Self-Management Energy Conservation for Cancer-Related Fatigue in Thai Women With Breast Cancer Receiving Chemotherapy: A Pilot Study

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OBJECTIVES: To examine the adherence to and the usefulness, satisfaction, and preliminary efficacy of a 12-week self-management energy conservation and active management intervention on fatigue.

SAMPLE & SETTING: A total of 19 Thai women diagnosed with stage I–III breast cancer receiving adjuvant chemotherapy were enrolled from a local hospital in the central region of Thailand.

METHODS & VARIABLES: A randomized controlled trial design was used. Fatigue was measured using the Piper Fatigue Scale–Revised and was collected at baseline and 12 weeks. Descriptive statistics and Student's t tests were used to analyze the data.

RESULTS: Participants completed four interventional sessions. Of participants in the experimental group, nine were satisfied with the intervention, seven were satisfied with its effects on fatigue, and seven were very satisfied with the telephone delivery. Participants in the experimental group reported significantly less fatigue at 12 weeks compared to the attention control group ($p = 0.008$).

IMPLICATIONS FOR NURSING: Teaching energy conservation principles and strategies to women with breast cancer undergoing chemotherapy is an intervention oncology nurses can easily deliver.

KEYWORDS self-management; energy conservation; cancer-related fatigue; breast cancer; chemotherapy

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Breast cancer is an important global health issue. It is estimated that by 2030 there will be about 21.7 million cancer cases and 13 million cancer-related deaths (Thun et al., 2010). In 2020, there were about 2.3 million new cases of breast cancer in women worldwide (Sung et al., 2021). In Thailand, cancer is the second most prevalent noncommunicable disease for women and the third most prevalent for men (Pittayapan, 2016). Breast cancer is the most prevalent cancer in women and is projected to still have the highest incidence rate in 2025, accounting for 42% of all cancer cases in women (Virani et al., 2017).

Cancer is defined as a chronic illness and can be accompanied by long-term morbidity, even when the prognosis is positive and long-term survival is expected. Treatment for breast cancer often involves a combination of surgery, chemotherapy, targeted therapy, radiation therapy, extended oral endocrine therapy with tamoxifen or aromatase inhibitors, and sometimes oral molecular-targeted therapies. All these treatments can result in multiple chronic side effects that can negatively affect patients' quality of life (McCorkle et al., 2011), making breast cancer a complex chronic illness (Bodai & Tuso, 2015). One of the most prevalent chronic side effects is cancer-related fatigue (CRF) (Williams et al., 2016).

Throughout the literature, 90% of patients report fatigue at some point during their experience with cancer (Williams et al., 2016), particularly during treatment. In one study, severe fatigue was more prevalent during chemotherapy compared to radiation therapy or combined chemotherapy and radiation therapy (Karthikeyan et al., 2012). In a longitudinal study of women with breast cancer undergoing active chemotherapy treatment, pretreatment fatigue and

TABLE 1. Intervention Components for Each Study Session

Time	Session/Module	Content
Week 1: oncology clinic	Understand cancer-related fatigue.	■ Get to know the participant and understand their beliefs, coping mechanisms for illness, and health practices, along with any concerns about family or work obligations. ■ Introduce using a journal for recording strategies at home and listing appointments.
Weeks 3–6: telephone call	Start journaling.	■ Assess fatigue symptoms and other common physical and emotional experiences during the week after chemotherapy cycle 1. ■ Explain the use of daily logs to monitor fatigue and other symptoms, and create a list for daily activities.
Weeks 6–9: telephone call	Get a plan and prioritize.	■ Evaluate patterns and other causes of fatigue during the past week. ■ Educate the participant about energy conservation and active management strategies, including priority setting, planning, delegating, and scheduling activities to take place at high-energy times. ■ Assist in decision-making about the activities the participant wishes to do; provide a list of most leisure activities (light to strenuous activities, Thai religious activities) done in Thailand, how long to rest, and whether to exercise.
Weeks 9–12: telephone call	Improve your plan.	■ Evaluate the effectiveness of the energy conservation plan and the use of skills to manage fatigue. ■ Identify barriers and problems surrounding implemented strategies. ■ Provide recommendations for modifying the plan to continue activities over time via direct mastery of things normally enjoyed.

distress were reported by 14% of women; the highest prevalence of fatigue was reported by 87% of women prior to the second cycle of chemotherapy (Phligbua et al., 2013). The prevalence of fatigue slowly declined until it reached 82% after one month of chemotherapy (Phligbua et al., 2013). CRF is not only the most prevalent symptom but also one of the most severe, requiring the development of self-management interventions to improve fatigue symptoms. The evidence is clear that CRF is more severe during active treatment (Hong et al., 2016; Lundberg & Rattanasuwan, 2007; Piamjariyakul et al., 2010; Suwisith et al., 2008).

Certainly, like many patients with chronic complex illnesses, symptoms involve self-management strategies. As such, the World Health Organization (2008) advocates that symptom management interventions be implemented throughout the chronic illness trajectory to enhance overall quality of life. Likewise, the Institute of Medicine (2011) in particular calls for symptom management research as a critical need for improved patient-centered cancer care. CRF management was ranked as the highest priority in the 2014–2018 Research Agenda of the Oncology Nursing Society (Knobf et al., 2015). The 2019–2022 Research Agenda of the Oncology Nursing Society (Von Ah et al., 2019) affirmed the importance of symptom intervention research, particularly the development of self-management interventions to improve and better control symptoms.

In agreement with clinical guidelines developed in North America, there are no pharmacologic treatments that have conclusively demonstrated effectiveness for the management of CRF (Berger et al., 2015; Bower et al., 2014; Mitchell et al., 2014). For more than a decade in the United States, studies of nonpharmacologic interventions for CRF and systemic reviews of interventions have been published (Fitch, 2012; Kangas et al., 2008). Only two interventions have undergone sufficient research to be recommended for treating CRF: physical activity or exercise and cognitive behavioral therapy (CBT), which includes energy conservation strategies (Berger et al., 2015). CBT focuses on changing maladaptive thoughts and behaviors to reduce negative emotions and behaviors, as well as to facilitate psychological adjustment. Common methods used in CBT include talk therapy, journaling, skill training, role-play, relaxation techniques, mindfulness, and

mental distraction. CBT influences thoughts and promotes changes in behavior (Daniels, 2015).

Energy conservation and active management (ECAM) is generally an effective strategy for managing CRF (Berger et al., 2015) and fatigue in patients with chronic illnesses (Dreiling, 2009). Although research has been published on ECAM and other nonpharmacologic interventions for fatigue, limited evidence has been published on ECAM interventions for CRF in patients with cancer (Pearson et al., 2016). ECAM intervention delivery was tested in four randomized controlled trials that studied individuals with cancer treatment–related fatigue (Barsevick, 2002; Barsevick et al., 2004; Ream et al., 2006; Yuen et al., 2006). Additional evidence suggests that ECAM is one strategy used in CBT that reduces CRF (Howell et al., 2014).

A comprehensive review of the literature in Thailand provided limited data to support interventions for reducing CRF in Thai patients with cancer. Fatigue was documented as a primary outcome in two studies (Khamboon & Pakanta, 2021; Wangnum et al., 2013). In traditional Thai culture, people believe that those with illness lack energy, so they must get additional rest and should avoid activities to preserve energy. Thailand also recognizes cancer as a life-threatening disease, and people with cancer are expected to do very little so they can conserve their energy. Resting to maintain health and aid recovery was reported as the most common way of coping with treatment for 69 Thai women with cancer (N = 89) (Lundberg & Trichorb, 2001).

The Theory of Symptom Self-Management (TSSM) was used to guide development and implementation of the ECAM intervention. The TSSM model details one's perceived self-efficacy that contributes to the self-management of symptoms using self-directed action for individuals who can act on their own behalf. According to the TSSM model, symptoms can be physiologic and psychological, and can occur alone or in combination with other symptoms. Symptoms are likely to interact with and exacerbate the overall level of symptom severity (Hoffman, 2013). As such, ECAM is a self-management intervention that teaches patients to apply the principle of energy conservation, and provides coaching to integrate these activities into their daily lifestyle (Yarbro et al., 2014). ECAM strategies are a potential solution that may be more culturally acceptable for Thai patients. The intervention evaluated in this study was designed to increase adherence and acceptance by incorporating important Thai cultural appropriateness and values related to family, spirituality, literacy, and economic issues.

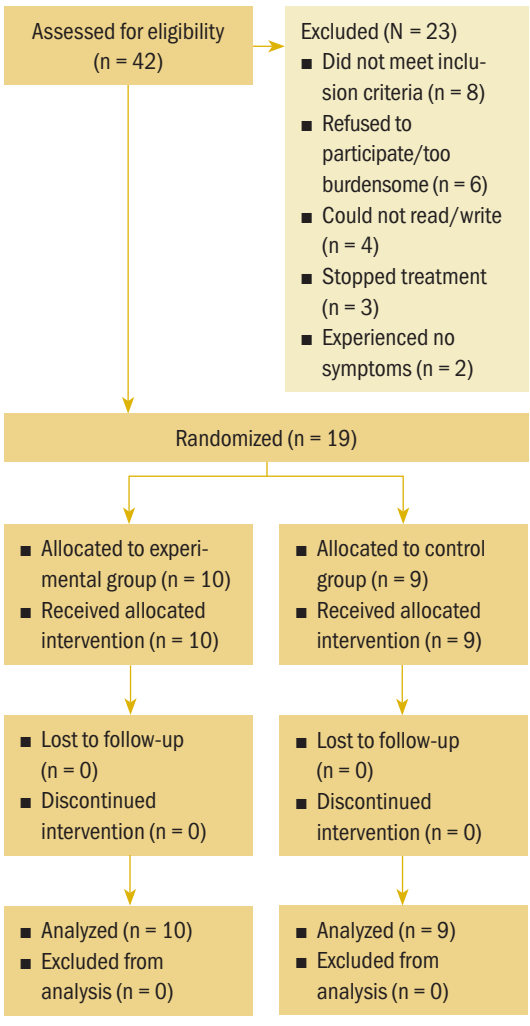
To the current authors' knowledge, the ECAM intervention has never been tested in a randomized controlled trial in Thai patients with cancer. The aim of this pilot randomized controlled trial was to evaluate adherence to, perception of usefulness of, and satisfaction with the ECAM intervention, titled Do It Yourself by Staying Active for Fighting Fatigue With Your Energy (DIY-SAFE), and to evaluate the preliminary efficacy of the DIY-SAFE for CRF using the Piper Fatigue Scale–Revised (PFS-R) in Thai women with breast cancer undergoing chemotherapy.

Methods

Settings, Study Participants, and Recruitment

This study used a two-arm randomized controlled trial, which followed Thai women with breast cancer

FIGURE 1. Participant Flow Diagram



receiving adjuvant chemotherapy. The study was approved by the ethics committees of two local hospitals in Thailand. One hospital withdrew and did not allow recruitment at its site because of a lack of women with breast cancer. As a result, participants were recruited from the outpatient chemotherapy

TABLE 2. Baseline Sample Characteristics

	Experimental Group (N = 10)		Attention Control Group (N = 9)		
Characteristic	**$\bar{X}$**	**SD**	**$\bar{X}$**	**SD**	**p**
Age (years)	43.5	9.06	48.78	6.51	0.167
Body mass index (kg/m^2)	24.06	3.43	22.78	3.34	0.424
Fatigue (0–10)	2.91	1.78	2.54	1.22	0.61
Hemoglobin (g/dl)	12.18	1.04	11.86	1.22	0.54
Characteristic		**n**		**n**	**p**
Chemotherapy agents					0.35
AC		5		7	
CAF/AC + paclitaxel		5		2	
Comorbidities					1
No		9		8	
Yes		1		1	
Completed education					1
High school or less		7		6	
College or more		3		3	
Employment status					1
Employed		7		7	
Unemployed		3		2	
Marital status					0.628
Married		8		6	
Single, other		2		3	
Menstrual status[a]					1
Pre- or perimenopausal		6		6	
Postmenopausal		4		3	
Number of chemotherapy courses at baseline					1
1		7		7	
2 or more		3		2	
Stage of breast cancer					0.478
I		1		1	
II		8		5	
III		1		3	
Type of surgery					1
MRM		9		8	
Other		1		1	

[a] At diagnosis
AC—doxorubicin/cyclophosphamide; CAF—cyclophosphamide/doxorubicin/5-fluorouracil; MRM—modified radical mastectomy
Note. Fatigue was measured using a numeric rating scale ranging from 0 (no fatigue) to 10 (worst fatigue).

TABLE 3. Frequency of Use and Perception of Usefulness of ECAM Strategies

ECAM Strategy	Implemented Strategy (Days Per Week)		Perceived Potential Effects	
	$\bar{X}$	SD	$\bar{X}$	SD
Made a prioritized list of daily activities	5.95	0.21	3.29	0.29
Delegated activities	3.34	0.72	3.09	0.18
Planned activities to do at high-energy times	2.35	0.82	3.09	0.48
Did some exercise	2.95	0.82	3.04	0.29
Ate healthier (more protein [e.g., fish, meat], vegetables, and fruit)	5.43	0.21	3.03	0.21
Drank more water	6.51	0.69	2.85	0.46
Got a better night's sleep	3.54	1.13	2.84	0.47
Practiced stress management	3.94	0.52	2.84	0.49
Decreased frequency of some activities	1.35	1.2	2.83	0.54
Chose not to do some activities	0.1	0.2	2.6	0.85

ECAM—energy conservation and active management
Note. Perceived potential effects rating was measured on a 4-point Likert-type scale ranging from 1 (none) to 4 (very much). Higher scores indicate the perception that the ECAM strategy was more effective.

clinic of one hospital. Participants were considered eligible if they were aged 18 years or older, had been diagnosed with stage I–III breast cancer, had received surgery for their cancer, and had been scheduled to receive a minimum of four cycles of chemotherapy. The chemotherapy treatment was to be given in 21-day intervals. Participants could have been scheduled to receive radiation therapy after chemotherapy, but this was not a requirement. Participants also had to report a score of 4 or higher on the 10-point numeric rating scale of fatigue, and the fatigue must have been present two weeks prior to study enrollment. Participants had to be able to read and write in Thai and have telephone access so they could be contacted by the nurse researcher. Participants' hemoglobin levels had to be within the normal range to rule out fatigue secondary to anemia.

Participants were excluded if they had a history of severe mental illness or a comorbidity other than cancer that is associated with fatigue (e.g., iron deficiency anemia, multiple sclerosis, congestive heart failure). Acute or chronic bone, joint, or muscular abnormalities were conditions that were also excluded because they could increase the risk of injury from falls. Participants were also excluded if they were to receive concurrent chemotherapy and radiation therapy.

All eligible participants received education about the trial and provided written informed consent if they wished to participate. The eligible consenting participants completed baseline questionnaires and were randomly assigned to the experimental or attention control group. Randomization was done through a table of random assignment provided by a statistician who did not perform data collection. Group allocation was concealed to the participants and the nurse researcher until after the baseline questionnaires were completed.

Data Collection and Measures

The fatigue outcome of the study was CRF severity, as measured by the PFS-R at baseline and week 12. The PFS-R was developed and published previously (Piper et al., 1998), and has been translated into Thai and validated in Thai women with breast cancer in previous studies (Naraphong et al., 2015; Pritsanapanurungsie, 2000). The scale contains 22 items rated on a 10-point numeric rating scale (0 = no fatigue, 1–3 = mild fatigue, 4–6 = moderate fatigue, 7–10 = severe fatigue). Adherence was calculated as the percentage

TABLE 4. Pre- and Postintervention Mean Fatigue Scores on the Piper Fatigue Scale–Revised in Experimental and Attention Control Groups From Baseline to Week 12

	Baseline		Week 12		Change From Baseline		Paired t Test	
Group	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	t	p
Experimental (N = 10)	2.91	1.78	1.41	1.35	−1.5	2.23	−2.131	0.062
Attention control (N = 9)	2.54	1.22	3.32	1.42	0.78	1.94	−1.205	0.263

Note. Negative change scores indicate improvement.
Note. Scale ranged from 0 to 10, with higher scores indicating more fatigue.

of participants in the experimental group who completed all ECAM sessions. The following two metrics were used to evaluate the perception of usefulness: (a) frequency of use and (b) perceived potential effects from various components of the ECAM intervention. A daily practice log was developed by the authors for this purpose. Participants were asked to record in the daily practice log what strategy they used each day at home throughout the 12 weeks, as well as to complete a questionnaire about potential effects on CRF from that strategy by rating each strategy on a Likert-type scale ranging from 1 (none) to 4 (very much).

Satisfaction was measured using a three-item questionnaire developed by the authors. The questionnaire evaluated participants' satisfaction with the intervention, the delivery method, and its effect on their CRF on a Likert-type scale ranging from 1 (dissatisfied) to 5 (completely satisfied).

Self-reported demographic data were collected at baseline and included questions about age, race, religion, marital status, education, and information related to disease and treatment at baseline. The final questionnaires were completed during week 12 and were returned by mail to the first author in a self-addressed stamped envelope for convenience or returned in person during clinical visits.

ECAM Intervention

The participants in the experimental group received four sessions delivered once every three weeks by the first author during a 12-week period. These sessions corresponded to the cycles of chemotherapy they received. The first session was delivered in the outpatient chemotherapy clinic. The remaining three sessions were delivered at home via a telephone call that lasted about 20 minutes.

The intervention was an individually tailored self-management program. The ECAM intervention consists of four sessions, which were developed and tested in non-Hispanic White patients with cancer (Barsevick et al., 2002, 2004). Because this intervention has not been tested in Thai patients with cancer, cultural and linguistic factors were considered in the intervention's design and delivery. The program contains information designed to address factors known to influence CRF. The content was categorized into the following four modules: (a) understand CRF, (b) start journaling, (c) get a plan and prioritize, and (d) improve your plan. Content was presented in written formats (e.g., journals, tip sheets). A summary of the content for each session is outlined in Table 1. The participants were taught to record their activities each day in the daily logs and track what ECAM strategies they used and their perceived effectiveness. The nurse researcher discussed the daily journal with each participant to clarify any issues and to ask whether the participants were experiencing any symptoms or whether they had used other symptom management resources (e.g., booklets, palliative care network). The participants completed the PFS-R and satisfaction information questionnaires at week 12.

All intervention sessions were conducted following detailed scripts delivered by the nurse researcher at each session. An oncology nurse, who served as an observer, monitored the delivery of each session and completed the fidelity checklist.

Attention Control Condition

The attention control participants received the same contacts as the experimental group. The attention control condition consisted of one clinical visit and one telephone call from the nurse researcher every 3 weeks for 12 weeks across the chemotherapy treatments. The telephone visits were scripted, lasting about 15–20 minutes. These calls provided information about general issues with breast cancer and self-care activities for patients receiving chemotherapy. Topics were specifically selected and designed not to provide advice. If participants asked for advice, they were referred to

their healthcare team. Standard care was provided by the healthcare team in the research setting through one-on-one nurse– or pharmacist–patient education.

Statistical Analysis

This study was an international collaborative research project. All data or research files were encrypted. Only the first author had access to these files throughout the data collection. Transport Layer Security was used for any data that were electronically transmitted. All data were deidentified and imported into IBM SPSS Statistics, version 24.0, for Windows.

Descriptive statistics were used to calculate frequencies, percentages, means, and SDs for participant characteristics. Baseline sociodemographic data, clinical characteristics, and the outcome of interest were first compared between the two groups using independent t tests for the continuous variables and chi-square tests or Fisher's exact tests for the categorical variables.

Adherence was determined a priori as having 80% of participants completing all four sessions. The number of participants who completed four, three, two, one, or no sessions were calculated for adherence. Results of the intervention's perceived usefulness were analyzed descriptively. The researchers calculated the number of participants who completed their daily activity logs throughout the 12 weeks of home practice, and calculated the frequencies of the individual energy conservation strategies used for each participant and for participants overall. Means were calculated for strategy use and its perceived potential effects. In addition, satisfaction of the intervention was evaluated by having 80% of participants answer 4 (satisfied) or 5 (very satisfied) regarding the intervention.

All statistical tests were performed at the two-tailed 5% level of significance, and 95% confidence intervals were computed. Means and SDs were calculated for the total scores of the PFS-R for the fatigue end point. Changes from baseline to the third telephone call during the fourth chemotherapy cycle (week 12) were calculated. Differences between means were evaluated using the independent t tests. Although this was a pilot study, the researchers looked for trends. From the means, changes, and SDs, the researchers calculated the effect size of the experimental group compared to the attention control group, as well as within each group pre- and postintervention. The data were used to inform the next trial. The effect size was conducted using Hedges's g, which is an unbiased estimate of the population effect size, especially for small samples where N is less than 20 (Lakens, 2013).

KNOWLEDGE TRANSLATION

- Energy conservation and active management (ECAM) is an acceptable cognitive behavioral therapy approach that can negate cancer-related fatigue when delivered to Thai women with breast cancer undergoing chemotherapy.
- Telephone follow-up calls are an alternative method for providing a self-management ECAM education program to Thai women.
- Oncology nurses trained in ECAM can deliver the intervention to help culturally diverse women manage their cancer-related fatigue.

Results

Sample Characteristics

Nineteen Thai women with breast cancer were eligible to participate in the study. All 19 women completed the study; 10 participants were randomized to the experimental group, and 9 to the attention control group (see Figure 1). Baseline demographic and medical characteristics for all 19 participants are presented in Table 2. Participants had a mean age of 46 years (SD = 8.2, range = 33–62), with most being married and employed. Participants

TABLE 5. Comparison of Mean Scores on the Piper Fatigue Scale–Revised Between Experimental and AC Groups at Week 12

	Experimental Group (N = 10)		AC Group (N = 9)						
Variable	$\bar{X}$	SD	$\bar{X}$	SD	t	df	p	g	95% CI
Fatigue score	1.41	1.35	3.32	1.42	–3.006	17	0.008	–1.38	[–2.35, –0.41]

AC—attention control; CI—confidence interval; df—degrees of freedom; g—Hedges's g
Note. Scale ranged from 0 to 10, with higher scores indicating more fatigue.

were predominantly diagnosed with stage II breast cancer. More than half of the participants were premenopausal. There were no significant differences between the groups at baseline on any sample characteristics and CRF outcomes.

Adherence, Perception of Usefulness, and Satisfaction

All 10 participants in the experimental group completed every ECAM session, demonstrating excellent adherence. When asked about having daily activity logs for home practice, the majority (n = 9) of participants said it was helpful for managing their fatigue. Throughout the 12 weeks, participants made entries an average of 5.6 days per week in their daily activity logs.

Table 3 describes the frequency of use and perceived usefulness of various strategies that were implemented. The four most frequently used ECAM strategies were (a) drinking more water, (b) making a prioritized list of daily activities, (c) eating healthier, and (d) practicing stress management. The energy conservation strategy that was implemented the least was choosing not to do some activities. Regarding intervention satisfaction, 9 of 10 participants in the experimental group reported satisfaction with the intervention, 7 reported satisfaction with the effect the intervention had on their CRF, and 7 reported satisfaction with the telephone delivery.

Preliminary Efficacy on Fatigue

Within-group changes from baseline to 12 weeks are shown in Table 4. Fatigue scores were lower in the experimental group at 12 weeks ($\bar{X}$ = 1.41, SD = 1.35) than in the attention control group ($\bar{X}$ = 3.32, SD = 1.42). There was no statistical difference within either the experimental group or the attention control group in the fatigue score from baseline to week 12.

An independent t test was performed to compare the mean fatigue scores in the experimental group and in the attention control group. There was a significant difference in the scores for fatigue intensity at week 12 ($t[17] = -3.006$, $p = 0.008$) (see Table 5). The effect size for the change in the fatigue was determined using Hedges's g ($g = -1.38$; 95% confidence interval [−2.35, −0.41]).

Discussion

This study is the first to pilot-test the preliminary effect of the ECAM intervention in Thai women with breast cancer receiving chemotherapy. The enrollment rate was 45.2%, but the retention rate was 100%. One research site was canceled because of a lack of eligible participants, which reduced the rate of recruitment. When considering the sites and timeline for recruitment for a full-scale study, careful exploration of the eligible population's availability, as well as previous rates of study recruitment, would be helpful information (Stewart et al., 2020).

Participants reported being satisfied with the intervention, and all were able to complete the three telephone intervention sessions. These findings suggest that participants were engaged and interested in the content. This is consistent with a systematic review by Ream et al. (2020) suggesting that studies using telephone-delivered interventions to reduce the severity of fatigue can be effective.

This study provides supportive data that ECAM may be effective in decreasing fatigue in Thai women with breast cancer receiving chemotherapy. This is consistent with previous studies in the United States (Barsevick, 2002; Barsevick et al., 2004, 2010). To the researchers' knowledge, there have been no previous studies on ECAM in Thai women. The fact that the intervention was adapted to the Thai culture and found to be feasible suggests that the ECAM intervention can be culturally adapted and tested in different populations. The effect size for this analysis was found to exceed Hedges's and Cohen's convention for a large effect (d = 0.8) (Cohen, 1988). This change may likely be a beneficial effect of decreased CRF in patients with cancer. The within-group change in CRF trended toward statistical significance in the DIY-SAFE interventional arm, but not in the attention control group. The lack of statistical significance is likely because of the small sample size in this pilot feasibility study.

A possible mechanism through which fatigue may be positively affected can be explained by the TSSM model, which states that boosting self-efficacy may improve symptom control (Hoffman, 2013; Hoffman et al., 2009). The symptom management content in the ECAM intervention focuses on enhancing patients' perception of control, rather than simply coping with treatment.

One notable finding was that the participants enrolled in this study were more likely to be aged 50 years or younger and were employed during chemotherapy, highlighting the need for good management of potentially debilitating symptoms such as CRF. The participant characteristics also highlight the fact that the intervention was not burdensome and could be accomplished despite employment and cancer treatment.

Finally, the study demonstrated that the participants learned the use of energy conservation strategies taught in the 12-week intervention and reported the strategies to be useful. It is interesting that the strategies rated the highest for effectiveness were not necessarily the ones most frequently used. The choice of strategies may have been driven by the fact that most of the participants were working and their time to devote to study strategies may have been sparse. It may be worthwhile in future research to reassess the educational content of the intervention to be sure enough information about the most effective strategies is included, as well as to include some tips on how to integrate some of the strategies into one's daily and often busy routine.

Limitations

Limitations of this current pilot study include the small sample size and the single-center nature of this study. The results of the study may not be representative of a national sample. In addition, the basic characteristics of participants may affect the research results. Strengths of this small pilot study include an attention control group and the use of randomization to treatment arms. Additional research with a larger sample size is warranted.

Implications for Nursing

The results demonstrate that the ECAM intervention has potential as an effective intervention to manage CRF. The intervention could be taught by oncology nurses and used by patients and their families in the home environment, even if participants were working. The study results provide support that an intervention providing information, training, and strategies to patients using a manualized program may be effective in the self-management of fatigue during a stressful treatment time. In addition, the results of this study support additional research with alternative modes of delivery, such as telephone delivery instead of in-person delivery. Oncology nurses can learn to deliver this manualized symptom self-management intervention for patients with cancer. The study results highlight the role of oncology nurses in using cultural context of the intervention to strengthen a patient's self-management capabilities for dealing with chemotherapy-related symptoms.

Conclusion

This study supports ECAM as a feasible and promising intervention to improve CRF. Participants showed improvement in fatigue. This study contributes to the growing body of literature that supports self-management interventions in patients with cancer undergoing treatment. More research with larger sample sizes is needed to determine the effectiveness of the intervention.

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Naraphong completed the data collection and provided statistical support and the analysis. Both authors contributed to the conceptualization and design and the manuscript preparation.

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