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Comparison of the Effect of 2 Virtual Education Methods: Family-based Versus Peer-Support on Perceived Stress and Stress Coping in Women with Breast Cancer: A Randomized Controlled Trial

Somayyeh Shalchi Oghli[1], Roya Sadeghi[1]*, Ramesh Omranipour[2], Abbas Rahimi Foroushani[3], Mahnaz Ashoorkhani[1,4], Yaser Tedadi[1]

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Abstract

Background: Stress is an overwhelming feeling in patients with breast cancer (BC). However, The effect of virtual education has not been fully regulated. Hence, this study intends to compare the impact of 2 virtual education methods on perceived stress and stress coping in women with BC.

Methods: A 3-armed randomized clinical trial was conducted among 315 women with BC who were referred to the Cancer Institute in Tehran. They were randomly assigned to 3 groups: (a) Family-based, receiving family-based training package; (b) peer-support, receiving peer-support educational package; and (c) control, receiving routine hospital care. Data were collected through demographic and disease characteristics, the Perceived Stress Scale (PSS-14), and Coping Inventory for Stressful Situations (CISS-21) questionnaires before and 3 months after the intervention.

Results: The effect of the group factor after controlling the before-intervention scores in perceived stress, problem-oriented, emotion-oriented, and avoidance-oriented strategies were $P < 0.0001$, $P = 0.015$, $P < 0.0001$, and $P = 0.111$, respectively. Also, the effect of the confounding factor of BC disease stage in the dependent variables was $P = 0.527$, $P = 0.275$, $P = 0.358$, and $P = 0.609$, respectively. The effect size test showed that before the intervention, the mean scores of perceived stress, problem-oriented, emotion-oriented, and avoidance-oriented strategies were 32.00 ± 7.03, 19.36 ± 4.68, 25.10 ± 5.90, and 17.65 ± 6.64 respectively, but after the intervention showed a decrease in mean scores of perceived stress, emotion-oriented, and avoidance strategies.

Conclusion: What is vibrant in virtual family-based education is far more effective than peer support when problem-oriented coping increases. Conversely, reducing perceived stress in women with BC receiving enough information and family support should be considered.

Keywords: Virtual Education, Family-Based, Peer-Support, Breast Neoplasms, Stress

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Introduction

Breast cancer (BC) is the most common and fatal form of cancer in women, while it also appears to be the most

Corresponding author: *Dr Roya Sadeghi, sadeghir@tums.ac.ir*

1. Department of Health Education and Promotion, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran
2. Breast Cancer Research Center, Tehran University of Medical Sciences, Tehran, Iran
3. Department of Epidemiology and Biostatistics, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran
4. Community-Based Participatory Research Center, Iranian Institute for Reduction of High-Risk Behaviors, Tehran University of Medical Sciences, Tehran, Iran

↑What is "already known" in this topic:
BC is the most common cancer diagnosis in women. Despite cancer diagnostic and treatment advances in the field of cancer, BC is a significant concern for patients. The supportive and informative interventions can decrease their stress. Notably, virtual interventions can solve geographic distance limitations, and scheduling issues make face-to-face clinical interviews impractical.

→What this article adds:
Based on the findings, supportive intervention could decrease patients' stress and increase stress coping. The virtual family-based method is far more effective than peer support in decreasing perceived stress and increasing stress coping.

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treatable (1). Thanks to medical advances, BC's survival rate has soared to almost 90%. BC is not a fatal disease anymore, yet it is ubiquitous and still causes many patient complications (2). BC is seen most noticeably in the United States, Australia, New Zealand, South Africa, and Eastern and Western Europe, and the number is increasing in developing countries (3). Out of every 100,000 women, 22 suffer from BC in Iran. The mean age of BC patients is 62 years in Western societies and 50 in Iran (4).

BC treatment techniques include surgery, chemotherapy, radiotherapy, hormone therapy, and immunotherapy, which inflict serious adverse effects on women's marital health (5). It is estimated that one-third of all cancer patients experience apparent emotional and psychological distress (3). Research has found adaptation strategies effective in managing and overcoming stress and augmenting emotional well-being in patients with BC (6, 7). Lazarus and Folkman divide adaptation strategies into problem-oriented, which helps eliminate the stressor from its source, and emotion-oriented, which helps to reduce arousal. The individual may actively use them in response to the stressor. For instance, the individual may use an avoidance coping strategy by trying to ignore or distancing from a stressful situation. Results of the studies have found problem-oriented adaptation strategy most helpful in overcoming stressful situations (8, 9). In the same way, access to appropriate supportive resources enhances adaptation to the disease in patients with cancer. Since therapeutic interventions have not been responding efficiently to the various problems these patients face (10, 11), we must devise a multidimensional approach that can meet their informational, spiritual, and supportive needs.

Social support for cancer patients not only positively impacts their health and reduces mortality and recurrence of the disease but also helps them to better adapt, accelerate rehabilitation, and cope with changes (5). Peer support includes support provided by people who suffer from the same illness, in which exchanging information, sharing experiences, and encouraging or helping each other to overcome problems can improve patients' emotions, quality of life, and self-efficacy (12). The support of an intimate individual surrounding the patient could enhance one’s endurance in coping with the disease. Women with BC believe family support is essential in better adaptation to the disease (13).

Studies have shown that patients with cancer are confronted by a lack of information, emotional needs, and inadequate understanding of the disease and its conditions. Insufficient information could have a negative effect on patients' adaptation procedures. In developing countries such as Iran, supportive programs for patients with cancer are scarce. These patients do not receive adequate care for their social and psychological needs (14). Subsequently, the therapeutic interventions have not responded to patients' various problems (10). Thus, it is unavoidable to design supportive interventions to deal with the ailment. Patients could get support for adaptation from family members, friends, healthcare providers, and other patients with cancer (15).

Studies reveal that training patients increases their satisfaction, improves their quality of life, reduces anxiety and complications of the disease, and helps them gain independence in their daily activities. There are now abundant approaches in the education enterprise, among which online education has demonstrated more opportunities to tackle some of the barriers that were frustrating in the traditional methods (16). Mobile education (m-learning) is a widely available recent technique of providing health care through portable devices (phones, tablets, etc).

Using m-learning has enabled most countries to access health care and health-related information through a cost-effective method (17). The requirement for long-term care has expanded in parallel with the rise in BC patients' survival rates. This situation causes patients, their families, and health service providers to confront the challenges of face-to-face education, such as geographical distance limitations and planning for care intervention problems (18). Education through the internet provides access to remote areas, reduces travel costs, eliminates waste of time, and facilitates the exchange of information and skills, thereby overcoming geographical, cultural, economic, and individual constraints (16). Adult education Freire’s model was appropriated as a broad concept that includes formal/informal education and learning activities. This model is an important example of using education to create social change and has 5 constructs: dialogue, conscientization, praxis, transformation, and critical consciousness (19). As stated, the purpose of this study was to assess how virtual education—namely, the support of friends and family—affects patients' perceived stress and their ability to cope with it when they are unable to access traditional educational settings because of their remote location.

Methods

Study Design and Setting

The study is a paralleled, nonblinded, 3-armed randomized clinical trial with pretest and posttest design with 2 intervention groups (family-based and peer-support) and a control group. It was conducted through available sampling at a ratio of 1 to 1 to 1 on 315 women with BC between February 2021 and May 2022. A code was randomly assigned to each patient, and the patients were then randomly placed in 3 groups: family-based (FB), peer-Support (PS), and control. A total of 105 patients were assigned to each group.

Confidentially and anonymity of the stude was confirmed by documenting in Research Ethics committee at IR.TUMS.SPH.REC.1399.251 (13/01/2021); in the Iranian registry of clinical trials (28/06/2021); IRCT20210118050070N1; and has been approved as a research project with the ethics code IR.TUMS.SPH.REC.1400.255 on July 12, 2021. Also, all participants were provided with written conversant consent.

Participants

Inclusion and Exclusion Criteria

The population consists of all women with BC who were referred to the Cancer Institute in Tehran in the study time interval. The inclusion criteria were as follows:

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awareness of the disease; a minimum of 6 months of definitive diagnosis; the age of 18≤ years, suffering from stage 1 to 4 of BC; literate; ability to see, hear, and verbally communicate; and access to a smartphone.

Each of the following could lead to exclusion from the study: the presence of mental disorders such as delusions and hallucinations; unwillingness to continue cooperation; simultaneous receiving of treatment from a psychologist or psychiatrist; attending similar training courses; and absence from half or more of the virtual training sessions.

Interventions

Researchers obtained the authorization in coordination with Tehran University of Medical Sciences. Objectives and methods were explained to the management and staff, and approval was obtained. Coordination with the appropriate physician, the surgical and chemotherapy wards, and the follow-up clinics of patients with BC was completed. Based on the inclusion and exclusion criteria, 372 patients were selected. After explaining the study's objectives to the patients and obtaining written informed consent, a multi-dimensional questionnaire of demographic information and disease characteristics, perceived stress, and coping with stress was distributed among the patients and completed. The patients were given a multidimensional questionnaire to complete, which included questions on their demographics, disease characteristics, perceived stress, and coping mechanisms after receiving an explanation of the study's goals and providing written informed consent. Information was collected from medical records and pathology sheets as well as semi-structured interviews.

After analyzing the completed questionnaires, 57 patients were excluded from the study due to low stress and more significant stress coping. A sample size of 315 patients with high stress and low stress coping were eventually included in the study. The patients were then randomly assigned to a control and 2 intervention groups in a ratio of 1 to 1 to 1 (Figure 1).

Virtual FB Intervention

In this group, patients were divided into 10 minor groups (5 groups of 10 and 5 groups of 11). They were trained virtually over an educational package with an active family member. In addition to routine hospital care, they were trained virtually, and a researcher was reachable 24 hours. Furthermore, to increase self-efficacy and encourage patients to manage stress and adapt to the disease, a past patient who had been in the control phase suffering from the disease for 2 years was invited to talk to other patients about her experiences of BC and its challenges.

The inclusion criteria for the active family member included being responsible for the patient's care needs, approval by the patient to attend the study, age of ≥18 years, willingness to participate in the study, and ability to hear and, see, and communication verbally. The criteria for the

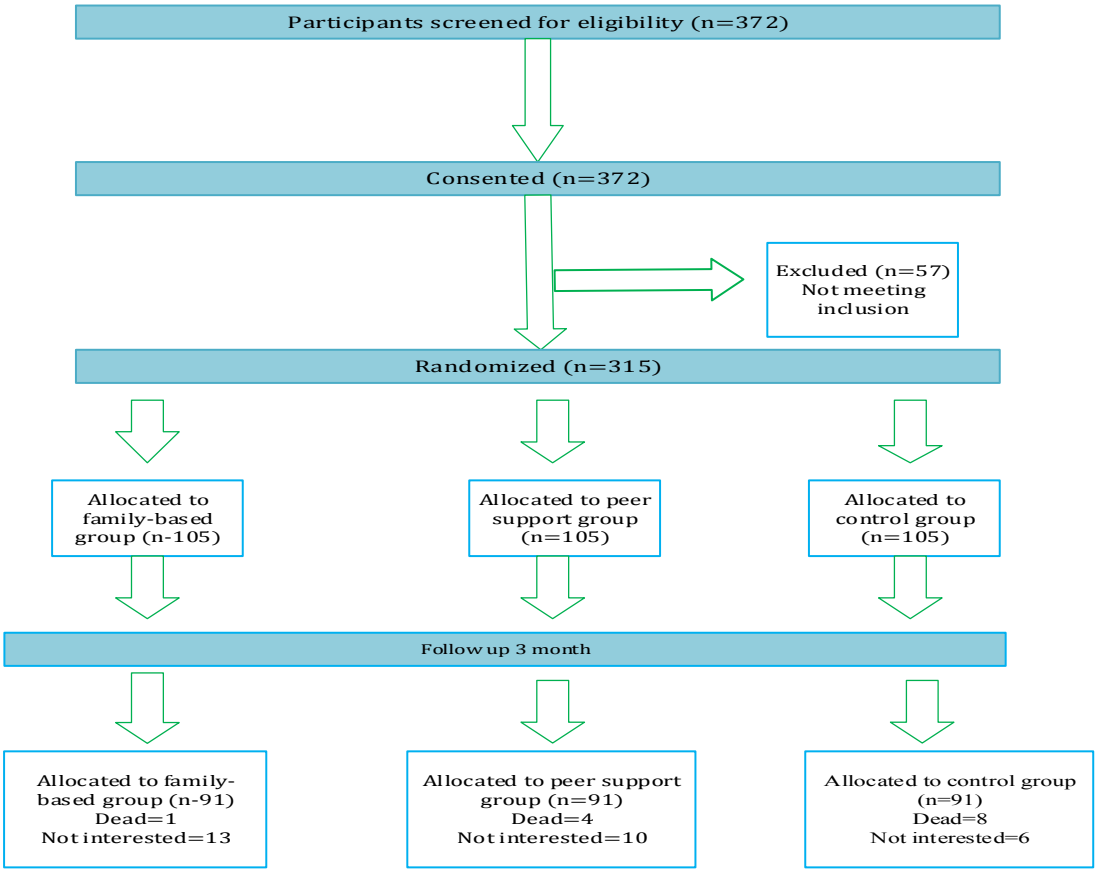

Figure 1. Consort diagram of the selection process of patients with BC in this RCT study

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exclusion of the active family member included mental disorder, unwillingness to continue cooperation, or patient's dissatisfaction with their presence.

Virtual PS Intervention

• Selecting Peer Trainers in the PS Group

In the virtual PS training group, patients were trained by their peers and received routine hospital care.

Having been diagnosed with the disease for at least 2 years, not being in the relapse stage, being literate, capable of verbal communication, having access to a smartphone, and giving permission to participate in the study were the inclusion criteria for peer trainers. The exclusion criteria of the peer trainers included unwillingness to continue cooperation. By referring to the study center and reviewing the patients' medical records, the eligible patients were selected, contacted by telephone, and invited to participate. After their agreement, their informed written consent was obtained. They then completed perceived stress and stress-coping questionnaires. Seventeen patients with low perceived stress and more stress coping were selected as trainers. Seven were willing to continue their cooperation, and 10 were excluded because of relapse and lack of collaboration—2 of them had relapsed, and 8 were not interested.

• Training Peer Trainers

The research team trained the peer trainers through a virtual training package. The package included communication and its types, factors affecting effective communication, and inhibitory factors. The peer trainers were also taught not to be allowed to provide medical advice, judge patients' treatment protocols, and/or declare personal agendas to patients. The educational content of the PS group was provided for and explained briefly to the peer trainers 2 days before each training session. Their empowerment to run each session was tested by question and answer before each session, and if they did not have enough empowerment, they received more explanation. They were also sent a reminder message the day before each training session. Every peer trainer was responsible for educating 15 to 16 patients according to their cooperation.

Virtual Educational Intervention

The educational intervention consisted of 16 virtual training sessions prepared for the FB and PS intervention groups and evaluated by health education and promotion specialists and breast surgeon specialist (Table 1).

The group members were familiar with each other in the first educational session. The researchers then explained the goals and rules of the groups and defined the FB group and the benefits of family support for the FB group and PS and PS benefits for the PS group, respectively.

The rest of the educational sessions shared between the 2 groups were similar. Educational topics under the titles of BC and its effective factors, chemotherapy and its complication management, the definition of stress and various methods of stress management, muscle relaxation, Tai chi exercises, problem-solving methods, and conflict resolution and happiness were presented in the form of motion graphics, audio, and video files using Canva software.

Training sessions were held regularly at 10:00 a.m. twice a week (on Saturday and Tuesday) and lasted for 8 weeks for 2 months via the WhatsApp social platform for patients. The training sessions began with 2 educational clips, and then questions and answers followed for 60 minutes. After each session, a discussion continued for the next 24 hours in the 2 intervention groups. Also, pa-

Table 1. Modalities and activities of FB and PS groups

No.	Session modalities	Activities
1	Presentation of Agenda Introduce participants An explanation of the group of goals and attending group of benefits	Motion graphic; Voice show; Voice
2	Orientation with BC	Motion graphic; Voice show; Voice
3	An orientation with chemotherapy and its side effects	Motion graphic; Voice show; Voice
4	Presentation of stress and stressors	Motion graphic; Voice show; Voice
5	Orientation with stress assessments Overcoming stress skills	Motion graphic; Voice show; Voice
6	Orientation with character types Self-efficacy A successful coping An unsuccessful coping	Motion graphic; Voice show; Voice
7	Description of stress management Prevention of stress	Motion graphic; Voice show; Voice
8	Orientation with muscles relaxation	Motion graphic; Voice show; Voice
9	Orientation with visual imagery Tai Chi exercise	Motion graphic; Voice show; Voice
10	Doing Tai Chi (1)	Motion graphic; Voice show; Voice
11	Doing Tai Chi (2)	Motion graphic; Voice show; Voice
12	Orientation with spiritual methods Different support	Motion graphic; Voice show; Voice
13	Orientation with different solutions Conflicts ways	Motion graphic; Voice show; Voice
14	Orientation with the cognitive-emotional way in stress management	Motion graphic; Voice show; Voice
15	Orientation with self-control ways	Motion graphic; Voice show; Voice
16	Humor Wellness	Motion graphic; Voice show; Voice

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tients and trainers in the PS group were contacted by the researcher every week, and questions were asked about how the sessions were held and the patients' satisfaction. According to the Freire model, in each session, patients having dialogue in small groups communicated with one another, expressed their problems, and explained with projection, role modeling. Self reported the root cause of their problems (conscientization)—even participants involved in running the study (praxis) as peer trainers involved too. Participants in the next virtual sessions argued and criticized harmful/harmless factors that may have an effect on their disease, stress, and stress coping (transformation and critical consciousness).

Measures

Demographic and Disease Characteristics Questionnaire

The researchers developed the questionnaire and validated in consultation with 2 subject and research specialists. It included age, number of children, ethnicity, education, occupation, economic status, stage of BC disease, duration of a definitive diagnosis of the disease (per month), number of lymph nodes involved in the disease, type of surgery, type of treatment, source of information about the disease, and person supporting the patient and insurance coverage.

Perceived Stress Scale (PSS-14)

The questionnaire, developed by Cohen et al (20), is a self-reported tool that examines a person's perceived stress over the past month. In the present study, the Persian version was used. The questionnaire has 2 subscales of perceived self-efficacy and perceived helplessness, each with seven items. The Likert scale is used from 0 to 4 to score (zero = never to 4 = very often). The scores of each item are added together to achieve the overall score, and the higher score indicates more perceived stress. The score range in this questionnaire is between 0 and 56. Internal consistency coefficient was assessed, and Cronbach's α for the perceived stress, perceived self-efficacy, and perceived helplessness were 0.76, 0.80, and 0.60 (Safaei and Shokri) (21).

Coping Inventory for Stressful Situations (CISS-21)

The questionnaire was developed by Endler and Parker (22) and is used to determine the dominant strategy a person uses in stressful situations. Its Persian version was used in the present study. It consists of 21 items scored from 1 to 5 on a Likert scale (1 = very low to 5 = very high) and 7 questions related to problem-oriented strategy, 7 questions of emotion-oriented strategy, and 7 other questions related to avoidance strategy. Shokri et al (2008) showed that Cronbach's α in this questionnaire was between 0.70 and 0.86. The corresponding reliability values for problem-oriented, emotion-oriented, and avoidance-oriented individuals were 0.64, 0.60, and 0.61 (23).

Outcomes

Consequences of the studies (perceived stress and stress coping) were measured through PSS-14 and CISS-21 questionnaires twice, before the intervention and 3 months after the intervention, in groups. Before the intervention, the questionnaires were completed in person at the Cancer Institute, and 3 months later, they were finalized through phone calls with the patients. To investigate the effect of virtual intervention, perceived stress and stress coping were investigated in the groups and compared before and after the intervention between the groups. Also, the difference in the mean score of the results was investigated.

Sample Size

The study's main goal was to investigate the effect of 2 training intervention methods; therefore, to determine the sample size with 95% confidence and 80% test power, 89 people were determined for each group. Because this was an experimental study with a 3-month follow-up period, and there was a possibility of attrition in the samples, the proportion of this attrition was considered to be 15%, and the final sample number in each group was adjusted. Thus, 105 people were evaluated in each group and 315 people were included in the study.

s = (100 – 0) / 6 = 16.7
d = (mu2 – mu1) / (s*sqrt(2)) = 7 / (16.7*1.41) = 0.3
n = (Za + Zb)^2 / d^2 = (1.96 + 0.84)^2 / 0.3^2 = 89 per group
n* = n / (1-r) = 89 / (1-0.15) = 89/0.85 = 105.

Randomization

It was conducted through available sampling at a ratio of 1 to 1 to 1 on 315 women with BC. A number written on a piece of paper was specified for each patient, which was placed inside a box. The papers were randomly removed from the box, and the patients were placed in the following groups randomly: FB, PS, and control groups at a ratio of 1 to 1 to 1. A total of 105 patients were assigned to each group.

Blinding

It was impossible to keep the participants in the intervention and control groups blinded in the study since the researcher directly interacted with patients and taught the intervention groups directly (FB) and indirectly (PS). Before the intervention, participants were told about groups and materials. Following the dividing of patients into groups and the creation of virtual groups on WhatsApp, each patient informed the group about their enrollment. Additionally, study materials were similar in both intervention groups except for the first session.

Statistical Methods

Data were analyzed by the independent t test and chi-square test to describe participants' quantitative and qualitative demographic and disease characteristics variables. Kolmogorov–Smirnov statistic, skewness, kurtosis, normal Q-Q plot, and histogram tests were used to describe the normality distribution of dependent variables. The analysis of covariance (ANCOVA) test was used to adjust group and confounding factors (BC stage) before and after intervention in dependent variables. An effect size test

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was used to compare the mean scores of dependent variables before and after intervention in each group. The significance level was set at .05.

Results

In this study, for the population set, per protocol was used. In this study, 315 people were determined as sample size (105 people per group), and 15% was considered for the proportion attrition. Fourteen patients in each group were eliminated 3 months after the virtual educational intervention because they had passed away or had not cooperated. Ultimately, with 91 patients in each group and 273 patients remaining in the trial (13% attrition), this is sufficient given the study's 80% test power and 95% confidence level. The Kolmogorov–Smirnov statistic, skewness, kurtosis, normal Q-Q plot, and histogram test results indicated that before the intervention, perceived stress, perceived helplessness, and emotion-oriented strategy had normal distribution. Still, after the intervention, perceived helplessness and 2 coping strategies (emotion and avoidance-oriented) had normal distribution.

All 3 groups of patients were similar in terms of demographic variables and characteristics of the disease (except for the 2 variables of the number of children and the period after the disease diagnosis (Table 2).

The ANCOVA test results indicated that the effect of the group factor after controlling the before-intervention scores in perceived stress, problem-oriented, emotion-oriented, and avoidance-oriented strategies were $P < 0.0001$, $P = 0.015$, $P < 0.0001$, and $P = 0.111$, respectively. Also, the results showed that the effect of the confounding factor of BC disease stage in the dependent variables were $P = 0.527$, $P = 0.275$, $P = 0.358$, and $P = 0.609$, respectively. These indicated the effectiveness of adult virtual training in the intervention groups. Also, the results showed that the effect of the confounding factor of BC disease stage in the dependent variables of the study was not significant ($P > 0.05$) (Table 3).

Table 2. Demographic information and disease characteristics in women with BC (N=315)

Variable		Family-based n (%)	Peer support n (%)	Control n (%)	*P*-value
Age Mean (SD)		48.52 (9.25)	48.17 (9.22)	46.11 (10.65)	0.155
Number of children Mean (SD)		2 (1.25)	2 (1.42)	2.4 (1.42)	0.039
Involved lymph Node (s) Mean (SD)		4.29 (6.05)	4.80 (6.33)	4.80 (6.33)	0.693
Duration after BC diagnosis Mean (SD)		23.32 (29.03)	34.31 (35.15)	31.77 (38.14)	0.007
Marital Status	Single	8 (7.6)	6 (5.7)	13 (12.4)	0.242
	Married	97 (92.4)	99 (94.3)	92 (87.6)	
Educational level	Under Diploma	45 (42.9)	56 (53.3)	47 (44.8)	0.280
	Diploma	41 (39)	32 (30.5)	32 (30.5)	
	University	19 (18.1)	17 (16.2)	26 (24.8)	
Ethnicity	Fars	46 (43.8)	43 (41)	34 (32.4)	0.890
	Turk	30 (28.6)	37 (35.2)	35 (33.3)	
	Other	29 (27.6)	25 (23.8)	36 (34.3)	
Occupation	Housewife	89 (84.8)	91 (86.7)	85 (81)	0.912
	Employed	10 (9.5)	9 (8.6)	13 (12.4)	
	Other	6 (5.8)	5 (4.8)	7 (6.7)	
Economic Status	Completely sufficient	7 (6.7)	10 (9.5)	13 (12.4)	0.707
	Relatively sufficient	88 (83.8)	85 (81)	84 (80)	
	Not sufficient	10 (9.5)	10 (9.5)	8 (7.6)	
Disease stage	Stage 1	6 (5.7)	16 (15.2)	13 (12.4)	0.300
	Stage 2	60 (57.1)	48 (45.7)	47 (44.8)	
	Stage 3	25 (23.8)	26 (24.8)	28 (26.7)	
	Stage 4	14 (13.3)	15 (14.3)	17 (16.2)	
Surgery type	Complete Mastectomy	49 (46.7)	60 (57.1)	52 (49.5)	0.101
	Partial and Reconstructive Mastectomy	56 (53.3)	45 (42.8)	53 (50.5)	
Treatment type	Surgery	18 (17.1)	23 (21.9)	17 (16.2)	0.205
	Chemotherapy	47 (44.8)	37 (35.2)	41 (39)	
	Radiotherapy	0 (0)	1 (1.0)	1 (1.0)	
	Hormone therapy	15 (14.3)	15 (14.3)	23 (21.9)	
	Targeted therapy	16 (15.2)	9 (8.6)	13 (12.4)	
	Mixed	9 (8.6)	20 (19)	10 (9.5)	
Information source	Physician and staff	86 (82)	86 (81.9)	84 (80)	0.051
	Internet	13 (12.4)	10 (9.5)	17 (16.2)	
	Radio and TV	0 (0)	1 (1.0)	0 (0)	
	Other	6 (5.6)	8 (7.6)	4 (3.8)	
Supportive Person	Spouse	50 (47.6)	51 (48.6)	40 (38.1)	0.689
	Children	28 (26.7)	31 (29.5)	33 (31.4)	
	Other family members	22 (18.1)	19 (17.1)	29 (23.8)	
	Other	5 (7.6)	4 (4.8)	3 (6.8)	
Insurance type	Social Security	67 (63.8%)	70 (66.7%)	65 (61.9%)	0.558
	Treatment services	33 (31.4%)	31 (29.5%)	38 (36.2%)	
	Other	5 (4.8%)	4 (3.8%)	2 (1.9%)	

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Table 3. Effect of group and BC stage factor on adjusted dependent variables (N=273)

Source	Perceived stress after			
	Sum of squares	Df	F	*P*-value
Perceived stress before	1059.90	1	18.62	<0.001
Group	2886.01	2	25.35	<0.001
Stage	126.95	3	0.743	0.527
Error	14800.12	260		
Corrected total	20007.12	272		
Source	Problem – oriented after			
	Sum of squares	Df	F	*P*-value
Problem oriented before	44.22	1	3.37	0.067
Group	111.57	2	4.25	0.015
Stage	51.16	3	1.30	0.275
Error	3409.20	260		
Corrected total	3777.37	272		
Source	Emotion – oriented after			
	Sum of squares	Df	F	*P*-value
Emotion oriented before	195.25	1	6.90	0.009
Group	582.37	2	10.30	<0.001
Stage	91.61	3	1.08	0.358
Error	7349.83	260		
Corrected total	8833.09	272		
Source	Avoidance – oriented after			
	Sum of squares	Df	F	*P*-value
Avoidance oriented before	220.97	1	12.44	<0.001
Group	78.88	2	2.22	0.111
Stage	32.55	3	0.61	0.609
Error	4618.55	260		
Corrected total	5215.52	272		

Table 4. Effect size adjusted for scores before intervention and BC disease stage (N=273)

Group	Perceived stress after intervention				
	Mean	Std. Error	95% CI		Mean perceived stress before
			Lower	Upper	32.00±7.03
FB	24.24	1.006	22.147	26.346	
PS	24.44	0.884	22.702	26.183	
Control	32.44	0.190	30.65	34.23	
Group	Problem- oriented after intervention				
	Mean	Std. Error	95% CI		Mean problem-oriented before
			Lower	Upper	19.36±4.68
FB	24.17	0.506	23.18	25.17	
PS	23.95	0.424	23.11	24.78	
Control	22.46	0.438	21.60	23.32	
Group	Emotion- oriented after intervention				
	Mean	Std. Error	95% CI		Mean emotion-oriented before
			Lower	Upper	25.10±5.90
FB	18.92	0.747	17.45	20.39	
PS	19.20	0.623	17.97	20.43	
Control	22.73	0.643	21.46	23.99	
Group	Avoidance- oriented after intervention				
	Mean	Std. Error	95% CI		Mean avoidance-oriented before
			Lower	Upper	17.64±6.64
FB	14.78	0.589	13.62	15.94	
PS	14.41	0.494	13.44	15.38	
Control	15.87	0.510	14.87	16.88	

The results of the effect size test showed that after the intervention, the mean score of the dependent variables (coping strategies and perceived stress) was adjusted to the stage of BC disease. This was done by taking into account that prior to the virtual intervention, the mean scores of problem-oriented, emotion-oriented, avoidance-oriented, and perceived stress in the groups were 32.00 ± 7.03, 19.36 ± 4.68, 25.10 ± 5.90, and 17.65 ± 6.64, respectively. The results showed a decrease in mean scores of perceived stress, emotion-oriented, and avoidance strategies, and an increase in the mean score of problem-oriented strategy, which is the best method of stress coping, after intervention in the groups, and this increase in compatibility is more significant in the FB group. Therefore, it can be concluded that the FB virtual educational intervention has effectively reduced perceived stress and increased problem-oriented strategy (Table 4).

Harms

Due to the nature of the educational and supportive interventions, the participants' health in the study was not at risk, and no harm was reported. A written informed state-

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ment was issued declaring that if any unexpected harm occurs to the participants, treatment of complications and costs will be the obligation of the research team members.

Discussion

The study was directed to compare the effect of FB and PS virtual training approaches on perceived stress and stress coping in women with BC. Conferring the results, a significant reduction in perceived stress scores, its subscales, emotion-oriented, and avoidance coping could be seen in the FB and PS virtual training groups. Results approve the effectiveness of virtual training, but the perceived self-efficacy variable, as the perceived self-efficacy in the 2 intervention groups, decreased**.** Furthermore, a significant increase in problem-oriented adaptation in the intervention groups indicates the positive effect of training. Also, results confirm that having social support from family members or peers, the provision of knowledge, and awareness could reduce the perceived stress in women with BC. This leads to an increase in the use of appropriate problem-oriented adaptation. Equally, virtual supportive training can reduce patients' stress and improve stress coping. Consequently, the virtual educational family-based method has shown to be more effective than the peer-support method in decreasing perceived stress and increasing problem-oriented coping.

Based on McMillan et al and Northouse et al, FB interventions in patients with cancer can reduce marital and psychological distress and also improve adaptation strategies in them (24, 25). Schroevers et al showed that the support of family and friends provides reassurance and comfort for patients with cancer and helps them in problem-oriented coping after the disease (26). Moreover, Alcalar et al showed that family members play an important role in facilitating the adjustment process in women with BC (27). The results of the present study are consistent with those of the above.

Rosenzweig et al found that participants who received a face-to-face intervention had greater capacity to accept chemotherapy than a control group who received web-based virtual training. Also, Lee et al showed that the PS intervention, which was conducted face-to-face or through telephone, significantly improved the self-efficacy of the participants in the study. Therefore, it can be concluded that face-to-face communication may well influence increasing patients' self-efficacy (28, 29). That is, it can be said that to increase self-efficacy in patients, there is a need for interventions whereby patients can receive training through face-to-face communication that impacts their self-efficacy and strengthens their confidence. The results of the present study are not consistent with those of the above. Manne et al showed a significant relationship between the lack of support from the spouse and the low level of adaptation to cancer in patients (30). The results of the present study are in line with Aghebati et al, who investigated the effect of relaxation on the anxiety and stress of patients with cancer admitted to Imam Khomeini Hospital in Tehran and found that anxiety and stress decreased in the patients after the intervention (31). In another study conducted by Behzadipour et al, which investigated the effectiveness of cognitive-behavioral intervention of stress management on quality of life and coping strategies in women with BC, results showed improvement in problem-oriented coping methods and a decrease in the score of emotional and avoidance coping methods (8).

Shabani et al, who investigated the effect of teaching life skills on patients' mental health with nonmetastatic BC, showed that the educational intervention was able to significantly reduce the symptoms of depression, anxiety, physical, sleep, and social functioning disorders (32). In another study conducted by Giese-Davis et al, which investigated the effect of peer counseling on the quality of life in patients recently diagnosed with BC, results showed that peer counseling improves well-being and marital satisfaction and decreases posttraumatic stress disorder (33). In this regard, Moghadam Tabrizi and Alizadeh investigated the effects of individual and group training with the presence of an active family member based on the FOCUS program on adaptation to cancer in Iranian patients with BC. The results of the present study are in line with the above and indicate the positive effect of training in reducing anxiety and increasing the ability to adapt to the disease in BC survivors. The present study pointed to the critical role played by family members in facilitating the process of adapting to cancer (13).

Farha et al showed that interventions through mobile phones can play an essential and pivotal role in supporting dynamic communication between the patient, physician, and family (34). Moreover, Mokhtari et al showed that good social support for female patients with BC during the disease can lead to mental and spiritual health and well-being and can be one of the influential factors in fighting the disease and creating a feeling of recovery in patients (35).

Furthermore, the results of the present study showed a decrease in the average of avoidance coping in the 2 intervention and control groups, and it was significant in the 2 intervention groups. As a result, it can be concluded that since the patients in the 2 educational groups had successfully employed the problem-oriented coping strategy, which is an appropriate method of stress management, the extent to which they had used the inappropriate and passive strategy of avoidance managing—that is, avoiding the problem and its solution—had decreased. Additionally, because the application of the adaptation strategy depends on the course of treatment and the time after the disease's diagnosis (3), a decrease in the control group's avoidance coping was observed as well. One of the factors that play a substantial role in stress coping in women with BC is social support. Social support for women with BC has a significant impact on their stress coping because it enables women to have a positive mindset during their treatment and better adapt to their disease (15). Moreover, the presence of social support from family, friends, and other patients who suffer from the same disease can improve mental health in these patients by reducing perceived stress, better adaptation to the disease, and limiting ineffective methods of adaptation to disease. Further treatments are required, with an emphasis on stress reduction techniques,

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persuasion and encouragement, using role models, and working in small stages in order to positively impact the self-efficacy of women with BC. In addition, women with BC who received the virtual educational intervention, who may avoid the challenges of in-person training, reported feeling less stressed and better able to adjust to their condition. The innovations that can be mentioned in this study are follows:

Comparison of the effect of 2 direct training methods (by the researcher) in the family-oriented intervention and indirect training (by peers) in the peer support intervention. This method was not done before.

The present study aims to design 2 virtual training packages that are appropriate for family-based intervention and peer support. This entails enlisting active family members to assist the patient and utilizing patients who have already been diagnosed with the disease and whose condition is under control to assist the patients in the study. This study was carried out at the Cancer Institute at Imam Khomeini Hospital, Iran's premier cancer-focused teaching, research, and treatment facility. It is located in Tehran and is affiliated with Tehran University of Medical Sciences. Patients with varying socioeconomic backgrounds are among the referrals to this clinic that come from all around Iran. Therefore, it is possible to argue that the results of this study apply to the entire population of Iran.

Strengths of the Study

A notable aspect of the research was the utilization of smartphones for conducting training sessions. Patients in good physical and mental health can access instructional materials whenever they are free thanks to virtual sessions. They can also ask questions at any time later on.

In Iran, women with BC often refuse to talk face to face or attend women's groups due to cultural reasons, physical conditions, and body image; thus, the virtual space as a means of negotiating between patients can be a suitable choice for Iranian women with such disease. Another strength of this study is the large number of samples, which strengthened the study. In addition, in this study, the teaching peers were trained before starting the intervention because the lack of training for the teaching peers and a lack of sufficient supervision can bring about negative, ineffective, and harmful results in the quality of life, mental state, and daily activities of the patients. Furthermore, teaching through trained peers is an effective and low-cost approach for patients and can partially cover the high costs and the shortage of health professionals. Another advantage of this study was that it included 2 intervention groups for comparison 2 educational methods, as well as a control group that showed the impact of the intervention.

Limitations

The study had some limitations, including difficulty in determining the impact of the intervention and granting patients access to follow-up. To further study such cases generally, the questionnaires employed are not specifically tailored for patients with BC. The inability to properly share instructional video clips on WhatsApp due to slow internet connectivity was discouraging. The researchers created software that allowed users to use the academic content offline in order to limit this limitation. Other limitations were self-reporting on the surveys, not being blinded to the study, and conducting the research in a single center.

Conclusion

This study indicated that virtual education of FB and PS could reduce perceived stress and increase problem-oriented coping strategy (unsurpassed stress coping process) in women with BC in Freire adult education model. It seems that the intervention could be effective in reducing stress and increasing their coping by improving patients' awareness of their ailment, management methods of complications of disease treatment, and types of stress management methods that were performed virtually for patients by the researcher in FB group and with the presence of the active family member with the patient and also peers in PS group. As a result, social support actively contributes to the improved wellbeing of cancer patients. Findings could be used to inform the creation of initiatives to enlist the help of peers, family, medical professionals, and the community. Given that BC presents a number of issues for both patients and their families, a number of multidisciplinary interventions are advised to address various elements of patients' life and can be performed in health care facilities for free or at a minimal cost.

Research Suggestions

The results showed that virtual training in FB and PS could decrease stress and improve stress coping in women with BC. The virtual family-based method is more effective than peer-support in increasing stress coping and decreasing perceived stress. Therefore, in order to address scheduling conflicts and physical distance constraints that render in-person clinical interviews unfeasible, it is advised to develop virtual supporting interventions. Participating in this intervention as a peer or family member can help to improve stress coping and reduce stress.

Ethics Approval and Consent to Participate

The study is registered in the Research Ethics Committee on January 13, 2021: IR.TUMS.SPH.REC.1399.251, in the Iranian registry of clinical trials on June 28, 2021: IRCT20210118050070N1, and has been approved as a research project with the ethics code: IR.TUMS.SPH.REC.1400.255 on July 12, 2021. All participants provided written informed consent. Confidentiality and anonymity were ensured.

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Authorship

Somayyeh Shalchi Oghli: conceptualization, validation, investigation, project administration, and writing original draft. Roya Sadeghi: conceptualization, methodology, validation, writing, reviewing and editing, supervision, and project administration. Ramesh Omranipour: Methodology, investigation, and writing/reviewing, and editing. Abbas Rahimi Foroushani: methodology, formal analysis, and validation; Mahnaz Ashoorkhani: methodology corporation in study design; Yaser Tedadi: validation, reviewing, and editing.

Conflict of Interests

The authors declare that they have no competing interests.

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