RN, AOCN®, is a professional associate in research, all at the Mayo Clinic in Rochester, MN. This research was supported by an ONS Foundation Novice Researcher and Mentorship Grant. (Submitted September 2001. Accepted for publication March 10, 2003.)*

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levels in the use of complementary therapies. Nursing leaders have supported the use of complementary therapies in nursing practice, and the topic is prevalent in the nursing literature. The use of complementary therapies is considered part of nursing care, but little is known about nurses' personal comfort with or endorsement of these treatments. A random sample of RNs (N = 467) in Ohio answered a questionnaire to assess their self-rated knowledge level, perceptions of efficacy, use for self and clients, and referral patterns for complementary therapies (King, Pettigrew, & Reed, 2000). The study indicated that nurses have positive opinions about complementary therapies, but, at the same time, their knowledge level remained lower than their interest in use. Nurses' knowledge, beliefs, and values can influence patients' expectations and interests in complementary therapies (Post-White & Johnson, 1991).

## Purpose

The purpose of this quasi-experimental pilot study was to evaluate the effects of an educational program on oncology nurses' attitude toward, perceived knowledge of, and self-reported application of 10 complementary therapies in nursing practice. The results will serve as a basis for conducting a study on a larger scale.

## Selection of Complementary Therapies

Selection of complementary therapies should be based on one or more of the following criteria: ease of use in a busy clinical setting, ease of learning, low cost of materials to patients, families, and healthcare facilities (Spross & Burke, 1996), and popularity among patients and families (Hooper, 1998). These criteria are important because medical insurance companies do not reimburse most complementary therapies as separate billable services; therefore, patients who use complementary therapies must bear the cost themselves.

The study investigators selected 10 complementary therapies (art, exercise, humor, imagery, journaling, massage, music, relaxation, spirituality, and touch) for inclusion in the educational intervention. These therapies were chosen because they can be incorporated and implemented quite easily throughout the day into the nursing care of patients with cancer. The therapies also were cost-effective and required few materials (e.g., audio or stereo equipment; drawing, painting, or writing materials) to continue with the therapy outside the hospital and clinical setting.

## Effectiveness of Education

Education can effect the use of nursing interventions by providing knowledge and opportunities for skill acquisition. Lack of knowledge and skill is a common barrier to application of nursing interventions. In regard to complementary therapies, an association exists among use in practice, knowledge, and skill. Thus, education may be the answer to increasing the use of complementary therapies (Hooper, 1998; Mackereth & Gale, 1994; ZaZa & Sellick, 1999).

Mackereth and Gale (1994) described the effectiveness of an educational program in a pilot study in which ongoing training for touch and massage therapy was offered to nurses

in an elderly care unit. The educational program was popular, and the touch and massage techniques learned were applied in clinical practice with positive comments from patients.

In another study, 800 medical students in Australia completed questionnaires about complementary therapies and attitudes toward them (Hooper, 1998). Results revealed that a single lecture on complementary therapies had a significant effect on the views of first-, third-, and fifth-year medical students. The therapies that these medical students considered to be most useful were those to which they had the most exposure. When students were not positive toward a therapy, it was because they did not know about or had no opinion of its utility not because they considered the therapy harmful or not useful.

These findings correlated with a study in which physicians, nurses, and radiation therapists (N = 89) in Ontario, Canada, answered a questionnaire following continuing education sessions on 19 nonpharmacologic strategies (e.g., acupuncture, massage, music, art, imagery, prayer) for managing cancer pain. Overall, the continuing education sessions were successful in increasing respondents' familiarity with previously unfamiliar interventions and their awareness of research concerning the therapies presented (ZaZa & Sellick, 1999).

## Conceptual Framework

King's (1981, 1992) theoretical framework on goal attainment and adult-learning principles (Anderson, 1998) served as the basis for the development of the educational intervention. All domains of learning—cognitive, psychomotor, and affective—were incorporated into the educational program. King's (1981, 1992) theory proposed that nurse and client interactions are characterized by verbal and nonverbal communication in which information is exchanged and interpreted by transactions where values, needs, and wants of each member of the dyad are shared and by perceptions of the nurse and client and their situation. In regard to complementary therapies, nurses play a key role in influencing the coping mechanisms that patients use. When introducing patients to the use of complementary therapies, nurses need to provide accurate information, be proficient with implementation of complementary therapies, and, perhaps most importantly, be genuine in their value of complementary therapies. This is supported by King's (1981, 1992) theory that nurses interact with patients to communicate information needed to establish mutual goals and to explore and agree on the means to achieve those goals. The overall goal with complementary therapies is to help patients maintain well-being so they can function in their roles. To reach this goal, oncology nurses need to feel comfortable with complementary therapies so they can discuss them with patients and families as a means to enhance the patients' quality of life (QOL) (Kane, 1997).

Didactic and written content addresses the cognitive domain, and hands-on skill demonstrations provide the tactile experimentation, which is a key component to successfully impacting the psychomotor domain of learning. Throughout the entire education session, the affective domain was targeted to create a value for complementary therapies, which is necessary to facilitate retention of knowledge and application into nursing practice. Methods used included research-based evidence of the effectiveness of complementary therapies in relation to QOL

and coping for patients with cancer. The presenters also had personal and clinical experience with the therapy they were presenting. Lastly, suggestions about how to efficiently incorporate complementary therapies into an already hectic schedule were shared with the learners.

## Research Questions

Many studies support the value of complementary therapies. Research that focuses on nurses' personal experience with the therapies and their attitude toward, knowledge of, and ability to facilitate and integrate the therapies into their nursing practice is limited. The following primary research questions were explored.

1. What differences exist in nurses' attitudes toward, perceived knowledge of, and self-reported application of complementary therapies before and after an educational intervention?
2. What differences in nurses' attitudes toward, perceived knowledge of, and self-reported application of complementary therapies exist between a control group on the same unit as the educational intervention group and a control group that works on a different unit from the educational intervention group?
3. What reasons do nurses give for presently promoting or impeding the use of complementary therapies in their nursing practice?

## Methods

### Population and Setting

The pilot study was quasi-experimental with a pre- and post-test design. A convenience sample of 53 RNs working on two patient care units within a large tertiary care medical center in the midwestern United States was asked to participate in the pilot study. Eighty-three percent completed the initial questionnaire ( $n = 47$ ), and three subjects were dropped from the study because of a change in specialty. The final sample ( $N = 44$ ) consisted of an educational intervention group working in the medical oncology unit ( $n = 11$ ), a control group of RNs working in the same medical oncology unit from which the educational intervention group was derived ( $n = 14$ ), and a second control group working in a different hematology unit ( $n = 19$ ).

### Instrument

A questionnaire was developed by the investigator after a review of the literature failed to reveal instruments that measured the variables of interest. The questionnaire consists of 30 items ranked on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The 30 items are comprised of the 10 complementary therapies ranked in relation to attitude toward, perceived knowledge of, and self-reported application of the therapies. Additionally, five open-ended questions

**Table 1. Complementary Therapies: Definitions**

Therapy	Definition
Art	The creative development of objects that provides another "language" for communicating ideas and emotions (Davis, 1989). Outlets for artistic expression include drawing, painting, sculpting, photography, cooking, dance, theater, interior design, acting, quilting, crocheting, viewing art forms, and any other activity that engages creativity.
Exercise	Any physical activity that uses muscles to increase physical fitness and stamina. Exercise can be fun and relaxing and have a positive impact on the healing process; the key is to find an exercise routine that is right.
Humor	The art of appreciating and discovering the comical and amusing aspects of life
Imagery	Uses the mind's power to focus on internal or external images (Stephens, 1993a, 1993b). Imagery is a technique that invites the subject to actively participate in the healing process through visualization. Imagery also can refer to focusing on a calm or empowering image (Mell, 1989; Sheikh, 1984). Imagery asks people to visualize the positive qualities wanted in life (e.g., better health, a better job, self-confidence) (Post-White & Johnson, 1991).
Journaling	A way to express experience, feelings, and thoughts in writing (Wykle & Morris, 1988). Journaling can take many forms. Some options are to write thoughts and feelings on a regular basis, detailing daily experiences or past events and feelings, stories or poems that express innermost thoughts, or a series of letters that may or may not be mailed.
Massage	Rubbing, stroking, or kneading the soft tissues of the body to promote comfort, relaxation, or healing (Maxwell-Hudson, 1988). Massage decreases muscle tension (Dunn et al., 1995), may aid in controlling or relieving pain (Hodgson, 2000; Nixon et al., 1997), and may promote a sense of well-being and contentment (Wilkinson, 1996).
Music	Playing or listening to music with the purpose of restoring, maintaining, or improving mental and physical health. Music is a nonthreatening form of communication. Music therapy includes playing an instrument, singing, listening to recorded music, or attending a concert (Lane, 1992).
Relaxation	Approaches used to produce a neutral state or the mental and physical freedom from tension or stress (McCaffery, 1980)
Spirituality	Promotes a connectedness with God, self, others, nature, the universe, or a superior being while validating inner feelings and beliefs (Cohen, 1993; Emblem, 1992; Gustafson, 1992). Spirituality often is confused with religion when, in fact, it is not so much connected to a specific system of belief or worship as it is with the spirit or the soul and a search for meaning, values, and purpose in life (Taylor, 1993). Although religion may be one way of expressing spirituality, the diversity of religious beliefs and complexity of defining spirituality add to the controversy surrounding spiritual issues in medical practice (Dorff, 1993).
Therapeutic touch (personal touch)	An instinctual act of communication that is necessary for growth and survival (Tobiason, 1981). Touch is a way to convey feelings and emotions to others and a way for others to convey their feelings (Bottorff, 1993; Colton, 1983). Touch can take many forms (e.g., embracing, bathing, hand holding, greetings and farewells, guided movement, stroking, sexual touch) (Bruder, 1992).

asked for information regarding previous education, reasons that promote or impede the application of complementary therapies in nursing care, and self-reported application of complementary therapies in nurses' personal lives. Demographic data (i.e., nursing degree, age, years in specialty, total years of nursing experience, ethnicity, and gender) also were obtained. The open-ended questions about education and personal use and the demographic data were used for descriptive purposes and administered only in the initial survey. Individuals were asked at the initial and six-month data collection points whether they had attended conferences or lectures on complementary therapies.

Ten master's-prepared RNs reviewed the questionnaire for content and face validity, clarity of the questions, effectiveness of instructions, completeness of response sets, and the time required for completion. The questionnaire then was pilot-tested with eight outpatient chemotherapy treatment nurses. As a result of this pilot, minor changes in wording were made. The questionnaire was retested with the eight outpatient chemotherapy nurses after a three-week interval to determine the instrument's reliability. Test-retest reliability revealed identical responses on 65% of the questionnaire items and only a one-point change on 30% of the items. This revealed a high level of consistency in individual responses. Because no summary scores were obtained, independent item scores were used and coefficient alphas were not calculated. The questionnaire took approximately 10–15 minutes to complete. A cover letter that described the study accompanied the questionnaire and provided definitions of terms to participants to serve as a common basis to interpret the complementary therapies (see Table 1).

## Procedure

Study participants from one medical hematology and oncology unit were randomized into the educational intervention group or control group 1. Each potential participant's name was written on a card; on the other side, the nurse's work shifts (i.e., 3–11:30 pm or 11 pm–7:30 am) were written. The cards were placed on a table with only the nurses' work shifts visible. These were mixed, and half of the potential subjects were picked randomly for inclusion in the educational intervention group. This process was done to facilitate scheduling and control any bias resulting from shift worked.

Self-learning may occur not only by stimulation of interest from completing the questionnaire, but also when nurses share information casually or purposely in conversation. Thus, information crossover among staff in the control group and those who received the education intervention could occur. To test for the possible crossover, a second control group was added, which was recruited from a different hematology and oncology unit. This allowed for comparisons that explore the effects of observation and discussion of complementary therapies by the education intervention group and control group 1 on the same hematology and oncology unit.

The study consisted of a baseline assessment of each participant's attitude toward, perceived knowledge of, and self-reported application of 10 complementary therapies. An educational intervention was provided to the study group. Reassessment of the three groups was conducted using the original questionnaire, without the demographic section, at three and six months after initiation of the educational intervention.

At all study points, participants were mailed a questionnaire with a return envelope through interclinic mail. A second questionnaire was sent out two weeks later to nurses who did not return the initial questionnaire.

## Educational Intervention

The intervention consisted of an eight-hour class addressing the 10 previously selected complementary therapies. The education program was presented in a large classroom setting within the hospital in which the nurses worked. The faculty included staff who were knowledgeable about specific complementary therapies and used those therapies in their practice. As shown in Figure 1, the class consisted of a sequential approach to introducing complementary therapies from a broad overview to specific strategies for implementation into nursing practice. The class began with psychoneuroimmunology followed by descriptions of the various therapies and their research-based benefits to enhance patients' QOL. Classroom experiences in a group setting followed to allow demonstrations and hands-on application of the various complementary therapies. The final portion of the class was dedicated to a discussion about methods for integrating complementary therapies into nursing practice and documenting interventions in the patient medical record.

## Data Analysis

Demographic characteristics and variables of interest were described using appropriate summary statistics. A paired *t* test was used to compare mean scores between time periods (baseline versus three months, baseline versus six months). Scores were compared among the three participant groups using the Kruskal-Wallis test. Results were considered significant at  $p < 0.05$ . Because of the small sample size, the investigators did not attempt to complete more complex statistical analysis.

**Objectives:** This program focuses on research-based complementary therapies and application in the clinical environment. Presentations and experiential methods will be used to provide participants with the knowledge and skills necessary to integrate complementary therapies into nursing practice.

- I. Introduction to complementary therapies
  - A. Definition and psychoneuroimmunology
  - B. Impact on quality of life
- II. Cluster I (art, journaling, humor, music)
- III. Cluster II (imagery, relaxation, spirituality)
- IV. Cluster III (exercise, massage, touch)
  - A. Research-based benefits
  - B. Patient assessment criteria
  - C. Implementation of techniques in the clinical setting
  - D. Group activities
- V. Nursing application
  - A. Resources
  - B. Adult-learning principles
  - C. Incorporation into clinical practice
  - D. Documentation of complementary therapies
- VI. Group discussion
  - A. Personal responses to complementary therapies
  - B. Action plan for application of complementary therapies into nursing practice

**Figure 1. Educational Intervention and Objectives for Integrating Complementary Therapies in Nursing Practice**

# Findings

## Demographics

The majority of nurses were bachelor's prepared, under 40 years of age, and female (see Table 2). Almost half of the nurses had been in oncology nursing for 5–15 years, and 39% had been in oncology nursing for less than five years. Approximately a third reported nursing experience in each of the following categories: less than 5 years, 5–14 years, and more than 15 years. Sixty-one percent of the nurses reported that they had attended a conference or lecture in complementary therapies or received information about complementary therapies in their nursing program. All but three of the nurses reported using complementary therapies as a coping strategy in their own lives.

Several demographic variables for the intervention group were different from the control groups. A greater percentage of nurses in the intervention group had associate's degrees. More nurses in the intervention group than in either of the control groups were under the age of 40. More nurses in the intervention group and control group 1 than those in control group 2 had less than four years of experience in oncology. Similar differences were noted in terms of overall nursing experience with a greater percentage of nurses in control group 2 having more than 15 years of experience. Although a greater percentage of nurses received content about complementary therapies in their nursing programs, fewer

nurses in this group attended a conference on complementary therapies.

## Attitude

No difference was documented among groups on baseline measure of attitude. Nurses, regardless of group, valued all 10 complementary therapies as potentially useful in improving patient QOL. At baseline, 82% of the nurses reported that every therapy was valuable; 90% rated all but two therapies (i.e., art and journaling) as valuable (score of four to five out of a possible five points, high scores reflect stronger value). Attitude did not change significantly over time for any group, with the exception of journaling, which changed only in the control group 1. A higher value for journaling was found in control group 1 at six-month scores compared to three-month scores ( $p = 0.04$ ) (see Table 3).

## Knowledge

The intervention group reported a statistically significant improvement in knowledge of relaxation and the application of touch from baseline to the three-month follow-up. This three-month mean score was maintained at six months. Additionally, the intervention group demonstrated a statistically significant increase in knowledge of spirituality from three months to six months. A trend was noted for the intervention group in terms of increased knowledge of all interventions, with the exception of art. This trend, however, was not at a

**Table 2. Sample Demographics**

Characteristic	Educational Intervention Group (N = 11)		Control Group 1 (N = 14)		Control Group 2 (N = 19)	
	n	%	n	%	n	%
<b>Education</b>						
Diploma	1	9	1	7	1	5
Associate's degree	4	37	4	29	6	32
Bachelor's degree	5	45	9	64	11	58
Omitted	1	9	–	–	1	5
<b>Age (years)</b>						
18–29	5	45	3	21	3	16
30–39	4	37	6	43	8	42
40–49	1	9	3	21	4	21
50–64	1	9	2	15	4	21
<b>Years in specialty</b>						
0–4	7	64	7	50	3	16
5–9	2	18	3	21	6	32
10–14	2	18	4	29	4	21
15–19	–	–	–	–	5	26
20–24	–	–	–	–	1	5
<b>Years in nursing</b>						
0–4	7	64	5	36	2	11
5–9	2	18	2	14	4	22
10–14	1	9	2	14	2	11
15–19	–	–	3	22	6	30
20–24	–	–	1	7	1	5
25–30	1	9	1	7	4	21
<b>Ethnicity</b>						
Caucasian	11	100	14	100	19	100
<b>Gender</b>						
Female	10	91	13	93	17	89
Male	1	9	1	7	2	11

**Table 3. Attitude**

Therapy	Group	Baseline X̄	Three Months X̄	Six Months X̄
Art	EIG	4.27	3.91	3.91
	CG1	3.86	3.86	4.00
	CG2	4.32	4.11	4.26
Exercise	EIG	4.45	4.36	4.27
	CG1	4.43	4.21	4.43
	CG2	4.50	4.56	4.58
Humor	EIG	4.82	4.73	4.45
	CG1	4.64	4.50	4.46
	CG2	4.74	4.74	4.79
Imagery	EIG	4.36	4.40	4.27
	CG1	4.29	4.14	4.29
	CG2	4.32	4.47	4.37
Journaling	EIG	4.36	4.09	4.27
	CG1	3.93	4.07	4.36*
	CG2	4.32	4.47	4.37
Massage	EIG	4.27	4.45	4.36
	CG1	4.21	4.36	4.43
	CG2	4.53	4.42	4.47
Music	EIG	4.64	4.60	4.36
	CG1	4.29	4.29	4.50
	CG2	4.68	4.63	4.74
Relaxation	EIG	4.45	4.64	4.45
	CG1	4.36	4.43	4.57
	CG2	4.58	4.63	4.53
Spirituality	EIG	4.73	4.73	4.55
	CG1	4.64	4.57	4.71
	CG2	4.74	4.68	4.74
Touch	EIG	4.36	4.27	4.36
	CG1	4.14	4.29	4.14
	CG2	4.42	4.32	4.47

\*p = 0.04

CG1—control group 1 (same unit); CG2—control group 2 (different unit); EIG—educational intervention group

statistically significant level when comparing baseline to the three-month follow-up and three-month to six-month measurements.

No statistically significant improvements in knowledge were noted in either control groups between baseline and three months. The nurses from control group 1 demonstrated an increase in knowledge regarding the use of touch from three months to six months. No statistically significant improvements in knowledge were found in control group 2 (see Table 4).

### Self-Reported Use

Although 80% of the nurses at baseline said they used humor frequently or regularly in their practice, only 30%–40% used exercise, massage, music, relaxation, spiritually, or touch frequently or regularly in their practice. Up to 15% of the nurses reported using journaling, imagery, or art frequently or regularly in their practice.

Nurses in the intervention group reported a statistically significant increase from baseline to three months in the use of imagery, which only slightly decreased in frequency at six months. An increase in the use of massage that was not statistically significant at three months became significant between the three-month to six-month measurements. The therapeutic use of touch increased over time, but this was not statistically significant.

Nurses in control group 1 reported increased use of exercise as a complementary therapy at three months compared to baseline. This three-month mean score was maintained at six months. Nurses in control group 2 reported an increase in the use of spirituality at three months, but this was not maintained at six months (see Table 5).

### Factors Promoting and Impeding the Use of Complementary Therapies

The factors reported most frequently as promoting the use of complementary therapies were adequate time and patient interest, but lack of time and limited knowledge impede the use of complementary therapies (see Table 6).

## Discussion

Patients frequently report a desire to integrate complementary therapies into their care, but barriers exist. Patients often do not discuss complementary therapies with their healthcare providers (Eisenberg et al., 1993, 1998). Many healthcare professionals report that they are uncomfortable with their ability to adequately provide support for patients who request these services (Kane, 1997), but, from personal work experience, nurses are in a key position to answer patient questions. However, nurses must value and be knowledgeable about

**Table 4. Knowledge**

Therapy	Group	Baseline X̄	Three Months X̄	Six Months X̄
Art	EIG	3.45	3.55	3.27
	CG1	2.71	2.79	2.64
	CG2	2.84	2.89	2.68
Exercise	EIG	3.73	4.00	4.09
	CG1	3.50	3.64	3.79
	CG2	3.79	4.05	4.00
Humor	EIG	4.18	4.36	4.45
	CG1	3.62	3.92	4.07
	CG2	4.05	4.37	4.21
Imagery	EIG	3.73	4.27	4.45
	CG1	3.31	3.43	3.14
	CG2	3.32	3.47	3.32
Journaling	EIG	4.09	4.18	4.36
	CG1	3.50	3.64	3.71
	CG2	3.37	3.53	3.74
Massage	EIG	3.36	3.91	4.18
	CG1	3.21	3.50	3.36
	CG2	3.58	3.42	3.26
Music	EIG	3.82	4.18	4.36
	CG1	3.57	3.79	4.00
	CG2	3.95	4.16	3.84
Relaxation	EIG	3.73	4.36*	4.55
	CG1	3.50	3.43	3.57
	CG2	3.68	3.95	3.79
Spirituality	EIG	4.00	4.18	4.55*
	CG1	3.50	3.64	3.93
	CG2	3.79	3.89	3.68
Touch	EIG	3.10	4.09*	4.45
	CG1	3.23	3.23	3.50*
	CG2	3.16	3.47	3.11

\* p ≤ 0.05

CG1—control group 1 (same unit); CG2—control group 2 (different unit); EIG—educational intervention group

**Table 5. Application**

Therapy	Group	Baseline $\bar{X}$	Three Months $\bar{X}$	Six Months $\bar{X}$
Art	EIG	1.73	2.09	2.18
	CG1	1.29	1.57	1.36
	CG2	1.68	1.63	1.47
Exercise	EIG	2.73	3.18	3.36
	CG1	3.14	3.57**	3.71
	CG2	3.42	3.53	3.79
Humor	EIG	4.45	4.27	4.09
	CG1	4.21	4.23	4.43
	CG2	4.11	4.16	4.47
Imagery	EIG	2.91	3.64*	3.27
	CG1	2.14	2.36	2.21
	CG2	2.32	2.32	2.21
Journaling	EIG	2.18	2.64	2.72
	CG1	1.64	2.07	1.86
	CG2	1.84	2.00	2.11
Massage	EIG	3.36	3.64	4.09*
	CG1	2.86	3.07	2.85
	CG2	3.05	2.95	3.00
Music	EIG	3.18	3.45	3.36
	CG1	2.50	2.64	2.79
	CG2	3.37	3.42	3.37
Relaxation	EIG	3.36	3.55	3.91
	CG1	2.71	3.14	3.21
	CG2	3.05	3.16	2.90
Spirituality	EIG	3.55	3.09	3.64
	CG1	3.00	3.29	3.29
	CG2	2.95	3.37*	3.05
Touch	EIG	2.91	3.64	3.82
	CG1	2.79	3.07	2.79
	CG2	2.47	2.95	2.37

\*  $p \leq 0.05$ \*\*  $p = 0.01$ 

CG1—control group 1 (same unit); CG2—control group 2 (different unit); EIG—educational intervention group

complementary therapies to feel comfortable sharing information with patients (Kane).

In this study, nurses held strong beliefs that complementary therapies can improve patients' QOL, yet nurses generally did not feel comfortable with their knowledge levels. In fact, few nurses actually implemented complementary therapies in their nursing practice. At baseline, humor was the only complementary therapy frequently used. These findings are consistent with Frost, Brueggen, and Managan (1997); in their study, nurses rated their ability to use interventions in practice lower than their value of each intervention.

A one-day educational intervention was successful in enhancing nurses' knowledge about three complementary therapies: relaxation, spirituality, and touch. Although imagery and massage were not areas in which a statistically significant increase was realized, they were areas in which a trend toward increased knowledge was identified at both three and six months. These findings are consistent with Hooper's (1998) conclusion that a single class had a favorable impact on medical students' views regarding complementary therapies. However, the limitations of a one-time class also need to be acknowledged. Teaching and learning principles support the need for repetition of material (Knowles, Holton, & Swanson, 1998). The ability to apply information enhances the chance

that the information will be integrated (Knowles et al.; Menix, 1996). Thus, an even greater increase in knowledge and application could occur with repeated information and the use of mentoring to integrate complementary therapies into practice.

The barrier most frequently identified in practice, lack of time, conceivably played a significant role in the actual application of the therapies. The timing of the research coincided with a period of high patient acuity and decreased nursing levels related to absences and employment changes. With ongoing reinforcement of the interventions, nurses may find the therapies easier to integrate in patient care. However, as is common when first learning a skill, the time required to perfect a skill can be a barrier to its actual implementation. This confirms a universal principle that is the foundation of adult education, learning by doing (Knowles et al., 1998; Menix, 1996).

Demographic differences between groups may have affected outcomes. These differences were more likely to favor one or both of the control groups. The intervention group consisted of fewer nurses with bachelor's degrees who were younger in age. Control group 2 had more nursing and oncology experience than nurses in the intervention group or control group 1.

The researchers did find some increased knowledge of touch and the application of exercise in control group 1. Likewise, nurses in control group 2 reported an increase in spirituality that was not maintained at six months. In both cases, the changes existed as isolated incidents. This may be a result of the continuing education classes that nurses reportedly attended.

Several limitations exist for this study. First, this initial study is based on a small sample. Thus, it should be repeated with a larger population. The educational intervention was one eight-hour class that covered 10 complementary therapies. This allowed for scheduled time for discussions about implementation and practice sessions. Ongoing learning and providing in-depth information on one therapy, followed by individual mentoring in the clinical setting, would be a preferred strategy. Additionally, 61% of the participants had attended a lecture on complementary therapies in their nursing programs; therefore, most nurses, regardless of group, had

**Table 6. Factors That Promote and Impede the Application of Complementary Therapies in Nursing Practice**

Factor	%
<b>Promoting factors</b>	
Adequate time	24
Patient interest	20
Nurses' beliefs	13
Resources available	13
Patient illness	11
Patient attitude	11
Connection with patient	7
<b>Impeding factors</b>	
Lack of time	52
Limited knowledge	22
Patient attitude	10
Lack of resources	8
Patient illness	4
Roommate	2
Not knowing the patient	2

been exposed to complementary therapies. This influence could not be controlled for or evaluated with the sample size.

A one-day educational intervention was successful in increasing knowledge and the application of some complementary therapies. However, this information and the accompanying skills must be reinforced. In the clinical setting, mentors may help novices in the application of these skills. Clearly, further research is needed to evaluate outcomes and determine whether expanded educational approaches will produce sustained changes in nurses' attitude, knowledge, and application of complementary therapies in their nursing practice.

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**Author Contact:** Rusti E. Hessig, RN, OCN®, can be reached at [hessig.arliss@mayo.edu](mailto:hessig.arliss@mayo.edu), with copy to editor at [rose\\_mary@earthlink.net](mailto:rose_mary@earthlink.net).

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