

Perceptions of Cognitive-Behavioral Therapy and Antidepressant Medication for Depression After Brief Psychoeducation: Examining Shifts in Attitudes

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The majority of people with depression in the United States either never seek treatment or gravitate exclusively to antidepressant medication (ADM), despite the existence of other effective treatments, such as cognitive-behavioral therapy (CBT). Reluctance to use psychotherapy is partly due to lack of appropriate mental health literacy and perceptions of low treatment acceptability (appropriateness for a given problem) and credibility (treatment logicalness, and whether the patient expects improvement). In the current investigation, we examined whether providing psychoeducation about CBT for depression would change participant perceptions of the treatment's acceptability and credibility. We recruited 554 (female $n = 314$; 57%) participants across two online studies, and assessed their baseline perceptions of CBT and ADM using modified Treatment Acceptability (TAAS) and Treatment Credibility and Expectancy (CEQ) scales. Participants were subsequently presented with evidence-based, expert-vetted psychoeducational materials

describing CBT and ADM, and were asked to recomplete the TAAS and CEQ. In Study 1, participants endorsed significantly higher CBT-CEQ (credibility/expectancy) scores postpsychoeducation. In Study 2, participants endorsed significantly lower CBT-TAAS (acceptability), and among those with no exposure to depression treatments, endorsed significantly higher CBT-CEQ scores postpsychoeducation. In both studies, there were no perceptual changes of ADM after the psychoeducation. Finally, in Study 2, endorsement of a biological model of depression and depressive symptoms were negatively predictive of CBT's acceptability and credibility and expectancy postpsychoeducation. Perceptions of credibility and expectancy of CBT for depression appear malleable even after exposure to brief psychoeducation, whereas shifting perceptions of CBT's acceptability may require more extensive intervention.

Keywords: treatment acceptability; treatment credibility; cognitive-behavioral therapy; mental health literacy; depression

This research was supported in part by a grant from the Collaborative Innovation Development Program, Saskatchewan Health Research Foundation.

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Depression is a highly prevalent mental health condition (Kessler & Bromet, 2013) and is the leading cause of disability worldwide (Friedrich, 2017; Moussavi et al., 2007). Fortunately, there are several efficacious treatments for depression (DeRubeis et al., 2005; Rush, Beck, Kovacs, & Hollon, 1977). These treatments include psychotherapy (e.g., cognitive-

behavioral therapy [CBT]) and pharmacotherapy (e.g., antidepressant medications [ADMs]). Despite the availability of such efficacious treatments, only a minority of people with depression in the United States receive any treatment for their depression and very few receive psychotherapy specifically. Researchers have found that general literacy about and knowledge of mental health is directly associated with access to mental health services in the general population (Jorm, 2012; Jorm et al., 2006)—however, very few studies to date have examined public perception of specific psychological treatments and whether providing members of the public with treatment-specific knowledge would improve their perceptions of such treatments.

Mental Health Literacy and Perceptions of Psychological Treatments

Research has identified several barriers that prevent people with mental health issues from accessing appropriate treatments and specifically psychotherapy. Out-of-pocket expenses and treatment costs remain a major barrier to receiving appropriate care in the United States (Mojtabai & Olfson, 2006; Olfson & Marcus, 2010). For example, Mohr et al. (2006) found that 46.7% of their sample reported costs as a major barrier to psychotherapy access. Researchers have also identified nonfinancial factors that prevent individuals from receiving appropriate treatment, such as stigma (Bathje & Pryor, 2011; Corrigan, 2004; Griffiths, Christensen, Jorm, Evans, & Groves, 2004) and the desire to “solve” the mental health issue on one’s own, without intervention (Sareen et al., 2007).

Mental health literacy is defined as knowledge of mental disorders, their prevention, and treatment. Mental health literacy is one of the key variables associated with reduced mental health stigma, which in turn is associated with help-seeking behavior (Jorm, 2012). To date, researchers have found that, although mental health literacy is increasing in several Western countries, it still significantly lags behind physical health literacy (Jorm et al., 2006). Most studies have examined the effects of mental health literacy on stigma, help-seeking behaviors, and symptomology. For example, Jorm et al. (2003) found that attitudes regarding some treatments changed among participants who were sent evidence-based brochures about mental disorders and their treatments in comparison to those in a control condition. Researchers have also found that providing participants with general information about depression and CBT was associated with small reductions in personal stigma (Griffiths et al., 2004).

Once people acquire mental health literacy, they must then decide whether they find the treatments on

offer acceptable and credible (Devilly & Borkovec, 2000; Miltenberger, 1990). Treatment acceptability is defined as layperson perceptions of how fair, nonintrusive, and appropriate for the problem a treatment is (Kazdin, 1980; Wolf, 1978). Treatment credibility is defined as how logical and convincing a treatment seems, while expectancy is the perception of how much improvement is expected in a given treatment (Devilly & Borkovec, 2000). Evidence suggests perceptions of treatment acceptability, credibility, and expectancy are associated with initiation of treatment, drop-out rates, and treatment outcomes (Borkovec & Costello, 1993; Goossens, Vlaeyen, Hidding, Kole-Snijders, & Evers, 2005; Joyce & Piper, 1998; Krain, Kendall, & Power, 2005; Smeets et al., 2008). Importantly, researchers have found that perceptions of acceptability, credibility and expectancy are all modifiable (Pietrzak, Johnson, Goldstein, Malley, & Southwick, 2009; Smeets et al., 2008).

The health promotion and social marketing literatures recommend a combination of education, marketing, and law to change health-related perceptions and behaviors (Babor & Robaina, 2013). In virtually all health behavior change models used in this literature (e.g., Bassett-Gunter, Martin Ginis, & Latimer-Cheung, 2013), educational messages serve as a first step toward convincing people to make beneficial health-related choices. While social marketing and public health promotion campaigns rely on persuasive emotional appeals to motivate behavioral and perceptual change (Rothschild, 1999), clinicians may be more likely to argue that choices among medical treatments should ideally be made using factual and balanced psychoeducation. While few studies to date have examined the effects of CBT literacy on perceptions of the treatment among the general population, preliminary research has been conducted on the effects of pre-CBT psychoeducation on retention rates among those already seeking treatment. Evans and McCormack (2008) provided support for applying social marketing practices in a health care setting through both mass communication channels and in practitioner–patient communication, making these results relevant to this work. Delgadillo and Groom (2017) found that individuals randomized to receive brief pretreatment psychoeducation about CBT were less likely to drop out of CBT than those not receiving pretreatment psychoeducation. The findings of the latter study are in line with earlier research that suggests pretreatment preparation and socialization may work to enhance patient engagement (Walitzer, Dermen, & Connors, 1999).

It remains unclear whether psychotherapy literacy and psychoeducation affect perceptions of

treatment acceptability and credibility. To our knowledge, there is only one published study that examined the effects of providing a CBT psychoeducation on perceptions of the treatment's acceptability and credibility, in which the researchers found that perceptions of Internet CBT's (ICBT) credibility and expectancy significantly increased after participants were asked to watch educational videos about the treatment (Soucy, Owens, Hadjistavropoulos, Dirkse, & Dear, 2016).

Models of Depression and Entry and Engagement in Treatment

There is a growing body of research suggesting that preexisting explanatory models of depression influence public perceptions of various mental health services and patients' entry into and engagement with treatment. CBT for depression rests upon an elaborated explanatory model first established by Aaron Beck (1967; Beck, Rush, Shaw, & Emory, 1979). Since its inception, the cognitive model has been subjected to hundreds of empirical investigations, with the majority of studies providing support of the validity of the cognitive model (Clark & Beck, 1999). At the heart of this cognitive model are the hypotheses that (a) there are systematic differences between healthy and distressed individuals in the content and organization of their cognitions; (b) distressed individuals (or those vulnerable to psychopathology) typically possess rigid, overly negative cognitions of the self, world, and future; and (c) as mood, behaviors, and cognitions are all interrelated, desired mood changes are preceded by changes in cognitions and behaviors (Beck, 2008; Beshai, Dobson, Adel, & Hanna, 2016). Therapists typically provide psychoeducation regarding this theoretical model early in treatment for patients undertaking a course of CBT (Kuyken et al., 2016), and patient buy-in to this model of distress appears to be important for engagement and outcomes. Fennell, Teasdale, Jones, and Damlé (1987) found that patients who endorsed the CBT conceptualization of depression did better in treatment than those individuals who did not endorse the model as credible. Further, Carter et al. (2011) found that patients' perceived logic of the treatment predicted outcomes in CBT. As such, there is a widely tested theoretical model of CBT for depression, and patients' endorsement of this model to explain their distress is predictive of treatment engagement and eventual outcomes.

Biological explanations of psychopathology specifically have increased substantially over the last few decades (Blumner & Marcus, 2009), and some have found that such biological conceptualizations negatively impact treatment outcomes (Lebowitz,

2014). For example, participants reporting heightened depressive symptoms had more prognostic pessimism about their depression when they attributed it to biology as opposed to other causes (Lebowitz, Ahn, & Nolen-Hoeksema, 2013)—however, the same researchers found that an intervention portraying the malleability of biological factors in depression significantly reduced such pessimism. Finally, there is also evidence that endorsement of a biological model of depression is associated with poorer outcomes in CBT specifically. In their review, Hamilton and Dobson (2002) found that pretreatment explanatory models of depression moderated the level of treatment engagement and outcomes, wherein individuals who endorsed biological or characterological models of depression tended to have poorer outcomes in CBT.

Very little research has examined whether pretreatment factors, such as explanatory models of depression, affect entry into treatment per se. However, it is likely that levels of mental health literacy, perceptions of treatment acceptability and credibility, and baseline explanatory models of distress will interact to produce a unique treatment preference profile, which will in turn be associated with treatment initiation, dropout, and outcomes (Swift, Callahan, Cooper, & Parkin, 2018).

General Overview

The reviewed evidence points to the following conclusions: (a) there are several evidence-based psychotherapies for depression, including CBT, but the majority of sufferers never seek psychotherapy; (b) those who have acquired the appropriate literacy regarding mental health conditions and their treatment must then make an assessment of these treatments' acceptability, credibility, and expectancy before seeking or recommending such treatments; and (c) literacy levels, perceptions of treatment acceptability and credibility, and preexisting explanations of distress all appear to be associated with help-seeking behavior and treatment outcomes, and all are modifiable individual differences.

After accounting for Soucy et al.'s (2016) study, there are no published studies examining the effects of psychoeducation on lay perceptions of CBT. This work is essential amid calls to improve mental health literacy among members of the general public (Jorm et al., 2006). Thus, the current investigation extends and replicates previous literature in several ways.

In this two-study investigation, we examined the effects of providing brief, written psychoeducation on perceptions of CBT's and ADM's acceptability and credibility. Further, we examined whether a biologically based baseline explanatory model of

depression predicted perceptions of CBT as a function of psychoeducation. We predicted that ratings of CBT's acceptability and credibility would increase as a function of the CBT-specific psychoeducation (Delgadillo & Groom, 2017; Soucy et al., 2016). As a large portion of individuals in Western countries are already familiar with ADMs (Mojtabai & Olfson, 2014), we did not make specific hypotheses about change in perceptions of ADMs as a function of the ADM-specific psychoeducation. Finally, we predicted that endorsement of a biological model of depression at baseline would negatively predict postpsychoeducation acceptability and credibility scores, over and above prepsychoeducation ratings.

Method

PARTICIPANTS AND RECRUITMENT

Participants were recruited through CrowdFlower, an online crowdsourcing website. Crowdsourcing platforms have been used in several behavioral and clinical studies (Beshai, Mishra, Meadows, Parmar, & Huang, 2017; Chandler & Shapiro, 2016). Data collection for both studies was completed between March 2016 and January 2017. All participants were compensated \$1.50 for their participation, which is commensurate with compensation rates in crowdsourcing studies. Informed consent was obtained from all participants prior to data collection.

Eligibility requirements were that all participants reside in an English-speaking country (i.e., Canada, United States, United Kingdom, New Zealand, and

Australia), speak English proficiently, and be 18 years of age or older. In Study 1, a total of 423 participants were initially recruited. Of these, 281 participants (female $n = 161$, 57.3%) provided consent, at least 80% complete data, and passed an included attention check question (see Figure 1). In Study 2, a total of 435 participants were initially recruited. Of those, 273 (females $n = 153$, 56.0%) provided consent, complete data, and passed an included attention check question (see Figure 2). Table 1 provides a summary of pertinent sample demographics.

MEASURES

Modified Treatment Acceptability/Adherence Scale (TAAS)

The TAAS (Milosevic, Levy, Alcolado, & Radomsky, 2015) is an 8-item, self-report measure of treatment acceptability. Participants rate their agreement, from 0 (*strongly disagree*) to 7 (*strongly agree*), with each presented statement (e.g., "If I began this treatment, I would be able to complete it"), with total scores ranging from 0 to 56. Greater scores are indicative of greater treatment acceptance. The scale was originally developed to assess anxiety treatment acceptability, therefore wording that specifically referenced "fear/anxiety" (Items 6 and 7) was changed to refer to depression. Further, for the purposes of the current study, "treatment" in all items was replaced with either "cognitive-behavioral therapy" or "antidepressant medication," depending on which treatment was being rated (e.g., "If I began cognitive-behavioral

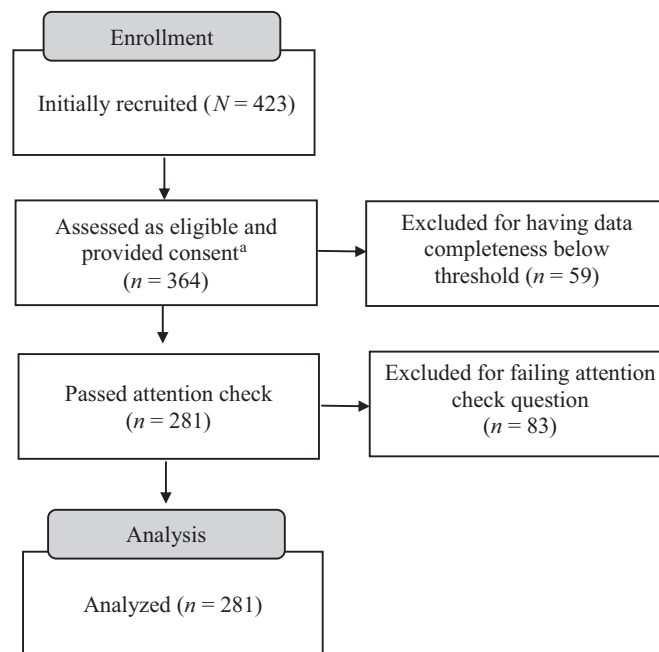


FIGURE 1 Study 1 participant flow.^aComplete data is defined as having >80% complete data.

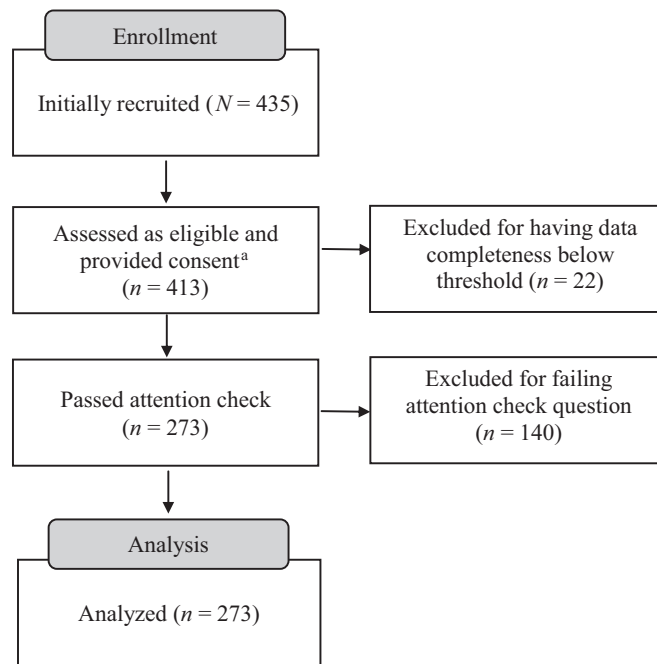


FIGURE 2 Study 2 participant flow.^aComplete data is defined as having >80% complete data.

therapy/antidepressant medication, I would be able to complete it”). Even with such modifications, internal consistencies for the TAAS were excellent (see Table 2 for internal consistency estimates).

Modified Credibility/Expectancy Questionnaire (CEQ)

The CEQ (Devilley & Borkovec, 2000) is a commonly used self-report measurement of patient

Table 1
Demographic Characteristics of the Three Samples in Study 1 and Study 2

	Study 1 (n = 281)	Study 2 (n = 273)
Age: <i>M</i> (<i>SD</i>)	38.16 (12.57)	36.58 (12.40)
Sex: <i>n</i> (%)		
Female	161 (57.3)	153 (56.0)
Marital status		
Single	92 (32.7)	87 (31.9)
Dating	30 (10.7)	42 (15.4)
Married/common-law	140 (49.8)	127 (46.5)
Separated/divorced	14 (5.0)	14 (5.1)
Widowed	5 (1.8)	3 (1.1)
Education		
Secondary school or below	51 (18.2)	43 (15.8)
Some college/university	71 (25.3)	66 (24.2)
College/university	121 (43.4)	122 (44.7)
Postgraduate/professional school	38 (13.5)	42 (15.4)
Personal annual income ^a		
Less than \$10,000	85 (30.8)	74 (27.1)
\$10,000–\$50,000	141 (50.2)	138 (50.6)
Over \$50,000	50 (17.8)	61 (22.3)
Previous depression diagnosis	67 (23.8)	64 (23.4)
Previous treatment for depression	101 (36.1)	98 (35.9)
CBT	10 (9.9) ^b	13 (13.3) ^b
ADM	81 (80.2) ^b	71 (72.4) ^b
Other	10 (9.9) ^b	14 (14.3) ^b

Note. CBT = cognitive-behavioral therapy; ADM = antidepressant medication.

^a Five participants did not provide responses to this item in Study 1. ^b Percentage derived from those who indicated receiving treatment.

Table 2
Cronbach's Alpha Coefficients for Study Measures

Measures	Study 1		Study 2	
	Prepsychoeducation	Postpsychoeducation	Prepsychoeducation	Postpsychoeducation
CBT-TAAS	.86	.87	.94	.95
ADM-TAAS	.89	.90	.93	.95
CBT-CEQ	.96	.96	.86	.88
ADM-CEQ	.95	.96	.87	.91
RFD-Biology	-	-	.90	-
PHQ-8	-	-	.89	-

Note. CBT = cognitive-behavioral therapy; TAAS = Treatment Adherence and Acceptance Scale; ADM = antidepressant medication; CEQ = Credibility and Expectancy Questionnaire; RFD-Biology = Reasons for Depression Questionnaire—Biology subscale; PHQ-8 = Patient Health Questionnaire-8.

acceptance of treatment rationale and beliefs regarding its expected efficacy. The CEQ comprises six items that ask respondents to rate their confidence in treatment (e.g., “At this point, how logical does the treatment seem to you?”). Four items are rated on a 9-point scale from 1 (*not at all logical*) to 9 (*very logical*), and two on an 11-point scale. The scale has been used with patient and nonpatient populations, and shows adequate validity and reliability (Beale, Kato, Marin-Bowling, Guthrie, & Cole, 2007; Powers & Emmelkamp, 2008). Among the current sample, the modified (i.e., “cognitive-behavioral therapy/antidepressant medication” instead of “this treatment”) versions of the CEQ evidence excellent internal consistencies.

Reasons for Depression Questionnaire (RFD)

The RFD (Addis, Truax, & Jacobson, 1995) is a 48-item measure designed to assess people's perceptions of what causes depression. The original scale consisted of 44 items that loaded onto eight different subscales corresponding to eight causes of depression (i.e., characterological, achievement, interpersonal conflict, existential, intimacy, childhood, physical, and relationship). For the purposes of this study, we only used the five-item biological subscale of the RFD. Each of the five items (e.g., “I have a chemical imbalance”; “It's a biological illness”; “I inherited it from my parents”) was rated on a 4-point Likert scale, from 1 (*definitely not a reason*) to 4 (*definitely a reason*). Although intended for use among clinical populations, the RFD has also been used and validated with nonclinical samples (Thwaites, Dagnan, Huey, & Addis, 2004). In addition, we changed the administration instructions for the RFD to allow participants who were not endorsing a depression diagnosis at the time of administration to imagine a time when they were depressed and/or to respond

to the items in relation to someone they know who has been depressed.

Patient Health Questionnaire-8 (PHQ-8)

The PHQ-8 (Kroenke et al., 2009) is an eight-item self-report measure that assesses depressive symptoms over the past 2 weeks. The PHQ was developed in accordance with criteria for major depressive episode in the fourth edition of DSM (DSM-IV). Participants answered each of the eight items (e.g., “Feeling down, depressed, or hopeless”) on a 4-point Likert-type scale, ranging from 0 (*not at all*) to 3 (*nearly every day*). Higher total scores were indicative of greater distress. The PHQ-8 has demonstrated excellent psychometric property in previous studies (Kroenke et al., 2009).

TREATMENT PSYCHOEDUCATION

The purpose of the psychoeducation was to provide basic, evidence-based information about CBT and ADM. Specifically, the psychoeducation for either treatment included a 300- to 400-word description that provided (a) the defining features of the treatment, (b) how the treatment purports to treat depression, (c) the nature and typical course of the treatment, and (d) providers who typically deliver the treatment (see Online Supplements). At the end of the descriptions for either treatment, evidence-based lists of five advantages and five disadvantages of CBT and ADM were also provided. To ensure accuracy and objectivity, four experts (including one psychiatrist who is an ADM expert, and three psychologists who are experts in CBT) provided feedback and quantitative ratings of the psychoeducational materials, and the materials were revised iteratively in accordance with such feedback. Both CBT and ADM psychoeducational materials were provided to all participants in counterbalanced order to eliminate any primacy or recency effects.

PROCEDURE

All study tasks were completed online through CrowdFlower. After providing consent and completing the demographic information form, all participants completed the CBT and ADM versions of the TAAS and CEQ (Study 1), or the PHQ-8, RFD-Biology subscale, and CBT and ADM versions of the TAAS and CEQ (Study 2). Participants were then shown psychoeducational materials for CBT and ADM in randomized order, followed by a second administration of both versions of the TAAS and CEQ. All scales were completed in randomized order. Finally, participants were thanked, debriefed, and compensated as appropriate. Average completion times of study procedures were approximately 28 (Study 1) and 31 (Study 2) minutes.

STATISTICAL ANALYSES

Data were cleaned and checked for accuracy. Data missingness was less than 1%, and for participants with at least 80% complete data (Dong & Peng, 2013), we mean imputed missing values. In both Studies 1 and 2, we conducted a series of mixed-plot (one repeated-measures and one between-group variables) analysis of variances (ANOVAs) to examine changes in TAAS and CEQ scores across time (pre- vs. postpsychoeducation) and across previous treatment exposure condition (treatment naïve vs. treatment experienced). Individuals who provided less than 80% of the data, as well as those who failed an included attention check question (e.g., “If you are reading this statement, please select ‘depression’ from the answer choices”) were excluded from the analyses.

In Study 2, and in addition to the mixed-plot ANOVAs, we also conducted a series of hierarchical linear regressions to examine whether depressive symptoms (PHQ-8 scores) or endorsement of a biological model of depression (RFD-Biological), entered in Block 2, can predict postpsychoeducation CBT-TAAS and CBT-CEQ scores, after accounting for prepsychoeducation CBT-TAAS or CBT-CEQ (Block 1).

Results

CHANGES IN CBT ACCEPTABILITY AND CREDIBILITY RATINGS

Study 1

Descriptive statistics for main outcome measures stratified by condition are summarized in Table 3. There was no significant main effect of psychoeducation, $F(1, 279) = 0.002, p = .96, d = 0.0$, nor a was there significant interaction between psychoeducation and treatment exposure, $F(1, 279) = 0.22, p = .64, d = 0.07$, on CBT-CEQ (Acceptability and Adherence) scores. There was a significant main effect of psychoeducation, $F(1, 279) = 13.99, p < .001, d = 0.45$ on CBT-CEQ (Credibility and Expectancy) scores; participants endorsed a significantly higher score on this measure after the psychoeducation. There was no significant interaction effect between psychoeducation and previous treatment exposure, $F(1, 279) = 0.04, p = .83, d = 0.0$.

Study 2

Descriptive statistics for study measures, stratified by psychoeducation condition, are summarized in Table 4. There was a significant main effect of psychoeducation on CBT-TAAS (Acceptability and Adherence) scores, $F(1, 271) = 4.64, p = .032, d = 0.26$. Specifically, participants endorsed a significantly lower score on this measure after the psychoeducation. There was no significant interaction between psychoeducation and treatment exposure on CBT-TAAS scores, $F(1, 271) = 1.54, p = .22, d = 0.16$.

There was no significant main effect of psychoeducation on CBT-CEQ (Credibility and Expectancy) scores, $F(1, 271) = 2.07, p = .15, d = 0.18$. However, there was a significant interaction between psychoeducation and treatment exposure on CBT-CEQ scores, $F(1, 271) = 5.74, p = .017, d = 0.29$; those with no previous treatment exposure reported significantly higher scores on the CBT-CEQ after the psychoeducation ($M = 36.70, SD = 9.85$) than those with previous treatment exposure ($M = 35.30, SD = 11.70$; see Figure 3).

Table 3
Descriptive Statistics of Study 1 Outcome Measures Stratified by Condition

Measure	CBT				ADM			
	Prepsychoeducation		Postpsychoeducation		Prepsychoeducation		Postpsychoeducation	
	<i>M</i> (<i>SD</i>)	95% CI	<i>M</i> (<i>SD</i>)	95% CI	<i>M</i> (<i>SD</i>)	95% CI	<i>M</i> (<i>SD</i>)	95% CI
TAAS	33.40 (8.28)	[32.43, 34.37]	33.35 (8.67)	[32.34, 34.37]	36.21 (9.56)	[35.09, 37.34]	36.70 (9.26)	[35.61, 37.79]
CEQ	33.11 (11.51)	[31.76, 34.46]	34.57 (11.31)	[33.25, 35.90]	34.32 (12.11)	[32.90, 35.75]	34.25 (11.30)	[32.93, 35.58]

Note. CBT = cognitive-behavioral therapy; ADM = antidepressant medication; TAAS = Treatment Adherence and Acceptance Scale; CEQ = Credibility and Expectancy Questionnaire.

Table 4
Descriptive Statistics of Study 1 Outcome Measures Stratified by Condition

Measure	CBT				ADM			
	Prepsychoeducation		Postpsychoeducation		Prepsychoeducation		Postpsychoeducation	
	<i>M</i> (<i>SD</i>)	95% CI	<i>M</i> (<i>SD</i>)	95% CI	<i>M</i> (<i>SD</i>)	95% CI	<i>M</i> (<i>SD</i>)	95% CI
TAAS	35.60 (5.08)	[35.00, 36.21]	34.41 (9.03)	[33.33, 35.48]	36.07 (9.83)	[34.90, 37.24]	34.59 (10.51)	[34.34, 36.85]
CEQ	35.12 (10.81)	[33.83, 36.41]	36.21 (10.55)	[34.96, 37.46]	35.31 (11.44)	[33.95, 36.67]	34.48 (11.02)	[33.17, 35.79]

Note. CBT = cognitive-behavioral therapy; ADM = antidepressant medication; TAAS = Treatment Adherence and Acceptance Scale; CEQ = Credibility and Expectancy Questionnaire.

CHANGES IN ADM ACCEPTABILITY AND CREDIBILITY RATINGS

Study 1

There was no significant main effect of psychoeducation on ADM-TAAS scores, $F(1, 279) = 1.66, p = .20, d = 0.16$. There was no significant interaction between psychoeducation and previous treatment exposure on ADM-TAAS scores, $F(1, 279) = 0.19, p = .66, d = 0.06$. Further, we found no significant main effect of psychoeducation, $F(1, 279) = 0.004, p = .95, d = 0.0$, nor a significant interaction between psychoeducation and treatment exposure, $F(1, 279) = 0.14, p = .71, d = 0.06$, on ADM-CEQ scores.

Study 2

There was no significant main effect of psychoeducation on ADM-TAAS scores, $F(1, 271) = 0.76, p = .38, d = 0.11$. There was also no interaction effect

between psychoeducation and treatment exposure on ADM-TAAS scores, $F(1, 271) = 2.79, p = .098, d = 0.20$. The final analysis revealed no significant main effects of psychoeducation on ADM-CEQ scores, $F(1, 271) = 2.23, p = .14, d = 0.18$, nor a significant interaction between psychoeducation and treatment exposure, $F(1, 271) = 1.32, p = .25, d = 0.14$.

ASSOCIATIONS OF BIOLOGICAL MODEL ENDORSEMENT, DEPRESSION SYMPTOMS, AND CBT-RELATED PERCEPTIONS (STUDY 2)

RFD-Biology scores were a significant predictor of CBT-TAAS postpsychoeducation scores, over and above the variance attributed by prepsychoeducation CBT-TAAS scores, $b = -.34, t(270) = -2.58, p = .011, F(2, 270) = 3.55, p = .03 (R^2_{\text{change}} = .024)$. Similarly, PHQ-8 scores were a significant predictor of postpsychoeducation CBT-TAAS scores, $b =$

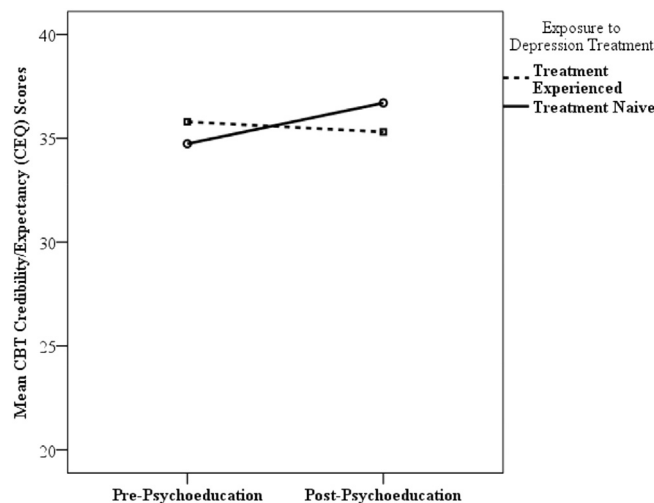


FIGURE 3 Significant interaction between psychoeducation and previous depression treatment exposure on cognitive-behavioral therapy (CBT) Credibility and Expectancy Questionnaire (CEQ) scores, wherein those who were treatment naïve experienced significant increases in credibility/expectancy scores postpsychoeducation in comparison to treatment-experienced participants.

$-.29, t(270) = -3.10, p = .002, F(2, 270) = 5.03, p = .007$ ($R^2_{\text{change}} = .034$), after controlling for prepsychoeducation CBT-TAAS scores.

RFD-Biology scores were a significant predictor of postpsychoeducation CBT-CEQ scores after controlling for prepsychoeducation scores, $b = -.28, t(270) = -2.64, p = .009, F(2, 270) = 140.92, p < .001$ ($R^2_{\text{change}} = .013$). Finally, PHQ-8 scores were a significant predictor of postpsychoeducation CBT-CEQ scores, over and above the variance contributed by prepsychoeducation CBT-CEQ scores, $b = -.27, t(270) = -3.52, p < .001, F(2, 270) = 146.33, p < .001$ ($R^2_{\text{change}} = .022$).

Discussion

In the current investigation, we found that providing psychoeducational materials of CBT functioned to improve perceptions of the treatment's credibility and expectancy. However, brief psychoeducation was not sufficient to change people's perceptions of the treatment's acceptability. In Study 2, there was evidence that psychoeducation actually functioned to reduce people's perceptions of CBT's acceptability. Finally, we found that the degree of endorsement of a biological model of depression, as well as depression symptoms' severity, negatively predicted perceptions of CBT postpsychoeducation.

The current study is one of very few that attempt to examine the effects of brief psychoeducation on perceptions of CBT. This work is important for both clinical and social reasons. Clinically, this work is important to understand attitudinal barriers to treatment engagement. Socially, understanding lay perceptions of treatments is necessary to tailor literacy campaigns to help increase social acceptance of CBT. Across two online studies ($n = 554$), we investigated whether providing individuals with brief written psychoeducation about CBT for depression would change their perceptions of the treatment's acceptability and credibility. We hypothesized that, after reading the psychoeducational materials, participants' perception of CBT's acceptability and credibility would increase. Further, we predicted that participants' endorsement of the biological model of depression would be negatively associated with these perceptions.

In partial support of the first hypothesis, we found that participants' perceptions of the credibility of CBT for depression changed positively after reading the psychoeducational materials of CBT in Study 1, while there was no change in the perceptions of credibility of ADM after the psychoeducation. This effect was small to medium across both studies and was only replicated among treatment-naïve participants in Study 2. With this said, results of this investigation showed that

providing even very brief, written psychoeducation on the nature and effectiveness of CBT appeared to be enough to produce significant and reproducible changes in participants' perceptions of the effectiveness and credibility of CBT for depression. These results are consistent with previous research showing that providing psychoeducational, evidence-based materials on mental health treatments may enhance attitudes about such treatments among depressed participants from the community (Jorm et al., 2003). These results are also consistent with evidence from physical health promotion campaigns. This evidence suggests that campaigns delivering health information can have small positive effects on health behavior and perceptions (Evans & McCormack, 2008).

Contrary to our hypothesis, there was no change in participants' perceptions of CBT acceptability or perceptions of one's ability to adhere to the treatment as a function of the psychoeducation across both studies. Notably, we found that participants' perceptions of the acceptability of CBT decreased as a function of psychoeducation in Study 2, although this effect was small. Researchers have found that low treatment acceptability is an important barrier to seeking mental health treatment, and may be related to self-stigma (Goodman, 2009). The results of our investigation suggest that, while the public's perception of how credible CBT is as a viable treatment for depression may change as a function of mental health education, attitudes regarding how difficult and intrusive the treatment is may inhibit adoption. Perceptions of CBT's credibility and acceptability are likely necessary to motivate people to seek out or engage in such treatments (Kazdin, 1980).

In partial support of the second hypothesis, we found in Study 2 that participants' level of endorsement of a biological model of depression was significantly and negatively predictive of perceptions of CBT credibility postpsychoeducation, after controlling for prepsychoeducation credibility ratings. A similar pattern of results was observed for CBT's acceptability ratings, wherein endorsement of a biological model of depression was negatively predictive of ratings of CBT's acceptability postpsychoeducation, after controlling for prepsychoeducation acceptability ratings of the treatment. This suggests that endorsement or "buy in" of the biological model of depression may be at odds with the generic, cognitive, and behavioral focus of CBT's explanatory model.

These results provide further support of the importance of explanatory models of mental disorders generally, and of depression specifically (Lebowitz, 2014). Results from several investigations support the notion that endorsement of

certain etiological models of depression impacts perceived stigma, and beliefs of treatment effectiveness (Nieuwsma & Pepper, 2010). Biological models of mental health tend to be associated with increased other-stigma and counterproductive attitudes about mental health (Lebowitz, 2014; Lebowitz et al., 2013). Further, there is evidence in support of tailoring the “illness myth” of a disorder to match participants’ preexisting understanding of such disorder. “Illness myth” is defined as the preexisting explanatory model of a condition. A meta-analysis found that tailoring such an “illness myth” is effective in the adaptation of treatments for use among culturally diverse populations (Benish, Quintana, & Wampold, 2011). Accordingly, it is plausible that pretreatment assessment and tailoring of patients’ explanatory models of depression may increase treatment engagement and reduce dropout. Health promotion researchers recognize that persuasive appeals can have almost twice as strong an effect as psychoeducation, and messages that are tailored to the individual have the potential to be even more effective (Evans & McCormack, 2008).

Further, we found that depressive symptoms were negatively predictive of perceptions of CBT’s acceptability and credibility postpsychoeducation, suggesting that increased depressive symptoms are associated with resistance to change. This finding is consistent with the overall clinical presentation of depression, which is often characterized by negative thoughts about the future (Beck et al., 1979; Clark & Beck, 1999) and feelings of hopelessness (Abramson, Metalsky, & Alloy, 1989). It is possible that as depression symptoms increase, so do thoughts of the futility of therapy, which may in turn inoculate some participants with higher depressive symptoms against change. However, future research is warranted to explore this possible relationship. There was no evidence that depressive symptoms were associated with change in beliefs regarding the acceptability of CBT for depression.

The current investigation replicated and extended extant literature in several ways. First, and to our knowledge, this is the first study to directly examine whether public perceptions of CBT for depression can change after the provision of psychoeducational materials using health promotion and literacy strategies. Second, this is the first study to examine how endorsement of a biological model may impact views of CBT. This study points to the relative malleability of perceptions of CBT’s expected efficacy—however, health researchers may need to expend more time and resources to convince the public of the acceptability of CBT.

With that said, the current investigation is not without its limitations. Samples in both studies

were convenient in nature, recruited via crowdsourcing sites. Further, there is some evidence that participants recruited from such websites differ systematically from those in the general population, as participants from the latter tend to be older, less educated, and present with fewer anxiety and depressive symptoms (Chandler & Shapiro, 2016). However, data from crowdsourcing websites generally, and CrowdFlower specifically, appear to be of adequate quality and participants recruited from there seem to be highly diverse (Peer, Brandimarte, Samat, & Acquisti, 2017). Indeed, crowdsourcing samples tend to be more representative of the general population than are university student samples (Berinsky, Huber, & Lenz, 2012). Further, all participants were asked to answer questions on both CBT and ADM, invited to read both CBT- and ADM-specific psychoeducational materials, and then answer the same questions again pertaining to both treatments. As such, the juxtaposition of psychoeducational materials for both treatments may be associated with a different pattern of results than presenting psychoeducational materials for either treatment alone. Moreover, samples in both studies were intentionally not clinical—thus, results may not be generalizable to a clinical population. In addition, while we focused on perceptions of treatment and explanatory models of depression as barriers to accessing cognitive therapy, other practical barriers remain, such as treatment costs (Mohr et al., 2006). Finally, we used the general linear model approach (e.g., repeated measures) in analyzing the data. Although robust, this approach is less ideal for longitudinal data points. Future studies should employ state-of-the-art data-analytic techniques in handling longitudinal data.

Future research should replicate the findings among nonconvenience and clinical samples. As observed, the written psychoeducational materials produced small but significant changes in attitudes regarding the credibility and possible effectiveness of CBT for depression. It is possible that the use of other media (e.g., audiovisual) to present information may produce bigger effects, or may even be associated with change in views of the treatment’s acceptability (Soucy et al., 2016). Finally, findings here suggest that researchers should tailor generic descriptions of CBT to match participants’ preexisting models of depression, and measure whether such tailoring has a stronger effect on perceptions.

The current, two-study investigation examined whether presenting a generic sample of mostly treatment-naïve participants with psychoeducational materials of CBT would change perceptions of how acceptable and credible CBT is as a

treatment for symptoms of depression. Across both studies, it appears that treatment-naïve participants' attitudes toward how credible CBT is as well as its expected efficacy are malleable to change. However, it also appears that a view of the treatment's acceptability or ability to adhere to this treatment was largely resistant to change across studies. This work provides an important step in helping mental health practitioners and researchers to more effectively reach members of the public. Further, this work may impact policy making regarding the effectiveness, importance, and potential provision of our evidence-based psychotherapies for depression.

Conflict of Interest Statement

The authors declare that there are no conflicts of interest.

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RECEIVED: March 11, 2018

ACCEPTED: January 3, 2019

AVAILABLE ONLINE: 11 January 2019