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## A Pilot Study: The Effects of Group Exercise On Fatigue and Quality of Life During Cancer Treatment

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## Abstract

Fatigue affects 60-100% of all cancer patients, is difficult to manage, and can have a profound impact on everyday functioning and quality of life. Though seemingly counterintuitive, exercise has emerged as a promising intervention for the management of cancer related fatigue (CRF). Current research predominantly involves individual, home-based exercise programs with few studies exploring other modes of exercise delivery. The purpose of this pilot study was to determine if participation in a structured group exercise program (SGEP) was a feasible intervention for adult oncology patients receiving cancer treatment and to test the impact of a SGEP on reducing CRF and improving quality of life (QOL). This unique study integrated the known benefits of exercise with the powerful effects of group dynamics in a group of adult oncology patients with mixed cancers, at various stages of treatment. Using a pretest and posttest one-group design, findings showed a significant decrease in bodily pain ( $p=0.0118$ ); subscale scores for physical role, vitality, and social function increased, but did not yield statistical significance. No difference was found in reported fatigue. A post-program questionnaire identified themes of support, learning from shared information, and usefulness of having an exercise program serve concurrently as an informal support group. The findings of this pilot study provide encouraging data that suggests a SGEP is feasible, safe, and well tolerated by adult oncology patients receiving cancer treatment, and may have positive effects on CRF and QOL.

**A Pilot Study: The Effects of Group Exercise  
On Fatigue and Quality of Life  
During Cancer Treatment**

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**August 9, 2005**

## Abstract

Fatigue affects 60-100% of all cancer patients, is difficult to manage, and can have a profound impact on everyday functioning and quality of life. Though seemingly counterintuitive, exercise has emerged as a promising intervention for the management of cancer related fatigue (CRF). Current research predominantly involves individual, home-based exercise programs with few studies exploring other modes of exercise delivery. The purpose of this pilot study was to determine if participation in a structured group exercise program (SGEP) was a feasible intervention for adult oncology patients receiving cancer treatment and to test the impact of a SGEP on reducing CRF and improving quality of life (QOL). This unique study integrated the known benefits of exercise with the powerful effects of group dynamics in a group of adult oncology patients with mixed cancers, at various stages of treatment. Using a pretest and posttest one-group design, findings showed a significant decrease in bodily pain ( $p < .02$ ); subscale scores for physical role, vitality, and social function increased, but did not yield statistical significance. No difference was found in reported fatigue. A post-program questionnaire identified themes of support, learning from shared information, and usefulness of having an exercise program serve concurrently as an informal support group. The findings of this pilot study provide encouraging data that suggests a SGEP is feasible, safe, and well tolerated by adult oncology patients receiving cancer treatment, and may have positive effects on CRF and QOL.

## A Pilot Study: The Effect of Group Exercise On Fatigue and Quality of Life During Cancer Treatment

Cancer-related fatigue (CRF), affecting 60-100% of all cancer patients, remains the most prevalent and difficult cancer related side effect to manage, profoundly impacting everyday functioning and quality of life (QOL) (Mock et al., 2001; National Comprehensive Cancer Network [NCCN], 2004; Stricker, Drake, Hoyer, & Mock, 2004). As physical abilities decline, psychosocial distress ensues; dependency on others disempowers the person with cancer reducing self-esteem and increasing feelings of helplessness and hopelessness (Ahlberg, Ekman, Gaston-Johansson, & Mock, 2003).

Though seemingly counterintuitive, exercise is emerging as a promising intervention to reduce CRF and improve QOL (Ahlberg et al., 2003; Christopher & Morrow, 2004; Drake, Falzer, Xistris, Robinson & Roberge, 2004; Galvao & Newton, 2005). The majority of studies in this area of research involve individual, home-based exercise programs (Drake et al., 2004; Galvao & Newton, 2005; Headley, Ownby, & John, 2004; Mock et al., 2001; Stricker et al., 2004). Few studies have used a structured group-based exercise format (Campbell, Mutrie, White, McGuire, & Kearney, 2005; Kolden et al., 2002; Turner, Hayes, & Reul-Hirche, 2004).

### Purpose of the Study

The purpose of this pilot study was to (a) determine the feasibility of participating in a SGEP for adult oncology patients receiving cancer treatment and (b) test the impact of a SGEP on reducing CRF and improving QOL.

This pilot study used group exercise as an intervention to address the physiological and psychological components of CRF. We combined the wellness-promoting behavior of exercise during cancer treatment with the psychosocial benefits of group interaction identified by Irvin Yalom (1985), in his *curative factors model* (see Figure 1): instillation of hope (“if others can do it, so can I”), universality (shared experience of cancer and treatment), sharing information (management of side effects/coping strategies), altruism (developing mutual support), increased ability to listen and relate to others, and the opportunity to observe effective coping strategies.

These factors can be influential in promoting change and may have a significant role in improving CRF and QOL.

## Methodology

### *Sample and Setting*

Following Institutional Review Board approval, 12 participants receiving outpatient cancer treatment were invited to participate in this study. Inclusion criteria were: English speaking, Karnofsky performance status  $>80$ , and no pre-existing co-morbid conditions (heart disease/COPD). Exclusion criteria were symptomatic bone metastases, serum hemoglobin  $\leq 10$  g/dl, and resting pain  $\geq 2$  on a 0-10 scale. Prior to beginning the intervention, the patient obtained their oncologist's permission for participation.

### *Study Intervention*

Subjects participated in a structured group exercise program (SGEP), meeting for one hour twice weekly for six weeks. Exercises focused on flexibility, muscle strength, and endurance with emphasis on strengthening proximal muscle groups and improving functional ability. All exercises were reviewed by an exercise physiologist and medical oncologist and followed the American College of Sports Medicine general guidelines for exercise testing and prescription (American College of Sports Medicine [ACSM], 2000). An oncology certified nurse with experience in teaching exercise to patients, conducted the intervention.

### *Instruments*

Fatigue and QOL were assessed using the Fatigue Symptom Inventory (FSI) (Hann, Dennison, & Baker, 2000) and the SF-36v2 (Ware, Kosinski, & Dewey, 2002); both instruments were self-administered at the beginning and end of the six-week intervention. A demographic questionnaire gathered participant's age, gender, living situation, cancer type, and previous exercise history.

The FSI is a 14-item inventory with three sub-scales: fatigue severity, frequency, and perceived interference with QOL. Subjects rate the extent to which they agree with each item using a 0-10 Likert scale. Established as a reliable and valid measure of fatigue in the oncology

patient, the FSI has a Cronbach's alpha coefficient ranging from 0.93 to 0.95, with convergent, divergent, and construct validities supported by significant correlations with the POMS-F and SF-26 vitality scale (Hann, et al., 2000).

The SF-36v2, a generic measure of health-related QOL, has eight subscales: physical functioning, role-physical, bodily pain, general health, vitality, social function, role-emotional, and mental health. Subjects mark Likert-type responses to questions regarding their perceived ability to complete activities of daily living, with higher scores indicating the best state. Brief, yet comprehensive, the SF-36v2 has been found to be an effective psychometric tool, with subscale reliability coefficients ranging from 0.78 to 0.93 (Ware et al., 2002).

#### *Data Analysis*

Demographic data were analyzed using descriptive statistics. Subscale scores on the FSI and SF-36v2 were calculated and compared using a paired t-test.

#### **Results**

Twelve individuals signed consent. One was hospitalized prior to beginning the study, one never attended, and one withdrew a third of the way through the program, stating she felt "...unable to keep up with everyone else". The nine participants completing the study ranged in age from 25-75 years ( $x = 58$ ), had various types and stages of cancer, and had done some physical activity prior to diagnosis (see Table 1).

No noticeable changes were seen pre and posttest on the FSI subscale scores, but reduction in bodily pain was seen from the SF-36v2 ( $p < .02$ ). Though not significant, changes were noted between pre and posttest subscale means with a slight improvement in physical role, social function, and vitality, and minor decreases in general health, physical functioning, and mental health. Absence of noticeable variations in fatigue and the minor decrease in some health measures are likely related to widely divergent disease and treatment stages.

Feasibility of this intervention was demonstrated by the ability to recruit individuals with a variety of cancers at various stages. Participants exhibited a high level of motivation, attending

an average of 90% of the sessions, and expressing a desire to have the program continue beyond the study. The exercises were well tolerated with no adverse reactions.

### *Limitations*

The primary limitation of this pilot study is the small sample size, creating inadequate power to demonstrate significant differences in the outcome variables, and preventing normal distribution generalizations. Direct recruitment by the oncology nurse in the treatment setting may be one effective way to obtain more subjects. The lack of a comparison group, self-selected participation, the brief duration of the intervention and no formal measurement of group process are additional limitations of this study. To facilitate application to clinical practice and the development of evidence-based SGEP guidelines, future studies should address intervention variables such as group size, participant age, type of exercises, instructor personality and measurement of group processes.

### Discussion

Participants expressed positive feelings regarding the SGEP both verbally and in a written course evaluation. Most had not planned to follow an exercise regimen during cancer treatment and would not have joined a formal support group, but were drawn by the opportunity to engage in a “normal” wellness promoting behavior (exercise), in a structured, professionally supervised setting. They expressed surprise and pleasure at the camaraderie that evolved. Group members independently established an e-mail list through which they shared information, personal status updates, and encouraged attendance by establishing a common social obligation toward self and the group.

Irvin Yalom’s (1985) curative factors were clearly observable over time; collective reciprocity was seen as the group, grounded by commonalities intrinsic to the cancer experience, shared personal stories, fears, concerns, and struggles, supporting and educating one another while concurrently engaging in the beneficial intervention of physical activity. Cohesion among group members was evidenced by increased spontaneity of verbal interactions and the development of trust and genuine camaraderie (attempts were made to coordinate chemotherapy

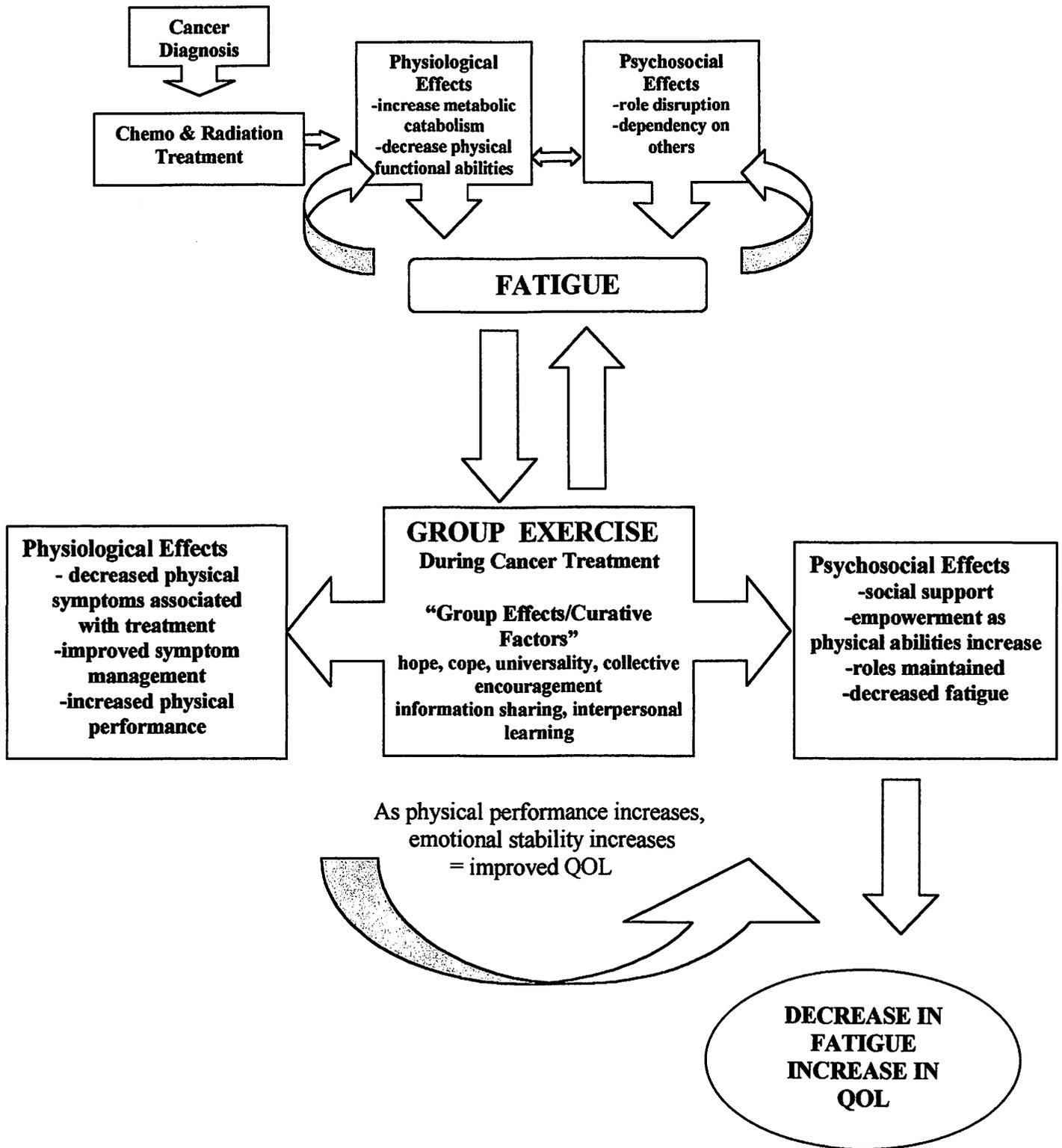
treatment appointments and meet for group walks). The results of this pilot study suggest that a SGEP can be safe, feasible, beneficial, and well tolerated.

#### Implications for Nursing

To manage CRF, interventions must address the physiological and psychological phenomena intrinsic to the fatigue experience and be easy to implement in a variety of clinical settings. A SGEP combines the power of group dynamics with the appeal of a wellness-oriented activity. Establishing a SGEP in clinical practice may be an effective way to use the foundation of physical activity to combat the uncertainty, lack of motivation, and social isolation frequently observed among cancer patients. This pilot study builds upon current research that confirms the benefits of exercise for adult cancer patients and provides encouraging data that suggests a SGEP is feasible and well tolerated by adult oncology patients receiving cancer treatment, and that such an intervention may have positive effects on CRF and QOL.

Figure 1.

Effects of Group Exercise on Fatigue and Quality of Life During Cancer Treatment: A Conceptual Framework



**Table 1. Background Characteristics of the Sample**

<b>Variable</b>	<b>n =9</b>	<b>%</b>
<b>Age</b>		
$\bar{X}$ = 58	-	-
Range 25-76 yrs	-	-
<b>Marital Status</b>		
Married	7	78%
Widowed	1	11%
Never Married	1	11%
<b>Type of Cancer/Stage</b>		
Breast -stage II	2	22%
Breast -stage III	2	22%
Breast- stage IV	1	11%
Colon - stage IV	1	11%
Lung - stage I	1	11%
Ovarian-stage I	1	11%
Pancreatic-stage IV	1	11%
<b>Cancer Treatment</b>		
Chemotherapy	8	89%
Radiation and Biological Response Modifier	1	11%
<b>Work Status</b>		
Part-time	1	11%
Leave of Absence	3	33%
Retired	5	56%
<b>Exercise Prior to Dx</b>		
Frequently ( $\geq 4x/wk$ )	3	33%
Moderately (3x/wk)	2	22%
Some (1-2x/wk)	4	44%
None	-	-

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