Psychological Characteristics and Treatment of Chronic Depression

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Treating Chronic Symptoms of Depression in the Virtual Clinic: Findings on chronicity of depression in patients treated with Internet-based Computerized Cognitive Behavioral Therapy for depression

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Abstract

Background:
Internet-based therapy for depression is an effective treatment. It may be questioned whether Internet based Computerized Cognitive Behavioral Therapy (CCBT) is appropriate in patients with chronic symptoms of depression. The aims of the present study were to determine whether patients with chronic symptoms of depression participate in CCBT and whether chronicity predicts the outcome of treatment.
Method:
Patients in the present study (n=112) were derived from a recent randomized controlled trial testing the efficacy of CCBT. Chronicity of depression was measured by a 4-item self-report questionnaire, based on the DSM-IV criteria of chronic depression. Patients were considered to have chronic symptoms when they had not been free of depression for 2 months or more in the past 2 years. ANCOVA was used to examine whether chronicity of depression predicted treatment outcome on the Patient Health Questionnaire (PHQ-9) and Beck Depression Inventory (BDI-II). To evaluate treatment outcome, effect sizes and recovery rates were calculated, and compared between the chronic and nonchronic group.
Results:
The chronicity criterion was fulfilled by 72.3% (n=81). Chronicity of depression did not predict treatment outcome on the PHQ-9 (p=.12) or on the BDI-II (p=.75). Effect sizes (pre- to post-treatment change) on the PHQ-9 and BDI-II were respectively 1.6 and 1.5 for the chronic group versus 1.3 and 1.1 for the nonchronic group. Of the chronic group 22.8% was considered fully recovered versus 53.3% of the nonchronic group (p=.002).
Conclusions:
Present findings indicate that depressed patients with chronic symptoms participate in Internet-based CCBT. In addition, our findings showed that these patients can benefit from CCBT, however, residual symptoms often remain.

Introduction

Approximately 20% of all individuals with major depressive disorder (MDD) and up to 47% of patients with MDD treated in primary and secondary care suffer from chronic depression.[1,2] There is a growing body of literature on the efficacy of therapy for chronic depression.[2,3] The combination of psychotherapy and pharmacotherapy appears to be most effective for this population.[2-5] Still, large numbers of chronically depressed patients do not receive appropriate treatment or fail to respond or respond only partially to treatment.[1] Hence, there is a need for treatments that maintain or optimize response over the longer term.

The increasing demands of managed health care to improve cost-effectiveness of treatment in combination with the likelihood that chronically depressed patients need longer periods of intervention[1] suggest the utility of a form of therapy for chronic depression that can be self-administered, such as Internet-based Computerized Cognitive Behavioral Therapy (CCBT). CCBT is a very promising line of treatment for depression. Several randomized controlled trials have confirmed the efficacy of clinician-guided CCBT for depression,[6-9] with effect sizes comparable to those associated with face to face treatment. Moreover, CCBT has several advantages over face-to-face treatment; it tackles the limited availability of clinicians to provide psychological treatment, the stigma of seeing a therapist, and the inability of many patients to attend treatment during working hours. Patients enrolled in CCBT programmes can obtain treatment at any time and place, work on their own pace, and review the material as often as desired. In addition, Internet-based CCBT may reach people who might otherwise not receive treatment for their depression.[10]

However, studies that have been conducted on CCBT have not investigated the effect of chronicity of depression on outcomes. The purpose of the current study was to determine the prevalence of chronicity of depression in patients who have used Internet-based CCBT as a treatment for their depression and to examine whether chronicity of depression predicted treatment outcome in CCBT. In order to do so we used the sample of a recent study on the efficacy of Internet-based CCBT for depression. Further details and results of this trial are described elsewhere.[11]

Methods

Patients

Patients in the current study participated in a recent randomized controlled trial testing the efficacy of Internet-based CCBT for depression. This trial compared technician-guided Internet-based CCBT vs. clinician-guided Internet-based CCBT vs. a control group (delayed clinician-guided Internet-based CCBT).[11] Patients were recruited from June to July 2009 via

the website of the VirtualClinic (www.virtualclinic.org.au). The VirtualClinic is an Australian-based research program that is developing and evaluating Internet-based education and treatment programs for common mental disorders.

The first stage of the recruitment process involved patients completing questionnaires online to determine that they: (i) were a resident of Australia; (ii) were at least 18 years of age; (iii) had access to a computer, the Internet, and use of a printer; (iv) were not currently participating in CBT; (v) were not using illicit drugs or consuming more than 3 standard drinks/day; (vi) were not currently experiencing a psychotic mental illness or severe symptoms of depression (defined as a total score >23 or responding >2 to Question 9 (suicidal ideation) on the PHQ-9[12]; (vii) had a total score >5 (indicating at least a mild or subthreshold depression) on the PHQ-9; and (viii) if taking medication, had been taking the same dose for at least 1 month and did not intend to change that dose during the course of the program.

In total, 258 individuals applied for the Sadness program of the VirtualClinic, of these individuals 189 met inclusion criteria and completed an online questionnaire enquiring about demographic details and treatment history. The diagnosis of MDD was established with the depression section of the Mini International Neuropsychiatric Interview (MINI) Version 5.0.0.[13] The MINI was administered by telephone. A total of 141 patients met DSM-IV criteria[14] for depression and were randomized to either clinician-guided Internet-based CCBT (n=49), technician-guided Internet-based CCBT (n=47) or the control group (delayed clinician-guided Internet-based CCBT, n=45).[11] Finally, a total of 127 patients (n=46 in the clinician-guided group, n=41 in the technician-guided group and n=40 in the control group) completed the pre-treatment questionnaires and started treatment. The control group received clinician-guided Internet-based CCBT after the two other groups had completed their treatment.

For the current study patients from the 3 groups were pooled after the control group finished treatment, to examine chronicity of depression in the total sample (n=127). Data on chronicity of depression was missing for 15 patients, leaving 112 patients for the present study. The study was approved by the Human Research Ethics Committee (HREC) of St Vincent's Hospital (Sydney, Australia) and the HREC of the University of New South Wales (Sydney, Australia).

Treatment program

The Sadness program consists of 6 online lessons. The lessons represent best-practice principles used in CBT programs for depression, including behavioral activation, cognitive restructuring, problem solving, and assertiveness skills. Part of the content of each lesson is presented in the form of an illustrated story about a woman with depression who, with the help of a clinical psychologist, learns how to gain mastery over her symptoms. Automatic emails are sent to congratulate patients for completing each lesson, to remind them to complete materials, and to notify them of new resources. As people progress through each lesson they have access to additional written documents providing supplementary information about techniques to manage sleep problems, anxiety and panic, as well as access to vignettes written by previous patients about their experiences in the program of managing depression. Patients are expected to complete the homework tasks prior to completing the next lesson, and to complete all lessons within 8 weeks.

Treatment procedure

During the treatment a technician or clinician provided patients with weekly email or telephone contact. In addition, patients in the clinician-assisted treatment group had access to an online discussion forum where they could post their experiences and progress with the program (for examples of postings see appendix). Further details about the treatment procedures are described elsewhere.[11]

Measures

Chronicity of depression

For the current study we needed a measure of chronicity of depression that could be administered online. Therefore, we developed a 4-item self-report questionnaire based on the chronicity of depression items of the Composite International Diagnostic Interview (CIDI, World Health Organisation [WHO] version 2.1)[15] and the DSM-IV criteria[14] of chronic depression. The first 3 items of the questionnaire are based on the CIDI[15] asking patients about the age of onset of their first depressive episode, number of depressive episodes, and the total amount of time they have been depressed for in their life. These items were used to provide additional information on chronicity of depression of the sample. The fourth item, based on the DSM-IV criteria of chronic depression,[14] was used to determine chronicity of depression. Patients were considered to have chronic symptoms when answering "no" on this item: "Before you started this program, have you been completely free of depression for 2 months or more in the past 2 years?" The chronicity questionnaire was administered at post-treatment.

Outcome measures

The Patient Health Questionnaire (PHQ-9)[12] and the Beck Depression Inventory-II[16] were administered at pre-treatment (week 1) and post-treatment (week 10) to measure treatment outcome. The PHQ-9 is a 9-item measure with scores ranging from 0-27. The BDI-II is a 21-item measure with scores ranging from 0-63. The PHQ-9 and BDI-II are widely used measures of symptoms of depression and are considered reliable, valid, and appropriate for

clinical and research purposes, with recent research indicating that online administration of questionnaires results in acceptable reliability of responses.[17] In addition, a treatment satisfaction questionnaire based on the Credibility/Expectancy Questionnaire (CEQ)[18] was administered at post-treatment.

Statistical analysis

The prevalence of chronicity of depression in the sample was calculated using descriptive statistics. The demographic, social, and clinical characteristics were compared according to MDD chronicity status using χ^2 tests for categorical variables and ANOVA analyses for continuous variables. Univariate analysis of covariance (ANCOVA) was used to examine whether chronicity predicted treatment outcome on the PHQ-9 and BDI-II. Chronicity of depression was entered as a fixed factor in the model. Age, sex, education, medication use, treatment group (clinician-guided / technician-guided / delayed clinician-guided Internet-based CCBT) and pre-treatment scores on the PHQ-9 and BDI-II were entered as covariates.

To evaluate the clinical significance of the impact of treatment on outcome, effect sizes (ES) of pre- to post-treatment change on the PHQ-9 and the BDI-II were calculated for both groups (chronics versus nonchronics) using Cohen's formula.[19] The standardized method of Jacobson and Truax[20] was used to determine statistically reliable change. This yielded a Reliable Change Index (RCI) of patient improvement as assessed on the PHQ-9. If the RCI is higher than 1.96, the probability that the mean difference in treatment outcome occurred by chance is less than .05. A reliable change on the PHQ-9 is defined as a decrease of at least 5 points (pre-post change). Patients were considered recovered when their PHQ-9 score was below 5 at post-treatment. Nonparametric tests were run to compare the recovery percentages between the chronic and the nonchronic group. Logistic regression analyses were used to adjust for medication use and treatment group. In addition, satisfaction and completion rates were calculated and compared between both groups.

Results

The study sample of 112 depressed adults consisted of 71.4% women. The mean age was 43.0 years (SD=12.8). The chronicity criterion was fulfilled by 72.3% (n=81). Table 1 summarizes the characteristics of nonchronically and chronically depressed patients. When comparing the chronic group with the nonchronic group on demographical and social characteristics, we did not find any statistically significant differences between the two groups. Regarding clinical characteristics, the patients in the chronic group were significantly more often depressed for 4 years or more in their life compared to the patients in the nonchronic

Table 1. Demographic, Social and Clinical Characteristics of the Total Sample, the MDD nonchronic Group and the MDD Chronic Group

Characteristics[a]	Total Sample (n=112)	MDD not chronic (n=31)	MDD chronic (n=81)	*P*[b]
Female	71.4	80.6	67.9	.18
Age, mean (SD), y	43.0 (12.8)	41.9 (12.3)	43.4 (13.0)	.58
Married or de facto	48.2	54.8	45.7	.61
Education (13 years or more)	84.8	87.1	84.0	.67
Employment status				.68
Full time paid work / Parent	45.5	45.2	45.7	
Part time paid work / Student	30.4	35.5	28.4	
Unemployed / Seeking work / Registered sick / Disabled / Retired	24.1	19.4	25.9	
Taking medication	58.0	58.1	58.0	.99
Previous mental health treatment	82.1	90.3	79.0	.16
Onset of depression before 22 years old	63.4	67.7	61.7	.82
Number of depressive episodes				.27
1	5.4	6.5	4.9	
2-4	17.9	25.8	14.8	
5-8	17.0	22.6	14.8	
> 8	59.8	45.2	65.4	
Total time depressed in lifetime				.001
< 1 month	0	0	0	
1-12 months	6.3	16.1	2.4	
1-4 years	24.3	38.7	18.8	
> 4 years	69.4	45.2	78.8	

[a] Values are shown as percents except where noted otherwise.

[b] Comparison using χ^2 statistics (categorical variables) and analyses of variance (continuous variables).

group (78.8% versus 45.2%, *P* =.001). The two groups did not differ on age of onset of first depressive episode and number of episodes of depression.

PHQ-9 and BDI-II scores at pre-treatment revealed that patients in the sample were mildly to moderately depressed at the start of the program (mean scores of 13.9 (SD 4.6) and 27.5 (SD 11.2), respectively) and scored in the minimal range at post-treatment (mean scores of 7.3 (4.4) and 13.1 (9.7), respectively). The chronic group scored higher on the PHQ-9 and BDI-II at pre- and post-treatment compared to the nonchronic group, although this was only statistically significant for the BDI-II scores at pre-treatment (*P* =.02) (Table 2).

Entering chronicity of depression as a fixed factor in univariate ANCOVAs on post-treatment PHQ-9 and BDI-II scores, controlling for age, sex, education, medication use,

Table 2. Treatment Outcome of the Sample on the PHQ-9 and BDI-II

Characteristics[a]	Total Sample (n=108)	MDD not chronic (n=29)	MDD chronic (n=79)	P[b]	P[c]
PHQ-9					.12
Pre-treatment, mean (SD)	13.9 (4.6)	13.0 (5.1)	14.3 (4.3)	.18	
Post-treatment, mean (SD)	7.3 (4.4)	6.2 (5.1)	7.7 (4.0)	.11	
BDI-II					.75
Pre-treatment, mean (SD)	27.5 (11.2)	23.4 (12.1)	29.0 (10.5)	.02	
Post-treatment, mean (SD)	13.1 (9.7)	11.2 (9.4)	13.8 (9.8)	.21	
Effect size on PHQ-9	1.5	1.3	1.6		
Effect size on BD-II	1.4	1.1	1.5		
Reliable change on PHQ-9	66.1	70.0	64.6	.59	
Recovered on PHQ-9[d]	33.0	53.3	22.8	.002	
Satisfaction	84.4	83.3	84.8	.85	
Completed	90.1	90.3	90.0	.96	

[a]Values are shown as percents except where noted otherwise.

[b]Anova comparisons between the nonchronic and chronic group.

[c]Ancova with chronicity of depression as a fixed factor and pre-treatment scores as a covariate.

[d]PHQ-9 score < 5 at post-treatment.

Abbreviations: PHQ-9 = PatientHealth Questionnaire (9 item version); BDI-II = Beck Depression Inventory (version II).

treatment group and pre-treatment scores, revealed no significant differences between the chronic group and the nonchronic group in treatment outcome (*P*=.12 and *P*=.75, respectively). The within-group effect sizes (ES) of the total sample was 1.5 on the PHQ-9 and 1.4 on the BDI-II (pre- to post-treatment change). The chronic group had a within-group ES of 1.6 on the PHQ-9 and 1.5 on the BDI-II versus 1.3 and 1.1 respectively, for the nonchronic group (Table 2).

The PHQ-9 was used to determine reliable change and recovery for all patients. Patients were considered to have a reliable change if their post-treatment PHQ-9 score represented an improvement of ≥ 5 compared with their pre-treatment score (RCI). Patients were considered recovered when their post-treatment PHQ-9 score was < 5. Of the total sample, 66.1% of the patients demonstrated reliable change and 33.0% were considered recovered. Of the chronic group 64.6% demonstrated reliable change and 22.8% were considered recovered versus 70.0% and 53.3%, respectively, of the nonchronic group (*P* =.59 and *P* =.002, respectively). Adjusting for medication use and treatment group using logistic regression did not change the effects of reliable change and recovery (Table 2).

The satisfaction and completion rates of the total sample were 84.4% and 90.1%,

respectively. Of the chronic group 84.8% reported that they were satisfied with the treatment and 90.0% completed the treatment versus 83.3% and 90.3%, respectively, of the nonchronic group (Table 2).

Discussion

To the best of our knowledge, this is the first study that explicitly examined chronicity of depression in patients diagnosed with Major Depressive Disorder (MDD) who used Internet-based Computerized Cognitive Behavioral Therapy (CCBT) as treatment for their depression. Our findings demonstrate that 72% of the patients in our sample fulfilled the chronicity criterion, since they reported they had not been free of depression for 2 months or more of the past 2 years. In addition, we found that chronicity of depression did not predict treatment outcome. Moreover, regarding effect-sizes and reliable change (pre- to post-treatment), patients with chronic symptoms of depression benefited as much from CCBT as patients without chronic symptoms of depression.

However, regarding recovery, patients with chronic symptoms of depression did not benefit as much from CCBT as patients without chronic symptoms of depression. Recovery was defined as a PHQ-9 score of less than 5, which signifies (almost always) the absence of a depressive disorder.[12] Patients in the chronic group reached significantly less often full recovery compared to patients in the nonchronic group (22.8% versus 53.3%). It is often the case that chronically depressed patients do not fully recover after treatment,[1] and these residual symptoms might explain their chronic course of depression, since residual symptoms are known to be a strong predictor of relapse and chronicity.[21,22] To prevent or alternate a chronic course of depression, patients should continue treatment until they are fully recovered from their depression.[23-25] For the current study this would mean that most of the patients in the chronic group, and some of the patients in the nonchronic group should continue treatment or seek additional treatment until they are fully recovered from their depression to minimize the risk of a relapsing or chronic course.

Patients' online forum posts, in which they described their symptoms and experiences of depression at the start of the program and recorded their progress during the program, resembled our findings of chronicity of depression in the sample. Most of the patients described having suffered from depression for years at the start of the program and most patients described having benefited from the treatment at the end of the program. Most of them realise, however, that they have to keep on practising their gained skills to prevent future relapses (see appendix).

Our findings indicate that the majority of patients that applied for CCBT reported

previous mental health treatment (82%) and suffered from chronic symptoms of depression (72%). Convenience (no need to travel, less time consuming and no costs) was the main reason why patients had applied for CCBT. Privacy and anonymity were also important reasons. In addition, they reported that face-to-face treatment did not help, was too confronting or was not available. CCBT is considered a low-intensity intervention, recommended as a first step treatment for mild to moderate depression.[26] Our findings suggest that CCBT can also be of value for patients with a prior treatment history of depression and chronic symptoms of depression.

Several limitations suggest caution in generalizing from these findings. First, it could be that the patients in the current sample belong to a different population (highly motivated, with a preference for Internet-based treatment and rather favourable social demographic characteristics) and/or are in a different stage of their illness (mildly to moderately depressed) than the depressed patients mostly seen in primary and secondary care. Learmonth and Rai,[27] however, found similar results in their study on CCBT for anxiety and depression in secondary care in a chronic sample (a median period of problem duration of 5-10 years and only 5% of these patients had no prior treatment history) indicating that CCBT can also be a beneficial treatment for patients who suffer from chronic symptoms of depression in secondary care. Second, the high prevalence of chronicity in the current study (72%) could be explained by the way chronicity of depression was measured. Patients fulfilled the chronicity criterion when they reported they had not been completely free of depression for 2 months or more in the past 2 years. We do not know whether these patients actually fulfilled the criteria of a diagnosis of depression during this period, which is the main criterion for chronic depression.[14] However, we do know they suffered from chronic symptoms of depression during this period, which appears to be a strong predictor of a relapsing, and chronic course of depression.[21,22] Third, chronicity of depression and treatment outcome was measured using self-report questionnaires administered online. Research indicates that online administration of questionnaires results in acceptable reliability of responses,[17] however, additional assessments by a clinician and independent ratings of response would have strengthen the results, though this is inherent in studies such as these and very difficult to overcome. Fourth, the fact that we did not find a significant difference between the chronic and nonchronic group on outcome could be explained by a lack of power due to our relatively small sample size (n=112). Finally, we did not consider a follow-up period. An RCT with an enlarged sample size and follow-up data is required to substantiate our findings. The results of the current study should therefore be viewed as tentative, pending a more methodologically rigorous replication.

Despite these limitations, the present findings offer grounds for optimism that CCBT, besides being a useful first step treatment for mild to moderate depression, might also be a useful treatment for patients with chronic symptoms of depression for whom face-to-face treatment did not help, was too confronting or was not available.

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Appendix. Examples of forum posts' at the start and at the end of the program

Start	End
I'm a 33 year old Primary School Teacher who has been suffering from depression since I was 14. I'm hoping this course can refresh my mind and give me the opportunity to do the things that I want to but my mind tells me that I can't - hope that makes sense.	Thanks to Virtual Clinic for providing a useful program that people can easily access. Your support has been fantastic. I'm 100% certain that I have gained skills that I can use in the present and future to help assist me with my depression.
I'm 56, with 4 sons and 1 grand-daughter. I've had 5 breakdowns over the years. I really hope this program will finally put paid to the relapses.	I think that we've been privileged to be chosen to participate in this important project, as well as learning a lot and being given new tools to manage our lives. To have a resource you can turn to at any time of the day or night and not have to travel to or wait for appointments (and be able to speak with psychiatrists) has been nothing short of miraculous! Plus, having the chance to keep written information that is informative but written in a manner that is easy for all to read and understand has been GREAT!! The final planning document for our future was EXCELLENT!!!
I am 19. I was diagnosed with depression rather early on. I think I was about 8 or something. When I was 14 my depression got pretty bad to the point I was suicidal and cutting myself but somehow have recovered from being pretty much rock bottom as depression goes. My depression affects me day to day with almost everything I do. I use to be on medication however I hated taking them and I felt like they didn't do anything. I just want to be able to get on with my life and not have all these horrible feelings.	In reflection the program has been a good help making me think about things I hadn't thought of before. However the downs still occur. I have gained a fair amount of knowledge from the course and just also wanted to say thank you to everyone from the virtual clinic. I plan to reread over the program several times and my boyfriend said he would have a look at it too :)
I'm 27 and have been suffering from depression on and off since my late teens, when I was diagnosed with arthritis and had to have hip replacements as a result. I've taken medication and it helped a lot but I dislike the idea of relying on them so prefer not to take them and am trying this CBT thing without them. For the last couple of years, I've been feeling like I'm barely functioning - I feel like it's such a struggle just to get to work, clothe and feed myself, and keep my tiny unit clean. I'm really hoping this program will help me see things in colour and will give me back some interest and vitality.	Well I definitely feel I've stabilized a bit since the beginning of the program. Unfortunately I don't think I really gave it as good a go as I should have, I ran a bit late with most of the exercises and some I didn't take seriously enough but I feel like I've learned some good skills, and I'm glad I will still be able to access the resources for a little while longer. I've seen counselors and therapists before who've said they practiced CBT, but have not given me homework or worksheets, and in the end, have not really helped. I do feel I've got far more out of this course than anything else I've tried.
I'm 62 years. When depressed, I tend to withdraw from everyone - at risk of becoming a recluse. My first recognized encounter with depression was in 1995 when working in a very stressful workplace. I sought counseling & medical help. I now believe I suffered depression for many years prior to 1995 but just thought I was being weak and that I would snap out of it. I do hope this program will help me to face and address my particular issues and improve my personal and social life.	I have found the program very helpful. I am now able to step back a little from a 'relapse' situation and give myself permission to start again. I am able to stop the negative thought processes, take a deep breath and consciously decide that "I can and will" be positive - I have the strategies and skills I need. Identifying my early warning signs of relapse and doing something about it I believe, has been the single most effective strategy in my new "bag of skills". This new awareness stops me descending into that black space of the past. Many thanks to the Virtual Clinic team - this is a great program - even though you have your KPI's of the success of the program, the impact you have had on me and everyone else, I believe, is immeasurable.