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Abstract

The object of this study was to examine the effectiveness of an Internet-based therapy (IBT) for bulimia nervosa (BN) as compared to a waiting list (WL). Sixty-two female BN patients, diagnosed according to DSM-IV criteria, were assigned to either the IBT or a WL. The control participants (WL) were matched to the IBT group in terms of age, duration of the disorder, number of previous treatments, and severity of the disorder. Assessment measures included the EDI, SCL-90-R, BITE, the TCI-R, and other clinical and psychopathological indices, which were administrated before and after the treatment. Considering the IBT, while the mean scores were lower at the end of the treatment for some EDI scales (bulimic, interpersonal distrust, maturity fears, and total score) and the BITE symptomatology subscale, the mean BMI was higher at posttherapy. Predictors of good IBT outcome were higher scores on the EDI perfectionism scale and EAT and a higher minimum BMI. Dropout (after IBT 35.5% of cases) was related to higher SCL-anxiety scores, a lower hyperactivity, a lower minimum BMI, and lower TCI-reward dependence scores. At the end of the treatment, bingeing and vomiting abstinence rates differed significantly between the two groups. Results suggest that an online self-help approach appears to be a valid treatment option for BN when compared to a WL control group, especially for people who present a lower severity of their eating disorder (ED) symptomatology and some specific personality traits.

Introduction

Given the interest of many national health care systems in extending the accessibility of services and treatment programs, especially in rural areas far away from urban centers, telemedicine has started to be applied in many illnesses. To date, the use of new Internet treatment programs has been applied with relative success in diverse mental health illnesses such as depression,1 alcohol abuse,2 anxiety disorders,3 and dementia.4

The effective use of new technologies for eating disorders (EDs) has recently been described in studies using telemedicine,5 CD-ROM,6 Internet-based programs,7,8 virtual reality,9 personal digital assistants (PDAs),10 e-mail support,11,12 and mobile text messages (SMS).13 Additionally, some prospective studies have been published on the delivery of ED prevention programs to student populations via the Internet.14 The literature on Internet-based programs for BN,7,8 however, is scarce and therefore warrants further investigation.

Aim of the study

The goals of the present study are threefold: (a) to analyze the short-term effectiveness of an Internet-based cognitivebehavioral therapy (CBT) program for BN; (b) to analyze the treatment results of Internet-based therapy (IBT) when compared to a waiting list control group (WL); and (c) to determine clinical and psychopathological predictors of good and poor short-term outcome after using IBT.

We hypothesized that individuals undergoing the IBT would exhibit better outcomes than patients on the waiting list and that lower severity of ED symptomatology and some specific personality traits will predict better short-term outcome after using IBT.

Method

Participants

Entry into the study was between September 2003 and December 2004. A total sample of 62 female patients

with BN, purging subtype, participated in the current study. All participants were diagnosed according to DSM-IV15 criteria using a semistructured clinical interview (SCID-I)16 conducted by experienced psychologists and psychiatrists. Participants were consecutive referrals for assessment and treatment at the Department of Psychiatry of the Bellvitge University Hospital in Barcelona. The initial BN individuals were consecutively assigned to either the treatment group (IBT) or the control condition (WL).

The mean age for the total sample was 23.7 years (*SD* ? 3.6). The mean duration of the illness for the total sample was 6.0 years (*SD* ? 4.2), and the number of previous treatments ranged from 0 to 4. No statistically significant differences between the two groups were observed for any of these variables at the beginning of the study. The Ethics Committee of our institution approved this study, and informed consent was obtained from all participants.

Assessment

ED symptomatology. The participants were given the Eating Disorder Inventory (EDI),17 the Eating Attitudes Test (EAT-40),18 the Bulimic Investigatory Test Edinburgh (BITE),19 and the Temperament and Character Inventory-Revised (TCI-R)20 prior to and after treatment. All the scales have been adapted and validated in Spanish populations and have demonstrated adequate internal consistency values: 0.74–0.92 (EDI),21 0.93 (EAT-40),22 0.96 (BITE),23 and 0.87 (TCI-R).24

In addition, throughout the study, participants kept a food diary,25 which recorded their binge-eating and purging episodes. The IBT group submitted this information using a specially designed section of the Internet-based program, whereas the other group (WL) completed this as a paperand-pencil task.

Treatments

The IBT was conducted with a guided self-help program developed in the SALUT project. The guide is based on a CBT self-help manual developed by the University Hospital of Geneva.7,8 The program introduces psychoeducational and CBT concepts in seven sequential steps. After the first evaluation, the participants work by themselves for 4 months. During this time, they are required to maintain a weekly contact with their coach, using a secured messaging module, which is part of the program. Participants are required to have two face-to-face evaluations with their coach during the therapy.

Participants in the WL control condition received no therapy between the initial assessment and the posttreatment assessment 12 weeks later.

Procedure

The therapeutic approach was explained to the participants during these initial sessions, and therapeutic material was provided. Patients were then consecutively assigned to the two conditions. Remission was defined as abstinence from bingeing and purging for a minimum of at least 2 consecutive weeks during the therapy period, as applied in previous studies.26

Statistical analysis

SPSS 15.0.1 was used. The short-term efficiency for the IBT was assessed with *t* tests for paired samples based on the preand posttreatment differences. Next, both treatments (IBT and WL) were compared through *t* tests for independent samples and chi-square procedures, and effect sizes were estimated with Cohen's d. Survival (Kaplan-Meier) functions valued rates to reach 2 whole consecutive weeks without bingeing and vomiting and drop-out from therapy. Backward stepwise (BSTEP) logistic models explored predictors for therapeutic results. Probability for stepwise entry and removal were 0.05 and 0.10 respectively.

Results

Short-term efficiency of IBT

Mean scores were lower at posttreatment than at baseline (Table 1) for some EDI scales (bulimic episodes, *p* ? 0.001; interpersonal distrust, *p* ? 0.025; and maturity fears, *p* ? 0.042), the total EDI score (*p* ? 0.012), and the BITE symptoms scale (*p* ? 0.038). No preand posttreatment differences were found in any of the scores of the SCL-90-R scales.

Comparison of therapy outcome for IBT versus WL

According to the results of Table 1, the mean change in the BITE symptomatology subscale was statistically higher for the IBT (7.20) than for the WL (0.23). Furthermore, patients in the IBT showed a greater decrease in the mean number of vomiting episodes.

The survival analyses for success for the IBT (first graph in Figure 1) indicates that only 15% of the patients achieved complete abstinence rates from bingeing and vomiting during the first month, 35% of the whole sample needed at least 2 months, and 50% of the total sample required 3 months or more. On the other hand, 25% of the patients abandoned the IBT during the first month, and 7% dropped out during the second month. During the rest of the treatment, the rate of drop-out was of little relevance (3% during the third month and 10% after week 12).

Individual survival functions for the event of achieving 2 whole weeks without bingeing and vomiting are shown in the second graph in Figure 1. At the end of the first month, 12% of the participants were abstinent from binges and 32% from vomits; during weeks 4 and 8, the success rate was 40% for binges and 62% for vomits; and after the third month, abstinence rates for binges and vomits were 55% and 73% respectively.

At the end of the study, IBT and WL showed statistical differences for the success proportions (abstinence of both binges and vomits; 22.6% for IBT and 0.0% for WL; *p* ? 0.005), and the percentage of participants who were only abstinent from bingeing (32.3% for IBT and 3.2% for WL; *p* ? 0.003) or vomiting (32.3% for IBT and 0.0% for WL; *p* ? 0.001).

Predictors of early change after IBT

The odds of achieving 2 whole weeks without bingeing and vomiting during therapy is increased with higher scores on the EDI perfectionism scale (*p* ? 0.092, *OR* ? 1.23, 95% *CI* ? 0.95 to 1.60), EAT total score (*p* ? 0.090, *OR* ? 1.05, 95% *CI* ? 0.99 to 1.15), and minimum BMI (*p* ? 0.066, *OR* ? 1.54, 95% *CI* ? 0.91 to 2.61). Drop-out is related to higher scores in the SCL90-R anxiety scale (*p* ? 0.021, *OR* ? 4.26, 95% *CI* ? 1.03 to 17.65), a lower hyperactivity (*p* ? 0.053, *OR* ? 0.12, 95% *CI* ? 0.01 to 1.24), a lower minimum BMI (*p* ? 0.053, *OR* ? 0.63, 95% *CI* ? 0.36 to 1.11), and lower scores on the TCI-R reward dependence scale (*p* ? 0.026, *OR* ? 0.72, 95% *CI* ? 0.51 to 1.01). Both final logistic models showed adequate adjustment (*p* ? 0.5 in Hosmer-Lemeshow's tests).

Discussion

The current study is a novel contribution to the literature

on the use of new technologies in the treatment of BN. The main finding in this study is that the use of IBT in patients with BN revealed a significant decrease in psychopathological levels and severity of bulimic behavior, even when compared with a WL control group. Furthermore, higher success rates (measured by the abstinence of binges and/or vomits at the end of the treatment or waiting list) were observed in the IBT (35, 5% of cases) than in the WL (3, 2%). These results are in accordance with a previous study.8 It therefore appears that the CBT components included in our IBT program helped the patients with BN to reestablish self-control over eating behavior and to reduce the emotional dysfunction associated with this disorder.

On the other hand, with regard to treatment adherence, our results suggest that the highest rates of drop-outs occurred during the first 8 weeks after having started the IBT. By this time, 35.5% of the participants had dropped out of treatment. These results are to some extent higher than those found by Carrard et al.,8 who reported a drop-out rate of 24.4% after 2 months of treatment. However, the present drop-out rates are not surprising given that other authors have suggested that self-treatments are demanding to accomplish.27,28

In agreement with previous findings,34,35 our results indicated that more anxious and low-reward-dependent individuals are more likely to abandon the IBT: higher persistence and some degree of emotional stability and attachment with the procedure is needed.

Some shortcomings of the study are noteworthy: (a) lack of mediumto long-term followup data; (b) not having assessed a longer abstinence period; (c) lack of randomization when assigning to the IBT or WL; and (d) not having collected information on additional relevant predicting factors (e.g., frequency of contact with the coach). Future studies should aim to overcome these limitations and should also include followup durations of at least 6 months to a year.

An Internet-based approach such as the one we employed in the present study, has several advantages worth mentioning: (a) the frequency of the contact between the patient and the therapist is increased; (b) the therapeutic alliance is improved; (c) the accessibility of the patients who live far away from eating disorder treatment units (e.g., work reasons, geographical distance) is enhanced; (d) the communicative spontaneity of the patient is favored; and (e) given the high frequency with which the Internet is usually employed among youngsters, a positive connotation is enriched especially in this age group.

The present results also have various clinical implications. Primarily, in order to improve adherence and clinical implementation of the IBT, clinicians should be aware of concerns and negative views related to IBTs and try to challenge these before starting the program. Secondly, clinicians treating BN individuals with such an approach should pay careful attention to the degree of internal motivation to change in this population, especially during the first 8 weeks of treatment, which seems to be a crucial period in order to achieve a correct therapeutic adherence. Finally, clinicians should assess psychopathology and personality profiles before starting the IBT and take them into consideration when deciding which treatment the individual should follow.

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Table 1

	Pretreatment		Posttreatment		Comparison (IBT vs. WL)			
	IBT	WL	IBT	WL	p*	Cohen's d	Mean changes	CI 95%
EDI: drive for thinness	14.00	15.81	11.55	15.10	0.429	0.25	1.14	(−1.77; 4.05)
EDI: body dissatisfaction	17.03	19.68	15.55	18.71	0.588	0.16	0.88	(−2.37; 413))
EDI: interceptive awareness	10.74	14.81	8.80	12.58	0.913	0.03	−0.18	(−3.39; 3.04)
EDI: bulimic episodes	**9.61**	12.29	**4.20**	10.26	0.060	0.54	2.72	(−0.12; 5.55)
EDI: interpersonal distrust	**5.39**	7.06	**3.70**	6.39	0.272	0.32	1.12	(−0.91; 3.15)
EDI: inefficiency	10.90	12.00	9.65	10.52	0.852	0.05	0.32	(−3.07; 3.70)
EDI: maturity fears	**8.94**	6.16	**6.55**	7.10	0.025	0.63	2.69	(0.35; 5.03)
EDI: perfectionism	5.52	7.06	4.35	7.06	0.610	0.13	0.50	(−1.46; 2.46)
EDI: total score	**82.13**	94.87	**64.35**	87.71	0.198	0.37	9.19	(−4.97; 23.34)
BITE: symptoms scale	**24.60**	24.13	**17.20**	23.97	0.045	1.03	6.97	(0.20; 13.74)
Bingeing episodes	5.48	7.35	1.79	6.94	0.091	0.49	3.11	(−0.52; 6.73)
Vomiting episodes	6.16	7.61	1.42	7.61	0.006	0.78	4.63	(1.37; 7.89)
BMI	22.58	22.50	23.13	22.79	0.962	0.01	0.02	(−0.88; 0.93)

Figure 1