

Cancer-behavior-coping in women with breast cancer: Effect of a cancer self-management program

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ABSTRACT

Objective: The Cancer Behavior Inventory (CBI), a measure of self-efficacy for coping with cancer, was used to examine the feasibility and impact of a self-management program for women with breast cancer. This controlled clinical trial was conducted on newly diagnosed breast cancer patients, using a time series, block design. Sixty-nine patients were allocated to receive four weekly sessions of the self-management training program, while 78 patients were allocated to the control (usual-care) group. **Results:** A significant difference was found between the means of the experimental and the control group at post-test (T2; $P=.01$) and at follow-up (T3; $P=.02$). The multivariate analyses of the three repeated measures showed significant differences ($P=.001$; partial eta-squared = 0.092). Pair-wise comparison shows that the differences were significant between baseline (T1) measure and follow-up (T3) measure ($P=.01$), and between post-test (T2) and follow-up (T3) ($P=.03$). **Conclusion:** For women undergoing intervention, the cancer-specific self-efficacy as measured by the cancer-behavior-coping inventory showed improvement over time. The result demonstrated that the self-management program to improve self-care correlates significantly with coping behavior in cancer. A larger and longer study of this efficacy-enhancing intervention is warranted.

Key words: Breast cancer, cancer behavior coping inventory, cancer self-efficacy, self-management

INTRODUCTION

Human performance and functioning is deeply embedded in cognitive, vicarious, self-regulatory, and self-reflective processes, which play a central role in human adaptation and behavior change.^[1,2] Self-efficacy, the central tenet of self-management, is a construct that has been widely applied in the behavioral sciences and human services. The terms self-efficacy, locus of control, and self-esteem, though often used interchangeably, are not similar. Self-esteem refers to one's own perception of self-worth,^[3] while locus of control refers to

one's beliefs with regard to explanation of outcomes, i.e., the relative influences of external forces beyond the individual's control and internal forces that are under the individual's control.^[4] In contrast, self-efficacy refers to one's perception of one's skills and abilities to act effectively and competently. These perceptions influence actions and coping behaviors, the situations and environments that individuals choose to access, and the individual's persistence in performing certain tasks. One cancer-specific self-efficacy measurement tool is the Cancer Behavior Inventory (CBI), which measures self-efficacy for coping with cancer.^[5] Although, the mechanism of how self-efficacy influences health behaviors is still not clear, it is a crucial construct to explain the promotion of health-behavior in chronic disease self-management.

Breast cancer has one of the best survival rates among the various types of cancers.^[6] It is increasingly being seen as a chronic illness,^[7] with many persistent medical and non-medical problems.^[8] As the most common cancer in women in the Asian regions,^[9] it warrants more interventions to curb its burden and to address the needs of women. The World Health Organization defines a chronic disease as one having one or more of the following characteristics:

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it is permanent, it involves residual disability, it is caused by nonreversible pathological alteration, and it requires special training/rehabilitation or a long period of supervision, observation, or care.^[10,11] Therefore, based on reviews on survivorship and the challenges faced over indefinite periods, the breast cancer condition can be classified as a form of chronic illness. The steep rise in chronic illnesses constitutes a challenge of great importance for health and social policy.^[12-15] New approaches are urgently needed, as increases in life expectancy coupled with the increased risk of breast cancer in older women will contribute to the burden of care in the years to come.^[16-18]

This paper highlights the changes in the level of coping self-efficacy in women with breast cancer in the experimental group versus the control group. The experimental group received a 4-week self-management program on top of usual care, whilst the control received usual care. We compared the self efficacy scores of the cancer coping behavior of the women from the two groups. We take a theoretical view that cancer survivors are people who can be viewed as self-organizing, self-regulating, and proactive persons rather than mere reactive organisms, shaped and shepherded by environmental forces or merely driven by concealed inner impulses.^[1] From this theoretical perspective, human functioning is viewed as the product of a dynamic interplay of personal, behavioral, and environmental influences, although cognition plays a critical role in people's capability to construct reality, self-regulate, encode information, and perform behaviors. Thus, perceived self-efficacy is an important variable to study when examining how cancer survivors perceive their confidence (on ability to act effectively and competently) in managing cancer-related tasks, as these beliefs influence their coping behaviors and is thus an important element for predicting adjustment after a cancer diagnosis.

MATERIALS AND METHODS

After ethical clearance, women with newly diagnosed breast cancer were allocated to either the experimental or the control block. A quasi-experimental clinical trial design was selected whereby the first 69 women were allocated to the experimental arm and received the 4-week intervention in addition to the usual care. Subsequently recruited women ($n=78$) constituted the control arm (receiving only usual care). The experimental block received the four weekly sessions (2 hour each) of self-management interventions in addition to the usual medical care.

This study had a total of 147 subjects, and all completed the protocol. The inclusion criteria were women with newly diagnosed breast cancer who were i) above 18 years of age,

ii) diagnosed with stage I-III cancer within the last 12 months (first diagnosis, as confirmed by a physician), iii) undergoing adjuvant/hormonal therapy, iv) able to read and understand English, and v) gave informed consent. They were excluded if there was severe cognitive impairment or learning disability (assessed through observation/interview) or other medical conditions interfering with participation and full attendance (e.g., being treated for stroke, on dialysis, etc).

The CBI was measured at three time points: baseline, post intervention, and at follow-up. A self rating by the women on their confidence level on several health behavior was conducted, as a fidelity check on the experimental group. This fidelity check was conducted at the end of the 4-week 'Staying Abreast, Moving Ahead' (SAMA) intervention for the experimental group. The fidelity check uses a self-report rating form, whereby the women were asked to reflect and rate their confidence level (on a sampling of health behaviours) at before the 4 weeks program, and at completion of the program. The mean scores of the women ratings, prior to the intervention was compared with the mean scores of their rating after the program.

The self-management intervention

The content of the 4-week self-management, SAMA, program was developed based on insights gathered from analysis of the four focus group discussions with women with breast cancer and consistent with self-management philosophy.^[19] The intervention was a program facilitated by health therapists and delivered over 2 hours, once a week, for 4 weeks in the cancer resource center. Workshops were facilitated by two trained leaders, one or both of whom were non-health professionals with a chronic diseases themselves. Both didactic and interactive sessions with activities were embedded in the program. Weeks 1 to 4 dealt with enabling the medical tasks, emotional tasks, health tasks, and role tasks.^[20,21] Topics included: i) 'my cancer profile'; ii) symptom charting and problem solving; iii) techniques to cope with changing emotions; iv) maintaining health, abiding with guidelines, eating healthy; and v) communicating effectively with family, friends, and health professionals. Participants were assigned buddies for mutual support and sharing of experience of successes; this was aimed at building their confidence in managing their own health.

Cancer Behavior Inventory

The CBI was reported as having good reliability on its various factors: i) maintenance of activity and independence ($\alpha=0.86$), ii) seeking and understanding medical information ($\alpha=0.88$), iii) stress management ($\alpha=0.86$), iv) coping with treatment-related side effects ($\alpha=0.82$), v) accepting cancer/maintaining positive attitude ($\alpha=0.86$), vi) affective regulation ($\alpha=0.81$),

and vii) seeking support ($\alpha=0.80$). The α for the entire CBI was 0.94, the test–retest (1 week) reliability coefficient was 0.74, and correlations with measures of quality of life and coping supported its validity. The brief CBI may be useful for researchers and clinicians and is recommended to be integrated into a self-regulation model of coping.

Data analysis

Data was analyzed using SPSS 16. Intention-to-treat analysis was conducted on the 147 participants (69 from the experimental group and 78 from the control group). All data were checked thoroughly. The missing data were imputed via mean substitution. The repeated-measure analysis of variance was conducted to examine: i) difference in scores between the experimental and control groups and ii) difference in scores before and after intervention with-in the experimental group. Student *t*-test was used to examine the fidelity check (pre- vs post-intervention ratings) on the confidence levels of the participants.

RESULTS

Fidelity check

The outcome of the fidelity check showed an increase in self-reported ratings of self-confidence on health behavior at post-test compared to at baseline ($P<.05$) [Table 1]. In Table 1, the line graph connects the mean scores on the various behavioural items. A clear positive shift in the perceived level of confidence before and after the SAMA program was

Table 1: Fidelity check - confidence (increase confidence in health behavior)

Parameter/Assessment question	Mean Scores	
	Pre-SAMA	Post-SAMA
Knowledge of treatment options	2.1	4.5
Knowledge on managing symptoms	2.5	4.8
Communicate with health staff		
Getting information from health staff	2.5	4.6
Asking questions	2.4	4.6
Resource utilization		
Getting aids (wig, prosthesis)	2.6	5.0
Getting support (buddy, etc.)	2.5	5.0
Awareness of risk reduction habits		
Awareness of need to exercise	2.5	4.4
Awareness of ideal body weight	2.3	4.5
Awareness of diet goals	2.6	4.5
Awareness of breast health, BSE	2.6	4.6
Engaging in healthy habits		
Practice exercise regularly	2.3	4.4
Maintain ideal body weight	2.2	4.2
Perform breast check periodically	2.3	4.5
Check mental hygiene regularly	2.2	4.4
Fight negative thoughts	2.3	4.4
Manage physical symptoms	2.3	4.5
Adopt social recreation activities	2.5	4.5

Pre-SAMA (mean scores = 2.5 ± 0.12), Post-SAMA (mean scores = 4.5 ± 0.08); BSE: Breast self examination

observed. This report can also serve as a triangulation method for verification of the improvement of the self-efficacy of the women as measured with the cancer self-efficacy tools.

Demographics

Demographic data was obtained from the patient information questionnaire (PIQ). Of the 147 women, the majority were Chinese (65%). The mean age was 50 ± 9 years (range: 25–75 years). More than two-thirds of the women were married (76%). Majority were living with their spouse and children (68%) and/or with parents/in laws. Only a negligible 6.8% were living alone, suggesting that the traditional Asian practice of living within an extended family system is still highly prevalent. More than half the women had some form of medical or health insurance schemes (53%). Almost half (42%) of the sample cohort was working either part-time or full-time. Overall, two-thirds of the women had been diagnosed with a stage I–IIA breast cancer (62.6%). About 30% had the non life-threatening ductal carcinoma *in situ* (or ductal intraepithelial neoplasia) and 29% had a Bloom-Richardson score of grade II–III cancer. Almost 40% had tumor size of 2–5 cm. Most women (64%) reported having estrogen/progesterone-positive cancer.

Baseline differences

One-way analysis of variance showed that at baseline there was no difference between the experimental group and control group. This suggests that the women in the two groups were comparable at baseline and any subsequent changes can be said to be due to the impact of the treatment [Table 2].

Repeated measures between groups

The four demographics found to be significantly different between the two groups at baseline were: ethnicity (95 Chinese vs 52 other ethnic groups); insurance coverage (78 insured vs 69 noninsured); activity level (46 sedentary, 60 light, 22 moderate, 19 active); and exercise group (129 with <5 hours vs 18 with >5 hours). These demographic factors and the group (experimental vs control) were added into the repeated-measure analysis as the between-group factors. There were three repeated measure—at baseline (T1), at immediately post intervention (T2) and at 4 weeks after intervention (T3). The mean-differences between the experimental group and the control group for cancer behavior coping was statistically significant at $P<0.05$. Means score for experiment group was higher than the mean scores of the control group.

Repeated measures within the experimental group

The multivariate analyses on the effect of the three repeated timings showed $F(2, 144) = 7.25$, partial eta-squared = 0.092, and a power of 93% [Table 3 and Figure 1]. Pair-wise comparison shows that the differences between baseline (T1)

and follow-up (T3) ($P=.01$) and between post-test (T2) and follow-up (T3) were both significant ($P=.03$) [Table 2].

DISCUSSION

The significant favorable improvement on the cancer behavior self-efficacy measures of the women in the experimental group was immediate at post intervention and it continues even at 4 weeks after intervention. These improvements on the cancer behavior self-efficacy measures in the experimental group, correlates with the positive results of the fidelity check. These matched results add to the confidence that the 4-week self-management intervention was effective in improving patient self-management, which have a positive effect on the self efficacy of the women. In comparison, the cancer behavior self-efficacy scores of the control group showed deterioration in scores at baseline compared to post intervention. This shows that a woman’s perception of her skills and abilities to self manage/act effectively

influences her actions and coping behaviors, the situations and environments she chooses, and finally her persistence in performing certain tasks.^[1]

Although a randomized controlled trial is the gold standard and the preferred design for a clinical trial, this trial adopts a quasi-experimental design; this was a nonrandomized study because it was logistically neither feasible nor ethical to conduct a randomized controlled trial in this scenario.^[22] The reasons being i) the possibility of contamination by diffusion, i.e., when the subjects in the control group learnt from those in the experimental group, either directly or indirectly; and ii) the chemotherapy treatment was delivered over a duration of 4–6 months, making it highly likely that the subjects would meet in the confined environment of the medical center. Thus a time series, block design was adopted, whereby the experimental subjects were seen first, followed by control subjects.

The results demonstrate that patients’ measures of self-efficacy can improve over time with a cancer self-management support intervention. Perceived self-efficacy influences actions and coping behaviors and contributes to the adjustment process after a cancer diagnosis. We conclude that this study provides preliminary evidence that patient self-management can be used to build survivors’ confidence. Patients’ self-efficacy showed a positive influence on survivors’ self-care adjustment over the 4-week follow-up; thus, longer follow-up is warranted to examine if the improvement in self-efficacy can be sustained and to study their impact on the health behaviors of cancer survivors who now live with a cancer diagnosis for indefinite periods.

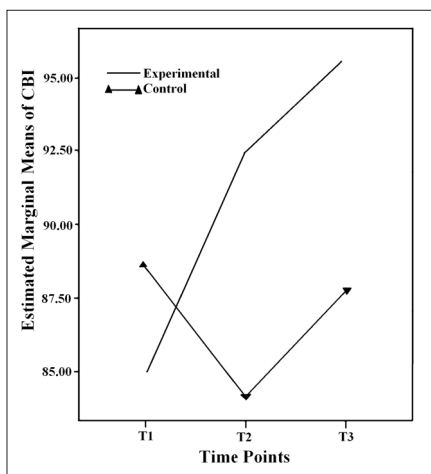


Figure 1: Graphical comparison between Cancer Behavior Inventory of experimental and control group at different time points (T1: baseline, T2: post-test, T3: follow-up)

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Table 2: Cancer Behavior Inventory (CBI) in experimental and control groups at different time points

Group at different time points	CBI score			F	P
	Min	Max	Mean ± SD		
Experiment T1	32.0	122.0	84.84 ± 20.50	1.421	0.235
Control T1	53.0	121.0	88.50 ± 16.68		
Experiment T2	47.0	126.0	92.48 ± 18.12	6.781	0.010
Control T2	29.0	126.0	84.12 ± 20.52		
Experiment T3	48.0	126.0	95.67 ± 20.26	5.648	0.019
Control T3	44.0	126.0	87.74 ± 20.09		

T1: At baseline, T2: post-test, T3: follow-up

Table 3: Estimate for the overall Cancer Behavior Inventory (CBI)

Group allocation	CBI (mean+SD)	95% CI	P	Effect size	Power
Experimental	90.995 ± 2.028	(86.987, 95.004)	0.001	0.09	93%
Control	86.786 ± 1.908	(83.016, 90.556)			

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