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## Homework completion via telephone and in-person Cognitive Behavioral Therapy among Latinos

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### Abstract

Homework completion in cognitive behavioral therapy (CBT) for depression is an integral ingredient in treatment that often goes unreported. Furthermore, many studies of homework completion focus on patient adherence without considering the therapists' role in reviewing and reinforcing this behavior. No studies to date have assessed the relationship between homework variables and outcomes among Latinos receiving CBT for depression. Since this population has often been difficult to engage in CBT, this study aims to assess whether homework completion and therapist review of homework are related to improved outcomes in a CBT intervention (telephone or in person) for Latinos with depression. We found that higher homework completion was significantly related to lower depression scores at the end of final treatment (as measured by PHQ-9) ( $B = -1.38, p < 0.01$ ). However, the significant association of homework with depression went away when clinician review of homework was included in a subsequent step of the model ( $B = -0.42, p = 0.45$ ). The number of times a clinician actively reviewed homework was still significantly related to a decrease in PHQ-9 when controlling for demographic factors ( $B = -1.23, p < 0.01$ ). This study found that homework is a predictor of improved outcomes in CBT for depression but highlights the role of therapists reviewing homework as a predictor of lower depression symptoms among Spanish speaking Latinos from low socioeconomic backgrounds.

### Keywords

CBT; depression; homework; Latinos; telehealth

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**Ethical approval:** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Informed consent:** Informed consent was obtained from all individual participants included in the study.

## Introduction

Cognitive behavioral therapy (CBT) is a well-established evidence based treatment for depression (Hofmann, Asnaani, Vonk, Sawyer, & Fang, 2012) that has been implemented with diverse populations and settings, including Latinos (Miranda et al., 2003). Increasingly, CBT is also being disseminated via methods beyond traditional face-to-face interactions, such as via telephone, video or Internet (Andersson, 2009; Mohr, Hart, & Marmar, 2006). Between session assignments (homework) in CBT are thought to be critical ingredients for the success of the intervention (Mausbach, Moore, Roesch, Cardenas, & Patterson et al, 2010). The purpose of homework is to extend the impact of the therapy outside of the time-limited session and can be an indicator of engagement in treatment (Gonzalez, Schmitz, & DeLaune, 2006). In CBT treatment, homework consists of various tasks such as self-monitoring of mood, thoughts and behaviors, behavioral activation, bibliotherapy and rehearsing specific cognitive and behavioral skills discussed in therapy session (Thase & Callan, 2006). The successful implementation of these skills can lead to cognitive and behavioral changes that can sustain treatment gains beyond a course of treatment. Therefore, it is helpful to understand how homework completion and the process of reviewing homework in sessions is related to outcomes among diverse populations, such as Latinos, and across various intervention mediums (in person, phone, etc.).

Meta analyses studying the effect of homework on CBT outcomes have found improved treatment outcomes when more homework is completed. Kazantzis, Deane, and Ronan (2000) researched studies prior to 2000 and found that a significant positive relationship between homework and outcomes ( $r = .36$ ). Mausbach et al. (2010) researched studies after 2000 and also found a significant relationship between homework adherence and treatment outcomes across a variety of targets including depression ( $r = .24$ ), with combined therapist and client reports of homework adherence resulting in the strongest relationship ( $r = .35$ ). Kazantzis and colleagues (2016) further provided support for the relationship between quality of homework compliance and improved outcomes, possibly through improved learning and skill acquisition. These results show the importance of quality homework adherence in ensuring positive treatment outcomes, but most studies of CBT do not report the relationship between homework completion and outcomes. Furthermore, very few of these studies provide information on ethnic background or socioeconomic status of the populations they are studying. For instance, in the Mausbach et al. (2010) meta-analysis, only one study reported information about the ethnic background of the sample (30% racial or ethnic minorities; Cowan et al., 2008) and only one study reported education and income levels of the sample (12% with high school or lower and mean income \$30,000; Burns & Spangler, 2000). No studies to date have assessed homework completion among Latinos as it relates to depression outcomes.

Studies focused on Latinos in low-income settings have reported that lack of homework completion is a barrier to delivering optimal care among Latino patients (Aguilera, Bruehlman-Senecal, Liu & Bravin, 2017; Ngo, Centanni, Wong, Wennerstrom, & Miranda, 2011). Homework completion may be generally difficult in depression due to anhedonic symptoms (loss of pleasure and motivation) that are endemic to the disorder (Dichter, 2010). These processes may be even more challenging for people who are primarily Spanish

speakers and have lower levels of educational attainment and less practice engaging in analytic tasks with a heavy emphasis on reading and writing compared to more educated populations (Interian, Allen, Gara, & Escobar, 2008). CBT interventions for anxiety among Latinos have also found less understanding of CBT principles (Chavira, et al., 2014). Moreover, people from low-income backgrounds often have multiple stressors that may interfere with their ability to engage in these often time consuming tasks on a daily basis (Cutrona, Wallace, & Wesne, 2006; Santiago, Wadsworth, & Stump 2011).

While CBT has been shown to be efficacious in controlled studies, there are barriers to access and utilization that require innovative outreach to specific populations, such as Latinos in the U.S. (Becker, Martinez-Tyson, DiGennaro, & Ochshorn, 2011; Keyes et al., 2012). New media for intervention delivery are being used to increase access to well-studied and efficacious therapies such as CBT. One of those means is telehealth or telepsychiatry, in which therapy is delivered remotely, such as via telephone, in order to reduce access barriers of travel time and limited availability. Initial data has shown phone therapy to be efficacious broadly (Mohr, Vella, Hart, Heckman, & Simon, 2008) and specifically with Latinos (Dwight-Johnson et al., 2011; Alegria et al., 2014). However, studies of telephone based therapy have not assessed whether homework completion and review is related to improved outcomes.

Studies assessing the impact of homework on depression outcomes typically examine completion of homework as a predictor of improved symptoms. However, the role of the therapist in assigning and reviewing homework is explored less often even though it is an important predictor of increased homework completion and improved outcomes (Bryant, Simons, & Thase, 1999). Since psychotherapy is a dyadic process, it is also necessary to consider the role of therapists in reviewing and reinforcing homework, as this has been shown to increase homework adherence (Detweiler-Bedell & Whisman, 2005; Bryant, Simons, & Thase, 1999).

In this study we explored the relationship between homework completion, therapist review of homework, and depression outcomes in a CBT treatment delivered to low-income Latinos in both face-to-face format and over the phone. Our aim was to assess whether homework completion and clinician review of homework are associated with improved outcomes at the next session as well as over the course of therapy. We hypothesized that both increased completion of homework by participants, and reviewing of homework by clinicians would result in improved outcomes on a session-by-session basis and would be an additive effect over the course of treatment in both the in person and phone conditions.

## Methods

This study uses a subsample of the “Comparando Estrategias para Reducir el Estrés y la Depresión” (CERED) study, which in English translates to “Comparing Strategies to Reduce Stress and Depression (see Alegria et al., 2014). The study was a randomized controlled trial conducted in Boston and Puerto Rico, assessing the effectiveness of short term CBT treatment (6–8 sessions) delivered in person and over the phone, as compared with usual care for depressed Latinos seen in primary care. In this paper, we are only analyzing data

from patients who received CBT either in person or via phone. For more detailed methods please refer to the main study paper (Alegría et al., 2014).

### Participants

The sample consists of 123 Latino adults, 18 or older, with moderate to severe depression recruited from clinics in Boston, Massachusetts, and San Juan, Puerto Rico.

### Intervention

The Engagement and Counseling for Latinos (ECLA) intervention is a brief cognitive-behavioral intervention delivered over the phone or in person. The ECLA-T, its version delivered by phone, has shown decreases in depressive symptoms, increases in patient satisfaction, and self-perceived global improvement when compared to usual care in primary care (Simon, Ludman, & Operskalski, 2006; Simon, Ludman & Operskalski, 2004; Tutty, Simon, & Ludman, 2000). The ECLA-F is the in-person version of ECLA. The ECLA intervention used in this study was shorter (6–8 sessions) than the original version of the intervention tested by Simon et al. (2006) which was 8–10 sessions. Additionally, the ECLA-T and ECLA-F versions used in this study were culturally adapted for Spanish speaking Latinos (see Ramos & Alegría, 2014).

The intervention includes modules that focus on behavioral activation via increasing pleasant activities and supportive relationships, and cognitive strategies to manage negative thoughts. Sessions were tailored to the needs of individual patients by using a collaborative approach to determine specific focus of content. Patients were also provided a workbook containing information about depression and CBT exercises. The first four sessions occurred on a weekly basis, while the 5th and 6th sessions occurred every two weeks, unless clinicians determined the need for more immediate care. Two additional sessions were added when patients did not improve in six sessions, all information could not be covered, or patients did not have a clear understanding of the core components of the intervention as determined by the clinicians. In those cases, patients had a possible total of 8 sessions. Therapy sessions were audio recorded.

### Measures

**Depression Symptoms**—For the CERED study, participants completed a battery of assessments including socio-demographic data and the Patient Health Questionnaire (PHQ-9), which were used for this study. The PHQ-9 (Kroenke & Spitzer, 2002) is a 9-item depression scale used in screening for probable depression and monitoring treatment progress (Löwe, Unützer, Callahan, Perkins, & Kroenke, 2004). It has been shown to have excellent reliability and validity in Latino samples (Huang, Chung, Kroenke, Delucchi, & Spitzer, 2006). Patients completed the PHQ-9 at baseline, during each session and at a final follow-up period after treatment to determine levels of depression symptoms.

**Clinician Review of Homework**—We assessed audio recordings of the psychotherapy sessions for whether clinicians reviewed homework by assessing whether the following question was true or not: “Within the first 10 minutes of the recording, did therapist review previous session’s homework AND ask follow-up questions?” If a therapist simply inquired

whether homework was completed but did not review it in detail, it was coded as non-review.

**Homework Completion**—To assess homework completion, we used a modified version of the Assignment Compliance Rating Scale (ACRS; Primakoff, Epstein, & Covi, 1986) to code audio recorded therapy sessions. The ACRS uses a 6-point scale to measure the degree of completion of tasks that were assigned during the previous session. The scale ranges from 1 (the patient did not attempt to do the homework) to 6 (the patient did more of the homework assignment than was assigned). For the purposes of our analyses we focused on full completion of assigned homework or more, as our primary outcome (categories 5 or 6) to ensure that we are testing for full effects of homework completion, and coded full completion of homework as a 1. We considered anything below category 5 as not full completion of homework and coded that as a 0. The emphasis on full completion also makes interpretation of analyses clearer. See Table 1 for details on homework completion rates by category.

Research assistants reviewed and coded audiotapes from therapy sessions. After eliminating invalid or unusable sessions due to bad quality of the recording, a total of 541 sessions were included in the analyses. In 342 (63.22%) of the 541 sessions available, a therapist was confirmed reviewing the homework within the first 10 minutes of session. In the rest of the sessions, homework was not mentioned within the first 10 minutes or was not reviewed in detail (See Table 1). Ten minutes was chosen as the cutoff since treatment manual asks for a review of homework as the first item on the agenda and it is unlikely that homework was reviewed after that point. These included recordings from sessions 2 to 8 (although it was a 6 session treatment some patients received extra sessions as needed). Ratings were made by three bilingual and bicultural research assistants (1 PhD and 2 BA level). Ratings that were not agreed upon were reviewed in detail in consultation with the lead author until a satisfactory reliability rate was settled. Coders had high reliability achieving an interclass correlation (ICC (2, k)) between .984 and 1 for the categories concerning the homework completion, and ICC (2, k) between .810 and 1 for the categories concerning therapist review.

## Procedure

The CERED study was approved by the institutional review boards of the University of Puerto Rico and the Cambridge Health Alliance, and all participants provided informed consent. Participants were recruited from May 2011 to September 2012 from primary care clinics in Boston, Massachusetts and San Juan, Puerto Rico. The Boston sample was from five community based clinics that are part of the Cambridge Health Alliance (CHA), an integrated healthcare system that includes “safety net” hospitals and primary care clinics. The Puerto Rico sample was from three health clinics run by the Triple S insurance company. Patients who scored within the moderate to severe range of depression, as measured by a score of 10 or higher on the PHQ-9, met at least one criterion for Major Depressive Disorder (MDD) (i.e., had at least 2 weeks of depressed mood or loss of interest and pleasure over the last 12 months), and demonstrated capacity for consent (as judged by a research assistant) were eligible to participate in the study. Exclusion criteria consisted of a

history of psychosis, use of any specialty mental health treatment in the 3 months prior, and suicidality as measured by the Paykel Suicide Questionnaire (Paykel, Myers, Lindenthal, & Tanner, 1974). For these analyses, we focus on patients that were randomized into either the ECLA by phone (ECLA-T) or ECLA administered face to face (ECLA-F).

## Analysis

To test whether overall completion of homework during the intervention led to significant decreases in PHQ-9 scores, we conducted a series of Ordinary Least Square (OLS) linear regression analyses (See Table 3). In these analyses, PHQ-9 at the end of the intervention is the dependent variable, controlling for baseline PHQ-9, and the number of sessions of homework that were fully completed was the primary independent variable. We assessed whether the overall number of times a patient completed homework was significantly related to lower PHQ-9 at the end of treatment (controlling for baseline PHQ9). We subsequently added clinicians' review of homework and other sociodemographic variables to the regression analyses. We report unstandardized betas for all model estimates, and Cohen's *d* for significant relationships. The betas reveal the change in the outcome associated with a unit change in the covariate. The unstandardized betas reveal this change in the original PHQ-9 scale for easier interpretation.

## Results

In Table 2, we describe sociodemographics (age, gender, education, employment status, and personal income) for the full sample of participants and for two subgroups, disaggregated by type of intervention modality (face-to-face and by phone). The subgroups were not significantly different on sociodemographic or clinical variables with the exception of educational levels with the in person group having higher educational levels compared to the phone group ( $p < .001$ ). We also summarize session completion and number of session reviewed along with PHQ-9 measured at both baseline and final session. Pearson Chi-square tests were used to test the significance of cross-group differences for categorical variables, and t-tests were used for continuous variables.

We tested whether patient completion of homework and clinician review of homework was associated with lower scores on the PHQ-9 in the final session, controlling for baseline PHQ-9. We found that the overall number of times a patient completed homework was significantly related to lower PHQ-9 at the end of treatment ( $B = -1.38, p < 0.01$ ; Cohen's  $d = 0.33$ ). However, the association between homework completion and depression symptoms became nonsignificant when clinician review of homework was included in subsequent steps ( $B = -0.42, p = 0.45$ ). The number of times a clinician actively reviewed homework was significantly related to lower scores on the PHQ-9 when controlling for demographic factors ( $B = -1.23, p < 0.01$ ; Cohen's  $d = 0.29$ ). The significant association of clinician review on depression symptoms remained statistically significant when controlling for intervention type (phone vs face-to-face) and sociodemographic factors (age, sex, education, employment, income) in the model.

In post-hoc analyses, we tested whether the interaction of patient completion of homework and clinician review of homework was associated with a decrease in PHQ-9 from the

previous session by conducting a series of linear multilevel models. We found that homework completion and homework review did not significantly interact ( $B = -1.44, p = 0.36$ ). Furthermore, the correlation of homework completion at prior visit and homework review was not significant either ( $r = .07, p = 0.48$ ). We also assessed whether the relationship between homework completion and review and outcomes differed based on the phone or the in person conditions and found no significant differences.

## Discussion

Our findings indicate that homework completion is related to improved outcomes at the end of treatment for Latinos receiving CBT both in person and via phone. However, we find that when including clinician's review of homework as a variable, the relationship between homework completion and depressive symptoms is not statistically significant. Clinicians who take time to review homework may be aiding patients in consolidating CBT concepts. Our findings show that homework completion was not significantly related to outcomes after considering clinician's review of homework as an additional variable among this Latino population. This finding could indicate that homework is not seen as relevant, not understood, forgotten, or that patients do not have time to engage in homework activities.

Our findings indicate that clinician review of homework is of particular importance in leading to improved outcomes in CBT for depression among Latinos. As consistent with the literature (Mausbach et al., 2010; Kazantzis et al, 2016), we found that homework completion is related to improved outcomes overall. However, the relationship of homework completion with outcomes is overshadowed by clinician review of homework.

The findings of this study highlight the importance of clinicians reviewing and reinforcing homework in therapy sessions. By reviewing homework, clinicians can create the expectation that homework should be completed and that it is a core element of the treatment. Also, homework may not be completed if it is not understood and thus review of homework can be critical in consolidating knowledge. A general problem in reviewing homework is that clinicians may not want to make patients "feel bad" by continually asking for homework if they know that it hasn't been completed repeatedly. However, this process may play a role in lowering engagement; therefore, it may be critical for clinicians to close the loop by reviewing homework in session. Another explanation of these findings, that clinicians may be biased in reviewing homework with patients that are doing better and engaging in homework, was ruled out in our post-hoc analyses showing that there was not a significant relationship between homework completion and homework review. Given that this was a Spanish speaking Latino population, it is also possible that therapist-level variables take on an increased importance due to the importance that Latino cultures tend to place on relationships (Aguilera & Berridge, 2014).

One way to improve the process of homework completion is to integrate adjunctive technologies such as automated text messaging (Aguilera & Munoz, 2011; Aguilera, Schueller, & Leykin, 2015; Aguilera & Berridge, 2014) and smartphone applications that can prompt patients to complete homework and provide data for clinicians to review more easily. These methods could reduce lack of completion due to forgetting and could hone in



on other barriers to completion. Technology based interventions also provide an opportunity to more easily collect data on homework quality (Kazantzis, Brownfield, Mosley, Usatoff & Fighy, 2017). If homework and skills practice are indeed a central component to CBT, we need to reduce as many barriers as possible to completion. In terms of the current study's findings, it seems imperative to review any homework that is completed, regardless of the medium in which it is done.

Limitations of this study include a lack of direct patient ratings of homework completion. Our measurement also lacked a theoretically based measure of the quality of homework completion that could indicate how much a patient gained from an exercise (Kazantzis, et al., 2016). We also did not assess for the quality of clinician's review of homework beyond asking for follow up questions. Given that therapists' review of homework was necessary to determine if homework was completed, it is possible that the significant association of therapist review and outcomes is driven by homework completion. There was a significant amount of missing data due to coded sessions missing either a homework variable or a PHQ-9 variable. Another limitation is that we are not able to assess the reasons why participants in this study did not complete homework. Hence, we recommend future research to address these limitations and to more closely examine the barriers to homework completion among low income Latinos.

## Conclusions

Our findings that reviewing homework was related to improved outcomes above and beyond the actual completion of homework have direct implications for practitioners and emphasize the role of reinforcing homework consistently. Treatment development should also focus on clinician review of homework and the rationale of treatment, potentially through the use of adjunctive technologies that make it easier to see what homework has been completed and what barriers might exist to non-completion. Finally, as our patient populations become more diverse, it is crucial that we continue to study these mechanisms of treatment among diverse groups in terms of race/ethnicity as well as socioeconomic status.

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**Table 1**

## Clinician Review and Homework Completion

<i>Clinician Review</i>	<b>N=541 n (%)</b>
Reviewed (Yes) – Within the first 10 minutes of the recording, did therapist review previous session's homework and ask follow-up questions?	342 (63.22%)
<i>Patient Homework Completion (ACRS)</i>	<b>N=342 n (%)</b>
1. The patient did not attempt the assigned homework.	41 (11.99%)
2. The patient attempted the assigned homework but was unable to execute it.	11 (3.22%)
3. The patient did homework that was different from that assigned, but that would be considered relevant to CBT and/or the patient's particular target problems.	15 (4.39%)
4. The patient did a portion of the assigned homework.	133 (38.89%)
5. The patient completed assigned homework.	142 (41.52%)
6. The patient did more of the assigned homework than was requested.	1 (0.29%)

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**Table 2**

Sample description

	Total (N=123)	In person (N=60)	Phone (N=63)
Age			
18-34	22.0%	23.3%	20.6%
35-49	36.5%	33.3%	39.7%
50+	41.5%	43.3%	39.7%
Gender			
Male	17.1%	20.0%	14.3%
Female	82.9%	80.0%	85.7%
Highest Education Level Attained			
11th Grade or Less	79.7%	91.7%	68.3%
12th Grade or Higher	20.3%	8.3%	31.8%
Employment Status			
Employed	38.5%	38.3%	38.7%
Unemployed	61.5%	61.7%	61.3%
Personal Income			
Less Than 15K	71.5%	68.3%	74.6%
15K or Higher	28.5%	31.7%	25.4%
	<b>M</b>	<b>SD</b>	<b>M</b>
Number of Sessions Attended	5.4	(1.7)	5.4
			(1.7)
			5.5
			(1.7)
Number of Sessions Partially HW	1.3	(1.2)	1.3
			(1.2)
			1.2
			(1.2)
Number of Sessions Completed HW	1.3	(0.9)	1.4
			(0.9)
			1.2
			(1.0)
Number of Sessions Homework Reviewed	2.7	(1.6)	2.6
			(1.7)
			2.8
			(1.5)
Baseline PHQ-9	17.3	(4.2)	17.7
			(4.2)
			17.0
			(4.1)
Final PHQ-9	8.6	(6.8)	9.3
			(7.6)
			8.0
			(6.0)

**Table 3**

Predictions of PHQ9 in Final Follow-up (Linear Model)

<i>Outcome Model</i>	PHQ9 at Final Follow-up					
	1		2		3	
	<i>B</i>	<i>SE B</i>	<i>B</i>	<i>SE B</i>	<i>B</i>	<i>SE B</i>
Baseline PHQ9	0.62***	0.14	0.56***	0.14	0.53***	0.14
Number of sessions HW fully completed	-1.38**	0.55	-0.42	0.55	-0.76	0.57
Number of HW reviewed by a clinician			-1.43**	0.45	-1.23**	0.46
<i>Type of Intervention (ref=face to face)</i>						
Phone					0.02	1.19
<i>Age Group (ref=18-34)</i>						
35-49					1.51	1.58
50-64					1.74	1.53
Female					-3.85*	1.56
<i>Highest Education Level Attained (ref=11th grade or less)</i>						
12th grade or higher					0.28	1.55
<i>Employment Status(ref=employed)</i>						
unemployed/out of labor force					2.36	1.33
<i>Personal Income (ref=less than 15K)</i>						
15K or higher					0.19	1.45
<i>Observations</i>	107		107		106	
<i>R-squared</i>	0.217		0.286		0.366	

\* p<0.05

\*\* p<0.01

\*\*\* p<0.001