Reprinted from the Archives of General Psychiatry April 1999 Volume 56 Copyright 1999 American Medical Association

ORIGINAL ARTICLE

Education and Peer Discussion Group Interventions and Adjustment to Breast Cancer

Vicki S Helgeson, PhD; Sheldon Cohen, PhD; Richard Schulz, PhD; Joyce Yasko, PhD, FAAN

Background: We report a clinical trial comparing the effectiveness of education-based and peer discussion–based group interventions on adjustment to breast cancer

Methods: Women with stage I, II, or III breast cancer (n = 312) were randomly assigned to 1 of 4 group conditions: control, education, peer discussion, or education plus peer discussion (combination). Seven groups (each comprising 8-12 women) were conducted in each of the 4 conditions (28 groups total). Adjustment was measured before the intervention, immediately after the intervention, and 6 months after the intervention

Results: Consistently positive effects on adjustment were seen in the education groups both immediately following and 6 months after the intervention. There were no benefits of participation in peer discussion groups, and some indications of adverse effects on adjustment at both follow-up examinations. The effects could be explained by changes in self-esteem, body image, and intrusive thoughts about the illness

Conclusions: Education-based group interventions facilitated the initial adjustment of women diagnosed with early stage breast cancer. There was no evidence of benefits from peer discussion group interventions

Arch Gen Psychiatry 1999;56:340-347

From the Psychology Department, Carnegie Mellon University (Drs Helgeson and Cohen); Department of Psychiatry, University of Pittsburgh (Dr Schulz); and the University of Pittsburgh School of Nursing and University of Pittsburgh Cancer Institute (Dr Yasko), Pittsburgh, Pa

EVIDENCE EXISTS that psychotherapeutic group interventions conducted by professional therapists facilitate adjustment to disease among people with cancer.[1,2] However, the costs associated with formal psychotherapy groups preclude communities from using them. Instead, community support groups borrow some of the cognitive and behavioral principles of psychotherapy, often focusing on providing emotional support through peer discussion and informational support through education. Education-based group interventions seem to produce more consistent, positive effects on adjustment than peer discussion group interventions.[3] However, most interventions include components of both education and peer discussion, making it difficult to determine which is responsible for positive effects on adjustment.[4,5]

We compared the effects of education-based and peer discussion–based group interventions among women with stage I, II, and III breast cancer. An educational intervention was developed to provide patients with informational support, which we expected would enhance their sense of control over the illness and reduce feelings of uncertainty and confusion associated with the illness. A peer discussion group intervention was developed to provide patients with emotional support, which we expected would enhance self-image and promote positive downward comparisons (ie, feeling lucky in comparison with others who were worse off), both of which have been shown to enhance self-esteem.[6] Both interventions were expected to reduce intrusive thoughts about the illness.

We recruited a sample of 312 women and randomly assigned them to 1 of 4 group categories: control, education, peer discussion, or education plus peer discussion (combination). Seven groups in each of the 4 conditions were conducted.

Previous research suggests that women with breast cancer want emotional and informational support. Thus, we expected combination groups to be the best adjusted. We predicted that both education-based and peer discussion interventions would enhance adjustment to disease, but did not predict that one would be more effective than the other.

RESULTS

RANDOMIZATION, PARTICIPATION, AND TREATMENT FIDELITY

Intervention condition was not associated with medical variables, demographic vari-

PARTICIPANTS AND METHODS

PARTICIPANTS

Women who had stage I or II breast cancer, were being treated with surgery and adjuvant chemotherapy, and lived within a 1-hour radius of Pittsburgh, Pa, were eligible for the study. We contacted 445 patients from more than 40 medical oncologists' offices, and 364 (82%) agreed to participate. Of those, 312 agreed to randomization and provided informed consent. Thus, our effective recruitment rate was 70%.

The age of the participants ranged from 27 to 75 years (mean, 48.25 years; SD, 9.64 years). Although physicians' offices were supposed to refer women with stage I and II disease only, our examination of medical records using the National Cancer Institute criteria for staging revealed that 25% had stage I disease, 69% had stage II disease, and 6% had stage III disease. Most women underwent lumpectomies (68%) rather than mastectomies (32%), which is consistent with the norms for the Pittsburgh area. Other demographic information is given in **Table 1**.

RANDOM ASSIGNMENT

Group meetings were held in 1 of 3 sites in the Pittsburgh area. When 10 to 12 women had been recruited for a site, we randomized the group to 1 of 4 conditions (control, peer discussion, education, or combination). Women were not told the condition to which they would be assigned during recruitment or during the baseline (time 1 [t1]) interview conducted prior to the intervention. Equal numbers of groups from each condition were conducted at each of the 3 sites. There were 28 groups consisting of 7 control groups (n = 77), 7 education groups (n = 79), 7 peer discussion groups (n = 74), and 7 combination groups (n = 82).

PROCEDURE

Groups met weekly for 8 consecutive weeks. The peer discussion and education groups met for 60 and 45 minutes, respectively. The combination group included 45 minutes of education followed by 60 minutes of peer discussion. The time 2 (t2) interview, conducted by telephone and mailed questionnaire, took place 1 to 2 weeks after the intervention ended. Time 3 (t3) data were collected from a mailed questionnaire sent 6 months after the intervention.

GROUP INTERVENTIONS

An oncology nurse and an oncology social worker, both with masters degrees, with experience conducting support groups for people with cancer acted as facilitators. They attended a 1-day workshop where the content of the education and peer discussion interventions was reviewed and guidelines for conducting the groups were provided. Each facilitator led all 3 of the interventions to eliminate the possibility that the results were affected by difference in facilitator. Audiotapes of sessions were monitored to ensure that the goals (described in each group intervention section) were being met.

Control

Patients in the control group did not attend any group meetings.

Education

The education intervention aimed to provide information about breast cancer and how to manage the disease and adverse effects of treatment. The theme was finding ways to enhance patient control of the illness. The information was provided either by a facilitator or by an expert in the field. In the 8 sessions, the following topics were covered: statement of the theme of control and an overview of breast cancer (presented by the facilitators), adverse effects of chemotherapy (nurse), nutrition (dietitian), exercise (physical therapist), body image (image consultant), communication (facilitators), future health care issues (physician), and relationships/sexuality (facilitators). Patients were taught a brief relaxation procedure at the third meeting and were given a relaxation audiotape. Subsequent meetings ended with relaxation.

Information was disseminated in lecture format. Facilitators discouraged discussion among the women. At the end of the 8 weeks, 1 facilitator called each patient once per month for 3 months to reinforce the principles of the group and to answer patients' questions.

Peer Discussion

Facilitators were instructed to encourage patients to help each other, as the "helper-therapy" principle is said to be a key principle of peer discussion groups.[7-10] Facilitators were told to promote feelings of acceptance and to encourage the expression of feelings (positive and negative) and confrontation of problems,[9-11] but were to avoid letting groups deteriorate into complaining sessions. Facilitators were instructed to take a positive approach to the group by encouraging members to learn something from the experience. Facilitators could not provide unsolicited information to the group, but could respond to patients' questions and correct misinformation.

Groups were structured to encourage discussion among patients. Workbooks were provided each week, wherein patients could record problems or thoughts related to their illness daily. Facilitators began each meeting by asking patients if they had any thoughts to share with the group. With patients' consent, a list of group members' names and telephone numbers was exchanged at the last meeting. At the end of the 8 weeks, 3 additional monthly meetings were held.

Combination

The combined intervention was a sequential combination, beginning with education and ending with peer discussion. At the end of the 8 weeks, 3 additional combined treatment meetings were held.

Continued on next page

ables, or use of other support services (all $P > .10$). There was a single intervention effect on one t1 outcome, t1 negative effect, and it was an interaction between peer discussion and education, $F_{1,308} = 8.14$, $P < .01$. Higher initial negative affect was observed in education-only (mean, 2.17; SD, 0.80) and peer

OUTCOME MEASURES

We used the Medical Outcomes Study, short form, 36 items (MOS SF-36) [12] to measure health-related quality of life. This instrument has excellent reliability and validity and has been used successfully to evaluate functional status in more than 20 000 depressed, chronically ill, and healthy patients [13] It contains 8 multi-item scales: general health perceptions, physical functioning, role limitations due to physical problems, bodily pain, general mental health, vitality, role limitations due to emotional problems, and social functioning Factor weights have been derived for the 8 scales, so that a mental health component score (MCS) and a physical health component score (PCS) can be created [14] In our study, principal components analysis, followed by varimax rotation of the 36 items, revealed 8 factors with eigenvalues greater than 1 Items loaded on their respective 8 scales Cronbach α for the scales were high (range, 81-91)

We also administered the Positive and Negative Affect scale.[15] The reliability of the 10-item positive affect scale was good (coefficient $\alpha = 86$), as was the reliability of the negative affect scale (coefficient $\alpha = 87$)

We assessed several proposed pathways by which interventions might influence adjustment Internal consistencies are given in parentheses We expected both interventions to reduce intrusive and avoidance thoughts about the illness, which were measured with the Impact of Event Scale[16] (coefficient $\alpha = 88$ and 83, respectively) We expected the peer discussion intervention to enhance self-image and to increase positive social comparisons We used the Rosenberg Self-Esteem Scale[17] to measure global self-esteem (coefficient $\alpha = 83$) and developed a body image scale based on the Cancer Rehabilitation Evaluation System[18] (coefficient $\alpha = 89$). We adapted a previous social comparison instrument[19,20] for parents of children with disabilities to persons with cancer

We were particularly interested in positive downward comparisons (ie, feeling lucky when seeing someone who is worse off; coefficient $\alpha = 58$) and negative downward comparisons (ie, feeling fearful when seeing someone who is worse off; coefficient $\alpha = 57$) The low α levels for the latter 2 scales are partly owing to the fact that the scales comprise only 3 items

We expected the educational intervention to enhance personal control and to reduce uncertainty about the illness We measured perceived personal control[21-24] (coefficient $\alpha = 70$), vicarious control[21-24] (ie, other control; coefficient $\alpha = 70$), and illness uncertainty[25] (coefficient $\alpha = 71$) We developed a 10-item measure of negative interactions with network members, based on research on failed support attempts[26,27] (coefficient $\alpha = 85$), and a face-valid index that reflected how often patients discussed their illness with network members (coefficient $\alpha = 82$)

All of the instruments were administered at t1, t2, and t3, except the social comparison and social interaction questions (t1 and t2 only) and the Impact of Event Scale (t2 and t3 only)

STATISTICAL ANALYSIS

We determined whether random assignment was effective with respect to t1 adjustment as well as medical variables (disease stage, surgery, family history of breast cancer, presence of other health problems), demographic variables (age, education, income, marital status, religion, employment status), and use of other supportive services with analyses of variance when outcome variables were continuous and χ^2 analyses when outcome variables were categorical Education and peer discussion were between-group factors In comparisons that only involved the 3 intervention conditions, we used 1-way analysis of variance with intervention as the between-group factor Individuals were used as the unit of analysis for t1 variables because women had not been assigned to a group

Because we had a complete factorial design (education × peer discussion), we conducted 2 (education [no, yes]) × 2 (peer discussion [no, yes]) analyses of covariance on t2 and t3 adjustment indices (MCS, PCS, positive affect, negative affect), controlling for the respective t1 variable An α level of 05 was used for all tests We analyzed the data fitting random regression models[28] using a split-plot analysis of variance and linear mixed effects software (S-Plus 4; MathSoft, Seattle, Wash) [29] The individual woman was the unit of analysis. This analytic procedure takes into account the variability due to the woman's individual characteristics and the variability due to being a member of a particular group.[28] We analyzed the individual MOS SF-36 scales and summarized their results, but do not present the data in this article. These data are available from the authors on request

We conducted all analyses using 3 methods. First, we included all participants who were randomly assigned to a group condition Second, we excluded women who never attended the group meetings Third, we included women who attended at least 4 meetings The pattern of results remained the same across the 3 analyses, often showing an increasing effect of the intervention, since those who did not attend meetings or attended only a few times were excluded We report results using all participants, the most conservative test of our hypothesis

We examined the psychosocial pathways by which interventions influenced adjustment by linear regression analysis [30] First, we present the regression equation that shows the intervention effect, including the regression coefficient, the F statistic for the coefficient, and the R^2 for the equation Second, we present the regression equation that contains the potential mediating variable along with the intervention effect We then compare the magnitude and significance of the regression coefficient for the intervention effect from the first equation to the second equation as well as the significance of the potential mediator [30] Mediating variables were computed as residualized change scores (ie, predicting the t2 or t3 mediator from its respective t1 measure) A variable operates as a mediator to the extent that its inclusion in the equation reduces the effect of the intervention on adjustment

discussion–only groups (mean, 2 17; SD, 0 86) than in combination (mean, 1 98; SD, 0 81) and control (mean, 1 84; SD, 0 70) groups Thus, we conducted all analyses on t2 and t3 adjustment by controlling for the respective t1 measure

There were no condition differences in meeting attendance (mean, 5 03; SD, 2 67; mode, 7). The primary reason for not attending was adverse effects of chemotherapy—two thirds of the women were undergoing chemotherapy during the intervention

We determined whether patients in the education groups acquired more information than patients in the other groups by administering a quiz at t1 and t2 that reflected knowledge of breast cancer and its treatment and how to cope with adverse effects of treatment. Patients in the education groups had higher quiz scores (mean, 9.82; SD, 2.54) than those in the other groups (mean, 9.03; SD, 2.33; $F_{1,296} = 15.77$; $P < .001$).

We determined whether bonds were formed in peer discussion groups (peer discussion and combination) relative to the education group by asking women how close they thought the group was and how close they felt to the group on a scale from 1 (not at all close) to 5 (extremely close). We averaged responses to the 2 questions. There was a greater feeling of closeness in the peer discussion group (mean, 3.86; SD, 1.03) and combination group (mean, 3.89; SD, 1.09) than in the education group (mean, 3.61; SD, 1.24), but the difference was not statistically significant. Six months after the the intervention groups stopped meeting (t3), women in the peer discussion group were more likely to continue to meet with other women from their group (42%) than women in the education (16%) or combination (13%) groups, $\chi^2_2 = 14.51$, $P < .001$.

After the group meetings ended, we asked women to rate their satisfaction with the group (1, completely dissatisfied; 7, completely satisfied) and whether they found the group to be a worthwhile experience (1, not at all worthwhile; 7, extremely worthwhile). There were no response differences across the 3 interventions. Mean (SD) responses to the 2 questions were 5.96 (1.53) and 6.08 (1.53), respectively.

Table 1. Demographics of the Sample

	No. (%)
Marital status	
Married	207 (67)
Divorced	38 (12)
Single	32 (10)
Widowed	22 (7)
Separated	13 (4)
Race	
White	289 (93)
African American	21 (7)
Hispanic	2 (1)
Religion	
Catholic	152 (49)
Protestant	137 (44)
Jewish	13 (4)
Atheist	3 (1)
Other	7 (2)
Education	
Less than high school	11 (4)
High school graduate	94 (30)
Some college	87 (28)
College graduate	76 (24)
Postgraduate training	44 (14)
Family income distribution, $	
<20 000	48 (15)
20-29 999	41 (13)
30-39 999	44 (14)
40-49 999	41 (13)
50-74 999	87 (28)
75-100 000	7 (2)
>100 000	17 (5)
Refused to answer	27 (9)

ADJUSTMENT IMMEDIATELY AFTER INTERVENTION

Education conditions had marginally higher MCS and significantly higher PCS scores—which indicates better functioning—than no education conditions. There were no effects of education or peer discussion on positive or negative affect. F values, adjusted means, and SEs are given in **Table 2**.

Analyses of the 8 individual MOS SF-36 scales revealed significant positive effects of education groups on vitality, social functioning, physical functioning, and role limitations due to physical health, and marginal effects on general health. Peer discussion groups had negative effects on vitality and physical functioning.

ADJUSTMENT 6 MONTHS AFTER INTERVENTION

As given in **Table 3**, education groups showed better functioning on all 4 outcome measures, significantly so for PCS and positive affect. Peer discussion groups had a slightly higher negative affect than groups without peer discussion.

Univariate analyses of the 8 MOS SF-36 scales showed significant positive effects of education for social functioning, physical functioning, and role limitations due to physical health, and marginal effects on mental health, vitality, and role limitations due to emotional health. Peer discussion had a significantly adverse effect on vitality and a marginally adverse effect on social functioning.

PATHWAYS

First, we examined the extent to which hypothesized mediating variables were influenced by the intervention (**Table 4**). Then, we examined the extent to which mediators accounted for intervention effects (**Table 5**).

T2 Education Effects

As presented in Table 4, patients assigned to education groups had higher self-esteem, better body image, less uncertainty about their illness, and were more likely to discuss the illness with family and friends than patients who were not assigned to education groups.

As presented in Table 5, the education effect on t2 PCS (given in equation 1) became nonsignificant when either residualized self-esteem or residualized body image was entered into the second equation. In both cases, the mediator was significant. Neither illness discussion nor uncertainty substantially altered the education effect. The education effect on t2 MCS was most reduced when residualized self-esteem or residualized illness discussion was included in the equation.

Table 2. Effects of Education on Peer Discussion on Time 2 Adjustment Indices: Adjusted Means and SE

Adjustment Index	Adjusted Mean (SE)	Adjusted Means for 2 Conditions (Average)							
Mental component score*									
Conditions		No Education		Yes Education		No Peer Discussion		Yes Peer Discusion	
No peer discussion, no education	45 75 (1 84)	45 75	(45 76)	49 35	(48 14)	45 75	(47 55)		
No peer discussion, yes education	49 35 (1 80)					49 35			
Yes peer discussion, no education	45 76 (1 82)	45 76						45 76	(46 35)
Yes peer discussion, yes education	46 93 (1 81)			46 93				46 93	
Positive affect†									
Conditions									
No peer discussion, no education	3 30 (0 13)	3 30	(3 32)	3 49	(3 42)	3 30	(3.40)		
No peer discussion, yes education	3 49 (0 13)					3 49			
Yes peer discussion, no education	3 33 (0 13)	3 33						3 33	(3 34)
Yes peer discussion, yes education	3 34 (0 13)			3 34				3 34	
Physical component score‡									
Conditions									
No peer discussion, no education	43 82 (0 94)	43 82	(43 42)	45 82	(45 47)	43 82	(44.82)		
No peer discussion, yes education	45 82 (0 88)					45 82			
Yes peer discussion, no education	43 01 (0 90)	43 01						43 01	(44.07)
Yes peer discussion, yes education	45 12 (0 90)			45 12				45 12	
Negative affect§									
Conditions									
No peer discussion, no education	1 84 (0 08)	1 84	(1 88)	1 73	(1 82)	1 84	(1 79)		
No peer discussion, yes education	1 73 (0 07)					1 73			
Yes peer discussion, no education	1 92 (0 08)	1 92						1 92	(1 91)
Yes peer discussion, yes education	1 90 (0 07)			1 90				1 90	

*Education $F_{1,23} = 3\ 52$, P = .07, peer discussion $F_{1,23} = 1\ 37$, P = .25, education × peer discussion $F_{1,23} = 0\ 36$, P = .55
†Education $F_{1,23} = 0\ 48$, P = .50, peer discussion $F_{1,23} = 0\ 16$, P = .69, education × peer discussion $F_{1,23} = 1\ 13$, P = .30.
‡Education $F_{1,23} = 5\ 60$, P< .05, peer discussion $F_{1,23} = 0.88$, P = .36, education × peer discussion $F_{1,23} = 0.003$, P = .96
§Education $F_{1,23} = 0\ 54$, P = .47, peer discussion $F_{1,23} = 2\ 35$, P = .14, education × peer discussion $F_{1,23} = 0\ 26$, P = .61

T2 Peer Discussion Effects

As given in Table 4, peer discussion conditions showed more negative interactions with network members and more negative downward comparisons than no peer discussion conditions. Peer discussion did not affect the overall t2 adjustment indices, so mediation was not tested.

T3 Education Effects

As presented in the lower half of Table 4, patients in education groups had greater personal control, less vicarious control, and fewer intrusive thoughts about the illness compared with patients who were not in education groups. As given in Table 5, the only mediator that reduced the size of the education effect on t3 adjustment indices was reduced intrusive thoughts.

T3 Peer Discussion Effects

As presented in the lower panel of Table 4, patients in peer discussion groups had greater intrusive and avoidant thoughts compared with patients not in peer discussion groups. Peer discussion did not have significant effects on the overall t3 adjustment indices, so mediation was not tested.

COMMENT

This is the largest randomized group intervention conducted with people who have cancer. Across an array of mental and physical functioning indices, educational groups showed benefits for women with early-stage breast cancer. These effects were maintained for 6 months, and even held in conservative analyses where the variability of the individual group of women was taken into consideration in the analysis.

Education interventions increased psychological and physical functioning largely by enhancing self-esteem, instilling a positive body image, and reducing disturbing intrusive thoughts about the illness. The psychological mechanisms that underlie the positive effects of education were somewhat surprising, as these were the mechanisms thought to underlie effective peer discussion groups. The receipt of information about one's illness and possible ways to cope with it may make women feel better about themselves in general and about their bodies in particular. The information may have directly increased self-image or altered health behaviors, which then boosted self-esteem.

Providing information to women about their disease and its consequences also may have helped them make sense of the experience, which then reduced intrusive thoughts about the disease. Education groups also increased illness discussions with network members, which may have contributed to the decrease in intrusive thoughts about the illness.

The education intervention we evaluated is easily transferable to the community. Most effects are modest, but the magnitude of education effects on several scales of the MOS SF-36 is large. The effect of the educational intervention on physical functioning at t2 and social functioning at t3 is greater than the reported difference be-

Table 3. Effects of Education and Peer Discussion on Time 3 Adjustment Indices: Adjusted Means and SE

Adjustment Index	Adjusted Mean (SE)	Adjusted Means for 2 Conditions (Average)					
Mental component score*							
Conditions		No Education		Yes Education		No Peer Discussion	Yes Peer Discussion
No peer discussion, no education	49 88 (2 27)	49 88	(48.92)	52 09	(51.25)	49 88, 52 09 (50.99)	47.96, 50.40 (49.18)
No peer discussion, yes education	52 09 (2 26)						
Yes peer discussion, no education	47 96 (2 26)	47 96					
Yes peer discussion, yes education	50 40 (2 27)			50 40			
Positive affect†							
Conditions							
No peer discussion, no education	3 49 (0 10)	3 49	(3.52)	3 71	(3.69)	3 49, 3 71 (3.60)	3.54, 3.66 (3.60)
No peer discussion, yes education	3 71 (3 60)						
Yes peer discussion, no education	3 54 (0 10)	3 54					
Yes peer discussion, yes education	3 66 (0 10)			3 66			
Physical component score‡							
Conditions							
No peer discussion, no education	43 18 (0.84)	48 13	(47.70)	49 44	(49.54)	48.13, 49 44 (48.79)	47.27, 49.63 (48.45)
No peer discussion, yes education	49 44 (48.79)						
Yes peer discussion, no education	47 27 (0 85)	47 27					
Yes peer discussion, yes education	49 63 (0 85)			49 63			
Negative affect§							
Conditions							
No peer discussion, no education	1 78 (0 17)	1 78	(1.87)	1 63	(1.69)	1 78, 1 63 (1.71)	1.95, 1.74 (1.85)
No peer discussion, yes education	1 63 (0 16)						
Yes peer discussion, no education	1 95 (0 16)	1 95					
Yes peer discussion, yes education	1 74 (0 16)			1 74			

*Education $F_{1,23} = 3.07$, P = .09; peer discussion $F_{1,23} = 2.02$, P = .17; education × peer discussion $F_{1,23} = 0.08$, P = .78
†Education $F_{1,23} = 4.76$, P < .05; peer discussion $F_{1,23} = 0.01$, P = .94; education × peer discussion $F_{1,23} = 0.10$, P = .76
‡Education $F_{1,23} = 4.46$, P < .05; peer discussion $F_{1,23} = 0.17$, P = .68; education × peer discussion $F_{1,23} = 0.50$, P = .49.
§Education $F_{1,23} = 2.88$, P = .10; peer discussion $F_{1,23} = 2.17$, P = .15; education × peer discussion $F_{1,23} = 0.24$, P = .63

Table 4. Education and Peer Discussion Effects on Time 2 and 3 Mediating Variable (Pathways): Adjusted Means and SE

	Conditions, Mean (SD)				Effects					
					Education		Peer		Education* Peer	
	Control	Peer	Education	Combination	F	P	F	P	F	P
Time 2 Pathways										
Self-esteem	4 24 (0 06)	4 34 (0 06)	4 41 (0 05)	4 38 (0 06)	4 64	04	0 50	.49	1 35	.26
Body image	3 43 (0 14)	3 48 (0 14)	3 69 (0 13)	3 56 (0 13)	3 43	08	0 21	.65	0.94	.34
Uncertainty	2 23 (0 08)	2 09 (0 07)	1 96 (0 07)	1 96 (0 07)	8 39	01	1 53	.23	1.31	.26
Extent discuss illness	4 92 (0 15)	5 00 (0 15)	5 37 (0 15)	5 17 (0 14)	5 67	03	0 00	99	2.65	.12
Negative family/friend interactions	1 62 (0 07)	1 88 (0 07)	1 75 (0 06)	1 82 (0 07)	0 25	63	7.08	.01	1.84	.19
Negative downward comparisons	3 18 (0 11)	3 25 (0 11)	3 01 (0 10)	3 38 (0 11)	0 002	96	5 28	.03	2.52	.13
Time 3 Pathways										
Personal control	3 58 (0 09)	3 56 (0 09)	3 71 (0 09)	3 73 (0 09)	3 58	07	0.02	90	0.04	.83
Vicarious control	3 20 (0 11)	3 20 (0 11)	2 91 (0 11)	2 97 (0 11)	5 33	03	0.06	.81	0.07	.80
Intrusive thoughts	1 42 (0 12)	1 36 (0 12)	0 94 (0 11)	1 27 (0 11)	4 38	05	3.40	.08	0.08	.78
Avoidant thoughts	1 48 (0 14)	1 54 (0 13)	1 21 (0 14)	1 50 (0 14)	1 41	25	6 01	.02	0.18	.67

*df is 1 for the numerator and 23 for the denominator.

tween individuals with current major depression vs subthreshold depression.[31] The effects on social functioning are equivalent to the effect of remission from major depression.

There are several limitations to these findings. First, it is possible that the benefits of the educational group were owing to the group context rather than the information provided. Future research needs to distinguish effects of information from effects of group interaction. Second, because the sample consisted of highly educated people, the education intervention may have been more valued than average.

Through the 6-month follow-up, no evidence was found for positive effects of peer discussion and some hints of adverse effects on vitality and negative affect. Unexpectedly, peer discussion groups increased womens' negative downward comparisons shortly after the intervention. Downward comparisons are not always positive (ie, feeling lucky). Bringing people together who face a common problem may have the unintended effect of

Table 5. Pathways by Which Education Intervention Affects Adjustment*

	β	F† test	P	R^2
T2 Physical Component Score				
Eq 1: t1 PCS	0 64	$F_{1,25}$ = 19 01	001	0 50
Education	2 06	$F_{1,25}$ = 5 86	02	
Eq 2: t1 PCS	0 64	$F_{1,24}$ = 18 77	001	0 51
Residualized uncertainty	2 24	$F_{1,24}$ = 0 19	67	
Education	2 45	$F_{1,24}$ = 6 29	02	
Eq 2: t1 PCS	0 63	$F_{1,24}$ = 19 40	001	0 51
Residualized discussed illness	−0 21	$F_{1,24}$ = 1 80	19	
Education	2.18	$F_{1,24}$ = 3 93	06	
Eq 2: t1 PCS	0 62	$F_{1,24}$ = 19 42	001	0 53
Residualized self-esteem	4 10	$F_{1,24}$ = 4 53	04	
Education	1 60	$F_{1,24}$ = 2 99	10	
Eq 2: t1 PCS	0 55	$F_{1,24}$ = 24 21	001	0 62
Residualized body image	4 78	$F_{1,24}$ = 13 10	001	
Education	1.21	$F_{1,24}$ = 2 21	15	
T2 Mental Component Score				
Eq 1: t1 MCS	0 36	$F_{1,25}$ = 4 44	05	0 24
Education	2 31	$F_{1,25}$ = 3 34	08	
Eq 2: t1 MCS	0 39	$F_{1,24}$ = 5 23	03	0 26
Residualized uncertainty	0 19	$F_{1,24}$ = 0 72	40	
Education	2 40	$F_{1,24}$ = 2 63	12	
Eq 2: t1 MCS	0 39	$F_{1,24}$ = 5 48	03	0 30
Residualized body image	2 95	$F_{1,24}$ = 2 79	11	
Education	1 84	$F_{1,24}$ = 1 85	19	
Eq 2: t1 MCS	0 34	$F_{1,24}$ = 4 36	05	0 25
Residualized discussed illness	1 82	$F_{1,24}$ = 2 75	11	
Education	1 63	$F_{1,24}$ = 1 05	32	
Eq 2: t1 MCS	0 41	$F_{1,24}$ = 6 80	02	0 43
Residualized self-esteem	11 89	$F_{1,24}$ = 10 89	003	
Education	1.01	$F_{1,24}$ = 0.66	.42	
T3 Physical Component Score				
Eq 1: t1 PCS	0.46	$F_{1,25}$ = 11 55	002	0 39
Education	1 81	$F_{1,25}$ = 4 73	04	
Eq 2: t1 PCS	0 46	$F_{1,24}$ = 10 80	003	0 39
Residualized vicarious control	0 49	$F_{1,24}$ = 0 52	48	
Education	1 96	$F_{1,24}$ = 4 23	05	
Eq 2: t1 PCS	0 45	$F_{1,24}$ = 10 01	004	0 39
Residualized personal control	0 09	$F_{1,24}$ = 0 91	35	
Education	1 86	$F_{1,24}$ = 3 89	06	
Eq 2: t1 PCS	0 43	$F_{1,24}$ = 11 03	003	0 41
Residualized intrusive thoughts	−0 55	$F_{1,24}$ = 1 75	20	
Education	1 84	$F_{1,24}$ = 3 95	06	

Table 5. Pathways by Which Education Intervention Affects Adjustment* (cont)

	β	F† test	P	R^2
T3 Mental Component Score				
Eq 1: t1 MCS	0 38	$F_{1,25}$ = 4 29	05	0 23
Education	2 31	$F_{1,25}$ = 3 12	09	
Eq 2: t1 MCS	0.38	$F_{1,24}$ = 4 31	05	0 23
Residualized vicarious control	0 30	$F_{1,24}$ = 0 42	52	
Education	2 37	$F_{1,24}$ = 2 43	13	
Eq 2: t1 MCS	0.39	$F_{1,24}$ = 4.53	.04	0 24
Residualized personal control	−0 02	$F_{1,24}$ = 0 49	49	
Education	2 28	$F_{1,24}$ = 2 34	14	
Eq 2: t1 MCS	0.59	$F_{1,24}$ = 5 63	03	0 51
Residualized intrusive thoughts	−6 37	$F_{1,24}$ = 19 18	001	
Education	0 59	$F_{1,24}$ = 0 27	.61	
T3 PA				
Eq 1: t1 PA	0 27	$F_{1,25}$ = 3 00	10	0 19
Education	0 17	$F_{1,25}$ = 3 13	09	
Eq 2: t1 PA	0 27	$F_{1,24}$ = 2 90	10	0 19
Residualized vicarious control	−0 01	$F_{1,24}$ = 0 56	46	
Education	0 16	$F_{1,24}$ = 2 06	16	
Eq 2: t1 PA	0 26	$F_{1,24}$ = 2 90	10	0 21
Residualized personal control	0 21	$F_{1,24}$ = 1 85	19	
Education	0 13	$F_{1,24}$ = 1 50	23	
Eq 2: t1 PA	0 23	$F_{1,24}$ = 3 71	07	0 38
Residualized intrusive thoughts	−0 34	$F_{1,24}$ = 10 16	003	
Education	0 08	$F_{1,24}$ = 0 66	42	

*t indicates time. Eq, equation, PCS, physical component score. MCS, mental component score, PA, positive affect

†The F statistics represent significance tests for the individual regression coefficients

increasing their anxiety about their condition (ie, feeling fearful and anxious when seeing someone who is worse off). That negative downward comparisons were problematic is surprising because participants were in the early stages of disease and no one had a recurrence during the 8 weeks in which the groups met. However, women could compare on other dimensions, such as varying adverse effects of chemotherapy and number of cancerous lymph nodes.

It also is disturbing that women assigned to peer discussion groups reported more negative interactions with network members compared with other women. Attending support groups may alter perceptions of existing support or disrupt relations with family and friends.

We do not conclude that women with breast cancer do not benefit from emotional support. Such a conclusion would contradict a vast literature.[3] However, peers may not be the most helpful source of emotional support to women with early-stage breast cancer. Efforts could instead be placed on strengthening existing social networks rather than creating new ones. It also is possible that peer discussion groups are only effective when led by professional therapists and when groups are psychotherapeutic in nature. Spiegel et al[11] found benefits of a year-long intervention, described as group psychotherapy rather than facilitated peer discussion, among women with metastatic breast cancer. The intervention by Spiegel et al[11] is obviously more costly than the interventions we designed. Because our facilitated peer discussion group more closely resembles community support groups, practitioners should at least be aware of the problems that may arise when conducting such groups.

Accepted for publication August 7, 1998

This research was funded by grant R01CA61303 from the National Institutes of Health, Bethesda, Md (Dr Helgeson). Dr Cohen's participation was supported by Senior Scientist Award MH00721 from the National Institutes of Health.

Presented in part at the annual meeting of the Society of Behavioral Medicine, San Francisco, Calif, March 18, 1997.

We thank David Spiegel, MD, and the 3 anonymous reviewers for their comments on a previous draft of the manuscript. We also thank the facilitators and speakers who conducted the groups and the more than 40 physicians who re-

ferred patients to the study. We also thank Pamela Blair, BA; Laura Bogart, PhD; Karen Pealer, BA; and Pamela Snyder, MA, for their invaluable assistance with this research, and Brian Junker, PhD; Joel Greenhouse, PhD; and Alix Gitelman, MS, for their statistical support.

Reprints: Vicki S. Helgeson, PhD, Psychology Department, Carnegie Mellon University, Pittsburgh, PA 15213.

REFERENCES

1 Andersen BL. Psychological interventions for cancer patients to enhance quality of life. *J Consult Clin Psychol* 1992;60:552-568.
2 Trijsburg RW, van Knippenberg FCE, Rijpma SE. Effects of psychological treatment on cancer patients: a critical review. *Psychosom Med* 1992;54:489-517.
3 Helgeson VS, Cohen S. Social support and adjustment to cancer: reconciling descriptive, correlational and intervention research. *Health Psychol.* 1996;15:135-148.
4 Fawzy IF, Cousins N, Fawzy NW, Kemeny ME, Elashoff R, Morton D. A structured psychiatric intervention for cancer patients, I: changes over time in methods of coping and affective disturbance. *Cancer Intervention* 1990;47:720-725.
5 Ferlic M, Goldman A, Kennedy BJ. Group counseling in adult patients with advanced cancer. *Cancer* 1979;43:760-766.
6 Reis TJ, Gerrard M, Gibbons FX. Social comparison and the pill: reactions to upward and downward comparison of contraceptive behavior. *Pers Soc Psychol Bull* 1993;19:13-20.
7 DeVita Jr VT, Hellman S, Rosenberg SA. *Cancer: Principles and Practice of Oncology.* Vol 1. 3rd ed. Philadelphia, Pa: JP Lippincott; 1989.
8 Rosenberg PP. Support groups: a special therapeutic entity. *Small Group Behav* 1984;15:173-186.
9 Spiegel D, Yalom ID. A support group for dying patients. *Int J Group Psychother* 1978;28:233-245.
10 Lieberman MA. Self-help groups. In: Kaplan HI, Sadock BJ, eds. *Comprehensive Group Psychotherapy.* Baltimore, Md: Williams & Wilkins; 1993.
11 Spiegel D, Bloom JR, Kraemer HC, Gottheil E. Effect of psychosocial treatment on survival of patients with metastatic breast cancer. *Lancet* 1989;2:888-891.
12 Ware JE, Snow KK, Kosinski M, Gandek B. *SF-36 Health Survey: Manual and Interpretation Guide.* Boston, Mass: Nimrod; 1993.
13 Wells KB, Stewart A, Hays RD, Burnam MA, Rogers W, Daniels M, Berry S, Greenfield S, Ware J. Detection of depressive disorder for patients receiving prepaid or fee-for-service care: results from the Medical Outcomes Study. *JAMA* 1989; 262:3298-3302.
14 Ware JE, Kosinski M, Keller SD. *SF-36 Physical and Mental Health Summary Scales: A User's Manual.* Boston, Mass: The Health Institute; 1995.
15 Watson D, Clark LA, Tellegen A. Development and validation of brief measures of positive and negative affect: the PANAS scales. *J Pers Soc Psychol* 1988;54: 1063-1070.
16 Horowitz MK, Wilner N, Alvarez W. Impact of Event Scale: a measure of subjective stress. *Psychosom Med* 1979;41:209-218.
17 Rosenberg M. *Society and the Adolescent Self Image.* Princeton, NJ: Princeton University Press; 1965.
18 Schag CAC, Heinrich RL. *CARES Cancer Rehabilitation Evaluation System.* Santa Monica, Calif: Cares Consultants; 1988.
19 Behr SK, Murphy DL, Summers JA. *User's Manual: Kansas Inventory of Parental Perceptions KIPP.* Lawrence: University of Kansas; 1992.
20 Behr SK, Murphy DL. Research progress and promise: the role of perceptions in cognitive adaptation to disability. In: Turnbull AP, Patterson J, Behr SK, Murphy DL, Marquis J, Blue-Banning, eds. *Cognitive Coping, Families, and Disability.* Baltimore, Md: Paul H Brookes Publishing Co; 1993.
21 Collins RL, Taylor SE, Skokan LA. A better world or a shattered vision? changes in life perspectives following victimization. *Soc Cogn* 1990;8:263-285.
22 Helgeson VS. Moderators of the relation between perceived control and adjustment to chronic illness. *J Pers Soc Psychol* 1992;63:656-666.
23 Campbell SM, Dunkel-Schetter CA, Peplau LA. Perceived control and adjustment to infertility among women undergoing in vitro fertilization. In: Stanton AL, Dunkel-Schetter CA, eds. *Infertility: Perspectives From Stress and Coping Research.* New York, NY: Plenum Publishing Corp; 1991.
24 Helgeson VS, Franzen PL. The role of perceived control in adjustment to diabetes. *Anxiety Stress Coping* 1998;11:113-136.
25 Mishel MH. The measurement of uncertainty in illness. *Nurs Res.* 1981;30:258-263.
26 Wortman CB, Lehman DR. Reactions to victims of life crises: support attempts that fail. In: Sarason IG, Sarason BR, eds. *Social Support: Theory, Research and Applications.* Dordrecht, the Netherlands: Martinus Nijhoff; 1985:463-489.
27 Dakof GA, Taylor SE. Victims' perceptions of social support: what is helpful to whom? *J Pers Soc Psychol* 1990;58:80-89.
28 Gibbons RD, Hedeker D, Elkin I, Waternaux C, Kraemer HC, Greenhouse JB, Shea MT, Imber SD, Sotsky SM, Watkins JT. Some conceptual and statistical issues in analysis of longitudinal psychiatric data. *Arch Gen Psychiatry* 1993; 50:739-750.
29 *S-Plus 4 Guide To Statistics.* Seattle, Wash: Data Analysis Products Division, MathSoft; 1997.
30 Baron RM, Kenny DA. The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *J Pers Soc Psychol* 1986;51:1173-1182.
31 Wells KB, Sturm R, Sherbourne CD, Meredith LS. *Caring for Depression.* Cambridge, Mass: Harvard University Press; 1993.

Printed and Published in the United States of America