

Supplementary file 1

Presentation on research group planning the project and providing training of therapists.

The research group planning the implementation project consisted of four central people from the Norwegian research group designing the PED-t and running the original RCT. The group is multidisciplinary with several years of experience within research and treatment in the field of eating disorders (1, 2).

In the current project, the Norwegian Council for Mental Health was one of the funders and participated with important opinions and experiences in the planning of this project. Additionally, the previous publications and the learning these brought were used to revise the PED-t before training of new therapists. Included in this work on revising the PED-t, was interviews with 19 PED-t participants and 9 therapists from the RCT-project, to include consideration on their experiences. Also included in the current project is an external expert and clinician to bring an international perspective on the new treatment, and to provide expert guidance on arrangement of low threshold- and accessible treatment for eating disorders.

TFM was responsible for running the training program of the therapists, being specifically qualified for this, as the PED-t was designed by her with support from the research group in the original RCT. She also specifically qualified as instructor because she held all PED-t sessions in the three years with intervention in that original work (1, 2).

Training program of therapists at the HLC

As illustrated in figure 1 (see manuscript), the training program consisted of (1) homework (reading a printed treatment manual), (2) digital learning resources, and (3) three workshops. The training period covered a three-month period, to ease self-studies while being in a full-time job at the HLC.

The printed manual consisted of learning material on eating disorders, with specific attention to BN and BED. It also included the original findings from the RCT which the PED-t rests on. Much of this course material is similar to what has been described in an official available PhD thesis (3). The second half of the printed manual consisted of detailed descriptions of the 20 therapy sessions delivered in the dietary therapy. The treatment manual is only available for those being trained as PED-t therapists.

Digital learning resources consisted of video lectures on dysfunctional exercise, and video lectures on eating disorders. The digital learning resources also included important files/material (like the screening-tools for eligibility of participants, the exercise programs, and the digital presentation files used in the psychoeducational part of the dietary therapy).

In the workshops the therapists were trained to screen participants, and to deliver PED-t in theoretical terms (dietary therapy) and practical terms (exercise therapy).

Because this was the very first exploration of the effectiveness and acceptability of PED-t in a naturalistic context, held by others than the original research group, the first round of treatment delivery was performed with guidance from the training instructor (TFM). Second and all following rounds with treatment are held unassisted (other than having the instructor available on request).

To be a certified PED-t therapist, training courses are held by TFM on a yearly basis.

Content of PED-t exercise therapy

The PED-t aims to establish healthy eating and exercise routines, and to increase body acceptance by changing focus from esthetical to functional valuation and experience. There may be a rationale to assume the high intensity training also provides improved self-regulation and impulse control through neuroplastic- and functional effects from myokines (signal substances secreted by active muscle mass) (4). As described in protocol paper (1) and the two main effect papers (2, 5) the exercise therapy specifically aims to provide an experience of a functional and strong body, and to redirect focus away from simply an aesthetic, compulsive and weight regulatory aim and behaviour. By the guidance of three exercise physiologists the patients are supervised on healthy exercise volumes and to improve performance by following simple exercise principles like progression, rest, and variety. On a weekly basis patients do three exercise therapy sessions, each of 45 min in duration, of which one session is under supervision (resistance exercise) and two is unsupervised and performed as homework (one resistance exercise session and one short interval running session). Details on the exercises and interval program has been reported previously (1). By combining psychoeducation about exercise and guided practical experience with exercise, we follow the suggested best practices for addressing and managing dysfunctional/maladaptive exercise (6-8).

Content of PED-t dietary therapy

The dietary module follows a structured psychoeducational manual led by one dietitian, aiming to normalise eating pattern, increasing nutrition literacy, and providing an arena for support and for food- and eating related discussions. The structure and main content of the dietary therapy in PED-t is displayed in table 1, like what has previously been described (1). Importantly, the 60-minute dietary therapy is divided into 30 minutes with psychoeducation on a manual based, predefined topic, and 30 minutes with open discussions within the group to provide an opportunity for supporting each other, sharing experience, and discussing difficulties or progress (the latter includes setting personal goals/homework between therapy sessions).

Table 1: Overview of dietary therapy content. The dietary therapy is a 60 min session with ~30 minutes psychoeducation, and ~30 minutes group discussion.

| Module | Therapy session | Topic | Main content of psychoeducation | Group discussion |
|--------|-----------------|--|---|---|
| 1 | 1-5 | Dietary routines & structure | Beauty ideals & the diet industry Drivers for B-P (CBT-model) Meal frequency Portion size Eating situation Exercise physiology-theory Repetition & summary | Each therapy session includes group discussion on prevailing topics and personal experiences (including suggestions/-sharing on how to cope with stress and triggers) |
| 2 | 6-17 | Nutritional knowledge & practical skills | Energy needs Daily routines Effects from bingeing & purging Nutrients Nutritional labels Impulsive food shopping Exercise physiology-theory Sports nutrition Repetition & summary | Each therapy session includes group discussion on prevailing topics and personal experiences (including suggestions/-sharing on how to cope with stress and triggers) |

| | | | | |
|---|-------|--------------------|---|---|
| 3 | 18-20 | Summary & planning | Reflections, repetition, & summary Presenting a personal plan (exercise, diet, daily routines) | Each therapy session includes group discussion on prevailing topics and personal experiences (including suggestions/-sharing on how to cope with stress and triggers) |
|---|-------|--------------------|---|---|

Note: B-P, bingeing and/or purging.

References

1. Mathisen TF, Rosenvinge JH, Pettersen G, et al. The PED-t trial protocol: The effect of physical exercise -and dietary therapy compared with cognitive behavior therapy in treatment of bulimia nervosa and binge eating disorder. *BMC Psychiatry*. 2017;17(1):180.10.1186/s12888-017-1312-4.
2. Mathisen TF, Rosenvinge JH, Friborg O, et al. Is physical exercise and dietary therapy a feasible alternative to cognitive behavior therapy in treatment of eating disorders? A randomized controlled trial of two group therapies. *Int J Eat Disord*. 2020;53(4):574-85.<https://doi.org/10.1002/eat.23228>.
3. Mathisen T. A randomized controlled trial of physical exercise- and dietary therapy versus cognitive behavior therapy: Treatment effects for women with bulimia nervosa or binge eating disorder [PhD]. Oslo: Norwegian School of Sport Sciences; 2018.
4. Mathisen TF, Sundgot-Borgen J, Bulik CM, Bratland-Sanda S. The neurostructural and neurocognitive effects of physical activity: A potential benefit to promote eating disorder recovery. *Int J Eat Disord*. 2021;54(10):1766-70.<https://doi.org/10.1002/eat.23582>.
5. Mathisen TF, Bratland-Sanda S, Rosenvinge JH, et al. Treatment effects on compulsive exercise and physical activity in eating disorders. *J Eat Disord*. 2018;6(1):43.10.1186/s40337-018-0215-1.
6. Cook B, Wonderlich SA, Mitchell J, et al. Exercise in eating disorders treatment: systematic review and proposal of guidelines. *Med Sci Sports Exerc*. 2016;48(7):1408.10.1249/MSS.0000000000000912.
7. Hallward L, Di Marino A, Duncan LR. A systematic review of treatment approaches for compulsive exercise among individuals with eating disorders. *Eating Disorders*. 2022;30(4):411-36.10.1080/10640266.2021.1895509.
8. Ouellet M, Monthuy-Blanc J. Quand bouger n'est plus synonyme de santé : une recension des traitements de l'exercice physique pathologique en troubles des conduites alimentaires. *Annales Medico Psychologiques*. 2022;180(9):862-74.10.1016/j.amp.2022.01.007.