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Pinto-Gouveia, J, Carvalho, SA, Palmeira, L et al. (7 more authors) (Cover date: September/October 2017) *BEfree: A new psychological program for binge eating that integrates psychoeducation, mindfulness, and compassion*. *Clinical Psychology & Psychotherapy*, 24 (5). pp. 1090-1098. ISSN 1063-3995

<https://doi.org/10.1002/cpp.2072>

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PRACTITIONER REPORT

BEfree: A new psychological program for binge eating that integrates psychoeducation, mindfulness, and compassion

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Funding information

FCT (Portuguese Foundation for Science and Technology), Grant/Award Number: PTDC/MHC-PCL/4923/2012.

Background

Binge eating disorder (BED) is associated with several psychological and medical problems, such as obesity. Approximately 30% of individuals seeking weight loss treatments present binge eating symptomatology. Moreover, current treatments for BED lack efficacy at follow-up assessments. Developing mindfulness and self-compassion seem to be beneficial in treating BED, although there is still room for improvement, which may include integrating these different but complementary approaches. BEfree is the first program integrating psychoeducation-, mindfulness-, and compassion-based components for treating women with binge eating and obesity.

Objective To test the acceptability and efficacy up to 6-month postintervention of a psychological program based on psychoeducation, mindfulness, and self-compassion for obese or overweight women with BED.

Design A controlled longitudinal design was followed in order to compare results between BEfree ($n = 19$) and waiting list group (WL; $n = 17$) from preintervention to postintervention. Results from BEfree were compared from preintervention to 3- and 6-month follow-up.

Results BEfree was effective in eliminating BED; in diminishing eating psychopathology, depression, shame and self-criticism, body-image psychological inflexibility, and body-image cognitive fusion; and in improving obesity-related quality of life and self-compassion when compared to a WL control group. Results were maintained at 3- and 6-month follow-up. Finally, participants rated BEfree helpful for dealing with impulses and negative internal experiences.

Conclusions These results seem to suggest the efficacy of BEfree and the benefit of integrating different components such as psychoeducation, mindfulness, and self-compassion when treating BED in obese or overweight women.

Key Practitioner Message

- The current study provides evidence of the acceptability of a psychoeducation, mindfulness, and compassion program for binge eating in obesity (BEfree);
- Developing mindfulness and self-compassionate skills is an effective way of diminishing binge eating, eating psychopathology and depression, and increasing quality of life in women with obesity;
- Integrating psychoeducation, mindfulness, and compassion seem to be effective in diminishing binge eating, with results maintained up to 6-month postintervention.

KEYWORDS

BEfree, binge eating, compassion, efficacy study, mindfulness, obesity

1 | INTRODUCTION

Binge eating disorder (BED) has an overall prevalence of 3–5% in community samples, is twice as common in females (Hudson, Hiripi, Pope, & Kessler, 2007; Kessler et al., 2013), and is comorbid with psychological distress, psychiatric (e.g., depression), overweight and obesity (Hudson et al., 2007). Research shows that BED is associated with an early onset of obesity (Mussell et al., 1996) and its maintenance and greater severity (Bruce & Agras, 1992; Picot & Lilienfeld, 2003). Also, individuals with eating disorders have high levels of shame and self-criticism (Gilbert, 2002; Goss & Allan, 2009; Goss & Gilbert, 2002), particularly binge eaters (Duarte, Pinto-Gouveia, & Ferreira, 2014, 2015a, 2015b).

Although research suggests that Cognitive-Behavioural Therapy (CBT) is a well-established treatment for BED (Grilo, Masheb, Wilson, Gueorguieva, & White, 2011; Wilson, Wilfrey, Agras & Bryson, 2010), studies show that its remission rates are 40% to 60% (e.g., Wilson, Grilo, & Vitousek, 2007), with 26% still meeting criteria for BED (e.g., Agras, Telch, Arnow, Eldredge, & Marnell, 1997).

In recent years, new and innovative approaches to BED have emerged, such as mindfulness-based treatments. These approaches promote the capacity to bring focused awareness to internal experiences, with a nonjudgemental, self-accepting attitude, interrupting conditioned patterns, and decreasing reactive automatic responses to negative affect (Kabat-Zinn, 1993). In a recent meta-analysis, Godfrey, Gallo, and Afari (2015) found nine mindfulness-based interventions for BED, showing large or medium effects, even though with high statistical heterogeneity between these studies. One of these mindfulness-based studies is mindfulness-based eating awareness training (Kristeller & Wolever, 2010), which has been found to improve control over eating and decrease anxiety and depressive symptoms in patients with BED.

Additionally, compassion-focused therapy (Gilbert, 1998, 2005; Gilbert, Price, & Allan, 1995; Gilbert & Procter, 2006) is a therapeutic approach that was developed to help individuals with high levels of shame and self-criticism. Helping patients develop self-compassion, but promoting one's responsibility to adopt more adaptive ways of coping with these complex emotional processes, seems specially suitable to reduce binge eating (Kelly, Vimalakanthan, & Miller, 2014; Kelly & Carter, 2015).

Moreover, there is growing evidence for acceptance and values-based programmes for difficulties in managing weight and eating (Juarascio, Forman, & Herbert, 2010; Lillis & Kendra, 2014) and specifically BED (Masuda, Hill, Melcher, Morgan, & Twohig, 2014). These approaches promote psychological flexibility, which seems to be a key mechanism operating in eating psychopathology (Ferreira, Palmeira, & Trindade, 2014; Hill, Masuda, & Latzman, 2013; Moore, Hill, & Goodnight, 2014; Trindade & Ferreira, 2014; Wendell, Masuda, & Le, 2012), namely, in binge eating (Duarte & Pinto-Gouveia, 2014; Duarte, Pinto-Gouveia, & Ferreira, 2015a, 2015b).

Although the aforementioned approaches are different, some have called for its integration. In fact, it is suggested the efficacy of integrating different approaches, such as Acceptance and Commitment Therapy (ACT) and CBT (Heffner, Sperry, Eifert, & Detweiler, 2002) and compassion-based components and ACT interventions in medical conditions (Skinta, Lezama, Wells, & Dilley, 2015).

The current study aims to test the efficacy and acceptability of BEfree in a sample of women with binge eating and obesity or overweight. Our main hypothesis is that participants in BEfree group present a decrease in binge eating severity and eating psychopathology at the end of the intervention and at the same time develop adaptive psychological processes such as psychological flexibility, mindfulness, and self-compassion.

2 | METHOD

2.1 | Participants

Inclusion criteria are (a) female, (b) age between 18 and 55 years old, and (c) with binge eating disorder, assessed by eating disorders examination (EDE) interview (conducted by clinical psychologists from the research team) and scores on Binge Eating Scale (assuming BES > 17 as the threshold for binge eating [Duarte et al., 2015a, 2015b; Marcus, Wing & Lamparski, 1985]) and with overweight or obesity (body mass index [BMI] \geq 25).

2.2 | Procedure

Participants were recruited directly from the endocrinology department of Coimbra's University Hospital Centre and through flyers and advertisements in national newspapers. Exclusion criteria are (a) medical conditions that affect weight, (b) severe psychiatric problems (severe depressive episode, bipolar, substance abuse, and borderline personality disorder) assessed through Structured Clinical Interview for DSM Disorders (SCID)-I and SCID-II, (c) cognitive impairment and low level of education that significantly compromised the comprehension of the contents and questionnaires, (d) taking medication that can cause significant weight or appetite changes, (e) unavailability to attend weekly sessions (see Figure 1).

2.3 | Study design

Participants ($N = 59$) were distributed into two conditions: intervention (BEfree) and waiting list group (WL), according to their availability to readily attend the sessions. Figure 1 depicts participants' allocation and drop outs.

2.4 | Measures

2.4.1 | EDE 16.0D

EDE 16.0D (Fairburn, Cooper, & O'Connor, 2008; Ferreira, 2012) is a semistructured clinical interview that assesses the frequency and intensity of disordered eating behaviours and attitudes and showed good internal consistency in the Portuguese population ($\alpha = .98$). EDE has consistently demonstrated good psychometric properties (e.g., Fairburn, 2008). In this study, EDE presented an internal consistency of $\alpha = .79$.

2.4.2 | Binge Eating Scale

Binge Eating Scale (Gormally, Black, Daston, & Rardin, 1982; Duarte et al., 2015a, 2015b) is a 16-item self-report questionnaire that measures binge eating symptomatology. Both the original and Portuguese

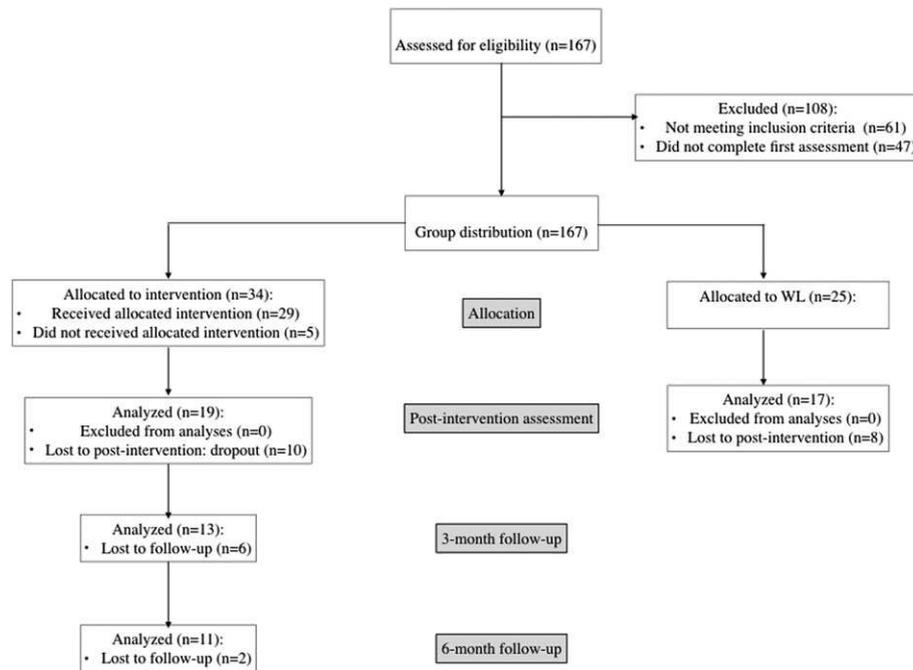


FIGURE 1 Summary of participants flow. WL = waiting list group

versions revealed good internal consistencies. Likewise, the current study presented a good internal consistency ($\alpha = .88$).

2.4.3 | Beck Depression Inventory-I

Beck Depression Inventory-I (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961; Portuguese version by Vaz Serra & Pio Abreu, 1973) is a well-known 21-items questionnaire that measures current depressive symptoms. The Portuguese version shows similar psychometric properties. In the current study, Beck Depression Inventory-I presented an internal consistency of $\alpha = .92$.

2.4.4 | Other as Shamer Scale

Other as Shamer Scale (Goss, Gilbert, & Allan, 1994; Matos, Pinto-Gouveia, Gilbert, Duarte, & Figueiredo, 2015) is an 18-item scale designed to assess individual's perception of being negatively evaluated by others. Other as Shamer Scale has been consistently showing high internal consistency, both in clinical and nonclinical samples ($\alpha = .96$ and $.92$, respectively; Goss et al., 1994). In the current study, the scale's internal consistency was $\alpha = .94$.

2.4.5 | Obesity-Related Well-Being Questionnaire

Obesity-Related Well-Being Questionnaire (Mannucci, et al., 1999; Silva, Ribeiro, & Cardoso, 2008) is a self-report questionnaire that assesses obesity-related quality of life (QoL), in which higher scores indicate diminished obesity-related QoL. Obesity-Related Well-Being Questionnaire-97 presents good internal consistencies both the original and the Portuguese versions ($\alpha = .83$ and $\alpha = .85$ respectively). This study found an $\alpha = .86$.

2.4.6 | Body Image-Acceptance and Action Questionnaire

Body Image-Acceptance and Action Questionnaire (Sandoz, Wilson, Merwin, & Kellum, 2013, Portuguese version by Ferreira, Pinto-

Gouveia, & Duarte, 2011) is a 12-item questionnaire that assesses the ability to accept and experience body image-related internal experiences without attempting to avoid or change them (Sandoz et al., 2013). Both the original ($\alpha = .93$) and the Portuguese version ($\alpha = .95$) revealed good psychometric properties. The current study found an internal consistency of $\alpha = .95$.

2.4.7 | Cognitive Fusion Questionnaire-Body Image

Cognitive Fusion Questionnaire-Body Image (Ferreira, Trindade, Duarte, & Pinto-Gouveia, 2015) is a 10-item self-reported questionnaire based on the original Cognitive Fusion Questionnaire (Gillanders et al., 2014). The original study presented good internal consistency, retest reliability, discriminant, and convergent and divergent validities (Trindade, Ferreira, Pinto-Gouveia, & Nooren, 2015). The current study found an internal consistency of $\alpha = .95$.

2.4.8 | The Engaged Living Scale

Engaged Living Scale (Trompetter et al., 2013) is a self-report measure developed to assess engagement with values-driven behaviour. Recently, a 9-item version of Engaged Living Scale has been used, showing good internal consistency ($\alpha = .88$; Trindade et al., 2015). The current study found similar internal consistency ($\alpha = .82$).

2.4.9 | Self-Compassion Scale

Self-Compassion Scale (Neff, 2003; Portuguese version by Castilho, Pinto-Gouveia, & Duarte, 2015) comprises 26 items instrument. Self-Compassion Scale may be used as a two-factor structure: one factor that assess self-compassion attitude and one factor of a self-criticism attitude. Previous studies found adequate model fit and good internal consistency ($\alpha = .91$ for self-compassion and $\alpha = .89$ for self-criticism; Costa, Marôco, Pinto-Gouveia, Ferreira, & Castilho, 2015). The current

study presented good internal consistencies for both the self-compassion factor ($\alpha = .93$) and the self-criticism factor ($\alpha = .91$).

2.4.10 | Five Facet Mindfulness Questionnaire-15

Five Facet Mindfulness Questionnaire-15 (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Portuguese version by Gregório, 2015) is the shorter version of the original 39 items questionnaire that measures the dispositional and multifaceted mindfulness characteristics. Five Facet Mindfulness Questionnaire-15 presents the same five-factor structure as the original version, as well as good internal consistency (ranging from .65 to .86). In the current study, the internal consistencies of the subscales were observing ($\alpha = .51$), describing ($\alpha = .79$), act with awareness ($\alpha = .50$), nonjudgement ($\alpha = .68$), nonreacting ($\alpha = .21$). The total scale presented an acceptable internal consistency ($\alpha = .70$).

Finally, participants who attended BEfree completed an after-intervention questionnaire designed to assess the practice between sessions and acceptability of the program.

2.5 | BEfree intervention

BEfree has 12 sessions, 2 hr 30 min each, run in small groups (10–15 participants). Sessions were carried out by three cognitive-behavioural clinical psychologists with previous training in contextual-behavioural therapies (see Table 1).

2.6 | Analytic plan

Baseline differences between BEfree and WL were examined for demographics and for variables in study. For the continuous variables, nonparametric Mann–Whitney U tests were conducted and for the categorical variables chi-square tests were performed.

A series of 2 (condition) \times 2 (time) repeated measures analysis of variance (ANOVA) were performed to test the hypothesis that

differences between premeasurements and postmeasurements differ between conditions. Additionally, in order to examine the differences within each group, we conducted a series of nonparametric Wilcoxon Signed Rank tests. A significant time-group interaction effect suggests that the differences found between prescores and postscores vary according to the condition to which the participants belong to.

To test whether the intervention effects were maintained at 3- and 6-month follow-up, we carried out a repeated measures ANOVA. Post hoc analyses using Fisher's least significant difference test was further computed to explore pairwise differences (pre-to-3 months; pre-to-6 months).

Effect sizes for the ANOVAs were calculated using partial eta squares (η^2) with .01 indicating a small effect size, .06 a medium effect and .14 a large effect size (Tabachnick & Fidell, 2013). The effect sizes for the Wilcoxon Signed Rank and Fisher's least significant difference tests were calculated using Cohen's *d*, with 0.2 indicating a small effect, 0.5 a medium effect and 0.8 a large effect (Cohen, 1988).

Descriptive statistics were calculated for the postintervention feedback data, which included questions regarding amount of practice, usefulness of sessions' components and benefits of participating in the intervention.

The α level was set at .05 for all analyses conducted in this study. All statistical procedures were computed with IBM SPSS (v.23).

3 | RESULTS

3.1 | Samples' characteristics

Participants in the intervention condition ($n = 19$) were 42.72 years old ($SD = 9.94$) and had a mean of 14.50 ($SD = 2.90$) years of schooling. Concerning marital status, 61.1% of participants were married and the majority had a medium socioeconomic status (36.8%). Participants had a mean BMI (kg/h^2) of 34.49 ($SD = 5.73$).

TABLE 1 BEfree sessions

Session	Theme	Goals
1	Introduction	To present the foundation of BEfree and the structure of the intervention;
	Creative hopelessness	To kindly confront the agenda of control and promote acknowledgement of the unworkability of the control strategies
2, 3, 4	Psychoeducation	To provide information on the evolutionary basis of emotions and discuss binge eating as a strategy to regulate negative affect and unwanted internal experiences, such as body shame, self-critical thoughts, and overall painful emotions.
5	Values clarification	Introduction of values as life direction and how we want our lives to be; Clarification of health-related values and reflection on obstacles that have prevented living in accordance to those values.
6, 7	Experiential distancing	Discuss language-related abilities as a source of psychological difficulties (the ubiquitous nature of suffering) and the difference between "describing" and "evaluating."
	Acceptance and willingness	To promote distancing from and acceptance of unwanted internal experiences. To promote willingness to have difficult internal experiences.
8, 9	Mindfulness	To promote specific mindfulness skills (e.g., mindfulness breathing meditation, body-scan, mindfulness of thoughts).
10, 11	Compassion	Cultivating self-compassion as an alternative to shame and self-criticism (e.g. loving kindness, safe-place, and compassionate image)
12	Committed action	To promote commitment to action by establishing new goals; anticipate potential setbacks and how to deal with them.

Note. Each session followed the same structure: (a) an initial moment of sharing personal experience, (b) a 5-minute mindfulness exercise, (c) the session theme, (d) an eating mindfulness exercise, and (e) summary of the session content and homework assignments.

Participants in the control condition ($n = 17$) were 41 years old ($SD = 9.56$) and had a mean of 15.92 ($SD = .86$) years of schooling. Concerning marital status, 60% of participants were married and the majority had a medium socioeconomic status (56.3%). Participants had a mean BMI (kg/h^2) of 35.06 ($SD = 4.93$).

There were no significant differences between the groups regarding age ($Z = -.525$; $p = .600$), years of schooling ($Z = -1.42$; $p = .155$), BMI ($Z = -.397$; $p = .691$), socioeconomic status ($\chi^2 = 1.89$; $p = .864$), and marital status ($\chi^2 = 1.38$; $p = .709$).

3.2 | Differences between groups in changes from preintervention to postintervention

Regarding outcome variables, there was a significant medium-to-large effect of the intervention on eating psychopathology, binge

eating, external shame, depression, and QoL. Additionally, it decreased body-image psychological inflexibility, body-image cognitive fusion, and self-criticism. Unexpectedly, mindfulness did not significantly change as a result of the intervention. Also, differences in self-compassion did not reach statistical significance at postintervention. No significant change was found for BMI (see Table 2).

3.3 | Differences within groups from preintervention to postintervention

In line with the results from ANOVA, participants in BEfree showed significant decreases in eating psychopathology, binge eating, depression, body-image psychological inflexibility, body-image cognitive fusion, external shame, and self-criticism, and increases in QoL, with

TABLE 2 Means, SDs at time 1 (pretest) and time 2 (posttest), time main effect, and time-group interaction effect

Variable	Time	Experimental		Control		Time			Time X group		
		M	SD	M	SD	F	p	Partial η^2	F	p	Partial η^2
BMI	1	34.49	5.73	35.10	4.65	.60	.444	.02	.92	.350	.03
	2	33.89	6.01	35.16	5.70						
Eating psychopathology	1	3.91	.94	3.60	.71	29.90	.000	.49	12.81	.001	.29
	2	2.40	.84	3.29	1.10						
Binge eating	1	29.94	10.98	28.65	7.85	40.61	.000	.55	23.68	.000	.42
	2	12.83	6.65	26.35	8.93						
Depression	1	23.00	8.85	17.71	12.81	12.94	.001	.29	14.99	.001	.32
	2	11.82	8.92	18.12	13.04						
External shame	1	34.67	7.96	30.59	16.09	.12	.730	.00	9.19	.005	.22
	2	29.56	13.11	34.65	18.20						
Quality of life	1	75.05	9.62	70.18	16.31	16.21	.000	.32	7.41	.010	.18
	2	61.05	13.71	67.47	17.98						
Psychological inflexibility-body image	1	63.00	12.96	59.71	16.11	21.03	.000	.38	6.64	.014	.16
	2	46.00	16.18	54.94	19.03						
Cognitive fusion-body image	1	42.95	14.68	39.53	14.82	4.47	.042	.12	6.97	.012	.17
	2	33.37	11.59	40.59	18.29						
Engaged with valued-living	1	26.26	4.60	30.06	6.12	2.33	.136	.06	3.59	.067	.10
	2	29.00	5.50	29.76	6.00						
Self-compassion (SCS)	1	7.60	1.63	8.46	2.45	2.15	.152	.06	2.04	.163	.06
	2	8.47	2.48	8.47	2.24						
Self-judgement (SCS)	1	10.64	1.91	9.77	2.47	15.11	.000	.31	18.31	.000	.36
	2	8.56	2.03	9.87	2.73						
Observing (FFMQ)	1	9.42	1.61	9.24	2.93	1.16	.288	.03	.037	.849	.00
	2	9.84	2.06	9.53	2.35						
Describing (FFMQ)	1	8.05	2.07	9.71	3.62	.25	.622	.01	.25	.622	.01
	2	8.47	2.82	9.71	3.04						
Act with awareness (FFMQ)	1	8.63	2.03	9.53	2.12	.02	.901	.00	.40	.530	.01
	2	8.89	1.56	9.35	2.06						
Non judging (FFMQ)	1	8.89	1.56	9.65	3.04	4.40	.044	.11	1.25	.272	.04
	2	10.05	1.78	10.00	2.45						
Non reacting (FFMQ)	1	8.26	1.19	8.41	2.03	.11	.743	.00	2.80	.103	.08
	2	9.05	1.96	7.88	2.03						
Total (FFMQ)	1	43.26	4.69	46.53	8.31	1.72	.198	.05	1.86	.182	.05
	2	46.31	6.51	46.47	6.09						

Note. Time 1 = Pretest; Time 2 = Posttest; SCS = Self-Compassion Scale; FFMQ = Five Facets of Mindfulness Questionnaire; Partial $\eta^2 = .01$ small effect size, $\eta^2 = .06$ medium effect size, and $\eta^2 = .14$ large effect size.

medium-to-large effect sizes. No significant differences were found in the control group in the same time periods, with the exception of external shame, which increased from pretest to posttest (see Table 3).

3.4 | Follow-up at 3 and 6 months after the intervention

Results presented in Table 4 suggest that the efficacy of BEfree was maintained at 3- and 6-month follow-up for eating psychopathology, binge eating, depression, QoL, body-image psychological inflexibility, body-image cognitive fusion, external shame, self-criticism, and self-compassion. Unexpectedly, there was a significant decrease in observing from preintervention to 3-month follow-up but not from preintervention to 6-month follow-up.

3.5 | Postintervention feedback from BEfree participants

Results from the feedback questionnaire indicated that, on average, participants found that BEfree was important for them ($M = 3.44$; $SD = .51$), improved their QoL ($M = 3.19$; $SD = .75$), improved how they deal with their impulses ($M = 3.06$; $SD = .57$), helped them deal with difficulties ($M = 3.06$; $SD = .77$), improved how they deal with negative or difficult thoughts, ($M = 2.94$; $SD = .57$) and how they deal with negative or difficult emotions ($M = 2.88$; $SD = .62$).

Regarding the usefulness of the program content, participants rated "the workings of the human mind" ($M = 3.56$; $SD = .51$), "nonreacting to thoughts and emotions" ($M = 3.44$; $SD = .73$), "cognitive fusion" ($M = 3.31$; $SD = .60$), and "acceptance of internal experiences" ($M = 3.25$; $SD = .45$) as very important.

TABLE 3 Median for control ($n = 17$) and experimental groups ($n = 19$) at preintervention and postintervention, Z-test, and effect size

Variables	Groups	Preintervention median	Postintervention median	Z	p	d
BMI	Control	34.28	34.20	-.863	.388	.28
	Experimental	34.00	34.20	-2.616	.009	.94
Eating psychopathology	Control	3.39	3.06	-1.758	.079	.65
	Experimental	4.24	2.32	-3.527	.000	1.52
Binge eating	Control	28.00	27.00	-1.594	.111	.57
	Experimental	28.00	12.00	-3.725	.000	1.58
Depression	Control	14.00	15.00	-.130	.897	.04
	Experimental	24.00	12.50	-3.197	.001	1.31
External shame	Control	34.00	43.00	-2.265	.024	.84
	Experimental	36.00	25.50	-2.157	.031	.77
Quality of life	Control	69.00	63.00	-1.045	.296	.36
	Experimental	75.00	63.00	-3.099	.002	1.16
Psychological inflexibility-body image	Control	62.00	60.00	-1.232	.218	.43
	Experimental	64.00	47.00	-3.361	.001	1.30
Cognitive fusion-body image	Control	42.00	41.00	-.699	.484	.24
	Experimental	45.00	30.00	-2.496	.013	.89
Engaged with valued-living	Control	29.00	30.00	-.286	.775	.10
	Experimental	27.00	30.00	-1.814	.070	.62
Self-compassion (SCS)	Control	8.30	7.75	-.237	.813	.08
	Experimental	7.05	8.90	-1.764	.078	.60
Self-judgement (SCS)	Control	10.15	10.60	-.517	.605	.18
	Experimental	10.85	8.55	-3.398	.001	1.37
Observing (FFMQ)	Control	10.00	10.00	-.414	.679	.14
	Experimental	9.00	9.00	-.991	.322	.33
Describing (FFMQ)	Control	9.00	9.00	-.576	.564	.20
	Experimental	8.00	9.00	-.782	.434	.26
Act with awareness (FFMQ)	Control	9.00	9.00	-.064	.949	.02
	Experimental	8.00	9.00	-.608	.543	.20
Non judging (FFMQ)	Control	9.00	10.00	-.891	.373	.31
	Experimental	9.00	10.00	-1.927	.054	.66
Non reacting (FFMQ)	Control	8.00	8.00	-1.151	.250	.40
	Experimental	8.00	9.00	-1.551	.121	.52
Total (FFMQ)	Control	46.00	46.00	-.311	.756	.11
	Experimental	43.00	45.00	-1.876	.061	.64

Note. BMI = body mass index; FFMQ = Five Facets of Mindfulness Questionnaire; SCS = Self-Compassion Scale.

TABLE 4 Means and SDs at 3- and 6-month follow-up and differences from preintervention to 3- and to 6-month follow-up

Variable	3-month		6-month		F	p	Partial η^2	Pre vs 3-month		Pre vs 6-month	
	M	SD	M	SD				p	d	p	d
BMI	32.79	4.38	33.63	4.15	8.05	.005	.54	n.s.	.59	n.s.	.45
Eating psychopathology	1.95	.87	2.25	1.09	20.50	<.001	.72	.001	1.39	<.001	1.38
Binge eating	12.00	5.39	13.56	9.44	15.89	<.001	.67	.001	1.33	.006	1.16
Depression	10.10	6.98	11.40	6.36	16.01	<.001	.64	<.001	1.21	.002	1.23
External shame	23.90	13.05	23.80	12.68	7.99	.003	.47	.010	.87	.003	1.16
Quality of life	57.50	15.22	58.40	14.14	17.86	<.001	.67	.001	.98	.001	1.27
Psychological inflexibility-body image	43.50	15.33	47.90	14.21	20.43	<.001	.69	.001	1.12	.001	1.28
Cognitive fusion-body image	29.40	13.01	31.90	15.33	11.32	.001	.56	.004	.43	.006	1.07
Engaged with valued-living	26.10	5.02	26.90	4.82	.26	n.s.	.03	n.s.	.19	n.s.	.41
Self-compassion (SCS)	8.69	1.77	8.02	2.04	6.05	.011	.43	.009	.87	.015	.80
Self-judgement (SCS)	8.59	2.00	8.63	2.13	7.72	.004	.49	.003	1.23	.017	1.07
Observing (FFMQ)	8.50	1.27	9.20	1.55	4.48	.026	.33	.012	.73	n.s.	.22
Describing (FFMQ)	8.60	2.12	8.10	2.13	.39	n.s.	.04	n.s.	.57	n.s.	.32
Act with awareness (FFMQ)	8.60	2.27	8.40	2.22	.18	n.s.	.02	n.s.	.45	n.s.	.36
Non judging (FFMQ)	9.30	1.95	9.70	1.25	.57	n.s.	.06	n.s.	.53	n.s.	.68
Non reacting (FFMQ)	8.50	1.78	8.20	1.69	.80	n.s.	.08	n.s.	.79	n.s.	.56
Total (FFMQ)	43.50	5.21	43.60	4.48	.12	n.s.	.01	n.s.	.57	n.s.	.82

Note. BMI = body mass index; FFMQ = Five Facets of Mindfulness Questionnaire; SCS = Self-Compassion Scale.

Most participants reported they practiced the recorded meditation and compassion-focused exercises once (37.5%) to twice (25.0%) a week.

4 | DISCUSSION

The current study explored the efficacy of BEfree, that is, a psychological intervention for binge eating in obesity that integrates psychoeducation, mindfulness, compassion and values-congruent action.

Results suggest that participants in BEfree presented lower levels of binge eating severity and eating psychopathology had less external shame, were less depressed, and had more QoL when compared to women in the WL condition; and these results presented medium-to-large effect sizes. Additionally, participants decreased in psychological inflexibility related to body image, decreased in body-image cognitive fusion and were less self-critical. In fact, previous research seems to point out for the pervasive role of self-criticism in eating psychopathology (Gilbert, 2002; Goss & Allan, 2009; Goss & Gilbert, 2002), particularly in binge eating (e.g., Duarte et al., 2014). Moreover, psychological inflexibility (e.g., Masuda, Boone, & Timko, 2011) and cognitive fusion (e.g., Duarte et al., 2015a, 2015b) seem to have a detrimental role in the maintenance of binge eating, which seems to echo the relevance of designing interventions that focus on these processes. No differences were found in mindfulness at postintervention. This was an unexpected result, even though there seems to be an ongoing discussion on the limitations of measuring mindfulness (see Grossman, 2011). Also unexpectedly, no differences were found in engagement with valued living. Although the promotion of values-based action was an inherent feature in BEfree, only one session was explicitly dedicated to values clarification and promotion of values-based action, which might

explain this result. Finally, differences in self-compassion between the two conditions were not found. It is important to have in mind that self-compassion was explicitly promoted only latter in intervention (session 10 and 11) and postintervention assessment were carried out immediately after. In fact, we also conducted 3- and 6-month follow-up analyses, which seem to suggest that self-compassion needs more time to be developed.

When considering each group separately, results were similar. Importantly, no differences were found in WL, except on external shame, which increased. Indeed, the detrimental role of shame in eating psychopathology and binge eating has been soundly suggested in previous studies (e.g., Duarte et al., 2014, 2015a; Gilbert, 2002; Goss & Allan, 2009). An interesting result is that although no differences were found in self-compassion at postintervention, results show that participants present significantly higher levels of self-compassion at both 3- and 6-month after intervention, which seems to suggest that self-compassion might need more time to reflect the benefits of compassion exercises.

After the intervention, participants reported that BEfree improved their QoL, helped them deal with difficulties and improved how they deal with negative or difficult emotions. Additionally, participants chose as the most important contents in BEfree “the workings of the human mind,” “nonreacting to thoughts and emotions,” “cognitive fusion,” and “acceptance of internal experiences,” which seems to be in line with the psychological processes that yielded greater results.

Some limitations should be considered when interpreting these results. This study was conducted in a small sample, which prevents us from drawing definite conclusions. Nevertheless, it is worth mentioning that the observed attrition is proportionately in line with previous intervention studies with BED samples (e.g., Wilfley et al., 2002; Wilson, Wilfley, Agras, & Bryson, 2010). Replication of these results in a larger sample is needed. Additionally, BEfree was designed to be implemented

in a sample of women, which compromises the extrapolation of these results to a population of men who binge eat. Furthermore, this is a nonrandomized control study, in which selection of participants to each condition took "availability to readily attend sessions" as the criteria for distribution into the two condition. It should also be considered that the control condition was a WL, which does not allow us to determine if BEfree is more effective than another active intervention.

Overall, the current study suggests the efficacy and feasibility of integrating different approaches such as psychoeducation, mindfulness, compassion and promotion of values-based action in treating binge eating.

ACKNOWLEDGEMENTS

The authors thank Dr. Dírcea Rodrigues, Dr. Patricia Oliveira, and Dr. Margarida Robalo at the endocrinology service of CHUC for their assistance with referencing patients.

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How to cite this article: Pinto-Gouveia J, Carvalho SA, Palmeira L, et al. BEfree: A new psychological program for binge eating that integrates psychoeducation, mindfulness, and compassion. *Clin Psychol Psychother*. 2017;24:1090–1098. <https://doi.org/10.1002/cpp.2072>