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# The evaluation of the effectiveness of a health promotion training on breast cancer survivors

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## Abstract:

**BACKGROUND:** Increased early diagnosis and improved treatment options have decreased the mortality rate of breast cancer and increased the survival rate. Healthy lifestyle behaviors are very important in breast cancer survivors as they reduce mortality and morbidity rates, cancer recurrence frequency, and side effects of treatment and improve health. This study was conducted to evaluate the effectiveness of a health promotion training intervention in breast cancer survival.

**MATERIALS AND METHODS:** The study is a quasi-experimental, pre-test–post-test and single-group study. It was conducted with 43 women breast cancer survivors. The “Healthy Lifestyle Behaviors Scale II” was used to collect the data. Four sessions of training were given to the women once a week, and a 3-month post-training follow-up was performed. The *t*-test, Wilcoxon analysis, and Spearman correlation analysis were used to evaluate the data.

**RESULTS:** Pre-training and post-training scores in the sub-dimensions and total scores of the healthy lifestyle behavior scale showed that the training was highly effective. There was a significant increase in all sub-dimensions and total scale post-training scores ( $P < 0.05$ ). In the correlation analysis, a negative correlation was found between age and physical activity, between elapsed time after diagnosis and nutrition, and between elapsed time after diagnosis and spiritual development ( $P < 0,05$ ). However, there was a positive correlation between educational status and nutrition ( $P < 0.05$ ).

**CONCLUSIONS:** The results show that a health promotion training program covering physical activity/exercise, healthy nutrition, effective communication, coping with stress, and increasing health responsibility had positive effects on healthy lifestyle behaviors in this population, and age, educational status, and elapsed time after diagnosis influence healthy lifestyle behaviors in survival.

## Keywords:

Breast cancer, health promotion, survival, training

## Background

Breast cancer is a global public health problem. The International Agency for Research on Cancer (IARC) estimates that there were more than 2.26 million new cases and approximately 685,000 deaths from breast cancer in 2020 worldwide.<sup>[1]</sup> World Health Organization (WHO) announced that 7.8 million women diagnosed with breast cancer in the last 5 years had survived by the end of 2020, making it the most common cancer in the world.<sup>[2]</sup> Currently,

breast cancer mortality rates are decreasing, and survival rates are increasing thanks to early diagnosis and improved treatment options.<sup>[3,4]</sup> According to recent reports, breast cancer survival for at least 5 years after diagnosis is more than 90% in high-income countries.<sup>[2]</sup>

Recent literature reports that healthy lifestyle behaviors improve health and significantly reduce mortality and morbidity rates, cancer recurrence, and side effects of treatment during cancer survivorship.<sup>[5,6]</sup> The cancer survivor population needs information and counseling on diet, exercise, mental

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health, and so on. Therefore, it is a critical issue to focus on promoting healthy lifestyle behaviors in health services.<sup>[7,8]</sup>

Healthy lifestyle behaviors are defined as the individual's taking control of behaviors that are effective in improving health and implementing them in daily life.<sup>[9]</sup> According to the health promotion model, physical activity, stress management, nutrition, health responsibility, inter-personal relationships, and spiritual development are among healthy lifestyle behaviors.<sup>[10]</sup> There is an increasing body of literature emphasizing the significance of healthy nutrition and physical activity to reduce the rate of recurrence and mortality and the side effects of cancer treatment and increase healthy survival.<sup>[11-13]</sup> However, studies also show that breast cancer survivors do not adhere to recommended dietary and physical activity guidelines.<sup>[14-16]</sup> In addition to daily stressors, breast cancer survivors often deal with the fear of recurrence or developing new cancer, which can lead to high levels of stress.<sup>[17,18]</sup> Coping with stress is effective in increasing the breast cancer survival rate.<sup>[17]</sup> A healthy lifestyle improves longer and healthier survival in breast cancer.<sup>[19,20]</sup> In breast cancer survival, women's inter-personal relationships with their environment (spouse, family, friends, etc.) may have positive or negative effects, and supportive relationships may be effective in promoting healthy survival.<sup>[21,22]</sup>

Enhanced spiritual well-being is effective in providing a positive perspective in the face of traumatic and negative situations, reducing pain, and increasing life satisfaction and self-belief.<sup>[23,24]</sup> A study evaluating the role of spirituality highlighted that spirituality is the main coping mechanism used at all stages of the cancer journey.<sup>[25]</sup>

Unfortunately, the treatment of cancer patients often focuses only on the pharmacological problems of the disease. However, as mentioned above, a healthy lifestyle has positive effects on cancer and survival, and integrating healthy lifestyle behaviors into health services is essential for a holistic patient-centered approach.

In the primary health care system, public\community health nurses play a critical role in health protection and promotion.<sup>[26]</sup> In the holistic approach, nurses focus on assisting individuals, families, and communities to make health-related decisions or supporting their participation in health promotion activities.<sup>[27,28]</sup> In health promotion activities, nurses aim to change individuals' behaviors and use health training, the most common health promotion intervention, to change health behaviors.<sup>[28,29]</sup>

Public health nurses need to include healthy lifestyle behaviors (physical activity, nutrition, health

responsibility, and inter-personal relationships), which are effective in promoting the health of survivors of breast cancer, one of the critical population groups, in educational interventions. This study was conducted to evaluate the effectiveness of a health promotion training intervention in breast cancer survival.

## Materials and Methods

### Study design and setting

The study was conducted between 2014 and 2015 in a single group using pre-test-post-test and quasi-experimental methods.

### Study participants and sampling

Forty-three volunteer women who completed chemotherapy and/or radiotherapy treatments in the oncology outpatient clinic of a training and research hospital were included in the sample.

The exclusion criteria include to have metastasized, inability to communicate verbally, an age under 18, and a history of psychiatric illness.

### Data collection tool and technique

The data were collected using the Demographic Information Form and the Healthy Lifestyle Behavior Scale II with 52 items.

The research data were collected by the researcher through home visits and face-to-face interview technique. During the data collection in the pre-test phase, Demographic Information Form and the Healthy Lifestyle Behavior Scale II of women were used. Upon completion of the training program, the Healthy Lifestyle Behavior Scale II was administered to the women in order to gather post-test data.

### The healthy lifestyle behavior scale II

Developed by Walker *et al.*<sup>[10]</sup> (1987) and revised in 1996 (Walker and Hill-Polerecky,<sup>[30]</sup> 1996), the scale measures health-promoting behaviors related to an individual's healthy lifestyle. It has 52 items and 6 sub-factors. The sub-factors are spiritual development, health responsibility, physical activity, nutrition, inter-personal relationships, and stress management. The overall score of the scale gives the healthy lifestyle behaviors score. All items of the scale are positive and have a 4-point Likert scale: never (1), sometimes (2), often (3), and regularly (4). The minimum and maximum scores on the scale are 52 and 208. The validity and reliability study for the adaptation of the scale into Turkish was conducted by Bahar *et al.* in 2008.<sup>[31]</sup> In this study, the Cronbach's alpha coefficient of the scale was found to be 0.92. The Cronbach's alpha coefficient of the sub-scales varied between 0.68 and 0.82.

## Research plan

The Healthy Lifestyle Behaviors Scale II was administered to the participants as a pre-test to assess their healthy lifestyle behaviors before the training program. Then, a training intervention lasting 50–60 minutes, one session per week for 4 weeks, was implemented during a home visit on the following healthy lifestyle behaviors. Post-test data were collected after the training.

The training topics were the importance of healthy lifestyle behaviors in survival, physical activity/exercise, coping with stress, nutrition, health responsibility, inter-personal relationships, and effective communication.

## Statistical method

The Statistical Package for the Social Sciences SPSS (V22.0) package program was used for the statistical analysis of the data. Descriptive data were expressed as percentage, mean, and standard deviation. In the statistical analysis of quantitative data, t-tests and Wilcoxon analysis were performed. Spearman correlation analysis was used to evaluate the relationship between variables.

## Ethical consideration

Ethical approval for this study was obtained from the Ethics Council of the University (Decision no: 2014\129). Informed consent was obtained from all the participants.

## Results

According to the results, 39.5% of the women were in the 50–59 age group, 55.8% had primary education, and the elapsed time after diagnosis was 0–4 years for 65.1% [Table 1]. The mean score of the healthy lifestyle scale was  $140.28 \pm 19.5$  before the training and  $166.84 \pm 15.25$  after the training [Table 2].

In the Spearman correlation analysis performed after the training, there was a statistically negative and moderately significant relationship between age and physical activity scores, a positive and moderately significant relationship between educational status and nutrition, a negative and moderately significant relationship between elapsed time after diagnosis and nutrition, and a negative and weak significant relationship between elapsed time after diagnosis and spiritual development [Table 3].

## Discussion

In this study, the mean score for a health-promoting lifestyle was found to be moderate, similar to an earlier study, and the highest and lowest mean scores were obtained from spiritual development and physical activity, respectively.<sup>[32]</sup> Age, educational status, and elapsed time since diagnosis were found to be factors affecting healthy lifestyle behaviors.

**Table 1: Determinant factors**

	Group (n=43)	
	S	%
Age		
40-49 years	16	37.2
50-59 years	17	39.5
60-69 years	10	23.3
Education status		
Literate	11	25.6
Primary education	24	55.8
High school degree and ↑	8	18.6
Number of children		
1	2	4.7
2	17	39.5
3	13	30.2
4 ≤	11	25.6
The stage at the time of diagnosis		
Stage I	9	20.9
Stage II	25	58.2
Stage III	9	20.9
Elapsed time since diagnosis		
0-4 years	28	65.1
5+ years	15	34.9

**Table 2: Comparison of the pre-test–post-test average scores of the sub-dimensions of the SYBD scale**

Participants (n=43)	Pre-training	Post-training	P
Health Responsibility			
A.M±SD	26,26±5,62	29,88±3,71	Z=-5,318
Median (min-max)	28 (12-34)	31 (19-34)	0,0001*
Physical Activity			
A.O±SD	10,21±4,41	18,51±3,28	Z=-5,657
Med (min-max.)	8 (8-26)	19 (12-26)	0,0001*
Nutrition			
A.O±SD	22,16±5,21	28,4±3,52	t=-11,552
Med (min-max.)	22 (11-34)	29 (20-35)	0,0001*
Spiritual Development			
A.O±SD	30,86±3,56	32,7±2,74	Z=-4,893
Med (min-max)	32 (21-36)	33 (24-36)	0,0001*
Interpersonal relationships			
A.O±SD	29,88±4,74	31,51±3,94	Z=-4,498
Med (min-max)	31 (17-36)	32 (20-36)	0,0001*
Stress Management			
A.O±SD	20,91±4,72	25,84±3,21	Z=-5,725
Med (min-max)	21 (11-30)	27 (20-32)	0,0001*
Total			
A.O±SD	140,28±19,5	166,84±15,25	t=-16,070
Med (min-max)	139 (91-177)	169 (123-194)	0,0001*

\*P<0.05 statistically significant difference; t: Significance Test for the Difference Between Two Pairs; Z: Wilcoxon Paired Two Sample Test

Physical activity is a significant modifiable lifestyle behavior influencing the health outcomes of cancer survivors.<sup>[33]</sup> However, a recent study shows that the physical activity level of women is low. Consistent with our study, it is reported that breast cancer survivors reduced their physical activities, mostly with a further decline in activity over 10 years or more.<sup>[15]</sup>

**Table 3: Correlation coefficients between post-training demographic factors and HLBD scale sub-dimensions (Spearman)**

Post-training <i>r</i> ( <i>P</i> )	Health Responsibility	Physical Activity	Nutrition	Spiritual Development	Interpersonal Relationships	Stress Management	Total
Age	-0.179 ( <i>P</i> =0.25)	-0.312* ( <i>P</i> =0.042)	-0.121 ( <i>P</i> =0.439)	-0.056 ( <i>P</i> =0.719)	0.219 ( <i>P</i> =0.158)	0.116 ( <i>P</i> =0.46)	-0.039 ( <i>P</i> =0.802)
Education status	0.183 ( <i>P</i> =0.24)	0.181 ( <i>P</i> =0.246)	0.309* ( <i>P</i> =0.043)	0.177 ( <i>P</i> =0.256)	-0.198 ( <i>P</i> =0.202)	0.073 ( <i>P</i> =0.644)	0.139 ( <i>P</i> =0.375)
Number of children	-0.193 ( <i>P</i> =0.215)	-0.191 ( <i>P</i> =0.221)	-0.086 ( <i>P</i> =0.584)	-0.042 ( <i>P</i> =0.787)	0.042 ( <i>P</i> =0.788)	0.014 ( <i>P</i> =0.929)	-0.058 ( <i>P</i> =0.712)
The stage at the time of diagnosis	0.044 ( <i>P</i> =0.78)	0.143 ( <i>P</i> =0.36)	0.116 ( <i>P</i> =0.457)	0.042 ( <i>P</i> =0.787)	0.022 ( <i>P</i> =0.889)	0.108 ( <i>P</i> =0.491)	0.112 ( <i>P</i> =0.476)
Elapsed time since diagnosis	0.008 ( <i>P</i> =0.958)	-0.076 ( <i>P</i> =0.63)	-0.313* ( <i>P</i> =0.041)	-0.296* ( <i>P</i> =0.05)	-0.116 ( <i>P</i> =0.458)	-0.07 ( <i>P</i> =0.654)	-0.169 ( <i>P</i> =0.278)

\**P*<0,05 statistically significant correlation (Spearman Correlation Analysis)

Cancer survivors engage in less physical activity than others.<sup>[34]</sup> As noted in previous studies, low physical activity among breast cancer survivors may be due to the insecurity and uncertainty about how to perform certain exercises, fear of injury due to general health problems, physical limitations (e.g., lymphedema, fatigue, obesity, lack of time, weight gain after chemotherapy), and low confidence and understanding of the benefits of exercise.<sup>[34-36]</sup> DeNysschen *et al.*<sup>[16]</sup> (2015) showed that physical activity levels were low in breast cancer survivors, but most women were interested in increasing their activity levels. These findings suggest the need for educational interventions to increase physical activity in breast cancer survivors. Our study shows that health promotion training given to breast cancer survivors is effective in increasing physical activity levels.

The literature is consistent with this present study and shows that the level of physical activity after breast cancer decreases with increasing age.<sup>[37,38]</sup> Age is a determining factor in physical activity in cancer survivors. Therefore, public health nurses need to prepare interventions to promote physical activity in this population based on age.

Women experience stress/post-traumatic stress in breast cancer survival.<sup>[39,40]</sup> These data reveal that women need stress management programs. In our study, the stress management level of post-survival women was moderate and increased after the training provided. A stress management program is an effective strategy to help women exposed to stress.<sup>[41]</sup> Therefore, it is recommended that public health nurses include stress management in health promotion training programs for breast cancer survivorship.

Healthy eating is one of the most reported health-related lifestyle changes after a cancer diagnosis,<sup>[42]</sup> yet most survivors do not comply with healthy eating guidelines.<sup>[43]</sup> Breast cancer survivors do not follow dietary recommendations and have low fruit and

vegetable intake and high dietary fat intake.<sup>[14,16]</sup> Unlike the literature, in the current study, the nutritional level was found to be moderate, which may be explained by the difficulty of maintaining healthy lifestyle behaviors like low diet quality in long-term cancer survivors compared to recently diagnosed patients.<sup>[43,44]</sup> The findings suggest that women survivors need training on topics like choosing and organizing their meals to increase the level of healthy eating.

Cancer survivors believe that nutrition is important, but health care teams often do not address nutrition issues, and healthy eating should be a core part of the cancer care process.<sup>[45,46]</sup> Breast cancer survivors were highly concerned about weight gain and needed individualized guidance.<sup>[47]</sup> In our study, health promotion training provided to breast cancer survivors is effective in healthy eating.

Low education level is a risk factor for breast cancer.<sup>[48]</sup> Research shows that individuals with low levels of education generally have a low tendency to eat healthily.<sup>[49,50]</sup> Similar to previous studies, in this study, as the education level of breast cancer survivors increased, their healthy eating habits also increased. A recent study supported the findings of the current study and showed that women's healthy eating habits decreased as the time since diagnosis increased.<sup>[51]</sup> Public health nurses should prepare the content of the training program by considering the level of education of women and the elapsed time since diagnosis while providing nutrition education to surviving women.

In parallel to the impact of individual lifestyle choices on health, the role of personal responsibility is inevitably gaining importance.<sup>[52]</sup> Health responsibility is an effective factor for individuals to develop a healthy lifestyle such as healthy eating and adequate physical activity.<sup>[19]</sup> In the current study, women's health responsibility was at a moderate level and health training was found to be effective in increasing women's health

responsibility. Positive inter-personal relationships with women's environment (spouse, family, friends, etc.) are effective in healthy survival in breast cancer survival.<sup>[21,22]</sup> Women had moderate inter-personal relationships, and the health promotion training increased their inter-personal relationships in our study. Therefore, public health nurses should educate women about the importance of taking responsibility for their health, establishing healthy inter-personal relationships during their survival, and participating in supportive social, friend, and family relationships.

Spiritual development makes cancer diagnosis meaningful;<sup>[53]</sup> improves the psychological, spiritual, and general well-being of patients; reduces depression;<sup>[54]</sup> and boosts the enjoyment of life and peace of mind.<sup>[55]</sup> In the present study, women's spiritual development was at a moderate level and increased after education, and spiritual development decreased with time after diagnosis. The present data show that women need spiritual development in the early survival period.

After these considerations on the positive effects of healthy lifestyle behaviors on breast cancer survival and the current results, it is concluded that this population needs interventions for health-promoting lifestyle behaviors. The health promotion training provided by public health nurses to this population is effective in increasing healthy lifestyle behaviors.

### Limitation and recommendation

The limitation of this study was the selection of participants from one hospital. Other studies are recommended by selecting a sample group from more than one hospital.

### Conclusion

Our study demonstrated that health promotion training given to women survivors of breast cancer is effective in increasing physical activity, healthy nutrition, developing positive inter-personal relationships, taking responsibility for their health, using effective stress coping methods, and spiritual development. Age influences physical activity, education level influences nutrition, and elapsed time since diagnosis influences nutrition and spiritual development. These results will guide the educational interventions that public health nurses will prepare to provide healthy lifestyle behaviors to survivors of breast cancer.

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### Conflicts of interest

There are no conflicts of interest.

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