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RESEARCH ARTICLE

Interpersonal sensitivity predicts slower change and less change in anxiety symptoms in cognitive behavioural therapy

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Abstract

Objectives: Patients in cognitive behavioural therapy (CBT) who are high in interpersonal sensitivity may have difficulty fully engaging in treatment because therapy sessions require intimate interpersonal interactions that are especially uncomfortable for these individuals. The current study tests the hypotheses that patients who are high in interpersonal sensitivity benefit less from CBT for symptoms of depression and anxiety, show a slower rate of change in those symptoms, and are more likely to drop out of treatment.

Methods: Participants were 832 outpatients who received naturalistic CBT. We assessed interpersonal sensitivity before treatment began and depression and anxiety symptoms at every therapy session. We assessed early, premature, and uncollaborative termination after treatment ended. We constructed multilevel linear regression models and logistic regression models to assess the effects of baseline interpersonal sensitivity on the treatment outcome, the slope of change in depression and anxiety symptoms, and each type of dropout.

Results: Higher baseline interpersonal sensitivity was associated with a slower rate of change and less overall change in anxiety but not depressive symptoms. Baseline interpersonal sensitivity was not a predictor of dropout.

Conclusions: Interpersonal sensitivity at baseline predicts less change and a slower rate of change in anxiety symptoms. Early detection of elevated interpersonal sensitivity can help therapists take action to address these barriers to

successful treatment and help scientists build decision support tools that accurately predict the trajectory of change in anxiety symptoms for these patients.

KEYWORDS

CBT, decision support tool, dropout, interpersonal sensitivity, outcome, personalization, trajectory of change

Practitioner points

- Interpersonal sensitivity is a common patient characteristic among individuals seeking cognitive behavioural therapy for symptoms of anxiety and depression.
- Patients with high interpersonal sensitivity may make less progress and slower progress in cognitive behavioural therapy for symptoms of anxiety than patients with lower interpersonal sensitivity.
- These results highlight the need for therapists to assess and attend to their patients' interpersonal sensitivity at the beginning of treatment to prevent and mitigate the deleterious effects of interpersonal sensitivity on the rate of change in anxiety.

BACKGROUND

Although cognitive behavioural therapy (CBT) has been shown to provide effective treatment for symptoms of depression and anxiety, many patients who receive CBT do not improve or remit (Cuijpers et al., 2014) and many terminate treatment prematurely (Fernandez et al., 2015; Swift & Greenberg, 2012). Identifying patient characteristics that influence a patient's response and propensity to drop out of psychotherapy can strengthen the therapist's ability to personalize the treatment to maximize the help provided to each patient (Fisher et al., 2019; Persons, 2008). This information can also help researchers develop algorithms to select the treatment most likely to be helpful to patients with those characteristics (Cohen & DeRubeis, 2018) and develop decision support tools to help therapists maximize treatment outcome (Delgadillo et al., 2018; Lambert & Shimokawa, 2011).

Interpersonal sensitivity may represent a patient characteristic that influences the process and outcome of psychotherapy and the probability of dropout. Interpersonal sensitivity was described by Derogatis et al. (1976, p. 283) in their validation study of the Symptom Checklist-90 (SCL-90) as follows, 'The interpersonal sensitivity dimension focuses on feelings of personal inadequacy and inferiority … Self-deprecation, feelings of uneasiness and marked discomfort during interpersonal interactions are characteristic manifestations, as are acute self-consciousness and negative expectancies regarding interpersonal communications.'

Psychotherapy is an interpersonal process, and patients high in interpersonal sensitivity are, by definition, vulnerable to self-consciousness and expectations of negative reactions from others, making them susceptible to feeling shame in therapy sessions and choosing not to fully disclose their difficulties to the therapist (Hook & Andrews, 2005; Swan & Andrews, 2003). Such nondisclosure could weaken the therapeutic alliance, which has repeatedly been shown to be related to treatment outcomes in psychotherapy (Horvath et al., 2011). Supporting this theory, Renaud et al. (2014) showed that patents who could disclose their experiences in a nondefensive and focused manner benefited most from CBT. Similarly, Whelton et al. (2007) showed that self-criticism was associated with lower client ratings of the working alliance in a sample of 169 clients receiving counselling in a community clinic.

Interpersonal sensitivity has been shown to be common in depressed and anxious outpatients (Wilhelm et al., 2004), including those with social anxiety (Vidyanidhi & Sudhir, 2009). Interpersonal sensitivity has been shown to predict the development of depression (Boyce et al., 1991), poor prognosis following a depressive episode (Boyce et al., 1992), and the experience of lifetime depression (Sakado et al., 1999).

However, little is known about the relationship between interpersonal sensitivity and the outcome of psychotherapy for depression and anxiety. A meta-analysis conducted by Löw et al. (2020) showed that higher levels of self-criticism, an element of interpersonal sensitivity as defined by Derogatis et al. (1976), was associated with poorer outcomes in psychotherapy. Rector et al. (2000) showed that depressed patients high on self-criticism had worse outcomes of CBT. Zuroff et al. (2000) reported that a patient characteristic they termed 'self-critical perfectionism' predicted poorer outcome in the National Institute of Mental Health Treatment of Depression Collaborative Research Programme and that the relationship between perfectionism and outcome was explained (mediated) by these patients' failure to develop a strong therapeutic alliance.

Wilhelm et al. (2004) showed that subscale scores on the Interpersonal Sensitivity Measure were correlated with neuroticism (correlations ranged from .28 to .62), and thus the small literature examining neuroticism as a predictor of treatment outcome and dropout is relevant here. Klein et al. (2011) and Quilty et al. (2008) showed that higher neuroticism predicted less symptom change in combined psychotherapy and pharmacotherapy for depression, but Sasso and Strunk (2013) failed to find a relationship between neuroticism and symptom change in CBT for depression.

Even less is known about the relationship between interpersonal sensitivity and similar personality characteristics and psychotherapy dropout. Though a meta-analysis conducted by Fernandez et al. (2015) found diagnosis, treatment modality, treatment setting, and number of sessions to be significant predictors of dropout in CBT, they did not examine interpersonal sensitivity or other similar personality characteristics. The meta-analysis of dropout from psychotherapy by Swift and Greenberg (2012) showed that a personality disorder diagnosis broadly predicted premature discontinuation. Interestingly, Sasso and Strunk (2013) found that patients with higher levels of neuroticism, often elevated in patients high in interpersonal sensitivity, were *less* likely to drop out of treatment before completing the full 16-week treatment protocol. They speculated that perhaps this is because neuroticism produces distress that induces the patient to stay in treatment. On the other hand, Schmidt et al. (2019), in their study of internet-based CBT for depression, did not find a relationship between neuroticism and treatment dropout. Nonetheless, because the patient high in interpersonal sensitivity may experience increased discomfort in therapy sessions, they may leave the therapy prematurely, before they can obtain all the benefits the therapy has to offer. Supporting this theory, Kegel and Flückiger (2015) showed that a poor therapeutic alliance predicted dropout from CBT.

The literature we reviewed here has several gaps. Only a handful of studies examine the degree to which interpersonal sensitivity or similar personality characteristics predict the outcome of treatment for depression and anxiety. None of these studies examine the relationship between interpersonal sensitivity and the trajectory of change during treatment despite its importance in treatment decision making (Saunders et al., 2019). Furthermore, almost nothing is known about the relationship between interpersonal sensitivity and treatment dropout. Dropout from psychotherapy is high (Fernandez et al., 2015), and information about predictors of dropout can provide help to therapists seeking to prevent or mitigate it.

To address these gaps in the literature, the present study examines the degree to which interpersonal sensitivity at baseline predicts the outcome of CBT for symptoms of anxiety and depression, the slope of the change in anxiety and depression during CBT, and the probability of dropout. We examined three types of dropouts: early termination, premature termination, and uncollaborative termination. We defined an early termination as a treatment that ended after 3 or fewer sessions. This definition of dropout aligns most closely with the larger dropout literature, which most commonly defines dropout in terms of the number of sessions of treatment completed. We coded premature termination when, in the therapist's judgement, the patient ended treatment before capturing all the benefits the patient could obtain

from treatment. An uncollaborative termination was coded when, in the therapist's judgement, a patient ended treatment against therapist advice or without discussing the termination with the therapist.

We hypothesized that patients who scored higher on a measure of interpersonal sensitivity at baseline would experience smaller overall changes and slower rates of change in both anxiety and depressive symptoms and would be more likely to drop out of treatment early, prematurely, and uncollaboratively.

METHODS

Participants

Participants were 832 adults who received individual CBT during the years 1981–2009 from the senior author or one of 19 other therapists at her group private practice. Demographic and training characteristics of therapists are as follows: 16 therapists were female and 4 were male; 17 were White, one was Middle Eastern, 1 was South Asian, and 1 was East Asian; 16 had a Ph.D., 3 had a Psy.D., and 1 had an MSW; 12 were trainees for all or part of the time they worked in the practice and 8 were fully licensed.

All patient participants gave written consent for data from their clinical record to be used for research purposes. The patient data we studied are stored in the Naturalistic CBT Archival Database, a completely deidentified database. The procedures used to establish and maintain the database were reviewed and approved by the Behavioral Health Research Collective Institutional Review Board.

Patients ($N = 832$) included in the sample studied here sought treatment rather than just a consultation and completed the Symptom Checklist-90 at baseline and the Burns Anxiety Inventory or the Beck Depression Inventory on at least one occasion. When there was more than one course of treatment for a patient, we included only data from their first course of treatment to avoid dependence in statistical analyses.

The mean age of the patients in the sample was 37.30 years ($SD = 13.06$), and patients had completed 16.68 years of education ($SD = 2.65$) on average. Approximately 62% of patients identified as women, 38% as men; demographic information was missing for three patients. About 86% of patients identified as White, 6% as Asian, 3% as Hispanic and Latino, 2% as Black, and 3% as other races.

Most patients (82%) received at least one anxiety or depressive disorder diagnosis from their therapist. Diagnoses were based on a clinical interview using the most recent version of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association [APA], 1987, 1994, 2000) available at the time the patient was in treatment.

Measures

Interpersonal sensitivity

Interpersonal sensitivity was assessed with the interpersonal sensitivity scale of the SCL-90 (Derogatis et al., 1973). The SCL-90 is a 90-item self-report inventory measuring the following dimensions of psychopathology: interpersonal sensitivity, somatization, obsessive-compulsive disorder, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. The interpersonal sensitivity scale consists of the following nine items: 'Feeling critical of others,' 'Feeling shy or uneasy with the opposite sex,' 'Your feelings being easily hurt,' 'Feeling others do not understand you or are unsympathetic,' 'Feeling that people are unfriendly or dislike you,' 'Feeling inferior to others,' 'Feeling uneasy when people are watching or talking about you,' 'Feeling very self-conscious with others,' and 'Feeling uncomfortable about eating or drinking in public.' Patients rated each item indicating 'How much that problem has distressed or bothered you during the last seven days, including today' using a 5-point Likert scale (0 = *not at all* to 4 = *extremely*). We computed the interpersonal sensitivity score by averaging the scores on the nine items, resulting in a theoretical range

of 0–4. The interpersonal sensitivity score exhibited good internal consistency in the present sample ($\alpha = .84$). Derogatis and Cleary (1977a) validated the factor structure of the SCL-90 in a factor analytic study of 1200 outpatients, and Derogatis and Cleary (1977b) showed factorial invariance across gender for the interpersonal sensitivity dimension of the SCL-90.

Outcome

Anxiety symptoms

The Burns Anxiety Inventory (Burns AI; Burns & Eidelson, 1998) was used to assess symptoms of anxiety. The Burns AI is a 33-item self-report inventory measuring 6 anxious feelings (e.g., anxiety, nervousness, worry or fear), 11 anxious thoughts (e.g., feeling that you're on the verge of losing control) and 16 physical symptoms (e.g., a lump in the throat). Patients rated each symptom on a 4-point Likert scale (0 = *not at all* to 3 = *a lot*), and the sum scores with a theoretical range of 0–99 were used to represent anxiety severity. The Burns AI was used to track patients' progress in treatment because it is sensitive to change and captures a wide range of symptoms of anxiety. The Burns AI has been shown to have sound psychometric properties (Burns & Eidelson, 1998), including excellent internal consistency and high convergent validity with the Anxiety subscale of SCL-90 (Derogatis et al., 1976). The Burns AI exhibited excellent internal consistency in the present sample ($\alpha = .94$).

Depression symptoms

The Beck Depression Inventory (BDI; Beck et al., 1961) was used to assess symptoms of depression. The BDI is a 21-item self-report measure of the severity of depressive symptoms with high internal consistency and high convergent validity with other measures of depression (Beck et al., 1988). Patients rated each depressive symptom on a 4-point Likert scale, and the sum scores with a theoretical range of 0–63 were used to represent depression severity. The BDI exhibited good internal consistency in the present sample ($\alpha = .89$).

Dropout

Early dropout

Patients who left treatment after 3 or fewer sessions were categorized as having an Early termination. This approach is in line with the widely used approach in the literature (Swift & Greenberg, 2012), which defines dropout by counting the number of sessions the patient attended. Although there is no consistent threshold for defining early dropout, three is commonly used.

Premature dropout

At termination, the patient's therapist answered the question: 'Has the therapy been given a fair shake/tried for long enough to help the patient accomplish their treatment goals?' If the therapist answered 'no,' the termination was coded Premature. It is important to note that many patients who were rated by their therapists as terminating prematurely stayed in treatment for a substantial number of sessions; the average number of sessions they attended was 8.52 (Zieve et al., 2019).

Uncollaborative dropout

At termination, the patient's therapist answered the question: 'Did the patient and therapist work well together on the termination, agree on it, and discuss it fully?' If the therapist answered 'no,' the termination was coded uncollaborative. For example, a patient who abruptly stopped attending sessions without discussing their plan to end treatment or who ended treatment against the therapist's recommendation would be coded as having an uncollaborative termination.

The three types of dropout were not mutually exclusive; a patient could be coded as having more than one type of dropout. For example, a therapist might report both early and uncollaborative dropout if the patient dropped out of treatment before the fourth session against the therapist's recommendation. Each patient received a code for each type of dropout. The dropout variables were dummy coded, where 1 indicated that the therapist rated the termination as that particular type of dropout.

Procedure

Participants completed the SCL-90 and the symptom measures as part of their routine treatment. The SCL-90 was part of a large packet of intake measures patients completed before the first session; the SCL-90 was useful in the initial assessment process because of its broad coverage of psychological symptoms. Patients completed the BDI and/or the Burns AI in the waiting room before each session, and at the beginning of the session the therapist scored the measure and plotted the symptom score to guide decision making. Therapists asked their patients to complete the BDI and/or the Burns AI based on the patients' primary symptomatology. After treatment ended, the research team collected information from the therapists about the treatment, including the dates of sessions, the number of sessions, and the nature of the patient's termination. Persons (2023) provides additional details about the data collection procedures.

Treatment consisted of individual CBT sessions, usually at a weekly frequency. Instead of following a manualized treatment protocol, therapists developed an individualized cognitive-behavioural case formulation for each patient and used the formulation and the progress monitoring data to guide decision-making during treatment, selecting interventions from the available CBT manuals and other sources (Persons, 2008). Therapists referred patients to adjunctive treatment based on the needs of each patient. 44% and 16% of patients received adjunctive pharmacotherapy and psychosocial treatment, respectively. Treatment was open-ended and ended ideally when the patient and therapist agreed that the patient had achieved their treatment goals.

Analytic plan

We conducted all analyses in R (Version 4.1.1.; R Core Team, 2021).

To test the hypothesis that patients with higher interpersonal sensitivity at baseline would experience slower rates of change in their anxiety and depression symptoms, we constructed and interpreted multilevel linear regression models using the *lme4* (Bates et al., 2015) and *lmerTest* (Kuznetsova et al., 2017) packages. Multilevel modelling was appropriate for our data given the nested structure of our outcome data (sessions within patients). According to the unconditional models, the therapist level did not account for significant variance in anxiety and depressive symptoms and was therefore not included for more parsimonious models. We evaluated the interaction effects of interpersonal sensitivity and session number on the anxiety and depressive symptoms to examine the respective rates of change. In the two separate multilevel models, the dependent variables were the anxiety and depressive symptoms at each session, and the independent variables were the interaction effects of interpersonal sensitivity and session number. We also included the interaction effects of the respective symptom severity at baseline and session number to adjust for greater room for change among patients with higher baseline symptom severity. All our multilevel models included the random intercept and random slope of session number and used maximum likelihood estimation to handle missing data.

To test the hypotheses that patients with higher interpersonal sensitivity at baseline would experience less overall change in anxiety and depressive symptoms, we conducted multiple linear regression analyses. We separately examined the effects of interpersonal sensitivity on change in anxiety and depression symptoms from baseline to termination. In each regression model, the dependent variable was the change score in anxiety or depressive symptoms, and the independent variable was interpersonal

sensitivity at baseline. We also adjusted for anxiety and depressive symptoms at baseline and for the presence of adjunctive pharmacotherapy and psychosocial therapies during treatment.

To test the hypotheses that patients with higher baseline interpersonal sensitivity would be more likely to terminate treatment early, prematurely, or uncollaboratively, we conducted logistic regression analyses. We conducted three analyses, one for each type of dropout. In each regression model, the dependent variable was the termination variable (early, premature, uncollaborative), and the independent variable was interpersonal sensitivity at baseline. We also included anxiety and depressive symptoms at baseline as covariates to control for initial symptom severity.

To handle missingness in our data, we used the *mice* package (van Buuren & Groothuis-Oudshoorn, 2011) for multiple imputation (Enders, 2017), which created multiple complete datasets based on the observed responses in the original dataset. We conducted logistic regression analysis in each of these datasets and interpreted the pooled results to reduce the likelihood of erroneous and biased conclusions. We calculated Cohen's *d* (small = .20, medium = .50, large = .80; Cohen, 1988) and odds ratios (small = 1.68, medium = 3.47, large = 6.71; Chen et al., 2010) to measure effect sizes.

RESULTS

Demographic information and descriptive statistics of our sample are provided in Table 1, and intercorrelations of our baseline measures are provided in Table 2. Missing data at baseline included 12% of the dropout types, 4% of the Burns AI scores, and 2% of the BDI scores. Over the course of the treatment, 9% of the Burns AI scores and 10% of the BDI scores were missing.

Outcome

Higher interpersonal sensitivity at baseline was associated with a slower rate of change in symptoms of anxiety, $B = .36$, $SE = .10$, $t(171.80) = 3.50$, $p = <.001$, $d = .53$, but not symptoms of depression, $B = .11$, $SE = .06$, $t(143.20) = 1.86$, $p = .065$, $d = .31$. The effect size of interpersonal sensitivity on the rate of change in anxiety was medium. Results from the multilevel regression analyses are shown in Table 3. The interaction effect of baseline interpersonal sensitivity and session number on anxiety symptoms severity is graphed in Figure 1.

Controlling for adjunctive pharmacotherapy and psychosocial treatment and for baseline symptoms of anxiety and depression, higher interpersonal sensitivity at baseline was associated with less overall change in symptoms of anxiety, $B = -2.82$, $SE = 1.05$, $t(7.30) = -2.69$, $p = .030$, $d = -1.99$, but not symptoms of depression, $B = -.85$, $SE = .44$, $t(13.44) = -1.94$, $p = .073$, $d = -1.06$. The effect of interpersonal sensitivity on the overall change in anxiety was large. Results from the linear regression analyses are shown in Table 4.

Dropout

Controlling for adjunctive pharmacotherapy and psychosocial treatment and for baseline symptoms of anxiety and depression, interpersonal sensitivity at baseline was not associated with the likelihood of early, $B = -.12$, $SE = .12$, $OR = .89$, $Wald = .97$, $p = .334$, uncollaborative, $B = -.05$, $SE = .12$, $OR = .95$, $Wald = .19$, $p = .669$, or premature, $B = .23$, $SE = .16$, $OR = 1.25$, $Wald = 1.83$, $p = .207$. Unexpectedly, greater depression symptom severity at baseline was associated with higher likelihood of uncollaborative dropout, $B = .03$, $SE = .01$, $OR = 1.04$, $Wald = 9.01$, $p = .010$. Furthermore, receiving adjunctive psychosocial treatment was associated with lower likelihood of premature dropout, $B = -.54$, $SE = .17$, $OR = .58$, $Wald = 10.64$, $p = .003$. Both effect sizes were small. Results from the logistic regression analyses are shown in Table 5.

TABLE 1 Descriptive statistics for sample demographics, dropout classification, and clinical characteristics at baseline.

Variable	*n*	%	*M*	*SD*
Age			36.91	12.50
Years of education			16.60	2.64
Gender				
Female	512	61.8		
Male	317	38.2		
Race/Ethnicity				
Asian	46	5.7		
Black	14	1.7		
Hispanic and Latino	27	3.3		
White	696	86.0		
Other Races	26	3.2		
Adjunctive treatment				
Pharmacological	367	44.1		
Psychosocial	131	15.7		
Dropout				
Early	288	34.6		
Uncollaborative	197	23.7		
Premature	425	51.1		
Baseline Burns AI			27.10	18.00
Baseline BDI			16.21	9.90
Baseline SCL-90 IS			1.09	.82

Note: $N = 832$. Three patients are missing gender information. Baseline Burns AI and BDI are total scores. Baseline SCL-90 IS is the average score on each item of the Interpersonal Sensitivity Subscale of the SCL-90.

Abbreviations: BDI, Beck Depression Inventory; Burns AI, Burns Anxiety Inventory; SCL-90 IS, Symptom Checklist-90 interpersonal sensitivity.

TABLE 2 Intercorrelations of baseline variables.

Variables	1	2	3	4	5	6	7
1. Age	–						
2. Years of education	.29***	–					
3. Early dropout	.05	.01	–				
4. Uncollaborative dropout	−.02	−.05	.12	–			
5. Premature dropout	−.09*	−.04	.23***	.33***	–		
6. Burns AI	−.19***	−.22***	.01	.04	.05	–	
7. BDI	−.09**	−.15***	.04	.11**	.10**	.66***	–
8. SCL-90 IS	−.25***	−.16***	.00	.04	.11**	.53***	.59***

Abbreviations: BDI, Beck Depression Inventory; Burns AI, Burns Anxiety Inventory; SCL-90 IS, Symptom Checklist-90 interpersonal sensitivity.

*$p < .05$. **$p < .01$. ***$p < .001$.

DISCUSSION

We studied the relationship between baseline interpersonal sensitivity and the trajectory of change in symptoms of anxiety and depression, the amount of change in symptoms of anxiety and depression, and the likelihood of dropout in a large sample of anxious and depressed patients who received naturalistic

TABLE 3 Fixed main and interaction effects of baseline symptomatology on session scores.

Variable	*B*	*SE*	95% CI LL	95% CI UL	*t*	*p*	*d*
Burns AI at each session							
Session number	.13	.17	−.19	.46	.81	.418	.12
SCL-90 IS	.29	.46	−.62	1.19	.62	.536	.05
Burns AI	.90	.02	.85	.94	38.63	<.001	3.38
Session number × SCL-90 IS	.36	.10	.16	.56	3.50	<.001	.53
Session number × Burns AI	−.06	.00	−.06	−.04	−11.04	<.001	−1.64
BDI at each session							
Session number	.10	.10	−.10	.30	.99	.326	.16
SCL-90 IS	−.22	.27	−.75	.31	−.82	.410	−.05
BDI	.91	.02	.87	.96	38.28	<.001	2.22
Session number × SCL-90 IS	.11	.06	−.01	.22	1.86	.065	.31
Session number × BDI	−.04	.01	−.05	−.03	−8.07	<.001	−1.32

Abbreviations: BDI, Beck Depression Inventory; Burns AI, Burns Anxiety Inventory; CI, Confidence interval; LL, lower limit; SCL-90 IS, Symptom Checklist-90 interpersonal sensitivity; UL, upper limit.

CBT. As we hypothesized, we found that baseline interpersonal sensitivity was associated with a slower rate of change and less change in symptoms of anxiety. However, our hypothesis that anxiety sensitivity would also be associated with a slower rate of change and less change in depressive symptoms was not supported. Contrary to our hypotheses, interpersonal sensitivity was not associated with a higher rate of early, uncollaborative, or premature dropout. We also found that higher pretreatment severity of depressive symptoms and the use of adjunctive psychosocial treatment predicted uncollaborative and premature dropout, respectively.

We hypothesized that patients high in interpersonal sensitivity would show slower and less symptom change because these individuals might be more likely to avoid opening up to their therapist and experience shame and self-criticism when they do so (Gilbert & Procter, 2006). Interestingly, in our study the treatment-interfering effect of interpersonal sensitivity on symptom change in CBT was specific to anxiety symptoms. Perhaps this is because anxiety sensitivity and its treatment-interfering effects, especially avoidance, are more related to anxiety than to depression. Avoidance is a prominent symptom of social anxiety and other anxiety disorders (American Psychiatric Association, 2013), and exposure, to counter avoidance, is a prominent feature of CBT for anxiety disorders (cf. Abramowitz et al., 2019). In addition, exposure treatment is challenging, and successful exposure treatment requires a strong alliance with the therapist (Hayes & Strosahl, 2005). Because patients high in interpersonal sensitivity may be less likely to develop a strong alliance with the therapist, they may be less likely to carry out aggressive exposure treatment, and thus may benefit less from cognitive behavioural treatment for anxiety.

Contrary to our hypothesis, patients who entered treatment with higher levels of interpersonal sensitivity were no more likely to drop out than those with lower levels of interpersonal sensitivity. Such null finding suggests that there perhaps are factors other than interpersonal sensitivity that better predict the nature of patients' dropout. For example, we found that patients who entered treatment with more severe depressive symptoms were more likely to terminate treatment uncollaboratively than those who entered treatment less severely depressed. Greater baseline depression severity might reflect the presence of additional barriers for therapists and patients to form a strong therapeutic alliance and work collaboratively on treatment termination (Cuijpers et al., 2008). It is, however, important to note that the effect size of the association between baseline depression severity and uncollaborative dropout was small. We also found that patients who were receiving adjunctive psychosocial treatment were less likely to drop out prematurely. As judged by therapists, patients who drop out prematurely have additional

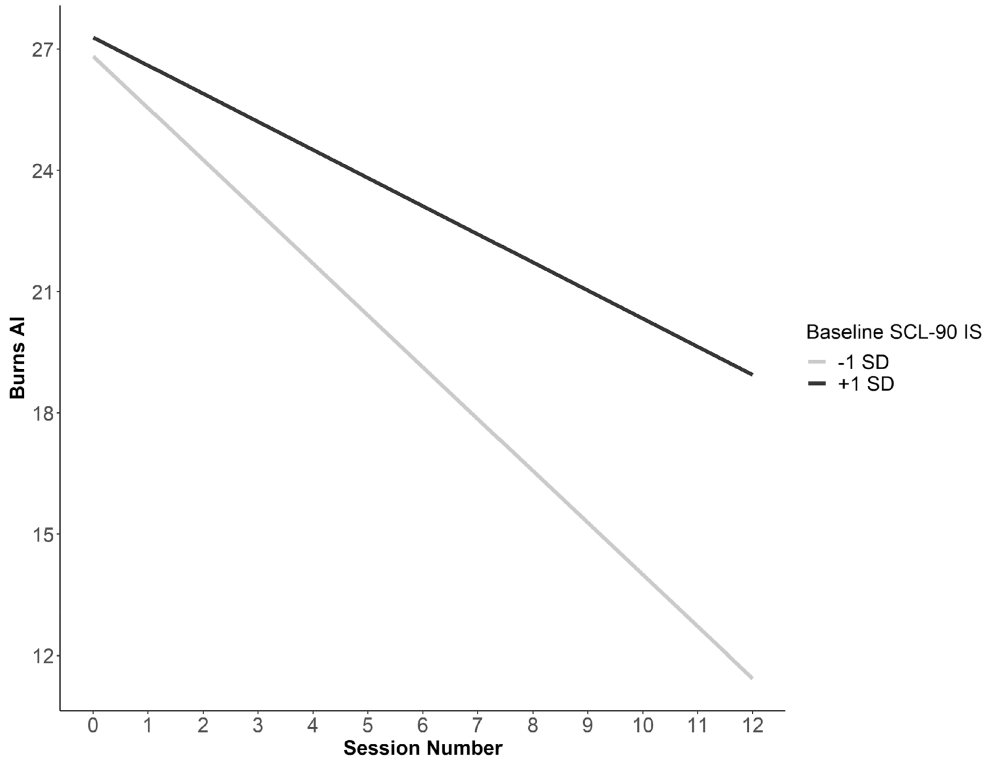

FIGURE 1 Effects of baseline interpersonal sensitivity on the rates of change in anxiety symptoms. *Note*: SCL-90 IS, Symptom Checklist-90 interpersonal sensitivity.

room to improve in their symptoms at termination, and patients who are receiving more than one psychosocial treatment might be more committed to fully resolving their symptoms before termination.

Our study contributes to the current literature on personalization of treatment, providing some evidence to support the notion that assessment of pretreatment patient characteristics has the potential to help the therapist adjust the treatment to better meet the patient's needs. Future studies might also investigate the degree to which information about interpersonal sensitivity might contribute to tools like the Personalized Advantage Index that are designed to identify which treatment is likely to be more helpful to a particular patient (Cohen & DeRubeis, 2018) as well as other decision support tools that monitor the patient's progress in treatment and send an alert to the therapist when the patient is off-track from a predicted path of good response (Delgadillo et al., 2018; Lambert & Shimokawa, 2011). Our study, which is based on data collected during routine progress monitoring, also highlights the way that therapists who monitor their patients' progress in treatment can collect data that contribute both to high quality care and to the research literature (Persons, 2023; Smith & Thew, 2017).

Clinical implications

Findings of the present study have useful clinical implications. When patients enter treatment with high interpersonal sensitivity, therapists could prepare for decreased rates of change in anxiety symptoms. By closely monitoring these patients' progress, therapists have an opportunity to implement timely strategies to prevent the treatment-interfering effects of interpersonal sensitivity. Therapists could use principles of functional analytic psychotherapy to identify patients' in-session problem behaviours, such as avoidance of disclosure of painful experiences, and target them for

TABLE 4 Effects of baseline symptomatology on the treatment outcome.

	Change in burns AI							Change in BDI						
			95% CI							95% CI				
Baseline variable	***B***	***SE***	**UL**	**LL**	***t***	***p***	***d***	***B***	***SE***	**UL**	**LL**	***t***	***p***	***d***
SCL-90 IS	−2.82	1.05	−5.27	−.36	−2.69	.030	−1.99	−.85	.44	−1.78	.09	−1.94	.073	−1.06
BDI	.07	.09	−.12	.27	.88	.403	.57	.33	.05	.20	.45	6.15	< .001	4.56
Burns AI	.40	.05	.29	.51	8.52	< .001	5.90	.03	.02	−.02	.07	1.35	.196	.67
Adjunctive pharmacotherapy	.60	.99	−1.47	2.67	.61	.551	.28	−.19	.56	−1.37	.98	−.34	.736	−.17
Adjunctive psychosocial treatment	−.98	1.28	−3.74	1.79	−.77	.458	−.43	−.43	.74	−2.05	1.19	−.59	.571	−.36

Abbreviations: BDI, Beck Depression Inventory; Burns AI, Burns Anxiety Inventory; CI, Confidence interval; LL, lower limit; SCL-90 IS, Symptom Checklist-90 interpersonal sensitivity; UL, upper limit.

TABLE 5 Effects of baseline symptomatology on dropout.

Baseline variable	*B*	*SE*	OR	95% CI UL	95% CI LL	Wald	*p*
Early dropout							
SCL-90 IS	−.12	.12	.89	.70	1.14	.97	.334
BDI	.09	.01	1.01	.99	1.03	.73	.397
Burns AI	.00	.01	1.00	.99	1.01	.16	.697
Adjunctive pharmacotherapy	.06	.23	1.06	.62	1.81	.07	.798
Adjunctive psychosocial treatment	−.25	.27	.78	.42	1.44	.86	.379
Uncollaborative dropout							
SCL-90 IS	−.05	.12	.95	.74	1.21	.19	.669
BDI	.03	.01	1.04	1.01	1.06	9.01	.010
Burns AI	−.01	.01	.99	.98	1.01	1.07	.312
Adjunctive pharmacotherapy	−.13	.13	.88	.68	1.14	.98	.327
Adjunctive psychosocial treatment	−.16	.19	.85	.57	1.28	.71	.412
Premature dropout							
SCL-90 IS	.23	.16	1.25	.85	1.83	1.93	.207
BDI	.02	.01	1.02	.99	1.05	1.48	.257
Burns AI	−.01	.01	.99	.98	1.01	.89	.367
Adjunctive pharmacotherapy	−.17	.13	.84	.65	1.09	1.77	.190
Adjunctive psychosocial treatment	−.54	.17	.58	.41	.82	10.64	.003

Abbreviations: BDI, Beck Depression Inventory; Burns AI, Burns Anxiety Inventory; CI, Confidence interval; LL, lower limit; SCL-90 IS, Symptom Checklist-90 interpersonal sensitivity; UL, upper limit.

change by reinforcing adaptive behaviours (Kohlenberg & Tsai, 1998). To target shame and self-criticism commonly present in patients with high interpersonal sensitivity, therapists could model compassion in the session and teach skills of self-compassion the patient can use outside the session (Gilbert & Procter, 2006). Therapists working with these patients would also benefit from monitoring the quality of the alliance in each session so that any difficulties in the alliance can be identified and addressed promptly (Falkenström et al., 2016).

Limitations and future directions

Although our study presents novel findings about the effects of interpersonal sensitivity on outcome and dropout in CBT, it has some limitations. First, we were unable to assess the reliability or validity of the ratings of premature dropout and uncollaborative dropout. Unlike the early dropout variable that was objectively determined by the number of sessions, the premature and uncollaborative dropout variables relied on the therapist's judgement. Obtaining more accurate and less biased information will require input from patients about why they ended treatment (Swift & Greenberg, 2012).

Second, the measure of interpersonal sensitivity we used was limited in that one of the interpersonal sensitivity items reads 'Feeling shy or uneasy with the opposite sex,' to assess difficulties engaging with someone the individual is sexually attracted to. However, this item entails the heteronormative assumption that romantic interests only occur between males and females. Although we did not remove the item to preserve the literature-supported factor structure of the measure, therapists and researchers who wish to assess interpersonal sensitivity will benefit from relying on measures that use more inclusive language, such as the Interpersonal Sensitivity Measure (IPSM; Boyce & Parker, 1989).

Third, we did not evaluate the mechanisms by which interpersonal sensitivity was related to outcome and dropout in CBT. We speculated that interpersonal sensitivity might interfere with treatment by harming the alliance by impeding the patient's self-disclosure, and by impairing the patient's ability to complete homework. However, our archival dataset did not include measures of the alliance or of homework compliance, so we were not able to test hypotheses about the mediating roles of self-disclosure, the alliance, and homework compliance. Future studies examining these variables and other mediators about the way interpersonal sensitivity affects the change process and outcome of CBT can expand the findings we presented here.

Lastly, we constructed single level models in addition to the multilevel models because we were unable to construct multilevel change score models that successfully converged in our programming language. Without proper convergence, we determined that it was unreliable to interpret such results. A more parsimonious solution to answering our research questions about the treatment outcome would have been to draw conclusions from the same multilevel models. Nonetheless, results from our multilevel and single level models on rates of change and overall changes were aligned with one another and thus unlikely to be spurious.

CONCLUSIONS

We investigated the effects of interpersonal sensitivity at the initiation of CBT on the treatment outcome and dropout in a large community sample of outpatients who received CBT. Higher interpersonal sensitivity at baseline was associated with slower change and less overall change in anxiety symptoms. Baseline interpersonal sensitivity, however, was not associated with a slower rate of change or less overall change in depressive symptoms. Our study suggests that heightened interpersonal sensitivity can interfere with the change process and outcome of CBT for anxiety symptoms, and that attention to this patient characteristic can increase our ability to personalize psychotherapy to improve outcomes.

AUTHOR CONTRIBUTIONS

Jiyoung Song: Conceptualization; methodology; software; formal analysis; writing – original draft; visualization. **Genevieve Freedman:** Conceptualization; writing – original draft; project administration. **Letian Li:** Writing – review and editing. **Jacqueline B. Persons:** Conceptualization; validation; investigation; resources; data curation; writing – original draft; writing – review and editing; supervision.

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CONFLICT OF INTEREST STATEMENT

The authors have no conflict of interest to declare.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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