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Research paper

Internet-based therapist-supported interpersonal psychotherapy for depression: A randomized controlled trial

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ABSTRACT

Background: Depression is a common disorder for which there are several treatments options including different psychological treatments. The aim of this study was to investigate the effects of internet-based interpersonal psychotherapy (IPT) for symptoms of depression in randomized controlled trial.

Methods: Following recruitment via advertisement a total of 113 participants with mild to moderate symptoms of depression were included and randomized to either a ten-week internet-based IPT with weekly therapist guidance or a waitlist control condition. The primary outcome was symptoms of depression measured weekly with the Montgomery Åsberg Depression Rating Scale (MADRS-S) and at pre- and post-treatment assessment with the Beck's Depression Inventory (BDI-II). Secondary outcomes were self-rated quality of life and symptoms of generalized anxiety disorder. We also measured therapeutic alliance and treatment credibility. Outcomes were evaluated with a latent growth curve model (for MADRS-S) and robust linear regression models (for the other measures). The trial was conducted during the Covid-19 pandemic in the spring of 2021.

Results: Significant differences favoring the treatment group were found on three of the four outcomes: BDI-II, quality of life ratings, and ratings of generalized anxiety. Between-group effect sizes for these outcomes were moderate (BDI-II, quality of life) or small (generalized anxiety). The latent growth curve model did not indicate a significant difference on the weekly MADRS-S ratings. Exploratory analyses did not show an association between therapeutic alliance, treatment credibility and outcome.

Limitations: Missing data at post-treatment was high in the treatment group (37 %), though the missingness was not significantly related to observed ratings at pre-treatment or estimated trajectories during the treatment. Few participants completed all modules. The Covid-19 pandemic situation may have affected both effects and dropout rates.

Conclusions: Internet-based IPT can lead to significant improvements, though the reductions in symptoms of depression were not consistent across the two measures used. Completion rates and dropout patterns suggest a need for improved acceptability.

Trial registration: The trial was preregistered at Clinicaltrials.gov (Identifier: NCT04721678). Registered January 2021.https://clinicaltrials.gov/study/NCT04721678

1. Introduction

Major depressive disorder continues to be a global burden, with estimates indicating that the disorder is a leading cause of disability worldwide with incidence rates that appear to increase (Herrman et al., 2022). The negative impact of major depressive disorder in society is not limited to persons who fulfil all diagnostic criteria for diagnosis, as subsyndromal symptoms (i.e., having some symptoms) also can have a negative impact on health and functioning (Herrman et al., 2022).

There are several alternative treatments of major depressive disorder and symptoms of depression, including antidepressant medication and different types and formats of psychological treatment/psychotherapy

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(Herrman et al., 2022). Recent meta-analytical findings indicate that psychological treatments lead to sustained long-term effects to a greater extent than available pharmacological options (Furukawa et al., 2021).

Different psychotherapy orientations of have found to reduce symptoms of depression, including cognitive behavioural therapy, brief psychodynamic psychotherapy, and interpersonal psychotherapy (Cuijpers et al., 2020). In addition to the traditional face-to-face format, many of these can be successfully administered via the internet (Andersson and Berger, 2021), which offers a flexibility and reach that can be advantageous as there still exists a substantial treatment versus demand gap (Thornicroft et al., 2017). Internet-based psychological treatments have been suggested to be an option with good acceptability among patients receiving treatment for depression (Hanson et al., 2016). However, not all forms of psychotherapy are currently adapted, tested or offered in this format, with internet-based cognitive behavioural therapy (ICBT) being the main orientation (Andersson, 2016). Expanding the range of psychological treatments available as guided internet-delivered self-help could be a way to expand evidence-based treatment options for clients with symptoms of depression. Having more than one way of delivering internet treatments could be of importance as clients may differ in what treatment orientations they prefer and accept (Cuijpers et al., 2021). Interpersonal psychotherapy (IPT) is an alternative given its efficacy (Cuijpers et al., 2016) and acceptability (Cuijpers et al., 2021) in the face-to-face format. Internet-based IPT for depressive symptoms has to our knowledge only been tested a few times with findings suggesting a similar effects as ICBT (Donker et al., 2013), including one pilot study in which internet IPT was blended with face-to-face meetings (van Schaik et al., 2023). There are also two previous controlled studies on internet IPT for social anxiety disorder (Dagöö et al., 2014) and loneliness (Käll et al., 2021). Additional development and tests of Internet-based IPT is therefore needed to determine if this treatment format can serve as a complement and alternative to the more common internet treatments (i.e., mainly different forms of CBT).

The aim of the current study was to evaluate the effects of therapist-supported internet-based IPT for symptoms of depression and major depressive disorder. We hypothesized that participants randomly assigned to the active IPT condition would have lower ratings of depressive symptoms at the posttreatment compared with a control group on a waitlist. We also investigated secondary outcomes of the IPT program, including quality of life and anxiety symptoms. Finally, we investigated treatment credibility and therapeutic alliance as predictors of outcome.

2. Methods

2.1. Design

The study was a randomized controlled trial with allocation to either a treatment group or a waitlist control group. Randomization was conducted using a true random number generator by an external party not involved in other aspects of the study. The treatment group received access to a 10-week treatment with weekly support from a therapist. The study was approved by the Swedish Ethical Review Authority (Dnr 2020-05757).

2.2. Recruitment and inclusion/exclusion

Recruitment took place during a two-week period in January 2021 during the Covid-19 pandemic. Recruitment material and advertisements were published on social media, in a national Swedish newspaper, and via websites covering IPT. Prospective participants were directed to a study website with information about the study. The application procedure included informed consent online. Following this step applicants filled in a series of screening questionnaires that were checked and eligible persons were called for a structured M.I.N.I telephone interview (Sheehan et al., 1998). This was followed by online meetings with the team during which the principal investigator (last author) was responsible for the final decision to include or exclude.

The inclusion criteria were a) a diagnosis of ongoing major depressive disorder according to the M.I.N.I. interview and/or at least a mild depression severity as indicated by ratings on either of the primary outcome measures ($\geq$ 13 points for MADRS-S, $\geq$ 14 points on BDI-II), b) 18 years or older, c) could devote time to the treatment during the ten week treatment period, d) could speak/write/read Swedish, e) access to the internet and a smartphone/computer. The exclusion criteria were a) severe/chronic psychiatric disorders in need of specialist psychiatry services (e.g., psychotic disorders, anorexia nervosa), b) change in psychotropic medication including dosage within the past three months or a planned change during the treatment phase, c) other ongoing psychotherapy, d) moderately severe/severe alcohol use or substance use disorder, ongoing self-harm, or suicidal plans.

2.3. Measures

2.3.1. Primary outcome measures

We used two questionnaires to measure symptoms of depression. The first one was the Beck Depression Inventory (BDI-II), which consists of 20 items measuring the cognitive, somatic, and emotional components of major depressive disorder. Ratings on each item are made on a scale from 0 to 4, with the total sum ranging between 0 and 80 points. Higher scores indicate more severe symptoms. The instrument has been shown to have good psychometric properties, including a high internal consistency and test-test reliability (Wang and Gorenstein, 2013). The second outcome measure used was the Montgomery-Åsberg Depression Rating Scale, self-rating version (MADRS-S). It consists of nine items rated on a seven-point Likert scale (from 0 to 6) measuring the presence and severity of symptoms of major depressive disorder. Sum scores can range from 0 (no symptoms) to 60 (severe symptoms). High internal consistency and sensitivity to change has been reported (Bondolfi et al., 2010). The reason for using two questionnaires was the need to use a briefer measure (i.e., MADRS-S) for weekly monitoring.

2.3.2. Secondary outcome measures

Self-rated quality of life was measured using the Brunnsviken Brief Quality of Life Inventory (BBQ) (Lindner et al., 2016). The 12 items included deal with 6 different life domains (e.g., work). The respondent is asked to indicate their satisfaction with each domain, along with a rating of how important they consider the domain to be. Ratings are made on a scale ranging from 0 to 4. Within each domain, the rating of importance is multiplied with the rating of satisfaction and the product of all life domains are then summed up for a sum between the lowest possible quality of life (0) and the highest possible (96). The questionnaire has been reported to have a good internal consistency and convergent validity to the Quality of Life Inventory (Lindner et al., 2016).

Symptoms of generalized anxiety were measured using the Generalized Anxiety Disorder 7-item scale (GAD-7). This instrument also has high internal consistency and test-retest reliability (Spitzer et al., 2006).

2.3.3. Reliable change, reliable deterioration, response rates, and symptom remission

We also evaluated four categorical outcomes: Reliable change, reliable deterioration, treatment response (the proportion of the participants experiencing a $\geq$50 % reduction in symptom levels), and the proportion of participants moving from a clinical to non-clinical symptom level. Reliable change and reliable deterioration were calculated with the RCI formula (Jacobson and Truax, 1991). We used the reported test-retest reliability coefficients of 0.92 (for the BDI-II) and 0.78 (for MADRS-S). The cut-off values for the measures were $\pm$9 for the MADRS-S and $\pm$7 for the BDI-II. Non-clinical symptom levels were operationalized as a score below the threshold of mild depression, i.e., $>$ 13 points for MADRS-S and $>$14 points for the BDI-II.

2.3.4. Other measures

Some additional measures were administered as part of the study. Participants in the treatment group completed the Credibility and Expectancy Questionnaire (Devilly and Borkovec, 2000) and the 12-item version of the Working Alliance Inventory (Andrusyna et al., 2001) during the third treatment week. They also completed the Client Satisfaction Questionnaire-8 item scale (Attkisson and Zwick, 1982) at posttreatment.

2.3.5. Treatment

The treatment was developed for this study. It was partly informed by two previous programs developed by our group (Käll et al., 2021; Dagöö et al., 2014), but was a new treatment. A detailed description of the treatment is provided in Appendix A in the Online Supplementary Materials. Briefly, the treatment spanned over 10 weeks and was divided into 10 modules (with 27 modules created in total). The modules included psychoeducation, video clips (recorded for the study), and exercises in order to convey an understanding of how depressive symptoms arise and how to deal with them according to an IPT rationale. The first four modules made up the IPT assessment phase. During the last of these, the participant could choose an interpersonal focus area for the rest of the treatment. A module containing general IPT strategies was made available for all participants who choose a focus as part of the fourth module. Participants received weekly feedback on the exercises and reflections on a fixed day each week from a final-year clinical psychology MSc program student with A-level IPT training in addition to basic clinical training. Participants had the option to contact their therapist when needed. The control group received information that they would get access to the treatment after the initial treatment phase had finished. Participants on the waitlist could contact a staff member not acting as a therapist for the treatment group in case of rapid deterioration. It was also possible to assist and help participants seek regular care. However, this did not happen during trial.

2.4. Statistical analyses and power calculation

The analyses were conducted using SPSS, version 28 or Mplus, version 8.4. The intention-to-treat principle was applied, meaning that data from all randomized participants were included. Confidence intervals are reported at 95 %. The alpha level was set at 0.05. Across the analyses, condition was dummy coded as 0 = waitlist, 1 = treatment group. Analyses with two categorical variables were calculated using Fisher's exact test. Outcomes with two timepoints (i.e., BDI-II, BBQ, and GAD-7) were evaluated using a linear regression model comparing the two groups at post-treatment while controlling for baseline scores (an ANCOVA model with the added benefit of missing data management using full information maximum likelihood estimation). Estimation was made using the MLR option in Mplus to provide non-normality robust standard errors. For the outcome with weekly measurements (MADRS-S), we instead specified a conditional latent growth curve model and evaluated the difference in rate of change during the treatment period. The model was specified iteratively to provide the best fit possible in accordance with guidelines for the fit indices (Hu and Bentler, 1999). The final model estimated a linear and quadratic effect of time, free estimation of residual variances, and no correlation between intercept and slope. As with the models described above, the MLR option was used. Maximum likelihood estimation produces unbiased estimated under the Missing at Random assumption (Enders, 2010). Given the disparity between the conditions in participants completing the post-treatment assessment, we also completed a pattern mixture model (Enders, 2011). This was done by adding a dummy-coded, time-invariant predictor (0 = complete data at posttreatment, 1 = missing data at posttreatment) to the original latent growth curve model. The results from the MAR models are described in the *Results* section with the pattern mixture model described under the heading *Sensitivity analysis*. Between-group effect sizes were calculated with the estimated means divided by the pooled standard deviation at baseline (i.e., Cohen's *d*).

A power calculation was conducted using the software G*Power (Faul et al., 2007). The calculation was two-tailed, based on a 1:1 randomization ratio, an alpha level of 0.05 and power of 0.8. The aim was to have enough power for a between-group effect of 0.60, which was considered a relevant threshold given that the average effect of IPT (Cuijpers et al., 2011) and internet-based interventions (Andersson et al., 2019) are both found around this estimate as compared to passive control groups. Given these parameters 90 participants would need to be included in the study. To account for a 25 % dropout rate, the goal was to recruit 113 participants. Exploratory analyses regarding treatment credibility, working alliance and outcome (using change scores) were calculated using Pearson correlations.

3. Results

A CONSORT flowchart of the participants is presented in Fig. 1. Demographic characteristics for the two groups are described in Table 1 and diagnoses at baseline in Table 2.

3.1. Attrition and missing data

In total, nine participants discontinued participation during the treatment phase. Seven were in the treatment group and two in the control group. The proportion of participants who withdrew from the study did not differ significantly between the groups, Fisher's exact test $p = .162$. For the weekly measurements with MADRS-S (including the post-treatment assessment), 71 % of the questionnaires were completed. For the post-treatment assessment of the other outcomes, 78 % of the participants provided complete data. At this timepoint, the control group was significantly more likely to provide data than the treatment group, Fisher's exact test $p < .001$. Those who provided data at the post-treatment assessment did not differ significantly from the participants who did not with regards to their ratings at baseline, range of *p*-values = .188 to .848.

3.2. Activity statistics, credibility, alliance, treatment quality and therapist resources

A total of 24 participants (42.1 %) in the treatment group accessed all 10 regular modules. The average number of modules accessed was 7.14 (SD = 3.90). Ten participants (17.5 %) completed all modules with an average completion of 5.31 modules (SD = 3.54). Detailed activity statistics are presented in Appendix B of the online supplement. In Table 3 mean results on treatment credibility, working alliance, client satisfaction, messages sent and required therapist time per module are presented. There were no statistically significant associations between change scores on the MADRS and CEQ $r(27) = 0.08$, n.s, or the WAI ($r(27) = 0.01$, n.s. Similar results were found for the change in BDI scores, with non-significant assocations for the CEQ $r(27) = 0.02$, n.s. and the WAI $r(27) = 0.00$, n.s.

3.3. Primary outcomes: symptoms of major depressive disorder

Observed means for all measurements at baseline and at post-treatment can be seen in Table 4. The regression model for the BDI-II indicated a significant difference between the two groups after the treatment phase with the treatment group scoring significantly lower, $b = -4.89$ [95 % CI −8.71, −1.07], SE = 1.95, $p = .012$, $d = -0.61$ [95 % CI −0.12, −1.09].

Full parameter estimates for the growth curve model is presented in Appendix C in the Online Supplementary Materials. The model investigating change in depressive symptoms suggested significant heterogeneity in initial ratings, $b = 29.85$ [95 % CI 20.30, 39.40], SE = 4.87, $p < .0001$, linear rate of change, $b = 2.72$ [95 % CI 1.44, 3.99], SE = 0.65, $p < .0001$, and quadratic rate of change, $b = 0.013$ [95 % CI 0.006,

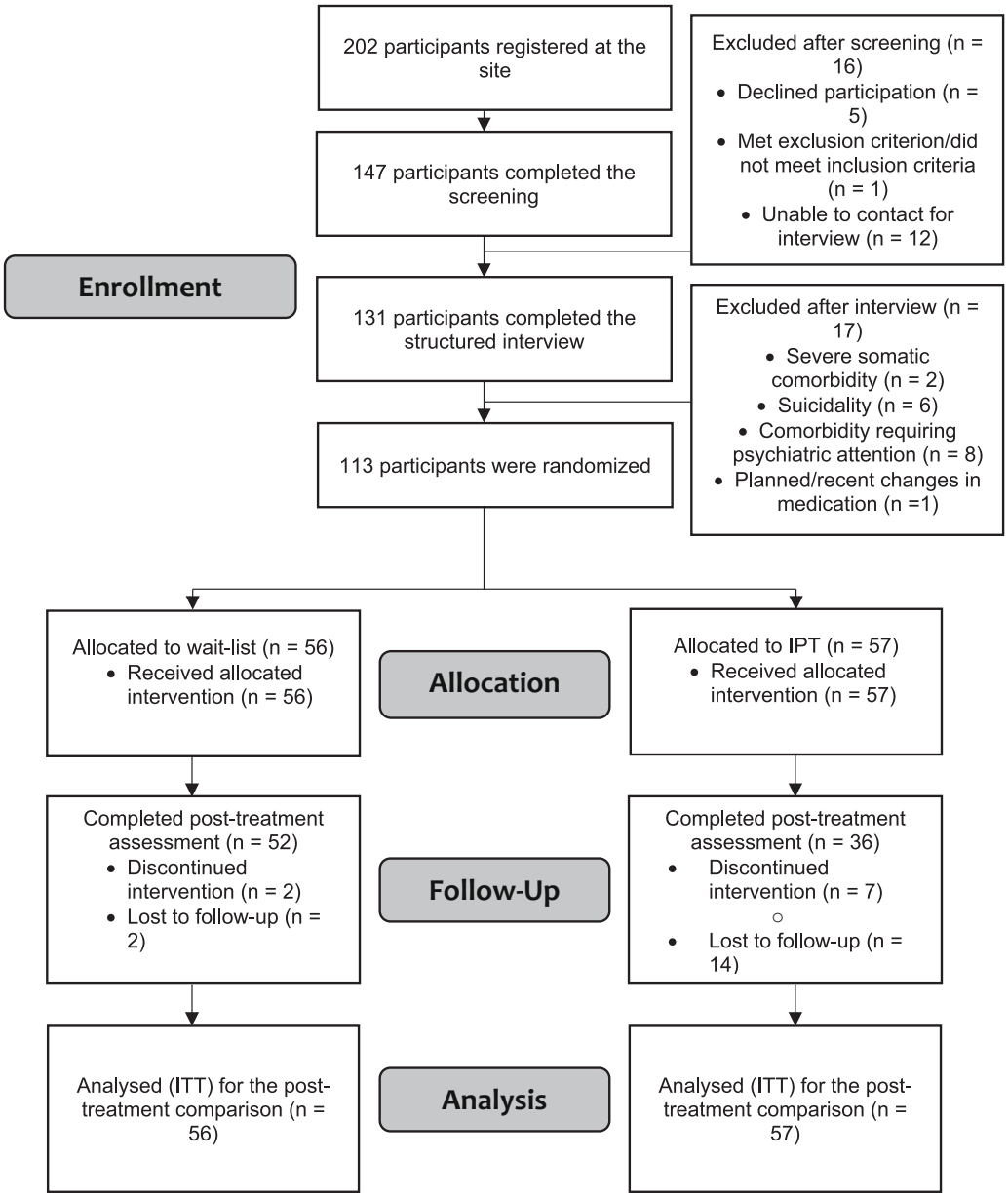

Fig. 1. Flowchart of the recruitment and assessments during the study.

0.021], SE = 0.004, $p < .0001$. For total change in symptoms during the treatment phase, the two groups did not differ significantly on this measure, $b = -0.37$ [95 % CI −3.64, 2.91], SE = 1.67, $p = .827$, $d = -0.05$ [95 % CI −0.53, 0.42].

3.4. Secondary outcomes: quality of life and symptoms of generalized anxiety

The regression model for the quality-of-life ratings indicated that the treatment group had significantly higher ratings at the posttreatment timepoint, $b = 9.24$ [95 % CI 2.24, 16.24], SE = 3.57, $p = .010$, $d = 0.60$ [95 % CI 0.13, 1.06]. For symptoms of generalized anxiety, the ratings in the treatment group were significantly lower than in the control group, $b = -2.13$ [95 % CI -3.99, −0.27], SE = 0.95, $p = .025$, $d = -0.43$ [95 % CI −0.81, −0.05].

3.5. Diagnostic status, reliable change, remission, and treatment response at post-treatment

Counts and percentages of participants classified as reliably changed, deteriorated and in remission are reported in Table 5. Based on the major depressive episode module of the MINI 7.0, 11 out of the 35 (31 %) responding participants in the treatment group met the criteria for major depressive disorder at posttreatment. For the control group, 21 out of the 42 participants (50 %) responding to the post-assessment phone call met the criteria for diagnosis. This difference was not statistically significant according to Fisher's exact test, $p = .111$. The two conditions did not differ significantly with regards to proportion of participants undergoing reliable change for neither on the BDI-II, $p = .132$, or the MADRS-S, $p = .079$. This was also the case for reliable deterioration on the BDI-II, $p = 1$, and the MADRS-S, $p = 1$. Similarly, the groups did not differ significantly with regards to remission rates for neither BDI-II, $p = .069$, nor MADRS-S, $p = .069$. In terms of a ≥50 % reduction in symptom levels, the groups did not differ significantly on the MADRS-S, $p = .093$, whereas they did on the BDI-II, $p = .023$ in favor

Table 1
Demographic characteristics of the sample (n = 113).

	IPT (n = 57)		Waitlist (n = 56)	
	M	SD	*M*	*SD*
Age	41.19	15.13	42.41	15.01
Categorical	*n*	%	*n*	%
Sex				
Female	44	77.2	45	78.8
Male	13	22.8	11	21.2
Marital status				
Single	17	29.8	17	30.4
Married	15	26.3	16	27.4
In a relationship (cohabiting)	14	25.6	11	19.6
In a relationship (not cohabiting)	8	14.0	5	8.9
Divorced	13	19.1	5	14.7
Widow/Widower	8	11.8	1	2.9
Living with				
Alone	19	33.3	21	37.5
With family	15	26.3	21	37.5
With friends	3	5.3	0	0
With partner	19	33.3	13	23.2
Other communal living	1	1.8	1	1.8
Highest attained educational degree				
Primary school	1	1.8	3	5.4
Secondary school	26	45.6	12	21.4
College/University	24	42.1	25	44.6
Other vocational education	5	8.8	12	21.4
Postgraduate degree	1	1.8	4	7.1
Occupational status				
Student	12	21.1	11	19.6
Employed	36	63.2	24	42.9
Unemployed	1	1.8	6	10.7
Parental leave	0	0	2	3.6
Retired	5	8.8	5	8.9
Sick leave (< 3 months)	1	1.8	1	1.8
Sick leave (> 3 months)	2	3.5	5	8.9
Other	0	0	2	3.6

Table 2
Diagnoses at the baseline assessment as indicated by the MINI 7.0 structured interview.

	IPT (n = 57)		Control (n = 56)		Total (n = 113)	
	n	%	*n*	%	*n*	%
Major depressive disorder	38	63.3	34	64.2	72	63.7
Bipolar disorder	3	5.0	2	3.8	5	4.4
Panic disorder	5	8.3	5	9.4	10	8.8
Agoraphobia	7	11.7	2	3.8	9	8.0
Social anxiety disorder	8	13.3	8	15.1	16	14.2
OCD	7	11.7	4	7.5	11	9.7
PTSD	8	13.3	6	11.3	14	12.4
Alcohol use disorder	8	13.3	4	7.5	12	10.6
Binge eating disorder	1	1.7	1	1.9	2	1.8
Generalized anxiety disorder	11	18.3	11	20.8	22	19.5

Table 3
Ratings of treatment credibility and working alliance measured during the third week of the treatment phase (n = 50). Client Satisfaction measured at post-treatment and total number of messages sent and required therapist time per module.

	M (SD)
CEQ	32.20 (9.59)
WAI-12	49.70 (13.23)
CSQ	23.64 (5.13)
Messages sent to the therapist	5.26 (5.40)
Therapist time per completed module (minutes)	24.90 (11.17)

CEQ = Credibility and Expectancy Questionnaire; WAI-12 = Working Alliance Inventory 12; CSQ = Client Satisfaction Questionnaire.

Table 4
Observed means for the outcome measures at the pre- and post-treatment timepoints.

	Pre-treatment		Post-treatment	
Outcome measure	*M* (SD)	*n*	*M* (SD)	*n*
BDI-II				
WL	26.80 (8.88)	56	22.29 (10.77)	52
IPT	24.82 (7.16)	57	16.25 (10.44)	36
MADRS-S				
WL	24.29 (6.61)	56	17.77 (8.22)	52
IPT	22.12 (5.86)	57	14.75 (9.32)	36
BBQ				
WL	32.50 (15.86)	56	38.10 (18.78)	52
IPT	31.84 (15.47)	57	45.00 (19.89)	36
GAD-7				
WL	10.34 (5.34)	56	8.79 (5.84)	52
IPT	9.98 (4.55)	57	6.08 (4.67)	36

BDI-II: Becks Depression Inventory, MADRS-S = UCLA Loneliness Scale, Version 3; BBQ = Brunnsviken Brief Quality of Life Scale; SIAS = Social Interaction Anxiety Scale; PHQ-9 = Patient Health Questionnaire 9; GAD-7 = Generalized Anxiety Disorder 7-item scale.

Table 5
Counts and frequencies of participants classified as reliably improved, reliably deteriorated, in remission, and responding to treatment.

	IPT (n = 36)				Waitlist (n = 52)			
	BDI-II		MADRS-S		BDI-II		MADRS-S	
	n	%	*n*	%	*n*	%	*n*	%
Reliably improved	20	55.6	18	50.0	20	38.5	16	30.8
Reliably deteriorated	4	11.1	2	5.6	5	9.6	2	3.8
In remission	17	47.2	17	47.2	14	26.9	14	26.9
Responding to Treatment	14	38.9*	14	38.9	8	15.4	11	21.2

Note. See definitions in the section Reliable change, reliable deterioration, response rates, and symptom remission.
* $p < .05$ compared to the waitlist according to Fisher's exact test.

of the treatment group.

3.6. Sensitivity analysis

A pattern mixture analysis was conducted for the weekly measurements of MADRS-S to investigate differences in the estimated trajectories between the participants who completed the posttreatment assessment and those who did not. The groups did not differ significantly in initial ratings, $b = 1.38$ [95 % CI −2.53, 3.59], SE = 1.54, $p = .368$, linear rate of change, $b = 0.01$ [95 % CI −0.95, 1.77], SE = 0.72, $p = .984$, or quadratic rate of change, $b = 0.05$ [95 % CI −0.12, 0.14], SE = 0.07, $p = .412$, suggesting that the missingness was not related to significant differences in the participants' estimated trajectories.

4. Discussion

The aim of the study was to investigate the effects of clinician-supported internet-based IPT targeting depressive symptoms. Overall, the treatment group showed statistically significantly changes at post-treatment relative to the waitlist on three of the four outcomes measures, including ratings of depressive symptoms measured using the BDI-II. However, the results also bring into question the usefulness of internet-based therapist supported IPT and calls for further improvements.

In relation to the aim of the study with regards to reduced symptoms of depression, the findings are somewhat inconclusive. The reduction observed on the BDI-II with a corresponding effect size of $d = -0.61$ is largely in line with earlier studies on IPT (Cuijpers et al., 2016) and internet-based interventions for symptoms of depression (Moshe et al.,

2021). However, the same effects were not found on the MADRS-S. While previous studies on the association between the two measures suggest that they are highly correlated, some differences have been noted. The BDI-II arguably measures maladaptive personality traits relevant for depression, while the MADRS-S focuses more on the core symptoms according to the description in diagnostic manuals (Svanborg and Asberg, 2001). Additionally, BDI-II measures a cognitive dimension that might not be captured adequately by other more diagnosis oriented self-report or clinician-administered measures (Uher et al., 2008). Using the diagnostic interview with the diagnostic criteria as a reference, the trend was towards the treatment group exhibiting a lower proportion of still diagnosed participants at post-treatment, but the difference was not statistically significant. This is in line with the estimates for the MADRS-S, but not with the results on the BDI-II. Taken together, the findings suggest that the treatment helped reduce the cognitive symptoms of depression, but that these improvements were not found to the same extent when diagnostic criteria dominate the construct measured.

The findings on the quality of life measure BBQ showed improvements with an effect size of $d = 0.60$, which is somewhat larger than in previous ICBT trials (Maj et al., 2023). This finding suggests that the benefits extend beyond the primary outcomes (Păsărelu et al., 2017). Similarly, though the effect size for the GAD-7 was slightly smaller ($d = -0.43$), the significantly lower ratings of generalized anxiety in the treatment group also suggests secondary improvements.

The exploratory analyses regarding treatment credibility CEQ and the WAI were not statistically significant which was unexpected given the previous literature on expectancies (Pontén et al., 2024) and working alliance (Kaiser et al., 2021) in internet treatments mainly including CBT trials. However, an association between alliance and outcome has also been reported internet trials based on psychodynamic psychotherapy (Lindegaard et al., 2020).

The strengths of the study include the randomized controlled design, and the involvement of a D-level IPT therapist/supervisor who helped create a credible and theoretically sound treatment. Another strength is the fact that the included participants to a somewhat greater extent than usual had a lower educational level, with <50 % having university education (usually a higher percentage of 70 % or higher in previous internet treatment depression trials on adults).

However, the results should also be interpreted with the relatively large amount of missing data in the treatment group in mind. Though the sensitivity analysis and the test of baseline differences did not show any significant differences between completers and non-completers of the post-treatment assignment, the missing data taken together with the relatively low average number of completed modules indicate that the acceptability of the intervention was not optimal. While the collected data does not allow us to draw conclusions about why this was the case, an investigation of this could be important to improve future iterations of the treatment program.

Another limitation was that the diagnostic assessment at post-treatment was not conducted by a blinded assessor. The data from the diagnostic evaluations should be interpreted with caution even if blinding of assessors in psychotherapy trials can be difficult and rarely implemented (Juul et al., 2021).

The lack of long-term follow-up data serves as an additional limitation. The long-term effects of the treatment are of interest as some studies have reported a delayed effect of IPT (Fairburn et al., 2015). Such a trend was also observed in a previous trial of internet-based IPT for loneliness (Käll et al., 2021). The estimates from the growth curve model for the MADRS-S ratings (which can be seen in the Online Supplementary Materials) also point to different trajectories with the waitlist condition having a steep initial decrease in symptoms but an increase towards the end, and the treatment group showing a slow initial decline that grow steeper over time. It remains unknown whether this trend continued over time, but that kind of data would be of interest in evaluating the intervention. Future research could also test internet-based IPT against other internet-delivered psychological treatments such as CBT and psychodynamic treatment as our previous studies on loneliness (Käll et al., 2021) and social anxiety disorder (Dagöö et al., 2014) suggested that IPT was inferior even if the differences were not large.

To conclude, the results suggest that internet-based IPT can help reduce symptoms of major depressive disorder. Improvements were also seen on secondary outcome measures. Treatment credibility and therapeutic alliance were not associated with outcome. The activity statistics and the relatively high proportions of missing data suggest a need for continued work in making the treatment acceptable and less demanding for participants.

CRediT authorship contribution statement

Anton Käll: Writing – original draft, Project administration, Methodology, Formal analysis. **Malin Bäck:** Writing – review & editing, Supervision, Project administration, Conceptualization. **Olivia Fahlroth:** Writing – review & editing, Project administration, Data curation. **Erik Ekeflod:** Writing – review & editing, Project administration, Investigation, Data curation. **Arvid Lundberg:** Writing – review & editing, Project administration, Investigation, Data curation. **Nils Viberg:** Writing – review & editing, Project administration, Investigation, Data curation. **Gerhard Andersson:** Writing – review & editing, Writing – original draft, Supervision, Project administration, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jad.2024.09.171.

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