

REVIEW

A systematic review on physical therapy interventions for patients with binge eating disorder

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Abstract

Purpose: Since a distorted body experience and a sedentary lifestyle are central in the course of binge eating disorder (BED), physical therapy might be an interesting add-on treatment. The aim of this study was to systematically review randomised controlled trials (RCTs) evaluating physical therapy on binge eating and physical and mental health in BED patients. **Method:** EMBASE, PsycINFO, PubMed, Cumulative Index to Nursing and Allied Health Literature, Physiotherapy Evidence Database and Cochrane Library were searched from their inception until 15 August 2012 for relevant RCTs comparing physical therapy with a placebo condition, control intervention or standard care. **Results:** Three RCTs involving 211 female community patients (age range: 25–63 years) met all selection criteria. Review data demonstrate that aerobic and yoga exercises reduce the number of binges and the body mass index (BMI) of BED patients. Aerobic exercise also reduces depressive symptoms. Only combining cognitive behavioural therapy (CBT) with aerobic exercise and not CBT alone reduces BMI. Combining aerobic exercise with CBT is more effective in reducing depressive symptoms than CBT alone. **Conclusions:** The limited number of available studies and the heterogeneity of the interventions limit overall conclusions and highlight the need for further research.

Keywords

Binge eating disorder, exercise, physical therapy, yoga

History

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► Implications for Rehabilitation

- Because of severe co-morbid psychiatric and physical conditions, binge eating disorder is one of the most difficult psychiatric conditions to treat.
- Both yoga and aerobic exercise have shown promise in reducing binge eating pathology and weight.
- Combining aerobic exercise with cognitive behavioural therapy seems more effective in reducing depressive symptoms than cognitive behavioural therapy alone.

Introduction

Binge eating disorder (BED) was included in the fourth edition of the *Diagnostic and Statistical Manual Mental Disorders* (DSM-IV) as a provisional eating disorder [1]. Extensive research has since demonstrated the clinical utility and validity of the DSM-IV research criteria [2]. In the fifth edition of the DSM,

which will be published in 2013, BED will be formally recognised as a specified eating disorder [3]. Binge eating disorder is characterised by frequent and persistent episodes of binge eating accompanied by feelings of loss of control and marked distress in the absence of regular compensatory behaviours. Furthermore, binge eating episodes are associated with three or more of the following: (a) eating much more rapidly than normal, (b) eating until uncomfortably full, (c) eating large amounts of foods when not feeling physically hungry, (d) eating alone because of being embarrassed by how much one is eating, and (e) feeling disgusted with oneself, depressed or very guilty after overeating [1]. To meet the current DSM-IV criteria [1], the binge eating occurs, on average, at least 2 days a week for 6 months. Epidemiological studies have shown BED to be the most common of the eating disorders, with a lifetime prevalence of 3.5% among women and 2.0% among men [4]. Although obesity is not a criterion for

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BED, there is a strong association [4,5]. More than 65% of the BED patients are obese [6] and within a group of patients seeking treatment for obesity, the prevalence of BED was 26.6% [7]. Some differences between obese binge eaters and obese non-binge eaters have been reported. Obese binge eaters often show more severe obesity and greater eating disorder psychopathology, i.e. more weight and shape concerns and body dissatisfaction, more emotional eating, more negative self-evaluations and lower self-esteem compared with obese non-binge eaters [7–9]. Obese patients with BED also present more psychiatric co-morbidity than obese patients without binges, and in a number of important areas, including depression, bipolar disorder, anxiety disorders, obsessive-compulsive disorder, panic disorder, social anxiety disorder, post-traumatic stress disorder and substance abuse [4,5,8]. Physical consequences of BED are largely due to a co-morbid obesity and a sedentary lifestyle. To our knowledge, three studies [10–12] have considered physical activity levels among BED patients. The level of physical activity reported by obese individuals who binge eat in these three studies is roughly less than half of the levels reported by community samples using similar assessment methods [13]. Because of severe co-morbid psychiatric and physical conditions, BED has been characterised as one of the most difficult psychiatric conditions to treat [14]. Specialised psychotherapies, in particular, such as cognitive behavioural therapy (CBT) and interpersonal therapy are effective for reducing binge eating, but not all BED patients respond adequately [6,15,16]. Moreover, these treatments are generally not effective for the obesity associated with BED, and patients with more complex yet common co-morbidities, such as bipolar disorder or unstable diabetes, have been excluded from study participation, raising questions about the generalisability of treatment effectiveness. Research into the pharmacotherapy of BED is in its early stages. No single medication has received approval from a regulatory body for use [16,17]. Since weight and shape concern, body dissatisfaction, obesity and physical inactivity are central in the course of BED, and patients perceive improving self-esteem and mood as core elements in their treatment [18], physical therapy might be an interesting add-on treatment. Already in 1980s, the addition of physical therapy (including adapted physical activity, yoga, tai chi and dance) to treatment programmes for eating disorder patients was advocated [19]. A previous review on body and movement therapies in the multidisciplinary treatment of eating disorders provided some evidence to support the implementation of moderate physical activity for weight reduction in BED patients [20]. The conclusions of this systematic review were however mainly based on the data from uncontrolled trials, and the findings therefore should be interpreted with caution. To our knowledge, no systematic reviews of randomised controlled trials (RCTs) on physical therapy interventions are available. The question of whether physical therapy is a relevant addition to the multidisciplinary management of BED, therefore, remains largely unanswered. The primary aim of this systematic review was to summarise the evidence from RCTs examining physical therapy on binge eating and on physical and mental health in the multidisciplinary management of patients with BED. The secondary aim was to provide directions for future research.

Method

Data sources and searches

A literature search of studies was conducted according to the search strategy of Dickersin et al. [21]. No restrictions were made regarding the language of publication. EMBASE, PsycINFO, PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Physiotherapy Evidence Database

(PEDro) and the Cochrane Library were searched from their inception until 15 August 2012 for RCTs. Medical subject headings included “binge eating disorder” AND “physical activity” OR “physical therapy” OR “physiotherapy” OR “exercise” OR “rehabilitation”. Two independent investigators screened the abstracts of the publications found in the databases. If either investigator felt that any published article potentially met the inclusion criteria, or if there was inadequate information to make a decision, a copy of the article was obtained. The next phase of the search strategy involved searching for unpublished studies and for studies potentially overlooked or absent from the databases. This involved hand searching the references of all retrieved articles for potential studies in order to locate unpublished research, we searched websites housing details of clinical trials, theses or dissertations.

Study selection

Inclusion in this review was restricted to RCTs in people with a diagnosis of BED on the basis of any criteria, any length of illness and any treatment setting. Studies limited to only patients with eating disorders not otherwise specified were excluded. We did not exclude trials because of age, nationality or sex of the participants.

Types of interventions

Studies were considered eligible for inclusion if they were RCTs comparing physical therapy interventions with a placebo condition, control intervention or standard care. The experimental physical therapy interventions could comprise aerobic exercises, resistance training, relaxation training, yoga, massage or a combination of these in accordance with the World Confederation for Physical Therapy position statement [22]. Aerobic exercise has been defined here in accordance with Caspersen et al. [23] as physical activity that is planned, structured, repetitive and purposive in the sense that improvement or maintenance of physical fitness or health is an objective. A physical therapy intervention could be used alone or in conjunction with other interventions. Specific effects of the physical therapy intervention had to be however separable from other active components in the intervention. Standard care was defined as care that people would normally receive had they not been included in the research trial. Such care would include hospitalisation, community psychiatric nursing support and outpatient care. For an RCT to be included, the experimental and comparison interventions must have had similar durations.

Data extraction and quality assessment

Assessments of quality were completed independently by two reviewers. Disagreements were resolved by discussion. If no consensus was achieved, a third reviewer made the final decision. Each study was evaluated with the previously validated 5-point Jadad scale [24] to assess the completeness and quality of reporting of RCTs as well as to assess for potential bias in the trials. This widely used scale focuses on three dimensions of internal validity: quality of randomisation, double blinding and withdrawals. This scale is the only published instrument that has been created according to psychometric principles [25]. A score of 0–5 is assigned, with higher scores indicating higher quality in the conduct or reporting of a trial. A trial scoring at least 3 of 5 is considered to be of strong quality. A data collection form was developed and used by the first reviewer (MP) to extract data from the included studies while the second reviewer (MA) cross-checked the extracted data. The data items extracted are shown in Table 1.

Table 1. Data extraction.

Design
• First author name
• Year published
Participants
• Number, mean age or age range, gender proportion
• Setting (inpatients, outpatients, community-based patients)
Intervention
• Type of intervention
• Duration, frequency, intensity
• Co-interventions
Outcome measures
• Type of outcome measures
• Assessment tools
• Adverse effects

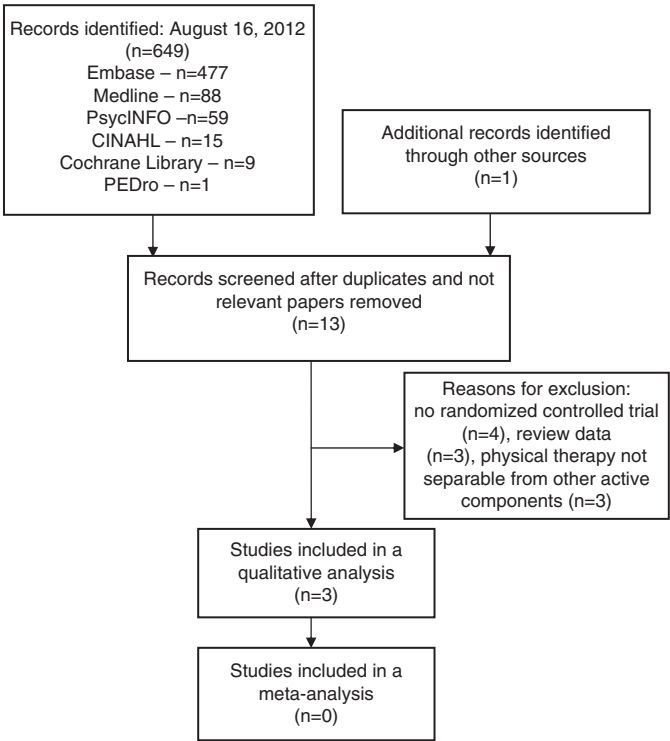


Figure 1. Flow chart of systematic review inclusion and exclusion.

Results

Study selection

The initial electronic database search resulted in a total of 649 articles. Through additional manual searches of reference lists and searches of websites, one other potentially eligible article was identified. Only English language studies were found. After the removal of duplicates and screening of full texts, three RCTs [26–28] were included. Reasons for exclusion are shown in Figure 1. On the basis of the full-text screening, we decided that there was too much heterogeneity in study designs and protocols to apply a formal meta-analysis.

Participants

In total, 211 participants with BED were included in the analyses. All included participants were female. Studies included also only community-based participants. The participants ranged in age from 25 to 63 years. In all studies, BED was diagnosed based on self-report questionnaires. Detailed information on the characteristics of the participants is provided in Table 2.

Methodological quality

Only one [27] of the included studies could be considered to be of strong methodological quality (Table 2).

Binge eating outcomes

Two RCTs [26,27] indicate that patients who follow an aerobic exercise programme report less binges per week. In the study of Levine et al. [26], more than 80% of the patients following a 6-month walking programme were abstinent from binge eating. In the study of Pendleton et al. [27], a combination of aerobic exercise and CBT resulted in significantly less binges per week than CBT alone. Also patients following a 12-week yoga programme reported less binge eating compared to participants in the wait list [28]. Binge eating pathology reduced even further 3 months post-treatment (Table 2).

Mental health outcomes

Levine et al. [26] showed that exercisers do have lower depressive scores following a 24-week walking programme while Pendleton et al. [27] demonstrated that a 4-month programme combining CBT with aerobic exercise results in less depressive symptoms than CBT alone (Table 2).

Physical health outcomes

The effect of aerobic exercise [26,27] and yoga [28] on body mass index (BMI) was investigated. Only the combination of aerobic exercise and CBT and not CBT alone resulted in significant BMI reduction [27]. Also, a 24-week walking programme [26] and a 12-week yoga programme led to significant BMI reduction (Table 2).

Adverse events

Adverse events were not reported in any of the included studies (Table 2).

Discussion

General findings

This systematic review explored the efficacy of physical therapy as an adjunct treatment for patients with BED. Our review demonstrates that the existing literature is limited, equivocal and difficult to interpret in light of significant methodological shortcomings, particularly the reliance on self-report questionnaires for the assessment of binge eating and the inclusion of only female community patients. Although with limitations, our review data do indicate that both aerobic exercise and yoga show promise in increasing abstinence from binge eating. The present review data also indicate that adding exercise to CBT may benefit the female binge eaters in two ways, and this by two different mechanisms. First, it may facilitate abstinence from binge eating through psychological pathways related to the recreational nature of the activity itself, i.e. those who exercise reported to experience less depressive symptoms. Second, in a recent study, DeBoer et al. [29] suggested that physical activity may buffer the effect that anxiety sensitivity (i.e. a fear of anxiety and related sensations) has on binge eating. That is, in the study of DeBoer et al. [29], the relation between anxiety sensitivity and binge eating was significant among individuals who reported low levels of moderate physical activity, but not significant among individuals who reported high levels of moderate physical activity. Both, yoga and aerobic exercise may also contribute to reductions in BMI through physiological responses to caloric expenditure. These BMI reductions could ostensibly include increased general physical

Table 2. Details of the included randomised controlled trials.

Authors	Participants	Intervention experi- mental versus control	Duration	Frequency	Intensity	Relevant outcomes (experimental versus controls)	Relevant instruments	Adverse effects	Co-interventions	Jadad score
Levine et al. [26]	77♀ community-based patients with BED; 36.6 ± 6.5 years; BMI = 36.8 ± 5.3; 84.4% Caucasian	Walking (n = 44) versus wait list (n = 33)	24 weeks	3 to 5 × week	>1000 kcal/week	81.4% of the walkers were abstinent from bingeing (% controls unknown), frequency of exercise was associated with being more abstinent [$F(1,40) = 9.04$, $p = 0.005$]; also lower BDI [$F(1,34) = 47.85$, $p < 0.001$] and BMI [$F(1,41) = 13.72$, $p = 0.001$] in exercisers	EDE BDI	No	No	2
Pendleton et al. [27]	84♀ community-based patients with BED; 45.0 ± 6.5 years; BMI = 36.2 ± 6.5; 76% Caucasian	Graded exercise + CBT (n = 44) versus CBT (n = 40)	4 months	3 × week 45 min (of which 1 × week at home)	–	In exercisers greater reductions in binge days/week at month 4 (from 4.4 ± 2.2 to 0.7 ± 1.2; versus from 4.4 ± 2.2 to 2.2 ± 2.1) ($Z = -3.3$, $p = 0.001$), month 10 ($Z = -2.5$, $p = 0.012$) (0.7 ± 1.2 versus 1.6 ± 1.6), and month 16 ($Z = -3.1$, $p = 0.002$) (0.9 ± 1.5 versus 2.1 ± 2.0) + more abstinent (59%, 55%, 61% versus 30%, 35%, 30%) + more decreased BMI (–0.77 ± 1.7, –1.41 ± 3.3, –1.58 ± 3.3 versus +0.26 ± 1.3, –0.25 ± 2.3, +0.42 ± 2.7) ($F = 8.77$, $p = 0.004$) + lower BDI (from 16.8 ± 10.1 to 6.8 ± 6.6) versus (from 18.6 ± 9.2 to 10.6 ± 7.8) at 4, months ($F = 7.7$, $p = 0.007$). Only lower BES-score (–14.4 versus –1.4, $p_{\text{group-differences}} < 0.001$), and BMI (–0.9 versus +0.1, $p_{\text{group-differences}} = 0.009$). BES-score reduced further after 3 months of follow-up (–2.2, $p = 0.09$).	BES BDI	No	CBT	2
McIver et al. [28]	50♀ community-based patients with BED; age yoga = 40.1 ± 10.6 years; age wait list = 42.0 ± 10.1 years; range: 25–63 years; BMI yoga = 35; 650♀ BED 6.2; wait list = 32.6 ± 6.6	Yoga (5 min of pranayama, 45 min of hatha yoga, and 10 min of yoga nidra = deep relaxation) (n = 25) versus wait list (n = 25)	12 weeks	1 × week 60 min + 5 × week home-based practice	–		BES	No	No	3

BED, binge eating disorder; NS, not significant; BMI, body mass index; EDE, eating disorder examination; BDI, Beck depression index; CAU, care as usual; EDI, eating disorders inventory; CBT, cognitive behavioural therapy; BES, binge eating scale.

and mental well-being, developing a positive rapport with one's body and potentially lead to the ongoing promotion of a healthy lifestyle [30].

Practical implications

The UK National Institute for Health and Clinical Excellence guidelines [31] recommend that people with eating disorders should first be offered community and outpatient treatment and that inpatient care be used for those who do not respond or who present with high risk. Our review data demonstrate that physical therapists could have a role within these first-stage community settings. Clear guidance regarding the type of physical therapy intervention (aerobic exercise or yoga-related interventions) and optimal dose is however at the moment limited by the small number of available RCTs and the variability of the interventions themselves in terms of frequency, intensity and duration. Physical therapists should therefore assess the types of exercises or techniques that would best fit a person's preferences.

Limitations

Although this systematic review is the first to investigate RCTs for the effectiveness of physical therapy interventions in patients with BED, there are several limitations that should be acknowledged. Firstly, performance bias may limit our findings. None of the included studies were double-blind. The reported results may therefore exaggerate estimates of treatment effect [32]. Secondly, the heterogeneity among the studies, particularly with regard to the duration and frequency of the experimental intervention and the chosen control/comparison intervention, was a challenge. This diversity limits overall conclusions and highlights the need for further rigorous research.

Future research

Practice recommendations emphasise the importance of specialised care for the treatment of BED, but such care is not always easily accessible [6]. Hence, new forms of service delivery with the use of, for example, exercise counselling by physical therapists trained in basic cognitive-behavioural and motivational skills and directed via mobile phones or Internet should be examined. For future research, the focus should be on high-quality RCTs to be able to draw firm conclusions. All future trials need to pay attention to the methodological and reporting requirements for RCTs, as specified in the CONSORT statement [33]. In particular, studies should minimise threats to internal and external validities, such as the lack of blinding of outcome assessors. Although researchers may not readily be able to mask participants to physical therapy interventions to remove the chance of performance bias, every attempt should be made to collect research data in a masked manner. For example, blinding of data collectors and outcome adjudicators is often achievable. If aerobic exercise would be used as a first line, stepped care for reducing depressive symptoms, we need to know the dose-response and at what point other treatments should be included. Furthermore, we also need to know to what extent aerobic exercise can add to the effects of antidepressants and in which way medication could be spared or used at lower doses when being more physically active. Lastly, future research needs to examine also physiological (e.g. increased norepinephrine, serotonin and beta-endorphins, increased parasympathetic activity) and/or psychological mechanisms (e.g. increased self-efficacy, distraction) that could be responsible for reduction in depressive symptoms in BED patients after aerobic exercise [34].

Conclusion

This systematic review demonstrated that specific physical therapy interventions (aerobic exercises and yoga-based physical therapy) might result in beneficial outcomes on eating pathology, depression and BMI. Future research into specific features of physical therapy interventions, such as tailoring interventions to the needs of people with BED may contribute to the currently available evidence.

Declaration of interest

The authors report no declarations of interest.

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