

# Putative mediators of enhanced cognitive behaviour therapy for adolescents with anorexia nervosa

Riccardo Dalle Grave, MD; Simona Calugi, PhD

Department of Eating and Weight Disorders, Villa Garda Hospital, Garda (VR), Italy

## Key words

Treatment  
Mediators  
Mechanisms  
Cognitive behaviour therapy  
Family-based treatment  
Anorexia nervosa  
Eating disorders

## Abstract

The effectiveness of enhanced cognitive behaviour therapy (CBT-E) for adolescents with anorexia has been supported by several cohort studies and a non-randomized effectiveness trial comparing this treatment with family-based treatment (FBT). However, although many patients achieve a good outcome, a significant proportion still has residual psychopathology at the end of the CBT-E. These indicate the need to further work on making CBT-E for adolescents more potent. Identifying treatment mediators of CBT-E (i.e., the mechanisms through which the treatment achieves its effect) is a potential strategy that might help improve its effectiveness. Some mediators of change hypothesized for the adult version of CBT-E (i.e., the regular eating procedure and reducing body checking) should also operate in the adolescent version of the treatment. However, there are at least three additional specific procedures used in CBT-E for adolescents that might be key treatment mediators in this population: (1) the procedure of engaging the patient in the treatment and the decision to change; (2) the procedure of weight regain; and (3) the procedure of involving parents as “helpers” (not “controllers”). An opportunity, which might help to identify these potential treatment mediators, is to compare FBT and CBT-E in a randomized controlled trial. Indeed, comparing these two treatments, which seem equally effective but operate via different mechanisms, may be used to ensure that change in the putative mediator is not a consequence of the change in the outcome variable.

## Introduction

There is accumulating evidence supporting the effectiveness of enhanced cognitive behaviour therapy (CBT-E) for adolescents with anorexia nervosa. The treatment has been evaluated in some cohort studies (Dalle Grave, Calugi, Doll, & Fairburn, 2013; Dalle Grave, Calugi, Sartirana, & Fairburn, 2015; Dalle Grave, Sartirana, & Calugi, 2019). Findings from these studies showed that in adolescent patients with anorexia nervosa who complete the treatment (60–65%), about 60% achieved a full response (i.e., BMI centile corresponding to an adult BMI of  $\geq 18.5$  kg/m<sup>2</sup> and an eating disorder examination score within one standard deviation of population means). These promising results

led the National Institute for Health and Care Excellence (NICE) to recommend CBT for anorexia nervosa in children and young people when family therapy is unacceptable, contraindicated, or ineffective (National Institute for Health and Care and Clinical Excellence, 2017).

Support for the effectiveness of CBT-E for adolescents with eating disorders also comes from a non-randomized effectiveness trial that compared the relative effectiveness of family-based treatment (FBT) and CBT-E (Le Grange et al., 2020). At the assessment, families were provided information sheets describing each treatment regarding patient and family roles and then asked to choose one of the two treatments. Those who started CBT-E were older and had a longer duration of illness, higher depression and anxiety, more

**Copyright © 2023** Riccardo Dalle Grave et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

Riccardo Dalle Grave (✉) rdalleg@gmail.com

**Received:** 01 March 2023; **Accepted:** 09 March 2023; **Published online:** xxx. **doi:** 10.32044/ijedo.2023.03

prior mental health treatment, and higher rates of psychosocial impairment due to eating disorder features. The lower weight cohort (<90% median body mass index) showed that the slope of weight regain at the end of treatment was higher for FBT than for CBT-E, but not at follow-up. In addition, the two treatments achieved similar outcomes in other domains assessed. Although 30–50% of patients achieve good outcomes in both treatments, a significant proportion still has residual psychopathology following treatment.

The above data indicate that CBT-E is effective for adolescents with anorexia nervosa. However, further work is needed to make the treatments more potent.

### Identification of the mediators of treatment: a strategy to improve the outcome of CBT-E for adolescents

A potential strategy to improve the efficacy of psychological therapies is to identify their treatment mediators, i.e., the possible mechanisms through which a treatment might achieve its effect (Kraemer, Wilson, Fairburn, & Agras, 2002). This knowledge then might permit focusing on enhancing the effective treatments' elements and discarding those elements found to be redundant that produce therapeutic change.

Unfortunately, the formal evaluation of mediators in treating adolescents with an eating disorder is still limited. However, the availability of two effective distinct treatments for this population opens the chance to compare FBT and CBT-E in a randomized controlled trial to assess some potential mediators of the two treatments.

CBT-E and FBT differ in conceptualizing eating disorders and the nature of parents' and adolescents' involvement (Dalle Grave, Eckhardt, Calugi, & Le Grange, 2019). In brief, FBT postulates the problem belongs to the entire family and separates the illness from the patient (i.e., "externalization"), while CBT-E assumes the problem belongs to the individual. The parents' involvement is vitally important in FBT, and patients are not actively involved. On the contrary, patients are actively engaged in CBT-E, while the parents' participation is helpful but not essential. Another fundamental difference between the two treatments is the strategies used to regain body weight. In CBT-E, weight regain in patients with anorexia nervosa is usually addressed after 2-4 weeks of treatment and only when patients conclude that they need to attend to their low weight (Dalle Grave & Calugi, 2020). In contrast, weight regain in FBT is addressed at the outset, and parents are

supported to drive this agenda (Lock & Le Grange, 2013). This strategy is probably the main reason explaining the initial more gradual weight gains achieved by CBT-E compared to FBT (Le Grange et al., 2020).

The comparison of treatments that seem equally effective but operate via different mechanisms – such as FBT and CBT-E – may be used to ensure that change in the putative mediator is not a consequence of the change in the outcome variable ("reverse causality") (Murphy, Cooper, Holton, & Fairburn, 2009).

### Putative CBT-E treatment mediators in adolescents

CBT-E for adolescents involves the young patient actively addressing the eating disorder psychopathology. It is implemented flexibly and personalized to address all key maintenance mechanisms operating in the patient. The treatment uses the same collection of strategies and procedures of the adult version of CBT-E. This means that some mediators of change found for the adult version of CBT-E, i.e., the "regular eating" procedure in reducing patients' binge-eating frequency (Sivyer et al., 2020) and the "decrease body checking" in improving eating disorder and general psychopathology (Calugi, El Ghoch, & Dalle Grave, 2017), might also operate in the adolescent version of the treatment. However, it is to underline that the only one case-series study evaluating the role of body image concern components (i.e., "preoccupation with shape/weight," "fear of weight gain," and "feeling fat") change in body mass index (BMI) centile in a sample of 62 adolescent with anorexia nervosa treated with intensive CBT-E, found that the modification in the three components from baseline to end of treatment did not affect any BMI centile trajectory over time (Calugi & Dalle Grave, 2019).

We also hypothesize that some specific procedures used in CBT-E for adolescents and described in the following sections are additional putative mediators of change.

#### ***The procedure of engaging the patient in the treatment and the decision to change***

Adolescents with anorexia nervosa are often difficult to engage as they are in an ego-syntonic eating disorder phase, often completely unaware of the problem. These characteristics have led to the development of treatments that view the illness as separate from the patient (i.e., "externalization") to enable parents (as in FBT) or clinicians to take firm action against the eating disorder and not against the

patient. The aim of these treatments, based on “external” control, is to help young patients regain weight and stop practising extreme weight-control behaviours, regardless of how willing they are to do so.

Contrary to treatments based on external control, CBT-E never separates the eating disorder from the adolescent patient and never asks them to do things they do not see as a problem to address. Instead, it maintains that young people can be helped to regain control by playing an active role in their treatment and in the decision to change. One of the tools used to stimulate patients’ engagement in change is the collaborative drawing up with the patients the individualized formulation of the processes maintaining their eating problem (including the starvation features), which will become the treatment targets. This involves describing the main eating disorders attitudes and behaviours operating in the young patient and the perceived positive but dysfunctional function that the control of eating, weight, and shape has in their self-evaluation. Once the patient agrees on the psychological explanation of their eating disorders, they are actively involved, evaluating the current and future pros and cons of changing the decision to address them (including the weight regain) to reach a more functional and less damaging solution in their self-evaluation. In other words, they are treated as young, self-determining individuals rather than children with no say in the matter. If they do not conclude that they have a problem to address, the treatment does not begin or is interrupted, although this rarely happens in our experience.

It is predicted that the adoption of a collaborative approach aimed at improving the patient’s general sense of control—a relational modality that is well suited to younger patients, in whom the pursuit of control, autonomy, and independence are themes of great relevance—the psychological explanation of their eating disorder and their active involvement in the decision to change are potential moderators of change.

### ***The procedure of weight regain***

Many adolescent patients with anorexia nervosa have the belief that if they eat specific foods or certain amounts of food, they will lose control and gain weight unpredictably. Usually, they mitigate the anxiety generated by this belief by dietary restriction or adopting other extreme weight-control behaviours, which in turn maintain their eating disorder. To address these problems, CBT-E for adolescents actively involves patients in interpreting weight regain (see the collaborative weighing procedure) and planning meals and snacks to regain weight at a rate of

0.5 kg per week. To reach this goal, patients are educated to create a positive energy balance of 500 kcal daily. Once a week, after the collaborative interpretation of weight, patients are actively involved in devising a flexible meal plan according to this weight regain goal.

It is predicted that the active involvement of the patients in interpreting weight regain and planning meals and snacks to regain weight helps reduce their anxiety and concerns about eating and food. Indeed, this procedure allows patients to experience weight regain as a predictable and controlled process, countering the belief that eating certain types or amounts of food will produce uncontrolled weight gain. Eating a broad range of foods also helps patients understand that “a calorie is a calorie” and that there are no foods that cannot be part of a healthy diet.

### ***The procedure of involving parents as “helpers” (not “controllers”)***

One of the main differences between CBT-E for adolescents and the adult version is that parents are always involved in the adolescent’s treatment. In contrast, in treating adults, significant others are only involved if the therapist and patient agree that they are in a position to help. Parents attend a single parent-only session and about six to ten joint patient and parent sessions at the end of the individual sessions. Additional joint sessions can be scheduled under rare circumstances (e.g., family crises, extreme difficulties during meals, or parental hostility toward the patient). The goals of these sessions are (i) involving the parents in creating an “optimal family environment” and (ii) supporting the adolescent to implement some procedures of the treatment. To create an optimal family environment, parents are educated to adopt a warm and functional communication style, spend stress-free time with their child, take time for them and ask for support, and change the home environment, which can be an obstacle to change. The involvement of parents in supporting the adolescent in implementing some treatment procedures varies from case to case. However, as a general guideline, the therapist first explains the rationale and practical aspects of the procedure (e.g., regular eating) to the patients. Then, if they agree to implement them, the parents may be involved, provided that both the therapist and the patient think they may be able to facilitate its application.

It is predicted that the involvement of parents in creating an optimal family environment can remove some interpersonal and environmental triggers maintaining the patient’s eating disorder and facilitating the patient’s change. In contrast, their role as “helpers” can facilitate the patient’s implementation of some CBT-E procedures.

## Conclusions

Despite the continuous effort of researchers and clinicians, the outcome of available treatments for adolescents is still suboptimal. Identifying how treatments works is a tough challenge, but it is a research area with potentially important clinical implications. The availability of two treatments, such as FBT and CBT-E, with marked differences in the conceptualization of eating disorders and the strategies and procedures to address the eating disorder psychopathology, is a great opportunity for testing some potential mediators of the two treatments in an RCT. Regarding CBT-E, in addition to the mediators proposed for adults, potential mediators to assess are the procedures used to engage the young patient in the treatment and in the decision to address the change (including to regain weight), those to address weight regain, and to involve the parents in supporting the implementation of the one-to-one treatment.

## References

- Calugi, S., & Dalle Grave, R. (2019). Body image concern and treatment outcomes in adolescents with anorexia nervosa. *International Journal of Eating Disorders*, 52(5), 582-585. doi:10.1002/eat.23031
- Calugi, S., El Ghoch, M., & Dalle Grave, R. (2017). Body checking behaviors in anorexia nervosa. *International Journal of Eating Disorders*, 50(4), 437-441. doi:10.1002/eat.22677
- Dalle Grave, R., & Calugi, S. (2020). *Cognitive behavior therapy for adolescents with eating disorders*. New York: Guilford Press.
- Dalle Grave, R., Calugi, S., Doll, H. A., & Fairburn, C. G. (2013). Enhanced cognitive behaviour therapy for adolescents with anorexia nervosa: an alternative to family therapy? *Behaviour Research and Therapy*, 51(1), R9-R12. doi:10.1016/j.brat.2012.09.008
- Dalle Grave, R., Calugi, S., Sartirana, M., & Fairburn, C. G. (2015). Transdiagnostic cognitive behaviour therapy for adolescents with an eating disorder who are not underweight. *Behaviour Research and Therapy*, 73, 79-82. doi:10.1016/j.brat.2015.07.014
- Dalle Grave, R., Eckhardt, S., Calugi, S., & Le Grange, D. (2019). A conceptual comparison of family-based treatment and enhanced cognitive behavior therapy in the treatment of adolescents with eating disorders. *Journal of Eating Disorders*, 7(1), 42. doi:10.1186/s40337-019-0275-x
- Dalle Grave, R., Sartirana, M., & Calugi, S. (2019). Enhanced cognitive behavioral therapy for adolescents with anorexia nervosa: Outcomes and predictors of change in a real-world setting. *International Journal of Eating Disorders*, 52(9), 1042-1046. doi:10.1002/eat.23122
- Kraemer, H. C., Wilson, G. T., Fairburn, C. G., & Agras, W. S. (2002). Mediators and moderators of treatment effects in randomized clinical trials. *Archives of General Psychiatry*, 59(10), 877-883. doi:10.1001/archpsyc.59.10.877
- Le Grange, D., Eckhardt, S., Dalle Grave, R., Crosby, R. D., Peterson, C. B., Keery, H., . . . Martell, C. (2020). Enhanced cognitive-behavior therapy and family-based treatment for adolescents with an eating disorder: a non-randomized effectiveness trial. *Psychological Medicine*, 1-11. doi:10.1017/s0033291720004407
- Lock, J., & Le Grange, D. (2013). *Treatment manual for anorexia nervosa: A family-based approach* (2nd ed.). New York: Guilford Press.
- Murphy, R., Cooper, Z., Hollon, S. D., & Fairburn, C. G. (2009). How do psychological treatments work? Investigating mediators of change. *Behaviour Research and Therapy*, 47(1), 1-5. doi:10.1016/j.brat.2008.10.001
- National Institute for Health and Care and Clinical Excellence. (2017). *Eating disorders: recognition and treatment | Guidance and guidelines | NICE*. Retrieved from <https://www.nice.org.uk/guidance/ng69>
- Sivyer, K., Allen, E., Cooper, Z., Bailey Straebler, S., O'Connor, M. E., Fairburn, C. G., & Murphy, R. (2020). Mediators of change in cognitive behavior therapy and interpersonal psychotherapy for eating disorders: A secondary analysis of a transdiagnostic randomized controlled trial. *International Journal of Eating Disorders*. doi:10.1002/eat.23390