Evaluation of a new Internet-based self-help guide for patients with bulimic symptoms in Sweden

LAURI NEVONEN, MIA MARK, BIRGITTA LEVIN, MARIANNE LINDSTRÖM, GUNILLA PAULSON-KARLSSON

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The current study evaluated a new Internet-based self-help guide based on cognitive–behavioural therapy for patients with bulimic symptoms. Thirty-eight participants from a waiting list at an eating-disorder outpatient unit were assessed pre-treatment, post-treatment and at a 2-month follow-up using the Rating of Anorexia and Bulimia interview-revised version, an anamnesis questionnaire, the Eating Disorder Inventory-2 (EDI-2) and Symptom Check List-90-Revised (SCL-90R). The SCL-90R Global Severity Index and most EDI-2 subscales showed significant differences from pre-to post-treatment and the 2-month follow-up, apart from ineffectiveness, impulse regulation and social insecurity. Expert ratings revealed a significant reduction in vomiting, dietary restraints and weight phobia, with the exception of binge eating from pre-treatment to the 2-month follow-up. Exercise increased significantly, indicating that participants changed their method of compensation. An Internet-based self-help guide for bulimic symptoms is a promising new tool and can be used effectively as the first step in a stepped-care model. Further evaluations with randomized controlled trials are necessary.
• *Bulimia nervosa, Cognitive–behavioural therapy, Internet, Self-help.*

Lauri Nevonen, Ph.D., Child and Adolescent Psychiatry Centre, Queen Silvia Children's Hospital, SE-416 85 Göteborg, Sweden, E-mail: Lauri.Nevonen@vgregion.se; Accepted 27 January 2006.

Bulimia nervosa (BN) and eating disorder not otherwise specified, types three and four (EDNOS) according to DSM IV (1), are both characterized by a preoccupation with body weight and shape, overeating and compensatory behaviours. The EDNOS subtypes do not fully meet the BN criteria because some criteria are missing or not severe enough. There is, however, consensus among leading researchers (2, 3) that the clinical treatment should not differ from that for BN, since no randomized controlled trials favouring a specific treatment for the EDNOS population have as yet been conducted. Cognitive–behavioural therapy (CBT) is the gold standard treatment for BN (2, 4) and it has been administered individually or in group formats and more recently in different forms of self-help. Self-help can be defined as the use of written materials and computer programs and listening to or viewing audio/video tapes (5) in order to obtain a greater understanding or solve relevant problems, in specific areas of life. Perkins & Schmidt (6) reviewed self-help in eating disorders and found that seven randomized controlled trials with "pure" self-help have been conducted over the past 2 years. These studies vary substantially in terms of quality and sample sizes. One conclusion that can be drawn from these studies is that self-help for BN based on CBT is superior to waiting lists. Palmer et al. (7) found, in a randomized controlled trial, that guided self-help with face-to-face contact was superior to pure self-help, in the short term. Perkins & Schmidt (6) encourage research on guided self-help approaches that use text messaging and the Internet, as they are more interactive than "pure" self-help.

Carrard et al. (8) present the initial results from Switzerland in a European multi-centre study, also including Germany, Spain and Sweden, of a new Internet-based guided self-help programme for bulimic symptomatology. The programme is based on CBT, and includes a text-messaging function and three face-to-face contacts during the treatment (described in more detail below). The results revealed a significant decrease in general psychopathology and eating-disorder symptoms from pre- to post-treatment and the 2-month follow-up.

Participants also reported a high level of satisfaction with the idea of self-help via the Internet, its ease of use, usefulness and the text-messaging module.

The objective of the present study is to study the effectiveness of a new Internet-based self-help guide for bulimic patients in Sweden, as part of a European multi-centre study. In particular, the study focused on pre- to post-treatment results and the 2-month follow-up.

Method
Procedures
Consecutive female participants aged between 18 and 24 years with bulimic symptomatology from the waiting list at the Anorexia and Bulimia Unit, Child and Adolescent Psychiatric Centre, Queen Silvia Children's Hospital, Göteborg, Sweden were asked to participate. Everyone who had access to a computer and agreed to participate was screened using a semi-structured interview in order to investigate the inclusion criteria for the study: 1) female gender, 2) between 18 and 24 years of age, 3) body mass index (BMI) >17.5 and 4) meeting DSM-IV criteria for BN or EDNOS. Exclusion factors for the study were specified as: 1) ongoing psychotherapy or psychopharmacological treatment, 2) severe depression, 3) drug addiction and/or alcoholism and 4) suicidal. After the screening interview, participants received information about the study and written consent was obtained. Self-reports were computer based and completed in conjunction with the screening interview. A

pseudonym and a password were handed over and the participants worked through the self-help programme individually, mostly at home but sometimes in a library, for example. All the assessments (e.g. pre-treatment, post-treatment, 2-month follow-up) were performed at the treatment site.

A normal control group of female participants aged between 18 and 24 years was randomly selected from the Göteborg City Civic Register. Three groups with 315 women in each group were created. A background questionnaire was sent to all three groups, together with Eating Disorder Inventory (EDI-2) to the first group and Symptom Check List-90R (SCL-90R) to the second group and Inventory of interpersonal problems, Becks Depression Inventory and Coping resources inventory to the third group. For the purpose of this study, the EDI-2 and the SCL-90 groups were used, with a response rate of 76% (239 subjects) and 84% (265 subjects) respectively.

Subjects
As shown in Fig. 1, 55 patients on the waiting list were asked to participate. Forty accepted and were screened, and all 40 fulfilled the inclusion criteria. Thirty-eight were pre-assessed and 27 were BN and 11 EDNOS patients. Thirty-four completed the post-treatment assessment and 31 the 2-month follow-up assessment.

Patient characteristics are shown in Table 1. The mean age was 21.1 years, with a mean duration of 5.1 years. The mean BMI was normal, the mean binge frequency
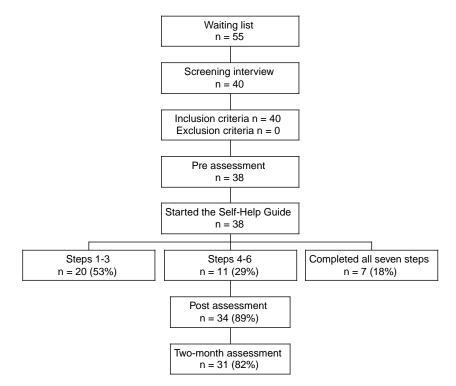

Fig. 1. Participants' flow.

Table 1. Participant characteristics.

	Mean	s	Range
Age	21.1	1.6	18–24
Duration (years)	5.1	2.4	0.5–12
BMI	22.0	2.4	18.5–27.5
Binge frequency, days/week	3.3	2.4	0–7
Vomiting frequency, days/week	3.6	2.6	0–7

s, standard deviation; BMI, body mass index.
Bulimia nervosa, $n = 27$; eating disorder not otherwise specified, types three and four, $n = 11$.

was 3.3 days a week and the vomiting frequency was 3.6 days a week. Even though EDNOS patients were included, the mean binge and vomiting frequencies were at the BN level according to DSM-IV.

Measures
The Rating of Anorexia and Bulimia Interview-revised version (RAB-R) (9) is a Swedish semi-structured interview for clinical and research purposes for a wide range of eating-disorder symptoms and related psychopathology through which the patient receives a DSM-IV diagnosis. The RAB-R has shown good psychometric properties (internal consistency, inter-rater and test–retest reliability, criterion and convergent validity). The RAB-R was used pre-treatment and at the 2-month follow-up.

The EDI-2 (10) is a self-report measure for the assessment of symptoms, attitudes and behaviour associated with eating disorders. The first version of the instrument (the EDI) comprised 64 items rated on a 6-point Likert scale, and subdivided into eight subscales. Three of the subscales measure central eating-disorder symptoms, *Drive for Thinness, Bulimia* and *Body Dissatisfaction,* while the additional five subscales measure psychological correlates associated with eating disorders, *Ineffectiveness*, *Perfectionism*, *Interpersonal Distrust*, *Interoceptive Awareness* and *Maturity Fears*. The second version of the Eating Disorders Inventory (EDI-2) has been expanded with 27 items on three subscales: *Asceticism*, *Impulse Regulation* and *Social Insecurity*. The EDI and EDI-2 have been translated into Swedish and are widely used for the assessment of eating disorders in Sweden (11, 12).

The SCL-90R (13) is a well-known and frequently used self-report instrument for measuring general psychopathology and contains 90 problem items rated on a 5-point Likert scale and comprising nine sub-scales: somatization, obsession–compulsion, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism. Seven additional items do not belong to any sub-scale. The nine sub-scales can be combined into three global indices: the Global Severity Index (GSI), which is used in this study, the

Positive Syndrome Distress Index (PSDI) and the Positive Symptom Total (PST).

An anamnesis questionnaire (QUATA) was used to evaluate user satisfaction.

BMI (weight in kilograms/height in metres^2) was noted.

The Self-Help Guide (SHG)
The CBT model of bulimia assumes that the pressure from society to be thin increases the risk of dieting in an uncontrolled manner. Starvation symptoms affect the individuals physiologically and psychologically, which increases the risk of binge eating. Binge eating in turn evokes attempts to compensate by purging behaviours, which increase distorted eating patterns, anxiety about gaining weight, low self-esteem and distress. CBT treatment is normally delivered in three phases: 1) breaking the diet–binge–purge–diet cycle with psycho-educational and behavioural strategies, 2) working with cognitive distortions about weight, shape and eating, 3) focusing on relapse prevention and consolidating the treatment progress.

The self-help guide used in this study is based on the above CBT principles and an online demonstration guide is available at http://www2.salut-ed.org/demo/. The self-help guide consists of seven steps: 1) Preparing yourself for change, 2) Observing yourself, 3) Changing your behaviour, 4) Changing the way you think: (a) Being aware of your thoughts and (b) Seeing things differently, 5) Identifying and solving your problems, 6) Self-assertion and 7) Prevention and conclusion. All the steps are divided into lessons, exercises and examples and both the patients and the coach have access to all the information generated by the patient.

Three senior psychotherapists authorized by the Swedish National Board of Health and Welfare and with long experience of treating eating-disorder patients were specially trained in Lausanne, Switzerland, in how to work with the programme. The treatment was conducted individually and lasted over a period of 6 months. In this programme, the patient and the coach are in contact within an internal messaging module once a week for at least 15 min, focusing on support, questions and answers, and a series of reports and analytical summaries.

Data analysis
All statistical analysis was carried out using the Statistical Package for the Social Sciences (SPSS), version 11. Paired sample *t*-test was used for comparisons between pre- to- post treatment and from pre- to- 2-months follow-up. Effect size (Es) was calculated as the mean difference between pre-treatment and the 2-months follow-up on expert ratings (RAB-R) divided by the pooled standard deviation. Small Es were defined as

≤0.20 low effect; 0.50 medium effect; ≥0.80 high effect 20 (14).

Informed and written consent was obtained from all the participants. The ethics committee at Sahlgrenska University Hospital, Göteborg, Sweden, approved the study.

Results

We found significant differences on all 11 subscales of the EDI-2 between patients' pre-treatment scores and normal controls, as well as in the SCL-90 GSI ($t =$ range 3.56–17.30, $P < 0.000$).

The analysis also revealed significant differences between pre-treatment and post-treatment scores and from pre-treatment to the 2-month follow-up on the SCL-90 GSI and all EDI-2 subscales apart from ineffectiveness, impulse regulation and social insecurity (Table 2).

When it comes to expert ratings, significant differences from pre-treatment to the 2-month follow-up appeared for vomiting, dietary restraints and weight phobia, which decreased, while exercise increased. Binge eating, one of the core eating-disorder symptoms, did not change significantly between pre-assessment and the 2-month follow-up (Table 3). Positive effect sizes from pre-treatment to the 2-month follow-up ranged from a low 0.30 (binge eating) to a high 0.93 (weight phobia). Exercise increased and therefore showed a negative medium effect (-0.65). The BMI stayed at a normal level throughout the trial.

As shown in Fig. 1, 53% ($n = 20$), the majority, stopped working with the SHG between steps 1 and 3 (the behaviour component), 29% ($n = 11$) at steps 4–6 (the cognitive component) and 18% ($n = 7$) completed all seven steps. A closer examination of how the three coaches succeeded (Table 4) reveals that coach 1 generated six patients who completed all seven steps, while coaches 2 and 3 combined only generated one. A post-hoc analysis excluding the seven patients who completed the SHG shows that the non-significant EDI-2 subscales doubled from three to six at the 2-month follow-up (Drive for thinness, Ineffectiveness, Perfectionism, Maturity fears, Impulse regulation and Social insecurity).

Discussion

The main objective of this study was to evaluate patients with bulimic symptoms using a guided Internet-based programme, over a period of 6 months. This study should be regarded as an exploratory case series study and should therefore be interpreted with care within these limitations.

The comparison between the normal group and patients participating in the SHG shows that the patient

Table 2. Paired sample t-test of patients pre-treatment to post-treatment ($n = 34$) and from pre-treatment to the 2-month follow-up ($n = 31$).

EDI-2	Pre-treatment, $n = 34$		Post-treatment, $n = 34$				Pre-treatment, $n = 31$		2-month follow-up, $n = 31$			
	Mean	s	Mean	s	t	p	Mean	s	Mean	s	t	p
Drive for Thinness	14.9	4.19	12.1	5.62	2.84	0.008	14.4	4.05	11.7	6.49	2.44	0.021
Bulimia	9.2	5.47	5.8	5.17	3.49	0.001	9.1	5.26	6.1	5.50	3.66	0.001
Body Dissatisfaction	17.0	7.14	14.4	7.41	2.52	0.017	17.1	7.15	14.7	7.13	3.02	0.005
Ineffectiveness	10.6	6.00	8.8	6.52	2.00	Ns	10.4	5.77	9.1	6.76	1.25	Ns
Perfectionism	6.3	4.60	4.7	4.02	4.04	0.000	5.7	4.29	4.6	3.86	2.11	0.043
Interpersonal Distrust	5.0	4.55	4.0	3.75	2.15	0.039	5.1	4.53	3.9	3.89	2.75	0.010
Interoceptive Awareness	13.4	6.74	9.6	6.41	4.65	0.000	13.2	6.75	9.5	6.93	4.45	0.000
Maturity Fears	7.8	5.83	5.9	4.62	2.60	0.014	8.2	5.89	6.2	5.25	2.55	0.016
Asceticism	8.2	4.01	5.6	3.86	4.66	0.000	8.0	3.88	6.3	4.49	2.50	0.018
Impulse Regulation	6.2	4.32	5.4	4.66	1.25	Ns	6.3	4.47	5.8	5.07	0.54	Ns
Social Insecurity	6.0	3.39	5.2	3.42	1.46	Ns	6.0	3.38	5.5	3.49	0.90	Ns
SCL-90 GSI	1.51	0.49	1.28	0.65	2.94	0.006	1.49	0.49	1.25	0.66	2.88	0.007

s, standard deviation.

Table 3. Expert ratings on core eating-disorder symptoms (BAB-R).

Dimensions	Pre-treatment		2-month follow-up				
	Mean	*s*	Mean	*s*	*t*	*p*	Es*
Binge frequency, days/week	3.3	2.40	2.6	2.31	1.40	Ns	0.30
Vomiting frequency, days/week	3.6	2.60	2.5	2.16	2.24	0.033	0.46
Dietary restraints	1.9	0.94	1.3	1.05	2.30	0.029	0.59
Weight phobia	2.5	0.77	1.7	0.95	3.36	0.002	0.93
Exercise	1.4	1.10	2.4	1.88	−2.81	0.009	−0.65

s, standard deviation; Es, effect size.
≤0.20 low effect; ≈0.50 medium effect; ≥0.80 high effect (14).

group was seriously affected by eating-disorder symptoms and general psychopathology, throughout the trial, despite a continuing improvement at post-treatment and at the 2-month follow-up on the SCL-90R and most of the EDI-2 subscales. Expert ratings reveal a significant decrease in core eating-disorder symptoms (e.g. vomiting, dietary restraints and weight phobia), except for binge eating and exercise. When binge eating and vomiting decreased, exercise increased, which shows that our participants changed their way of compensating from vomiting to exercise. Binge eating is characterized by a sense of lack of control over eating and can been viewed as a marker for problems of impulse control, which is confirmed by the fact that the EDI-2 subscale impulse control was non-significant at both the post-treatment and 2-month follow-up. Our participants also showed non-significant changes in EDI-2 ineffectiveness and social insecurity. When addressing poor impulse control, binge episodes, ineffectiveness and social insecurity, a personal therapeutic relationship appears to be necessary.

We had a low rate of completion (18%), which probably adds to the result for binge eating, but there was a tendency towards a decrease. The low completion rate can be explained in terms of the seriously affected patient group, the limited impact of the programme and different approaches among coaches. Interviews with all three coaches, individually, revealed that coach 1 had a more therapeutic approach and provided more support to her participants than the other two, which probably resulted in more completers. A post-hoc analysis demonstrated that participants who complete the SHG gain more than incompleters. We also found that step 4 (Changing the way you think) and step 5 (Identifying

Table 4. Analysis of treatment steps.

	n	Steps 1–3	Steps 4–6	Completed
Coach 1	14	5	3	6
Coach 2	12	8	3	1
Coach 3	12	7	5	0
Total	38	20 (53%)	11 (29%)	7 (18%)

and solving your problems) could change place, as most patients became stuck at step 4. It appears to be difficult to work with cognitive distortions through the Internet when most patients still have severe eating-disorder symptoms (e.g. binge eating and vomiting). Step 5 is easier to handle and appears to be more appropriate to work with at this stage. Another solution is to give coaches more flexibility to use different steps for their participants if they become stuck at a specific part of the programme. Our results show that this Internet-based SHG is not powerful enough as a single treatment for this patient group to generate participants who stop bingeing. However, several eating-disorder symptoms decreased on both self-reports and expert ratings from pre-treatment to follow-up. Twenty-two (58%) participants of 38 were referred back to the waiting list after having finished the SHG.

Consumer satisfaction at the 2-month follow-up demonstrates that the SHG was easy to use and that steps 1−3 were most useful. The text-messaging function was appreciated. The majority said that self-treatment on the Internet was a reasonably good idea but added that they would not recommend it to a friend as an alternative to psychotherapy but rather as an adjunct.

Our results are partly in line with the study by Carrard et al. (8). Both the Swiss study and the Swedish study showed significant improvements on most EDI-2 and SCL-90 subscales at the post-treatment and follow-up assessments. However, there are some major differences between the two treatment sites, which make them difficult to compare. The Swiss study recruited female participants with a mean age of 26 years of age through newspaper articles and referrals from local healthcare professionals, while the Swedish study recruited females with a mean age of 21 years of age from an eating-disorder outpatient waiting list. The drop-out rate in the Swiss study at the post-treatment and 2-month assessments was 36% and 49%, respectively, and the drop-out rate in the Swedish study was 11% and 18%, respectively. We also used expert ratings and were not only dependent on self-report questionnaires. Furthermore, the original SHG version was written in French and later translated into Swedish and modified for cultural differences. The

Swedish SHG version is probably more suited for the Scandinavian countries and is now being translated into Norwegian.

The Internet-based self-help guide used in this pilot study was shown to be a fairly effective treatment form, targeting most of the core symptoms of bulimic symptomatology. We used the SHG as a self-management tool for patients who were on our waiting list for standard psychotherapeutic treatment. The SHG can only work for patients with less severe psychopathology or as a primer for patients with severe pathology before entering individual or group psychotherapy based on CBT. The SHG is a promising new treatment tool well worth developing. Guided self-help can be regarded as a first-line treatment or as the first step in a planned stepped-care model, as recommended by the National Institute of Clinical Excellence for eating disorders (15). Any further evaluation should focus on randomized controlled trials comparing the SHG with a waiting list control group or with an active form of treatment, with sufficient sample sizes and long-term follow-ups.

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Lauri Nevonen, Ph.D., Department of Clinical Medicine, Örebro University Hospital, Örebro, Sweden, and Queen Silvia Children's Hospital, Göteborg, Sweden.
Mia Mark, M.Sc., Anorexia and Bulimia Unit, Queen Silvia Children's Hospital, Göteborg, Sweden.
Birgitta Levin, M.Sc., Anorexia and Bulimia Unit, Queen Silvia Children's Hospital, Göteborg, Sweden.
Marianne Lindström, M.Sc., Anorexia and Bulimia Unit, Queen Silvia Children's Hospital, Göteborg, Sweden.
Gunilla Paulson-Karlsson, B.Sc., Department of Clinical Medicine, Örebro University Hospital, Örebro, Sweden, and Anorexia and Bulimia Unit, Queen Silvia Children's Hospital, Göteborg, Sweden.