Randomized Controlled Trial of an Internet-Based Cognitive-Behavioral Treatment Program for Binge-Eating Disorder

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Binge-eating disorder (BED) is a prevalent health condition associated with obesity. Few people with BED receive appropriate treatment. Personal barriers include shame, fear of stigma, geographic distance to mental health services, and long wait-lists. The aims of this study were to examine the efficacy of an Internet-based cognitive-behavioral intervention for adults with threshold BED (DSM-IV) and to examine the stability of treatment effects over 12 months. Participants were randomly assigned to a 16-week Internet-based cognitive-behavioral intervention ($n = 69$) or a wait-list condition ($n = 70$). Binge-eating frequency and eating disorder psychopathology were measured with the Eating Disorder Examination–Questionnaire and the Eating Disorder Examination administered over the telephone. Additionally, body weight and body mass index, depression, and anxiety were assessed before and immediately after treatment. Three-, 6-, and 12-month follow-up data were recorded in the treatment group. Immediately after the treatment the number of binge-eating episodes showed significant improvement ($d = 1.02$, between group) in the treatment group relative to the wait-list condition. The

treatment group had also significantly reduced symptoms of all eating psychopathology outcomes relative to the wait-list condition ($0.82 \leq d \leq 1.11$). In the treatment group significant improvement was still observed for all measures 1 year after the intervention relative to pretreatment levels. The Internet-based intervention proved to be efficacious, significantly reducing the number of binge-eating episodes and eating disorder pathology long term. Low-threshold e-health interventions should be further evaluated to improve treatment access for patients suffering from BED.

BINGE-EATING DISORDER (BED) IS characterized by recurrent episodes of eating large amounts of food accompanied by feelings of loss of control over eating. BED can cause a substantial disease burden and is associated with high personal and social costs (Smink, van Hoeken, & Hoek, 2012). The lifetime prevalence of BED according to DSM-IV is estimated to be 1.9% (Kessler et al., 2013). Many individuals with BED are likely to experience comorbid psychiatric disorders (Hudson, Hiripi, Pope, & Kessler, 2007) and to attempt or complete suicide (Sansone & Levitt, 2002). Lifetime BED has also been found to be associated with current severe obesity (BMI $\geq$ 40 kg/m^2; Hudson et al., 2007). Although efficacious treatments for BED are available (Vocks et al., 2010), individuals with BED do not necessarily seek treatment. Hart, Granillo, Jorm, and Paxton (2011) found in their systematic review that only 23% of people suffering from eating disorders have sought treatment. Specific personal barriers to psychological treatment include shame, fear of stigma, or self-discrimination (Griffiths, Mond, Murray, Thornton, & Touyz, 2015), as well as lack of time, long waiting times, lack of skilled therapists, geographic distance to mental health services, and unwillingness to disclose psychological problems (Bell & Newns, 2004). Low-threshold interventions such as self-help programs (Beintner, Jacobi, & Schmidt, 2014) or Internet-based interventions (Dölemeyer, Tietjen, Kersting, & Wagner, 2013) can help to overcome these obstacles.

A growing body of research has examined the effects of self-help interventions for BED and bulimia nervosa (BN; Carter & Fairburn, 1998; Grilo & Masheb, 2005). These interventions are offered in different treatment modalities. *Overcoming Binge Eating* (Fairburn, 1995) is one of the best-researched self-help books for BED. It was evaluated in a number of clinical trials and the findings suggest that cognitive-behavioral therapy (CBT) administered through guided or unguided self-help is an effective treatment for BED (Carter & Fairburn, 1998; Ghaderi & Scott, 2003; Wells, Garvin, Dohm, & Striegel-Moore, 1997). An increasing number of Internet-based interventions have been developed as the digitalization process and general use of the Internet have expanded (Wantland, Portillo, Holzemer, Slaughter, & McGhee, 2004; Webb, Joseph, Yardley, & Michie, 2010). Originally based on bibliotherapy, Internet-based interventions provide more sophisticated treatment tools (e.g., online eating diaries) and are often therapist-assisted. In their meta-analysis of BED and BN self-help interventions, Beintner et al. (2014) found that Internet-based interventions showed lower treatment dropout rates than CD-ROM and bibliotherapy interventions. Furthermore, personalized guidance generally improved treatment adherence, especially when given by a specialist.

Several Internet-based interventions have been conducted for BED over the past few years (Carrard, Crépin, Rouget, Lam, Golay, et al., 2011; Carrard, Crépin, Rouget, Lam, Van der Linden, et al., 2011; Ljotsson et al., 2007; Robinson & Serfaty, 2008). Medium-to-large effect sizes from pre- to posttreatment were found in the intervention groups of controlled studies for binge-eating episodes, ranging from 0.41 to 0.77 (Dölemeyer, Tietjen, et al., 2013). These effect sizes are comparable to those found for face-to-face therapies (Vocks et al., 2010).

Ljotsson et al. (2007) conducted a 12-week randomized controlled trial using the Swedish translation of *Overcoming Binge Eating* (Fairburn, 1995) among patients with threshold and subthreshold BN or BED. The participants were assigned homework based on each book chapter and received weekly feedback on their completed homework by e-mail. The treatment dropout rate was 31%. The rate of abstinence was 37% and improvements were maintained during 6-months posttreatment. Robinson and Serfaty (2008) used an e-mail therapy for BED and BN that did not follow a structured treatment program for their 12-week randomized controlled trial. Even though the model of therapy varied among therapists, all interventions included collecting a personal eating history, identification of problematic eating behaviors and dysfunctional thoughts, and encouragement of eating diaries. On average, the frequency of contact with the therapist was two e-mails per week. The study dropout was 47% and the rate of abstinence 23%. Carrard, Crépin, Rouget, Lam, Golay, et al. (2011) and Carrard, Crépin, Rouget, Lam, Van der Linden, et al. (2011) conducted two Internet-based studies of BED based on the same guided self-help program. They included participants with BED or subthreshold BED in the first study