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Effectiveness and acceptability of the physical exercise and dietary therapy in a healthy life center

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Abstract

Objective: The high burden of eating disorders (EDs) and limited availability of treatment speaks of a need to explore new avenues for treatment delivery. To understand if new treatment avenues are helpful and acceptable to patients, we investigated the effectiveness of Physical Exercise and Dietary Therapy (PED-t) in participants with bulimia nervosa or binge-eating disorder, and acceptability when the PED-t was implemented in a Healthy Life Center in a municipal primary healthcare service.

Method: Exercise physiologists and one dietitian were trained in ED literacy and to run PED-t, before screening women for eligibility. Effectiveness ($n = 16$) of PED-t and participants' experiences ($n = 8$) were evaluated by a mixed methods study design. Results were analyzed by relevant statistics and reflexive thematic analysis.

Results: Of 19 eligible participants, 16 completed treatment. At post-treatment, the Eating Disorder Examination Questionnaire global score, binge-eating frequency, and symptoms of depression were lower, and nine (56% of completers) were in remission. Participants' treatment experiences were classified into two overarching themes: "competence" and "emotional support." Participants reported high acceptance for PED-t, the local venue and group format, and felt that PED-t provided them with coping tools and increased mental strength. However, many also spoke of an unmet need to address emotional eating.

Discussion: Findings point to a potential for making an effective ED therapy more accessible, and that participants find the local low-threshold delivery within a group-format helpful. With small adjustments, the PED-t could emerge as a promising first-line treatment for bulimic EDs.

Public Significance Statement: Limited access to treatment for EDs, patients' high barriers to help-seeking, and the high rates of limited efficacy from psychotherapy speak of a need to explore new therapies and avenues for delivery. In this study, we build on findings from a controlled ED treatment trial and replicate the beneficial effects and find a high patient acceptance of "physical exercise and diet therapy" implemented in a real, non-clinical setting.

KEYWORDS
acceptability, dietary therapy, eating disorders, effectiveness, healthy life center, exercise therapy, experiences, implementation, physical activity, treatment access

1 | INTRODUCTION

Cognitive-behavioral treatment (CBT) is internationally regarded as the first-line treatment for bulimia nervosa (BN) and binge-eating disorder (BED) (Hay, 2013; Hilbert et al., 2017; Linardon, 2018; Linardon et al., 2018; Linardon & Wade, 2018), also showing high patient satisfaction (Hoskins et al., 2019). However, many people with these disorders do not fully recover after CBT (Linardon & Wade, 2018), or are unable to access CBT, as it is typically provided in specialist centers (Kazdin et al., 2017; Kazdin & Blase, 2011; Regan et al., 2017). Further limiting treatment accessibility is the rising prevalence of EDs (van Hoeken & Hoek, 2020; Zipfel et al., 2022), putting high stress on the capacity of specialized treatment facilities (Feldman et al., 2023; Katzman, 2021). As such, there is a need to develop scalable, effective, and acceptable therapies that can be delivered with minimal barriers.

In a randomized controlled trial (RCT) (Mathisen et al., 2017, 2020), we showed that Physical Exercise and Dietary therapy (PED-t) delivered in a group format was comparably effective to CBT in treating BN and BED and with improvements maintained at 2-year follow-up (Bakland et al., 2019; Mathisen et al., 2018, 2020). Concurrent exploration of patients' experiences of PED-t pointed to high acceptance and satisfaction (Bakland et al., 2019; Pettersen et al., 2017). Although the treatment facilities and therapists were not what is typically considered clinical in nature, the therapy was held within a research-renowned institution by trained interventionists (exercise physiologists, physiotherapists, dietitians), supervised by ED clinicians and researchers (Mathisen et al., 2017, 2020). Exploring how well a therapy developed and tested in a highly controlled research context can be implemented in a more ecologically valid routine naturalistic setting, and understanding patients' experiences of this, can help adapt and refine treatments and their delivery (Hoskins et al., 2019; Waller et al., 2014). The current study explores effectiveness and acceptability of PED-t when implemented in a self-referral unit of the local primary healthcare service. While hypothesizing that measurable changes in symptom severity and remission rates will align with the findings from the original RCT, we additionally aim to explore the acceptability of local primary healthcare delivery of PED-t.

2 | METHOD

This mixed method study is based on data from the first implementation of PED-t in a "healthy life centre" (HLC) during 2021. Integrated into primary healthcare services in Norway, HLCs are nationally organized as local low-cost self-referral services with a basic program offering lifestyle guidance and additional programs for managing stress and minor mood disturbances. The professionals working in HLCs are dietitians, physiotherapists, and exercise physiologists.

2.1 | Ethical consideration

All participants were informed about the research associated with this first implementation of PED-t in a naturalistic setting, both by verbal information when responding to recruitment, and by information sent by email in advance of signing the consent to participate. Trial registration number: Prospectively registered in Norwegian Regional Committee for Medical and Health Research Ethics on June 25, 2019 with the identifier number 2019/552 REK SørØst B, approved according to GDPR by the Norwegian Center for Research Data on July 16, 2019 with the identifier number 389139, and further pre-registered in Clinical Trials on July 27, 2021 with the identifier number NCT04980781.

2.2 | Recruitment and screening

Included in the first round of study were non-pregnant women, 18–40 years of age with BN or BED within the BMI range 17.5–40 kg/m^2. For the second round of recruitment, inclusion criteria were extended to age 50 years and BMI 42, respectively, to accommodate the more diverse characteristics of responding women. Exclusion criteria were suicidality or any major comorbid axis I mental disorder, or those who were currently receiving ED-psychotherapy. All were recruited by efforts by the HLC and screened with the MINI-SCREEN (Sheehan et al., 1998), Eating Disorder Examination Questionnaire (Fairburn & Beglin, 2008) and demographic questions. Recruitment before Round 1 resulted in 33 responders, from which 23 were excluded due to comorbid disorders, not matching demographic criteria, or wanting to halt treatment initiation or not responding to calls, resulting in 10 included women. In Round 2, 27 women were interested in participating, from whom 12 were excluded due to the general inclusion/exclusion criteria, 2 were excluded due to comorbid disorders, and 4 did not respond further to contact, hence 9 were finally included.

2.3 | Treatment

The PED-t is a group treatment for BN and BED based on supervised, progressive exercise and dietary therapy (see Supplementary file 1 for details; Mathisen et al., 2017, 2020).

2.4 | Training and supervision of therapists

The invited therapists in one HLC received program training before commencing two rounds of treatment. In Round 1, the HLC received support from the research team, via fortnightly team meetings. In

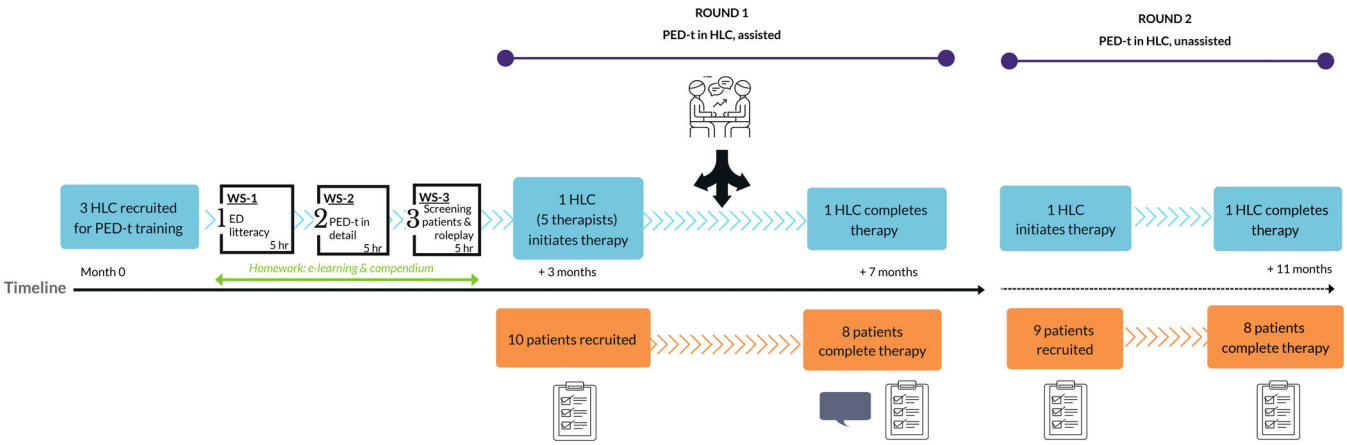

FIGURE 1 Study design. In a 3-month period, the HLC received training on EDs and PED-t by a program including a manuscript, digital content with video lectures, and three work-shops. The HLC recruited and screened participants to receive PED-t for 3 months with the research team as support (Round 1), and continued to recruit participants for a subsequent, unsupported second round of PED-t. Participants were asked to complete digital questionnaires pre- and post-treatment (in addition to a short, weekly questionnaire to report therapy fidelity), and invited for interviews on experiences.

Round 2, the HLC ran the PED-t group on their own (Figure 1, Supplementary file 1).

2.5 | Outcome measurements

This study includes evaluation of symptom severity by questionnaires before and after therapy, and interviews on acceptability of treatment. Additionally, the first author completed clinical interviews to evaluate ED-diagnoses according to the DSM-5 criteria (American Psychiatric Association, 2013) for the first round of therapy. Similar to findings from the RCT (Mathisen et al., 2020), the results from the diagnostic interviews did not deviate from the screening interviews by HLC-therapists or from the self-reported questionnaires. This adds to the validity of pre-post diagnostic evaluation in the second round, in which the HLC arranged everything by themselves (i.e., no clinical interview by trained specialist).

2.5.1 | Treatment fidelity

All participants responded (yes/no/not sure) to a weekly question about whether they felt that a particular topic from the dietary therapy had been addressed in the group. Total treatment fidelity was calculated as the total mean (range) percentage of participants with a positive response in their weekly ratings.

2.5.2 | Eating Disorders Examination Questionnaire

Eating Disorders Examination Questionnaire (EDE-Q) measures disordered eating behaviors and ED-cognitions by 28-items, and consists of a global score and four subscales (eating restriction, and eating-, weight- and shape concern). Internal consistency was high for pre- and post-global scores (Cronbach's alpha [CA] = .85 and .91, respectively).

2.5.3 | Beck Depression Inventory II v1.5

The Beck Depression Inventory (BDI) measures symptoms of depression by 22-items, scored from 0 to 3, and with a suggested clinical cut-off by a total score of ≥17 (Beck et al., 1961). Internal consistency was high for pre- and post-scores (CA = .87 and .87, respectively).

2.5.4 | Satisfaction with life scale

The Satisfaction With Life Scale (SWLS) is a five-item questionnaire measuring quality of life by asking about the personal satisfaction with life (Diener, 1994), rating responses on a Likert scale from 0 (not at all) to 7 (very much). Internal consistency was high for pre- and post-scores (CA = .87 and .91, respectively).

2.5.5 | Compulsive Exercise Test

The Compulsive Exercise Test (CET) measures symptoms of compulsive exercise by 24 items, scored on a Likert scale ranging from 0 (never) to 5 (always) (Taranis et al., 2011), with a clinical cut-off by ≥15 (Taranis et al., 2011). Internal consistency was high for pre- and acceptable for post-scores (CA = .88 and .72, respectively).

2.5.6 | Remission status

As in the PED-t RCT (Mathisen et al., 2020; Rø et al., 2015), recovery required no purging or binge-eating for four consecutive weeks, and normative global EDE-Q scores ≤2.35 (full remission), or EDE-Q global score below clinical cut-off (≤2.6) combined with fewer than four binge-eating episodes for four consecutive weeks (partial remission).

TABLE 1 Demographic baseline presentation of the participants, and changes in symptom across therapy period.

	Baseline	Post-therapy	Mean change (SD)	Significance (*p*), Hedges *g*
Age, years	36.6 (8.1)	–	–	–
Body mass index[a], kg × h^{-2}	31.0 (6.0)	–	–	–
Self-reported duration of illness (years)	20.0 (17)[b]	–	–	–
EDE-Q global mean score	3.6 (1.0)	2.2 (1.1)	−1.3 (1.0)	***p* < .001**, *g* = *1.1*
BDI, total score	15.6 (8.4)	9.5 (7.7)	−4.6 (6.5)	***p* = .006**, *g* = *6.8*
CET, total score	11.5 (3.7)	11.6 (2.5)	−.5 (2.5)	*p* = .2, *g* = 2.6
SWLS, mean score	3.2 (1.4)	3.9 (1.5)	.5 (.9)	*p* = .02, *g* = *1.0*
Binge eating episodes, no. per 28 days	12.0 (13)	2.5 (7)[b]	–	*Z* = −*2.7*, ***p* = .008**
Previous ED-treatment, no. of participants (%)	3 (15%)	–	–	–

Note: Numbers are mean (SD) if not otherwise stated. Bold numbers are the p-values/the significance values.
Abbreviations: BDI, Beck Depression Inventory; BED, binge-eating disorder; BN, bulimia nervosa; CET, Compulsive Exercise Test; EDE-Q, eating disorder examination questionnaire; no., number; SWLS, Satisfaction With Life Scale.
[a]Self-reported at screening.
[b]Median (interquartile range).

2.5.7 | Interviews on acceptability of PED-t

To evaluate the acceptability of PED-t in the local HLC, we invited the women who started the first round of treatment ($n = 10$) for individual interviews, of which eight completed and contributed. Interviews focused on the acceptability of the therapy offered, specifically focusing on the local HLC therapy venue and therapists, the group format, and the PED-t per se. The interviews were semi structured following a topic guide (see Supporting Information file 2). From a deductive, semantic, and realistic approach, the interviews were analyzed by reflexive thematic analyses (Braun & Clarke, 2006, 2019). The first author conducted the analyses, and GP validated the thematization. JSB additionally validated the translation of quotes.

3 | STATISTICAL ANALYSES

All statistical analyses were performed with IBM SPSS statistics 28. Pre- to post changes were analyzed by paired students *t*-tests, or with a Wilcoxon test as appropriate. Parametric values are presented as mean (SD) and non-parametric values are presented as median (interquartile range, IR). Effect sizes are presented as Hedges *g*; an effect size ≤.2 was considered small, .5 medium, and .8 large, respectively (Hedges & Olkin, 1985). Statistical significance was set to $p < .01$. Intention-to-treat analyses were not performed as dropouts did not provide information at post-test and considering the enhancement of errors in imputation of missing data from small samples.

The two therapy groups (Rounds 1 and 2) were compared for any baseline differences or differences in treatment response. Where no differences occurred, only total group results are reported.

4 | RESULTS

Nineteen women were included (seven had BN and 12 had BED). Demographic information and changes in symptoms are presented in Table 1.

Sixteen of the 19 women completed therapy. Among the dropouts, one (with BN) withdrew before therapy was initiated, and two (with BED) left therapy after three sessions due to time constraints. Dropouts did not differ from the completers neither by age ($p = .6$), BMI ($p = .7$), total scores of EDE-Q ($p = .4$), BDI ($p = .03$), SWLS ($p = .2$) nor by CET ($p = .09$). There were no differences between groups in the two treatment rounds, other than participants were older by a mean (SD) difference of 9.6 years (SD 2.9), $p = .005$.

4.1 | Therapy attendance and manual fidelity

The median (IR) therapy attendance was 90% (14), therapy homework compliance for resistance training was 77.9% (39.3), and for aerobic training 50% (45.2). Mean (range) therapy manual fidelity was rated as 95.6% (33.3).

4.2 | EDE-Q, BDI, SWLS, CET

The EDE-Q global scores, BDI, SWLS, and CET are presented in Table 1 and illustrated in Figure 2.

Apart from the body weight concern subscale, the reductions in EDE-Q subscales were statistically significant, that is "eating restriction" −1.5 (1.1), $p < .001$, $g = 1.2$; "eating concern" −1.6 (1.4), $p < .001$, $g = 1.5$; "figure concern" −1.5 (1.2), $p < .001$, $g = 1.3$; "body weight concern" −.8 (1.3), $p = .02$, $g = 1.4$.

Of the 16 treatment completers, six (37.5%) were in full remission at post-treatment while three reached partial remission (18.8%). Hence, nine (56.3% of completers; 47.4% of the total sample) had lost their BN or BED diagnosis at post-treatment.

The numbers with symptoms of compulsive exercise were five (26.3%) at pre-treatment, and none post-treatment. None of the dropouts were compulsive exercisers.

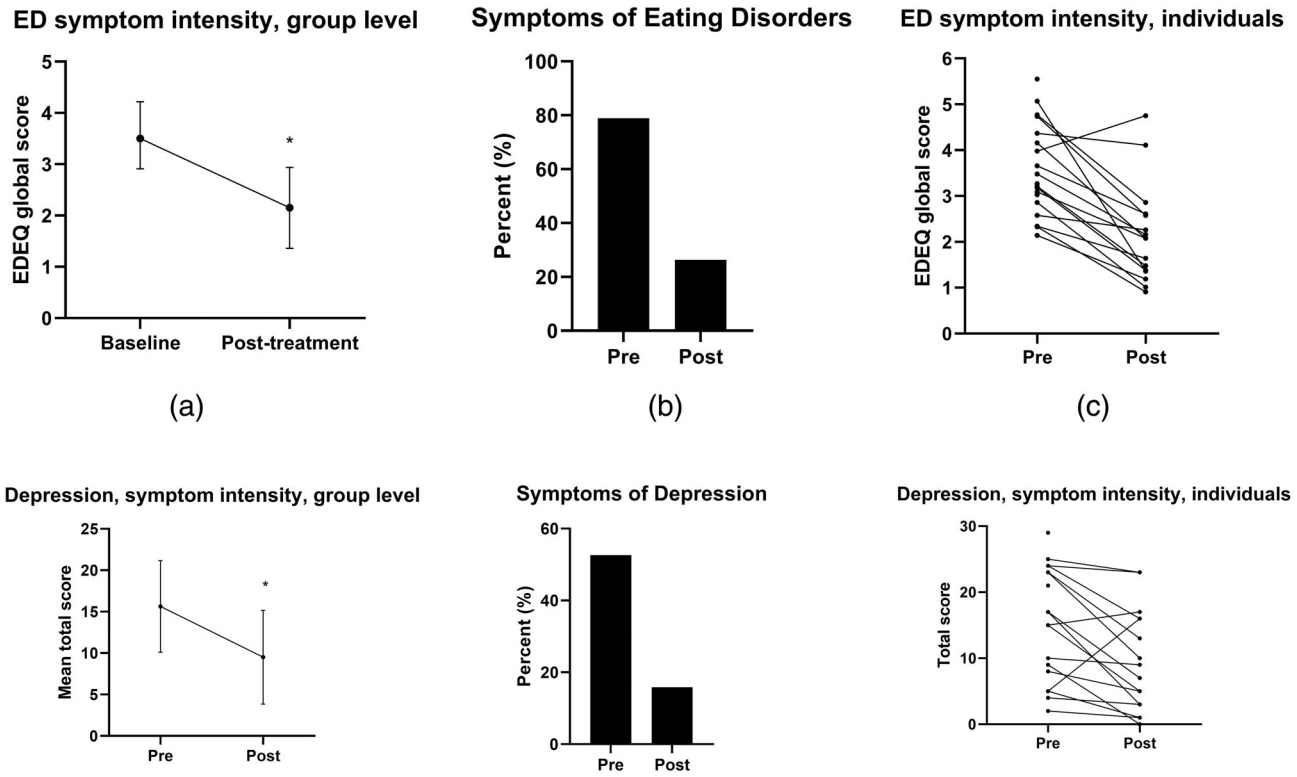

FIGURE 2 Changes in symptoms of ED and on depression. Panel A illustrates the mean results in symptoms of ED (upper panel) and symptoms of depression (lower panel). Panel B illustrates the numbers above the respective suggested cut-offs, while panel C illustrates the individual changes in mean scores of EDE-Q (upper) and BDI (lower). *Note*: ED, eating disorder. *Statistically significant change.

4.3 | Acceptability of PED-t in the HLC

Two main themes describe the experiences by the participants; "competence" and "emotional support."

4.3.1 | Theme 1: Competence

The theme "competence" covers three sub-themes, that is, "confidence in the service," "gaining nutritional literacy" and "I feel strong." These sub-themes summarize an overall positive experience of meeting at a local HLC for ED-therapy, a varied experience with the dietary psychoeducation, and overall positive experience with exercise therapy.

"Confidence in the service"

This theme covers the experience of meeting at a health-center located in the municipality to receive specialized treatment, together with other local people. Not all were familiar with the HLC; however, when the recruitment to the specific ED-therapy was commenced, the HLC venue was considered trustworthy by all.

> *I've sort of always thought of the HLC as something not relevant for me. But now, I consider this as….yeah—an overall exclusively positive experience.*
>
> Woman with BED, 39 years

The participants trusted the competence of the therapists, including nutrition-, exercise, and ED competence. Importantly, the variation in exercise techniques that different therapists advised about, caused some uncertainty, and the most inexperienced and performance-oriented participants expressed a need for more consistent advice. Still, the professional competence by the exercise therapists was mentioned as important and something that made participants feel safe. This was also enabling those with dysfunctional exercise routines to change:

> *It was the competence of the exercise therapists [that was important]—that they were good at communicating the importance of rest and recovery to gain any benefit from the exercise, and sort of—that life is about more than exercise and being able to prioritize other things.*
>
> Woman with BN, 29 years

When receiving therapy in the local municipality, one may risk meeting acquaintances among the staff, the group of participants, or at the treatment facility. All reported confidence about the therapists, and that they were not particularly worried about meeting any acquaintances among the staff. Explanations were their trust in primary healthcare services as professional, and specifically the knowledge of the duty of confidentiality. Two participants mentioned that they had met acquaintances either in the treatment group or at the

treatment facility, but both described this as a scenario that was not too difficult.

> *One from the staff at the HLC was a person that I had been running a local race with, and when I noticed him, I just: "that person—I've seen him somewhere—where is it?" And then I met him the next Wednesday too, and—yeah, I wonder what he thinks of me now, as I was in this kind of group, because he probably knows what it is about. So, yes, it was a bit uncomfortable, but i haven't thought about it anymore.*
>
> Woman BN, 29 years

One participant said that finding a familiar person in the treatment group, could have had the potential to be a positive experience, as this could mean that they might have a shared experience and understanding. Still, one participant who had been exercising regularly said that if she was to receive therapy at her local gym, it would not be an option for her to participate in the group therapy.

"Gaining nutritional literacy"

The experience with the dietary therapy was varied, and the theme "gaining nutritional literacy" points both to an appreciation of dietary psychoeducation, but concurrently to an overly detailed manual. While some said the dietary therapy could be conducted by a non-professional moderator, others had the preference and trust in knowing that the therapist had a professional dietary competence. Still, a shared expressed need was the need for the structured manual designed by professionals. However, the details in it, and the experienced rigidity of the therapy, made needed flexibility difficult, such as meeting the group's needs in addressing emotional eating and associated stress. Most mentioned the psychoeducational focus during the first weeks of the dietary therapy module as important, in which overall dietary structure and routines were emphasized. This was specifically highlighted by one woman with BED (33 years of age):

> *When it comes to food, I was a bit surprised by how successful it was for me, to simply adjust so that I have 4 main meals to focus on during a day…or simply four larger meals. It was a new experience to me to see how much this could change my life.*

In contrast, the mid-modules dealing with more detailed nutritional focus were considered redundant to most. The experiences by the following two women complement each other on this perspective.

> *Well, to me the nutritional education was important, because I didn't know much about diets, nutritional content, and such, but…. I noticed that the others had much knowledge, because they had been doing low-carb diets, and they had knowledge on fatty acids, like if it's saturated or unsaturated fats. Well, I have never had the interest for such things, and as such, I really liked the psychoeducation in the dietary therapy.*
>
> Woman with BN, 29 years

> *I have honestly not gained much from the dietary therapy. It has been like a Rosemary Conley diet—like one type of margarine is bad food for you, and another is good for you. And when the participants needed to discuss emotional difficulties, there was no time for this… And it is good that we focus on food…and that we must learn how important it is with meal frequency and how to portion your meals, but…. well… Most of us have this knowledge, and the problem is not what we eat, but…how we feel, and I did not see that there was any room for such explorations.*
>
> Woman with BED, 38 years

"I feel strong"

The third sub-theme of "competence" describes the overall experience participants had from the exercise therapy specifically. All were talking about an arena where they as a group felt specifically united, and where joy, mastery and performance progression had important effects on their mental health and identity. This was something very different from what most had experienced previously, either as recreational exercisers, or from the schools' gym class.

> *The guidance we had, it…it made me dare to push harder….and I realized that I really did good and that my body responded very well…. It was like a…it was an ENORMOUS feeling of mastery because I have never felt like that before – in this type of context [exercise].*
>
> Woman with BED, 38 years

Several of the participants highlighted the benefit of a combined therapy (exercise and dietary therapy), as this made it possible to still feel mastery (in exercise) at times when eating was not always going so well. The importance of the exercise therapy is well described by one participant responding to the question on how much the exercise therapy could be attributed to her diagnostic remission:

> *Wow, it is much!…I'd say almost 60–70%. I have felt strong. Both in myself and physically. Yes, both mentally and physically have I felt strong, and it made me feel I could accomplish anything!*
>
> Woman with BED, 39 years

4.3.2 | Theme 2: Emotional support

The second main theme describes a positive experience from group therapy, yet albeit not always with the required level of empathy from the therapist. Theme 2 may be sorted in two sub-themes; "I feel you" and "Please, listen."

"I feel you"

The group-setting was widely mentioned as a positive experience and an important aspect of the treatment process. While not all were positive about attending group therapy at first, all spoke of the unique experience of meeting people with a similar illness and experiences after the therapy. Participants talked about reduction in the feelings of loneliness and shame, and about meeting unique compassion and understanding from the other participants.

> *I'm not really a "group-person"…but, this project was really challenging at times, and during those times I felt it was mostly the other participants, more than the therapist, that was the motivation to continue, because there was a really good group cohesion. It was a very nice experience. You suddenly did not feel so alone, and I think this is something all experienced—that you had been so alone with this eating disorder. And then you realize that there are so many others that are in the same situation—someone to share your thoughts with. Then it also becomes easier to work towards the common goal of getting better.*
>
> Woman with BED, 29 years

Participants supported each other, in and outside therapy, through the shared experiences and empathy and had much value from inspiring each other with their individual progress. This common experience emerged as specifically important, thinking of all previous unsuccessful efforts in behavioral changes, without recognizing the underlying cause to their challenges:

> *So, well—the group setting has probably been the most important thing to me, because this isn't something I could have managed on my own. I couldn't just have consulted a dietitian and a PT and then simply achieved the same things in eating behavior and with exercise on my own. So—it is this thing about the group that has been the game changer.*
>
> Woman with BED, 29 years

"Please, listen"

"Emotional support" was also about the need to be given enough time to speak of difficulties and emotional binge-eating, and to feel that the therapist acknowledged the associated stress the participants were dealing with. Most participants reported that the therapist alone would not be able to provide similar empathy and understanding as the participants, but the role as moderator and facilitator was acknowledged as important, yet with necessary interpersonal skills:

> *Essential for making the therapy successful, is the persons involved. More than the competence. I believe the ability to communicate, feel empathy, and to be able to read the room—understand the persons and situations that arise… the ability to be flexible… I think that is more important than having high subject competence.*
>
> Woman with BED, 29 years

With a detailed and manualised dietary therapy program, participants did not feel that enough time was given for discussions on emotional stress. Several mentioned that delivery of the theoretic part of dietary therapy took precedence over the need for discussions about coping and emotional stress. This issue was also related to what participants experienced as a lack of experience by some therapists in handling fluctuations of emotions within a group and therefore cutting short vital discussions.

> *A few weeks into the therapy, we addressed the issue that many who started crying during therapy were abruptly met with considerations of time constraints, like "well, we need to move forward…." But when they finally tried to facilitate more time for emotional support, the trust was broken.*
>
> Woman with BED, 37 years

5 | DISCUSSION

This study aimed to explore the effectiveness of PED-t when being delivered in a naturalistic setting, and the acceptability to participants. We were able to reproduce favorable changes reported in the original RCT of PED-t in terms of a significant reduction in ED-symptoms, and with nine participants (56.3% of completers) in full or partial remission at post-treatment. Participants reported high acceptance of the self-referral access route to PED-t. Whilst participants overall reported high satisfaction with the therapy and the competence of the professionals delivering it, some important limitations were noted.

While this study is a non-controlled, naturalistic study, the almost perfect replication of changes in symptom severity from the original RCT (Mathisen et al., 2020) suggests a reliable treatment result. This is a promising finding, considering the need for scalable and accessible treatment for EDs. The acceptability reported by participants and accessibility of HLCs assists to make PED-t an available therapy.

Participants found the local arrangement attractive and helpful to make the treatment manageable with everyday activities and family life. The chance of meeting acquaintances during the local treatment was for most participants not perceived as a barrier, as they had trust in the professional confidentiality, or said that this could mean a shared experience and understanding. The latter may specifically be a result of finally recognizing that their struggle was an illness rather than weakness, and that they were ready to confront this. Group-cohesion emerged as an unexpected and impactful experience to the participants, considering that most participants initially were skeptical of group meetings.

The treatment experiences were quite similar to what has been reported in CBT (Hoskins et al., 2019; Waller et al., 2014) and when the PED-t was delivered in a controlled research setting (Bakland et al., 2019; Pettersen et al., 2017); meeting professional competence, finding a treatment benefit by attaining coping tools, reducing shame by being invited to talk about binge-eating, and gaining self-confidence from the experiences of resistance exercise. Still,

frequently was an overly detailed dietary psychoeducation mentioned as unnecessary. Furthermore, participants mentioned an experience of low therapists' competence to facilitate group discussions about emotional eating and associated stress. While this is important learning that must lead to changes in the PED-t program and training, there are some additional considerations to understanding these findings. First, therapists' variable expertise in working in group settings may explain some of the dissatisfaction with therapists, and points to the need for being in a trainee role before leading a group therapy. Second, we noticed an important change from the RCT to the current implementation in the presenting diagnosis by participants that potentially explains the differences in satisfaction with the dietary therapy. In the RCT, which was predominantly designed for treating BN, 75% of participants presented with BN, while in the current study, although this used a similar recruitment strategy, most of the participants had BED diagnoses (∼80%). Many participants with BED described numerous attempts of following commercial diets or having been offered somatic health services by their GP, all which often includes nutritional education, but rarely address emotional eating. Hence, dietary psychoeducation can be beneficial for patients with BN, but feels less relevant for patients with BED. Nevertheless, the experiences shared by the current participants point to important improvement potential for the PED-t, such as reducing focus on nutritional details, increasing time for group discussions, and ensuring that the therapists are trained and comfortable in moderating discussions addressing emotions and stress.

Participants spoke of the benefit of attaining "tools" for coping with their emotional triggers, and that regular meal frequency and adequate portion sizes were important learnings. Additionally, the positive mental effect and experiences from the resistance exercise made participants realize an underutilized or undiscovered psychological strength, improving self-confidence. Although speculative, it is tempting to suggest such findings may be explained by neurobiological effects from exercising (Mathisen et al., 2021), potentially explaining improved skills in self-regulation, as reported previously after a period with regular exercise (Oaten & Cheng, 2006).

The services provided by HLCs are comparable to those offered in Scandinavia, other European countries (Exercise Referral Scheme or community physiotherapists in the United Kingdom) and Australia (Accredited Exercise Physiologists) (Bergmeier et al., 2021; Fibbins et al., 2021; Rowley et al., 2018; Stanton et al., 2018) and may provide a treatment setting that makes professional health services more available, while the social acceptability of consulting such systems may lower the barriers to seek treatment. We argue that in such services professionals within exercise physiology and dietetics, all with a minimum of a bachelor's degree and proper clinical training, are a prerequisite for a nonclinical setting to accept ED-patients, including program training (Bakland et al., 2018; Bergmeier et al., 2021; Lederman et al., 2016; Stanton et al., 2018). The network communication the HLC keeps with other health service parties within primary healthcare is another important reason for why the HLCs appear specifically qualified for such service, compared to other similar agents (e.g., Fitness Centers or personal trainers). As such, there is a good potential for PED-t to be implemented and integrated to healthcare systems of other countries.

Low statistical power may result in spurious findings regarding the quantitative outcomes and remission, and causal effects of PED-t cannot be inferred from our non-controlled study. However, the replication of the RCT findings (Mathisen et al., 2018, 2020), may encourage future research investigating the effectiveness of the PED-t as well as practitioners dedicated to offer first-line services to treat individuals with BN or BED. Previously, PED-t was documented to be similar effective as CBT (Mathisen et al., 2020). Effectiveness studies of CBT have shown similar outcomes as in controlled research settings for patients with BN or BED (i.e., remission rate of ∼42%) (Linardon et al., 2018; Waller et al., 2014). As such, the current finding that PED-t in the HLC compares to the results produced in a controlled research setting, brings promises for an effective therapy. Important lessons to inform future PED-t include allocating more time to address emotional eating, and a change in the aerobic exercise to increase adherence.

Our findings point to a potential for making effective ED therapy more accessible, and that participants find the local low-threshold arrangement helpful. These findings further support PED-t as an encouraging first-line treatment for BN and BED symptoms.

AUTHOR CONTRIBUTIONS

Therese Fostervold Mathisen: Conceptualization; data curation; formal analysis; funding acquisition; investigation; methodology; project administration; software; visualization; writing – original draft; writing – review and editing. **Gunn Pettersen:** Conceptualization; formal analysis; methodology; writing – review and editing. **Jan H. Rosenvinge:** Conceptualization; writing – review and editing. **Ulrike Schmidt:** Supervision; writing – review and editing. **Jorunn Sundgot-Borgen:** Conceptualization; funding acquisition; investigation; methodology; supervision; writing – review and editing.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

Data from this research may be made available on reasonable request.

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