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Incorporating Exercise into Eating Disorder Treatment and Recovery

Cultivating a Mindful Approach

Rachel M. Calogero and Kelly N. Pedrotty-Stump 

The eating disorder (ED) literature is replete with labels and definitions to describe the exercise behaviors often observed in this patient population: “activity anorexia” (Epling, Pierce & Stefan, 1983), “exercise anorexia” (Touyz, Beumont & Hoek 1987), “obligatory exercise” (Davis, Brewer & Ratusny, 1993), “exercise addiction” (Adams & Kirkby, 2002), “exercise dependence” (Veale, 1987), “exercise abuse” (Davis, 2000), “excessive exercise” (Le Grange & Eisler, 1993). The common theme underlying all of these labels is that exercise is dysfunctional and detrimental in the context of ED. In light of this prevailing negative view, there is considerable debate about whether exercise should be promoted or prohibited during treatment (Rosenblum & Forman, 2002). This chapter reviews the evidence for the role of exercise in eating-related pathology and for the use of exercise in ED treatment. “Dysfunctional exercise” (DEX) will be used throughout the chapter to cover the range of terms, labels, and definitions otherwise used to describe this phenomenon in the literature.

This chapter bridges the research–practice gap in several ways. To begin, the harmful role of exercise in eating-related pathology is described, underscoring the imperative of addressing DEX in treatment. Common myths and misconceptions about the function and meaning of exercise in ED treatment, and how these faulty beliefs serve as barriers to implementing exercise in treatment, are also considered. Then, the evidence for a quantity versus quality approach to the conceptualization and operationalization of DEX is evaluated, with an eye toward reconsidering historically narrow definitions of DEX. Published exercise protocols that have been empirically tested in ED programs are reviewed and compared to elucidate the common and unique themes. Finally, an integrative approach to the treatment of DEX within the context of ED treatment is offered, providing a new direction for ED research, treatment, and recovery that relies on a conceptualization of mindful exercise informed by both science and practice. The chapter concludes with future directions and perspectives on how to bridge the research–practice gap in the area of exercise and ED.

THE HARMFUL ROLE OF EXERCISE IN THE CONTEXT OF EATING DISORDERS

Dysfunctional patterns of exercise feature in the etiology, development, and maintenance of EDs (Beumont, Arthur, Russell & Touyz, 1994; Brewerton, Stelfox, Hibbs, Hodges & Cochrane, 1995; Bruch, 1973; Calogero & Pedrotty, 2004; Davis et al., 1997; Touyz et al., 1987). Clinical studies have estimated that the prevalence of disordered eating (DE) among residential ED patients is 33 to 78% (Dalle Grave, Calugi & Marchesini, 2008; Davis et al., 1997, Davis, Kennedy, Ravelski & Dionne, 1994; Katz, 1996; Shroff et al., 2006). It occurs across the spectrum of EDs and is not, as commonly presumed, exclusively an aspect of anorexic pathology (Boyd, Abraham & Luscombe, 2007; Peñas-Lledó, Vaz Leal & Waller, 2002; Solenberger, 2001).

Dysfunctional exercise can precede the onset of the ED, is one of the last symptoms to subside, or develops later as the major behavioral problem, suggesting that it is not merely secondary to weight loss or weight loss attempts (Calogero & Pedrotty, 2004; Crisp, Hsu, Harding & Hartshorn, 1980; Davis, Blackmore, Katzman & Fox, 2005, Davis et al., 1994; Kron, Katz, Gorzynski & Weiner, 1978; Long & Hollin, 1995; Wichstrom, 1995; Windauer, Lennerts, Talbot, Touyz & Beumont, 1993). In addition, not only do high levels of exercise predict longer periods of ED hospitalization (Solenberger, 2001), but a compulsion to exercise at discharge from treatment predicts a quicker relapse and a chronic outcome, at least among AN patients (Strober, Freeman & Morrell, 1997). Other research has shown that AN patients who resumed high levels of exercise (i.e., more than 6 hours of intense exercise per week) within the first 3 months following discharge were more likely to relapse (Carter, Blackmore, Sutandar-Pinnock & Woodside, 2004). In sum, the evidence clearly indicates that DEX is related to ED pathogenesis, can disrupt treatment, can bring about relapse, and occurs across the spectrum of ED diagnoses.

EXERCISE: A NEGLECTED COMPONENT OF EATING DISORDERS TREATMENT

Considering the severity of DEX with regard to ED development, course, and recovery, its neglect in treatment protocols is of special importance to ED professionals. Several misconceptions and problems on the topic of exercise have contributed to this oversight. One misconception is that exercise serves as an obstacle to weight recovery. The common wisdom among ED professionals is that additional physical activity during treatment interferes with patients' weight recovery. The fear of compromised weight gain is reasonable, due to longer and more costly treatment stays. This perspective is guided, however, by the belief that the primary purpose for patients' exercising would be weight loss. It fails to distinguish between supervised, structured physical activity and unsupervised, high-level exercise, which undoubtedly compromises weight gain. In following a weight-based approach, prohibiting exercise is perceived as imperative in ED treatment, but it only appears to be relevant for the low weight patients. For example, whereas underweight patients may be restricted from exercise indefinitely, normal weight patients may be allowed to exercise 5 days per week, yet they may similarly struggle with DE and be equally at risk for quicker relapse.

A second misconception is that DEX will resolve with general treatment. ED professionals rightly agree that DEX is integral in ED pathology (Hechler, Beumont, Marks & Touyz, 2005); yet many also believe that DEX will resolve itself with ED treatment and weight restoration. This passive resolution of DEX within the context of standard treatment is unlikely to occur. The evidence reviewed earlier in this chapter suggests that, as a central feature of ED pathology, *not* specifically addressing DEX during treatment is more likely to compromise treatment and recovery.

Third, the boundaries between healthy versus unhealthy exercise are blurred. Dysfunctional exercise is unique among the constellation of ED symptoms (e.g., vomiting, starvation, or laxative abuse) because of the widely proclaimed health properties associated with the core behavior (regular exercise). Compounding this issue, according to a survey of ED units in the United Kingdom, very few had a written definition of healthy exercise (Davies, Parekh, Etelapaa, Wood & Jaffa, 2008). Given this acclaim, and the wider cultural fervor around 'fitness' (Robison, 2000), discerning healthy versus unhealthy exercise among patients presents unique challenges for ED professionals.

Finally, despite some recommendations (Andersen, Bowers & Evans, 1997; Beumont, Beumont, Touyz & Williams, 1997; Calogero & Pedrotty, 2004), there is a general lack of widely established exercise protocols in ED treatment. Protocols that do exist have not been adequately tested, raising valid concerns among ED professionals about the cost-benefit ratio of systematically implementing these protocols (Hausenblas, Cook & Chittester, 2008; Hechler et al., 2005). Standardized guidelines, such as those published by the American College of Sports Medicine, would not be appropriate because they do not consider individuals with eating and exercise pathology (Corbin, LeMasurier & Franks, 2002). In addition, there is little specific expertise about exercise among ED professionals (Yates, 1991), making it difficult for some professionals to confidently or competently interpret and evaluate existing recommendations.

IT'S NOT THE EXERCISE: QUALITY TRUMPS QUANTITY

Actual frequency, volume, and intensity of exercise appear to be largely unrelated to ED pathology. It is the underlying psychological motivations and beliefs, and not the exercise behavior per se, that warrants more attention in research and practice. In a large study of American college women, Ackard, Brehm & Steffen (2002) found that those who did *not* exercise, but indicated more negative thoughts and feelings about exercise, reported lower self-esteem, greater depressed mood, and more disordered eating compared to women who frequently engaged in exercise without the accompanying emotional commitment. In a more recent study, Cook and Hausenblas (2008) found that exercise dependence, defined by an individual's pathological motivation to exercise, fully explained the link between exercise behavior and eating-related pathology. A qualitative study of British women found that exercise dependence occurred exclusively in the context of eating-related pathology or a full-blown ED, and not in relation to recreational or high-level exercise (Bamber, Cockerill, Rodgers & Carroll, 2000). Other research has shown that an emotional commitment to exercise predicts disordered eating (Davis et al., 1993) and mediates the relationship between perfectionism and dietary restraint (McLaren, Gauvin & White, 2001).

Exercise that is undertaken to escape or regulate negative affect also signals DEX. A study of 21 consecutively admitted AN inpatients found that regulation of negative affect was a major reason for their exercise (Long, Smith, Midgley & Cassidy, 1993). In a sample of female ED inpatients in Belgium, chronic negative affect was identified as a central feature precipitating both the compulsion to exercise and actual exercise behavior (Vansteelandt, Rijmen, Pieters, Probst & Vanderlinden, 2007). These findings are particularly compelling because the women reported on their emotions, cognition, and behaviors at random intervals throughout the day over the course of a week, thus providing a more naturalistic and ecologically valid representation of the link between negative affect and exercise in ED patients. Using exercise to escape negative affect altogether is also not uncommon in non-clinical samples, as demonstrated by De Young and Anderson (2010). These researchers found that exercise motivated primarily by negative affect was associated with more eating-related pathology among both college women and men, independent of exercise frequency, although this pattern was stronger for women (see Figure 25.1).

Other research has shown that exercise motivated by external appearance goals predicts greater eating-related pathology and poor psychological functioning (Adkins & Keel, 2005; Calogero et al., 2009; Maltby & Day, 2001; Strelan, Mehaffey & Tiggemann, 2003), especially exercise undertaken primarily for weight loss and control of body shape (Mond & Calogero, 2009). In several large-scale studies of community populations of American and Australian

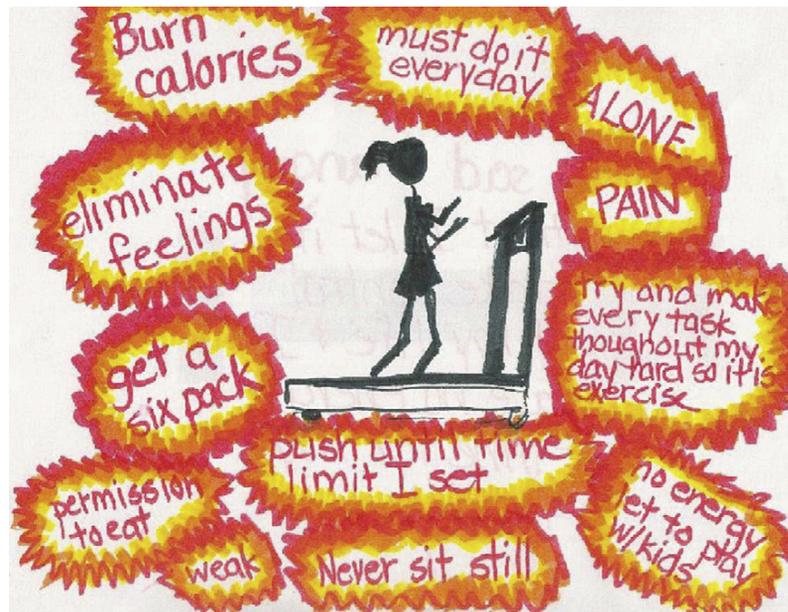


FIGURE 25.1 Personal exercise world of a residential eating disorders patient who struggles with DEX. Her drawing reflects key qualities of DE, such as pain and punishment, escaping negative affect, permission to eat, weight/appearance focus, isolation, and interferes with daily functioning. These themes are accentuated by her color choices (red, orange, and yellow) which communicate the intense power and anger she experiences in her exercise world. Reprinted with permission from author. Please refer to color plate section.

women, Jon Mond and colleagues have found no relationship between self-reported frequency of exercise and disordered eating or quality of life (Mond, Hay, Rodgers, Owen & Beumont, 2004; Mond, Hay, Rodgers & Owen, 2006). Instead, they have demonstrated that exercise for the primary purpose of changing appearance (i.e., weight, shape, or body tone), and feeling intense guilt when missing exercise, were the two strongest predictors of disordered eating in community samples, and also significantly distinguished ED patients from healthy participants (Mond & Calogero, 2009).

In addition to the qualities highlighted above, other dimensions of DEX have been reported among ED patients. Based on clinical observations and anecdotal reports from female ED inpatients, we have extended the scope of DEX to include the following exercise functions or attitudes: self-harm, identity maintenance, permission to eat, bodily disconnection, rigid isolation, dread, all or nothing approach, and when physical well-being and/or safety are compromised (Calogero & Pedrotty, 2004, 2007). Empirical evidence for some of these patterns demonstrated that exercise characterized by self-harm, identity maintenance, weight loss focus, and an outcome orientation (referred to as *mindless* exercise) predicted more eating-related pathology (measured by EDE-Q), higher body shame and chronic body monitoring, more distorted exercise beliefs, and less body responsiveness and body appreciation (Calogero et al., 2009). Other researchers have found that exercise characterized by identity maintenance, affect regulation, rigid routines, and exercising when physically compromised clearly distinguished ED patients from a non-clinical comparison group (Boyd et al., 2007). Similarly, systematic interviews with a variety of undiagnosed women found that exercise in the context of ED pathology (high levels of eating-related pathology or full-blown ED vs. healthy women) was characterized by patterns of self-harm, focus on weight loss and caloric compensation, surreptitious activity, and largely controlled day-to-day living (Bamber et al., 2000). In sum, the evidence consistently shows that irrespective of the volume or frequency of exercise activity, the *quality* of the exercise—or exercise mindset—is what links DE to eating-related pathology (see Figure 25.2).

EVIDENCE FOR EXERCISE PROTOCOLS IN EATING DISORDERS TREATMENT

Beumont and colleagues (1994) pioneered the use of exercise in ED treatment by incorporating a structured anaerobic exercise program into patients' total treatment plans based on the following rationale: (a) total restriction of physical activity is an ineffectual policy that cannot be fully instituted; (b) distorted beliefs about exercise need to be challenged and exercise education is required; and (c) real-world pressures to exercise can be confronted more successfully when patients have been exposed to a healthy model for exercise. They argued cogently for the inclusion of physical activity and exercise counseling in ED treatment, and they emphasized the importance of exercise across ED diagnoses (Beumont et al., 1997). Despite this call for exercise in ED treatment, there is a dearth of research that evaluates exercise in ED treatment, and virtually no published research on the effectiveness of exercise programs that incorporate Beumont's recommendations. The scientific evidence that does exist has been criticized on various methodological grounds, including the use of relatively small sample sizes, the lack of appropriate comparison groups, and/or the reliance on



FIGURE 25.2 Personal exercise world of a residential eating disorders patient who struggles with DEX. Her drawing reflects the core experience of imprisonment, as illustrated by the prison bars and handcuffs that confine her. She identifies many qualities of DEX in her exercise world: source of identity, fear and isolation, dangerous, escaping feelings, and control over her life. We can see that what imprisons her is not the behavior, but her mindset. Yet, she also communicates her awareness of an alternative exercise world, where she is free of these restraints, as depicted by the hopeful ray of sunshine in the corner. Reprinted with permission from author. Please refer to color plate section.

non-randomized assignment. Although these methodological weaknesses are difficult to overcome in real treatment settings, and to some degree are offset by the ecological validity of the findings, these issues represent a critical research-practice gap that requires more attention.

Exercise Protocols in Anorexia Nervosa Patients

An evaluation of the effectiveness of Beumont and colleagues' program in a sample of 39 female AN inpatients in Australia found that participation in structured exercise did not interfere with weight gain compared to a non-exercising control group (Touyz, Lennerts, Arthur & Beumont, 1993). Exercising patients engaged in a structured anaerobic exercise program 3 hours per week throughout their treatment stay which included: stretching, posture enhancement, weight training, social sport, and occasional low-impact aerobics. Eligibility for participation required a body mass index (BMI) of at least 14, weekly weight gain (1+ kg), and no significant medical complications that would preclude exercise. The exercise program emphasized exercise education, challenging distorted exercise beliefs, and practicing healthy forms of exercise. Exercising patients showed an average increase of 1 kg per week over 4- and 6-week refeeding periods and improved program compliance. No other studies were located that reported on whether patients' exercise attitudes and behaviors improved following participation in this program.

A different approach was implemented and tested by Long and Hollin (1995). In this case, an adjunctive exercise intervention was implemented immediately following inpatient treatment for the purpose of relapse prevention. Participants included six fully weight-restored AN outpatients (one male) in the UK who were excessive exercisers. The exercise program did not include structured or supervised physical activity, but instead followed a two-phase treatment approach to moderate exercise. In the first phase, individual or group sessions included exercise education, making self-motivational statements, identifying the perceived costs and benefits of changing exercise, and setting appropriate treatment goals. In the second phase, individual sessions incorporated a variety of cognitive-behavioral techniques to help self-monitor exercise, restructure distorted cognitions around exercise, and manage exposure and response prevention. On average, 12 days (range 8–12) of outpatient treatment were focused on DEX, and 8.3 sessions (range 4–12) were devoted to exposure and response prevention. At the 4-year follow-up, all patients had maintained their weight and only two patients had a poor outcome with respect to exercise. That is, although the patients reported similar levels of exercise behavior at follow-up, the two poor outcome patients continued to exercise to control weight and shape, to regulate negative affect, and dreaded exercise. In contrast, the good outcome patients reported using exercise for social reasons and general fitness and they did not change their schedule to accommodate exercise. It is noteworthy that although the poor outcome patients continued to exercise at their pre-treatment levels at follow-up, they had not returned to the particular sports that were targeted in the exposure and response prevention sessions.

The use of an exercise program over a 3-month period was evaluated by Thien, Thomas, Markin & Birmingham (2000) with 16 AN outpatients (one male) in Canada to determine whether randomly assigned participation in exercise could improve patients' quality of life without interfering with weight gain. The exercise protocol involved a graduated reintroduction of activity with seven levels. Exercising patients began with stretching three times per week and exercise levels were increased based on percent ideal body weight and percent body fat. Higher levels incorporated higher intensity exercise, including isometric work, low-impact aerobics, and resistance training. The exercise activities were not supervised, but they were highly structured, periodically monitored, and revised (levels increased or decreased) based on progress toward treatment goals. Patients were clearly instructed about the type, intensity, and frequency of exercise at each level, and wore heart-rate monitors to check intensity. The findings showed that exercise participation did not interfere with weight gain as indicated by BMI and percent body fat values. In addition, exercising patients reported better quality of life than did controls (i.e., functioning at work, daily and social activities, energy level), although these differences were not statistically significant.

Szabo and Green (2002) evaluated resistance training as an adjunctive treatment for AN inpatients in South Africa. Patients were randomly assigned to participate in resistance training or a control group for 8 weeks, and a healthy exercising control group was included for comparison. All patients were within 15–20% of their target discharge weight. Resistance training consisted of two alternating exercise schedules that included a combination of 2.5 kg dumbbells, elastic bands, and body weight to target a wide range of muscle groups throughout the body. Compared to healthy exercising controls, body fat and body weight significantly increased and ED pathology significantly decreased from baseline for the exercising and non-exercising AN groups, and depression decreased among non-exercising AN.

Thus, while exercise participation did not interfere with weight gain, the exercising and non-exercising AN groups did not significantly differ from each other on these outcomes.

Tokumura, Yoshida, Tanaka, Nanri & Watanabe (2003) evaluated stationary bike riding in adolescent AN patients in Japan during the convalescent phase of inpatient treatment to improve their exercise capacity and to alleviate emotional stress. Eligibility required patients to have achieved a medically stable weight and increase their body fat by 25% from admission. Patients engaged in 30 minutes of supervised cycling at their individualized anaerobic threshold five times per week, for about 10 months. At the 1-year follow-up, patients who exercised had a significantly higher BMI and improved exercise capacity relative to their baseline, whereas a non-exercising control group did not. Participation in this exercise protocol did not interfere with weight gain or the onset or resumption of menstruation, and it did not produce relapse. Although measures of emotional stress were not indicated, the researchers reported that emotional stress was reduced as well.

Exercise Protocols in Bulimia Nervosa Patients

In one of the only studies to examine the use of exercise with bulimia nervosa (BN) patients, Sundgot-Borgen, Rosenvinge, Bahr & Schneider (2002) compared physical exercise (mixed aerobic and non-aerobic) to cognitive-behavioral therapy (CBT) on a range of outcomes in female BN outpatients in Norway who were randomly assigned to exercise, CBT, nutritional counseling, or wait-list control. Exercise was described as moderate levels of aerobic and anaerobic activities over a period of 16 weeks designed to promote physical fitness, to reduce feelings of fatness, bloating, and distention associated with eating, and to reduce ED pathology. Exercising patients participated in weekly 1-hour sessions with a qualified fitness instructor who did not engage in eating-related discussions. They were also advised to exercise unsupervised twice weekly for at least 35 minutes. Compared to baseline, exercising patients reported significantly lower drive for thinness, fewer bulimic symptoms, and less body dissatisfaction at the 6- and 18-month follow-up. In addition, exercise patients showed greater improvement than CBT patients on drive for thinness and bulimic symptoms at both follow-ups. Not surprisingly, exercise capacity (as measured by peak oxygen consumption) was significantly improved in the exercise patients relative to all other conditions at the 18-month follow-up. The researchers also reported significant reductions in percent body fat for the exercise patients compared to the other groups at the 18-month follow-up. However, at 18 months, patients were regularly exercising with concomitant vomiting, which is not only dysfunctional, but life-threatening. The markers of success associated with exercise protocols for BN patients require further consideration.

Exercise Protocols with Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder Not Otherwise Specified (EDNOS) Patients

Similar to the philosophy underlying Beumont et al.'s (1994) program, we implemented an exercise program specifically targeting DEX within the context of the ED by providing residential ED patients with opportunities to practice and process alternative experiences with exercise before discharge (Calogero & Pedrotty, 2004). Core features of the program include: disrupting the link between exercise and weight loss, providing exercise education,

challenging distorted exercise beliefs, supervising exercise sessions, and guided processing of exercise experiences during and after the activity. Exercise is based on a graded 3-level system that varies in frequency and intensity, and includes a combination of guided stretching, posture and alignment work, yoga, Pilates, partner exercises, resistance training, stability ball, low impact aerobic activity, strength training (2.5–5 kg), and recreational activities (e.g., skipping, bat and ball, nature walks, musical pillows). Participation is voluntary and eligibility requires that patients are: not on bed rest (or modified bed rest); medically cleared; and agree to work on their exercise issues within the program. Patients advance to the next level based on clearance from both the treatment team (including medical clearance) and the exercise program coordinators.

An evaluation of the effectiveness of this exercise program in a non-randomized mixed sample of 254 residential ED patients (AN, BN, EDNOS) in the USA found that, after an average of 4 weeks' participation in supervised, structured exercise, the exercising AN patients gained significantly more weight than the non-exercising AN control patients (Calogero & Pedrotty, 2004). All exercising patients also reported significantly less ED pathology and DEX at discharge compared to those who did not participate. Specifically, emotional commitment to exercise, excessive involvement with exercise, and rigid exercise were significantly lower at discharge.

CRITICAL THEMES OF EXERCISE PROTOCOLS IN EATING DISORDERS TREATMENT

Based on the review above, it is clear that the use of exercise in ED treatment is happening on a global scale, which underscores the need for established guidelines and formal evaluations of their effectiveness in ED treatment. There were many notable differences in the methodology followed across the exercise protocols, making it difficult to directly compare effects. The nature of the exercise, the degree of supervision, the indicators of success, the rationale for using exercise in ED treatment, and whether DEX was directly targeted varied widely across the studies. In addition, researchers did not randomly assign patients to exercise or control groups. Personality and motivational factors could thus be confounding the interpretation of any significant effects of exercise participation. Several critical themes emerged from the review of these protocols.

First, supervised exercise did not interfere with weight gain and it reduced ED pathology. Regardless of the type or intensity of exercise it did not interfere with weight gain/maintenance during weight recovery/maintenance periods. When ED pathology was assessed, symptomatic behaviors were markedly reduced after participation in exercise, even up to four years following the intervention. In each of the exercise protocols, actual BMI and caloric intake were closely monitored by the treatment team and exercise activities were monitored to some degree. Thus, structured exercise can be used with significant profit in ED inpatient and outpatient treatment without interfering with weight gain/maintenance.

Second, female AN patients were predominantly targeted. None of the exercise protocols included an evaluation of male ED patients. Moreover, only two studies examined BN patients (Calogero & Pedrotty, 2004; Sundgot-Borgen et al., 2002) and only one study examined EDNOS patients (Calogero & Pedrotty, 2004). None of the studies examined binge eating disorder patients, children, older adults, or elite athletes. Thus, despite the cross-cultural

scope of these exercise protocols, the documented effects of exercise in ED treatment cannot be widely generalized.

Third, few protocols targeted DEX directly. Findings from the three programs that did specifically target DEX showed significant decreases in: emotional commitment to exercise; obligatory exercise attitudes toward exercise; appearance-based motives for exercise; and distress over missing exercise sessions (Calogero & Pedrotty, 2004; Long & Hollin, 1995; Touyz et al., 1993). Those programs that did not target DEX used exercise to facilitate treatment and/or to improve overall recovery. Most programs did not implement any of Beumont et al.'s (1994) recommendations that focused on changing patients' relationship with exercise.

Fourth, exercise participation was based predominantly on weight. Despite the evidence that exercise does not interfere with weight gain, exercise participation was typically based on the achievement of a particular weight, without consideration of the underlying exercise pathology. Many treatment programs that incorporate exercise rely on BMI values to determine appropriate activity levels, although the values used to set these levels vary markedly (Davies et al., 2008). This relatively common approach reinforces the idea that exercise is only about weight—weight loss, weight maintenance, and weight control. From the patients' perspective, this policy could be interpreted to mean that they are now in a position where they can afford to lose weight or that they need to exercise at this weight. It is critical to question why exercise is often considered dangerous or dysfunctional only in the context of low weight (vs. normal or higher weight). The answer to this question has real implications for how we utilize exercise in the treatment of all ED.

TAKING A MINDFUL APPROACH TO EXERCISE

Most of the abovementioned exercise protocols neglected the mind–body connection. They did not target the problematic quality of the exercise—the negative exercise mindset. Yet, this may be where exercise can make its greatest impact in ED treatment. Non-verbal movement-based groups have been highly recommended in ED treatment (Beumont et al., 1994), but rarely included in the management of DEX (Hechler et al., 2005). We consider mindful awareness during exercise to represent a key phenomenological shift in how patients move and feel in their bodies. Thus, we recommend that ED professionals broaden their conceptualization of DEX as described earlier to include a wider spectrum of mindless and dysfunctional patterns of exercise that disconnect the mind and body (e.g., self-harm, identity maintenance, appearance motives).

Cultivating Mindfulness in Exercise

Drawing from our clinical experiences and seminal work on mindfulness (Langer, 1989; Siegel, 2007), we have come to conceptualize DEX on a continuum that ranges from more *mindless* exercise to more *mindful* exercise (see Table 25.1). These opposing dimensions of exercise capture the variety of labels, definitions, and qualities of exercise described in the extant literature, while offering healthier, positive practices to replace DEX. Mindful exercise encompasses any movement that is done with attention, purpose, self-compassion, acceptance, awareness, and joy. It is focused on the *process* of becoming more connected, healthier, and stronger, whereas mindless exercise is often appearance-based and focused on outcomes.

TABLE 25.1 Qualities of Mindful versus Mindless Exercise

Mindless Exercise	Mindful Exercise
Orientation to past and/or future	Orientation to the present moment
Focus on external outcomes (calories burned)	Attention to internal process (breathing)
Injures and depletes the body	Rejuvenates the body
Disrupts mind–body connection	Enhances mind–body connection
Exacerbates mental and physical strain	Alleviates mental and physical strain
Brings pain, dreaded	Provides pleasure, joy, fun

Mindfulness-based practices promote well-being and self-care without increasing reactivity to stress and other triggers (Siegel, 2007; Wall, 2005; see also Ressler et al., Chapter 24). In addition, mindfulness practices decrease cortisol levels, thereby changing the neurophysiology of the body to facilitate healing (e.g., Monnazzi, Leri, Guizzardi, Mattioli & Patacchioli, 2002; Schell, Allolio & Schonecke, 1994; West, Otte, Geher, Johnson & Mohr, 2004). Utilizing a new scale that measures mindful exercise (Calogero et al., 2009), recent research has demonstrated a link between a mindful exercise mindset and improved ED pathology and psychological functioning.

Yoga is a particularly powerful tool for cultivating mindful exercise. The aim of yoga is to fully experience the present moment, encouraging attunement to internal sensations versus external stimuli (see Ressler et al., Chapter 24). Yoga serves as a metaphor for life in many different ways. A yoga practice can be created to include poses (or asanas) that address particular psychological or emotional challenges. Some asanas emphasize balance or flexibility, whereas others may focus on openness and trust, or acceptance. Thus, yoga may help in ED treatment and recovery because it teaches specific tools to facilitate healing.

Evidence for the benefits of yoga in ED treatment is largely anecdotal (Boudette, 2006; Douglass, 2009; Wyer, 2001); however, some empirical research with non-clinical samples has been conducted. Daubenmier (2005) found that regular yoga participants had significantly greater body awareness, responsiveness, and satisfaction and less self-objectification compared to non-yoga participants. Dale et al. (2009) found significant improvements in psychological well-being and mood and less negative emotionality after an intensive 6-day yoga workshop among a sample of women with histories of EDs, and these effects were maintained up to 1 month following the workshop. More recently, a randomized controlled clinical trial found that incorporating individualized yoga as an adjunctive therapy in ED outpatient treatment significantly reduced ED pathology compared to a no-yoga control group, and did not interfere with weight gain/maintenance (Carei, Fyfe-Johnson, Breuner & Brown, 2010). In contrast, Mitchell Mazzeo, Rausch & Cooke (2007) did not show significant benefits of yoga compared to a dissonance-based intervention with respect to ED pathology, although no harm was shown either. A key difference between Mitchell et al. (2007) and the other studies is that Mitchell and colleagues studied a brief yoga intervention among women largely new to yoga; whereas the studies that had demonstrated positive effects included participants familiar with yoga. However, none of these studies examined the effect of yoga on DEX *per se*. Therefore, the effectiveness of yoga for reducing DEX cannot

be inferred from these findings alone. More systematic research is needed to clarify these findings, especially which type of yoga is most appropriate for reducing DEX in ED treatment, and which mechanisms underlie its potential positive impact. Yoga is a popular and promising intervention, but the idea of a mindfulness-based approach to DEX applies to all types of physical activity. The principles and techniques that characterize yoga (and mindful awareness more generally) could be—and we would argue should be—applied to any exercise protocol.

Cultivating Mindful Exercise in Patients

Although most treatment programs do not systematically address DEX (Davies et al., 2008; Hechler et al., 2005), those programs that do tend to rely heavily on psycho-education, challenging distorted beliefs, and self-monitoring—standard tools from the CBT toolbox. Programs that have used these techniques have reported positive changes with respect to exercise quantity and quality. As reviewed above, current data support incorporating supervised mindful exercise into ED treatment in conjunction with CBT. Calogero and Pedrotty (2007) suggest additional ways that ED professionals can build their practice to cultivate mindful exercise.

Hechler et al. (2005) found that 95% of ED professionals (primarily psychiatrists) surveyed assessed patients' exercise history during initial evaluation. Learning more about the contexts in which exercise occurs maximizes this aspect of assessment. Asking patients about various exercise-relevant contexts that characterize their exercise (e.g., physical, environmental, historical, emotional, social, cognitive, cultural) provides a more comprehensive picture of the nature and meaning of their DEX—the quality as well as quantity (e.g., Calogero & Pedrotty, 2007; Otis & Goldingay, 2000; Prichard & Tiggemann, 2005; Rejeski & Thompson, 1993; Taylor, Baranowski & Sallis, 1994; Trost, Owen, Bauman, Sallis & Brown, 2002). For example, exercise without proper nourishment, with concomitant laxative abuse, or in unsafe locations, characterizes physical contexts of DEX. Raising patients' consciousness around the role and patterns of DEX in their lives challenges their mindless exercise mindset.

“Drawing an exercise world” is a powerful non-verbal technique for cultivating awareness and facilitating communication around exercise issues (see Figures 25.1 and 25.2). Patients are asked to draw their exercise world—the people, places, things, thoughts, feelings, and contexts that represent their exercise as they experience it. Examining their drawings can help both patients and therapists better understand the present mindsets guiding the exercise. It is not uncommon for patients to be unaware of their exercise issues until they begin to draw their exercise world. Ideally, specific components of the patient's exercise world are identified as targets for change during treatment. It is also beneficial to ask patients to draw another exercise world at a later stage of treatment to evaluate the extent to which their DEX has changed as a result of the exercise interventions. The therapeutic impact of drawing an exercise world, as well as using it as a marker of change, is a subject for future empirical investigation.

Cultivating Mindfulness in Treatment Teams

Resolving DEX requires a treatment team (e.g., physicians, psychiatrists, therapists, nutritionists, nurses, coaches, counselors, exercise specialists). Becoming more mindful of the unique role each team member plays in the management of DEX improves the quality of

care around exercise. The treatment team should send clear and consistent messages about the purpose of exercise, how to create a balanced program of activity, and how participation in exercise depends on safety. In order to facilitate treatment of DEX in the context of ED treatment, the treatment team must implement exercise protocols with a shared understanding of the purpose of the exercise and how they will support it. Supporting exercise in ED patients does not mean aligning or colluding with the ED, although it can feel this way if patients are not changing how they think about and practice exercise. However, focusing on weight to determine the prescription or prohibition of exercise *does* collude with the ED, and may actually demand more policing of surreptitious exercise by staff. Moreover, a weight-based exercise policy represents an all or nothing approach to exercise that mimics (not challenges) ED patients' relationship to exercise. Being mindful of the messages communicated to patients regarding policies and programs around exercise is critical to the treatment of DEX.

Addressing DEX provides a unique opportunity to more fully develop the therapeutic alliance. Conveying to patients that the intention is not to take exercise away, but to help them redefine and discover a new relationship with it, creates a new link in the therapeutic connection. Indeed, giving them opportunities to change, and not give up, their exercise practices lets them feel more supported and empowered in the treatment process. Patients are correct when they say that exercise is good for them (unlike other symptomatic behaviors). The difference is that their approach toward exercise, and the quality of their exercise, does not facilitate their health in the way that regular exercise is meant to do. As mentioned above, there are a variety of tools and interventions that can be used during therapeutic sessions to stimulate this process. In addition, patients often appreciate the sharing of personal exercise experiences. Self-disclosure about exercise is another way to build a bridge with clients and develop a dialog around shared interests and/or mutual confusion about exercise. When executed appropriately and mindfully, self-disclosure deepens the therapeutic alliance and assures clients that clinicians do "get it" (Bloomgarden & Mennuti, 2009; see also McGilley and Szablewski, Chapter 12).

FUTURE DIRECTIONS AND PERSPECTIVES

The topic of exercise in the international ED community is receiving necessary and overdue recognition. This is a promising and critical shift in ED research and treatment. However, current approaches to exercise in the context of ED remain largely unbalanced. Much of the focus is on reducing DEX, with less attention given to replacing dysfunctional practices with healthier positive ones. Clearly, more work is needed.

Systematic evaluation of the effectiveness of current interventions targeting DEX is urgently needed. One important empirical question is to what extent DEX can be resolved in ED patients if not addressed in combination with other ED therapy. More qualitative research is needed to better inform our quantitative designs (see McGilley and Szablewski, Chapter 12). For example, more information is needed about patients' perspectives on exercise, including how they perceive it to be viewed and managed within ED programs. To date, research offers virtually no information about DEX in the treatment of men, children, or elite athletes, highlighting a critical research–practice gap. In addition, much of the attention

around DEX has centered on the AN experience. To better inform practice, DEX across the ED spectrum requires greater recognition and investigation. Importantly, research is needed on the long-term impact of an exercise program during ED treatment on ED relapse and recovery.

In closing, caution is recommended. It is imperative to standardize exercise protocols implemented in ED treatment, but ED professionals do not yet have a shared understanding of the problem. ED professionals do not agree on the nature or definition of DEX, the goals for exercise programs in ED treatment, the quality and quantity of exercise that is helpful (and why), who should facilitate these programs, who should participate in these programs, and how positive outcomes should be defined. There is a wealth of clinical wisdom around exercise in ED treatment that could be shared and documented to help build a sturdier bridge between science and practice on this topic. As researchers and practitioners, we must proceed mindfully, paying critical attention to both qualitative and quantitative perspectives that inform our use of exercise in ED treatment.

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