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Education for Homecare Patients With Leukemia Following a Cycle of Chemotherapy: An Exploratory Pilot Study

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Purpose/Objectives: To explore the differences in the outcome between routine health education and health education delivered through telephone-based surveys on self-care, symptom distress, and quality of life among homecare patients with leukemia after a cycle of hospitalized chemotherapy.

Design: A quasi-experimental research design.

Setting: A medical teaching center in Taipei, Taiwan.

Sample: 70 patients with leukemia.

Methods: A nonrandomized trial of a clinical-based intervention. Patients were selected into either an experimental ($n = 35$) or control (usual care) group ($n = 35$) according to the timing of their discharge. In addition to routine education before discharge, patients in the experimental group received educational and emotional support through two telephone sessions after discharge. Self-administered questionnaires were completed four weeks after discharge.

Main Research Variables: Self-care, symptom distress, and quality of life.

Findings: Significantly different scores were found between the two groups in self-care, symptom distress, and quality of life. The experimental group had higher scores in the self-care and quality of life categories, but lower scores for symptom distress.

Conclusions: The follow-up telephone calls, placed at the proper time, met patients' specific needs. The experimental group perceived a difference in self-care, symptom distress, and quality of life from the control group.

Implications for Nursing: Individualized telephone intervention can deliver continuing care. The use of telephone-based education should be included in nursing students' training.

Alternative therapies for chemotherapy-related distress and quality-of-life assessments following aggressive therapy regimens for patients with hematologic cancer have not been explored. Patients should receive the knowledge and skills needed for promoting home-based self-care, particularly when oncology nurse involvement is minimal. For nurses, the responsibility to assess patients, treat side effects, and develop a care plan that ensures continuity of care is critical. Although the aim of chemotherapy has been to extend patients' lives, healthcare providers should not lose focus on the importance of quality of life.

Literature Review

Chemotherapy for patients with active leukemia typically is divided into two phases and may involve repeated cycles of chemotherapy to kill any remaining leukemia cells. Antileukemic drugs also kill bone marrow and cells with high replicative rates, such as hair follicles and gastrointestinal and skin cells; therefore, side effects are common and last for several weeks after chemotherapy. Side effects include nausea, vomiting, fatigue, anorexia, alopecia, diarrhea, and a temporary reduction of white blood cells, red blood cells, and platelets (DeVita, Hellman, & Rosenberg, 2001). A study by Beeharry and Broccoli (2005) indicated that chemotherapy affects the long-term replicative potential of regenerative tissues. Others have found that symptom distress alters the cancer experience and influences quality of life (Boehmke & Brown, 2005; Chen et al., 2004; Freihart, 2005). A study by Wang, Lin, Kuo, and Fan (2005) indicated that delivering information to patients on how to manage adverse effects during or after chemotherapy is crucial for attaining patient

Cancer has been Taiwan's most common cause of death for over two decades (Department of Health, 2007). Although hematologic malignancies constitute a minor number of the newly diagnosed cancers per year, they do pose a substantial burden to patients. Patients with leukemia currently receive systematic chemotherapy where the treatment dose is set to increase proportionately to the cytotoxic agents. Changes in the advent of dose-intensive chemotherapeutic regimens have resulted in increased myelosuppression and cytotoxicity, resulting in greater symptom distress after treatment. In addition, the use of part-time or rotating nurses who do not have the training needed to treat patients with cancer is common in many Taiwanese hospitals.

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Quick Facts: Taiwan

Geography and economy: Taiwan is a relatively small island country in Asia that, as of June 2007, had a total population of about 23 million people. Because of the free economic environment and limited natural resources, Taiwan has transformed from a labor-intensive agricultural economy to a technology- and capital-intensive industrial economy.

Healthcare system: The Taiwan government established a national health insurance program in 1994 that provides universal medical care to all citizens. Medical expenses for children who are diagnosed with cancer are covered with the exception of a small co-pay. Cancer was the leading cause of death for Taiwanese people in 2007 and has been since 1982.

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satisfaction with treatment. Hsiao (2001) also indicated that patients are more inclined to learn symptom management after they have returned home from the hospital or treatment center. However, Chen, Cai, and Juang (2003) reported that patients did not receive enough written information or information about the side effects of chemotherapy during discharge. Patients will experience side effects after returning home and Dodd (1999) found that a patient with ineffective self-care behavior for symptom distress may delay or prematurely terminate the treatment regimen.

Education about side effects and symptom management has been shown to decrease the side effects of chemotherapy, optimize drug tolerance, and increase self-care behavior in patients with cancer (Thomas, Williams, & Garcia-Vargas, 2003; Williams & Schreier, 2004). However, Doak, Doak, and Root (1996) found that printed materials used in oncology clinics are ineffective in meeting patients' needs. More recently, researchers have explored various alternatives for educating patients receiving chemotherapy, including audio and videotapes, interactive multimedia (CD-ROM or the Internet), and telephone calls from healthcare professionals (Agre, Dougherty, & Pirone, 2002; Williams & Schreier). Findings have suggested that, for patients experiencing symptom distress during a chemotherapy cycle, an emergent need arises for information delivery at home via the telephone (Lechner & De Vries, 1996; Lai, 1998). Telephone social support and education also have been used to provide symptom management and counseling for patients during or after chemotherapy by a variety of healthcare providers, including pharmacists, psychologists, and nurses (Badger, Segrin, Meek, Lopez, & Bonham, 2005; Beney et al., 2002; Coleman et al., 2005). However, most of the findings did not indicate differences in adaptation, quality of life, and self-care activity, primarily because of deficiencies in research design. In addition, study participants primarily were patients with breast cancer.

Many considerations should be taken into account when providing education via the telephone. Timing calls to maximize the efficacy of healthcare service while minimizing cost is important (McBride & Rimer, 1999). Murphy-Ende and Chernecky (2002) reported that patients treated for leukemia suffered the most severe myelosuppression about 7–14 days after a chemotherapy cycle. Conducting the support calls during that time frame, therefore, is crucial to improving the symptom management of patients at home.

A conceptual framework based on Orem's (1995) **Self-Care Deficit Model** guided the current study to explore the effect of telephone-based education and support on patients' self-care measures for managing symptom distress and improving quality of life.

According to Orem (1995), the nurse's role is to promote the patient as the self-care agent and to educate them on how to carry out self-care. Orem also indicated that basic conditioning factors, such as health states and social support, have an impact on therapeutic self-care demand. A study of 70 patients with breast cancer who received audiotapes as a teaching tool confirmed the idea (Williams & Schreier, 2004). Patients had effective self-care behaviors that enhanced their independence.

Methods

Design

A nonrandomized trial of a clinic-based intervention for patients with leukemia was conducted. This study was designed so that the experimental group ($n = 35$) received routine patient education through printed materials and additional education and support via the telephone; the control group was given routine education through printed materials.

Participants

Inclusion criteria consisted of patients aged 18–65 years in an adult hematology-oncology unit at a medical center in northern Taiwan. All subjects received chemotherapy only, had no history of mental dysfunction or hearing disability, had not previously received healthcare education via the telephone, were capable of communicating in both written and oral formats, and were willing to participate in the study. Patients were excluded if they had received therapy other than chemotherapy or had been readmitted to the hospital during the four-week period.

Procedures

After receiving approval for the study from the institutional review board of Yuanpei University, patients who met the inclusion criteria were approached by a study nurse who served as the only intervener. Signed consent forms were delivered and collected after the nurse explained the purpose of the study, how data would be collected, and the rights of the participants. Patients were recruited sequentially until a sample size of 35 for each group was achieved. The study nurse was blinded as to whether the patients were in the experimental or control group so as to not affect one-on-one patient education prior to discharge. The outcome measure following intervention implementation took place four weeks after each patient's discharge. Patients in both groups were then asked to complete three questionnaires when they returned to the hospital for bloodwork related to their diagnosis.

Instruments

The **Self-Care Agency Questionnaire (SCA)** developed by Yang (1996) was used to monitor the self-care exercise in the current study. The questionnaire originally was used to measure self-care in patients with hematologic malignancies in response to symptom distress. The seven subscales in the SCA are physical strength maintenance, skin care, mouth care, dietary restrictions, precaution against injury, attention to physical appearance, and other aspects such as relaxation

skills, sleep hygiene, and treatment compliance. Content validity of the 31 questions was established through an evaluation conducted by four clinical experts and two patients. Items consisted of four-point Likert scales, ranging from 0 (never) to 3 (always), with a higher total score indicating better self-care. Test-retest and alpha coefficients demonstrated that the SCA was a reliable instrument with internal consistency and stability (Cronbach $\alpha = 0.95$).

Symptom distress was measured with the **Symptom Distress Scale-Chinese Modified Form (SDS-CMF)** (Lai, 1998), which originally was designed to measure the distress level of patients with leukemia treated with chemotherapy in the home setting. Clinical experts recommended modifying this tool by deleting one item and changing “intensity of nausea” and “frequency of nausea” to “nausea” and “intensity of pain” and “frequency of pain” to “pain.” The 22-item responses were scored on a five-point Likert scale, ranging from 0 (without any distress) to 4 (severe distress). For this study sample, a Cronbach α coefficient of 0.83 was found.

The **SF-36® Taiwan version** was used to measure perceived health status, physical function, and mental health domains of quality of life (Tseng, Lu, & Tsai, 2003).

The eight subscales (comprised of 36 items) included physical functioning, role performance influenced by physical health issues, bodily pain, vitality, social functioning, role performance influenced by emotional issues, mental health, and general health and were numerically scaled in a Likert format. The total score ranged from 0 to 100, with 100 being most favorable. Discriminate validity was established and alpha coefficients ranged from 0.73–0.81 (Ware & Sherbourne, 1992). Reliability and validity ($\alpha = 0.96$) of the SF-36 (Taiwan version) was established with a sample of 17,515 subjects.

Usual Care

Patients in the usual care group received health education on the day of discharge about possible side effects and the common interventions used to alleviate side effects. Amount of instruction depended on the individual patient’s ability to attend the information session, which usually lasted about 10–20 minutes. Printed information based on the clinical experience of the staff and a survey of relevant literature also was distributed (Boyer, 2000; Newton & Smith, 2001; Rogers, 2005; Wilson, 2002; Yang, 2000). After being reviewed by a hematologist, an oncologist, and hematology-oncology

Table 1. Demographic Characteristics

Variables	Experimental Group (N = 35)		Control Group (N = 35)		Total (N = 70)	
	n	%	n	%	n	%
Age (years)						
18–40	16	46	12	34	28	40
> 41	19	54	23	66	42	60
Gender						
Male	23	66	22	63	45	64
Female	12	34	13	37	25	36
Education						
Elementary school or below	3	9	8	23	11	16
Junior or senior high school	12	34	12	34	24	34
College or higher	20	57	15	43	35	50
Religion						
With	10	29	6	17	16	23
Without	25	71	29	83	54	77
Residence status						
With family	33	94	33	94	66	94
Single	2	6	2	6	4	6
Income per month (Taiwan dollar)						
None	8	23	17	49	25	36
≤ 30,000	7	20	7	20	14	20
> 31,000–45,000	12	34	5	14	17	24
> 45,000	8	23	6	17	14	20
Length of hospital stay						
≤ 14 days	10	56	8	48	18	26
> 14 days	25	44	27	52	52	74
Chemotherapy treatments						
1	11	31	6	17	17	24
>1–5	15	43	21	49	36	51
> 5	9	28	8	23	17	24
White blood cell count						
< 5,000 and > 10,000/mm ³ (abnormal)	29	83	26	74	55	79
5,000–10,000/mm ³ (normal)	6	17	9	26	15	21

Note. Because of rounding, not all percentages total 100.

nurse specialists, the content was read by three patients treated with chemotherapy who had different education levels. After refinements were made to the teaching packet, a manual with various illustrations and a 20-minute verbal script for providing information about available resources was produced.

Telephone Contact

Patients in the experimental group received usual care and two additional phone calls regarding symptom distress and management. The first call took place one week after discharge; the second occurred three weeks after discharge. The time frame was chosen so that patients' distress and management could be monitored on a regular basis and information delivered if patients felt ineffective in managing symptoms. The calls lasted 10 minutes or more depending on patients' needs. A study nurse who worked in a hematology-oncology unit for more than 10 years was trained by a social worker and investigators to conduct the telephone calls. A standardized telephone education protocol was conducted by two physicians and a social worker. This protocol included a systematic survey and associated instructions regarding the patient's well-being; whether or not symptom distress was present; the self-care for those with symptom distress; reassurances about patients' reactions and whether the reactions were normal; giving patients advice, when appropriate, to support and reinforce the education provided at the time of discharge; the importance of having someone close at hand; and maintaining a positive attitude.

Statistical Analysis

Statistical analysis was performed using SPSS® version 10.0 through descriptive statistics, sample t test, and χ^2 test procedures.

Results

Power of Testing

The mean difference and standard deviation on quality of life between groups was 23.98 and 16, respectively, with an alpha value of 0.05. This infers that the actual power will be larger than 1.0, which is larger than the planned power (0.80) although the actual sample size for each arm is 35 (Polit & Beck, 2004).

Demographic Characteristics

Seventy patients were enrolled in the study and 35 placed in the control and experimental groups. Seventy-nine percent of the patients had less than a 5,000/mm³ leukocyte count prior

Table 2. Test of Two-Group Differences Four Weeks After Discharge

Variable	Experimental Group (N = 35)		Control Group (N = 35)		t
	$\bar{X}$	SD	$\bar{X}$	SD	
Self-care	2.67	0.36	1.78	0.38	10.347*
Symptom distress	0.34	0.21	0.82	0.51	-5.158*
Quality of life	70.46	18.76	44.15	16.01	6.074*

*p < 0.001

Table 3. Test of Two-Group Difference of Symptom Distress

Variable	Experimental Group (N = 35)		Control Group (N = 35)		t
	$\bar{X}$	SD	$\bar{X}$	SD	
Appetite change	1.00	1.59	1.66	1.24	-1.931
Fatigue	1.00	0.59	2.11	1.13	-5.158***
Appearance change	1.14	1.03	1.54	1.15	-1.533
Nausea	0.43	0.61	0.46	0.74	0.464
Irritability	0.29	0.46	0.86	0.73	-3.909***
Change in sexual interest	0.71	0.83	1.23	1.17	-2.131
Insomnia (sleeplessness)	0.17	0.38	1.09	1.20	-4.303***
Dry mouth	0.34	0.48	1.23	1.06	-4.502***
Pain	0.37	0.65	0.97	1.22	-2.564
Dizziness	0.43	0.65	0.51	0.78	-0.498
Lack of concentration	0.23	0.43	0.94	0.87	-4.352***
Numbness	0.26	0.44	0.83	0.79	-3.748***
Diarrhea	—	—	0.29	0.52	-3.260**
Chest discomfort	0.09	0.37	0.43	0.70	-2.562*
Oral or esophageal ulcer	0.26	0.44	0.49	0.89	-1.364
Stomach discomfort	0.09	0.28	0.23	0.49	-1.492
Dyspnea	0.11	0.40	1.02	3.57	-1.506
Bleeding	0.11	0.40	0.49	0.92	-2.188*
Cough	0.17	0.38	0.60	0.81	-2.826**
Trembling	0.09	0.37	0.43	0.74	-2.449*
Fever	0.06	0.24	0.40	0.74	-2.626*
Dysuria	0.09	0.37	0.14	0.69	-0.430

*p < 0.05; **p < 0.01; *** p < 0.001

to hospital discharge. Twenty-one percent of the patients had normal leukocyte levels. No significant differences in any of the demographic variables were documented between the two groups (see Table 1). The sample included 45 men (64%) and 25 women (36%) aged 20–65 years ($\bar{X}$ = 43.21 $\pm$ 13.04). Most subjects had completed at least junior high school (84%), categorized themselves as without a religion (77%), had some form of income (64%), and lived with their families (94%). Seventy-five percent had completed chemotherapy treatments more than one time with frequencies ranging from 1 to 15 treatments ($\bar{X}$ = 4 $\pm$ 2.86). Seventy-four percent of subjects had been hospitalized for more than 14 days ($\bar{X}$ = 18.44 $\pm$ 5.47).

Outcome Assessment

The two groups had significant differences in self-care (p < 0.001), symptom distress (p < 0.001), and quality of life (p < 0.001) after health education and telephone calls were completed (see Table 2). The experimental group had higher levels of self-care and quality of life and the degree of symptom distress was lower.

A further analysis of the SDS-CMF demonstrated that 14 of the 22 items had significant differences between the two groups, particularly among items rated higher than 1 (indicating slight distress), such as fatigue, insomnia, dry mouth, and sexual interest (see Table 3). However, changes of appearance and appetite were still rated higher than 0.99 in the experimental group. An analysis of the seven subscales of the SCA showed that each subscale was significantly different between the two groups (see Table 4). Differences also were found in each of the eight individual subscales of the SF-36 (see Table 5).

Table 4. Test of Two-Group Difference of Self-Care

Subscale of Self-Care	Experimental Group (N = 35)		Control Group (N = 35)		t
	$\bar{X}$	SD	$\bar{X}$	SD	
Energy conservation	2.61	0.43	1.86	0.58	6.614
Skin care	2.38	0.53	1.38	0.59	7.466
Oral care	2.71	0.37	1.89	0.63	6.699
Diet modification	2.67	0.52	1.65	0.56	7.904
Injury precaution	2.68	0.43	1.79	0.69	6.408
Hair and appearance care	2.90	0.41	1.80	0.77	7.411
Treatment compliance	2.86	0.25	2.06	0.54	8.062

Note. For all subscales, $p = 0.000$.

In addition, the subscale of role performance limitation related to physical health had the lowest score (14.29) in the control group, meaning that patients experienced severe performance limitation but only slight role performance limitations in the experimental group.

Discussion

Patients in the experimental group reported lower symptom distress and higher self-care and quality of life. This supports Orem's (1995) Self-Care Deficit Model which states that patients suffering severe myelosuppression and cytotoxicity who received follow-up calls from an oncology nurse engaged in more effective self-care. The results also are consistent with previous findings regarding the benefits of telephone calls for patients with cancer with respect to self-care, quality of life, and alleviation of symptom distress (Badger et al., 2005; Williams & Schreier, 2004). Telephone calls tailored to individual needs have shown promise in meeting the support needs of patients undergoing chemotherapy (Siegel, Mesgano, Karus, & Christ, 1992). As one patient stated, "I didn't feel alone in confronting the disease and its related symptoms and felt comforted by the telephone calls received from the nurse. I also realized that I am not the only one to have had that experience or reaction to those symptoms." Another patient described her appreciation of receiving telephone calls by saying that, "Talking really helps. Having someone who cares about me and is willing to call and listen to my problems in a way that ensures my privacy gives me a sense of dignity."

Patients in the current study usually waited for the intervener to call first; the tendency to rely on another person to take the initiative is common. Patients were grateful for having someone available to listen to them, particularly when they were feeling isolated. Similar findings by Glasgow and Toobert (2000) indicated that more advice offered by healthcare providers on self-care results in better self-care by the patient and patients who trusted their healthcare providers experienced lower levels of symptom distress (Boehmke & Brown, 2005).

Unlike previous intervention studies by Beney et al. (2002), and Craddock, Adams, Usui, and Mitchell (1999), the current study only included two telephone calls from an intervener who also was a senior nurse in a hematology-oncology unit. A close working relationship between the nurse and patient developed prior to the telephone intervention may have led patients to be more receptive to the telephone intervention. In one case, a patient stated that, "I can get answers to my

questions pertaining to symptoms and be more confident when taking subsequent action to deal with them. The important thing is that I felt secure about the advice from the nurse." The use of telephone calls promoting patient confidence to deal with symptoms is supported by Lev et al. (2001), whose focus was intervention to increase self-care self-efficacy for patients with cancer.

In Broadstock (1995), patients with elevated distress took an active role in accessing a cancer helpline after discharge, which resulted in a positive impact on cognitive, behavioral, and affective outcome measures. However, the personal experiences of the authors are that few people access the service even if a demand for symptom management exists. Lechner and De Vries (1996) found that eight participants in the control group made a call to the helpline after discharge or inquired from unit nurses about symptoms during visits for bloodwork, but no one in the experimental group did. In terms of outcome measures, patients in the experimental group showed a significant difference compared to control.

The most common symptom distresses reported by patients in both groups after four weeks were fatigue, changes in appearance, and changes in appetite. Lai (1998) reported similar findings for patients after chemotherapy treatment. However, an investigation by Curt et al. (2000) of 379 patients who underwent chemotherapy found that 88% reported that fatigue affected their normal life and quality of life but did not show a difference in appearance and appetite. Therefore, developing fatigue-, appearance-, and appetite-related interventions into a routine education program for patients is strongly recommended.

The results of the current study did not indicate any significantly higher scores in self-care or less symptom distress, nor could the authors analyze in detail why no significant difference existed between patients in either group. However, the most frequent patient inquiries in the experimental group were related to fatigue and appetite changes. Although information and instructions on how to manage such symptoms were provided verbally and in printed manuals, patients were still surprised by the sometimes overwhelming level of the symptoms.

All patients reported higher levels of decreased appetite compared to other symptom distress items. Decreased appetite may need to be explored further as an intervention; however, the

Table 5. Test of Two-Group Difference of Quality of Life

Subscale of Quality of Life	Experimental Group (N = 35)		Control Group (N = 35)		t
	$\bar{X}$	SD	$\bar{X}$	SD	
General health	57.86	21.26	42.14	21.15	3.100*
Physical functioning	79.43	13.60	56.43	26.00	4.638**
Role performance from physical health	60.00	40.31	14.29	29.88	5.390**
Role performance from emotional issues	77.14	35.03	33.33	37.05	5.083**
Social functioning	72.50	22.03	45.36	20.58	5.326**
Pain	85.64	23.97	58.21	29.32	4.284**
Vitality	63.14	17.62	42.86	17.79	4.793**
Mental health	73.14	21.42	57.49	19.28	3.214*

* $p < 0.01$; ** $p < 0.001$

current study did not take into account the cultural value Taiwanese people place on food enjoyment. Similarly, Taiwanese people value social acceptance and an alteration in appearance may have an increased impact on patients after chemotherapy. One patient said, "I felt uneasy attracting attention while I wore a wig or hat in public." Another patient said, "I was afraid of being perceived as a robber when wearing a hat and mask." To address these concerns, two items covering diet and self-esteem were added to the Taiwanese edition of the World Health Organization's quality-of-life instrument (Wang et al., 2001).

Quality of life had the lowest role performance score (14.29) in the control group; fatigue had the highest mean symptom distress score. Improvements in chemotherapy treatment continue to prolong life but at a cost of seriously compromising quality of life. Cancer-related fatigue has been identified as one of the most common and distressing symptoms experienced by patients during and after cytotoxic treatment (Servaes, Verhagen, & Bleijenberg, 2002). Psychoeducational interventions for patients receiving cytotoxic treatment are effective in preventing or treating fatigue (Barsevick et al., 2004; Ream, Richardson, & Alexander-Dann, 2006). Studies also have found that providing information, psychological support, and continual follow-up through telephone interviews is useful for lowering anxiety, uncertainty, and distress (Allard, 2007; Liu, Li, Tang, Huang, & Chiou, 2006; Sandgren, McCaul, King, O'Donnell, & Foreman, 2000). Continuing care through telephone calls could possibly explain the different outcomes in role performance limitation and fatigue between the experimental and control groups and highlight the need for patients to develop an array of self-care techniques to cope with symptom distress from chemotherapy.

In dealing with psychosocial issues through telephone intervention, caregivers should consider the moderating variable of the length of the intervention. Rehse and Pukrop (2003) conducted a meta-analysis to investigate the effectiveness of psychosocial interventions on quality of life among adult patients with cancer and found that programs lasting more than 12 weeks were more effective than those having shorter intervention periods. In addition, printed information and telephone care provided no sufficient, specific, or effective approaches for symptom management of appearance and appetite changes specific to Taiwanese populations; therefore, demonstrating a need to modify the printed manual and conduct further study when dealing with a Taiwanese patient. Other attributes may be involved beyond educational approaches (e.g., social support, self-care efficiency, adjustment in chemotherapy). Future studies should explore the roles that appearance and appetite management play during chemotherapy. Encouraging results have suggested that short-term cognitive therapy through

videophone interventions might help patients better adjust to cancer treatment (Schuyler, 2003). Advances in telemedicine also may offer potential solutions to meet patient-support needs. Therefore, further research also is needed to explore the use of these additional educational techniques on changes of appetite and appearance.

Implications for Nursing

The generalizability of the results is limited because of nonrandom allocation to groups and the lack of a pretest/follow-up test design. However, combining printed materials with follow-up telephone calls may have some advantages compared to traditional patient education. The preliminary findings also provide some practical implications. Knowing that patients will have different values related to food intake and appearance could facilitate cultural awareness for nursing practice and deliver multicultural education and support. In addition, the findings suggest that all patients should receive follow-up telephone calls from a nurse regardless of the patient's perceived understanding of the symptoms. Because the way information and support are delivered to patients is as equally important as the information itself, oncology nurses should take a leadership role in instituting supportive calls to patients to promote and sustain patient health and overall well-being. Also, by developing a standardized script that allows for individualized interventions, nurses may become more effective and efficient in helping patients cope with the side effects of chemotherapy treatment. Telephone calls not only provide oncology nurses with an opportunity to share with patients strategies for the expected or usual symptom experience, but also allow patients to employ self-care strategies and empower them to improve their own quality of life. In addition, telephone intervention training may be included in nursing students' clinical education and outpatient department staff education.

Conclusion

Patients with leukemia experience many symptoms caused by chemotherapy that can linger after discharge. Because of this, follow-up health education and support is needed to reduce the suffering caused by chemotherapy-induced side effects. Critically important follow-up telephone calls at the proper time can be delivered at a minimal cost to the healthcare institution, can maintain respect for a patient's privacy, and can be individualized to the specific needs of the patient.

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