

# Brief cognitive-behavioral therapy for weight loss in midlife women: a controlled study with follow-up

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**Objective:** Cognitive-behavioral therapy (CBT) has proven to be effective in weight reduction. This study explores whether individual, 8-session CBT can promote weight loss in midlife women.

**Methods:** Anthropometric (weight, abdominal perimeter, and body mass index calculation), psychological (health-related and sexual quality of life, stress, anxiety, and depression), and behavioral measures (binge eating disorder and restrained, external, and emotional eating) were assessed at baseline (T1), posttreatment (T2), and 4-month follow-up (T3), for a total of 21 women at baseline; the CBT group ( $n = 11$ ) and the control group ( $n = 10$ ; waiting list) were compared.

**Results:** Statistically significant effects that were dependent on the intervention were observed on weight ( $F = 4.402$ ;  $P = 0.035$ ;  $\eta_p^2 = 0.404$ ;  $\pi = 0.652$ ) and body mass index ( $F = 3.804$ ;  $P = 0.050$ ;  $\eta_p^2 = 0.369$ ;  $\pi = 0.585$ ); furthermore, marginally significant effects were observed on external eating ( $F = 2.844$ ;  $P = 0.095$ ;  $\eta_p^2 = 0.304$ ;  $\pi = 0.461$ ). At follow-up, women in the CBT group presented with lower weight, abdominal perimeter, body mass index, and external eating; higher health-related quality-of-life and restrained eating were also observed in this group. Most differences identified were at a marginally significant level. Moreover, at follow-up, none of the participants of the CBT group met the criteria for binge eating disorder, whereas the number of women with binge eating disorder in the control group remained the same through all three assessments.

**Conclusion:** An effective, though small, weight loss was achieved. Changes in quality of life were also observed. Moreover, changes in external eating behavior were successful.

**Keywords:** cognitive-behavioral therapy, control group, follow-up, midlife, weight loss, women

## Introduction

It has been more than a decade since the World Health Organization (WHO) identified obesity as an epidemic, recognizing it as a public health threat.<sup>1</sup> Currently, 30%–80% of adults in the countries of the WHO's European Region are overweight, and recent studies have shown that, in 2010, almost 150 million adults were obese.<sup>2</sup> In the United States, current data points to a prevalence of 33.0% of adults who are overweight and 35.7% who are obese.<sup>3</sup>

Obesity is a risk factor for cardiovascular diseases, metabolic syndrome, dyslipidemia, type II diabetes, and premature death.<sup>4–6</sup> In addition, metabolic and muscular-skeletal benefits as well as brain function improvement may be attained through weight loss and physical fitness.<sup>6,7</sup>

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Cognitive-behavioral therapy (CBT) has proven to be effective in weight reduction.<sup>8–11</sup> However, it is not easy to achieve and maintain this weight loss.<sup>8,12</sup>

Psychological symptoms can be associated with excessive weight and obesity. Some studies have shown that anxiety, depression,<sup>13–15</sup> and stress are strongly related to higher body mass index (BMI) and weight gain, especially in women.<sup>16–18</sup> However, this association is not unanimous, given that in another study, anxiety and depression symptoms were not associated with the severity of overweight.<sup>19</sup> Furthermore, and independently from the depressive mood, increased stress can predict binge eating.<sup>20</sup> The presence of binge eating disorder (BED), as proposed by the *Diagnostic and Statistical Manual of Mental Disorders-IV-TR*,<sup>21</sup> increases the likelihood of higher BMI when compared to individuals without BED.<sup>22</sup>

Research examining BED has shown that CBT can be effective in the reduction or cessation of binge eating<sup>23,24</sup> and its decrease will promote weight reduction.<sup>25</sup> A consequence of weight loss can be the improvement of sexual-<sup>26</sup> and health-related quality of life (QoL).<sup>27,28</sup> However, this conclusion is not unanimous.<sup>29</sup>

The objective of this study was to explore the efficacy of 8-week individual CBT in reducing weight and binge eating, as well as to investigate whether intervention promotes differences in depression, anxiety, stress, QoL levels, and eating behaviors in a sample of middle-aged women.

## Methods

### Participants

Twenty-one women agreed to participate in this study. The mean age of the 21 participants was 51 years ( $M = 51.0$ ;  $SD = 5.8$ ) and the mean BMI was 29 ( $M = 29.3$ ;  $SD = 2.2$ ). Table 1 describes the participants.

### Measures

The sociodemographic characteristics, menopausal status, BMI, and physical exercise were evaluated through self-reported measures.

The menopausal status was defined according to Harlow et al.<sup>30</sup> Premenopausal women did not show any changes in their menstrual cycle, perimenopausal women reported cycle variations, and postmenopausal women had a period of at least 12 months of amenorrhea.

Weight and abdominal perimeters were measured by a trained health psychologist, always using the same scale; the remaining variables were assessed through self-reported measures.

**Table 1** Participant characterization

Variables	CBT group n = 11	Control group (WL) n = 10
Marital status		
Married or in a relationship	7	9
Not married or in a relationship	4	1
Professional status		
Active	9	8
Inactive	2	2
Educational level		
Primary school	2	1
Middle school	3	2
High school	2	4
University	4	3
Family annual income		
Less than 10,000 euro	4	0
10,001–20,000 euro	2	3
20,001–37,500 euro	4	3
37,501–70,000 euro	1	3
More than 70,001 euro	0	1
Menopausal status		
Premenopause	3	2
Perimenopause	4	4
Postmenopause	4	4
Physical exercise		
Yes	4	3
No	7	7

**Abbreviations:** CBT, cognitive-behavioral therapy; WL, waiting list.

Binge eating disorder was explored using the *Diagnostic and Statistical Manual of Mental Disorders-IV-TR*<sup>21</sup> criteria, as evidenced in the “Criteria for further study” chapter.

The instruments included the Portuguese adaptation of the Depression, Anxiety, and Stress Scales, to assess stress, anxiety, and depression symptoms;<sup>31</sup> the Utian Quality of Life Scale, used to explore sexual- and health-related quality of life in menopausal women;<sup>32</sup> and the Dutch Eating Behavior Questionnaire,<sup>33</sup> to measure restrained, emotional, and external eating behaviors.

### Procedure

A study on menopause and body weight was undertaken in the city of Lisbon and the participants' recruitment was done through community settings (such as schools, universities, and corporate settings) and in the gynecology department of a hospital. The vast majority of respondents who agreed to participate (89% of the sample) were recruited in an educational setting and were mothers and grandmothers of students (only 7% of the respondents were recruited in the hospital and 4% through enterprises). To meet the inclusion criteria, participants had to be female, literate, and between 42 and 60 years old.

The American Psychological Association's standards on the ethical treatment of participants were followed. A written informed consent form was delivered to all participants, which explained the aims of the study, emphasizing that participation in this research was voluntary and that participants could interrupt their collaboration at any point without consequences. After giving informed consent and agreeing to participate in the research, a community sample of 1003 participants was integrated in the study.

Sociodemographic, health- and menopause-related, lifestyle, psychological, and contextual variables were collected in this cross-sectional study. Women who had participated in the cross-sectional phase were offered voluntarily enrollment in a weight loss intervention if they fulfilled the criteria for overweight or obesity.

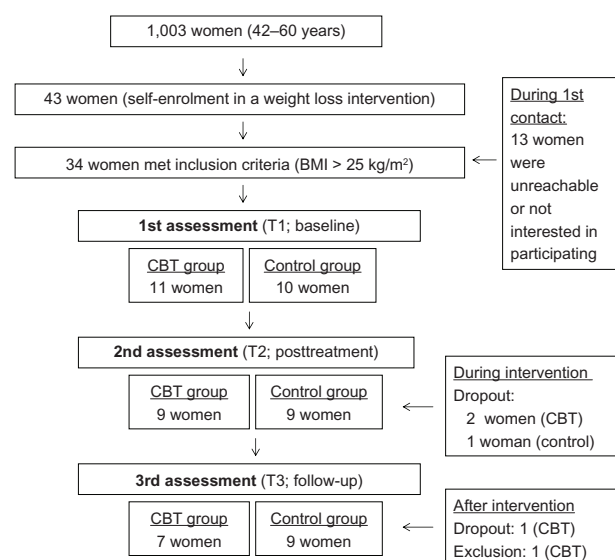
Of the 43 women who enrolled in the intervention program, 34 had a BMI above 24.9 kg/m<sup>2</sup> (ie, were overweight or obese). These participants were contacted by telephone, and 13 women were unreachable or unable to participate.

With the support of a computer-generated randomization scheme, 11 participants were selected to undergo individual CBT, and 10 were included in a waiting list (WL). The control group (WL) lasted for the same period as the intervention group, which was 26 weeks. During the intervention, two participants in the CBT and one in the WL dropped out. One participant of the experimental group did not complete the follow-up assessment, and one participant from the same group was not taken into consideration in the statistical analysis because she was diagnosed with an axis II mental disorder. The sample recruitment and retention along the study is presented in Figure 1.

After the 26 weeks, the nine women on the waiting list began the individual intervention and went from T1 (baseline) until T3 (4-month follow-up); however, their outcomes were not analyzed in the present study in order to maintain the independency of both groups.

Menopausal status, anthropometric measures, and psychological variables were evaluated 1 week before the intervention (or control condition) began, 1 week after it ended, and 4 months after the second assessment. T1, posttreatment (T2), and T3 were conducted by a different psychologist from the one who performed the intervention. Anthropometric measurements were always made using the same weight scale.

To prevent experimenter's bias, the first psychologist, who was responsible for the assessments, was told that these were done in the context of a study on menopause, without giving any further information on the different groups or



**Figure 1** Progress of participants through the study.

specific objectives. The participants were told at the time of the recruitment that any questions regarding the intervention should be addressed to the psychologist who was responsible for the treatment, and a telephone contact was provided for that effect.

The second psychologist, who was responsible for the intervention, had formal training in CBT by the Portuguese Association on Cognitive and Behavioral Therapies.

## Intervention

The cognitive-behavioral intervention was structured by two psychologists (and psychotherapists) after a literature review and based on previous interventions. It was planned as presented in Table 2. The intervention was individual, conducted in an adequate setting, and performed weekly (each session lasted 60 minutes). Regarding the materials used, in the second session, a matrix entailing seven columns (day/hour; situation; presence of excessive food ingestion; type of food; thoughts before excessive food ingestion; emotions before excessive food ingestion; other comments) was introduced and each participant began filling it in with the psychologist during the second session; the women were asked to continue filling in this report sheet at home over the following 3 weeks. During the fifth session, another matrix was delivered, a table with two columns (achieving my target weight; maintaining my present weight) and two rows (disadvantages; advantages), and used in the context of the motivation increment. This table was completed during the session and analyzed with the psychotherapist.

**Table 2** Contents of each session

Session	Contents
1st	Relationship with the food and the body Eating routines Psycho-education about the consequences of excessive weight and obesity Motivation increment
2nd	Analysis of situations when there was an excessive ingestion of food Exploration of thoughts, emotions, and behaviors subsequent to excessive food ingestion Evaluation of perceived control before and during excessive food ingestion
3rd	The ABC model Lifestyle characteristics facilitating excessive eating Trigger identification
4th	Trigger identification and exploration of obstacles to trigger management Cognitive restructuring Behavioral techniques Physical exercise promotion
5th	Evaluation of successful and unsuccessful implementation of behavioral techniques Exploration of new behavioral techniques Development of mindfulness Development of attention towards triggers and consequent behavior (successful versus unsuccessful management) Motivation increment
6th	Assessment of successful and unsuccessful management of excessive food ingestion Difficulty anticipation Assessment of cognitive and behavioral techniques
7th	Lifestyle: integrating changes Redefinition of daily well-being
8th	Maintenance of adaptive changes made Relapse prevention

**Abbreviation:** ABC, activating event, beliefs, consequences.

## Statistical analysis

Data was first analyzed to identify outliers and distribution forms. No missing value imputation was made.

To explore if the two groups were homogeneous at baseline, Student's *t*-test was used to compare both conditions (experimental and control) on the anthropometric, psychological, and behavioral variables.

Comparisons between groups on the repeated measures were made using mixed repeated measures analysis of variance. A post hoc least significant difference test for mean differences was used to compare the three assessments (T1, T2, and T3) for the anthropometric, psychological, and behavioral measures in each group (CBT and waiting list).

Finally, to explore whether the amount of weight loss in the experimental group was related with educational level and family income, Spearman correlation was used.

## Results

The protocol of CBT was implemented as expected, using the structure of sections previously outlined for most participants. Regarding the women who completed the program, the adherence rate to the CBT sessions varied: there was 100% adherence for 5 participants (who attended 8 sessions), 88% for a woman who attended seven sessions, and 75% for one participant (who attended six sessions).

To determine whether the participants who completed CBT differed from those on the waiting list, the two groups were compared regarding anthropometric, psychological, and behavioral variables. Table 3 presents the results; no significant differences between the two groups in the baseline assessment were observed.

To analyze whether weight and psychological changes were dependent on the condition (CBT group versus control group), multivariate tests were conducted. Hence, the variables for which variation was significantly dependent on the condition included weight ( $F = 4.402$ ;  $P = 0.035$ ;  $\eta_p^2 = 0.404$ ;  $\pi = 0.652$ ) and BMI ( $F = 3.804$ ;  $P = 0.050$ ;  $\eta_p^2 = 0.369$ ;  $\pi = 0.585$ ), while external eating presented a marginally significant dependence on the condition ( $F = 2.844$ ;  $P = 0.095$ ;  $\eta_p^2 = 0.304$ ;  $\pi = 0.461$ ). Changes in abdominal perimeter ( $F = 0.703$ ;  $P = 0.513$ ;  $\eta_p^2 = 0.098$ ;  $\pi = 0.114$ ), health QoL ( $F = 0.305$ ;  $P = 0.742$ ;  $\eta_p^2 = 0.045$ ;  $\pi = 0.089$ ), sexual QoL ( $F = 0.934$ ;  $P = 0.418$ ;  $\eta_p^2 = 0.126$ ;  $\pi = 0.177$ ), stress ( $F = 0.271$ ;  $P = 0.767$ ;  $\eta_p^2 = 0.040$ ;  $\pi = 0.084$ ), depression ( $F = 0.232$ ;  $P = 0.796$ ;  $\eta_p^2 = 0.034$ ;  $\pi = 0.079$ ), anxiety ( $F = 0.762$ ;  $P = 0.486$ ;  $\eta_p^2 = 0.105$ ;  $\pi = 0.152$ ), restrained eating ( $F = 2.560$ ;  $P = 0.116$ ;  $\eta_p^2 = 0.283$ ;  $\pi = 0.421$ ), and emotional eating ( $F = 1.534$ ;  $P = 0.252$ ;  $\eta_p^2 = 0.191$ ;  $\pi = 0.268$ ), were not dependent on the implementation of the CBT.

**Table 3** Comparison of participants placed in intervention (CBT) with participants in waiting list (WL) at baseline assessment (T1)

Variables	Student's t-test t (df) P
Weight (kg)	-1.061 (16) ns
Abdominal perimeter (cm)	-1.014 (16) ns
BMI (kg/m <sup>2</sup> )	-1.850 (16) ns
Health QoL	0.324 (16) ns
Sexual QoL	-0.579 (16) ns
Depression	-0.463 (16) ns
Anxiety	0.474 (16) ns
Stress	0.542 (16) ns
Restrained eating	-0.857 (16) ns
Emotional eating	-0.548 (16) ns
External eating	0.117 (16) ns

**Abbreviations:** BMI, body mass index; CBT, cognitive-behavioral therapy; ns, not significant; QoL, quality of life.

To explore whether the variables changed during the three assessments under the same conditions, the CBT and the waiting list groups were analyzed separately after the confirmation of sphericity for all variables/groups using the Mauchly test. Results for the control group are presented in Table 4. As shown, there were no significant differences in the controlled variables.

Changes in the experimental group from the baseline assessment to follow-up are presented in Table 5. As demonstrated, significant and marginally significant differences were observed in several variables, including weight, abdominal perimeter, BMI, health QoL, and restrained and external eating (although only changes in weight, BMI, and external eating were proven to be dependent on the experimental condition).

In relation to binge eating disorder (BED), there were differences in the intervention group when comparing T1 (which had 2 women meeting the criteria), both with T2 (1 participant meeting the criteria) and with T3 (none of the participants meeting BED criteria). Regarding the waiting list group, there were no significant differences regarding BED prevalence, since the same number of participants had BED in T1, T2, and T3 (4 women with binge eating disorder and 5 without).

Additionally, within the experimental group, it was observed that the association between both family income ( $r_p = 0.334$ ;  $P = 0.465$ ) and educational level ( $r_p = 0.335$ ;  $P = 0.465$ ) with the amount of weight lost was not significant.

**Table 4** Waiting list: T1, T2, and T3 assessment for all variables

Variables	T1 n = 10 M (SD)	T2 n = 9 M (SD)	T3 n = 9 M (SD)	I	J	Mean difference I-J (SE) P
Weight (kg)	78.1 (7.2)	78.1 (6.3)	78.9 (5.7)	T1	T2	0.022 (0.561) ns
					T3	-0.822 (0.765) ns
					T2	-0.844 (0.492) ns
Abdominal perimeter (cm)	98.5 (7.0)	99.5 (7.0)	99.0 (5.8)	T1	T2	-0.989 (1.508) ns
					T3	-0.478 (0.695) ns
					T2	0.511 (1.289) ns
BMI (kg/m <sup>2</sup> )	31.8 (2.4)	31.8 (2.2)	32.2 (2.2)	T1	T2	-0.011 (0.234) ns
					T3	-0.372 (0.332) ns
					T2	-0.361 (0.212) ns
Health QoL	2.5 (0.6)	2.7 (0.7)	2.8 (0.6)	T1	T2	-0.175 (0.138) ns
					T3	-0.286 (0.124) ns
					T2	-0.111 (0.109) ns
Sexual QoL	3.3 (0.7)	3.1 (1.0)	3.1 (0.9)	T1	T2	0.222 (0.229) ns
					T3	0.222 (0.176) ns
					T2	0.000 (0.157) ns
Depression	1.7 (0.8)	1.6 (0.6)	1.7 (0.8)	T1	T2	0.079 (0.107) ns
					T3	0.016 (0.230) ns
					T2	-0.063 (0.235) ns
Anxiety	1.6 (0.6)	1.5 (0.6)	1.4 (0.4)	T1	T2	0.063 (0.093) ns
					T3	0.206 (0.137) ns
					T2	0.143 (0.141) ns
Stress	1.9 (0.5)	1.8 (0.9)	1.9 (0.8)	T1	T2	0.079 (0.160) ns
					T3	-0.016 (0.198) ns
					T2	-0.095 (0.245) ns
Restrained eating	3.0 (0.7)	2.8 (0.8)	2.7 (0.7)	T1	T2	0.178 (0.262) ns
					T3	0.278 (0.262) ns
					T2	0.100 (0.130) ns
Emotional eating	2.7 (0.8)	3.0 (1.0)	2.8 (0.9)	T1	T2	-0.222 (0.121) ns
					T3	-0.093 (0.146) ns
					T2	0.130 (0.161) ns
External eating	2.8 (0.4)	2.8 (0.6)	2.9 (0.7)	T1	T2	-0.033 (0.125) ns
					T3	-0.167 (0.166) ns
					T2	-0.133 (0.147) ns

**Abbreviations:** BMI, body mass index; ns, not significant; QoL, quality of life; T1, baseline; T2, posttreatment; T3, follow-up.



**Table 5** CBT: T1, T2 and T3 assessment for all variables

Variables	T1 n = 11 M (SD)	T2 n = 9 M (SD)	T3 n = 7 M (SD)	I	J	Mean difference I-J (SE) P
Weight (kg)	76.9 (5.4)	76.4 (5.1)	74.5 (4.4)	T1	T2	-1.414 (1.367) ns
					T3	1.643 (0.719)*
					T2	3.057 (1.446)*
Abdominal perimeter (cm)	96.5 (5.9)	96.1 (5.5)	95.0 (6.0)	T1	T2	-1.143 (1.716) ns
					T3	1.171 (1.917) ns
					T2	2.314 (1.133)*
BMI (kg/m <sup>2</sup> )	30.9 (2.3)	30.7 (2.6)	29.9 (2.1)	T1	T2	-0.594 (0.574) ns
					T3	0.654 (0.283)*
					T2	1.249 (0.650) ns
Health QoL	2.7 (0.6)	3.0 (0.5)	2.9 (0.6)	T1	T2	-0.347 (0.213) ns
					T3	-0.490 (0.243)*
					T2	-0.143 (0.125) ns
Sexual QoL	3.0 (1.0)	3.1 (1.0)	3.2 (0.5)	T1	T2	-0.190 (0.160) ns
					T3	-0.190 (0.377) ns
					T2	0.000 (0.291) ns
Depression	1.6 (0.7)	1.3 (0.3)	1.5 (0.6)	T1	T2	0.184 (0.145) ns
					T3	-0.020 (0.248) ns
					T2	-0.204 (0.184) ns
Anxiety	1.6 (0.7)	1.4 (0.4)	1.5 (0.5)	T1	T2	0.150 (0.152) ns
					T3	0.027 (0.201) ns
					T2	-0.122 (0.154) ns
Stress	2.0 (0.6)	1.6 (0.3)	1.9 (0.6)	T1	T2	0.245 (0.138) ns
					T3	0.095 (0.137) ns
					T2	-0.245 (0.206) ns
Restrained eating	2.8 (0.7)	3.3 (0.6)	3.3 (0.6)	T1	T2	-0.486 (0.307) ns
					T3	-0.586 (0.248)*
					T2	-0.100 (0.251) ns
Emotional eating	2.8 (0.7)	2.4 (0.7)	2.6 (0.7)	T1	T2	0.264 (0.274) ns
					T3	0.385 (0.315) ns
					T2	0.121 (0.203) ns
External eating	2.9 (0.6)	2.7 (0.4)	2.7 (0.4)	T1	T2	0.143 (0.139) ns
					T3	0.371 (0.143)**
					T2	0.229 (0.081)**

Notes: \* $P < 0.10$ ; \*\* $P < 0.05$ .

Abbreviations: BMI, body mass index; CBT, cognitive-behavioral therapy; ns, not significant; QoL, quality of life; T1, baseline; T2, posttreatment; T3, follow-up.

## Discussion

Being able to reduce weight and maintain the weight loss after the end of an intervention is not easy.<sup>8,12</sup> In the present research, the mean weight loss evidenced at follow-up (T3) by the participants who had undergone CBT was 2.4 kg or 3.1% of the baseline weight. In contrast, between baseline and follow-up, the control group had a mean 1.2% increase of their initial weight (that is, a mean increment of 0.8 kg).

Although this reduction was below 5% loss, which has been pointed as a milestone for successful weight loss in other studies,<sup>34</sup> it was marginally significant and dependent on the CBT implemented. It is important to note that weight loss was only achieved at the follow-up (comparing T1 with T3, and T2 with T3), with no weight decrease being observed at the post-intervention assessment (comparing T1 with T2).

This emphasizes that since this intervention was not focused on caloric decrease or on physical activity promotion (which would likely lead to a rapid weight decrease), this treatment (which entails the identification of excessive food ingestion triggers, and the examination of the successful/unsuccessful implementation of cognitive and behavioral strategies, among others) may take more time to promote an effective change that results in weight loss. However, the loss at the follow-up assessment, 4 months after the last session, indicates that while taking longer (ie, more than the duration of the program itself) to promote a weight decrease, the effects of this intervention can be active and effective long after its implementation.

At the follow-up assessment, a marginally significant increase in restrained eating was observed in the participants

who completed the CBT, as well as a significant decrease in external eating. Although changes in eating behavior were expected to follow this intervention, only external eating modifications were directly associated with the CBT implemented since there were no significant interactions between restrained eating and the experimental condition. Thus, this program seems to be effective in reducing the disinhibition or loss of control when facing external stimuli associated with food ingestion.

Additionally, BED also decreased in women who completed the CBT (this reduction was observed immediately after the intervention and at follow-up) when compared with the control group, in which the participants who met the criteria for BED at T1 continued meeting these criteria at follow-up. Although binge eating status and eating behaviors changed between T2 and T3, this did not reflect a successful weight reduction (that is, higher than 5% of the initial weight) after the intervention. This is congruent with the results of prior research which demonstrated that despite the decrease in binge eating behavior, successful weight loss may not be achieved.<sup>35</sup> It has been concluded in previous studies examining cognitive-behavioral and behavioral interventions that the former is more effective in reducing binge eating while the latter promotes a greater weight loss reduction by the end of the intervention,<sup>11</sup> evidence that supports the results of the present research. Moreover, external eating being the only behavioral change that derives from CBT, and given that both external eating and weight (although the reduction of the latter was only marginally significant and around 3.1% of initial weight) are reduced only at the follow-up assessment, it can be hypothesized that the modification of these two variables is associated.

Cognitive restraint has been associated with a significantly lower energy and fat intake, higher carbohydrate and fiber use, and higher weight reduction at 18-month follow-up.<sup>36</sup> This evidence supports the results of the present study: 4 months after the CBT intervention, a marginally significant weight loss was accompanied by an increase in restrained eating and a decline in external ingestion when compared to the baseline assessment, although the increment of restrained eating was not dependent on the CBT since there was no significant interaction between these variables. Other variables, not assessed in this study, may be responsible for this change, such as the increment of perceived control. This data is also in agreement with another study which pointed out that, after 2-year follow-up, participants who managed to maintain their weight also demonstrated the maintenance of the changes in their eating behaviors.<sup>37</sup>

Cognitive factors and the establishment of clear objectives, components that were approached in this brief CBT, have been evidenced as important when addressing a treatment of this kind, as they can contribute to weight regain.<sup>38</sup>

It is also important to consider that most women in this study (eight in the CBT group and eight in the control group) were in the menopause phase (perimenopause) or had already gone through menopause (postmenopause). Given that during the menopausal process there are changes in body fat distribution with a loss of lean body mass and an increase in total body fat and visceral fat,<sup>39-41</sup> this sample's characteristics may have had an impact on the success rate observed in this research. Therefore, weight loss programs for menopausal women should consider this and target specific nutritional and physical exercise recommendations, alongside cognitive and behavioural strategies, to avoid or minimize the frequently observed weight gain during the menopausal transition and postmenopause.

The therapy format (group versus individual) has been the subject of debate. There are no significant differences in terms of the intervention's efficacy when comparing group with individual therapies.<sup>42,43</sup> However, in a recent research with a large sample, weight reduction, as well as decrease in blood pressure, glucose, and cholesterol, was higher in a group intervention when compared with an individual approach. This may be due to the encouraging and mutually supportive environment prompted by the group format, which can make the lifestyle changes and long-term maintenance of healthier behaviors easier.<sup>44</sup> Consequently, it is suggested that a group format could enhance the efficacy of this CBT. Furthermore, and because contents regarding physical exercise and nutrition were promoted according to general guidelines,<sup>45</sup> it would be important in future research to include individualized nutritional and physical exercise plans as a complement to this intervention, given their efficacy in weight reduction.<sup>46</sup>

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## Disclosure

The authors report no conflicts of interest in this work.

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