



Improving Psychosocial Functioning in Mastectomized Women Through a Mindfulness-Based Program: Flow Meditation

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Women who have survived a mastectomy see their quality of life diminished by postsurgery complications and their changed body image. Cancer treatment is often associated with physical and psychosocial problems that can worsen patients' psychosocial functioning. This research investigated the influence of flow meditation, a 7-week mindfulness program, on a wide range of psychosocial variables, comprising experiential avoidance, social avoidance, social anxiety, tension, depression, anger, vigor, fatigue, resilience, and self-esteem. Using a quasi-experimental design with pretest and posttest measurements, the study involved experimental and control groups. Adult women who had breast cancer ($N = 36$) were randomly assigned to the program or a waiting-list control group. After the intervention, statistically significant differences in the 2 groups' self-esteem, depression, social avoidance, experiential avoidance, resilience, tension, and social anxiety were obtained. The results are clinically significant, with an important effect size, and support the program's use for breast cancer patients who have been mastectomized.

Keywords: mindfulness, breast cancer, psychosocial functioning, mastectomized women

Breast cancer is the second most common type of cancer worldwide and the first among women, with more than 1 million new cases each year. The highest incidence of disease is experienced in Europe, North America, and Australia–New Zealand (Ferlay et al., 2013; Johannsen et al., 2016; Lötze et al., 2016). In these continents and countries, breast cancer

affects one in every eight women (Reich et al., 2017), most frequently those between 45 and 65 years old (Segura-Valverde, García-Nieto, & Saúl Gutiérrez, 2014).

Although cancer continues to be the leading cause of death across the world, early detection of the disease, medical advances, and greater access to health services have resulted in an

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increase in cancer survival over the past 20 years (Ferlay et al., 2013; Jemal et al., 2009). Spain has an 80% survival rate 5 years after the diagnosis of breast cancer. In an epidemiological study conducted in Almeria and Granada Provinces in the south of Spain (Ocón Hernández et al., 2010), the survival rates 5 years and 10 years after diagnosis were 81% and 71.3%, respectively, with a mean follow-up of 118.7 months. The Spanish Breast Cancer Research Group (Vivar, 2012) indicates that the survival rate across Spain improved from 65% in 1980 to 80% in 2011, comparable with the percentages in North America and some European countries, such as France, Italy, Holland, Sweden, Norway, and Finland (EUROCARE-5 database, 2015).

Despite the increase in survival rates, breast cancer continues to be a serious public health concern because cancer and its treatments are often associated with physical and psychological problems that result in a decrease in the quality of life (Dobos et al., 2012; Lötze et al., 2016). Common symptoms of treatment include mental stress, sleep disturbance, pain, and fatigue, with fatigue as the most debilitating and often lasting up to 10 years after treatment (Cogwell Anderson, Jensik, Peloza, & Walker, 2013; Hofman, Ryan, Figueroa-Moseley, Jean-Pierre, & Morrow, 2007; Hoffman et al., 2012; Reich et al., 2017). Furthermore, the prevalence of sleep disorders has been reported to double that of the general population (Hall, Mishel, & Germino, 2014; Reich et al., 2017). Approximately one third of all cancer patients will also suffer from some kind of mood disorder (e.g., anxiety and depression) at some point in their healing process (Hall et al., 2014; Singer, Das-Munshi, & Brahler, 2010).

Surviving women who have undergone a mastectomy report a decrease in psychosocial functioning due to postoperative complications, such as lymphedema. In addition, changes to their body image can negatively affect femininity (Lerman, Jarski, Rea, Gellish, & Vicini, 2012; Vivar, 2012). Women report feeling less attractive after the removal of one or both breasts, which can lower their self-esteem. Other additional complications of oncological treatments, such as anticipated menopause, anovulation, sterility, hot flushes, and vaginal atrophy, are reported to negatively impact self-esteem, sexuality, and the quality of life (Dizon,

2009; Jun, Kim, Chang, Kang, & Kang, 2011; Paterson, 2015). Psychological sequelae may also include fear of relapse (Amir & Ramati, 2002) and can have a negative influence on family and work life (Johns et al., 2016). Return to work can be difficult and discriminatory, and dismissals or job demotion can occur. These circumstances can result in a lower socioeconomic status and have adverse implications for family and social life (e.g., social isolation; Mellon, Northouse, & Weiss, 2006).

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Some countries use complementary and alternative medicine in combination with conventional treatments to holistically care for patients (Fouladbakhsh & Stommel, 2010; Greenlee et al., 2017; Hyodo et al., 2005; Molassiotis et al., 2005). Complementary treatments include yoga, massage, music therapy, and qigong (Cramer, Cohen, Dobos, & Witt, 2013; Dobos et al., 2012). These interventions consider the person a whole being and incorporate the spiritual dimension in the management of the disease (Lötze et al., 2016).

Many of these integrative or mind-body medical interventions are based on mindfulness, which is the heart of the meditation construct (Gunaratana, 2002; Kabat-Zinn, 1990). Mindfulness has been defined as a state of moment-to-moment awareness without judgment (Bishop et al., 2004). Mindfulness-based interventions include not only formal meditation exercises but also informal practices, bringing awareness to daily activities (Kabat-Zinn, 1990; Shapiro, Carlson, Astin, & Freedman, 2006). One of the most used interventions is the mindfulness-based stress reduction (MBSR) program, which Kabat-Zinn (1982, 1990) developed at the University of Massachusetts. MBSR has been used in the mindfulness-based cancer recovery program, which is specific for this type of patients (Carlson, 2013, 2017). Several meta-analyses demonstrate the effectiveness of mindfulness-based interventions for the treatment of symptoms of depression, anxiety, or stress among cancer patients (Cramer, Lauche, Paul, & Dobos, 2012; Piet, Würtzen, & Zachariae, 2012; Zainal, Booth, & Huppert, 2013). Other clinical trials have revealed positive effects on fatigue reduction and sleep (Amutio et al., 2018; Lengacher et al., 2014; Reich et al., 2017). Mindfulness-based interventions have also been shown to positively influence immune system parameters and proinflammatory cytokines in

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cancer patients (Carlson, Speca, Faris, & Patel, 2007; Carlson, Speca, Patel, & Goodey, 2003), blood pressure, as well as the length of telomeres and the activity of telomerase (Alda et al., 2016; Carlson et al., 2015; Lengacher et al., 2014). However, the insufficient evidence to support the use of complementary and integrative therapies in oncology, including mindfulness (Greenlee et al., 2017), makes it necessary to conduct controlled and randomized studies, such as the one presented in this article.

Despite the physical and the psychosocial consequences of the disease, the evaluation and the treatment of the psychosocial impact on the survivors continue to be pending tasks in Spain's health system. Currently, most care plans focus on the detection of recurrences and the side effects of therapies. However, the existing literature suggests the need for a multidisciplinary approach and an expansion of these care plans' objectives to include psychosocial variables, such as depression, anxiety, and self-esteem, as they also affect the patients' quality of life (Vivar, 2012).

Taking into account all of the above factors, our study's purpose was to investigate the efficacy of flow meditation (*Meditación-Fluir*)—a mindfulness-based intervention developed in Spain (Amutio et al., 2018; Franco, 2009; Franco, Amutio, Mañas, Gázquez, & Pérez-Fuentes, 2017)—in a wider range of psychosocial variables, such as experiential avoidance, social avoidance, social anxiety, tension, depression, anger, vigor, fatigue, resilience, and self-esteem. The intervention also aimed to improve the quality of care of mastectomized women and surviving patients with breast cancer, covering the deficiencies of the current health system. We hypothesized that after the intervention, patients who had suffered from breast cancer would experience significant improvements in most of the aforementioned variables.

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Method

Participants

To be eligible for the study, the participants should be (a) able to prove that they had suffered breast cancer and had undergone the amputation of one of their breasts (e.g., via a letter from a doctor or pain consultant), (b) female, (c)

aged 18–70 years, and (d) not currently attending mindfulness training. All participants were recruited from the Association of Mastectomized Women of Almeria and were informed that they would attend a mindfulness training program for individuals who had suffered breast cancer. In total, 36 eligible women were recruited for the study and randomly assigned to either the intervention ($n = 19$) or the control group ($n = 17$). Specifically, ballots, concealing the numbers 1 (control group) or 2 (experimental group), were placed in equal numbers into an urn, and each participant drew one ballot. A researcher who did not participate in the study conducted the randomization, and the participants completed baseline assessments prior to the allocation. After the completion of all assessment phases, the mindfulness training course was offered to the control group participants.

Procedure

First, we contacted the Association of Mastectomized Women of Almeria to offer its members the “Training in and practice of mindfulness” course. Before the course began, we obtained pretest scores on the variables evaluated in the study. The study's participants were given the questionnaires (described in the Instruments section), for individual completion.

Then, the mindfulness training program called flow meditation (Franco, 2009) was administered to the intervention group, using 2-hr weekly group sessions for a period of 7 weeks. The training program included (a) mindfulness exercises from Kabat-Zinn's (1990) stress-reduction program, (b) mindfulness techniques used in acceptance and commitment therapy (Carrascoso, 2006; Hayes, Stroschal, & Wilson, 1999; Wilson & Luciano, 2002), and (c) exposure to and debate on metaphors and exercises used in Zen (Deshimaru, 2006) and Vipassana meditation (Hart, 1994), which promote values such as acceptance, forgiveness, and nonidentification with mental events. The effectiveness of flow meditation has been tested in various treatment studies with acceptable size effects (Amutio, Franco, Pérez-Fuentes, Gázquez, & Mercader, 2015; Amutio et al., 2018; Franco, Amutio, López-González, Oriol, & Martínez-Taboada, 2016; Franco et al., 2017). The program covers existential, ethical, and spiritual

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aspects and values, thus conforming to Van Gordon, Shonin, and Griffith's (2015) criteria for second-generation mindfulness-based interventions (SG-MBIs). An instructor with extensive experience in both practicing and teaching mindfulness techniques facilitated the program. Each weekly session was structured as follows:

- (1) discussion and feedback on the mindfulness meditation exercises practiced during the previous week (starting with the second session);
- (2) a 10-min guided body-scan;
- (3) presentation of the various metaphors and exercises corresponding to each session; and
- (4) practice of mindful breathing (flow meditation) for 30 min.

The main purpose of flow meditation is for participants to learn to allow their thoughts to flow, without trying to modify them or interfere with them. The intervention is not concerned with teaching participants not to think about anything but seeks to offer an alternative to conditioned automatic ways of reacting to inner and outer experiences.

Both during the active treatment and the follow-up phases, the participants were requested to practice body-scan and mindful breathing exercises on a daily basis at home for 10 min and 30 min, respectively. They were also asked to keep a daily record of their level of engagement with at-home practices by means of a register sheet specially designed for this purpose. Finally, upon completion of the training program for the experimental group, posttest measurements of the different variables analyzed in the study, under the same conditions as in the pretest phase, were obtained for both groups.

Ethical Considerations

All participants provided informed consent and the Bioethics Committee of the University of Almeria (Spain) approved the study. After completion of all assessment phases, the mindfulness training course was offered to the control group participants.

Measures

The measures administered during the pre- and the postinterventions and at 3 months after the final group session in Week 7 are presented next.

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Acceptance and Action Questionnaire. This questionnaire evaluates experiential avoidance and psychological acceptance (Hayes et al., 2000). It consists of nine items that are assessed on a 7-point Likert-type scale ranging from 1 (*never true*) to 7 (*always true*; e.g., "I am able to take action on a problem even if I am uncertain about what is the right thing to do"). The scores range from 9 to 63 points. A high score is interpreted as less experiential avoidance and greater psychological acceptance. Baraca's (2004) Spanish adaptation was used. The internal consistency in our sample was similar to that of the original ($\alpha = .74$).

Social Avoidance and Distress Scale. This scale evaluates two dimensions: (a) fear of negative evaluation and (b) social avoidance and distress (Watson & Friend, 1969). It comprises 28 items (e.g., "I usually feel calm and comfortable at social occasions") rated on a 5-point scale (1 = *never*, 2 = *hardly ever*, 3 = *occasionally*, 4 = *often*, and 5 = *very often*). The scale showed an internal consistency of .84 in the current sample, to whom the Spanish-validated version of the scale was administered (Bobes et al., 1999).

Profile of Mood States. This questionnaire lists 30 adjectives that evaluate five moods and psychophysical states (tension, depression, anger, vigor, and fatigue), which are scored by the subject on a 5-point Likert-type scale ranging from 0 to 4 (0 = *not at all*, 1 = *a little bit*, 2 = *moderately*, 3 = *quite a bit*, and 4 = *very much*; McNair, Lorr, & Droppleman, 1971). The items include "Tense", "Sad", and "Worn-out", among others. Fuentes, Balaguer, Meliá, and Garcia-Merita's (1995) abbreviated Spanish adaptation was used, and Cronbach's α value was .76.

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Connor-Davidson Resilience Scale. This scale evaluates resilience with 25 items on a Likert-type scale ranging from 0 (*disagree*) to 4 (*agree*; e.g., "I do not give up even though things do not seem to have a solution"; Connor & Davidson, 2003). A higher score corresponds to a higher level of resilience. Bobes and colleagues' (2011) Spanish adaptation was used.

The scale's internal consistency showed an α coefficient of .89.

Rosenberg Self-Esteem Questionnaire. This questionnaire comprises 10 items whose contents are focused on the feelings of self-respect and self-acceptance (e.g., "I feel that I'm a person of worth, at least on an equal plane with others"; Rosenberg, 1965). The questionnaire is scored according to a 4-point Likert-type scale (1 = *strongly agree*, 2 = *agree*, 3 = *disagree*, and 4 = *totally disagree*). Half of the items are written positively and the other half negatively. For data interpretation, the scores of the negatively stated items must be inverted. Morejón, Jiménez García-Bóveda, and Vázquez-Morejón Jiménez's (2004) Spanish adaptation was used, and Cronbach's α coefficient was .80.

Daily record sheet. The participants registered the number of practice days each week and the length of each session.

Design

To analyze the effects of the mindfulness training program (independent variable) on the different variables evaluated (dependent variables), a quasi-experimental group comparison design with pretest and posttest measurements was used, with the experimental and the control groups.

Data Analyses

First, the descriptive statistics and the inter-correlations among all the variables were calculated. Second, to verify the existence of statistically significant differences between the control and the experimental groups' mean scores for the different variables in each phase of the study, Mann-Whitney *U* nonparametric contrast statistics for independent samples were used, as the data did not fit the normal distribution of probabilities. Subsequently, to test for statistically significant within-group differences for the different variables of the study between assessment phases, Wilcoxon's nonparametric contrast statistics for related samples were calculated.

Cohen's *d* was used to assess the magnitudes of the changes in the different variables experienced by the experimental group after attending the intervention program. Values higher than 1.5, between 1.5 and 1, and between 1 and 0.5 indicate very important, important, and moder-

ately important changes, respectively. Finally, the percentages of the changes from the pretest to the posttest scores were calculated. All the analyses were performed with the statistical package SPSS, Version 22.0.

Results

Demographics, Completion, and Compliance

In the intervention group, the participants' ages ranged from 34 to 58 years ($M = 41.27$; $DT = 9.76$). A total of 17% had dropped out of elementary school, 54% finished primary studies, 16% had completed high school, and 13% had finished higher education. In terms of marital status, 68% were married, 23% were single, and 9% were separated. The mean time that elapsed since surgery was 3 years and 10 months ($DT = 2.9$). Regarding at-home practice, the average rates of compliance were 79% for the body-scan exercise and 87% for the mindful breathing exercise.

Intervention Effects

Table 1 shows the means and the standard deviations of the study variables corresponding to the control and the experimental groups in each of the phases of the study. In addition, the correlations among the main psychosocial variables of the study are displayed in Table 2. No significant correlations were found between these variables with age, marital status, or educational level ($p > .05$).

The Mann-Whitney *U* test for independent samples for the pretest scores in the study variables revealed no statistically significant differences between the mean scores of the control and the experimental groups. However, there were statistically significant differences between the two groups' posttest scores in self-esteem, depression, social avoidance, experiential avoidance, resilience, tension, and social anxiety (Table 3).

The Wilcoxon's test for related samples showed statistically significant differences between the experimental group's pretest and posttest scores in self-esteem, depression, social avoidance, experiential avoidance, resilience, tension, and social anxiety. In the control group, no significant differences in these variables

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Table 1
Means and Standard Deviations for Each Outcome Measure at Pretest and Posttest

Variable	Pretest				Posttest			
	Control		Experimental		Control		Experimental	
	M	SD	M	SD	M	SD	M	SD
Anger	15.87	6.93	16.73	6.04	16.76	7.13	14.98	5.13
Depression	19.09	8.14	19.96	7.32	20.03	8.19	12.34	5.02
Experiential avoidance	49.92	12.83	51.72	10.77	51.89	13.01	42.36	8.92
Fatigue	16.24	7.16	17.56	6.74	17.08	7.45	15.11	5.13
Resilience	41.06	10.14	39.93	9.97	39.79	9.64	49.14	10.57
Self-esteem	17.56	8.14	16.04	5.12	18.13	7.79	23.17	6.94
Social anxiety	39.78	10.94	41.04	10.07	40.93	11.09	33.13	8.14
Social avoidance	44.16	11.03	45.94	9.08	46.09	11.98	37.14	8.01
Tension	17.14	6.99	18.01	5.73	17.98	7.04	13.18	4.23
Vigor	13.34	5.76	12.06	5.12	13.67	5.54	13.93	5.78

T4 were obtained (Table 4). Moreover, and even if the mean values of some of the outcome measures seem to be fairly modest, important changes in the intervention group in depression, self-esteem, and social avoidance were obtained, and medium-sized effects on tension, experiential avoidance, resilience, and social anxiety were indicated. The percentages of the changes in the experimental or intervention group ranged from decrements of 10% in anger to 38% in depression, whereas increases ranged from 15% in vigor to 44% in self-esteem. However, changes in anger, fatigue, and vigor in the experimental group did not achieve statistical significance.

Discussion

In this study, we demonstrated that the flow meditation program, an SG-MBI, was effective

in decreasing a wide variety of symptoms associated with breast cancer in mastectomized women, including depression, social avoidance, social anxiety, tension, and experiential avoidance, as well as enhancing resilience and self-esteem, thus improving psychosocial functioning. The results support our initial hypothesis. After the 7-week intervention in flow meditation, the sample of mastectomized women experienced significant improvements in most of the studied psychosocial variables, as compared with the control group, where no significant changes were found.

These findings are consistent with studies showing improvements in reducing anger, anxiety, and depression by using flow meditation for different samples of patients, including those with different conditions, such as fibromyalgia (Amutio, Franco, et al., 2015), and who were older (Franco et al., 2017). The results are

Table 2
Correlation Matrix of the Variables Under Study

Variable	1	2	3	4	5	6	7	8	9	10
1. EA	1									
2. SAV	.556***	1								
3. SA	.036	.672***	1							
4. Tension	.354**	.448**	.263**	1						
5. Depression	.641***	.484***	.301**	.548***	1					
6. Anger	.141*	.195**	.422**	.299**	.231**	1				
7. Vigor	-.061	-.351**	-.405**	-.448**	-.393**	-.496***	1			
8. Fatigue	.628***	.261**	.467***	.081	.526***	.004	-.353**	1		
9. Resilience	-.208**	-.289**	-.351**	-.214**	-.604***	-.158**	.024	-.514**	1	
10. SE	-.342**	-.363**	-.605***	-.230**	-.419**	-.356**	.099*	-.261**	.573***	1

Note. EA = experiential avoidance; SAV = social avoidance; SA = social anxiety; SE = self-esteem.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3
Pretest and Posttest Between-Group Differences for All Outcome Measures (Mann–Whitney U Test)

Variable	Pretest		Posttest	
	z	p	z	p
Anger	.172	.884	1.04	.136
Depression	.694	.493	4.56	.000***
Experiential avoidance	.259	.845	3.36	.001***
Fatigue	.256	.804	1.23	.115
Resilience	.848	.407	2.97	.004**
Self-esteem	.712	.489	5.06	.000***
Social anxiety	.229	.826	2.68	.009*
Social avoidance	.328	.738	3.57	.001***
Tension	.368	.721	2.83	.006*
Vigor	.438	.667	1.16	.121

* $p < .01$. ** $p < .005$. *** $p = .001$. **** $p < .001$.

also in line with other studies demonstrating an improvement in the quality of life of patients with breast cancer (Hoffman et al., 2012). To our best knowledge, this is the first study to specifically investigate the effects of mindfulness on a wide range of psychosocial variables experienced by mastectomized women.

The decrease produced in experiential avoidance is noteworthy, as implicit emotional suppression affects the psychosocial adjustment of people with cancer and can negatively influence the evolution of the disease. Along the same line, Tamagawa and colleagues' (2013) study involving 227 women with breast cancer demonstrated that high levels of emotional suppression were associated with worse self-reported health, whereas high levels of mindfulness were

linked to a better mood and fewer symptoms related to stress. More recently, the absence of avoidance was related to the growth of telomeres (Alda et al., 2016; Lengacher et al., 2014).

Besides decreasing a wide variety of symptoms associated with breast cancer in mastectomized women, the flow meditation training also significantly increased self-esteem and resilience levels. These findings are important considering that high scores in these variables are related to more adaptive coping methods (Campbell-Sills, Cohan, & Stein, 2006; Scrigar, Barni, & Magrin, 2011; Zayas, 2015). In turn, these adaptive coping methods positively influence the quality of life and the psychosocial functioning of people who face stressful situations, such as those experienced by mastectomized women (De Haro-Rodríguez et al., 2014; Henderson et al., 2012; Mera & Ortíz, 2012). Thus, and in line with other studies using the MBSR technique (Haller et al., 2017; Hoffman et al., 2012), mindfulness training based on flow meditation can help alleviate the adverse effects (physical and emotional) of medical treatments.

As far as fatigue and vigor are concerned, decreases in the experimental group were not statistically significant. However, the results obtained point to a trend in this direction. As previously discussed, fatigue is the most debilitating symptom experienced by mastectomized women and one of the most common residual symptoms after treatment, so longer mindfulness training programs will likely be needed to produce significant changes in this variable. Our

Table 4
Wilcoxon Test for Related Samples of Pretest to Posttest Within-Group Differences in the Study Variables, Cohen's d, and Percentages of Change

Variable	Control		Experimental			
	z	p	z	p	d	%
Anger	.964	.305	-1.16	.122	.271	-10.46
Depression	.916	.313	-4.88	.000***	1.22	-38.17
Experiential avoidance	.234	.817	-3.49	.001**	.947	-18.11
Fatigue	.245	.809	-1.48	.096	.441	-15.69
Social anxiety	.526	.582	-2.89	.005*	.864	-19.27
Social avoidance	.731	.431	-3.84	.001**	1.03	-19.15
Resilience	.548	.572	3.26	.001**	.896	23.06
Self-esteem	.696	.492	5.67	.000***	1.17	44.45
Tension	.364	.767	-3.19	.001**	.963	-26.81
Vigor	.009	.916	1.32	.104	.334	15.51

* $p = .005$. ** $p = .001$. *** $p < .001$.

findings reflect those obtained by Carlson (2017) and Johns and colleagues (2015, 2016), using the MBSR program.

We found no significant difference in anger, in contrast to the results obtained by Amutio, Franco and colleagues (2015), who used flow meditation in a sample of patients with fibromyalgia and reported significant changes in the feelings and the control of anger after 7 weeks. One possible explanation for this contrast is that in our study, the general questionnaire on mood states that we used was unable to capture these differences.

Regarding the achievements of our research, this randomized controlled study evaluated a wide range of psychosocial variables that are crucial to the prognosis of this medical condition. In addition, our study used a mindfulness approach corresponding to an SG-MBI. Compared with the first-generation mindfulness-based interventions, SG-MBIs use a slightly different model of mindfulness that highlights the importance of nonattachment to self, as well as to psychological and somatic symptoms (Van Gordon et al., 2015).

In terms of the possible mechanisms of action, several processes may have occurred, including the experience of positive emotions associated with improvements in attention and acceptance (Amutio, Martínez-Taboada, Hermosilla, & Delgado, 2015; Franco et al., 2017; Johns et al., 2016), stress reduction (Amutio, Franco, 2015; Amutio et al., 2018; Amutio, Martínez-Taboada, et al., 2015; Reich et al., 2017; Smith, 2017), and finding a new meaning in life (Lötzke et al., 2016; Van Gordon, Shonin, Dunn, Garcia-Campayo, & Griffiths, 2017; Van Gordon et al., 2015).

The present study's findings should be considered in the light of its limitations that include (a) a small sample size, (b) the exclusive reliance on self-report, and (c) the absence of an active control condition. Furthermore, although the study included a 3-month follow-up assessment, it would be useful to investigate the maintenance effects over a longer period.

Conclusions

Our results support the use of mindfulness techniques as adjunct therapies to other physical and psychological treatments of patients with breast cancer, as well as women who have un-

dergone mastectomy. Each year, enormous sums of money are spent on complementary and integrative therapies whose efficacy has not yet been proven (Greenlee et al., 2017). Further research on this area is anticipated to provide patients with evidence-based treatment options that will attain greater success than treatment with conventional therapy alone. In addition, future research will identify those therapies that are evidence-based and those that are not, and these findings will have positive effects on resource allocation and economic savings.

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