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Evaluation and deployment of evidence based patient self-management support program for bulimia nervosa

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KEYWORDS

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Self-help techniques;
Cognitive and
behavioral therapy;
Chronic disease
management

Summary

Objective: This article presents initial results from a European multi-centre study to determine the effectiveness and feasibility of an online self-help treatment support program for Bulimia Nervosa (BN).

Method: The online program is based on Cognitive Behavioral Therapy (CBT) and consists of seven steps that patients work through progressively. An overall sample of 141 women suffering from BN used the program over a 6-month period. Patients were supported by three face-to-face evaluation interviews with a therapist, and a weekly e-mail contact. Data on general psychopathology and specific eating disorder symptoms were also collected at the evaluation interviews.

Results: Initial results from the Swiss sample ($N = 41$) showed significant improvement of overall psychological health ($p < .001$) as measured by the Symptom Checklist (SCL-90R), and for all dimensions of the Eating Disorder Inventory (EDI-2).

Conclusion: An online Self-Help program for BN can be used effectively to reduce eating disorder symptoms in Bulimic patients and user feedback showed that this approach contributed to increase patient involvement and service availability. Additional data from the other centers will further inform the efficacy and impact of this approach.

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1. Introduction

Eating disorders are a common source of psychiatric morbidity among young women. In order to respond to such problems, it is urgent to develop and evaluate more accessible treatment tools and

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methods. CBT is a recognized form of therapy for the treatment of BN [1–6]. The efficacy of self-treatment books based on CBT has been studied in various therapeutic settings for BN. Results showed a reduction in symptoms, and even complete remission, in 13–50% of patients [7–10].

Several studies have also examined the effectiveness of integrating new technologies in the treatment of psychiatric disorders such as panic attacks [11], depression [12] and PTSD (post-traumatic stress disorder) [13], as well as for medical behavioral problems (e.g. chronic pain) [14], psychological problems linked to psychosomatic pathologies (e.g. breast cancer) [15] and obesity [16]. Ott [17], reviewed 30 studies assessing the effectiveness of interventions through the Internet for the pathologies cited above, 73.3% of these studies were based on CBT and the large majority demonstrated the treatment to be effective, although some reservations were reported with the treatment of depressive illnesses.

A number of studies have also shown positive results on the use of an online program for the prevention of eating disorders in an at risk population [18–21]. Studies on the use of e-mails in the identification and treatment of bulimia and binge-eating disorder [22] and on CBT treatment for BN, delivered by CD-ROM [23] also revealed significant reduction in symptoms. An overview of the research has shown that integrating technology in the treatment process for psychiatric disorders, especially eating disorders, has provided a positive impact on treatment outcome.

The aim of the current study is to determine the effectiveness and feasibility of using a guided online self-help program as a treatment support tool for BN. To our knowledge, the work present here is the first efficacy study on the use of a Self-Help Guide as an online treatment support tool.

2. The study

2.1. Method

Clinical trials to evaluate the efficiency and user acceptance of the SHG were conducted in Switzerland, Spain, Sweden and Germany. The trials followed a common protocol targeting an adult female population – between the age of 18- and 30-year-old – suffering from bulimia, purging type or from some type of eating disorder not otherwise specified [24].

The trial period has a 6-month cycle: a 4 months self-treatment and 2 months follow-up. During this period, contact between the coaches and patients

consists of three face-to-face evaluations and one e-mail contact per week, during the self-treatment period and an optional e-mail support during the follow-up period.

At the first interview, coaches verify the inclusion criteria and patient status, explain the research protocol and administer the first assessment measures. The coach then gives the patient access to the online program to start their 4 months self-treatment period.

2.2. Description of the self-treatment guide

The online program (<http://www2.salut-ed.org/demo/>) was based on a CBT self-help manual written by the Psychiatric Liaison Unit of the HUG [25] and is composed of seven sequential steps: (a) motivation, (b) self-observation, (c) modification of behavior: dietary plan and strategies for warding off or avoiding binges, (d) observation and modification of automatic thoughts, (e) problem solving, (f) self-affirmation, (g) conclusion and relapse prevention (Fig. 1).

Steps are divided into lessons, exercises and examples. One of the most important exercises is the food diary and its weekly summaries. Users are asked to record their meals, bingeing or compensatory behaviors (e.g. vomiting), and the emotions or situations that triggered these behaviors.

The guide aims at helping the patient to progressively regain control over eating habits. It focuses on behavior changes, such as, eating more regularly, and helping the user to develop simple strategies for managing symptoms, and dealing with situations or emotions that trigger bingeing and purging behaviors, rather than on achieving qualitative goals, such as weight, or daily caloric intake.

2.3. Sample

The pilot study started in Switzerland consists of 45 eating-disordered patients (41 suffering from bulimia nervosa and 4 from an eating disorder not otherwise specified). Inclusion criteria for the sample were: women, from 18- to 30-year-old, suffering from BN, purging type (according to DSM-1V [24]) or EDNOS (eating disorder not otherwise specified) type 3 or 4 with a Body Mass Index (BMI) higher than 17.5. Patients above 30-year-old were included if their BN history was less than 10 years.

Patients were excluded from the study if they are currently undergoing CBT for any disorder or psychotherapy for an eating disorder; suffering from alcohol or drug dependency, severe depression, or having had more than three suicide attempts dur-

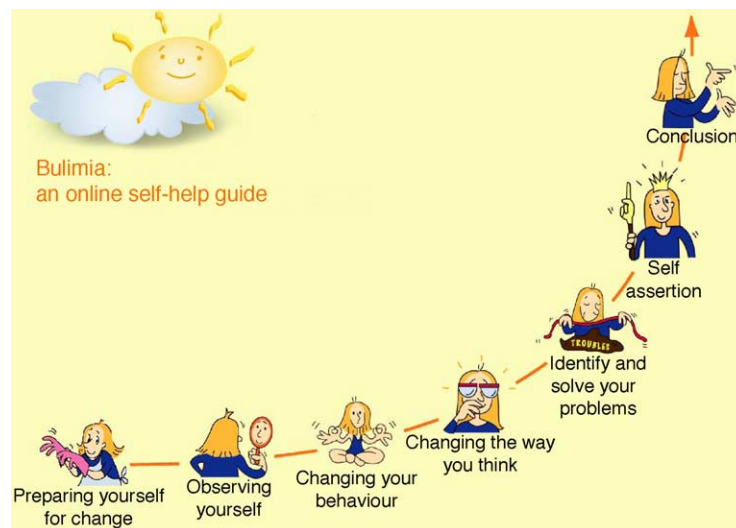


Fig. 1 SHG steps.

ing the last 2 years. The final sample consisted of women with a mean age of 26.2 (S.D. 4.44), mean BMI of 20.8 (S.D. 4.30) and a mean duration of the disorder of 5.6 years (S.D. 3.17).

2.4. Assessment

Patient evaluations were conducted using standardized questionnaires (Eating Disorder Inventory (EDI-2) [26] and the Symptom Check List (SCL-90R) [27]. These questionnaires were administered during the three face-to-face interviews at pre-treatment, post-treatment (fourth month), and follow-up evaluation (sixth month). An anamnesis questionnaire was also used to capture patient history and to evaluate user acceptance.

2.5. Procedure

Recruitment of participants took place between November 2002 and May 2003 through newspaper articles and referrals from local health care professionals. The two trial centers, the Hôpitaux Universitaires de Genève (HUG) and the Institutions Psychiatriques du Valais Romand (IPVR) assigned a coach to monitor patient progress over the 6 months study period. Patients can only work on the program under the supervision a coach. Both hospitals are located in the French-speaking part of Switzerland, and ethical committees from both institutions approved the trial protocol.

After the initial interview, patients work through the guide individually. The program generates a series of reports and analytical summaries that are used by both the coach and the patient for progress monitoring and as a support for weekly e-mail con-

tacts. These reports are used as objective record for reinforcing a collaborative approach towards disease management between the patient and the healthcare provider (Fig. 2).

Patients progressed at their own speed. Instead of setting a fixed time frame for completing the program i.e. one-step per week; we stressed a minimum amount of time that patients should spend on each step (e.g. minimum of 2 weeks for working with the Food Diary). This decision was taken to insure that participants would not complete the whole program within a few days.

Particular attention was given to data security and privacy protection. Only the coach can create the patient's account using the patient's pseudonym. All personally identifiable patient information is keep, separately, within the trial centre in accordance to the hospital's internal procedures. Collected information is transmitted over a Secured Socket Layer (SSL) connection. Safe password rules are implemented to help users in choosing "more secure" passwords. User passwords are stored as MD5 (Message Digest 5) hash in the database. Only the pseudonym is stored on the application server. An internal messaging module allows coaches and patients to exchange messages without exposing their e-mail address. A major design concern was protecting the confidential relationship between the coach and the patient. Only the coach, or an interim coach who takes up the monitoring tasks when the main coach is absent, can access the patient information. Prevaling European and local legislation on privacy and data protection were also considered in setting the technical and procedural safeguards of the program [28,29].

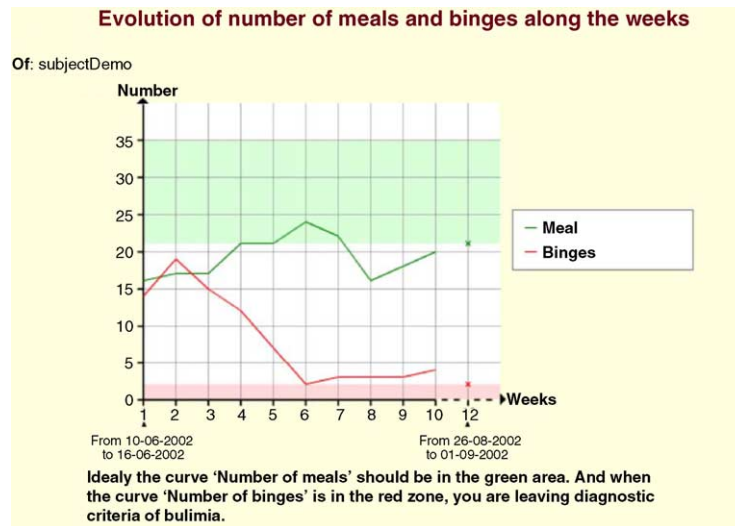


Fig. 2 Evolution of number of meals and binges along the weeks.

3. Analysis

3.1. Statistical analysis

Participants who completed the self-treatment and those who dropped out were compared on several variables, with *t*-tests for continuous variables, Wilcoxon test and χ^2 for categorical variables. Comparisons of the pre-post and follow-up time of evaluation were done with MANOVA with repeated measures on the standardized questionnaires, the EDI-2 and the SCL-90R. Symptoms improvement was evaluated with a Wilcoxon test. Spearman correlation was used to analyse the link between satisfaction, as well as compliance indexes (see Appendix B), and symptoms improvement.

3.2. Drop out rates

Of the 45 participants who took part in the research, 29 (64%) filled in their questionnaires for the second evaluation after 4 months of self-treatment, and 23 (51%) completed the questionnaires for the third evaluation after 2 months of follow-up. During the 4 months of self-treatment, 16 participants stopped, representing a drop out rate of 36%. Eleven individuals stopped the treatment during the first 2 months, between the first and the fourth step. The only significant differences which we found between subjects who dropped out and the completers concerned the frequency of binges ($Z = -2.731, p = .006$) and vomiting ($Z = -2.564, p = .010$) (measured on an ordinal scale, see Appendix A). Analysis of the data leads us to think that the severity of the disorder (more

binges, more vomiting) is closely linked to the drop-out rate for the self-treatment. The data concerning the percentage of completers according to the number of binges can be represented in Plate 1.

3.3. Standardized questionnaires

There were statistically significant improvements after the Internet self-treatment when considered the different scales and questionnaires (see Table 1) on eating symptomatology and psychopathology. The results show that the subjects improved significantly over time in all areas.

3.4. Symptoms

Bulimic symptoms, namely binges and vomiting, were evaluated according to an ordinal scale of six

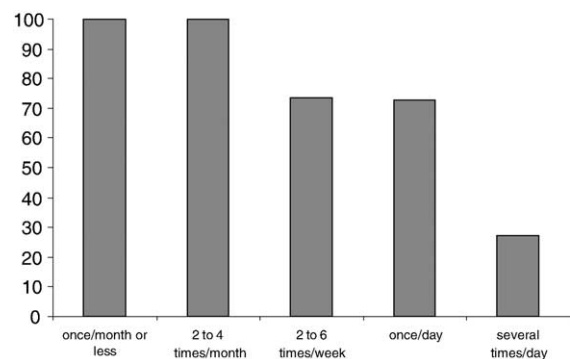


Plate 1 Percentage of subjects who completed the 4 months of self-treatment in comparison to those who dropped out, relative to their frequency of pre-treatment bulimic binges.

Table 1 Means (S.D.) and analysis of variance of SCL-90R total score (GSI) and EDI-2 dimensions

Dimensions	Mean (S.D.)			F-time (2,21)	p
	Pre	Post	Follow-up		
GSI	1.15 (.48)	.59 (.41)	0.54 (0.43)	16.848	.000
Drive for thinness	14.48 (5.86)	8.17 (5.79)	7.00 (6.37)	13.265	.000
Bulimia	11.13 (5.31)	4.09 (5.00)	3.61 (5.28)	21.038	.000
Body dissatisfaction	15.78 (7.37)	11.17 (7.33)	9.87 (6.75)	4.656	.021
Ineffectiveness	9.52 (6.11)	3.57 (4.19)	3.35 (4.75)	10.776	.001
Perfectionism	8.13 (4.74)	5.61 (4.55)	5.00 (4.55)	9.016	.001
Interpersonal distrust	5.13 (4.61)	3.26 (3.43)	3.00 (3.58)	4.988	.017
Interceptive awareness	10.78 (6.44)	4.83 (5.29)	3.87 (4.14)	10.513	.001
Maturity fears	4.30 (4.93)	2.26 (2.93)	1.61 (2.59)	6.565	.006
Asceticism	7.04 (3.39)	3.91 (1.88)	3.22 (1.57)	13.490	.000
Impulse regulation	6.22 (5.74)	2.65 (2.89)	1.35 (1.82)	9.829	.001
Social insecurity	6.00 (2.32)	3.96 (2.53)	3.52 (2.27)	16.977	.000

points (see [Appendix A](#)). Following 4 months of self-treatment, 17.2% of subjects could be considered as “abstainers”—in other words, they no longer suffered from binges or episodes of vomiting. Moreover, 68.9% of those who followed self-treatment showed a diminished frequency of bingeing (including the “abstainers”) ($Z=3.22$, $p=.001$), and in 58.6%, the frequency of vomiting episodes had also been reduced ($Z=3.51$, $p=.000$). In the follow-up, the percentage of “abstainers” had maintained. Binges had diminished in 65.2% ($Z=2.74$, $p=.006$) and vomiting in 60.8% of participants ($Z=2.84$, $p=.005$).

3.5. Satisfaction

At the time of the follow-up evaluation, questions from the QATA questionnaire were put to participants concerning their satisfaction with the self-treatment method (see [Appendix A](#)). The following graph shows the distribution of the participants’ responses in the form of box plots ([Plate 2](#)).

The graph reveals a relatively high satisfaction rate for areas such as the idea itself (median = 6.0; interquartile range = 2.0), its ease of use ($M=6.0$; $IR=1.0$), the usefulness of self-treatment ($M=5.0$; $IR=2.0$) and the e-mails ($M=5.0$; $IR=1.0$). Concerning the dietary notebook ($M=5.0$; $IR=3.0$) and feedback from it ($M=4.0$; $IR=3.0$), the results were more varied. Finally, for the question comparing the effectiveness of self-treatment with face-to-face therapy, the responses were more concentrated around the “equally effective” answer ($M=3.0$; $IR=2.0$). An index of “improvement” was calculated in the following way: we subtracted the score of the third evaluation from that of the first evaluation on the ordinal scale of the number of binges.

This gave a result, which represents the number of categories of difference in the improvement or worsening of the “binge” symptom between the start of self-treatment and the end of the follow-up. This improvement score was correlated to the items of satisfaction and the following data was obtained (see [Table 2](#)).

The participants who improved the most for the “binge” symptom also found that: the dietary notebook was the most useful, the self-treatment on the internet was a good and useful idea, and a face-to-face psychotherapy would not have been more effective (or been even less effective) than self-treatment on the internet. On the other hand, the usefulness of the feedback from the dietary notebook, as well as the ease of use of the self-treatment guide, or the usefulness of e-mail con-

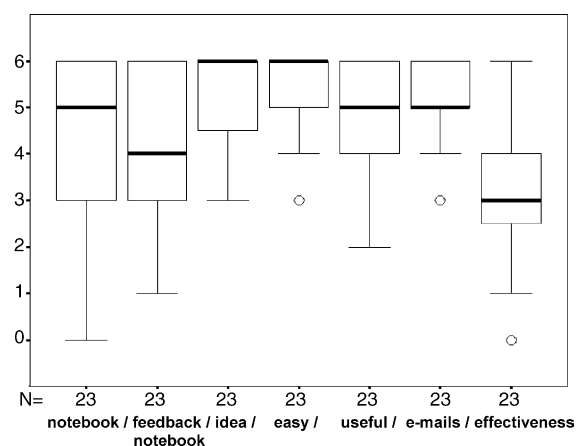


Plate 2 Box plots on participants’ satisfaction with the dietary notebook, its feedback, the idea of self-treatment, its ease of use and usefulness, the usefulness of e-mails and the self-help effectiveness.

Table 2 Spearman correlation between the improvement of the participants and the level of satisfaction with the dietary notebook, its feedback, the idea of self-treatment, its ease of use and usefulness, the usefulness of e-mails and its effectiveness

	Improvement
Notebook	.553** (.006)
Feedback notebook	.199 (.361)
Idea	.611** (.002)
Easy	.282 (.192)
Useful	.701** (.000)
E-mails	.405 (.055)
Effectiveness	-.761** (.000)

The number in parenthesis represents the two-tailed significance; sig < .05.

** Sig < .01.

tact were not dependent on the improvement of the symptom.

3.6. Compliance

By considering the number of days completed in the dietary notebook in comparison to the total number of days when it should have been completed as an index of compliance to the self-treatment, results showed that: the improvement score for the binges is not linked to the number of days filled in ($\rho = -.172$, $p = .432$) not filled in ($\rho = .242$, $p = .266$), or to the total number of days in the dietary notebook ($\rho = .135$, $p = .540$). Nor is it linked to the percentage number of days filled in compared to the number of days to be filled in ($\rho = -.289$, $p = .180$).

A second index of compliance was the step reached in the treatment at the last follow-up evaluation, which we correlated with the improvement score ($\rho = .488$, $p = .018$). This result shows that there is a correlation between the step reached at the time of the follow-up evaluation and the improvement score. The more steps the subject has completed, the better was their improvement in relation to bulimic binges.

4. Discussion

While results from all the trial centers are being analyzed, first results from the Swiss pilot ($N = 45$) were promising [30]. 17.2% of participants had no more binges or purges, 68.9% of participants had less binges, and 58.6% of participants had less purges. Patients also showed significant improvements on both specific (EDI-2) and overall psy-

chological measures (SCL-90R). The most important improvement took place (highest F value) on the Bulimia scale of the EDI-2, which shows that self-treatment is effective in reducing the targeted symptom. In addition, improvements were also recorded on all other EDI-2 subscales, indicating that the online guide succeeds equally in reducing other symptoms associated with eating disorders.

Early results from a second study, conducted in Barcelona, showed comparable results between the online programs with a traditional psycho-education group therapy concerning symptoms reduction. Both were preferable to a control group (without any treatment). Overall results from all the European trial centers ($N = 141$) showed significant improvements in total mean EDI-2 scores [31].

User feedback showed high acceptance from both the coaches and patients. Sixty-six percent of the patients "liked the idea of treating themselves". Thirty seven percent of the respondents liked the SHG because "they did not have time to come to therapy each week". Analysis of access logs also shows that a high percentage of the connections took place after hours (19:00 and 8:00h) or on weekends. Some feedback also indicated that an online approach could provide an acceptable therapeutic option for people who might otherwise not seek treatment, due to shame or stigmatism. It is interesting to note that patient satisfaction with the tool and the approach was generally positive and was independent of patient results.

Coaches thought the SHG helps save time and the progress monitoring tools were especially useful in getting a quick overall view of patient progress. The exercise summaries and charts were useful in explaining otherwise difficult to explain concepts.

The results concerning compliance show that the participants were able to profit from the self-treatment guide even if they did not assiduously fill in the dietary notebook. Neither regularity nor non-regularity in filling out the dietary notebook were linked to the improvement of symptoms. However, there could be a link between patient improvement and the number of steps completed.

The drop out rate was not surprising since a self-treatment is difficult to complete, indeed many of the participants stressed the importance of the weekly e-mail contact without which they thought they would never have terminated the self-treatment. There was general agreement in ease of use, of the usefulness of the exercises and the importance of the e-mail contact.

One the other hand, coaches also noticed that patients seemed to get stuck at the cognitive restructuring exercises, and proposed suggestions just as changing the orders of some steps, or making the steps more flexible after the first three steps could reduce drop outs and improve compliance. While the online program assured a standardized toolset, early results also indicated a "coaches effect". Since the coach instructions were set at the minimum, some further development in the coaching guideline could also improve compliance.

5. Conclusions

Based on the results of the current study we could conclude that an online help program guide could be used as a treatment support tool for Bulimia. User feedback and clinical experience also revealed the potential of this approach for improving the timeliness and accessibility of treatment services. The program has also shown that well planned exercise and feedback module such as the automatic feedback from the dietary notebook, can provide continuous reinforcement, and could enable more labor intensive patient center health care processes: allowing participants to develop and refine a set of personal strategy for managing their eating disorder, developing a cost effective collaborative platform for the carer and the patient.

The results also indicate that further improvements in the structure and content of the program as well as a refinement in the coaching procedure i.e. more encouragement to the participants on finishing the steps within a given time, could improve compliances and improve the clinical performance of this approach.

Nonetheless, the study result does provide further evidence that new technology can amplify the benefits of self-help techniques and that online

management programs could be a key component in an overall strategy for improving the quality of health care in the coming decade [32,33].

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Appendix A. Questions extracted from the QATA

The scale used to evaluate symptoms at the three times of evaluation: how often did you experience these behaviors for the last 3 months? (post and follow-up measurement: at the present time instead of for the last 3 months)

	Never	Once a month or less	Two to four times a month	Two to six times a week	Once a day	Several times a day
	0	1	2	3	4	5
Binges						
Self-induced vomiting						
Use of appetite suppressants						
Use of laxatives						
Use of diuretics						
Use of enemas						
Excessive exercises						

Questions on satisfaction, asked at post and follow-up evaluations:

Was the exercise with the dietary notebook useful to you?						
-3	-2	-1	0	1	2	3
not at all			quite useful			very useful
Did you find the charts from the dietary notebook summary useful?						
-3	-2	-1	0	1	2	3
not at all			quite useful			very useful
Does the idea of self-treatment through the Internet seem a good one to you?						
-3	-2	-1	0	1	2	3
not at all			quite a good idea			a very good idea
Did you find self-treatment on the Internet easy to use?						
-3	-2	-1	0	1	2	3
not at all			quite easy			very easy
Was self-treatment on the Internet useful to you?						
-3	-2	-1	0	1	2	3
not at all			quite useful			very useful
Did you find the e-mail contacts useful?						
-3	-2	-1	0	1	2	3
not at all			quite useful			very useful
In your opinion, would a face-to-face psychotherapy have been more or less effective than self-treatment on the Internet?						
-3	-2	-1	0	1	2	3
less efficient			same efficiency			more efficient

Appendix B

Other indicators were also extracted from the computer programme telling us about the participants' level of compliance, which we were then able to link with their results:

- time spent on each step;
- step reached at the time of the second and third evaluation;
- number of days completed in the dietary notebook;
- number of days not filled in the dietary notebook;
- total number of days (filled in or not) for the dietary notebook (from the first day when the participant starts the exercise until the 6th step when the notebook is no longer obligatory. If the 6th step was not reached, the end date was that of the 3rd evaluation).

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