

BRIEF REPORT

Rapid Response in Psychological Treatments for Binge Eating Disorder

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Objective: Analysis of short- and long-term effects of rapid response across 3 different treatments for binge eating disorder (BED). **Method:** In a randomized clinical study comparing interpersonal psychotherapy (IPT), cognitive-behavioral therapy guided self-help (CBTgsh), and behavioral weight loss (BWL) treatment in 205 adults meeting *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; APA, 1994) criteria for BED, the predictive value of rapid response, defined as $\geq 70\%$ reduction in binge eating by Week 4, was determined for remission from binge eating and global eating disorder psychopathology at posttreatment, 6-, 12-, 18-, and 24-month follow-ups. **Results:** Rapid responders in CBTgsh, but not in IPT or BWL, showed significantly greater rates of remission from binge eating than nonrapid responders, which was sustained over the long term. Rapid and nonrapid responders in IPT and rapid responders in CBTgsh showed a greater remission from binge eating than nonrapid responders in CBTgsh and BWL. Rapid responders in CBTgsh showed greater remission from binge eating than rapid responders in BWL. Although rapid responders in all treatments had lower global eating disorder psychopathology than nonrapid responders in the short term, rapid responders in CBTgsh and IPT were more improved than those in BWL and nonrapid responders in each treatment. Rapid responders in BWL did not differ from nonrapid responders in CBTgsh and IPT. **Conclusion:** Rapid response is a treatment-specific positive prognostic indicator of sustained remission from binge eating in CBTgsh. Regarding an evidence-based, stepped-care model, IPT, equally efficacious for rapid and nonrapid responders, could be investigated as a second-line treatment in case of nonrapid response to first-line CBTgsh.

What is the public health significance of this article?

This study provides evidence for rapid response as a treatment-specific positive prognostic indicator of long-term remission in cognitive-behavioral guided self-help (CBTgsh), a low-intensity, low-cost treatment for binge eating disorder.

In contrast, interpersonal psychotherapy (IPT), a specialty treatment, was comparably efficacious for both rapid and nonrapid responders, whereas nonrapid responders in CBTgsh and rapid and nonrapid responders in behavioral weight loss treatment showed the lowest remission rates.

Monitoring rapid response can provide guidance regarding a switch from a low-intensity treatment (e.g., CBTgsh) to a more intensive treatment (e.g., IPT) to promote successful outcomes in individuals diagnosed with binge eating disorder.

Keywords: binge eating disorder, rapid response, self-help treatment, interpersonal psychotherapy, behavioral weight loss

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Binge eating disorder (BED), characterized by recurrent binge eating that occurs in the absence of regular compensatory behaviors (APA, 2013), is associated with increased eating disorder and general psychopathology, psychiatric comorbidity, overweight and obesity, and impaired quality of life. Cognitive-behavioral therapy (CBT) and interpersonal psychotherapy (IPT) are considered standard specialty treatments for BED (AWMF, 2011), leading to large and long-lasting improvements of binge eating and associated psychopathology (Hilbert et al., 2012), whereas behavioral weight loss (BWL) treatment yields only moderate effects (Vocks et al., 2010). A recent randomized clinical study showed that both IPT and CBT in guided self-help format (CBTgsh) produced greater improvement of binge eating over a 2-year follow-up than BWL (Wilson, Wilfley, Agras, & Bryson, 2010). While patients with low psychopathology were as well-suited to CBTgsh as IPT, those with high psychopathology improved more with IPT.

Rapid response during the first weeks of treatment is presumably the most well-established predictor of treatment outcome of BED. Rapid response, typically defined as a 65–70% reduction in binge eating over the first 4 weeks of treatment, predicted greater remission across various treatment approaches for binge eating and obesity (e.g., CBT, CBTgsh, BWL, BWLgsh, dialectical behavior therapy [DBT]), with some evidence of stable effects up to 1 year posttreatment (Grilo, Masheb, & Wilson, 2006; Grilo & Masheb, 2007; Grilo, White, Wilson, Gueorguieva, & Masheb, 2012; Masheb & Grilo, 2007; Safer & Joyce, 2011; Zunker et al., 2010). Effects of rapid response on global eating disorder psychopathology were documented as well (Grilo et al., 2012; Masheb & Grilo, 2007). However, for specialist CBT only, rapid response has not predicted these outcomes (Grilo et al., 2012). This study was an examination of the prognostic significance of rapid response for the two core clinical features of BED, binge eating remission and eating disorder psychopathology over a longer, 2-year period in a large randomized trial of CBTgsh, BWL, and for the first time, IPT. It was hypothesized that rapid responders would show better outcomes than nonrapid responders in CBTgsh and BWL, but not in IPT (analogous to specialist CBT); and that rapid responders in CBTgsh, and both rapid and nonrapid responders in IPT, would fare better than nonrapid responders in CBTgsh and patients in BWL.

Method

Participants

Individuals with BED ($N = 205$) were recruited through advertising and clinic referrals at two treatment sites (Rutgers University, $n = 100$, Washington University, $n = 105$). Ethical approval was granted by site-specific institutional review boards. After telephone screening, eligible participants were invited to a diagnostic visit during which informed consent was obtained and clinical interviews and self-report questionnaires were used to ascertain inclusion. Inclusion criteria were age ≥ 18 years, $27.0 \text{ kg/m}^2 \leq \text{body mass index (BMI)} \leq 45.0 \text{ kg/m}^2$, calculated from measured height and weight, and *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; APA, 1994) criteria for BED as established by the Eating Disorder Examination (EDE; Fairburn & Cooper, 1993). Exclusion criteria were current psychosis, bipolar disorder, active suicidality, alcohol or drug depen-

dence, medical conditions or treatments that would affect weight and/or ability to participate, and insufficient fluency in English. Further methodological detail can be found in the main report (Wilson et al., 2010).

Treatments

All treatments were manualized and conducted individually over a 24-week period (see Wilson et al., 2010). BWL treatment was based on the National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases' Diabetes Prevention Program's manual (DPP Research Group, 2002) and consisted of 16 individual, weekly, 50-min sessions, followed by four sessions at 2-week intervals. The treatment was delivered by master's level therapists in clinical psychology or nutrition under biweekly supervision. CBTgsh, based on Fairburn's book *Overcoming Binge Eating* (1995), offered ten 25-min sessions with a therapist (first session = 1 hr). The first four sessions were weekly, the next two at 2-week intervals, and the last four at 4-week intervals. The treatment was delivered by graduate students without prior experience in CBTgsh or treatment of BED, receiving monthly supervision. IPT, adapted for BED (Wilfley, Frank, Welch, Spurrell, & Rounsaville, 1998), included 19, 50- to 60-min sessions over 24 weeks (first session = 2 hr). The first three sessions were scheduled during the first 2 weeks, followed by 12 weekly sessions, and ending with four sessions at 2-week intervals. The treatment was delivered by doctoral level therapists under weekly supervision.

Assessments

For this study, assessments at pretreatment, posttreatment, 6-, 12-, 18-, and 24-month follow-ups were used. At all time points, the semistructured eating disorder interview EDE (Fairburn & Cooper, 1993), which has established reliability and validity, was administered to determine the number of objective binge eating episodes over the past 28 days (OBEs, defined by the *DSM-5* as consumption of an unusually large amount of food accompanied by a subjective experience of loss of control; APA, 2013). For primary outcome, remission from binge eating was defined as full abstinence from OBEs (i.e., zero OBEs) in the past 28 days. For secondary outcome, the severity of eating disorder psychopathology was determined by the EDE global score (22 items, 0–6-point scale, with higher scores indicating greater severity). Interviewers were blind to treatment condition (see Wilson et al., 2010).

Data Analytic Plan

Definition of rapid response. According to Grilo et al. (2006), we initially tried to determine rapid response by calculating receiver operator characteristic (ROC) curves for the predictive value of within-treatment binge eating (self-reported OBE frequency) regarding posttreatment remission from binge eating (EDE-determined). We calculated ROC curves for percent change in OBEs and for the total percent change in OBEs over the first 4 weeks of treatment. Weekly area under the curve (AUC) was calculated and evaluated according to Cohen (small, $\text{AUC} \geq .556$; medium, $\geq .638$; large, $\geq .714$). For predictive models, thresholds of $\text{AUC} > .80$ are considered acceptable (Wickens, 2002). The ROC analysis did not reveal any significant result (all $ps > .05$).

AUCs were minimal, range: .493 ($SE = .047$) to .565 ($SE = .046$). As there was no empirical definition of rapid response possible based on this study's data, we applied Grilo et al.'s (2012) empirically derived definition of rapid response as a reduction in binge eating $\geq 70\%$ by the 4th week of treatment for facilitation of comparisons between studies.

Prediction of treatment outcome. Analyses were performed by intent to treat and included all randomized participants. First, remission from binge eating over follow-up (number of time points with remission) was compared in rapid and nonrapid responders in each treatment using an omnibus Kruskal–Wallis H test and pairwise t and χ^2 tests for follow-up analyses. In cases of missing data on remission from binge eating, baseline values were carried forward. To ensure robustness of the results, the analyses were repeated with missing data multiply imputed, creating five completed datasets using an iterative Markov chain Monte Carlo method. Multiple imputation results were reported only if they diverged from baseline value, carried-forward results. Effect sizes were displayed as r or ϕ (small, $\geq .10$; medium, $\geq .30$; large, $\geq .50$). Second, for the global eating disorder psychopathology, a mixed linear model analysis of rapid response (rapid vs. nonrapid response; between-subjects), Rapid Response \times Treatment (BWL, CBTgsh, IPT; between-subjects), Rapid Response \times Time (baseline, posttreatment, 6-, 12-, 18-, 24-month follow-up; within-subjects), and Rapid Response \times Treatment \times Time was conducted. Participants were hierarchically nested within time and treated as a random factor. As hierarchical linear modeling allows data from participants with missing data at some, but not all, time points to remain in the analyses, data from all randomized participants were used without imputation. All analyses were performed with SPSS 20.0. A two-tailed significance level of $\alpha < .05$ was applied to all statistical tests.

Results

Defining rapid response as a reduction in binge eating $\geq 70\%$ by the 4th week of treatment, rapid response was identified in 70.7% of study participants (145/205). Rapid response rates in BWL (73.4%; 47/64), CBTgsh (74.2%; 49/66), and IPT (65.3%; 49/75) did not differ, $\chi^2(2, 205) = 1.68, p = .433, \phi = .090$.

Rapid Response and Remission From Binge Eating

Following significance of the omnibus Kruskal–Wallis H test, $H(5, 205) = 17.34, p = .004$, pairwise comparisons revealed greater remission from binge eating in rapid versus nonrapid responders in CBTgsh ($p = .01$), but not in IPT or BWL (both $ps > .05$; Figure 1, Table S1). Rapid and nonrapid responders in IPT, and rapid responders in CBTgsh, showed greater remission from binge eating than nonrapid responders in CBTgsh and BWL (all $ps < .05$). Rapid responders in CBTgsh ($p = .027$) and, at a trend level, rapid responders in IPT ($p = .061$), showed greater remission from binge eating than rapid responders in BWL. Regarding time course, rapid responders in CBTgsh showed significantly greater rates of remission from binge eating at 6-, 12-, and 18-month follow-ups, and at a trend level, at 24-month follow-up than nonrapid responders posttreatment, $\chi^2(1, 66) = 1.04, p = .309, \phi = .125$; 6 months $\chi^2(1) = 5.13, p = .024, \phi = .279$; 12 months $\chi^2(1) = 5.36, p = .021, \phi = .285$; 18 months $\chi^2(1) = 6.15,$

$p = .013, \phi = .305$; and 24 months $\chi^2(1) = 3.04, p = .081, \phi = .215$; small to medium effects. Overall, the mean differences in rates of remission from binge eating between rapid responders and nonrapid responders were 27.3% in CBTgsh, 13.4% in BWL, and 1.3% in IPT (see Figure 1)¹.

Rapid Response and Global Eating-Disorder Psychopathology

The mixed linear model analysis of the global EDE (Fairburn & Cooper, 1993) score revealed variations by rapid response, $F(1, 909) = 21.72, p < .001$, modified by interactions with treatment, $F(4, 917) = 4.03, p = .003$ and time, $F(10, 297) = 29.61, p < .001$. The three-way interaction was not significant, $F(20, 301) = 0.36, p = .996$. According to follow-up tests, rapid responders in each treatment condition had lower global eating disorder psychopathology than nonrapid responders (all $ps < .05$), which amounted on average to 0.35 EDE units less (Figure 2, Table S2). Across treatments, rapid response effects on global eating disorder psychopathology were observed from posttreatment through 6-month follow-up (both $ps < .05$) and, at a trend level, at 12- and 18-month follow-ups (both $ps < .10$), but were no longer significant at 24-month follow-up ($p > .10$). Rapid responders in CBTgsh and IPT achieved lower eating disorder psychopathology than those in BWL and than nonrapid responders in each treatment (all $ps < .05$). Rapid responders in BWL did not differ from nonrapid responders in CBTgsh and IPT, and there were no differences by treatment in nonrapid responders (all $ps > .05$).

Discussion

Based on a large randomized clinical trial of BED, this study examined the short- and long-term prognostic significance of rapid response, defined as a reduction in binge eating $\geq 70\%$ by the fourth week of treatment, in BWL, CBTgsh, and for the first time, IPT. We found evidence for a treatment-specific predictive value of rapid response. Rapid responders in CBTgsh showed significantly greater rates of remission from binge eating than nonrapid responders, 6 to 18 months following treatment. This rapid response effect amounted to a 27.3% greater rate of remission from binge eating and can thus be considered clinically relevant. In contrast, rates of remission in IPT and BWL did not differ significantly by rapid response. Rapid and nonrapid responders in IPT and rapid responders in CBTgsh revealed greater remission from binge eating than nonrapid responders in CBTgsh and BWL. In

¹ An additional analysis served to evaluate the association between rapid response and the psychopathological moderator identified in the main report (Wilson et al., 2010). The moderator of global eating disorder psychopathology/self-esteem indicated that CBTgsh was as well-suited as IPT for patients with high global eating disorder psychopathology and high self-esteem or for those with low global eating disorder psychopathology, whereas IPT was superior for patients with high global eating disorder psychopathology and low self-esteem. BWL patients fared worse if they had low self-esteem, especially in combination with high global eating disorder psychopathology, than if they had high self-esteem. ϕ coefficients on the association between rapid response and the moderator variables were low and nonsignificant (median-split variables; self-esteem and EDE) global score: $\phi = .143$; self-esteem: $\phi = .107$; EDE global score: $\phi = .089$; all $ps > .05$).

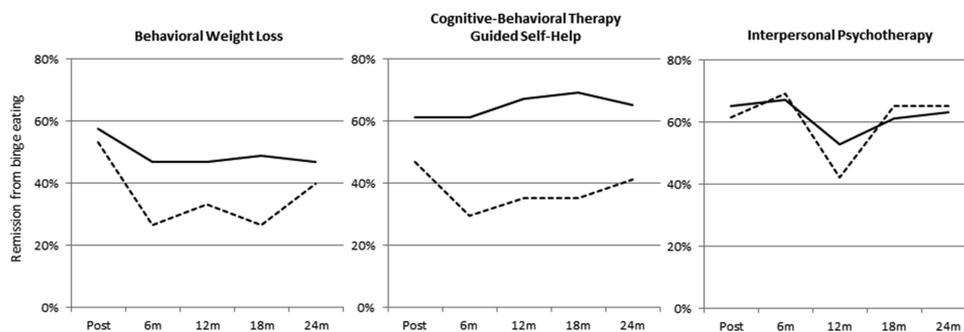


Figure 1. Rates of remission from binge eating over follow-up (posttreatment, 6-, 12-, 18-, and 24-month follow-up assessments) by rapid response and treatment. Rapid response indicated by solid lines; nonrapid response by dotted lines. Rapid response defined as a reduction in binge eating $\geq 70\%$ by the fourth week of treatment. Remission from binge eating defined as zero episodes of binge eating over the past 28 days using the EDE (Fairburn & Cooper, 1993).

addition, rapid responders in CBTgsh showed greater remission than those in BWL.

Demonstrating the treatment specificity of rapid response for CBTgsh, the results extend previous short-term findings on rapid response and suggestions of a treatment-specific time course in individual CBTgsh (Grilo & Masheb, 2007; Masheb & Grilo, 2007). The absence of differences between rapid and nonrapid responders in IPT, however, is inconsistent with effects in other specialist treatments, such as CBT leading to short-term rapid response (Grilo et al., 2012) and DBT leading to short- and long-term rapid response (Safer & Joyce, 2011). Unlike IPT, which was offered individually, CBT and DBT were conducted in groups. Therapists providing individual treatment may be better able to prevent adverse effects of nonrapid response than those providing group treatment, possibly as a result of greater intensity or treatment personalization. In line with this interpretation, individual BWL did not produce a significant rapid response effect, whereas group BWL did (Grilo et al., 2012). CBTgsh, although individual, was the least intense treatment in this study, potentially explaining its rapid response effect. For BWL and CBTgsh, rates of rapid response were higher than in previous studies: BWL, 73.4% vs. 47%; Grilo et al., 2012; CBTgsh, 74.2% vs. 42% to

62.2%; Grilo & Masheb, 2007; Masheb & Grilo, 2007). For IPT, they were comparable or higher, 65.3% vs. 67% CBT (Grilo et al., 2012) or 56% DBT (Safer & Joyce, 2011). This could also be related to the individual format (BWL, IPT) or more extended individual treatment (CBTgsh).

The pattern for global eating disorder psychopathology was similar to that of binge eating remission: In all treatments, rapid responders had lower levels of global eating disorder psychopathology than nonrapid responders, with rapid responders in CBTgsh and IPT showing more improvement than those in BWL and more than nonrapid responders in each treatment. Rapid responders in BWL did not differ from nonrapid responders in CBTgsh and IPT. The fact that rapid responders in all treatment conditions had lower global eating disorder psychopathology than nonrapid responders, especially at posttreatment and 6-month follow-up, and, at a trend level, at 12- and 18-month follow-ups, is generally consistent with most of the literature (Grilo et al., 2012; Masheb & Grilo, 2007; Safer & Joyce, 2011).

An important difference between this and previous studies is that Grilo and colleagues used daily self-monitoring of binge eating that was reviewed by therapists at each session (Grilo et al., 2006; Grilo & Masheb, 2007; Grilo et al., 2012; Masheb & Grilo,

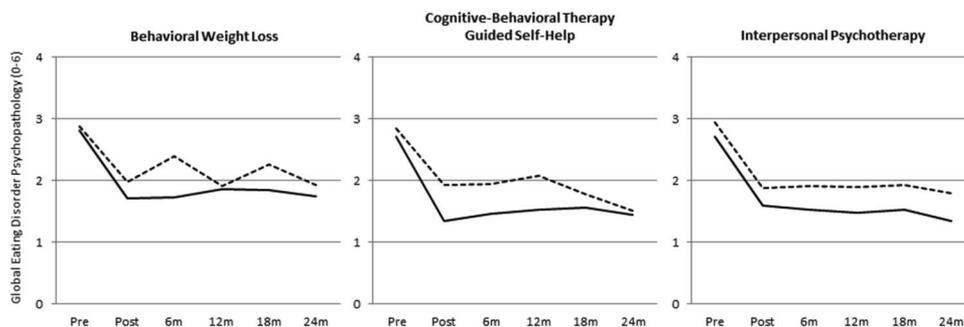


Figure 2. Global eating disorder psychopathology over follow-up (pretreatment, posttreatment, 6-, 12-, 18-, and 24-month follow-up assessments) by rapid response and treatment. Rapid response is indicated by solid lines, nonrapid response by dotted lines. Rapid response is defined as a reduction in binge eating $\geq 70\%$ by the 4th week of treatment. Global eating disorder psychopathology assessed as the global score of the EDE (0–6 scale, with higher scores indicating greater severity; Fairburn & Cooper, 1993).

2007), whereas this study used retrospective recall of binge eating during the previous week of treatment to define rapid response. This may explain why an empirical threshold for the within-treatment reduction of binge eating was not derived based on this study's data, and the overall rapid response effects were small when applying the criterion of a reduction in binge eating $\geq 70\%$. Another study that used binge recall diaries also found a relatively small effect size of prediction and no evidence for a rapid response effect when using the same criterion (Zunker et al., 2010). In general, retrospective recall, for example, as performed in the self-report form of the EDE, has been found to have acceptable convergence with the EDE interview and self-monitoring, especially to assess OBEs (Grilo, Masheb, & Wilson, 2001). Self-monitoring reviewed by therapists, as done by Grilo and colleagues, may have increased validity further, although this assessment was not "blinded" and was thus confounded with treatment. In contrast, self-monitoring by patients did not lead to satisfactory sensitivity and specificity when empirically defining rapid response (Safer et al., 2011). Thus, the definition of rapid response likely depends on measurement. Further research is necessary on the reliable measurement of binge eating during treatment.

Clinically, the results may inform a model of evidence-based stepped care to be further investigated, according to which CBTgsh (AWMF, 2011), rather than BWL (Grilo et al., 2012), represents a low-cost, low-intensity, first-line treatment, and IPT, equally efficacious for rapid and nonrapid responders, (or another evidence-based treatment) represents an alternative specialist approach in case of nonrapid response. Grilo et al. (2012) had recommended BWL as first-line treatment because of superior binge eating remission in BWL rapid responders versus nonrapid responders and because of superior weight loss outcome in BWL compared with CBT. This was, however, not the focus of our study. This brief report concentrated on the core clinical features of BED, that is, binge eating remission and the associated global eating disorder psychopathology. Based on this study's results, monitoring rapid response may offer the advantage of identifying CBTgsh patients early who are not likely to benefit from this treatment so that alternative treatments might be pursued. This monitoring could be conducted in addition to evaluating pretreatment moderators such as eating disorder psychopathology and self-esteem (Wilson et al., 2010), which showed no significant overlap with rapid response. Generally, pretreatment patient characteristics of rapid response have proven elusive (Grilo et al., 2006; Grilo & Masheb, 2007; Masheb & Grilo, 2007; Safer & Joyce, 2011; Zunker et al., 2010). An examination of associated within-treatment changes could offer further insight into proximal predictors or correlates of rapid response in BED.

Regarding a potential matching of nonrapid responders to alternative treatments, it is important to note that neither in this study nor in prior studies has the effect size of rapid response been sufficiently high to justify its use as an algorithm for evidence-based clinical decision making. Ecological momentary assessment for concurrent recording of binge eating, smartphone- or Internet-based measurement, and training and instructions on self-monitoring may provide research avenues to increase the diagnostic validity of rapid response for individual treatment decisions. Finally, future research should determine interventions suited to achieve and improve early therapeutic gains, for example,

the use of CBTgsh tailored to binge eating in BED, the inclusion of novel interventions (e.g., cue exposure), and the identification of the optimal dose, type, and training of guidance for enhanced rapid response.

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