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RESEARCH PAPER

Internet delivered guided cognitive behavioral self-help for panic disorder: An open trial and benchmarking study

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Abstract An open trial of a therapist-guided internet cognitive-behavioral therapy (ICBT) for panic disorder with and without agoraphobia (PD/A) was conducted. Ninety adults diagnosed with PD/A were treated using ICBT adapted from a face to face (FTF) protocol. Results were benchmarked against two FTF samples, one at the same research site using the same protocol and another from a large cognitive-behavioral therapy (CBT) study. In addition, effects were compared to mean aggregated estimates from four meta-analyses. Attrition rates and therapist time were also examined to facilitate cost-effectiveness analyses and inform policy makers. Both full intent-to-treat and completer samples were used when analyzing data. Overall, results suggest that within-group effects for ICBT (0.88 to 1.7) are similar to the effects found in the benchmarking samples and to effects across meta-analytic studies. Effects were larger for symptoms assessed by an independent evaluator compared to self-report measures. Treatment gains continued to increase 3 months after post treatment and were maintained at 6 month and 1 year follow-up. However, attrition rates in ICBT were twice as large (46%) compared to the FTF sample, possibly due to a more conservative definition of attrition used here compared to previous reports. Therapist time in ICBT was reduced by a factor of three (14 min/week)

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compared to FTF, suggesting that treatment effects can be maintained even when reducing therapist time. Taken together, these findings suggest good short and long-term efficacy and time efficiency along with greater attrition for ICBT, allowing for dissemination and enhancing accessibility to quality, evidence-based treatment in the community.

Cognitive behavioral therapy (CBT) is considered a first line of evidence-based treatment for panic disorder with or without agoraphobia (PD/A; e.g., NICE, 2019). However, as with most mental disorders, only approximately 10% receive adequate care (Wittchen et al., 2011) due to several causes: limited availability, lack of access, lack of knowledge, restricted resources, stigma and shame (e.g., Ebert et al., 2018). To bridge the above gaps, many propose increasing evidence-based treatments by providing such treatments at different levels of intensity and in a variety of formats (e.g., Layard & Clark, 2014). One increasingly used direction is the implementation of therapist-guided internet cognitive behavioral therapy (ICBT) which has the potential to offer high quality, evidence-based interventions at low cost to a broad clientele (Andersson et al., 2019). However, most studies on ICBT have not benchmarked their results to face-to-face (FTF) treatments.

ICBT for PD/A has been found to be effective when compared to inactive controls (see meta-analyses: Polak et al., 2021 $g = 0.89$; Stech et al., 2020 $g = 1.22$), with between-group effects varying considerably ranging from 0.24 to 2.82 (Stech et al., 2020). Considerable variation also emerges when examining within-group effects: 0.65 to 1.92 (Polak et al., 2021), with larger effects reported for efficacy compared to effectiveness studies when considering panic symptoms but not agoraphobia symptoms (Stech et al., 2020). Polak et al. (2021) reported that on average 49.56% of patients showed clinical significant remission, yet again with considerable variability ranging from 33% to 81%. An even larger range (26% to 92%) has been reported in a recent review by Domhardt et al. (2020). Differences are likely due to different criteria for remission as well as differences in treatment protocols. Three studies to date have directly compared FTF CBT and ICBT via randomized trials (Bergström et al., 2010; Carlbring et al., 2005; Kiropoulos et al., 2008) with no significant differences reported (Carlbring et al., 2018). However, randomized trials prevent individuals who are only willing to participate in one condition to participate, and do not take into account patient preferences thereby limiting external validity. Moreover, symptom severity, percentage of initial uptake, and country of study have been suggested as possible moderators for effect variability when treating PD/A via ICBT (Polak et al., 2021). Indeed, given that acceptability of internet intervention may be influenced by culture, examination of these interventions in various countries is of great importance. To date, no study has examined ICBT for PD/A in Israel, where internet usage is very high (86.85%; Central Bureau of Statistics, 2019). Thus, we present an open trial study in Israel that aimed to evaluate therapist assisted ICBT for PD/A and to benchmark treatment effects to data of two open trials of FTF CBT for PD/A.

In general, ICBT has been found to be cost-effective (e.g., Hedman et al., 2012). However, cost-effectiveness depends on variables, which vary across studies, limiting generalization of recommendations across treatment settings and countries. One such variable is therapist time which is the major cost of therapy across most settings. Maintaining outcomes while reducing time can be important to policy makers. To date, based on Polak et al. (2021), average total therapist time per patient in existing guided ICBT for PD/A ranges from minimal ($M = 6$ min; Allen et al., 2016) to intensive ($M = 376$ min; Richards et al., 2006). Even for the upper boundary, therapist time is still reduced by half compared to FTF psychotherapy (assuming 12 60-minute sessions).

A second, important variable is rate of attrition. If attrition rates in ICBT for PD/A are higher compared to FTF, and dropouts need additional treatment, cost-effectiveness may be compromised. Attrition rates for FTF CBT have been estimated at 9.28% and 15.10% (Sánchez-Meca et al., 2010 and Mitte, 2005 respectively). Higher average attrition rates have been reported for ICBT, though rates likely depend upon methodological considerations including definition of dropout. Defined by completion of intervention modules, Domhardt et al. (2020) estimated the average dropout rate at 21% (range 5%-50%). Similarly, defined by having a post-treatment assessment, Polak et al. (2021) reported an estimate of 18% (range 5%—43%).

The current study presents data regarding an internet adaptation of a FTF CBT protocol for PD/A, adapted with the intention of dissemination to the Israeli public health sector. Over four years, 90 patients diagnosed with PD/A were treated via ICBT. Data from FTF treatment using the same protocol in the same laboratory was used as the main benchmark for evaluating the effects of the ICBT version. A second benchmark from a large, open FTF CBT treatment study for PD/A (Aaronson et al., 2008) was also used to enhance comparability across countries. In addition, treatment effects were compared to aggregated estimates driven from four meta-analyses reporting within-group effect sizes (Hedman et al., 2012; Norton & Price, 2007; Stech et al., 2020; Stewart & Chambless, 2009). Attrition rates and therapist time were examined and compared to facilitate a health economic assessment of factors critical to public mental health policy decisions.

Method

Participants

Ninety adults diagnosed with PD/A participated in a preregistered (clinicaltrials.gov NCT04659577) open trial from 2016-2019 examining uptake and adherence to ICBT at The

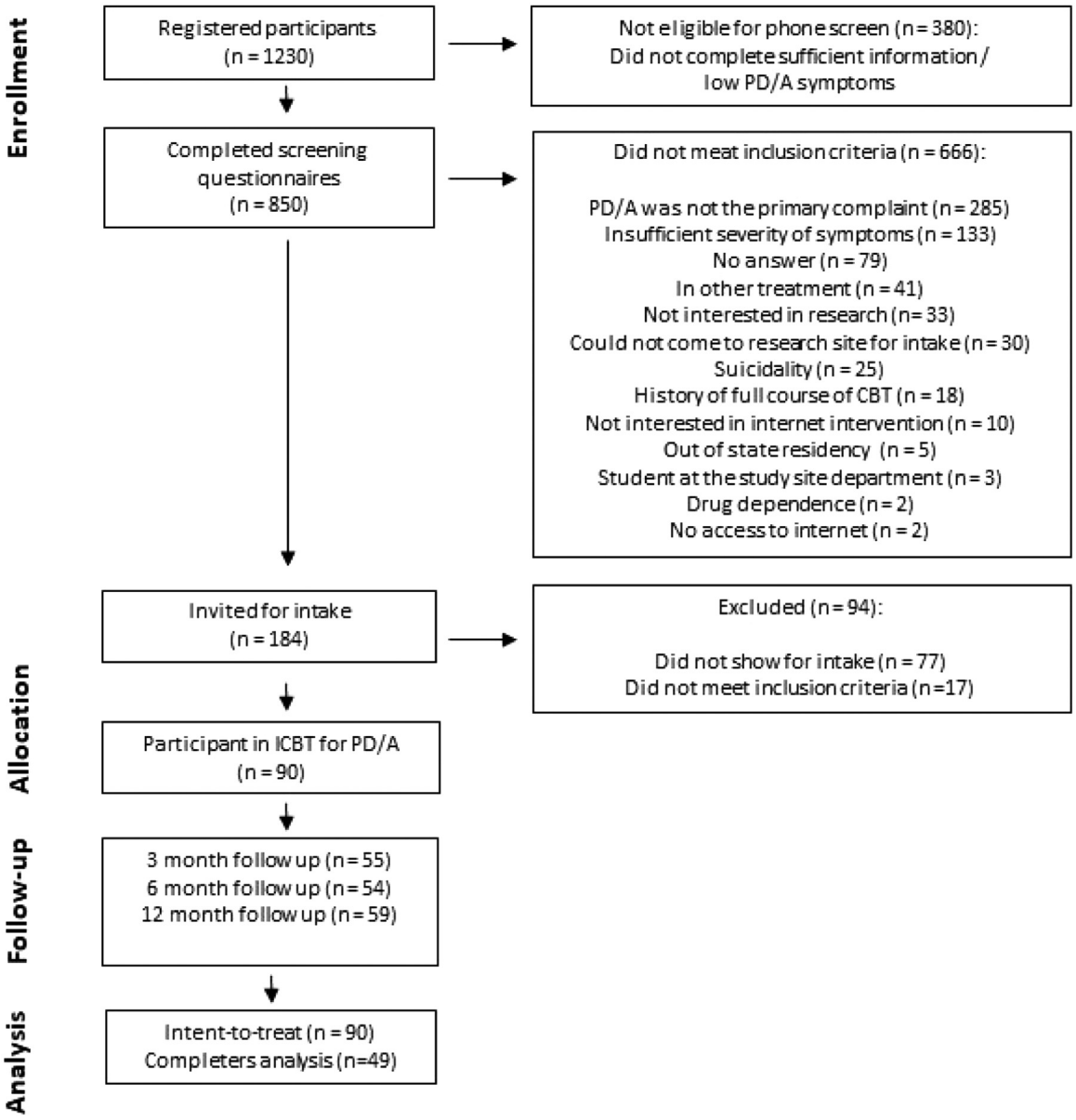

Figure 1 CONSORT flow chart designating number of participants at each stage of treatment: enrollment, allocation, follow-up and analysis.

Hebrew University of Jerusalem. A CONSORT flow chart designating the enrollment process is provided in Fig. 1. Inclusion criteria which were assessed via an independent evaluator: primary DSM-5 diagnosis of PD/A according to the Mini International Neuropsychiatric Interview 7.0 (MINI 7.0; Sheehan et al., 1998), $\geq$ 10 on the Panic Disorder Severity Scale—Independent Evaluator (PDSS-IE; Shear et al., 1997), $\geq$ 18 years old, not in concurrent therapy, and no history of a full course of CBT for PD/A. Evaluations were recorded and 20 interviews were randomly examined to determine inter-rater reliability. Both the PDSS-IE score (ICC1: .98, CI [.95; .99]) and PD/A diagnosis (100% agreement) were found to have excellent reliability (Koo & Li, 2016). Patients taking a stable dose of medication for two months prior to treatment could participate provided that they did not increase doses during treatment. Exclusion criteria included a history of psychosis or mania, recent history of substance abuse or dependence, or current suicidal ideation. Descriptive statistics of demographic variables of our sample are presented in Table 1. The university ethics board approved the study and all participants signed informed consent.

Treatment

Treatment was an internet version of CBT for PD/A based on Craske and Barlow (2007) with elaborations from Huppert and Baker-Morissette (2003), with internet considerations and design taken from Ebenfeld et al. (2014, 2021) and Carlbring et al. (2001). Careful consideration was taken to generate the internet version as identical as possible to the FTF treatment protocol implemented in previous studies at the same site (Halaj et al., 2019; Strauss et al., 2019;

Table 1 Descriptive statistics for demographic variables of the ICBT sample.

Females (%)	66%
Age M (SD)	38.13 (11.26)
Education M (SD)	14.66 (2.26)
Family status (%)	
Single	41%
Married	48%
Divorced	9%
Widowed	2%
Comorbidity (%)	
Depression	20%
Obsessive-compulsive disorder	9%
Social anxiety	19%
Post-traumatic stress disorder	9%
General-anxiety disorder	40%
On medication (%)	44%

Weiss et al., 2014; Zalaznik et al., 2019; Zlotnick et al., 2020) and was intended as the main benchmark for evaluation. Treatment included six modules containing written text, worksheets and videos:

1) introduction and initial psychoeducation (1 week);
2) further psychoeducation and creating an idiosyncratic model (2 weeks);
3) cognitive restructuring (2 weeks);
4) interoceptive exposure (3 weeks);
5) in vivo exposure combined with interoceptive exposure (4 weeks);
6) summary and relapse prevention (1 week).

All modules included weekly assignments. Therapists assigned each module after completion of the previous one and supported patients via asynchronously bidirectional text exchanges. These exchanges were initiated by therapist after reviewing the patient worksheets or by the patients when clarification and support was needed. The minimal recommended treatment length was 13 weeks (following the FTF treatment protocol). However, to mimic dissemination in the community, actual length was flexible and dependent on patient needs. Additional time was allowed according to clinical judgment, and patients at risk for dropout (e.g., did not respond to messages, did not fill worksheets) were encouraged to return to the program and offered an extension to complete program assignments. Patients were encouraged first by messages, but also by phone if necessary (e.g., if patient failed to login). The mean length of treatment was 17.67 weeks (SD = 7.84) for the total sample. Treatment length for completers, defined as patient who completed module 5, was 20.49 weeks (SD = 5.18). To complete a module active participation was required. To be considered an active participant patients were required to login and exhibit at least minimal engagement with module material, which was monitored by the module worksheets and text communications with the therapists. Therapists were eight doctoral students who were already trained and experienced with FTF CBT for PD/A and were supervised by the last author.

Benchmark samples and meta-analyses

Treatment effects were benchmarked to two samples and four meta-analyses. First, we compared our results to a FTF treatment sample (n = 54), treated at the same site, with an equivalent protocol (used for creating the online version) from 2008—2020. This sample has the advantage of being generated from a partially shared sample frame, supervised by the same supervisor, with similar inclusion and exclusion criteria. The sample was 61% female with a mean age of 32.6 (SD = 9.78). The mean length of treatment was 10.39 sessions (SD = 2.79) spanning over 13.26 weeks (SD = 4.63). Treatment length for completers, defined as patients who participated in *in-vivo* exposure (introduced after cognitive restructuring and interoceptive exposure), was 11.69 sessions (SD = 0.78) spanning over 15.16 weeks (SD = 2.81). The second benchmark sample was from a large FTF CBT treatment study for PD/A (n = 383; Aaronson et al., 2008). This sample was 65% female with a mean age of 37 (SD = 11). In addition, we compared the results to four meta-analyses reporting within-group effect sizes (Hedman et al., 2012; Norton & Price, 2007; Stech et al., 2020; Stewart & Chambless, 2009).

Measures

The Panic Disorder Severity Scale—Independent Evaluator (PDSS-IE; Shear et al., 2001) was the primary outcome administered by an evaluator, blind to treatment progress, pre- and post-treatment and follow-up (3-months, 6-months and 1-year). In addition, participants completed four self-report measures at pre- and post- treatment and follow-up: The Sheehan Disability Scale (SDS; Sheehan et al., 1996), the Panic Disorder Severity Scale—Self-Report (PDSS-SR; Houck et al., 2002), the Anxiety Sensitivity Index (ASI-3; Taylor et al., 2007) and the Mobility Inventory for Agoraphobia (Chambless et al., 1985). The last three measures (PDSS-SR, ASI and MI) were also administered weekly throughout the treatment. Therapist time was measured in the ICBT sample by therapists' reports of time spent per patient after each module. In the same site FTF benchmark sample, therapist time was derived from the length of video recordings of treatment sessions.

Statistical Analyses

Raw data from the ICBT sample and both FTF benchmark samples were examined using the same linear mixed-effects models (LME) via the ''nlme'' package version 3.1 in R (Pinheiro et al., 2016). Models were adjusted for repeated measures with restricted maximum likelihood estimation (REML), which is robust for handling missing data (Shin et al., 2017), estimating random intercepts and slopes at the patient level. Both full intent-to-treat and completer samples were examined. Effect sizes (Cohen's *d*) were calculated based on estimated pre- and post-treatment means and standard deviations derived from the LME models. In addition, we determined the number of patients achieving reliable change and end-state functioning by calculating the percentage of participants who recovered, improved reliably, or did not exhibit a reliable change. Following Furukawa et al. (2009) and Shear et al. (2001), clinical levels

of PD were defined by cut-off scores ≥ 8 on the PDSS (i.e., < 8 were considered in remission). When calculating the reliable and clinically significant change index (Jacobson & Truax, 1991), pre-treatment standard deviations were used. Test-retest reliability estimates were based on existing estimates from Shear et al. (2001; $\alpha = 0.71$) for the PDSS-IE and from Houck et al. (2002; $\alpha = 0.81$) for the PDSS-SR.

Results

Attrition

The average number of completed modules was 4.05 (range = 1–6). Forty-one participants (46%) dropped out of ICBT, considerably higher than the benchmark samples: 22% and 19% in our same-site FTF sample and in Aaronson et al. (2008) respectively. Attrition in our ICBT sample was greater than attrition reported in meta-analyses (Domhardt et al., 2020: 21%; Polak et al., 2021: 18%).

Effectiveness

ITT (intent-to-treat) analysis

Table 2 presents estimated marginal means, standard deviations, change slopes and effect sizes for all outcome measures. ICBT was effective in reducing PD symptoms according to within group effect sizes: $PDSS-IE = 1.54$ and $PDSS-SR = 0.88$. Similar large effect sizes were found for all other outcome measures: ASI ($d = 1.00$), MI ($d = 0.83$) and the SDS ($d = 0.72$). In terms of weekly change, on average clients displayed a significant reduction of .24 points on the PDSS-SR for every week in the treatment program $\left(t_{(1118)} = -5.28, p < .001\right)$. Weekly reduction on the ASI and MI were 0.64 $\left(t_{(1118)} = -6.67, p < .001\right)$ and 0.03 $\left(t_{(1118)} = -5.97, p < .001\right)$ respectively. In terms of clinically significant change, as presented in Table 3, 59 (66%) participants met the recovered criteria on the PDSS-IE at post treatment. On the PDSS-SR, 52 (58%) participants met the recovered criteria. As depicted in Fig. 2, symptoms on the PDSS-IE and PDSS-SR continued to decrease from post to 3-month follow-up ($IE: t_{(235)} = -5.28, p < .001$; $SR: t_{(186)} = -2.30, p = .02$). These gains were maintained from post to 6-month ($IE: t_{(235)} = -0.39, p = .39$; $SR: t_{(186)} = -0.61, p = .54$) and one-year follow-up ($IE: t_{(235)} = -0.29, p = .69$; $SR: t_{(186)} = -0.19, p = .89$).

Completers analysis

Effect sizes were larger in the completers sample. Completers exhibited within group effect size of 1.70 on the PDSS-IE. In terms of weekly change, on average clients displayed a significant reduction of .27 points on the PDSS-SR for every week in the treatment program $\left(t_{(797)} = -5.01, p < .0.01\right)$. Weekly reduction on the ASI and MI were 0.84 $\left(t_{(797)} = -6.90, p < .0.01\right)$ and 0.03 $\left(t_{(797)} = -5.32, p < .0.01\right)$ respectively. In terms of clinically significant change, as presented in Table 2, 36 (73%) completers met the recovered criteria on the PDSS-IE at post treatment. On the PDSS-SR, 38 participants (78%) met the recovered criteria. As depicted in Fig. 2, symptoms on the PDSS-IE and PDSS-SR continued to decrease from post to 3-month follow-up ($IE: t_{(148)} = -2.67, p < .01$; $SR: t_{(136)} = -1.01, p = .03$). Treatment gains were maintained from post to 6-month ($IE: t_{(148)} = -1.67, p = .10$; $SR: t_{(136)} = -0.02, p = .99$) and 1-year follow-up ($IE: t_{(148)} = -0.09, p = .93$; $SR: t_{(136)} = -0.10, p = .92$).

Benchmarking results

Pre-to-post symptom change assessed by an independent evaluation (PDSS-IE) in our sample ($d = 1.54$) was similar to the reduction seen in Aaronson et al., 2008 ($d = 1.46$). As seen in Table 2, overall effects were meaningfully larger in our sample for ICBT completers, but not in the FTF samples. Examination of the post-treatment means reveals that ICBT completers reduced their PDSS-IE and PDSS-SR score by more than 1 point compared to the total ICBT sample (*IE*: 6.34 vs. 7.46; *SR*: 6.53 vs. 7.83).

Fig. 3 compares PDSS-SR scores obtained in our sample to the two-benchmark samples. Pre-treatment PDSS scores were slightly greater in our sample compared to both benchmarks. This may reflect a portion of participants in the internet sample, which due to symptom severity, refrained from enrolling in a FTF study (indeed, some participants in the ICBT sample were housebound). As seen in the Fig. 3 and in Table 2, all post-treatment means in all samples fell below the clinical cutoff (< 8). However, the ITT effect for self-reported symptoms (PDSS-SR) is considerably smaller ($d = 0.88$) compared to the same site FTF ($d = 1.49$) and Aaronson et al., 2008 ($d = 1.45$). This effect is larger when examining completers alone ($d = 1.03$), though still smaller than both FTF benchmark sample (same sote: $d = 1.36$; Aaronson et al., 2008: $d = 1.37$).

Table 3 compares the percentage of patients achieving clinically significant and reliable change in the three samples. ICBT recovery rates in the total sample were found to be smaller than in the FTF benchmarks. Given that recovery was operationally defined as falling below a score of 8 (dashed line in Fig. 3) and that post-treatment means were 7.46 and 7.83 for the IE and SR respectively, this is understandable. Indeed, in the completer analysis, where symptoms reduced an additional point, the percentages of recovered are more like the benchmark samples.

Table 4 summarizes four meta-analysis reporting aggregated within-group effect size for treatment of PD/A in comparison with the three samples examined here. Effects on the PDSS-IE both for the current ICBT total sample and completers alone are equivalent (and even greater) to effects obtained in efficacy trials. Effects on the PDSS-SR both for the total sample and completers are closer to effects obtained in effectiveness trials.

Therapist time

Therapist time in the ICBT sample was estimated at 282.58 min for supporting the total treatment (all six modules) (range = 174.32 – 364.18). Given that the average length of treatment for completers was 20.49 weeks, therapists averaged 13.79 min per week per patient. In comparison, therapist time for the same site FTF sample was 76.29 min per session. On average the number of sessions for completers was 11.69 (range = 10 – 13), resulting in an

Table 2 Estimated marginal means, standard deviations, change slopes per week and effect sizes for all outcome measures in internet cognitive behavioral therapy (ICBT) and face to face (FTF) benchmark samples.

	Intent to treat analysis (ITT)				Completers analysis			
	Pre	Post	Change per week	Effect size (d)	Pre	Post	Change per week	Effect size (d)
	ICBT							
	n = 90				*n* = 49			
PDSS-IE	14.59 (3.79)	7.46 (5.05)		1.54 [1.30, 1.77]	14.27 (3.40)	6.34 (4.63)		1.70 [1.39, 2.00]
PDSS-SR	13.06 (5.35)	7.83 (5.38)	−0.24 [−0.33, −0.15]	0.88 [0.63, 1.14]	12.80 (5.48)	6.53 (5.29)	−0.27 [−0.38, −0.16]	1.03 [0.71, 1.34]
ASI	39.31 (11.94)	25.17 (15.11)	−0.64 [−0.83, −0.45]	1.00 [0.75, 1.26]	39.24 (11.88)	22.42 (16.51)	−0.84 [−1.08, −0.60]	1.17 [0.86, 1.48]
MI	2.23 (0.89)	1.65 (0.72)	−0.03 [−0.04, −0.02]	0.83 [0.57, 1.09]	2.24 (0.94)	1.54 (0.71)	−0.03 [−0.04, −0.02]	0.89 [0.58, 1.20]
SDS	17.63 (6.27)	11.99 (8.55)		0.72 [0.44, 1.00]	17.61 (5.74)	10.6 (9.09)		0.83 [0.48, 1.17]
	FTF benchmark I (Same site sample)							
	N = 54				N = 42			
PDSS-SR	11.87 (4.26)	4.80 (3.29)	−0.38 [−0.48, −0.28]	1.49 [1.17, 1.80]	11.45 (3.99)	4.76 (3.29)	−0.40 [−0.50, −0.29]	1.36 [1.05, 1.68]
ASI	42.07 (13.24)	19.37 (15.65)	−1.42 [−1.76, −1.07]	1.28 [0.96, 1.59]	40.9 (12.85)	19.10 (15.71)	−1.45 [−1.83, −1.07]	1.19 [0.88, 1.51]
MI	2.25 (0.99)	1.50 (0.56)	−0.04 [−0.06, −0.03]	0.88 [0.56, 1.20]	2.21 (1.04)	1.49 (0.57)	−0.04 [−0.06, −0.03]	0.75 [0.44, 1.07]
	FTF benchmark II (Aaronson et al., 2008)							
	n = 383				*n* = 256			
PDSS-IE	14.20 (4.86)	6.85 (4.48)		1.46 [1.34, 1.59]	13.85 (4.46)	6.73 (4.53)		1.37 [1.24, 1.49]
PDSS-SR	11.34 (5.56)	4.89 (4.30)	−0.36 [−0.40, −0.33]	1.23 [1.10, 1.35]	11.08 (5.22)	4.80 (4.37)	−0.37 [−0.41, −0.33]	1.15 [1.02, 1.27]
ASI	37.86 (12.95)	16.74 (12.02)	−1.14 [−1.24, −1.03]	1.52 [1.39, 1.64]	37.37 (12.61)	16.6 (12.15)	−1.15 [−1.26, −1.03]	1.41 [1.28, 1.54]

PDSS-IE: Panic Disorder Severity Scale—Independent Evaluator; PDSS-SR: Panic Disorder Severity Scale—Self-Report; ASI: Anxiety Sensitivity Index-3; MI: Mobility Inventory for Agoraphobia; SDS: Sheehan Disability Scale.

average total of 891.86 min per patient, more than three times more than therapists in the ICBT sample.

Discussion

Overall, results from this study suggest that within-group effects of ICBT are in line with the large, significant effects found for FTF at the same site, a large FTF sample and across other studies. On average, treatment gains continued to increase after post-treatment and were maintained at one-year follow up. Percentage of patients achieving clinically significant change was smaller compared to the benchmark studies especially when examining the intent-to-treat sample. Effects were generally larger than placebo effects (IE effect size = .94, .CI = [0.75—1.13]; Sugarman et al., 2017) with larger effects for symptoms assessed by an independent evaluator. However, a

Table 3 Number and percentage of patients achieving clinical significant and reliable change in ICBT and benchmark samples.

			Intent to treat analysis (ITT)		Completers analysis	
			n	%	*n*	%
ICBT	PDSS-IE	Recovered	59	66%	36	73%
		Improved only	17	19%	8	16%
		No change	14	16%	5	10%
	PDSS-SR	Recovered	52	58%	38	78%
		Improved only	20	22%	4	8%
		No change	18	20%	7	14%
FTF benchmark I (Same site sample)	PDSS-SR	Recovered	49	91%	37	88%
		Improved only	1	2%	1	2%
		No change	4	7%	4	10%
FTF benchmark II (Aaronson et al., 2008)	PDSS-IE	Recovered	261	68%	180	70%
		Improved only	86	22%	40	16%
		No change	36	9%	36	14%
	PDSS-SR	Recovered	306	85%	215	84%
		Improved only	29	8%	20	8%
		No change	23	6%	21	8%

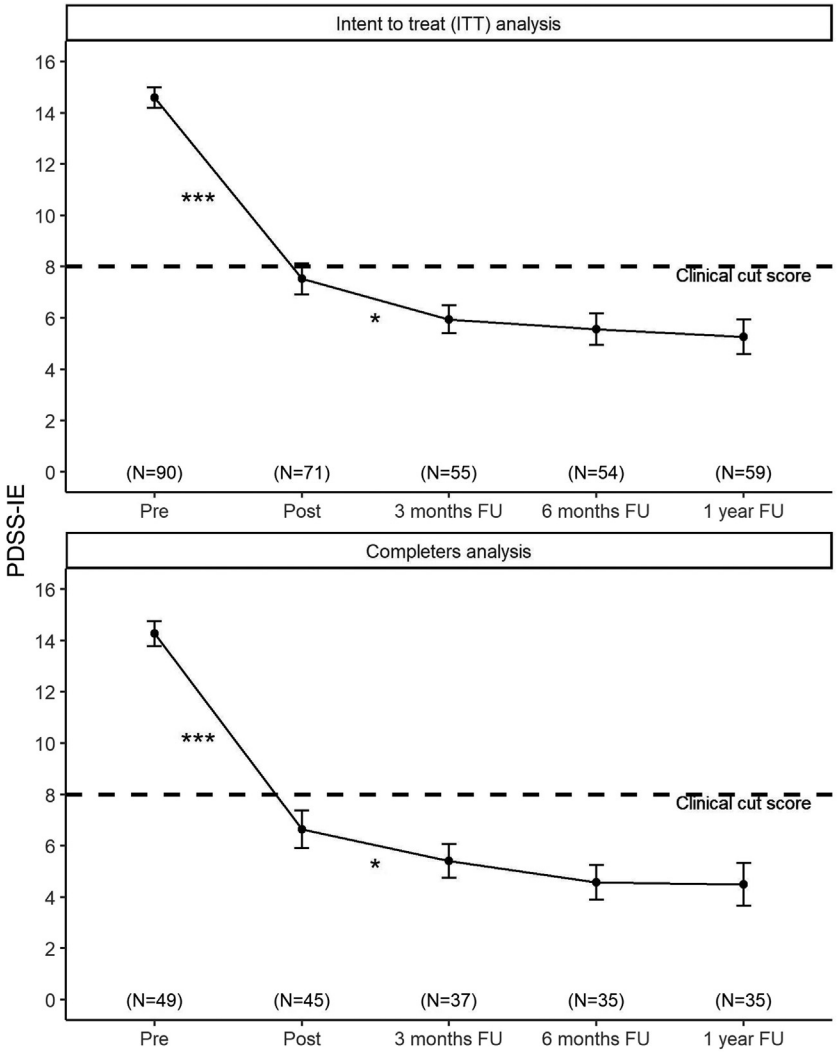

Figure 2 Panic Disorder Severity Scale–Independent Evaluator (PDSS-IE) scores at pre, post, 3 months, 6 months and 1 year follow-up (FU) for internet based cognitive behavioral therapy. N = number of observations at each time point. */*** = significant at 0.05/0.001 level.

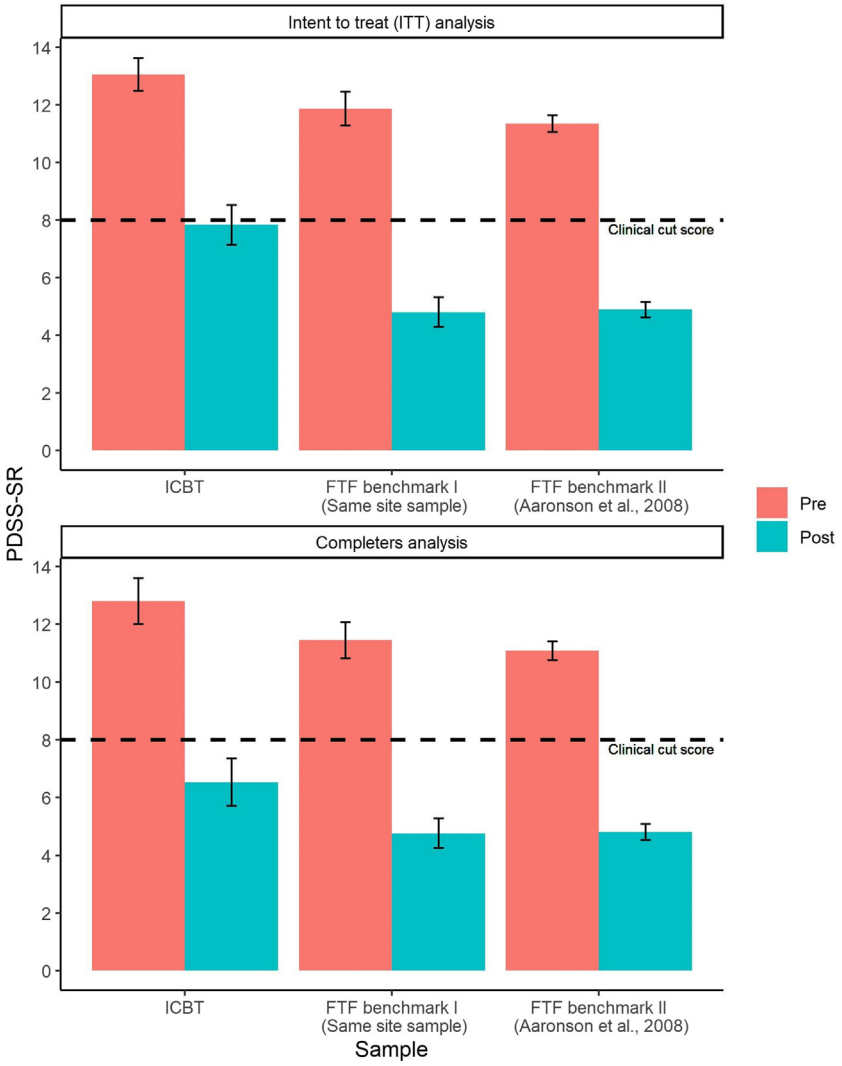

Figure 3 Pre and post treatment PDSS-SR scores for ICBT and face to face (FTF) benchmark samples in intent to treat and completers analysis.

Table 4 Benchmark within-group effect size for treatment of panic disorder with and without agoraphobia.

Meta-analysis Meta-analysis	Treatment format	Trial	Aggregated effect size
Hedman et al., 2012	Internet	Efficacy	d = 1.42
Norton & Price, 2007	Mixed	Efficacy	g = 1.53
Stech et al., 2020	Internet	Efficacy	g = 1.38
		Effectiveness	g = 0.98
Stewart & Chambless, 2009	Face to face	Effectiveness	Attacks: g = 1.01
			Avoidance: g = 0.83
			Fear of Fear: g = 1.23

larger proportion of patients (46%), twice as many compared to the FTF samples, dropped out prematurely from therapy. Finally, therapist time was reduced by a third compared to FTF, suggesting that guided ICBT can be time-efficient and provide a potential cost-effective treatment alternative.

Internet vs. FTF modes of dissemination have unique advantages and disadvantages (Andersson & Titov, 2014), which may overall even out. Main advantages of ICBT include:

(a) *Accessibility* – patients can choose treatment place and time;
(b) *Flexibility* – patients work at their own pace and can return to materials;

(c) *Active role* — treatment requires patients to take an active role potentially strengthening integration of acquired skills and increase self-efficacy;
(d) *Support availability* — therapists can support patients frequently and quicker compared to weekly FTF.

Indeed, some of our patients conducted their therapy at late night hours and reported that therapist availability was essential for their recovery. However, disadvantages include:

(a) *Greater responsibility* upon patients — patients are required to maintain motivation and participation;
(b) *Fixed treatment* — treatment is not tailored for patients' specific symptoms;
(c) *Reduced support* — though frequent and quick, the total amount of therapist support is reduced. Indeed, some of our patients seemed to need the actual presence of a therapist for motivation or to ''go all the way'' with exposure.

A hybrid model, where ICBT is blended with a small number of FTF booster sessions may lead to less dropout, greater symptom improvement, and still be cost-effective (Erbe et al., 2017). Indeed, the treatment program studied here is currently being examined in a broad community pilot in Israel, with the addition of an introductory, intermediary, and final session. However, not all patients have accessibility or are willing to use such a format.

Dropout rate in our sample was larger in comparison to the FTF benchmark samples as well as other ICBT for PD/A studies. In FTF settings, ''dropout'' can be easily determined when patients discontinue weekly visits. Definitions are more challenging in ICBT. The number of completed modules required to be considered a ''completer'' varies considerably among studies. Moreover, ''completing'' a module must also be defined (Beintner et al., 2019). There is a difference between opening a module and actively engaging in it. Monitoring participation depends on the nature of the internet program and therapist support. In our sample, completers were defined as actively participating in the first five modules (83% of modules; c.f., Domhardt et al. (2020) 77% modules completed). The fifth module included in-vivo exposure, an integral part of PD/A treatment. Active engagement, which in module 5 meant conducting or attempting to conduct exposure, was monitored via an exposure diary and patient-therapist correspondence (first by messages and then by phone if necessary). Patients who did not actively engage were considered dropouts and referred to post-treatment evaluation. Our strict definition might explain our higher attrition rate. Indeed, if we were to use Polak et al.'s (2021) definition—participants missing post-treatment measures—our attrition rate would be 21%: similar to average attrition rates reported by Polak et al. (2021) and Domhardt et al. (2020) (see Fig. 2 for number of observations at each time-point).

The higher dropout rate in ICBT compared to the FTF benchmark samples may suggest that the greater independent responsibility on patients can outweigh availability and flexibility offered by ICBT. Remotely guided self-help requires considerable self-discipline and motivation throughout treatment. Our results suggest that this may be challenging for some patients. Given equivalent treatment effects for completers, exploring possible attrition predictors (e.g. Edmonds et al., 2018) and developing methods to enhance acceptability and adherence are important for implementation of ICBT (e.g. Pihlaja et al., 2020)

Therapist time was reduced by a third compared to FTF. Whereas guided ICBT overall typically produces larger effects compared to unguided ICBT, the optimal dose of support is still unknown (see Domhardt et al., 2019 review). Our results suggest that 14 min on average per week per patient is sufficient. Given that therapist time is the main cost of therapy, the ability to cut back these costs while maintaining efficacy creates a potential for enhancing community accessibility to evidence-based treatments. Reducing therapist time is made possible due to the therapeutic role assigned to the treatment program (see Zalaznik et al., 2021).

This study has several limitations. First, alternative explanations such as spontaneous recovery or selection biases cannot be completely ruled out, given the absence of a randomized control group. Benchmarking our results partially reduces such threats. Second, some of our data were missing. To maximize validity, data were analyzed using restricted maximum likelihood models, which are robust for handling missing data (Shin et al., 2017). Third, therapist time estimates were based on self-report. Future studies should utilize digital records to obtain a more precise estimate.

In sum, this is the first study of ICBT for PD/A in Israel. In the last few years, Israel has been at the advent of a large mental health reform, moving responsibility for outpatient care to HMOs from the Ministry of Health public clinics (see Rosen et al., 2008). Our findings, suggesting that dissemination via the internet results in similar outcomes, opening opportunity for increasing accessibility to evidence-based treatment in the community. Given the high percentages of untreated mental disorders and the number of available therapists, moving beyond ''one-on-one'' FTF therapy for all is inevitable. This work complements other studies that provide policy makers with important information regarding enhancing accessibility to high quality, evidence-based treatment in the community.

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