

Computer-Based Cognitive Behavioral Therapy for Anxiety Disorders or Depression

SBU ALERT REPORT NO 2007-03 • 2007-06-20 • WWW.SBU.SE/ALERT



Summary and Conclusions

TECHNOLOGY AND TARGET GROUP Anxiety and depression are two conditions that affect a large percentage of the population. Anxiety refers to an intensive sense of apprehension and distress associated with anticipated danger or harm. The symptoms are distinguished by having both physical and psychological characteristics. Anxiety disorders refer to multiple anxiety symptoms that present concurrently in a specific manner and have a certain duration. Anxiety disorders can be separated into panic disorder, obsessive-compulsive disorder, post-traumatic stress disorder, generalized anxiety disorder, social phobia, specific phobias, and unspecified anxiety disorders. Typically, depression involves a sense of hopelessness, meaninglessness, and depressed mood over an extended period. As with anxiety disorders, patients with depression are often affected by other problems or substance abuse, and some are unable to work for shorter or longer periods.

Cognitive behavioral therapy (CBT) is a form of psychological treatment that focuses on a patient's thoughts, feelings, and behaviors from a learning perspective, and which has been shown to be relatively effective for anxiety disorders and depression. CBT emphasizes the importance of self-help and developing the ability to learn how to cope with one's problems. Computer-based CBT involves treatment based on CBT manuals that have been adapted to a computerized format. In most cases, computer-based therapy includes some type of personal contact with a CBT therapist who follows the patient's progress and is available to answer questions, eg, via e-mail, telephone, or during a few, limited face-to-face meetings. Some computer-based programs involve minimal contact with a CBT therapist, while others are mainly used as a complement to CBT provided by a therapist. Criteria have not been defined for selecting patients with anxiety disorders or depression who may be appropriate for computer-based CBT. Lacking such criteria, the size of the potential target group for this method cannot be estimated.

PRIMARY QUESTION What effects and costs are associated with computer-based CBT in treating adult patients with anxiety disorders or depression?

PATIENT BENEFIT Twelve randomized controlled trials, where computer-based CBT was tested in treating anxiety disorders or depression, were included in this systematic

review. All of these studies were found to provide moderately strong scientific evidence and serve as a foundation for the conclusions regarding the state of knowledge. The results were measured primarily by participants responding to validated self-assessment forms, or by clinical assessment of symptoms in a few cases.

Anxiety disorders (7 studies). In the 4 studies that tested CBT for treating panic disorder, computer-based treatment was better than a waiting list control in 2 of the studies and better than a telephone support group in 1 study. Two of the 4 studies found no significant differences in outcome between the group receiving computer-based CBT and the group receiving therapist-lead treatment. One of these studies used computer-based CBT as a complement to therapist-lead treatment. Two studies included people with social phobia where computer-based CBT was compared to waiting lists or participation in an Internet-based discussion group. In both studies, the results were better for participants in the computer-based treatment. In a study of participants with obsessive-compulsive disorder, therapist-lead CBT yielded better results than computer-based CBT, which in turn yielded better results than relaxation exercises.

Depression (4 studies). In 4 studies of people with depression, the group receiving computer-based CBT demonstrated better results than those in control groups that received treatment as usual, participated in telephone interviews, participated in Internet-based discussion groups, or remained on the waiting list. One of these studies used computer-based CBT as a complement to therapist-lead treatment. In addition to comparing computer-based CBT to a waiting list, this study also made a direct comparison with therapist-lead CBT where participants had no access to the computer-based form of treatment. No significant differences were observed in the results between the 2 groups receiving different variations of CBT. In another of the 4 studies, no differences were observed in results between participants receiving computer-based CBT and those with access to an information page on depression on the Internet.

Mixed anxiety/depression (1 study). In a study of people with anxiety and/or depression, the group receiving computer-based CBT demonstrated better results than those in a control group receiving treatment as usual.

Continues on next page

ETHICAL ASPECTS It is important to assess each individual program from an ethical perspective. However, several questions common to all types of programs, and which need to be considered from an ethical standpoint, can be distinguished. These concern how patients should be diagnosed and selected for treatment. Furthermore, it is important for patients to feel acceptance for the computer-based form of treatment, that other treatment options are made available, and that the patient can participate in choosing a form of treatment. Other issues concern who should be responsible for the treatment and how the patient's response to treatment should be monitored. Yet another aspect having ethical implications concerns the role that computer-based CBT should play in relation to other treatment options offered by the health services.

ECONOMIC ASPECTS A British study assessed the cost effectiveness of computer-based CBT in treating people with anxiety and/or depression. This study found the cost of care to be roughly 550 Swedish kronor (SEK) higher and the cost of lost productivity roughly SEK 5500 lower in the group receiving computer-based CBT compared to the control group receiving treatment as usual. The treatment gains from the intervention were estimated at 0.032 quality-adjusted life-years (QALYs), which would correspond to approximately SEK 17 000 per QALY gained, based on direct costs. When indirect costs were included in the estimate, it showed that computer-based CBT was both better and saved cost compared to treatment as usual. The reliability of the analysis is, however, limited by uncertainty related to the information on morbidity, costs, and some of the assumptions. The study described above serves as the foundation for a model analysis that compares treatment as usual for 18 months versus 3 different computer programs for CBT in treating depression. The cost of the program found to be most cost effective ranged between SEK 5700 and SEK 25 000 per QALY, depending on the number of users per license.

SBU's appraisal of the evidence

There is limited scientific evidence (Evidence Grade 3)* indicating that computer-based CBT has favorable, short-term effects on symptoms in the treatment of panic disorder, social phobia, and depression. The scientific evidence is insufficient* to assess the effects of treatment on obsessive-compulsive disorder and mixed anxiety/depression. The scientific evidence is insufficient* to assess the cost effectiveness of the method. It is essential to clarify how patients should be selected for treatment and the role of computer-based CBT in relation to other treatment options. Studies with a more representative selection of participants and with longer followup periods are needed to enable more reliable conclusions on the effects and costs of using the method within the health services.

References

1. Rachman S. Anxiety. East Sussex (England): Psychological Press Ltd; 1998.
2. Barlow DH. Anxiety and its disorders: The nature and treatment of anxiety and panic. London: The Guildford Press; 2002.
3. Kessler RC, Berglund P, Demler O, Jin R, Merikangas KR, Walters EE. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Arch Gen Psychiatry* 2005;62(6):593-602.
4. SBU. Behandling av depressionssjukdomar. En systematisk litteraturoversikt. Stockholm: Statens beredning för medicinsk utvärdering (SBU); 2004. SBU-rapport nr 166. 91-87890-87-9.
5. SBU. Behandling av ångestsyndrom. En systematisk litteraturoversikt. Stockholm: Statens beredning för medicinsk utvärdering (SBU); 2005. SBU-rapport nr 171. 91-87890-98-4.
6. Andersson G, Bergstrom J, Hollandare F, Carlbring P, Kaldø V, Ekselius L. Internet-based self-help for depression: randomised controlled trial. *Br J Psychiatry* 2005;187:456-61.
7. National Institute for Health and Clinical Excellence (NICE). Computerised cognitive therapy for depression and anxiety. *Technology Appraisal* 97; 2006.
8. Spek V, Cuijpers P, Nyklicek I, Riper H, Keyzer J, Pop V. Internet-based cognitive behaviour therapy for symptoms of depression and anxiety: a meta-analysis. *Psychol Med* 2007;37(3):319-28.
9. Kalthenthaler E, Brazier J, De Nigris E, Tumor I, Ferriter M, Beverley C. Computerised cognitive behaviour therapy for depression and anxiety update: a systematic review and economic evaluation. *Health Technology Assessment* 2006;10(33).
10. Klein B, Richards JC, Austin DW. Efficacy of internet therapy for panic disorder. *J Behav Ther Exp Psychiatry* 2006;37(3):213-38.
11. Carlbring P, Nilsson-Ihrfelt E, Waara J, Kollenstam C, Buhrman M, Kaldø V et al. Treatment of panic disorder: live therapy vs. self-help via the Internet. *Behav Res Ther* 2005;43(10):1321-33.
12. Carlbring P, Bohman S, Brunt S, Buhrman M, Westling BE, Ekselius L et al. Remote treatment of panic disorder: a randomized trial of internet-based cognitive behavior therapy supplemented with telephone calls. *Am J Psychiatry* 2006;163(12):2119-25.
13. Kenardy JA, Dow MG, Johnston DW, Newman MG, Thomson A, Taylor CB. A comparison of delivery methods of cognitive-behavioral therapy for panic disorder: an international multicenter trial. *J Consult Clin Psychol* 2003;71(6):1068-75.
14. Marks IM, Kenwright M, McDonough M, Whittaker M, Mataix-Cols D. Saving clinicians' time by delegating routine aspects of therapy to a computer: a randomized controlled trial in phobia/panic disorder. *Psychol Med* 2004;34(1):9-17.
15. Carlbring P, Westling B, Ljungstrand P, Ekselius L, Andersson G. Treatment of panic disorder via the Internet: A randomized trial of a self-help program. *Behavior Therapy* 2001;32(4):751-64.
16. Klein B, Richards J. A brief internet based treatment for panic disorder. *Behavioural and Cognitive Psychotherapy* 2001;29:113-7.
17. Newman MG, Kenardy J, Herman S, Taylor CB. Comparison of palmtop-computer-assisted brief cognitive-behavioral treatment to cognitive-behavioral treatment for panic disorder. *J Consult Clin Psychol* 1997;65(1):178-83.

*Criteria for Evidence Grading SBU's Conclusions

Evidence Grade 1 – Strong Scientific Evidence. The conclusion is corroborated by at least two independent studies with high quality and internal validity, or a good systematic overview.

Evidence Grade 2 – Moderately Strong Scientific Evidence. The conclusion is corroborated by one study with high quality and internal validity, and at least two studies with medium quality and internal validity.

Evidence Grade 3 – Limited Scientific Evidence. The conclusion is corroborated by at least two studies with medium quality and internal validity.

Insufficient Scientific Evidence. No conclusions can be drawn when there are not any studies that meet the criteria for quality and internal validity.

Contradictory Scientific Evidence. No conclusions can be drawn when there are studies with the same quality and internal validity whose findings contradict each other.

18. Andersson G, Carlbring P, Holmstrom A, Sparthan E, Furmark T, Nilsson-Ihrfelt E et al. Internet-based self-help with therapist feedback and in vivo group exposure for social phobia: a randomized controlled trial. *J Consult Clin Psychol* 2006;74(4):677-86.
19. Carlbring P, Gunnarsdottir M, Hedensjö L, Andersson G, Ekselius L, Furmark T. Treatment of social phobia: randomised trial of internet-delivered cognitive-behavioural therapy with telephone support. *Br J Psychiatry* 2007;190:123-8.
20. Gilroy LJ, Kirkby KC, Daniels BA, Menzies RG, Montgomery IM. Controlled comparison of computer-aided vicarious exposure versus live exposure in the treatment of spider phobia. *Behavior Therapy* 2000;31:733-44.
21. Gilroy LJ, Kirkby KC, Daniels BA, Menzies RG, Montgomery IM. Long-term follow-up of computer aided vicarious exposure versus live graded exposure in the treatment of spider phobia. *Behavior Therapy* 2003;34:65-76.
22. Heading K, Kirkby KC, Martin F, Daniels BA, Gilroy LJ. Controlled comparison of single-session treatments for spider phobia: Live graded exposure versus computer-aided vicarious exposure. *Behaviour Change* 2001;18:103-13.
23. Ghosh A, Marks IM, Carr AC. Therapist contact and outcome of self-exposure treatment for phobias. A controlled study. *British Journal of Psychiatry* 1988;152:234-8.
24. Greist JH, Marks IM, Baer L, Kobak KA, Wenzel KW, Hirsch MJ et al. Behavior therapy for obsessive-compulsive disorder guided by a computer or by a clinician compared with relaxation as a control. *J Clin Psychiatry* 2002;63(2):138-45.
25. Lange A, Rietdijk D, Hudcovicova M, van de Ven JP, Schrieken B, Emmelkamp PM. Intertapy: a controlled randomized trial of the standardized treatment of posttraumatic stress through the internet. *J Consult Clin Psychol* 2003;71(5):901-9.
26. Hirai M, Clum GA. An Internet-based self-change program for traumatic event related fear, distress, and maladaptive coping. *J Trauma Stress* 2005;18(6):631-6.
27. Clarke G, Reid E, Eubanks D, O'Connor E, DeBar LL, Kelleher C et al. Overcoming depression on the Internet (ODIN): a randomized controlled trial of an Internet depression skills intervention program. *J Med Internet Res* 2002;4(3):E14.
28. Clarke G, Eubanks D, Reid E, Kelleher C, O'Connor E, DeBar LL et al. Overcoming Depression on the Internet (ODIN) (2): a randomized trial of a self-help depression skills program with reminders. *J Med Internet Res* 2005;7(2):e16.
29. Christensen H, Griffiths KM, Jorm AF. Delivering interventions for depression by using the internet: randomised controlled trial. *BMJ* 2004;328(7434):265.
30. Wright JH, Wright AS, Albano AM, Basco MR, Goldsmith LJ, Raffield T et al. Computer-assisted cognitive therapy for depression: maintaining efficacy while reducing therapist time. *Am J Psychiatry* 2005;162(6):1158-64.
31. Selmi PM, Klein MH, Greist JH, Sorrell SP, Erdman HP. Computer-administered cognitive-behavioral therapy for depression. *Am J Psychiatry* 1990;147(1):51-6.
32. Grime PR. Computerized cognitive behavioural therapy at work: a randomized controlled trial in employees with recent stress-related absenteeism. *Occup Med (Lond)* 2004;54(5):353-9.
33. Bowers W, Stuart S, MacFarlane R, Gorman L. Use of computer-administered cognitive-behavior therapy with depressed inpatients. *Depression* 1993;1:294-9.
34. Proudfoot J, Ryden C, Everitt B, Shapiro DA, Goldberg D, Mann A et al. Clinical efficacy of computerised cognitive-behavioural therapy for anxiety and depression in primary care: randomised controlled trial. *Br J Psychiatry* 2004;185:46-54.
35. Carlbring P, Brunt S, Bohman S, Austin D, Richards J, Öst LG et al. Internet vs paper and pencil administration of questionnaires commonly used in panic/agoraphobia research. *Computers in Human Behavior* 2007;23:1421-34.
36. Carlbring P, Forslin P, Ljungstrand P, Willebrand M, Strandlund C, Ekselius L et al. Is the Internet-administered CIDI-SF Equivalent to a Clinician-administered SCID Interview? *Cognitive Behaviour Therapy* 2002;31(4):183-9.
37. Lambert M, Ogles BM. *The efficacy and effectiveness of psychotherapy*. New York: John Wiley & Sons; 2004.
38. McCrone P, Knapp M, Proudfoot J, Ryden C, Cavanagh K, Shapiro DA et al. Cost-effectiveness of computerised cognitive-behavioural therapy for anxiety and depression in primary care: randomised controlled trial. *Br J Psychiatry* 2004;185:55-62.
39. Andersson G, Bergstrom J, Carlbring P, Lindefors N. The use of the Internet in the treatment of anxiety disorders. *Curr Opin Psychiatry* 2005;18(1):73-7.
40. Andersson G. Internet-based cognitive-behavioral self help for depression. *Expert Rev Neurother* 2006;6(11):1637-42.
41. Carlbring P, Ekselius L, Andersson G. Treatment of panic disorder via the Internet: a randomized trial of CBT vs. applied relaxation. *J Behav Ther Exp Psychiatry* 2003;34(2):129-40.
42. Dewis LM, Kirkby KC, Martin F, Daniels BA, Gilroy LJ, Menzies RG. Computer-aided vicarious exposure versus live graded exposure for spider phobia in children. *Journal of Behavior Therapy and Experimental Psychiatry* 2001;32:17-27.
43. Kenardy J. Internet delivered indicated prevention for anxiety disorders: a randomized controlled trial. *Behavioural and Cognitive Psychotherapy* 2003;31:279-89.
44. Muris P, Merckelbach H, Holdrinet I, Sijenaar M. Treating phobic children: effects of EMDR versus exposure. *J Consult Clin Psychol* 1998;66(1):193-8.
45. Schneider AJ, Mataix-Cols D, Marks IM, Bachofen M. Internet-guided self-help with or without exposure therapy for phobic and panic disorders. *Psychother Psychosom* 2005;74(3):154-64.
46. Spence SH, Holmes JM, March S, Lipp OV. The feasibility and outcome of clinic plus internet delivery of cognitive-behavior therapy for childhood anxiety. *J Consult Clin Psychol* 2006;74(3):614-21.
47. Christensen H, Griffiths KM, Mackinnon AJ, Brittliffe K. Online randomized controlled trial of brief and full cognitive behaviour therapy for depression. *Psychol Med* 2006;36(12):1737-46.
48. Christensen H, Leach LS, Barney L, Mackinnon AJ, Griffiths KM. The effect of web based depression interventions on self reported help seeking: randomised controlled trial. *BMC Psychiatry* 2006;6:13.
49. Patten SB. Prevention of depressive symptoms through the use of distance technologies. *Psychiatr Serv* 2003;54(3):396-8.
50. Proudfoot J, Goldberg D, Mann A, Everitt B, Marks I, Gray JA. Computerized, interactive, multimedia cognitive-behavioural program for anxiety and depression in general practice. *Psychol Med* 2003;33(2):217-27.

SBU – The Swedish Council on Technology Assessment in Health Care

SBU is an independent public authority which has the mandate of the Swedish Government to comprehensively assess healthcare technology from medical, economic, ethical, and social standpoints. SBU Alert is a system for identification and early assessment of new methods in health care.

This summary is based on a report prepared at SBU in collaboration with Prof. **Steven J Linton**, Örebro University. It has been reviewed by Prof. **Lars von Knorring**, Uppsala University and Prof. **Lars-Göran Öst**, Stockholm University.

The complete report is available only in Swedish.

PO Box 5650, SE-114 86 Stockholm, Sweden • alert@sbu.se