



The effectiveness of guided internet-based cognitive behavioral therapy for social anxiety disorder in a routine care setting

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ABSTRACT

Social anxiety disorder (SAD) is a common mental disorder with high persistence when untreated. As access to effective treatment is limited, guided internet-based cognitive behavioral therapy (ICBT) has been proposed as an effective alternative to face-to-face treatment. In this study, we examined the effectiveness of a 14-week therapist-guided ICBT program for patients with SAD undergoing routine care. From 2014 to 2017, 169 patients were included in the study, of which 145 started the treatment. The sample was all general practitioner-referred and had a lower educational level and higher rate of work absence compared to similar effectiveness studies. Regarding social anxiety symptoms, we identified significant within-group effect sizes (post-treatment: $d = 1.00$ – 1.10 ; six-month follow-up: $d = 1.03$ – 1.55). We also found significant effects on secondary depression symptoms ($d = 0.67$). Clinically significant improvement was reported by 66.2% of the participants, and 16.6% had a significant deterioration. Clinical implications of the current study are that guided ICBT for SAD is an effective treatment for the majority of the patients undergoing routine care. Future studies should explore interventions targeting non-responders and deteriorated patients.

1. Introduction

Social anxiety disorder (SAD) is associated with a fear of being negatively evaluated by others in social performance or interaction situations (Stein, 2008). It is a disorder with a global lifetime prevalence of 4.0%, with a somewhat higher percentage in high-income countries (Stein et al., 2017). The disorder is more prevalent in females than males; however, males tend to seek help more often than females (Asher et al., 2017). The median age of onset across Europe is in the mid-teens (11–17 years; Stein et al., 2017). The disorder negatively affects social and romantic relationships and academic and career achievements (Asher et al., 2017). From the perspective of the burden on society, SAD is associated with higher risks of school dropout and work absenteeism compared to the general population (Griffiths, 2013). Access to treatment for SAD is limited owing to a lack of available services and a fear of stigma (Shafraan et al., 2009). Specific to SAD is also the fact that the symptoms are often perceived as personal traits like shyness, and not as

a common mental disorder that may be effectively treated (Griffiths, 2013). Overall, SAD is associated with large individual and societal burdens owing to its early onset, persistence when left untreated, and high prevalence, which is why it is important to increase access to care for this group.

Clinical guidelines for the psychological treatment of SAD recommend cognitive behavioral therapy (CBT) as an individual face-to-face treatment (United Kingdom: National Institute of Clinical Excellence, CG159 ICE), or in the form of guided internet-based CBT (ICBT; Sweden: Socialstyrelsen, 2017). The first efficacy trial on the subject were published > 10 years ago and reported large effects of a guided ICBT program combined with two in-vivo exposure sessions (Andersson et al., 2006). In another early randomized controlled trial comparing telephone-supported ICBT to waiting list, the results showed large treatment effects for the intervention group but not for the control group (Carlbring et al., 2007). The results remained the same at the 30-month follow-up (Carlbring et al., 2009). Tillfors et al. (2008)

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compared guided ICBT inclusive of five exposure sessions to guided ICBT alone. The results showed large within-group effect sizes at post-treatment and at the one-year follow-up in both groups, with no between-group differences. Nordmo et al. (2015) compared the effects of combining guided ICBT with an initial face-to-face psychoeducation session (90 min) to guided ICBT without an initial face-to-face psychoeducation session. The results showed moderate to large within-group treatment effects, and no significant differences between the two groups.

The effects reported in 21 trials of guided and unguided ICBT for SAD ($N = 1801$) were reviewed by Boettcher and colleagues (Boettcher et al., 2013). Overall, there were large within-group effects at post-assessment, three-month follow-up, and five-year follow-up. Also, a moderate effect on comorbid depression was reported. In a recent meta-analysis of 20 randomized controlled trials comparing face-to-face treatment and guided ICBT (Carlbring et al., 2018), including three studies on SAD, no significant differences between guided ICBT and face-to-face treatments were identified.

In spite of an increasing number of studies confirming the efficacy of guided ICBT for SAD, it is rarely implemented in routine practice (Olthuis et al., 2016), and only a few effectiveness trials have been conducted.

In an effectiveness study ($N = 654$) from the specialist internet treatment clinic in Sweden, large within-group effect sizes of guided ICBT have been reported (Cohen's $d = 0.86$ – 1.15 ; El Alaoui et al., 2015). In this study, 90% of the sample was self-referred, 3% was on sick leave, and 8% was unemployed. On average, participants completed eight out of the 12 modules in the guided ICBT manual. In an effectiveness trial comparing a stepped-care approach (psychoeducation, guided ICBT, 12 sessions of face-to-face treatment) to 12 sessions of face-to-face treatment, 80% of the patients who recovered did so after guided ICBT (Nordgreen et al., 2016). From an effectiveness trial of transdiagnostic guided ICBT for anxiety and depression, moderate effects ($d = 0.63$) of SAD symptoms were reported (Newby et al., 2014). Another small trial ($N = 37$) reported no difference between face-to-face therapy and guided ICBT for SAD patients (Andrews et al., 2011). Even if routine care is used as a distinct category across the effectiveness trials, it differs when it comes to patients' access to care. The majority of the previously conducted effectiveness trials were on self-referred samples. We know that self-referral is associated with higher effects compared to general practitioner (GP)-referred samples (Haug et al., 2012). It is therefore, important to gain knowledge about the effectiveness of guided ICBT in a setting where patients are GP referred, which is what this study set out to achieve.

2. Method

2.1. Setting

Since 2013, the eCoping (eMeistring.no) clinic at Haukeland University Hospital, Bergen, Norway, has offered guided ICBT for panic disorder (Nordgreen et al., 2018) and SAD in routine mental health outpatient care settings. ICBT for depression was introduced in the clinic in 2015. The clinic is part of the Division of Psychiatry, Haukeland University Hospital, Norway. The catchment area of the hospital is 250,000 persons and comprises three mental health outpatient clinics. The Western Regional Committee for Medical and Health Research Ethics in Norway approved the present study (2012/2211/REK).

2.2. Design

This trial was an open effectiveness study with a naturalistic within-group design with repeated primary and secondary treatment outcomes and six-month follow-up.

2.3. Procedure

All patients admitted for specialized mental health treatment in Norway must be referred by their GP. Accordingly, referred patients admitted for treatment were invited for an initial face-to-face assessment interview at the clinic. During this meeting, patients were informed about guided ICBT as one of the treatment alternatives available.

All patients referred to one of the three mental health outpatient clinics for SAD and who were willing to consider guided ICBT as a treatment alternative were invited to a diagnostic assessment using the Mini International Neuropsychiatric Interview (MINI; Sheehan et al., 1998). Patients who were interested in starting guided ICBT and fulfilled the inclusion criteria were offered ICBT and invited to participate in this trial. The following inclusion criteria were used: 1) SAD as the main problem according to the MINI, 2) 18 years of age or older, 3) not using benzodiazepines on a daily basis, 4) if using antidepressants, a stable dosage over the previous four weeks, and 5) able to read and write in Norwegian. The exclusion criteria were: 1) current suicidal ideation, 2) current psychosis, 3) current substance abuse, 4) in immediate need of other treatment, and 5) no access to the internet. All participants signed a written informed consent form.

2.4. Treatment

The guided ICBT treatment program used in the present study builds on research from Sweden (Furmark et al., 2009; Hedman et al., 2014). The program was translated into Norwegian in 2007. Two previous studies on telephone-supported ICBT for SAD were reported from our research group (Nordgreen et al., 2016; Nordmo et al., 2015), with large effect sizes reported in both studies. Based on the preliminary results from these studies, guided ICBT for SAD was integrated into routine care in 2013.

The ICBT program for SAD comprises nine online text-based modules that include psychoeducation, working with automatic thoughts, behavioral experiments, shifting focus, and relapse prevention. The main part of treatment is defined as completing the first five modules with the following content: psychoeducation, working with automatic thoughts, and behavioral experiments. The treatment lasts up to 14 weeks. The patients spend an average of 7–10 days per module and access each module after completing the previous one. Therapist guidance was given at least once a week through a secure email system. The therapist provided guidance of an average of 10–15 min per week per patient. The treatment was implemented on an existent, secure self-report assessment IT platform.

2.5. Training

The therapists at eMeistring are co-located for one to two days per week for working with guided ICBT, with an ordinary workload during the rest of the week. In addition to a one-year continuing education, there was weekly peer supervision and monthly expert supervision.

2.6. Measures

Owing to a limitation in the platform, the self-report assessment measures were made accessible to the patients at the end of the module and not on a fixed timeline (e.g., every seven days).

2.7. Primary outcome measure

The Social Phobia Scale (SPS; Mattick and Clarke, 1998) includes 20 items rated from 0 to 4. The SPS is used to assess self-reported symptoms of SAD in performance situations (pretreatment Cronbach's $\alpha = 0.91$). The scores on the SPS were assessed at pretreatment, after modules two–eight, at post-treatment, and at the six-month

follow-up.

2.8. Secondary outcome measures

The Social Interaction Anxiety Scale (SIAS; Mattick and Clarke, 1998) includes 20 items rated from 0 to 4. The SIAS is used to assess self-reported symptoms of SAD in social interaction situations (pretreatment Cronbach's $\alpha = 0.89$). The scores on the SIAS were assessed at pretreatment, after modules three and six, at post-treatment, and at the six-month follow-up.

The Montgomery-Åsberg Depression Rating Scale-self report (MADRS-SR; Svanborg and Asberg, 2001) includes nine items rated from 0 to 6. The MADRS-SR is used to assess self-reported measures for depressive symptoms during the previous three days (pretreatment Cronbach's $\alpha = 0.83$). The scores on the MADRS-SR were assessed at pretreatment, after modules one–eight, at post-treatment, and at the six-month follow-up.

The Credibility Scale (Borkovec and Nau, 1972) includes five items rated from 1 to 10. The C-scale was used to measure treatment credibility at the end of module one, when patients were familiar with the treatment format but still had limited exposure to the treatment content (pretreatment Cronbach's $\alpha = 0.89$).

2.9. Statistical analysis

Descriptive statistics, frequencies, chi-square tests, and *t*-tests were analyzed with SPSS 24 (IBM Corp, 2017), while latent growth curve (LGC) models were analyzed with Mplus 8.0 (Muthén and Muthén, 2017). Linear LGC models were analyzed with specifications of all points of time between the first and last measurement points as free time factors to explore the degree of change at each module level (Bollen and Curran, 2006; Wang and Wang, 2012). The estimator was maximum likelihood with robust standard errors (MLR) to estimate unbiased standard errors due to some non-normality in data (Kline, 2010). The full information maximization likelihood method provides estimates based on all available data and assumes “missing at random” (Muthén and Muthén, 2017).

Within-group effect sizes used the magnitude of change from pre- to post-treatment and follow-up, respectively, divided by pretreatment standard deviations (Cohen and Cohen, 1983).

SPS at post-assessment was used to estimate clinically significant change. Clinically significant change at an individual level was estimated using the Jacobson and Truax (1991) formula of reliable change combined with the C criteria for clinical change according to the cutoff for caseness as reported in the literature. Reliable change was calculated using the change score divided by standard error of difference at pretreatment ($S_{diff} = 1.73$; improvement or deterioration \pm SPS = 3.39 \approx 3; Rozenental et al., 2017). The cutoff for caseness on the SPS was set to ≤ 25 , in accordance with previous studies (Nordgreen et al., 2016; McEvoy, 2007).

3. Results

3.1. Participants

A total of 222 patients referred during the study period—August 2014–2017—were eligible for guided ICBT for SAD and invited to participate in the study. A total of 169 patients were included in the study, all GP-referred. The El Alaoui study (El Alaoui et al., 2015) is comparable to the present study regarding the percentage of females, mean age, marital status, and years of complaints. However, the percentages of those with higher education (+12 years) (29%) and patients on sick leave were higher in the present study. Demographics and former help-seeking behavior are presented in Table 1.

Table 1
Demographics and former help-seeking behaviour.

	n/N	mean	%/SD	Range
Female	96/169		56.8%	
Years		29.8	10.6	17.0–63.0
Married/cohabitant	66/166		39.8%	
Children	41/167		24.6%	
Higher education ^a	49/169		29.0%	
Years of complaints		13.8	11.3	(0.2–50.0)
On sick leave, disability pension, unemployed	60/167		35.9%	
Psychotropic medication last three months	68/169		40.2%	
Previous mental health treatment ^b	135/169		79.9%	

Note. *N* = 169. *M* = mean. *SD* = standard deviation.

^a College or university level.

^b Previous 6 months.

3.2. Attrition

A total of 169 patients were included in the study, and 145 patients (85.8%) subsequently started treatment. Among these 145, a total of 113 (77.9%) responded to the post-treatment assessment, and 52 (35.9%) responded to the six-month follow-up.

No significant differences regarding age ($t(166) = 1.67, p = .10$), gender ($\chi(1) = 2.61, p = .11$, or pretreatment level of self-reported symptoms (SPS = $t(167) = 0.09, p = .93$; SIAS = $t(167) = 0.18, p = .86$; MADRS-SR = $t(167) = 1.86, p = .07$) were identified between those who did and did not start treatment. No significant differences were identified between patients who provided six-month follow-up data and those who did not with regard to gender ($p = .25$) or pretreatment symptoms (SPS, $p = .36$; SIAS, $p = .23$; MADRS-SR, $p = .07$). However, there was a significant difference ($t(166) = 2.57, p = .01$) with regard to the age of the patients who did not complete the follow-up assessment (28.5 years old) and those who did (33.1 years old).

3.3. Pretreatment level and change during treatment period

Mean pretreatment levels and the mean change for the three outcome variables are illustrated in Table 2 ($N = 169$). Variables were normally distributed (skewness = -0.20 to 0.09 ; kurtosis = -0.84 to -0.64). All outcome variables showed statistically significant mean reductions during treatment. Statistically significant individual variations, both in baseline and change scores, were seen. The negative correlations between baseline and change indicate that patients with higher pretreatment symptoms showed a larger reduction during treatment compared to patients with lower levels of pretreatment symptoms. The estimated values for the SPS, SIAS, and MADRS-SR for each module are presented in Table 3.

3.4. Magnitude of change across modules

The magnitude of change across modules is illustrated in Fig. 1. The curve shows the percentage of total change at each module at the primary (SPS) and secondary (SIAS and MADRS-SR) outcome measures.

3.5. Changes from post-treatment to six-month follow-up

Changes from post-treatment to six-month follow-up were not statistically significant for the primary outcome measure SPS ($\Delta_{post,FU} = -0.53, p = .753$) with a pretreatment to follow-up ES = 1.01 (Table 2). On the SIAS, ($\Delta_{post,FU} = -4.67, p = .006$) a highly significant mean reduction was found with a pretreatment to follow-up ES = 0.93 (Table 2). No significant mean change was found in the MADRS-SR ($\Delta_{post,FU} = 0.17, p = .885$) with a pretreatment to follow-up ES = 0.79 (Table 2).

Statistically significant individual variations in change were found

Table 2
Latent change results with mean and individual differences (standard deviation, SD) in baseline (Intercept I) and change in the total follow-up period (Slope S).

	Baseline (I)			Change (S)				ES _a	ES _b	r _{i,s}	p
	Mean	SD	p	Mean	p	SD	p				
SPS	40.56	15.14	.001	-15.14	.001	14.94	.001	1.00	1.01	0.24	.012
SIAS	45.89	10.39	.001	-11.47	.001	12.37	.001	1.10	0.93	0.23	.092
MADRS-SR	17.66	7.53	.001	-5.05	.001	6.36	.001	0.67	0.79	0.17	.179

Note. N = 169. I = intercept. S = slope. SPS = Social Phobia Scale. SIAS = Social Interaction Anxiety Scale. MADRS-SR = The Montgomery Åsberg Depression Rating Scale–Self Report. SD = standard deviation. ES = Effect size. _a = post-treatment. _b = Follow-up. r_{i,s} = correlation between level and change.

Table 3
Estimated primary and secondary symptom mean values.

	SPS		SIAS		MADRS-SR	
	Mean (SD)	ES	Mean (SD)	ES	Mean (SD)	ES
Pre	40.56 (14.73)		45.89 (9.58)		17.63 (7.31)	
M 1	–		–		17.12 (7.26)	0.07
M 2	40.56 (14.73)	0.00			16.54 (7.25)	0.14
M 3	37.38 (14.31)	0.21	44.73 (9.42)	0.11	15.42 (7.32)	0.29
M 4	34.61 (14.25)	0.39			15.38 (7.32)	0.30
M 5	32.64 (14.39)	0.52			13.75 (7.67)	0.52
M 6	30.52 (14.70)	0.66	39.31 (9.43)	0.63	13.07 (7.89)	0.60
M 7	28.60 (15.11)	0.79			12.96 (7.94)	0.62
M 8	27.31 (15.46)	0.88			12.73 (8.02)	0.65
M 9	25.43 (16.05)	1.00	34.42 (10.48)	1.10	12.58 (8.08)	0.67

Note. N = 169. M = module. SPS = Social Phobia Scale. SIAS = Social Interaction Anxiety Scale. MADRS-SR = The Montgomery Åsberg Depression Rating Scale–Self Report. SD = Standard deviation. ES = effect size.

for all three variables (SPS: SD = 8.38, p < .001; SIAS: SD = 9.92, p < .001; MADRS-SR: SD = 6.00, p = .005).

3.6. Modules completed

Patients completed a mean of 5.3 modules (range = 0–9, SD = 3.02) out of the nine modules. A total of 96 (66.2%) of the 145 patients who started treatment also completed the main parts of the treatment (five out of nine modules).

Table 4
Clinically reliable changes at post-treatment measured by social phobia scale.

	Recovered	Improved	Unchanged	Deteriorated
Completed main parts (n = 96)	45 (46.9%)	28 (29.2%)	13 (13.5%)	10 (10.4%)
Did not complete main parts (n = 49)	4 (8.2%)	19 (38.8%)	12 (24.5%)	14 (28.6%)
Total (N = 145)	49 (33.8%)	47 (32.4%)	25 (17.2%)	24 (16.6%)

Note. N = 145. Recovered = clinical change and reliable change. Improved = reliable change. Unchanged = no clinical or reliable change. Deteriorated = negative reliable change. Completed main parts = completed five modules or more. Did not complete main parts = stopped at module four or before.

3.7. Clinically significant change and deterioration

Significant improvement according to the Jacobsen and Truax (1991) formula was identified in 96 of the 145 patients (66.2%) who started the treatment (Table 4). Significant improvement according to the Jacobsen and Truax (1991) formula was identified in 73 of the 96 patients (76.0%) who completed five or more treatment modules. Significant deterioration according to the Jacobsen and Truax (1991) formula was identified in 24 of the 145 patients (16.6%) who started the treatment (Table 4), with the majority (n = 14) stopping treatment between modules one and four. Deteriorated patients were offered face-to-face treatment at the clinic.

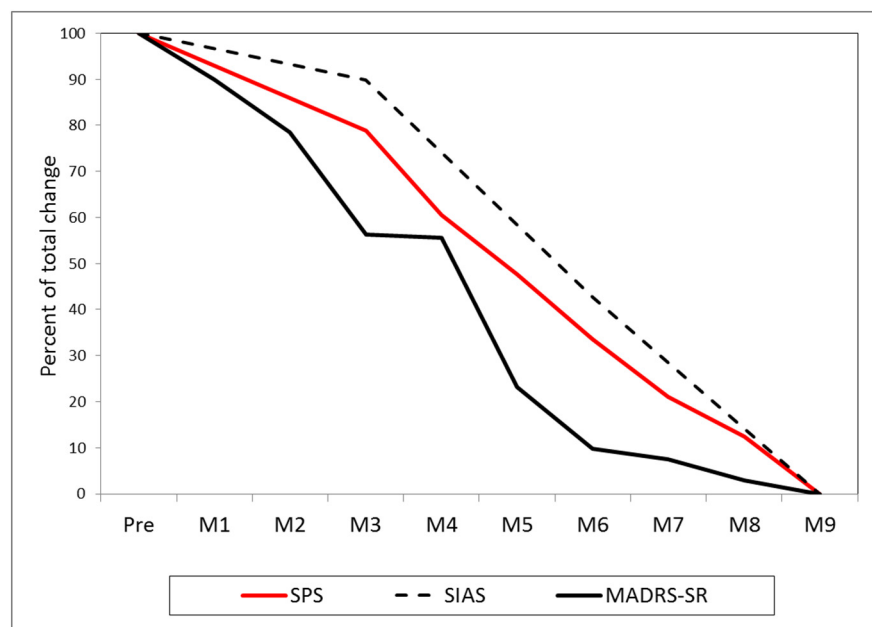


Fig. 1. Magnitude of change.
Note. N = 169. M = module. SPS = Social Phobia Scale. SIAS = Social Interaction Anxiety Scale. MADRS-SR = The Montgomery Åsberg Depression Rating Scale–Self Report.

3.8. Treatment credibility

Treatment credibility was rated as moderate to high on all items, with a mean score of 6.9 (range = 1–10, SD = 1.73). A total of 107 of 143 (74.8%) patients would recommend the treatment to a friend.

4. Discussion

This study examined the effectiveness of guided ICBT in routine care in secondary mental health services in Norway. A total of 222 GP-referred patients were eligible for guided ICBT for SAD, out of which 169 provided informed consent for this study and were included, and 145 patients (85.8%) subsequently started treatment. On average, the sample had had their complaints for nearly 14 years, and 40% were married or cohabitating. Moreover, the majority (80%) had received other mental healthcare services in the last six months, and one of three participants in the sample was on sick leave, receiving a disability pension, or unemployed. Comparable effectiveness studies have samples with considerably higher educational levels (El Alaoui et al., 2015; Kok et al., 2014) and a lower proportion of participants on sick leave, receiving a disability pension, or unemployed (El Alaoui et al., 2015).

Positive significant changes were reported on primary and secondary outcome measures. Large treatment effects were reported on the primary outcome measure—the SPS—at post-treatment and at follow-up. Moderate and large treatment effects were reported on the secondary outcome measures—the SIAS and MADRS-SR—at post-treatment and the six-month follow-up. A significant improvement was reported by 66.2% of the sample.

The treatment effects of guided ICBT for SAD reported in this study are comparable to findings from previous efficacy (Boettcher et al., 2013) and effectiveness (El Alaoui et al., 2015; Newby et al., 2014) studies. The improvement rate of ICBT for SAD of 66% in the current trial is higher compared to improvement rates reported in a recent Cochrane review (50%; Olthuis et al., 2016).

Patients in the current trial completed a mean of 5.3 out of nine (59%) modules. This is somewhat lower compared to a mean completion of 8.2 out of 12 (68%) modules in the El Alaoui trial and higher compared to the three out of eight (38%) completed exercises in the Kok et al. (2014) trial. However, it should be noted that Kok et al.'s trial and the present one are both from secondary mental healthcare settings where all patients are GP-referred to a general mental health clinic where ICBT is one of several treatment formats. This is different from the setting of self-referred patients at a specialized ICBT clinic in the El Alaoui et al. (2015) trial.

A total of 16.6% of the participants in the current trial had a significant deterioration after starting treatment. This is higher than the 5.8% reported in a recent individual patient data meta-analysis of deterioration of ICBT trials (Rozenal et al., 2017). The relatively high deterioration rate may reflect limitations of the platform used (inflexibility) or the implementation of ICBT in routine care with GP referrals only. However, the difference between the meta-analysis and the current trial may also reflect variance in patient characteristics on sick leave/unemployment (6–11% versus 36%), 12 + educational level (64% versus 29%), cohabitants (66% versus 40%), or psychotropic medication (32% versus 40%). This interpretation is in line with previous research showing that having a university degree is associated with a lower degree of deterioration (Rozenal et al., 2017).

The present study has limitations, the main one being the lack of a control group. However, the efficacy of this treatment has been reported in previous randomized controlled trials, showing that the treatment, and not time alone, contributes to short-term (Andersson et al., 2006; Carlbring et al., 2007; Nordgreen et al., 2016; Nordmo et al., 2015) and long-term effects (Carlbring et al., 2009; Andersson et al., 2018). Also, in a recent meta-analysis of waitlist control groups in randomized trials for SAD (Steinert et al., 2017), time alone had a very limited effect on improvement. Further, when comparing the effects of

active treatment to waitlist control across 30 randomized trials ($N = 2460$), the within-group effect sizes were large for treatment ($g = 0.86$) and small for waitlist ($g = 0.13$). Ten of the 30 studies were internet or self-help based. This supports the notion that SAD is often chronic if not treated, and time alone cannot explain treatment effects in open trials. Another limitation is the lack of diagnostic interviews post-treatment by independent assessors. In line with routine care, this was not implemented in this effectiveness trial. Finally, a low response rate of 35.9% at the six-month follow-up is a limitation. According to routine care, we only sent one automatic reminder to the participants at the six-month follow-up. This makes generalizability to the total sample difficult.

The main strength of the current study is the documentation of the effects of guided ICBT for SAD after implementation during routine care in a relatively large sample. Another strength is the documentation of the effects of guided ICBT of SAD on a GP-referred sample.

The clinical implication of the current study is that guided ICBT for SAD is an effective treatment for the majority of participants undergoing routine care. This study shows that this is also true when the patients have a relatively low educational level and high work absence. The rate of deterioration in this study underlines the importance of clinical monitoring and reporting of negative effects in clinical care services. Future studies need to explore interventions targeting non-responders and deteriorated patients.

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Disclosure statement

Andersson and Carlbring receive royalties for a self-help book based on a major part of the treatment material used in the internet treatment. No other conflicts of interest to disclose.

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