

University of Groningen

## Psychomotor therapy and aggression regulation in eating disorders

Boerhout, Cornelis

**IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.**

*Document Version*

Publisher's PDF, also known as Version of record

*Publication date:*

2017

[Link to publication in University of Groningen/UMCG research database](#)

*Citation for published version (APA):*

Boerhout, C. (2017). *Psychomotor therapy and aggression regulation in eating disorders: Evidence-based treatment and performance-based measurement*. Rijksuniversiteit Groningen.

### Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

### Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

## Chapter 4

# **Aggression regulation in day treatment of eating disorders: Two-centre RCT of a brief body and movement-oriented intervention**

European Eating Disorders Review 2017; 25:52-59

Cees Boerhout <sup>a,b</sup>

Marte Swart <sup>a,b</sup>

Marjon Voskamp <sup>c</sup>

Nadine A. C. Troquete <sup>d</sup>

Joske T. van Busschbach <sup>a,e</sup>

Hans W. Hoek <sup>a,f,g</sup>

<sup>a</sup> *University of Groningen, University Medical Center Groningen, University Center of Psychiatry, Groningen, the Netherlands*

<sup>b</sup> *Lentis Psychiatric Institute, PsyQ Center for Eating Disorders, Groningen, the Netherlands*

<sup>c</sup> *GGNet Mental Health Care, Amarum Center for Eating Disorders, Zutphen, the Netherlands*

<sup>d</sup> *University of Groningen, University Medical Center Groningen, Department of General Practice, Groningen, the Netherlands*

<sup>e</sup> *Windesheim University of Applied Sciences, Zwolle, the Netherlands*

<sup>f</sup> *Parnassia Psychiatric Institute, The Hague, the Netherlands*

<sup>g</sup> *Department of Epidemiology, Mailman School of Public Health, Columbia University, New York, NY, USA*

## Abstract

**Objective:** The objective is to evaluate a body and movement-oriented intervention on aggression regulation, specifically aimed towards reducing anger internalization in patients with eating disorders.

**Method:** Patients were randomized to treatment-as-usual (TAU) plus the intervention ( $n = 38$ ) or to TAU only ( $n = 32$ ). The intervention was delivered by a psychomotor therapist. TAU consisted of multidisciplinary day treatment (3–5 days per week during 3–9 months).

Anger coping (Self-Expression and Control Scale) and eating pathology (Eating Disorder Examination-Self-report Questionnaire) were measured at baseline and follow-up. Differences between pre-intervention and post-intervention scores were tested by using repeated measures ANOVA.

**Results:** The intervention group showed a significantly larger decrease of anger internalization than the control group ( $\eta^2 = 0.16$ ,  $p = 0.001$ ). Both groups showed a significant reduction in eating pathology, but differences between groups were not significant.

**Discussion:** A body and movement-oriented therapy seems a viable add-on for treating anger internalization in patients with eating disorders.

**Keywords:** eating disorders; body-oriented; psychomotor therapy; anger; aggression

## Introduction

In eating disorders (ED), anger and aggressiveness are found to be salient psychopathologic features.<sup>1-6</sup> Anger dysregulation is associated with ED subtypes, as well as severity of ED symptoms, altered biochemical functioning, endocrinologic dysfunction and poorer treatment outcome.<sup>7,8</sup> Moreover, impulse dysregulation, an important feature of ED<sup>9</sup>, may be related to difficulties in expressing anger and hostility.<sup>1,7,10</sup> High levels of anger internalization refer to a strong tendency to direct experienced feelings inwardly, for example by restraining from expression of anger towards the person involved or blaming oneself.<sup>11</sup> Clinical experiences indicate that persistent overregulation of anger by restraining from expression increases the risk of losing control and may result in anger outburst directed towards others or towards the own body. Instead of internalizing anger, patients need to learn to regulate anger expression with appropriate timing and intensity in interactions with others.<sup>12</sup>

In a review of the role of anger in ED, Truglia et al.<sup>8</sup> found that anger feelings are mostly self-directed in an attempt to control the body, to regulate emotions and to experience a confirmation of one's own identity. They argue that bingeing, vomiting and misuse of laxatives or diuretics are aggressive behaviours that can be considered as self-injurious behaviours serving various functions. For example, bingeing could be a means to avoid anger, whereas vomiting may reduce the immediate anger state. Waller et al.<sup>13</sup> related different aspects of anger to specific bulimic behaviours and found that unhealthy core beliefs seem to impact eating pathology by means of increasing the tendency to suppress anger. Despite the importance of adequate anger regulation in clinical practice, research on how to treat anger and aggression underlying an ED is lacking.<sup>7,8,14</sup>

In an attempt to enhance the impact of treatment in this respect, we evaluated a new aggression regulation intervention originating from psychomotor therapy (PMT). PMT is a body and movement-oriented therapy frequently used in the Netherlands and Belgium.<sup>15</sup> PMT may be of specific use in reducing anger internalization. Body awareness techniques and physical activities are combined to help patients improve their emotional recognition and expression skills. In PMT, body and movement exercises and the use of props with symbolic meaning offer the opportunity to overcome shame, guilt, fear or taboo and to experience anger as a resource of empowerment. The exercises evoke physiological responses, feelings, thoughts and images associated with anger, which can be addressed therapeutically. The aim of our intervention is to use anger positively in goal-directed actions instead of avoiding it and internalizing it as destructive thoughts and actions against the body. The intervention is further explained in the methods section and has been theoretically substantiated elsewhere.<sup>12</sup>

The intervention under study has been evaluated in another randomized controlled trial (RCT) ( $n = 40$ ) conducted in an outpatient setting for ED treatment, showing a large decrease in anger internalization in the experimental group when compared with the control group.<sup>16</sup> Moreover, ED symptoms only reduced significantly in the experimental group. During the intervention period, patients of both groups received supportive contact once every 1 or 2 weeks, including prescription of medication, psycho-education, reassurance, advice and diet management, with both groups receiving the same total amount of treatment contacts.<sup>16</sup> These results support the idea that body and movement-oriented therapy may reduce anger suppression and hence may affect ED pathology. Promising as these findings are, they are limited by the small sample size. Furthermore, data were collected in an outpatient treatment setting, whereas in Dutch clinical practice, PMT is often embedded in multidisciplinary day or inpatient treatment. Therefore, we concurrently conducted a second RCT in 2-day hospitals with a larger sample of participants. We hypothesized that after our brief intervention, anger internalization would be decreased in patients attending an intensive (3 to 5 days) multidisciplinary treatment programme. Like in the outpatient trial, we did not expect that promoting anger expression immediately would lead to a measurable increase in anger externalization. Given the comprehensive treatment and the more severe ED issues, we did not expect to see a significant difference between groups regarding eating pathology, as was the case in the context of low frequent, individual supportive contact within the outpatient trial. The results are presented in this paper.

There is increasing evidence to support the use of non-verbal interventions in mental health care.<sup>17,18</sup> However, as far as ED are concerned, systematic reviews of RCTs on the effectiveness of physical therapy interventions concluded that, whilst promising, more evidence is required.<sup>19,20</sup> Our randomized controlled research aims to contribute to this evidence base.

## Method

### Study design and participants

We conducted a two-centre RCT (trial registration: NTR 3382). Participants were recruited at two treatment locations: PsyQ Center for ED in Groningen (SITE-1), part of Lentis Psychiatric Institute which provides specialized care for 350–400 ED patients per year; and Amarum Center for ED in Zutphen (SITE-2), part of GGNet Mental Health Care providing specialized care for 400–500 ED patients per year. Patients were included between 2011 and 2014.

Eligible participants met the Diagnostic and Statistical Manual of Mental Disorders Fourth Edition (DSM-IV) criteria for anorexia nervosa (AN), bulimia nervosa (BN) or eating disorder not otherwise specified (EDNOS). EDs were diagnosed by the lead clinician assessing the patient and confirmed in regular diagnostic meetings. The DSM-IV criteria were still in use during the inclusion period. For the current study, however, diagnoses were reclassified according to DSM-5 criteria for AN, BN, binge eating disorder (BED) and other specified feeding and eating disorder (OSFED). Two ED experts (an independent psychiatrist and senior author HWH) completed the reclassification.<sup>21</sup> Exclusion criteria were mental retardation (IQ<70), acute psychosis or current substance dependence. Patients with a body mass index (BMI) above 30 were not included in treatment-as-usual (TAU), since they followed a day treatment programme with obesity related issues, which was different from the programme offered to the patients with ED included in this study. The medical ethical review board approved the study protocol (CCMO nr. NL28665.097.09).

Since the present study started before the results on the outpatient RCT were available, the power analysis was performed by using the findings on anger internalization from an earlier pilot study (in Dutch),<sup>22</sup> also described in the outpatient paper.<sup>16</sup> With alpha set to 0.05 and a power of 90% to detect a comparable large effect size, we would need to include 34 patients in each study arm. If the power is reduced to 80%, we would need 26 participants in each arm.

All new patients at both sites followed the standard assessment procedure. Consecutive referrals were invited to participate in the trial. When written informed consent was obtained, participants were invited for assessment and randomization (T<sub>1</sub>). As the intervention was given in dyads, participants were randomized in consecutive blocks of four, with two assigned to TAU plus the intervention, and two to TAU only. If necessary for continuity of the trial, randomization was performed in a block of three participants instead of four, at the cost of one assignment to the control condition. The assignment to the condition was conducted by drawing numbered envelopes, prepared by an external office manager. At the end of the intervention period, the second assessment was completed (T<sub>2</sub>). Participants then continued TAU.

At SITE-1, the psychomotor therapist who delivered the intervention did not participate in the regular multidisciplinary team delivering TAU. The research assistant who was in contact with participants and collected the data was not part of the research team that analysed the data. At SITE-2, the psychomotor therapist who delivered the intervention also participated in TAU. Therefore, attention was paid to monitor possible spillover effects both in practice and, afterwards, by extra analyses per site. At this site, the assessment and collection of research data were performed under supervision of an independent senior researcher. Data analyses were performed by authors (MS, CB and JTvB) who had not been in contact with trial participants.

## Therapies

### Intervention

The intervention protocol was semi-structured and consisted of six weekly 1-hour sessions with two patients and an experienced psychomotor therapist.

As explained in our previous paper, the purpose of the intervention is to reappraise aggression as a positive phenomenon and to learn to safely express angry thoughts and feelings with appropriate timing and intensity.<sup>16</sup> The therapist educates the participants on the various facets of aggression, basically explained as behaviour resulting from anger-related emotions, cognitions, images and impulses. Starting point is making a distinction between destructive and constructive aggression. Anger and aggression are usually considered as negative concepts related to violence and hostility. In the intervention, this negative aggression is linked to the self-destructive ED. Anger, however, can also be a positive resource in building up strong identity and defending personal territory.<sup>23</sup> To revalue anger as a resource for empowerment, a meaningful connection is made to body awareness, life experiences and present interaction with others.<sup>24</sup> The patient is supported to step forward and overcome shame, guilt and fear of emptiness or losing control. The body-felt 'urge to act', inherent in aggression, is triggered by the use of props such as boxing gloves, sticks, balls and drums. These props can adopt symbolic meaning in relation to therapeutic objectives. So the boxing bag may become the external representation of a bully at school, a nosy parent or critical inner voices. In contrast to verbal therapies, body and movement-oriented strategies are applied to facilitate functional anger expression, deal with old frustrations and to empower the patient. Aggression is redirected against self-destructive thoughts and behaviours, and corresponding emotions are projected onto the bag. Importantly, just hitting a bag is not a solution, just as venting anger on another person does not solve a problem. Learning to use anger in a socially acceptable way can be a liberating and empowering experience. 'Prosocial' aggression seems to be an effective coping strategy in stressful situations.<sup>25</sup> The goal is not only to cope with anger in an open way but also to use anger itself as a useful coping strategy. In a previous paper, we described the intervention with several case vignettes illustrating the method.<sup>12</sup>

The psychomotor therapists who delivered the intervention had received academic training as a therapist and had a background in mental health care. They were trained and supervised by the first author (CB) in addressing anger and aggression in the context of ED. Treatment fidelity was monitored bimonthly by telephone, email or during a meeting with the first author. Therapists provided video recordings of a compilation of samples from different therapy sessions as a tool for supervision by the first author.

### **Treatment-as-usual**

Treatment-as-usual (TAU) consisted of group treatment by using principles of cognitive behavioural therapy and was provided by multidisciplinary teams involving a psychiatrist, psychotherapist, psychomotor therapist, specialized nurse practitioner and dietician. The psychomotor therapist participating in TAU did not address aggression explicitly during the regular PMT sessions but focused on body image and movement behaviour. TAU was offered in three therapy groups, either for four (SITE-1) or for three or five (SITE-2) days a week.

### **Measures**

#### **Self-Expression and Control Scale**

The Self-Expression and Control Scale (SECS) is a Dutch scale derived from the State Trait Anger Expression Inventory.<sup>26,11</sup> The State Trait Anger Expression Inventory is widely used to investigate the role of anger expression and anger control in somatic and mental diseases. The SECS consists of 40 items divided into four subscales: Anger In, Anger Out, Control Anger In and Control Anger Out. The subscale Anger In assesses efforts to hide anger (anger internalization), and the Anger Out subscale assesses outwardly directed anger (anger externalization). As no changes were found on both control subscales in the pilot study,<sup>22</sup> these were not included. Items are rated at a 4-point scale ranging from Almost Never to Almost Always. The SECS subscales have high levels of internal reliability ( $\alpha = 0.87$  for Anger In and  $0.84$  for Anger Out) and test–retest correlations (stability coefficient  $0.65$  for Anger In and  $0.72$  for Anger Out).<sup>26</sup> Anger In was found to be correlated with cynicism, cynical distrust and indirect aggression, while Anger Out with aggressive responding and direct aggression.<sup>11</sup> The norm scores of the SECS were available as frame of reference.<sup>27</sup>

#### **Eating Disorder Examination-Self-report Questionnaire**

The Eating Disorder Examination-Self-report Questionnaire (EDE-Q)<sup>28</sup> was used to assess the key behavioural features and associated psychopathology of the eating disorder in the past 28 days (Dutch translation: Nauta, Hospers, Kok, and Jansen, Maastricht University, the Netherlands, 2000). The EDE-Q consists of 36 items resulting in four subscales: Restraint, Eating Concern, Weight Concern and Shape Concern. Current research provides support for the reliability and validity of the EDE-Q.<sup>29</sup> Internal consistency for the EDE-Q total score is good ( $\alpha = 0.90$ ).<sup>30</sup> The EDE-Q was part of the standard assessment procedure for all ED patients at both sites independent of the study. Patient satisfaction At T2, patients in the intervention group received a questionnaire measuring satisfaction with the module with the following questions: ‘Are you satisfied with the module?’ [rated 1 (absolutely not) to 10 (very much)] and ‘Would you recommend the module to others?’ [1 (defi-

nately not) to 5 (definitely)]. In addition, we asked respondents to specify which part of the module may or may not have been satisfactory. Treatment attendance was monitored.

## Statistical analysis

Statistical analyses comparing the two trial conditions were performed in SPSS (version 22). Independent samples t-tests, chi-squared tests and Mann–Whitney U-tests were used to control for baseline differences between conditions at both sites. To control for the influence of site characteristics, differences between sites and differences between conditions per site were checked in the total group, including those with incomplete data at T2. Analyses were performed following the intention to treat principle over all participants for whom sufficient data were available, including those who did not fully receive the intervention. Only five participants of the 70 in the trial (7%) did not complete questionnaires (Figure 4.1), so we did not test for differences between those who did or did not complete all measures.

Analysis was performed following the intention to treat principle over the total group with complete data, including those who did not fully receive the intervention. For the primary outcomes SECS Anger In and Anger Out, a repeated measures ANOVA with time as within and condition as between subjects variables was conducted. To study the effect of site on outcome, a dummy variable was used. BMI and age were added as covariates in the analyses. This same procedure was followed for the exploration of effects on the EDE-Q.

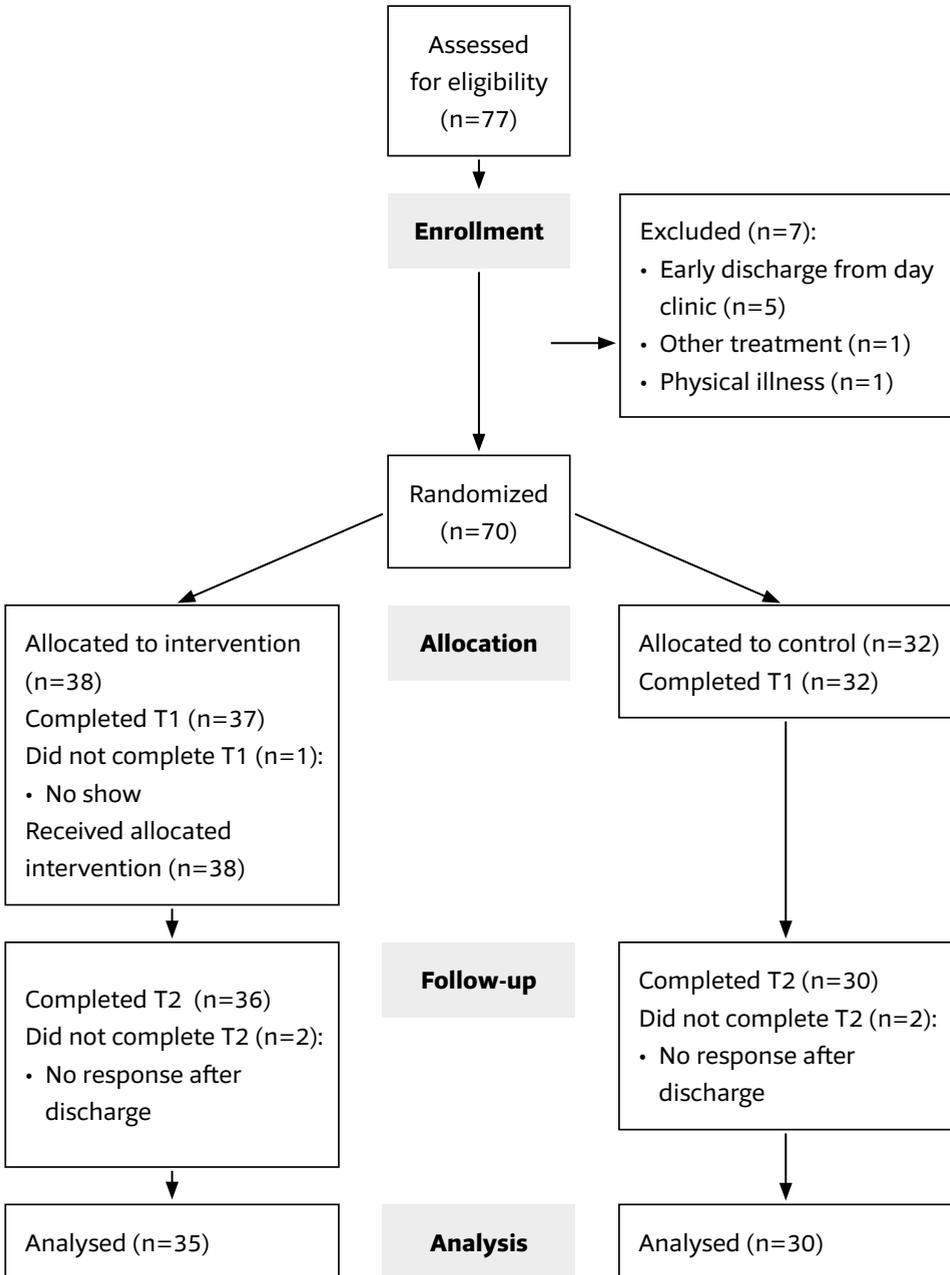
To assess clinical significance of outcomes, the within subject effect size (Eta squared,  $\eta^2$ ) was used. Cut off scores in Cohen's guidelines<sup>31</sup> indicate that an effect is small if  $\eta^2 = 0.01$ , medium if  $\eta^2 = 0.059$  and large if  $\eta^2 = 0.138$ .

## Results

### Participant flow

After assessing 77 patients for eligibility, 70 (Figure 4.1) were randomized in 13 blocks of 4 ( $n = 52$ ) and 6 blocks of 3 individuals ( $n = 18$ ). They were allocated to either the intervention condition ( $n = 38$ ) or the control condition ( $n = 32$ ). Of these 70 participants, 44 patients were recruited at SITE-1 and 26 at SITE-2. The study dropout rate at pre-intervention and postintervention measurements was low, resulting in 65 patients that could be analysed in the final dataset ( $n = 35$  intervention,  $n = 30$  TAU). Of the three dropouts in the intervention group, one was diagnosed with AN and two with BN. The two dropouts in the control group were diagnosed with BN.

One patient in the intervention group did not complete T1 in a timely manner and was dropped from further analyses. However, since she was already paired with another participant she was allowed to continue in the intervention.



**Figure 4.1.** Consolidated Standards of Reporting Trials flow diagram of participants

Out of 38 patients, 35 (92%) attended all sessions (six in total). In case an appointment was cancelled, the session was postponed. Two patients attended five sessions, and one patient attended two. The latter patient and one from the control group did not finish day treatment. Both completed T2 measures and therefore were included in the intention to treat analyses.

## Baseline measures

### Differences between groups

Participants (the total of both sites) did not differ in gender between intervention and control group (<5 male participants in one cell;  $p = 0.39$ ), neither did they differ in mean age ( $p = 0.36$ ); see Table 4.1. There were no differences between groups on DSM-5 diagnoses [ $\chi^2(3) = 1.70$ ,  $p = 0.64$ ]. Based on their BMI, participants were classified by using standard cut off points: underweight ( $BMI < 18.5$ ;  $n = 36$ ), normal weight ( $18.5-24.9$ ,  $n = 29$ ) and overweight ( $BMI > 24.9$ ,  $n = 3$ ). In the underweight category, the lowest BMI as recorded during treatment was used to indicate the severity level. This categorization yielded no differences between groups at baseline [ $\chi^2(2) = 0.41$ ,  $p = 0.82$ ]. The data distribution of duration of previous treatment was non-normal. Therefore, differences were calculated by using three time intervals (<2, 2-5 and >5 years), which were not significantly different [ $\chi^2(2) = 3.14$ ,  $p = 0.21$ ]. There were no differences at baseline on SECS Anger In [ $t(76) = 0.38$ ,  $p = 0.71$ ], Anger Out (not normally distributed; Mann-Whitney U-test,  $p = 0.82$ ) or EDE-Q total score [ $t(65) = -0.002$ ,  $p = 1.00$ ]. There was no significant difference in the mean number of weeks between T1 and T2 between the intervention group (9.37,  $SD = 2.30$ ) and control group [9.50,  $SD = 2.83$ ;  $t(63) = -0.169$ ,  $p = 0.87$ ].

### Differences between sites

No differences between sites were found on baseline characteristics, except for the score on SECS Anger In. Patients receiving treatment at SITE-2 ( $M = 32.81$ ,  $SD = 4.49$ ) scored significantly higher than patients treated at SITE-1 ( $M = 28.63$ ,  $SD = 6.36$ ) on Anger In [ $t(65.28) = -3.19$ ,  $p = 0.002$ ].

### Group differences by site

At both SITE-1 and SITE-2, no differences between intervention and control group were found on baseline characteristics.

**Table 4.1.** Baseline differences between groups (total of both sites)

	Intervention <sup>a</sup>	Control <sup>a</sup>	<i>p</i>
Females (%)	<i>n</i> =38 92%	<i>n</i> =32 97%	0.39 <sup>b</sup>
Mean age in years (SD)	25.00 (7.59)	23.34 (7.30)	0.36 <sup>c</sup>
Diagnosis DSM-5 ( <i>n</i> , %)	<i>n</i> =38	<i>n</i> =32	0.64 <sup>b</sup>
Anorexia Nervosa	20 (52.6%)	19 (59.4%)	
Bulimia Nervosa	12 (31.6%)	11 (34.4%)	
Binge Eating Disorder	2 (5.3%)	1 (3.1%)	
Other Specified Feeding and Eating Disorders	4 (10.5%)	1 (3.1%)	
BMI ( <i>n</i> , %)	<i>n</i> =36	<i>n</i> =32	0.82 <sup>b</sup>
<18.5 (M=16.53, SD=1.03)	18 (50.0%)	18 (56.3%)	
18.5-24.9 (M= 20.79, SD=1.62)	16 (44.4%)	13 (40.6%)	
>24.9 (M=28.63, SD=2.07)	2 (5.6%)	1 (3.1%)	
Duration of previous treatment ( <i>n</i> , %)	<i>n</i> =32	<i>n</i> =28	0.21 <sup>b</sup>
Mean (SD)	4.78 (5.20)	4.71 (6.97)	
<2 years	13 (34.2%)	9 (28.1%)	
2-5 years	8 (21.1%)	13 (40.6%)	
>5 years	11 (28.9%)	6 (18.8%)	
Mean baseline scores (SD)	<i>n</i> =37	<i>n</i> =32	
Anger In	30.46 (5.90)	29.90 (6.29)	0.71 <sup>c</sup>
Anger Out	18.62 (5.80)	18.59 (4.76)	0.82 <sup>d</sup>
EDE-Q total	<i>n</i> =37 3.41 (1.08)	<i>n</i> =30 3.41 (1.18)	1.00 <sup>c</sup>

<sup>a</sup> *n* varies due to missing data<sup>b</sup> Chi-square<sup>c</sup> T-test <sup>d</sup> Mann-Whitney U test

## Outcome measures

The main outcome measures are presented in Table 4.2. On our primary outcome Anger In, the repeated measures analysis showed a significant within subject effect for time [ $F(1, 63) = 31.10, p < 0.001$ ], but no effect for group [ $F(1, 63) = 1.12, p = 0.29$ ]. The time  $\times$  group effect for Anger In was statistically significant [ $F(1, 63) = 12.27, p = 0.001$ ]. Indeed, compared with the control group, anger internalization reduced more in the intervention group. In the intervention group, the mean Anger In scores dropped 5.40 points ( $SD = 5.19$ ) and in the control group 1.23 points ( $SD = 4.25$ ). The effect size was large ( $\eta^2 = 0.16$ ). No significant time  $\times$  group effect was found on Anger Out.

On the EDE-Q, a significant within subject effect for time was found as well [ $F(1, 60) = 32.73, p < 0.001$ ], and there was no significant difference between groups [ $F(1, 60) = 0.24, p = 0.63$ ]. Although the decrease in eating problems was larger for those in the intervention group ( $M = 0.69, SD = 0.72$ ) compared with the control group ( $M = 0.51, SD = 0.92$ ), there was no significant time  $\times$  group interaction effect [ $F(1, 60) = 0.74, p = 0.40$ ].

To control for difference between sites in Anger In (baseline) scores, an extra analysis was performed with site as a between subject variable. With a direct effect for site [ $F(1, 62) = 14.16, p < 0.001$ ] and no difference between intervention and control group [ $F(1, 62) = 1.40, p = 0.24$ ], the interaction effects for Anger In (time  $\times$  group) remained statistically significant [ $F(1, 62) = 12.31, p = 0.001$ ].

## Patient evaluation

The mean satisfaction score of all participants in the intervention was 8 on a 10-point Likert scale with 69% who would definitely recommend the module to others, 26% think they would and the remaining 5% were neutral. There was no significant difference between sites in this respect. Patients were satisfied with the exercises and gradual approach to practice expression (54%), the relational qualities of the therapist (49%), the recognition of emotions and listening to body signals (31%), the structure of the intervention (29%) and the cooperation with the co-participant (20%). Patients were less satisfied with the small number of sessions (37%) and the time/attention spent on particular issues (14%).

**Table 4.2.** Outcome data and results of the repeated measures analysis

	Intervention		Control		Post- / Pre-assessment			
	T1	T2	T1	T2	Time	Group	Time x Group	ES
	M (SD)	M (SD)	M (SD)	M (SD)	F (p)	F (p)	F (p)	$\eta^2$
SECS anger-in	30.54 (6.07)	25.14 (5.53)	29.97 (6.41)	28.73 (6.48)	31.10 ( <b>&lt;0.001</b> )	1.12 (0.29)	12.27 ( <b>0.001</b> )	<b>0.16</b>
SECS anger-out	18.60 (5.85)	19.20 (4.03)	18.57 (4.56)	17.83 (4.41)	0.02 (0.90)	0.43 (0.52)	1.69 (0.20)	0.03
EDE-Q total	3.40 (1.08)	2.71 (1.31)	3.45 (1.08)	2.94 (1.26)	32.73 ( <b>&lt;0.001</b> )	0.24 (0.63)	0.74 (0.40)	0.01

Sample sizes for the intervention group: SECS n=35, EDE-Q n=34; and for the control group: SECS n=30, EDE-Q n=28  
 EDE-Q, Eating Disorder Examination-Questionnaire; SECS, Self-Expression and Control Scale; ES, effect size

## Discussion

Our brief aggression regulation intervention yielded a positive and immediate effect in patients with an ED seen in 2-day hospital settings. Compared with the regular multidisciplinary programme only, the addition of the intervention led to a significantly larger decrease of anger internalization. This result confirms the outcome of our outpatient trial that PMT may give patients handholds to deal with a difficult to treat emotion. Continued attention for this persistent issue seems warranted since also in the intervention group, the post-treatment scores ( $M = 25.14$ ,  $SD = 5.53$ ) remained two deciles above average of a Dutch norm population ( $M = 22.1$ ,  $SD = 7.0$ ).<sup>27</sup>

As expected, the current day treatment trial did not confirm the extra effect of the intervention on ED pathology as achieved in the outpatient trial. Both groups showed significant improvement in eating pathology, but differences between groups did not reach significance, possibly because of the extensive therapeutic schedule for both groups in the current trial, including the interaction between participants.

The findings on Anger In support the results of studies pointing towards a relationship between anger and ED,<sup>1,7,8</sup> particularly between anger, the inner psychological self and the physical self. Anger inhibition in ED is found to be correlated with perceived threat from anger.<sup>4,32,33</sup> Literature shows that patients who suppress anger tend to ‘silence the self’, which may be related to dissatisfaction with one’s body.<sup>34,35</sup> We noticed in an earlier paper that they are in fact ‘silencing the body’ by reducing themselves to a rational executive system in control of an irrational, emotional body they are extremely ashamed of.<sup>12</sup> Fox and Power<sup>32</sup> use a model of emotions in ED, whereby anger is detached from the person’s sense of self as a dangerous emotion, taking the form of disgust towards the body. The body seems to be a target of destructive aggression by means of distorted eating, bulimic behaviours or other self-injurious behaviours. The decrease of anger internalization found in our study reconfirms the notion that anger issues deserve attention in the treatment of ED.<sup>7,8</sup> Recent literature recommends the use of body exercises on aggressiveness-related emotions by using punch ball, psychodrama,<sup>36</sup> breathing and relaxation techniques, thought-stopping, timeout exercises and rehearsing anger situations.<sup>37</sup> Importantly, the aim cannot be ‘to get rid of’ aggression by hitting a bag,<sup>12,38</sup> but to permit oneself to use it as an empowering coping mechanism in stressful situations. Patients need to focus on problem solving instead of avoiding emotional tension by internalizing anger.<sup>39</sup> Therefore, challenging patients to see anger as a positive, relational, body-felt experience and to regulate aggression at the right time with appropriate intensity of expression may be a fruitful undertaking.<sup>16</sup> Like the outpatient trial, the present trial did not detect a direct change on Anger Out. So a decrease in Anger In scores does not imply an increase on the Anger Out scale of the SECS. This could be attributed to the perseverance of anger inhibition in the target group. For instance, Van Coillie and Van Mechelen<sup>40</sup> suggest that, especially in individuals who tend to act in a socially acceptable way, behaviour outcome expectancies may suppress Anger Out. One could also argue that the negative content of most Anger Out items of the SECS increases the threshold for a higher score (e.g. ‘I make sarcastic remarks to others’ and ‘I say hateful things’). In fact, such items in the Anger Out scale are not aimed at constructive aggression as pursued in the intervention. An additional self-report measure may be required in future research to assess constructive anger expression.

## **Strengths and limitations**

A strength of the study is that it was conducted following the regular course of clinical practice at two sites, which adds to its validity and generalizability. The dropout rate was low. The numbers recruited conformed to the power analysis, and randomization was resulting in comparable groups. The attendance of the

intervention was high, and the intervention was positively evaluated by the participants.

With the extra PMT intervention added to the regular treatment package at the day clinic, the overall dose of therapist contact was higher for those in the intervention group since no form of contact was offered to the control group. It can be argued that the extra 6 hours of treatment have led to the difference between both groups. However, these hours are only a very small portion of the total amount of contacts during the study period (3 to 5 days per week over an average period of 9 weeks).

In this study, two different psychomotor therapists delivered the intervention with one of them exclusively engaged in the intervention, but the other also acting as therapist in TAU. This last situation could have negatively influenced results because of possible spillover effects. However, no indication was found for a loss in effect size, for example a decrease of the difference between intervention and control group at the site where the single psychomotor therapist participated in both arms of the study.

Another limitation of our study was the use of self-report questionnaires. Reported levels of anger expression are known to be influenced not only by levels of social desirability but also by denial or (body) awareness deficits,<sup>41</sup> especially in patients with an ED.<sup>42</sup> We think that research on emotional responses requires behavioural measures, including measures that provide information derived from observing body behaviour.<sup>43</sup>

In the study, only short-term changes are presented with no follow-up data. To gain insight into the stability of the effects of the intervention and the possible accelerating influence on the overall treatment process, research should include data on longterm treatment outcomes also focusing on duration, intensity and success, possibly combining data on symptoms with data on functioning. As many participants recommended to extend the intervention with more sessions, studies should also address this issue, comparing the lasting effects of both the original and an extended programme.

As with other RCTs, our study does not give much insight in predictive factors. Covariates need to be identified including both patient and therapist characteristics as well as process variables. Also, studies with different but homogeneous patient populations are necessary to shed light on possible differences between diagnostic groups.

## Conclusion

The direct effects on reducing anger internalization achieved with our brief intervention show that a body and movement-oriented therapy may be a useful add-on for addressing anger and aggression in patients with an ED. How anger suppres-

sion and ED pathology are interrelated requires further investigation. To better understand this relationship, more diverse outcome measures are needed as well as research into long-term effects and working mechanisms.

### **Acknowledgements**

The authors wish to thank psychomotor therapist Robert Statema; research assistants Noortje Struijck, Janette Flikkema and Martha Messchendorp; psychotherapist Helga Pruiksma; psychiatrist Marion Bakker; and colleagues and staff of the Lentis Psychiatric Institute and the Amarum Center for Eating Disorders for their highly appreciated contribution to this trial. We thank Dr. Elske Bos for her major efforts in designing the study, Dr. Maartje Vroling and Dr. Ellen Visser for their methodological input and Henk Hallie for the data entry. Last but not least, special thanks to the patients who were willing to participate in this study.

## References

1. Engel SG, Boseck JJ, Crosby RD, et al. The relationship of momentary anger and impulsivity to bulimic behavior. *Behav Res Ther* 2007; 45: 437-447.
2. Harrison A, Sullivan S, Tchanturia K, et al. Emotion recognition and regulation in anorexia nervosa. *Clin Psychol Psychother* 2009; 16: 348-356.
3. Harrison A, Sullivan S, Tchanturia K, et al. Emotional functioning in eating disorders: Attentional bias, emotion recognition and emotion regulation. *Psychol Med* 2010; 40: 1887-1897.
4. Ioannou K and Fox JR. Perception of threat from emotions and its role in poor emotional expression within eating pathology. *Clin Psychol Psychother* 2009; 16: 336-347.
5. Miotto P, De Coppi M, Frezza M, et al. Eating disorders and aggressiveness among adolescents. *Acta Psychiatr Scand* 2003; 108: 183-189.
6. Quinton S and Wagner HL. Alexithymia, ambivalence over emotional expression, and eating attitudes. *Pers Individ Dif* 2005; 38: 1163-1173.
7. Krug I, Bulik CM, Vall-Llovera ON, et al. Anger expression in eating disorders: Clinical, psychopathological and personality correlates. *Psychiatry Res* 2008; 161: 195-205.
8. Truglia E, Mannucci E, Lassi S, et al. Aggressiveness, anger and eating disorders: a review. *Psychopathology* 2006; 39: 55-68.
9. Fernández-Aranda F, Jiménez-Murcia S, Álvarez-Moya EM, et al. Impulse control disorders in eating disorders: Clinical and therapeutic implications. *Compr Psychiatry* 2006; 47: 482-488.
10. Tiller J, Schmidt U, Ali S, et al. Patterns of punitiveness in women with eating disorders. *Int J Eat Disord* 1995; 17: 365-371.
11. Van Elderen T, Maes S, Komprou I, et al. The development of an anger expression and control scale. *Br J Health Psychol* 1997; 2: 269-281.
12. Boerhout C, Van Busschbach JT, Wiersma D, et al. Psychomotor therapy and aggression regulation in eating disorders. *Body Mov Dance Psychother* 2013; 8: 241-253.
13. Waller G, Babbs M, Milligan R, et al. Anger and core beliefs in the eating disorders. *Int J Eat Disord* 2003; 34: 118-124.
14. Fassino S, Daga GA, Piero A, et al. Dropout from brief psychotherapy in anorexia nervosa. *Psychother Psychosom* 2002; 71: 200-206.
15. Probst M, Knäpen J, Poot G, et al. Psychomotor therapy and psychiatry: What's in a name? *Open Complement Med J* 2010; 2: 105-113.
16. Boerhout C, Swart M, Van Busschbach JT, et al. Effect of aggression regulation on eating disorder pathology: RCT of a brief body and movement oriented intervention. *Eur Eat Disord Rev* 2016; 24: 114-121.
17. Röhrich F. Body oriented psychotherapy. The state of the art in empirical research and evidence-based practice: a clinical perspective. *Body Mov Dance Psychother* 2009; 4: 135-156.
18. Röhrich F. Body psychotherapy for the treatment of severe mental disorders—an overview. *Body Mov Dance Psychother* 2015; 10: 51-67.
19. Vancampfort D, Vanderlinden J, De Hert M, et al. A systematic review on physical therapy interventions for patients with binge eating disorder. *Disabil Rehabil* 2013; 35: 2191-2196.
20. Vancampfort D, Vanderlinden J, De Hert M, et al. A systematic review of physical therapy interventions for patients with anorexia and bulimia nervosa. *Disabil Rehabil* 2014; 36: 628-634.
21. Attia E, Becker AE, Bryant-Waugh R, et al. Feeding and eating disorders in DSM-5. *Am J Psychiatry* 2013; 170: 1237-1239.
22. Boerhout C, Van der Weele K. Psychomotorische therapie en agressieregulatie; een pilot-onderzoek; [Psychomotor therapy and aggression regulation; a pilot study]. *Tijdschr Vakther* 2007; 2: 11-18.

23. Roffman AE. Is anger a thing-to-be-managed? *Psychother Theor Res Pract Train* 2004; 41: 161-171.
24. Boerhout C, Van Busschbach JT, Wiersma D, et al. Re: Re: Do we need to treat aggression? *Br J Psychiatry* 2011; 198: may 2011.
25. Monnier J, Hobfoll SE, Dunahoo CL, et al. There's more than rugged individualism in coping. Part 2: Construct validity and further model testing. *Anxiety Stress Coping* 1998; 11: 247-272.
26. Van Elderen T, Verkes R, Arkesteijn J, et al. Psychometric characteristics of the self-expression and control scale in a sample of recurrent suicide attempters. *Pers Individ Dif* 1996; 21: 489-496.
27. Van Elderen T, Maes S, van der Kamp L, et al. Handleiding bij de Zelf-Expressie en Controle vragenlijst. [Manual to the Self-Expression and Control Scale; SECS]. Leiden University, Leiden 1994.
28. Fairburn CG and Beglin SJ. Assessment of eating disorders: Interview or self-report questionnaire? *Int J Eat Disord* 1994; 16: 363-370.
29. Berg KC, Peterson CB, Frazier P, et al. Psychometric evaluation of the eating disorder examination and eating disorder examination-questionnaire: a systematic review of the literature. *Int J Eat Disord* 2012; 45: 428-438.
30. Peterson CB, Crosby RD, Wonderlich SA, et al. Psychometric properties of the eating disorder examination-questionnaire: Factor structure and internal consistency. *Int J Eat Disord* 2007; 40: 386-389.
31. Cohen J. *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates 1988.
32. Fox JR and Power MJ. Eating disorders and multi-level models of emotion: an integrated model. *Clin Psychol Psychother* 2009; 16: 240-267.
33. Tárrega S, Fagundo AB, Jiménez-Murcia S, et al. Explicit and implicit emotional expression in bulimia nervosa in the acute state and after recovery. *PLoS One* 2014; 9c101639.
34. Norwood SJ, Bowker A, Buchholz A, et al. Self-silencing and anger regulation as predictors of disordered eating among adolescent females. *Eating Behav* 2011; 12: 112-118.
35. Zaitsoff SL, Geller J and Srikameswaran S. Silencing the self and suppressed anger: Relationship to eating disorder symptoms in adolescent females. *Eur Eat Disord Rev* 2002; 10: 51-60.
36. Abbate-Daga G, Marzola E, Gramaglia C, et al. Emotions in Eating Disorders: Changes of Anger Control After an Emotion-focused Day Hospital Treatment. *Eur Eat Disord Rev* 2012; 20: 496-501.
37. Saldana E, Quiles Y, Martin N, et al. Anger as comorbid factor for interpersonal problems and emotional dysregulation in patients with eating disorders. *Actas Esp Psiquiatr* 2014; 42: 228-233.
38. Bushman BJ, Baumeister RF and Stack AD. Catharsis, aggression, and persuasive influence: Self-fulfilling or self-defeating prophecies? *J Pers Soc Psychol* 1999; 76: 367-376.
39. Brytek-Matera A. Dimensions of locus of control and the role of anger expression & anger control in women diagnosed with eating disorders: a pilot study. *Archives of Psychiatry & Psychotherapy* 2008; 10: 49-53.
40. Van Coillie H and Van Mechelen I. Expected consequences of anger-related behaviours. *Eur J Pers* 2006; 20: 137-154.
41. Bartz AE, Blume NE and Rose J. Gender differences in self-report measures of anger: the role of social desirability and negative affect. *J Soc Behav Pers* 1996; 11: 241-253.
42. Fassino S, Daga GA, Pierò A, et al. Anger and personality in eating disorders. *J Psychosom Res* 2001; 51: 757-764.
43. Mauss IB and Robinson MD. Measures of emotion: A review. *Cogn Emot* 2009; 23: 209-237.