Effectiveness of brief cognitive behavior therapy on symptoms severity in relation to social avoidance among patients with panic disorder: a randomized controlled trial

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Informed consent: the privacy and confidentiality of personal information were strictly ensured for all patients in both groups. Prior to the commencement of the study, oral and written consent was obtained from each participant and they were informed about their right to withdraw from the study at any time they wished.

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ABSTRACT

Background. Panic disorder is a debilitating condition characterized by severe symptoms and social avoidance. Due to insufficient knowledge, this study examined the effectiveness of brief cognitive behavioral therapy (CBT) on symptom severity and social avoidance in patients with panic disorder. Patients and Methods. In this randomized controlled trial (RCT), 44 patients were included in the Brief CBT group or the control group after addressing issues related to lost-to-follow-up. Panic disorder symptom severity (PDSS) and the work and social adjustment scale (WSAS) were used to assess symptom severity and social adjustment, respectively. Results. After one month of treatment, the total PDSS scores (1.79 *vs*. 4.47; P=0.0409) and WSAS scores (2.97 *vs*. 7.41; P=0.0015) in the brief CBT group were significantly lower compared to the control group. The study revealed that in the brief CBT group, the mean score of PDSS and WSAS significantly decreased from 21.53 to 1.79 (P<0.0001) and from 24.63 to 2.95 (P<0.0001), and in the control group from 19.59 to 4.47 (P<0.0001) in PDSS and from 22.18 to 7.41 (P<0.0001) in WSAS, respectively. Furthermore, the change in WSAS scores in the brief CBT group was independent of the decrease in PDSS. Conclusions. This study demonstrated that the application of brief CBT is an effective technique for reducing symptom severity and social avoidance in patients with panic disorder.

Introduction

Panic disorder (PD) is defined by an apprehension of experiencing panic attacks or symptoms associated with panic in circumstances or places where escape is deemed challenging.[1] PD is a debilitating condition that can have long-lasting effects if left untreated.[2] Furthermore, PD is linked to substantial economic burdens and a high reliance on pharmaceutical interventions.[3-5]

According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), PD is an anxiety disorder defined by recurrent, unexpected, and intense panic attacks accompanied by physical and cognitive symptoms.[6] A review study

(2016) found lifetime panic attack prevalence at 13.2% and PD prevalence at 1.7% with an average onset age of 32.[7] The incidence of anxiety disorders increased by 47.19% from 1990 to 2019, reaching 45.82 million cases.[8] In Iraq, anxiety disorders accounted for 13.8% of cases, with major depressive disorder affecting 7.2% within a 12-month period.[9] Panic attacks can occur unexpectedly or be triggered by specific situations, leading to anxiety and avoidance behaviors.[10] The fear of experiencing future panic attacks and the associated physical and psychological distress can lead to significant anxiety and avoidance behaviors.[11,12] Panic disorder can significantly impact a person's daily life, relationships, and overall well-being.[13]

Fortunately, PD is treatable, primarily through cognitive behavioral therapy (CBT), which helps individuals recognize and confront negative thought patterns linked to panic attacks.[14] Medications like selective serotonin reuptake inhibitors or benzodiazepines may be prescribed in some cases.[15] The role of psychotherapy on symptoms in patients with PD has been approved in the literature.[16,17] Several studies have also reported that very brief, intense, exposure-based interventions produce outcomes comparable to standard CBT in a matter of weeks or even days.[18-20] These alternatives are crucial for patients with time or distance constraints.[19]

Consequently, there is a need to consider the possibility of utilizing brief CBT for PD to deliver effective treatment. Thus, it is possible to achieve meaningful therapeutic progress with fewer sessions.[19]

This study aims to examine the effectiveness of brief CBT and pharmacotherapy on symptom severity and social avoidance in adult PD patients compared to regular pharmacotherapy. It also analyzes the impact of symptom severity on social avoidance. We hypothesized that patients receiving brief CBT will experience lower symptom and social avoidance scores compared to those receiving regular pharmacotherapy alone.

Patients and Methods

Study design, participants, and setting

In a parallel randomized controlled trial (RCT), 153 clients who visited two senior psychiatrists were assessed for eligibility. Ultimately, 19 were assigned to an experimental brief CBT group, and 17 to a control group (Figure 1). Participants were selected from the outpatient psychiatric clinic of Azadi General Teaching Hospital and private clinics in Duhok, Iraq, between October 1, 2022, and February 20, 2023. Two psychiatrists medically and clinically screened patients for eligibility criteria.

Eligibility criteria

Patients were assessed based on DSM-5 criteria, with inclusion criteria encompassing panic disorder without agoraphobia, ages 18 to 55, and both genders. Exclusion criteria included concurrent mental disorders (*e.g.*, psychosis, depressive disorders, other anxiety disorders, or substance use disorders), major diseases, cognitive or auditory disabilities, concurrent psychotherapy, relationships between patients in the same group, and benzodiazepine use. Out of 153 patients, 44 met the eligibility criteria, with 22 randomized into each group.

Of the patients assigned to the brief intensive CBT group, two patients did not attend the preplanned time for implementation of the brief intensive CBT, and one patient decided to change his psychotherapist, leaving 19 cases by the end of the study. Of the 22 patients allocated to the control group, three patients were not accessible for the follow-up session, one patient changed his medications and added a benzodiazepine to his regimen, and another patient discontinued the regular treatment, resulting in 17 cases remaining in the study (Figure 1).

Randomization process

An independent statistician entered numbers into the JMP Pro 14.3.0 statistical software. These numbers were randomly assigned to two study groups equally. Then the groups were numbered as group one and group two using a lottery technique. The first eligible patient was allocated a random number, determining their group. This process ensured randomization into either the control or brief intensive CBT group. Patients were included based on the pre-generated random numbers.

Bias reduction techniques

To mitigate alpha error in our study, we randomly allocated patients to either the control or brief intensive CBT group. We strived to ensure gender balance and a representative sample by including both male and female patients over a suitable period. We also incorporated patients from the private sector, seeking care from the same psychiatrists as those in the public sector. Allocation concealment was not an issue since patients visited clinicians individually.

Sample size determination

To estimate the required sample size, we assessed the first five patients at the tertiary hospital. Their mean and standard deviation (SD) of panic disorder symptoms severity (PDSS) scores were 13.44 and 5.36, respectively. We anticipated a substantial intervention effect based on prior studies, aiming to reduce current

levels to a mean of 8.5 with an SD of 2.5. Analysis indicated an effect size of 1.18 (Cohen's d), a two-tailed test, an error probability of 0.05, and 0.95 power with a 1:1 allocation ratio. Based on these parameters, each group required 20 patients. We minimized beta error by referencing effect sizes from previous literature.[21]

Data collection

The primary author collected baseline patient data, including age, gender, residency, occupation, and education, using a pre-designed questionnaire. Written informed consent was obtained before inclusion, ensuring patient understanding and voluntary participation. At the study's outset, both groups underwent assessments for symptom severity (PDSS) and social functioning (work and social adjustment scale, WSAS) by a senior psychiatrist, who was blinded to group allocation.

Procedure

In the brief intensive CBT group, patients received two consecutive days of CBT lasting 3 hours per day, in addition to their regular pharmacotherapy. The interventions were conducted by the first researcher, a psychiatric nurse with a master's degree, psychotherapy training, and 4 years of experience. Individualized CBT was provided to the patients.

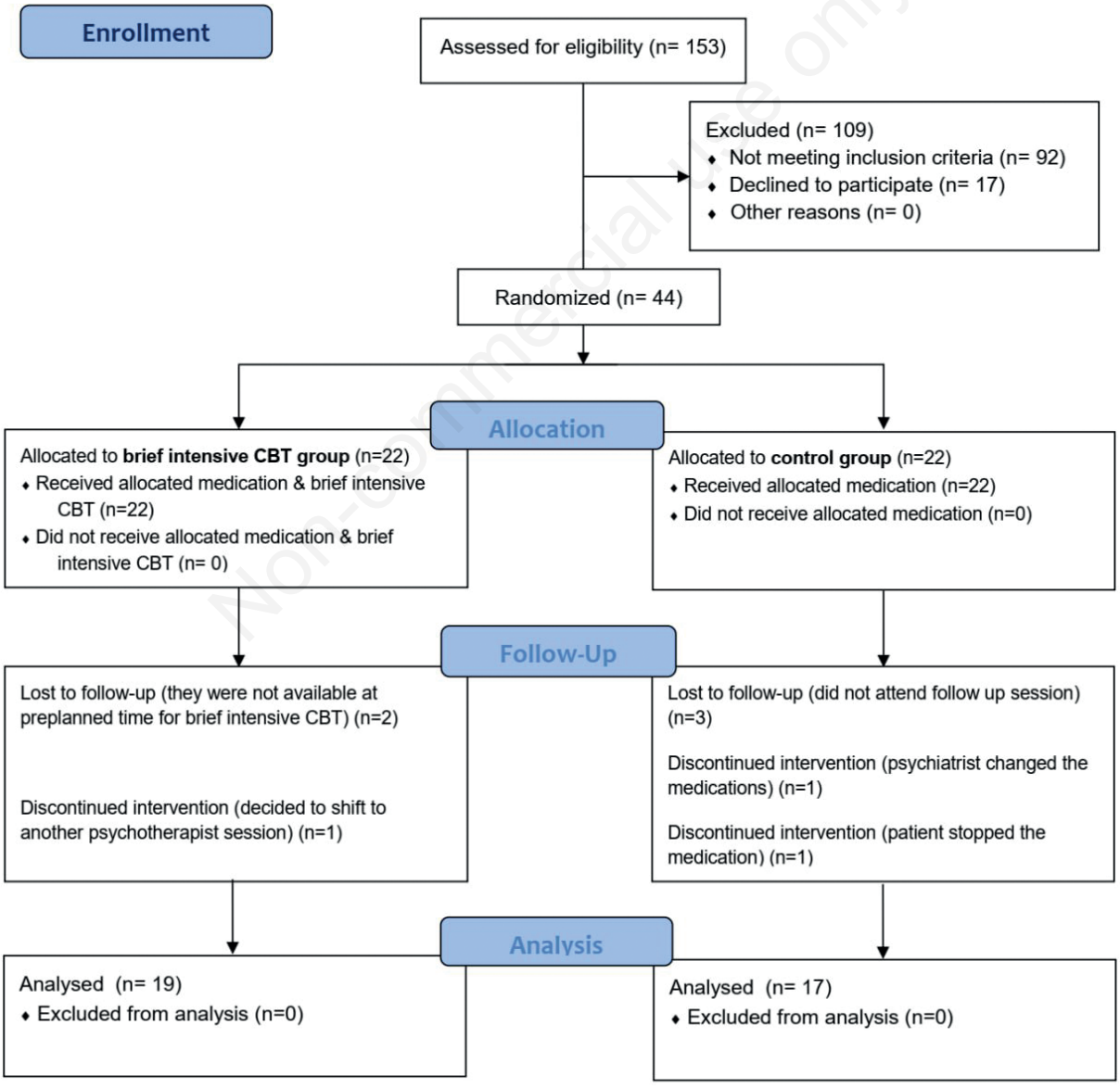

Figure 1. Flowchart of participants through the study (according to intention to treat approach).

On the first day, 90 minutes were dedicated to psychoeducation, followed by 90 minutes of cognitive restructuring, with a 15-minute break in between. Psychoeducation aimed to help patients recognize their symptoms, understand anxiety and fear, grasp the natural origin of panic symptoms, and reducing excessive anxiety. Cognitive restructuring, a vital CBT component, targeted erroneous beliefs contributing to panic disorder. Patients were guided to identify thoughts during panic attacks and evaluate their supporting evidence. Inaccurate beliefs were challenged, fostering more realistic assessments.

The second day was devoted to exposure to internal fear cues (interoceptive exposure) because engaging in exposure therapy can be quite demanding and frequently the most impactful aspect of CBT. The purpose of the implementation of interoceptive exposure was explained to each patient and revealed it is a behavioral experiment that let the patient test the catastrophic forecast through a simulated experiment and see how accurate it was after completion of the experiment.

The most common internal fear cues experienced in panic attacks are bodily sensations (*e.g.*, heart racing, dizziness, shortness of breath). Therefore, the patient was exposed to those body sensations which were more common during each panic attack. The first researcher together with the patient identified and ordered the most common symptoms the patient experienced during each panic attack. Then after the patient was exposed to the simulated sensation as is explained in the following section.

The exercises used by the researcher to provoke feared bodily sensations include: i) going up and down stairs for 30 seconds to 1 minute, inducing racing heart, breathlessness, and chest discomfort; ii) engaging in rapid and deep breathing for 30 seconds to 1 minute, resulting in sensations such as dizziness, breathlessness, racing heart, numbness, and tingling; iii) spinning around in place or using a chair to spin for 30 seconds, leading to sensations of dizziness and potential nausea; iv) holding the breath for 15 to 30 seconds, resulting in breathlessness and dizziness; v) staring at the hand for two to three minutes, inducing feelings of unreality and things appearing strange.

The first researcher together with the patient used subjective units of distress scale (SUDS) that is to make a fear hierarchy including the patient's most challenging interoceptive exercise.

While the standard approach typically involves starting with less anxiety-provoking exercises and gradually progressing to more challenging ones, there is an alternative for motivated patients seeking a more aggressive approach to treating their panic disorder. These individuals can choose to begin exposure treatment with exercises that are more demanding, typically those near the top of their fear hierarchy. This approach is based on the belief that tackling higher-intensity exercises from the outset may potentially expedite their progress toward achieving treatment goals.

After each experiment, patients provided verbal SUDS ratings. Interoceptive exposures were repeated until the patient reported a 50% or greater reduction in distress, indicating reduced fear. In brief intensive CBT, patients typically engage in independent situational exposures as homework assignments.[6] Thus, in addition to these exercises, patients in the intensive CBT group were encouraged to confront real-life situations associated with panic attacks such as walking in a street, driving on a highway, or visiting a crowded area and they were encouraged to reduce avoidance behaviors. Patients in the control group received regular pharmacotherapy and were followed up every two weeks by the author via phone to ensure medication compliance.

Outcome measurement

The severity of panic attack symptoms and social avoidance was measured using the English versions of the PDSS and the WSAS. To make the assessment culturally relevant, the PDSS and WSAS were initially translated into Kurdish by a translator and two psychology experts experienced in scientific text translation. These translations were then meticulously compared for any discrepancies in ambiguous expressions. To ensure equivalence, a third translator, fluent in Kurdish and experienced in academic text translation, performed a back-translation.

All assessments were carried out by a senior psychiatrist who was unaware of the patient group allocation. Both study groups underwent pre and post-assessments of PDSS and WSAS at baseline and one-month follow-up. The brief intensive CBT group received the CBT intervention in the first week after the pre-assessment to facilitate the study's objectives.

Panic disorder severity scale

The PDSS is a 7-item self-reporting scale used to assess the severity of symptoms experienced during panic attacks. Each item is rated on a 5-point scale, ranging from 0 (no symptoms) to 4 (extreme symptoms). The PDSS measures various aspects, including the frequency of panic attacks, distress during panic episodes, anxiety related to anticipating panic attacks, avoidance of situations due to fear, avoidance of physical sensations associated with panic,

impairment in work functioning, and impairment in social functioning. The scores from each item are summed to calculate the overall PDSS score, with higher scores indicating more severe panic symptoms. This self-report version of the PDSS has demonstrated reliability and can be valuable in clinical and research settings.[22] Cronbach's alpha of 0.7215 and 0.8901 were obtained for the brief CBT and control patients, respectively.

Work and social adjustment scale

The WSAS is a self-report questionnaire that assesses work and social adjustment. It consists of five items, each rated on a 9-point scale ranging from 0 (not at all) to 8 (very severely), indicating the degree of impairment in carrying out various activities. The WSAS provides a straightforward and reliable measure of impaired social and work functioning. It is considered sensitive and effective for measuring outcomes, allowing for easy comparisons between different research studies and disorders.[23] In this study Cronbach's alpha of 0.8563 and 0.8256 were obtained for the brief CBT and control patients, respectively.

Statistical analyses

Statistical analyses were conducted to assess the demographic and medical characteristics of the patients in both groups, including continuous and categorical variables. Various statistical tests were used to compare symptom severity and social avoidance severity between the brief intensive CBT and control groups, including independent t-tests and paired t-tests. The study also calculated the uncertainty of mean differences, examined correlations between PDSS and WSAS, and analyzed differences among characteristics of the brief intensive CBT group using Tukey or Kruskal-Wallis tests. JMP Pro 14.3.0 was used for these statistical calculations.

Ethical considerations

The privacy and confidentiality of personal information were strictly ensured for all patients in both groups. Prior to the commencement of the study, oral and written consent was obtained from each participant. The research study received ethical approval from the local ethical committee, which is a collaborative committee comprising the Duhok Directorate General of Health, Ministry of Health, and Duhok University, Ministry of Higher Education and Scientific Research, under the Kurdistan Regional Government of Iraq. The study was officially registered with the appropriate authorities to meet the required ethical standards. (Clinical Trial Reference Number: 1808202 l-8-5 on 18 August 2021).

Results

Comparison of baseline characteristics

Both the brief intensive CBT group and control group per-protocol and intention to treat were homogenous. Baseline and sociodemographic characteristics of clients in the brief intensive CBT and control trial arms were demonstrated in Table 1. The mean of clients' age (36 persons) of brief intensive CBT and control groups were respectively 32.79 (SD: 9.38; 19-50 years) and 36.94 (SD: 8.53; 27-55 years). More than half of the clients of both groups were female (63.16% and 82.35%). The clients in the brief intensive CBT and control groups were comparable in all socio-demographic aspects except for the occupation as seen in Table 1.

The study showed that the study groups and lost-to-follow-up patients were comparable in age (P=0.3486), age groups (P=0.6657), gender (P=0.2216), residency (P=0.0837), marital status (P=0.5967), education (P=0.4847), but not in occupation (P=0.0386; see Table 1). The comparison of followed-up (n=36) and dropped-out (n=8) of both study groups showed that they are similar in age (P=0.8905), gender (P=0.2222), residency (n=0.3288), marital status (P=0.7100), occupation (P=0.2629), and education (P=0.2715; data not shown in the table).

Comparison of panic disorder symptom severity and work and social adjustment scale between groups at baseline and one-month follow-up

Before treatment, brief intensive CBT and control groups were similar in the means of total PDSS (21.53, 19.59; P=0.1789) and the total WSAS (24.63, 22.18; P=0.4626). But after one-month treatment, total PDSS (1.79 *vs*. 4.47; P=0.0409) and WSAS (2.97 *vs*. 7.41; P=0.0015) in the brief CBT group were significantly lower compared to the control group (Table 2, Figure 2). After treatment the PDSS and WSAS has lower standard deviation in brief intensive CBT compare to control group (Figure 2).

Comparison of panic disorder symptom severity and work and social adjustment scale within groups at baseline and one-month follow-up

The study revealed that in the brief CBT group, the mean score of PDSS and WSAS significantly decreased from 21.53 to 1.79 (P<0.0001) and from 24.63 to 2.95 (P<0.0001) accordingly. In addition, in the control group similarly, the mean of PDSS and WSAS were significantly reduced from 19.59 to 4.47 (P<0.0001) and from 22.18 to 7.41 (P<0.0001), respectively (Table 3, Figure 3). It is interesting to mention however after treatment the mean of PDSS and

WSAS reduced in both brief intensive CBT and control groups significantly but at on-month follow-up, both PDSS and WSAS standard deviation in brief intensive CBT noticeably decreased compared to the control group (Figure 3).

Contributing factors to work and social adjustment scale at one-month follow-up

In terms of factors that may contribute to WSAS level in brief intensive CBT group after treatment, there is no factor identified whereas for the control

Table 1. Comparisons of general characteristics between study groups per protocol step and intention to treat steps.

General characteristics	Per protocol no (%) Brief intensive CBT (n=22)	Control (n=22)	P (2-sided)	Intention to treat step no (%) Brief intensive CBT (n=19)	Control (n=17)	Lost-to-follow-up (n=8)	P (2-sided)
Age (years) mean (SD)	33.05 (8.91)	36.09 (8.30)		32.79 (9.38)	36.94 (8.53)	33.75 (6.61)	
Range	19-50	26-55	0.2476[a]	19-50	27-55	26-44	0.3486[c]
Std err mean	1.90	1.77		2.15	2.07	2.34	
Age groups							
18-19	1 (4.55)	0 (0.00)		1 (5.26)	0 (0.00)	0 (0.00)	
20-29	8 (36.36)	5 (22.73)		7 (36.84)	3 (17.65)	3 (37.50)	
30-39	6 (27.27)	11 (50.00)	0.4202[b]	5 (26.32)	9 (52.94)	3 (37.50)	0.6657[b]
40-49	6 (27.27)	4 (18.18)		5 (26.32)	3 (17.65)	2 (25.00)	
50-60	1 (4.55)	2 (9.09)		1 (5.26)	2 (11.76)	0 (0.00)	
Gender							
Male	9 (40.91)	5 (22.73)	0.3319[b]	7 (36.84)	3 (17.65)	4 (50.00)	0.2216[b]
Female	13 (59.09)	17 (77.27)		12 (63.16)	14 (82.35)	4 (50.00)	
Residency							
Urban	20 (90.91)	15 (68.18)	0.1324[b]	18 (94.74)	12 (70.59)	5 (62.50)	0.0837[b]
Suburban	2 (9.09)	7 (31.82)		1 (5.26)	5 (29.41)	3 (37.50)	
Marital status							
Single	7 (31.82)	5 (22.73)		6 (31.58)	3 (17.65)	3 (37.50)	
Married	15 (68.18)	16 (72.73)	0.5052[b]	13 (68.42)	13 (76.47)	5 (62.50)	0.5967[b]
Divorced	0 (0.00)	1 (4.55)		0 (0.00)	1 (5.88)	0 (0.00)	
Occupation							
Student	4 (18.18)	1 (4.55)		4 (21.05)	0 (0.00)	1 (12.50)	
Jobless	10 (45.45)	15 (68.18)		10 (52.63)	13 (76.47)	2 (25.00)	
Government employed	3 (13.64)	5 (22.73)	0.1209[b]	1 (5.26)	4 (23.53)	3 (37.50)	0.0386[b]
Self-employee	4 (18.18)	0 (0.00)		3 (15.79)	0 (0.00)	1 (12.50)	
Private sector	1 (4.55)	1 (4.55)		1 (5.26)	0 (0.00)	1 (12.50)	
Education							
Illiterate	2 (9.09)	5 (22.73)		2 (10.53)	5 (29.41)	0 (0.00)	
Read and write	2 (9.09)	3 (13.64)		2 (10.53)	2 (11.76)	1 (12.50)	
Primary school	5 (22.73)	3 (13.64)	0.6714[b]	4 (21.05)	3 (17.65)	1 (12.50)	0.4847[b]
Secondary school	2 (9.09)	3 (13.64)		2 (10.53)	2 (11.76)	1 (12.50)	
High school	6 (27.27)	3 (13.64)		4 (21.05)	1 (5.88)	4 (50.00)	
Institute and college	5 (22.73)	5 (22.73)		5 (26.32)	4 (23.53)	1 (12.50)	

[a]An independent t-test; [b]pearson chi-squared tests; [c]anova one-way were performed for statistical analyses. CBT, cognitive behavioral therapy; SD, standard deviation.

Table 2. Comparisons of panic disorder and social avoidance severities between brief intensive cognitive behavioral therapy and control groups at baseline and one month follow up.

Time Baseline	Study groups mean (SD) Brief intensive CBT (n=19)	Control (n=17)	Mean diff (95% ci)	P (two-sided)
Total PDSS	21.53 (4.55)	19.59 (3.86)	-1.94 (-4.81 to 0.94)	0.1789
Total WSAS	24.63 (10.41)	22.18 (9.29)	-2.46 (-9.17 to 4.26)	0.4626
Time One-month follow up	**Study groups mean (SD) Brief intensive CBT (n=19)**	**Control (n=17)**	**Mean diff (95% ci)**	**P (two-sided)**
Total PDSS	1.79 (1.58)	4.47 (5.25)	2.68 (0.12 to 5.24)	**0.0409**
Total WSAS	2.95 (2.20)	7.41 (5.15)	4.46 (1.83 to 7.09)	**0.0015**

An independent t-test was performed for statistical analyses. The numbers in bold show the significant differences. SD, standard deviation; CBT, cognitive behavioral therapy; PDSS, panic disorder symptom severity; WSAS, work and social adjustment scale.

group total PDSS has contributed to WSAS (Table 4). Proofing for the contribution of PDSS on WSAS in the control group there is a positive correlation (P=0.0009) between PDSS and WSAS as shown in Table 5 and Figure 4. Figure 4 revealed there is a positive correlation between PDSS and WSAS in the control group and there is no correlation between them in the brief intensive CBT group.

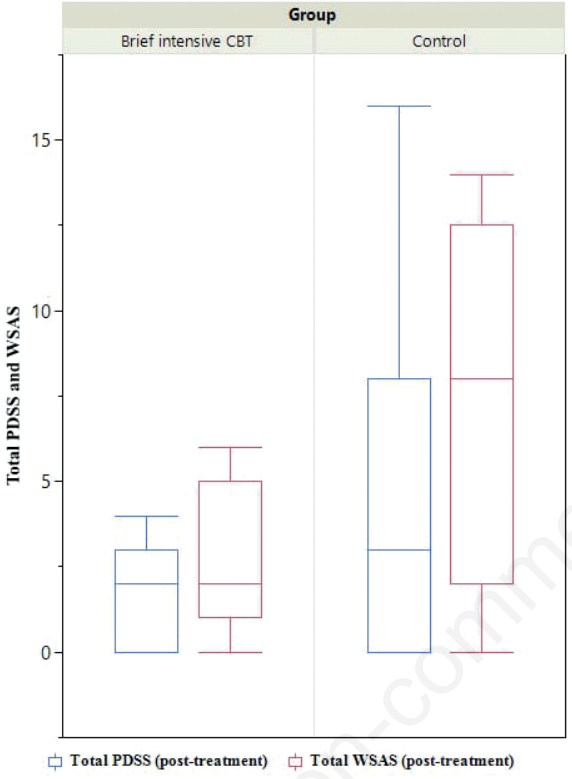

Figure 2. Panic disorder symptom severity and work and social adjustment scale levels of brief intensive cognitive behavioral therapy and control groups following one month of treatment.

Comparison of panic disorder symptom severity among different socio-demographic characteristics of the cognitive behavioral therapy group

The study showed that median values of PDSS were similar among patients with different socio-demographic characteristics (Table 6). This finding demonstrates that brief intensive CBT is equally beneficial for all participants regardless of their socio-demographic information.

Discussion

This study showed that the mean values of PDSS and WSAS scores were significantly reduced in both the brief CBT and control groups after one month. However, more significant improvements in PDSS and WSAS scores were found among brief CBT patients compared to those receiving pharmacotherapy at one month. Additionally, the overall improvement in social avoidance in the brief CBT group was independent of the improvement in the PDSS score, in contrast to the control group.

An increasing bulk of literature has been dedicated to examining the effect of standard CBT on different psychiatric disorders., including PD. However, there are few studies on the effect of brief intensive CBT in conjunction with pharmacotherapy on symptom severity and social avoidance in patients with PD. Brief intensive CBT incorporates the fundamental techniques of standard CBT while prioritizing therapist-guided exposure to internal and external triggers. The mean values of PDSS and WSAS scores were significantly lower in the brief intensive CBT group compared to the control group in our study.

Regarding the impact of combined CBT and regular pharmacotherapy on symptom severity in PD patients, we found two studies. One was a RCT conducted in 2019 with 20 patients,[24] and the other was an experimental study in 2005 with ten patients.[18] Both studies reported a significant improvement in symptom sever-

Table 3. Comparisons of panic disorder symptom severity and work and social adjustment scale at baseline and one-month follow-up in the control and brief intensive cognitive behavioral therapy groups.

Scales	Brief intensive CBT mean (SD)		Mean diff (95% ci)	P (wo-sided)
	Baseline	One-month follow up		
PDSS	21.53	1.79	-19.74 (-22.09 to -17.38)	<0.0001
Total WSAS	24.63	2.95	-21.68 (-26.05 to -17.32)	<0.0001
Scales	**Control**		**Mean diff (95% ci)**	**P (two-sided)**
	Baseline	**One-month follow up**		
PDSS	19.59	4.47	-15.12 (-18.32 to -11.92)	<0.0001
Total WSAS	22.18	7.41	-14.77 (-18.18 to -11.35)	<0.0001

A paired t-test was performed for statistical analyses. CBT, cognitive behavioral therapy; SD, standard deviation; PDSS, panic disorder symptom severity; WSAS, work and social adjustment scale.

ity in patients with PD.[24] The RCT study included an intervention group (n=20), who received four two-hour successive sessions of short-term CBT, and a control group (n=20) received regular pharmacotherapy treatment only.[24] The study revealed that after one month of treatment, symptom severity was significantly lower in the experimental group (Mean=3.90, SD=1.33) compared to the control group (Mean=14.90, SD=3.95) (P<0.001; effect size=3.16). In another study by Deacon and Abramowitz an intensive CBT program was implemented over two successive days with ten participants (n=10). The study showed a significant reduction in symptom severity from 1.83 (SD=0.94) to 0.20 (SD=0.27) (P<0.001; effect size=1.73) after one month.[18] In conjunction with the results of Deacon,[25] our study provides evidence supporting the practicality and effectiveness of a two-day CBT program. Deacon also reported similar improvements in a 38-year-old woman experiencing severe and persistent panic symptoms and agoraphobia.[25]

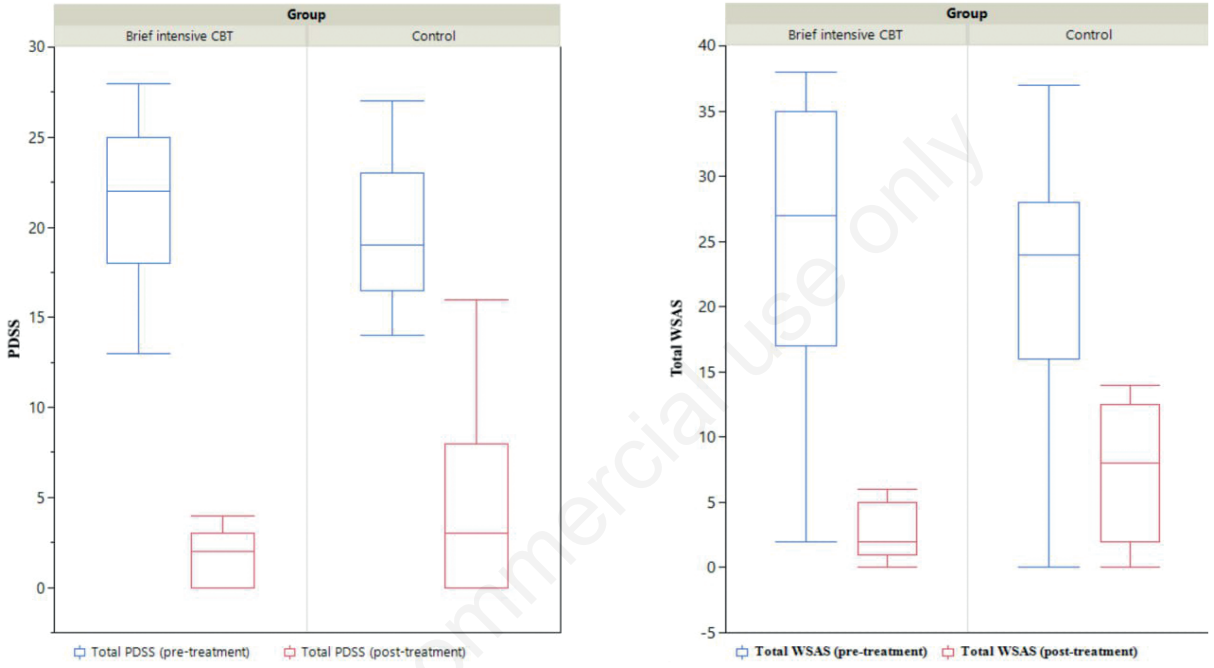

Figure 3. Panic disorder symptom severity and work and social adjustment scale levels at baseline and one-month follow-up in the brief intensive cognitive behavioral therapy and control groups.

Table 4. Contributing factors to work and social adjustment scale at one-month follow-up in the brief intensive cognitive behavioral therapy and control groups.

Groups	Outcomes: WSAS (one-moth follow up)	
CBT	**Pretentious**	**P-value**
Total PDSS (one-month follow up)		0.21082
Gender		0.38071
Education		0.63847
Age groups		0.68940
Control	**Pretentious**	**P-value**
Total PDSS (one-month follow up)		0.02037
Education		0.04608
Gender		0.59227
Age groups		0.91899

Standard least squares with effect leverage were performed for statistical analyses. WSAS, work and social adjustment scale; CBT, cognitive behavioral therapy; PDSS, panic disorder symptom severity.

The success of brief intensive CBT can be attributed to factors beyond its application. Schmidt *et al.* (2005) suggested that CBT can be enhanced by reducing or eliminating certain procedures that have minimal impact on its effectiveness, such as the breathing retraining technique that we omitted in our study.[26]

Furthermore, the methods employed to administer interoceptive exposure in our study deviated from the usual recommendations for treating PD. Established CBT manuals advise therapists to carry out a series of short interoceptive exposure trials, followed by a rest period where physiological provocation is allowed to diminish, and coping strategies like diaphragmatic breathing.[26] Additionally, as demonstrated by Deacon in 2007, in some cases, all interoceptive exposure trials are preplanned without considering coping strategies between trials.[27]

In our study, similar to Deacon's study, we implemented prolonged delivery of interoceptive exposure until habituation occurred, and no coping strategies were utilized. The use of coping strategies between trials that reduce arousal carries the potential risk of producing context effects,[28] where the sense of safety becomes dependent on the effectiveness of these coping strategies and the experience of only temporary and moderately intense bodily arousal.[29] To maintain a consistently high level of arousal throughout the interoceptive exposure exercises, the resting period be-

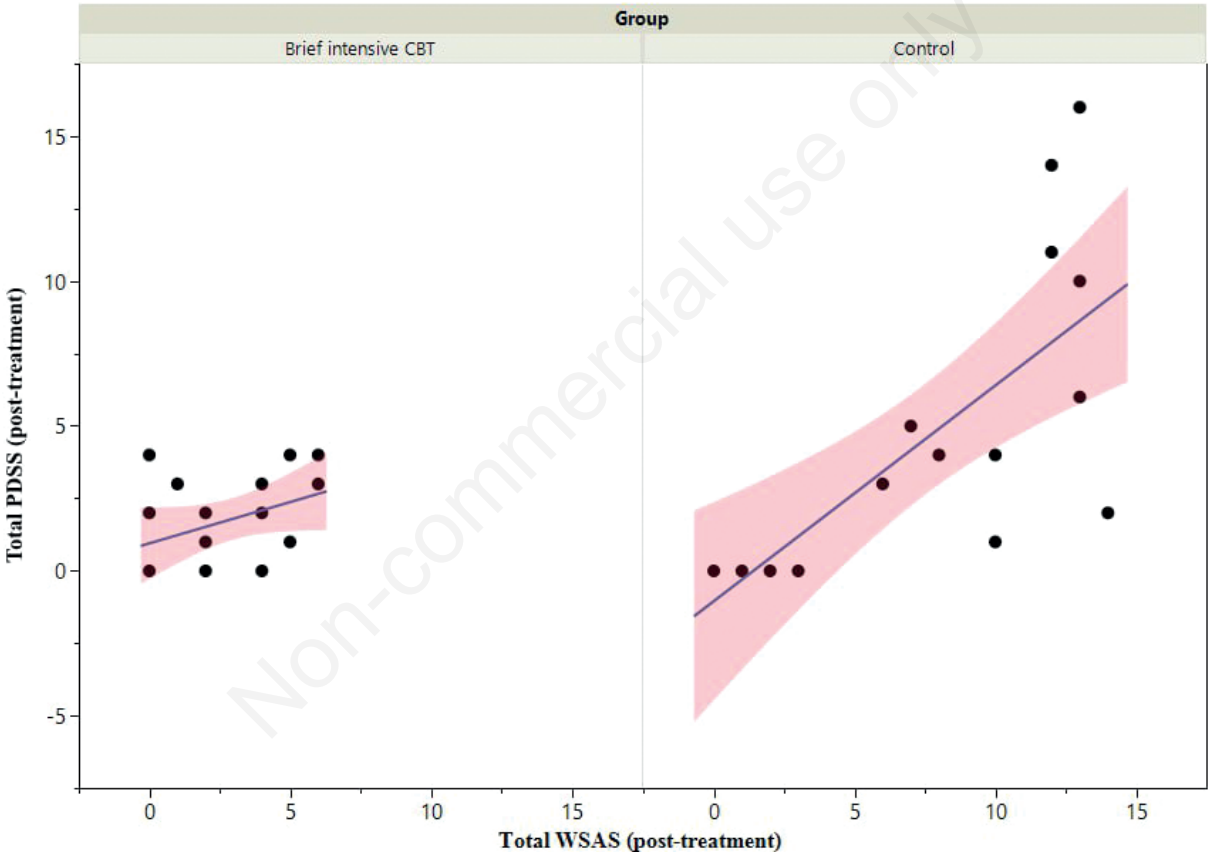

Figure 4. Scatter plot of correlation of work and social adjustment scale and panic disorder symptom severity scales in the brief intensive cognitive behavioral therapy and control group.

Table 5. Correlation of panic disorder symptom severity with work and social adjustment scale among cognitive behavioral therapy group at one-month follow-up.

Brief intensive CBT	**Total WSAS**	**R2**	**P (two-sided)**
Total PDSS (one-month follow-up)	0.3956 (-0.0714 to 0.7204)	0.16	0.0936
Control	**Total WSAS**	**R2**	**P (two-sided)**
Total PDSS (one-month follow up)	0.7306 (0.3853 to 0.8965)	0.53	0.0009

Pearson correlation test was performed for statistical analyses. CBT, cognitive behavioral therapy; WSAS, work and social adjustment scale; PDSS, panic disorder symptom severity.

tween each trial was limited to a maximum of 15 seconds. By doing so, patients were able to habituate to sustained and intense arousal, potentially resulting in an enhanced process of fear structures and the provision of adaptive information.[30]

Regarding social function in patients with PD, a comparative study (n=126) compared the quality of life (QOL) of patients with PD to a control group from the community. This study demonstrated that patients with PD had significantly poorer QOL in social functioning than the control group (P=0.03).[31] In terms of social avoidance, it is important to note that the generalized form of social anxiety disorder is marked by a pervasive fear and avoidance of a wide range of social situations. This subtype of social anxiety disorder results in considerable distress and impairment in social interactions, education, and work. Additionally, it often co-occurs with other conditions, including mood disorders, anxiety disorders, and substance abuse disorders.[32]

Regarding social avoidance, a study administered a six-week course of group CBT to patients with social anxiety disorder. The therapy sessions were conducted in groups lasting for a duration of two hours. Every group comprised four to six patients and was co-facilitated by two clinical psychologists. The treatment protocol used in the study was derived from Heimberg's treatment program developed in 1991, which is usually implemented over a period of 12 weeks or more, according to Heimberg and Becker's work in 1995. They reported the significant effect of the brief CBT on the severity of social anxiety.[33]

A study reported a similar improvement in adult patients aged 18-65 years stating that it is possibly due to individual treatment. The researchers speculated that patients may have experienced anxiety or apprehension when in contact with other patients, leading to a preference for individual therapy. We concur with this analysis and attribute the positive outcomes observed in our own patients to the utilization of individual therapy.[34]

What is noteworthy and surprising in our study is that the improvement in social avoidance in the control group is primarily attributed to regular pharmacotherapy and a decrease in panic symptom severity. However, brief intensive CBT has shown the ability to effectively improve social avoidance directly with-

Table 6. Comparisons of panic disorder symptom severity among different characteristics of the cognitive behavioral therapy group at one-month follow-up.

Characteristics	Total PDSS (one-month follow up)-adjusted		P (two-sided)
	Median	Interquartile range	
Age groups			
18-19	0	0	
20-29	2	4	
30-39	1	2.5	0.4600[b]
40-49	3	2.5	
50-60	0	0	
Gender			
Female	1	4	0.6334[a]
Male	2	2.75	
Residency			
Urban	1.5	3.25	0.4537[a]
Suburban	3	0	
Marital status			
Single	0	3.25	0.1920[a]
Married	2	2.5	
Occupation			
Student	0	2.25	
Jobless	2	2.5	
Employed	4	0	0.1603[b]
Self-employee	1	2	
Private sector	4	0	
Education			
Illiterate	2	4	
Read and write	2	2	
Primary school	2.5	1.75	0.5064[b]
Secondary school	2.5	3	
High school	1	3.5	
Institute and college	0	2	

A Mann Whitney U-test, and b Kruskal Wallis tests were performed for statistical analyses. PDSS, panic disorder symptom severity.

out relying on a reduction in panic symptoms as a prerequisite. In brief CBT, through psychoeducation and cognitive reconstruction, the therapy aims to reassure patients with panic disorder that panic attack symptoms are not life-threatening or dangerous, addressing the underlying factors of social avoidance. In panic disorder through replacing false negative beliefs about panic symptoms with realistic thoughts, CBT helps improve social avoidance and encourages patients to reintegrate and maintain social adjustment, fostering social connections. Our study found no significant differences in the reduction of panic symptom severity among various sociodemographic characteristics, indicating that brief intensive CBT has a comparable impact across different sociodemographic groups.

Limitations

It is important to acknowledge that data collection for this study was time-consuming, spanning approximately 17 months. Additionally, due to time limitations faced by the first author, who is a PhD student, the targeted sample size of 25 participants per group could not be fully achieved. Therefore, the findings reported in this study may not be generalizable to patients in other outpatient clinics.

Recommendations

Addressing these limitations in future research is crucial to ensure the robustness and generalizability of findings. Researchers should consider overcoming these limitations for a more comprehensive understanding of the effectiveness of brief CBT in the treatment of PD.

Conclusions

This study showed the significant impact of brief intensive CBT on reducing the severity of panic attack symptoms and improving social adjustment. Furthermore, it demonstrates the beneficial effects of this approach across diverse sociodemographic populations.

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