Latino Immigrants, Depressive Symptoms, and Cognitive Behavioral Therapy:
A Systematic Review

Maria Pineros-Leano, MSW, MPH¹

School of Social Work, University of Illinois at Urbana-Champaign

Janet M. Liechty, PhD

School of Social Work and College of Medicine, University of Illinois at Urbana-Champaign

Lisette M. Piedra, PhD

School of Social Work, University of Illinois at Urbana-Champaign

¹Maria Pineros-Leano, (corresponding author) MSW, MPH, School of Social Work, University of Illinois at Urbana-Champaign, 1010 West Nevada St., Urbana, IL 61801; tel: 217-244-9884, fax: 217.244.5220; pineros1@illinois.edu

Latino Immigrants, Depressive Symptoms, and Cognitive Behavioral Therapy:

A Systematic Review

Although treatable, depression affects about 350 million people around the world and it persists as the leading global cause of disability (World Health Organization, 2015). In the U.S., 25 million adults suffer from major depression disorder yearly (National Alliance on Mental Illness, 2013). Depressive symptoms in parents, particularly mothers, are associated with poorer outcomes for children (Augustine and Crosnoe, 2010; Murray et al., 2010) and loss in work productivity (Wang et al., 2004). Lifetime prevalence of depression among Latinos follows that of the general population (Interian et al., 2008; Jackson-Triche et al., 2000), though rates vary among Latino immigrants. Compared to the general population, Latinos tend to be under diagnosed and less likely to be treated than white individuals (Alegría, Canino, et al., 2008; Alegría, Mulvaney-Day, et al., 2007a, 2007b; Cabassa et al., 2006). Even more worrisome, although immigrant Latinos report better mental health compared to the overall population (Breslau et al., 2005), their mental health worsens with increased exposure to the U.S. (Alegría, Canino, et al., 2008; Alegría, Mulvaney-Day, et al., 2007a; Stone and Balderrama, 2008; Stone et al., 2007).

Rates of depression among recent Latino immigrants are difficult to assess and poorly understood. Immigrant and U.S. native born Latinos make up 17.1% of the U.S. population (Stepler and Brown, 2016); and while this population remains concentrated in nine states and metropolitan areas, the most rapid and sustained growth has occurred in nongateway states with new growth Latino immigrant communities (Lichter and Johnson, 2006, 2009). Prevalence studies of depression among immigrants have typically been conducted in urban areas with large,

established immigrant populations (Coffman and Norton, 2010) and thus, may not be generalizable to more recent immigrants in new growth communities. Elevated depressive symptoms were found in 25-26% of Latino immigrants in Philadelphia (Bennet et al., 2007) and in Charlotte, North Carolina (Coffman and Norton, 2010), respectively. Another study compared levels of depressive symptoms among Latino immigrants living in San Francisco, Mexicans living in Mexico City, and Puerto Ricans living in Puerto Rico. Latino immigrants were found to have higher levels of depressive symptoms compared to non-immigrant Puerto Ricans and Mexicans; and when compared to white individuals, all three groups had significantly higher levels of depressive symptoms (Munet-Vilaró et al. 1999).

However, other studies using nationally representative data in the U.S. found similar rates of depressive disorders between Latino immigrant and non-immigrant adults (Alegría et al., 2007a) and adolescents (Lee and Liechty, 2015). Further, the latter study found that neighborhood ethnic density protected against onset of depression one year later only among immigrant --but not among non-immigrant-- Latino youth (Lee and Liechty, 2015), thus highlighting the importance of geographic context and immigrant status for understanding risk of depression. This literature indicates that the prevalence of depression and levels of depressive symptoms among Latino immigrants compared to the general population is mixed and inconclusive. More research is needed to better understand the needs of this population. Social investments in depression screening, prevention, and treatment and the wellbeing of immigrant families will pay dividends in the future. As a young population, U.S. native born Latinos—many who today have one or more immigrant parent—will make up a sizable portion of the future labor force (Fry and Passel, 2009).

Contextual Factors and Latino Immigrant Mental Health

The rapid growth and dispersal of the Latino immigrant population into new growth communities underscore a heightened need to evaluate treatment models tailored to specific service needs of Latino immigrants. Language and geographic context play a critical role in service access for Latino immigrants. Those with limited English proficiency (LEP) have lower odds of receiving mental health services than their English-speaking counterparts (Sentell et al., 2007; Bauer et al., 2010). Service barriers can exacerbate depressive symptomology for those living in emerging communities; the shortage of bilingual service providers magnifies the loss of community and basic cultural resources such as Spanish language religious services and supermarkets that carry familiar cooking ingredients (Shattell et al., 2009; Villalba et al., 2007). Qualitative studies indicate that while Latino immigrants recognize and understand depressive symptoms, they often attribute such indicators to the difficulties associated with the migration experience and acculturating to a new country (Cabassa et al., 2007; Karasz and Watkins, 2006; Martinez et al., 2007) rather than as a treatable condition.

Although the reasons underlying depressive symptoms among Latino immigrants remain complex, researchers have speculated that acculturation and English-language competency play a role (Torres, 2010). Immigrants face increased vulnerability to mental health issues (Salas-Wright et al., 2014), in part because of the type of jobs they find in the U.S (Martínez et al., 2007). Many Latino immigrants— especially those of Mexican and Central American origin— are monolingual Spanish speakers with low levels of education, which in turn consigns them to low-wage jobs without health insurance or opportunity for advancement (Andrade and Viruell-Fuentes, 2011). Such disadvantages place Latino immigrants at increased risk for poverty and occupational hazards, and decreased access to services throughout the lifespan (Andrade and Viruell-Fuentes, 2011; Vega et al., 2009). Furthermore, these disadvantages can contribute to the

development of chronic stress and symptoms of depression (Beeber et al., 2008). In addition, Latino immigrants frequently must deal with a public services sector with varying abilities to address basic issues of linguistic access and cultural sensitivity (Piedra, 2010; Piedra et al., 2011). Such institutional barriers add to the stress of economic survival and may contribute to an immigrant's sense of alienation in both the public and private spheres. Over time, such stressors may erode one's mental health (Adkins et al., 2009).

Mental Health Practice with Latino Immigrants and the Need for Cultural Adaptations

Interventions that target Latino immigrants raise the issue of cultural adaptations. A groundbreaking report by the U.S. Surgeon General found dismally low participation rates in research among Latinos and other minority participants (U.S. Department of Health and Human Services, 2001). Although a follow-up study found improvements in Latino participation in clinical trials addressing depression, it also found that few trials are ethnic-specific or have sufficient numbers of Latino participants to analyze separately; and participation in clinical trials remains low (Santiago and Miranda, 2014). Because most research on treatment for depression continues to be conducted with white middle class populations (Santiago and Miranda, 2014), adaptations are needed for use with minority populations (Barrera et al., 2013; van Loon et al., 2013). Cultural adaptations help to ensure that: a) the concerns of the participants are addressed, b) the therapeutic content is consistent with their cultural and linguistic norms and beliefs, and c) the intervention reflects the client's worldview (Cabassa z Baumann, 2013; Griner and Smith, 2006). Such adaptations have also been known to increase treatment retention rates (Yancey, Ortega, and Kumanyika, 2006).

Previous studies indicate that cultural adaptations are necessary to work effectively with Latino immigrants to treat depressive symptoms (Barrera et al., 2013; Grinner and Smith, 2006).

A wide range of cultural adaptations have been used with immigrant populations (Kalibatseva and Leong, 2014; van Loon et al., 2013) and can be categorized as follows: (a) cognitive informational adaptations, (b) affective-motivational adaptations, and (c) environmental adaptations (Castro, Barrera, and Martinez, 2004). While core aspects of prevailing treatments will mostly likely apply, adaptations in service delivery remain essential (Barrera et al., 2013). For Latino immigrants, such modifications might include attention to treatment preferences, such as group treatment over individual therapy (Stacciarini et al., 2007) and counseling as an alternative to medication to treat depression (Givens et al., 2007).

Cognitive Behavioral Therapy with Latino Immigrants

Cognitive Behavioral Therapy (CBT) remains widely used and the most evaluated treatment for depression for Latinos (Collado et al., 2016) and Latino immigrants (Antoniades et al., 2014); and thus, holds promise for Latino immigrant populations (Stacciarini et al., 2007). Key elements of CBT therapy include structured and often manualized approaches to monitor and modify problematic thoughts and behaviors that contribute to depression (Muñoz and Miranda, 2000). In addition, CBT has been modified and tested extensively with Spanish-speaking populations. For example, the Community Partners in Care (CPIC) is a federally-funded project (Miranda, Chung, et al., 2003; Miranda, Duan, et al., 2003) that provides empirically tested Spanish translations of CBT manuals to the professional community at no cost (Muñoz and Miranda, 2000).

However, despite the diffusion of CBT approaches with Latino individuals, to date, there has been no synthesis of findings on CBT with Latino immigrants to address depressive symptoms, or of the cultural adaptations commonly used to augment CBT with this growing population. The closest the literature comes to addressing this gap can be found in two

systematic reviews. In the more recent study, Collado et al. (2016) summarized 36 studies of depression treatment for Latinos that examined a variety of interventions: Behavioral Activation, CBT, Interpersonal Therapy, Problem-Solving Therapy, and Structural Ecosystems Therapy. Among these treatments, CBT was by far the most widely used treatment (Collado et al., 2016). Regrettably, the reviewers treated the Latino population as a homogeneous group and did not disaggregate findings for Latino immigrants or by geographic characteristics.

In contrast, another review of depression interventions conducted among immigrants (Antoniades et al., 2014) distinguished between immigrant and non-immigrant groups, but did not disaggregate by Latino versus other immigrant populations. This review examined the effectiveness of depression interventions among any immigrant group residing in the U.S. and other countries (Antoniades et al., 2014). Unfortunately, because the reviewers did not distinguish between Latino immigrants and other immigrant groups (here or abroad), the effectiveness of CBT with immigrant Latinos in the U.S. remains an open question. Moreover, like the Collado et al. (2016) review, the investigators did not consider how geographic characteristics might affect treatment outcomes (Antoniades et al., 2014). The current review fills this gap by examining the effectiveness of CBT with immigrant Latinos and by describing how CBT has been culturally adapted and used with Latino immigrants in both urban and new growth communities.

Purpose of Study

This study presents: (a) a systematic review of Cognitive Behavioral Treatment (CBT) intervention studies designed to reduce depressive symptoms among Latino immigrants and (b) a description of cultural adaptations used to enhance treatment adherence and outcomes in the included studies. In addition, we discuss the heterogeneity of geographic characteristics and

cultural adaptations.

Methods

Search Strategy and Inclusion Criteria

We used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. After registering the systematic review with PROSPERO (CRD42014013616), the first and second authors conducted a search using keywords such as: depression, depressive symptoms, cognitive, behavioral, therapy, treatment, Latino, Latina, Hispanic, minority, and immigrant. The search was conducted in PsycINFO, PubMed, and Medline databases. Eligibility criteria for included studies were: (a) peer-reviewed articles published in English or Spanish from January 1995 through July 2016; and studies that (b) identified a cognitive behavioral intervention to treat depressive symptoms; (c) assessed depressive symptoms using a standardized measure; (d) employed either a randomized controlled trial (RCT) design, quasi-experimental, or one-group pre/post test design; (e) had a sample of at least 50% Latino immigrant adults being treated in the U.S. (mean age 18 or over) or presented disaggregated results for this population. The timeframe was selected to correspond to a spike in immigration from Latin America in the mid-1990's (Passel et al., 2005). After identifying the studies in the different databases, removing duplicates, and conducting the title/abstract search, all three authors independently reviewed the full articles for inclusion.

Study Selection

As shown in Figure 1, 590 records were identified after removing duplicates. These titles/abstracts were screened against inclusion/exclusion criteria, yielding 76 articles for full-text review. These were assessed by all three reviewers using an eligibility checklist and 66 studies were excluded. When there were discrepancies about whether a study should be retained, the

study was discussed among reviewers until consensus was reached. Our search initially yielded 10 studies that met eligibility criteria. Authors were contacted when there were questions about sample composition (native vs. foreign-born), effect sizes, or disaggregated results and several author teams responded with clarifications; however no additional studies met inclusion criteria. We then independently reviewed the citations section from all the included studies and also from previous systematic reviews, and one additional potential study was identified. It was checked for eligibility, and included. This yielded a total of 11 included studies in this review.

<Insert Figure 1 here>

Data Extraction

Characteristics of each study that were extracted are summarized in Table 1. To assess the effectiveness of the interventions, we extracted information regarding change in depressive symptom severity, statistical significance, and effect size. We used the content model developed by Castro, Barrera, and Martinez (2004) to categorize types of cultural modifications used: (a) cognitive informational adaptations, (b) affective-motivational adaptations, and (c) environmental adaptations. Cognitive-informational adaptations are those which help overcome language and literacy barriers. Affective-motivational adaptations are used to deliver content and activities congruent to the traditions and values of the population. Such cultural frames of reference help improve the relevance of the intervention to the target population and minimize potential conflict between cultural values. Environmental adaptations consider ecological features of the particular population and community (Castro et al., 2004). Data extraction about effectiveness and cultural adaptations was conducted and compared by two reviewers (MPL and JML); discrepancies were discussed until agreement was reached.

<Insert Table 1 here>

Risk of Bias Assessment

We used two quality assessment tools from the National Heart, Lung, and Blood Institute (NHLBI, 2014) to rate the risk of bias for each included study: the *Quality Assessment of Before and After (Pre-Post) Studies With No Control Group* and the *Quality Assessment of Controlled Intervention Studies* tools. The NHLBI tools are widely used and provide clear guidelines for interpretation (NHLBI, 2014). Each author independently evaluated each article; any discrepancies in ratings were discussed along with the guidelines until consensus was reached. These tools were used to evaluate key aspects of the studies such as: (a) the clarity of hypotheses, (b) the sampling strategy and representativeness, (c) the adequacy of the sample size to detect intervention effects and calculations of power, (d) blinding procedures, (e) the inclusion of effect sizes, and (f) the quality of measures. The NHLBI tools are not designed to generate a final quantitative score, but rather, they draw attention to elements of rigor and bias reduction and guide a qualitative assessment of bias as low, moderate, or high. Lower risk for bias corresponds to a higher quality of evidence. For example, most but not all of the RCTs reported design elements that yielded a low risk of bias assessment, and most but not all of the studies with small samples sizes (<16) reported design elements that yielded a moderate risk for bias assessment.

Results

Characteristics of Included Studies

The majority of the studies ($n = 7$) sampled Latino immigrants in urban settings, and four studies ($n = 4$) focused on immigrants in rural or new growth settings (Dwight et al., 2011; Hovey, et al., 2014; Piedra and Byoun, 2012; Shattell, et al., 2010). Thus, sample sizes ranged widely from 5 to 217 participants, depending on location. Studies conducted in new growth immigrant communities had smaller sample sizes given the smaller pool of potential Latino

participants and difficulty accessing these communities. Most studies used a group treatment format, while three provided individual treatment (Alegría et al, 2014; Dwight-Johnson et al, 2011; Interian et al., 2008). Although all the studies used standardized measures of depressive symptoms, the most common ones were the Beck Depression Inventory (BDI) followed by the Center for Epidemiologic Studies Depression Scale (CES-D) as shown in Table 1. Five studies used a randomized controlled trial design, three used pre-post plus follow-up design ranging from 2 to 6 months post treatment, and three used a pre-posttest design only (Table 1). Two of the RCT studies were designed as post-partum depression prevention studies (Le et al., 2011; Muñoz et al., 2007), though they met eligibility for this review because they also included continuous measures of depressive symptoms.

The interventions tested ranged from 6 to 12 weeks. As shown in Table 1, a total of six studies provided between six and eight sessions and the other 5 provided between 10 and 12 sessions. The studies that used an RCT design used different types of control groups including usual care (Alegría et al., 2014; Le et al., 2011; Muñoz et al 2007), enhanced usual care (Dwight-Johnson et al., 2011), and one used 6 months of group CBT alone since the treatment group included CBT and case management (Miranda, Azocar, et al., 2003). The usual care that was provided in the RCTs ranged from providing information about resources services available to prescription of medication.

In terms of the characteristics of the study participants, the majority of the studies included females. All studies were conducted among adults and the mean age was 36 years across 9 studies that provided ages of the participants. In terms of country of origin, the majority of the Latino immigrant participants were born in Mexico, followed by Central America and a few were from South America and the Caribbean.

Risk of Bias

The risk of bias for each study was based on the NHLBI Quality Assessment tools and is summarized in Table 1. Overall, the randomized controlled trials (RCTs) had stronger methodology and lower risk for bias compared to studies with a pre-post test design but no randomization to treatment. Three of the 11 included studies were rated as having low risk of bias, all of which were RCTs. Among studies with low risk of bias, all included follow-up measures, intent to treat (ITT) analysis; and two reported high adherence to intervention protocols (Dwight et al., 2011; Le et al., 2011).

Based on the NHLBI tools, seven of the studies showed moderate risk for bias (Table 1). Two of these studies were RCTs and five used a pre-post test plus follow-up design. Only one of these studies provided ITT analysis (Interian et al., 2008). One of the limitations that increased the risk of bias of these studies was the sample size, which was typically less than 20. Five of these studies included follow-up measures (Hovey et al., 2014; Interian et al., 2008; Miranda, Azocar, et al., 2003; Muñoz et al., 2007; Piedra and Byoun, 2012;). The RCTs rated as having moderate risk of bias had methodological shortcomings such as no ITT analysis, high attrition, or incomplete reporting. Only one (pilot) study had high risk of bias due to small sample size, incomplete statistical reporting, and no follow-up (Table 1).

Findings: Effectiveness of CBT to Treat Depression among Latino Immigrants

All three of the studies with low risk of bias were RCTs and found significant reduction in depressive symptoms among Latinos receiving CBT treatment compared to usual care (see Table 1). Sample sizes ranged from 101 to 217 and each used different measures of depressive symptoms. Among the remaining studies, all but two reported a significant decrease in depressive symptoms among CBT participants; both were RCTs with a moderate risk of bias

(Interian et al., 2008; Muñoz et al., 2007). In the study by Miranda and colleagues, statistical significance of symptom reduction pre/post was not reported because the study by Miranda et al. was designed to compare CBT to CBT-enhanced rather than CBT to no treatment. The RCT by Muñoz et al. was primarily a feasibility study, and although they found depressive symptoms were lower in the treatment group compared to usual care, differences were not statistically significant.

Sustained treatment effects varied over time. Eight studies included follow-up measures, ranging from 2 to 5 time points (see Table 1). Significant treatment effects were observed at 3 month (Piedra and Byoun, 2012), 4 month (Alegría et al., 2014) or 6 month follow up (Dwight-Johnson et al., 2011; Hovey et al., 2014; Interian et al., 2008).

Baseline scores of depressive symptoms varied across studies. Five studies reported mild depressive symptoms at baseline, two with moderate, two with severe depressive symptoms; two studies did not specify baseline severity. However, five different standardized measures of depressive symptoms were used, which makes direct comparisons between studies difficult (Table 1). Despite heterogeneity of the samples and methodological limitations, overall reductions in depressive symptoms were observed regardless of baseline depressive symptom severity, measures used, and study design; and across studies with low, moderate, and high risk of bias.

Description of Cultural Adaptations

The second aim of this review was to describe the cultural adaptations to CBT that have been used with Latino immigrants. As noted in Table 2, the studies employed a variety of cultural adaptations that ranged from expanded language access to the use of empirically supported modifications to CBT techniques. As shown below, we categorized the cultural

adaptations following the framework by Castro and colleagues (2004): (a) cognitive informational adaptations, (b) affective-motivational adaptations, and (c) environmental adaptations.

<Insert Table 2 here>

Cognitive-informational adaptations. As one would expect, all the included studies made cognitive adaptations that facilitated language access and helped participants identify with the intervention (Table 2). This was mainly done through the use of bilingual/bicultural facilitators. In addition, some researchers took into account the level of education and literacy of the participants and made changes to CBT manuals accordingly; visual aids were used and the Spanish reading level of the manuals adjusted (Alegría et al., 2014; Le et al., 2010; Miranda, Azocar, et al., 2003; Muñoz et al., 2007; Piedra and Byoun, 2012; Shattell et al., 2010).

However, cognitive-informational adaptations proved more challenging for those studies that took place in new growth communities. These environments tend to lack bilingual/bicultural professionals (Lichter and Johnson, 2009) and thus, the first step in their adaptations included finding ways to overcome bilingual personnel scarcity (Dwight-Johnson et al., 2011; Hovey et al., 2014; Piedra and Byoun, 2012; Shattell et al., 2010). Shattell and colleagues reported that they settled on bilingual (and not bicultural) facilitators to deliver the intervention to the participants and speculated that this fact may have affected the participants' ability to relate to the facilitators. Piedra and Byoun (2012) addressed the worker shortage by training bilingual and bicultural Social Work and Psychology graduate students to deliver the intervention. Dwight-Johnson et al. (2011) used bilingual and bicultural Social Work graduate students and Social Work therapists; all with varying degrees of experience in therapy. Hovey and colleagues (2014) employed *promotoras* (health promoters) --community members trained to provide general

health education-- to help facilitate the sessions between the migrant worker participants and the primary facilitator who was bilingual and bicultural but came from a vastly different background than the study participants. Because the *promotoras* shared similar cultural and life experiences with participants, their insights were used to bridge cultural gaps.

Affective-motivational adaptations. The majority of the studies reported appealing to specific Latino values such as *confianza* (Le et al., 2010), *simpatía* (Hovey et al., 2014; Interian et al., 2008; Miranda, Azocar, et al., 2003), *respeto* (Cardemil et al., 2005; Hovey et al., 2014; Interian et al., 2008; Miranda, Azocar, et al., 2003; Muñoz et al., 2007), *familismo* (Hovey et al., 2014; Interian et al., 2008; Le et al., 2010; Muñoz et al., 2007), and *personalismo* (Cardemil et al., 2005; Dwight-Johnson et al., 2011; Hovey et al., 2014; Interian et al., 2008; Le et al., 2010; Miranda, Azocar, et al., 2003; Muñoz et al., 2007). In addition, two studies used an empirically-tested modification that substituted the A-B-C method with the use of *si, pero, (yes, but)* to help participants restructure and replace negative thoughts for positive ones (Interian et al., 2008; Piedra and Byoun, 2012). This modification has been tested elsewhere and it was found to be effective in helping low-income Spanish-speakers with elementary education understand the concept of cognitive restructuring (Organista and Muñoz, 1996).

Another affective-motivational adaptation was the use of Spanish metaphors and sayings used in everyday speech (Alegría et al., 2014; Dwight-Johnson et al., 2011; Interian et al., 2008; Le et al., 2010; Muñoz et al., 2007; Piedra and Byoun, 2012). These metaphors went beyond the instrumental use of language by evoking deeper cultural meanings (Schyve, 2007).

One of the most striking affective-motivational adaptations specific to Latino immigrants was the inclusion of topics related to migration and the hardships that come with it (Cardemil et al., 2005; Dwight-Johnson et al., 2011; Hovey et al., 2014; Interian et al., 2008; Le et al., 2010;

Muñoz et al., 2007; Piedra and Byoun, 2012). In describing the rationale for this modification, researchers underscored the potentially traumatic nature of migration and how subsequent adjustment can be fraught with unanticipated losses. For this population, investigators reasoned that depressive feelings are intertwined with the hardships of transitioning to and living in a new culture.

Environmental adaptations. These adaptations focused on the needs of low-income populations and for the working poor who frequently lack job flexibility, a condition that is more common among recently arrived immigrants (Camarota, 2012). New immigrants unfamiliar with the host country may also need a range of supportive services to make attendance a viable option. For instance, a few studies provided childcare (Cardemil et al., 2005; Muñoz et al., 2007; Piedra and Byoun, 2012; Shattell et al., 2010); others provided transportation by giving bus tokens or paying for taxi service (Cardemil et al., 2005; Hovey et al., 2014; Muñoz et al., 2007; Shattell et al., 2010), and one study provided snacks (Piedra and Byoun, 2012). Most studies that made environmental adaptations also offered flexibility in scheduling by making sessions available during the late afternoons, evenings, or during the weekends to accommodate work schedules and other time conflicts that might take place during business hours (Alegría et al., 2014; Cardemil et al., 2005; Dwight-Johnson et al., 2011; Hovey et al., 2014; Muñoz et al., 2007; Piedra and Byoun, 2012).

Discussion

Overall, we found evidence that CBT interventions effectively reduced depressive symptoms in Latino immigrants; nearly all the studies showed significant improvements in affect, including three RCTs with low risk of bias; and all studies showed symptom reduction. Given the negative effects of depressive symptoms on child rearing (Grote et al., 2010; Wojcicki

et al., 2011), arguably even modest improvements can be clinically meaningful, particularly among Latino immigrants who might not have access to other treatment options (Keith et al., 2011). We also noted that investigators used a wide array of cultural adaptations—beyond merely translating the intervention into Spanish—to facilitate the recruitment and retention of participants. However, two issues warrant attention and cautious interpretation of findings.

First, generalizability remains a problem. While CBT can yield positive results with Latino immigrants, this conclusion rests on an analysis of eleven studies, many of which used small sample sizes and non-experimental designs (less than a third used random assignment or comparison groups). Moreover, most studies used a group treatment format with female samples recruited from health care settings, further limiting generalizability. Thus, we concur with conclusions drawn from another recent systematic review of depression treatments for immigrants that raised similar concerns about generalizability; more research is needed outside the United States with different ethnic groups and larger sample sizes (Antoniades et al., 2014).

Second, the relative effectiveness of particular cultural adaptations could not be determined with the existing study designs. An important feature of this study was to describe the numerous and diverse cultural adaptations made to the CBT interventions; however, since typically multiple adaptations were used at the same time (see Table 2), it is difficult to distinguish the extent to which specific adaptations drove the effectiveness of the interventions or facilitated access and retention among Latino immigrant populations. There is a need for dismantling studies that isolate and compare effects of specific adaptations.

All of the studies used some combination of cognitive-informational, affective-motivational, and environmental adaptations. Although each study cited a growing literature that underscores the importance of cultural adaptations (Benish et al., 2011; Griner and Smith, 2006;

Kalibatseva and Leong, 2014), many of the adaptations shown in Table 2 were practical in nature—that is, their purpose was mainly to facilitate recruitment and retention—rather than to modify the structure or components of the intervention. Several notable exceptions are worth mentioning. The Cardemil group (2005) departed from the typical CBT protocol by offering family informational sessions. Similarly, two other studies drew on previous work (Organista & Munoz, 1996) which recommends adapting Albert Ellis’ A-B-C-D method into a two-prong *si, pero* method (Interian et al., 2011; Piedra et al., 2011). This adaptation was the only CBT-specific modification in our sample designed to address cultural, language, and literacy issues that might interfere with the benefits of the intervention. Such adaptations may constitute a fourth type of theoretical adaptation in which the intervention itself was altered to better align with Latino values (e.g., family informational sessions; Cardemil et al., 2005) and incorporate deeply ingrained linguistic forms such as the *si, pero* formulation (Interian et al., 2011; Piedra et al., 2011).

In addition, our focus on immigrant Latinos revealed one affective-motivational adaptation that was specifically tailored to this group. Nearly two-thirds of the studies recognized the complexity of the migration experience and modified their intervention to include a discussion of these experiences. This particular adaptation—inclusion of the immigrant experience—was paired with the numerous other supports (i.e. literacy and language modifications, cultural values, transportation, child care, flexible schedule, etc.) and underscored the need to address unanticipated losses generated from the migration and settlement experience (Kaltman et al., 2014; Piedra and Engstrom, 2009), losses which could contribute to depressive symptoms. Thus, for Latino immigrants—and perhaps, other immigrant groups—attention to the immigrant experience constitutes an important cultural adaptation. Moreover, we would argue

that how recently the target population migrates to the area might dictate the relevance (or urgency) of attending to that experience. Indeed, we found that three of the four studies conducted in areas with new immigrant populations emphasized the use of such discussions alongside other practical accommodations. By contrast, this point is overlooked in the Collado et al. (2014) systematic review because of its focus on Latinos in general and lack of attention to geographic location.

Our study recognizes the changing service context driven by the movement of immigrants into untraditional settlement areas. The problems and challenges faced by Latino immigrants are exacerbated in these new growth communities because the lack of infrastructure and bilingual workers not only undermines mental health services but many other services as well (Buki and Piedra, 2011; Lichter et al., 2009). Yet, in these service contexts, there is also room for experimentation and novel adaptations. For example, Cardemil et al. (2005) reasoned that given the strong emphasis on *familismo*, family meetings to explain the intervention the participant would receive might facilitate retention. Although these meetings were underused by the participants, the investigators surmised that perhaps the mere availability of such meetings alleviated concerns about seeking outside help. Other examples of novel approaches to overcome the lack of infrastructure in new growth communities include counseling sessions over telephone (Dwight-Johnson et al., 2011), the use *promotoras* (Hovey et al., 2014), and the use of bilingual graduate students (Piedra and Byoun, 2012).

This review reveals a number of knowledge gaps. First, the review uncovered only eleven studies. Clearly, more clinical trials are needed with immigrant Latino populations; or alternatively, larger trials with Latinos sufficiently powered to disaggregate findings by immigration status.

Second, such studies should include greater consideration for how the geographic location affects the delivery of the intervention. While new growth communities face a number of service challenges that must be addressed for an intervention to succeed, towns that bordered the United States and Mexico confront a unique set of problems related to cyclical migration and a hostile political climate for immigrants, particularly those who are undocumented (Lapeyrouse et al., 2012; Martínez-Donate et al., 2014). For example, we excluded two studies conducted in border towns (Camacho et al., 2015; Simoni et al., 2013) because they did not report the immigration status of their participants despite the fact that interventions were offered in Spanish. We contacted these authors for clarification of their sample; one reported that they chose not to ask participants about their nationality. Clearly, issues of recruitment among immigrant Latinos may be more complex in border towns and more studies are needed that examine effectiveness of existing treatments for depression among immigrants living along multinational borders.

Third, the effectiveness of specific cultural adaptations in enhancing CBT treatments for depression remains unclear due to study design limitations. All of the included studies were designed to assess the CBT treatment but not to assess effectiveness of single or additive cultural adaptations, and included only brief descriptions of general adaptations for language and culture. One study published an in-depth description of their adaptations elsewhere (Le et al., 2010), but most did not. There is an urgent need for research that incorporates specificity and delineation of cultural adaptations in order to identify which types of adaptations beyond linguistic modifications function as “active ingredients” with Latino immigrants.

Finally, several limitations of this review should be noted. The inclusion criterion that the sample or disaggregated subsample had to be at least 50% Latino immigrants could have led to

the omission of some relevant studies. Second, relevant articles published in languages other than English or Spanish and those published before 1995 may have been omitted. Finally, publication bias is always a concern since positive results tend to be published more often than those that favor the null-hypothesis.

Conclusion

Overall, this systematic review suggests that CBT is an effective approach to reducing the burden of depressive symptoms among Latino immigrants, and that cultural adaptations may be needed to serve this population. However, there is insufficient evidence at this time to draw definitive conclusions about the relative effectiveness of specific components of treatment such as length of treatment, and type of cultural adaptations. Further research is needed. There are still too few Latino immigrants participating in clinical trials, insufficiently powered quasi-experimental studies, and broad heterogeneity of contexts and cultural adaptations examined with this population. Rapid growth of the Latino community and dispersion of immigrants into non-urban communities in the U.S. calls for innovation in developing new evidence-based behavioral health practice models. To achieve this goal, there is a critical need for study designs that can evaluate the effectiveness of specific components of culturally adapted CBT and to determine if treatment response among Latinos varies by immigration status, acculturation level, and type of cultural adaptations offered. Finally, this review underscores the need for current behavioral health training programs not only to recruit bilingual and bicultural students into the workforce, but also to equip all practitioners with skills to work effectively with Latino immigrants.

Acknowledgement

The first author is a doctoral training fellow with the Illinois Transdisciplinary Obesity Prevention Program (I-TOPP) and is partially supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under award number 2011-67001-30101.

References

- Adkins, D.E., Wang, V., Dupre, M.E., van den Oord, E.J. Elder, G. H. (2009). Structure and stress: Trajectories of depressive symptoms across adolescence and young adulthood. *Social Forces*, 88, 31-60.
- *Alegría, M., Ludman, E., Kafali, E. N., Lapatin, S., Vila, D., Shrout, P. E., . . . Li, X. (2014). Effectiveness of the Engagement and Counseling for Latinos (ECLA) intervention in low-income Latinos. *Medical Care*, 52, 989-997.
- Alegría, M., Canino, G., Shrout, P. E., Woo, M., Duan, N., Vila, D., ... Meng, X. L. (2008). Prevalence of mental illness in immigrant and non-immigrant US Latino groups. *American Journal of Psychiatry*, 165, 359–369
- Alegría, M., Mulvaney-Day, N., Torres, M., Polo, A., Cao, Z., Canino, G. (2007a). Prevalence of psychiatric disorders across Latino subgroups in the United States. *American Journal of Public Health*, 97, 68-75.
- Alegría, M., Mulvaney-Day, N., Woo, M., Torres, M., Gao, S., Oddo, V. (2007b). Correlates of past-year mental health service use among Latinos: Results from the national Latino and Asian American study. *American Journal of Public Health*, 97, 76-83.
- Andrade, F. C. D., Viruell-Fuentes, E. (2011). Latinos and the changing demographic landscape: Key dimensions for infrastructure building. In *Creating Infrastructures for Latino Mental health*. Springer, New York, pp. 3-30.
- Antoniades, J., Mazza, D., Brijnath, B. (2014). Efficacy of depression treatments for immigrant patients: results from a systematic review. *BMC Psychiatry*, 14, 176-176.
- Augustine, J. M., Crosnoe, R. (2010). Mothers' depression and educational attainment and their children's academic trajectories. *Journal of Health and Social Behavior*, 51, 274-290.

- Barrera, M., Castro, F. G., Strycker, L. A., Toobert, D. J. (2013). Cultural adaptations of behavioral health interventions: A progress report. *Journal of Consulting and Clinical Psychology*, 81, 196–205.
- Bauer, A., Chen, C., Alegría, M. (2010). English language proficiency and mental health service use among Latino and Asian Americans with mental disorders. *Medical Care*, 48, 1097-1104.
- Beeber, L. S., Perreira, K. M., Schwartz, T. (2008). Supporting the mental health of mothers raising children in poverty: How do we target them for intervention studies? *Annals of the New York Academy of Sciences*, 1136, 86-100.
- Benish, S. G., Quintana, S., Wampold, B. E. (2011). Culturally adapted psychotherapy and the legitimacy of myth: A direct-comparison meta-analysis. *Journal of Counseling Psychology*, 58, 279-289.
- Bennett, I. M., Culhane, J. F., McCollum, K. F., Mathew, L., Elo, I. T. (2007). Literacy and depressive symptomatology among pregnant Latinas with limited English proficiency. *American Journal of Orthopsychiatry*, 77, 243.
- Breslau, J., Kendler, K., Su, M., Gaxiola-Aguilar, S., Kessler, R. (2005). Lifetime risk and persistence of psychiatric disorders across ethnic groups in the United States. *Psychological Medicine*, 35, 317-327.
- Buki, L.P. & Piedra, L. M. (Eds.). 2011. *Creating Infrastructures for Latino Mental Health*. Springer, New York.
- Cabassa, L. J., Baumann, A. A. (2013). A two-way street: bridging implementation science and cultural adaptations of mental health treatments. *Implementation Science*, 8, 1-14.

- Cabassa, L. J., Lester, R., Zayas, L. H. (2007). "It's like being in a labyrinth:" Hispanic immigrants' perceptions of depression and attitudes toward treatments. *Journal of Immigrant and Minority Health*, 9, 1-16.
- Cabassa, L. J., Zayas, L. H., Hansen, M. C. (2006). Latino adults' access to mental health care: A review of epidemiological studies. *Administration and Policy in Mental Health and Mental Health Services Research*, 33, 316-330.
- Camacho, A., González, P., Castaneda, S. F., Simmons, A., Buelna, C., Lemus, H., & Talavera, G. A. (2015). Improvement in depressive symptoms among Hispanic/Latinos receiving a culturally tailored impact and problem-solving intervention in a community health center. *Community Mental Health Journal*, 51, 385-392.
- Camarota, S. A. (2012). Immigrants in the United States: A profile of America's foreign-born population. Center for Immigration Studies. <http://cis.org/2012-profile-of-americas-foreign-born-population> (accessed 23.08.2015).
- *Cardemil, E. V., Kim, S., Pinedo, T. M., Miller, I. W. (2005). Developing a culturally appropriate depression prevention program: the family coping skills program. *Cultural Diversity and Ethnic Minority Psychology*, 11 (2), 99.
- Castro, F. G., Barrera Jr, M., Martinez Jr, C. R. (2004). The cultural adaptation of prevention interventions: Resolving tensions between fidelity and fit. *Prevention Science*, 5, 41-45.
- Coffman, M. J., Norton, C. K. (2010). Demands of immigration, health literacy, and depression in recent Latino immigrants. *Home Health Care Management and Practice*, 22, 116-122.
- Collado, A., Lim, A. C., MacPherson, L. (2016). A systematic review of depression psychotherapies among Latinos. *Clinical Psychology Review*, 45, 193-209.

*Dwight-Johnson, M., Aisenberg, E., Golinelli, D., Hong, S., O'Brien, M., Ludman, E. (2011).

Telephone-based cognitive-behavioral therapy for Latino patients living in rural areas: A randomized pilot study. *Psychiatric Services*, 62, 936-942.

Fry, R.A., Passel, J. S. (2009). Latino children: A majority are U.S.-born offspring of immigrants. Washington, DC: The Pew Hispanic Research Center.

<http://www.pewhispanic.org/files/reports/110.pdf> (accessed 10.08.2015).

*Gelman, C. R., López, M., Foster, R. P. (2006). Evaluating the impact of a cognitive-behavioral intervention with depressed Latinas: a preliminary report. *Social Work in Mental Health*, 4, 1-16.

Givens, J. L., Houston, T. K., Van Voorhees, B. W., Ford, D. E., & Cooper, L. A. (2007).

Ethnicity and preferences for depression treatment. *General Hospital Psychiatry*, 29, 182-191.

Griner, D., Smith, T. B. (2006). Culturally adapted mental health intervention: A meta-analytic review. *Psychotherapy: Theory, Research, Practice, Training*, 43, 531-548.

Grote, N. K., Bridge, J. A., Gavin, A. R., Melville, J. L., Iyengar, S., & Katon, W. J. (2010). A meta-analysis of depression during pregnancy and the risk of preterm birth, low birth weight, and intrauterine growth restriction. *Arch Gen Psychiatry*, 67, 1012-1024.

*Hovey, J. D., Hurtado, G., Seligman, L. D. (2014). Findings for a CBT support group for Latina migrant farmworkers in western Colorado. *Current Psychology: A Journal for Diverse Perspectives on Diverse Psychological Issues*, 33, 271-281.

*Interian, A., Allen, L. A., Gara, M. A., Escobar, J. I. (2008). A pilot study of culturally adapted cognitive behavior therapy for Hispanics with major depression. *Cognitive and Behavioral Practice*, 15, 67-75.

Jackson-Triche, M. E., Sullivan, J. G., Wells, K. B., Rogers, W., Camp, P., Mazel, R. (2000).

Depression and health-related quality of life in ethnic minorities seeking care in general medical settings. *Journal of Affective Disorders*, 58, 89-97.

Kalibatseva, Z., Leong, F. T. (2014). A critical review of culturally sensitive treatments for

depression: Recommendations for intervention and research. *Psychological Services*, 11, 433.

Kaltman, S., Hurtado de Mendoza, A., Gonzales, F. A., Serrano, A. (2014). Preferences for

trauma-related mental health services among Latina immigrants from Central America, South America, and Mexico. *Psychological Trauma: Theory, Research, Practice, and Policy*, 6, 83.

Karasz, A., Watkins, L. (2006). Conceptual models of treatment in depressed Hispanic patients.

Annals of Family Medicine, 4, 527-533.

Keith, J. A., Verdeli, H., & Vousoura, E. (2011). Evaluating the clinical significance of

depression treatment: Implications for global mental health research. *International Journal of Mental Health*, 40, 3-28.

Lapeyrouse, L., Morera, O., Heyman, J., Amaya, M., Pingitore, N., & Balcazar, H. (2012). A

profile of US-Mexico border mobility among a stratified random sample of Hispanics living in the El Paso-Juarez area. *Journal of Immigrant and Minority Health*, 14, 264-271.

*Le, H. N., Perry, D. F., Stuart, E. A. (2011). Randomized controlled trial of a preventive

intervention for perinatal depression in high-risk Latinas. *Journal of Consulting and Clinical Psychology*, 79, 135-141.

- Le, H. N., Zmuda, J., Perry, D. F., Muñoz, R. F. (2010). Transforming an evidence-based intervention to prevent perinatal depression for low-income Latina immigrants. *American Journal of Orthopsychiatry*, 80, 34-45.
- Lee, M. J., Liechty, J. M. (2015). Longitudinal associations between immigrant ethnic density, neighborhood processes, and latino immigrant youth depression. *Journal of Immigrant and Minority Health*, 17, 983-991.
- Lichter, D. T., Johnson, K. M. (2006). Emerging rural settlement patterns and the geographic redistribution of America's new immigrants. *Rural Sociology*, 71, 109-131.
- Lichter, D. T., Johnson, K. M. (2009). Immigrant gateways and Hispanic migration to new destinations. *International Migration Review*, 43, 496-518.
- Martínez-Donate, A. P., Zhang, X., Rangel Gomez, M. G., Hovell, M. F., Simon, N.-J., Amuedo-Dorantes, C., . . . Guendelman, S. (2014). Healthcare access among circular and undocumented Mexican migrants: Results from a pilot survey on the Mexico-US border. *International Journal of Migration and Border Studies*, 1, 57-108.
- Martínez Pincay, I., Guarnaccia, P. (2007). "It's like going through an earthquake:" Anthropological perspectives on depression among Latino immigrants. *Journal of Immigrant and Minority Health*, 9, 17-28.
- *Miranda, J., Azocar, F., Organista, K. C., Dwyer, E., Areane, P. (2003). Treatment of depression among impoverished primary care patients from ethnic minority groups. *Psychiatric Services*, 54, 219-225.
- Miranda, J., Chung, J. Y., Green, B. L., Krupnick, J., Siddique, J., Revicki, D. A., Belin, T. (2003). Treating depression in predominantly low-income young minority women: A randomized controlled trial. *JAMA*, 290, 57-65.

- Miranda, J., Duan, N., Sherbourne, C., Schoenbaum, M., Lagomasino, I., Jackson-Triche, M., Wells, K. B. (2003). Improving care for minorities: can quality improvement interventions improve care and outcomes for depressed minorities? Results of a randomized, controlled trial. *Health Services Research*, 38, 613-630.
- Munet-Vilaró, F., Folkman, S., Gregorich, S. (1999). Depressive symptomatology in three Latino groups. *Western Journal of Nursing Research*, 21, 209-224.
- *Muñoz, R. F., Le, H.-N., Ippen, C. G., Diaz, M. A., Urizar, G. G., Jr., Soto, J., . . . Lieberman, A. F. (2007). Prevention of postpartum depression in low-income women: Development of the Mamás y Bebés/ Mothers and Babies course. *Cognitive and Behavioral Practice*, 14, 70-83.
- Muñoz, R. F., Miranda, J. (2000). Group therapy manual for cognitive-behavioral treatment of depression. Rand Corporation.
- Murray, L., Arteché, A., Fearon, P., Halligan, S., Croudace, T., Cooper, P. (2010). The effects of maternal postnatal depression and child sex on academic performance at age 16 years: A developmental approach. *Journal of Child Psychology and Psychiatry*, 51, 1150-1159.
- National Alliance of Mental Health. (2013). Major Depression: Fact Sheet.
http://www2.nami.org/factsheets/depression_factsheet.pdf (accessed 02.05.2015).
- National Heart, Lung, and Blood Institute [NHLBI]. 2014. Study quality assessment tools.
<https://www.nhlbi.nih.gov/health-pro/guidelines/in-develop/cardiovascular-risk-reduction/tools> (accessed 20.10.2014).
- Organista, K. C., Muñoz, R. F. (1996). Cognitive behavioral therapy with Latinos. *Cognitive and Behavioral Practice*, 3, 255-270.

Passel, J. S., Suro, R. (2005). Rise, peak, and decline: Trends in US immigration 1992-2004.

Washington, DC: The Pew Hispanic Research Center.

<http://www.immigrationdaily.com/articles/2005,1205-passel.pdf> (accessed 22.10.2015).

Piedra, L. M. (2010). Latinos and Spanish: The awkwardness of language in social work practice. In R. Furman and N. Negi (Eds.), *Social Work Practice with Latinos*. Lyceum Books, Chicago, IL, pp. 262-281.

Piedra, L. M., Andrade, F. C. D., Larrison, C. R. (2011). Building response capacity: The need for universally available language services. In L. P. Buki and L. M. Piedra (Eds.), *Creating Infrastructures for Latino Mental Health*. Springer, New York, NY, pp. 55-76.

Piedra, L. M., Engstrom, D. W. (2009). Segmented assimilation theory and the life model: An integrated approach to understanding immigrants and their children. *Social Work*, 54, 270-277.

*Piedra, L. M., Byoun, S.-J. (2012). Vida Alegre: Preliminary findings of a depression intervention for immigrant Latino mothers. *Research on Social Work Practice*, 22, 138-150.

Salas-Wright, C. P., Kagotho, N., Vaughn, M. G. (2014). Mood, anxiety, and personality disorders among first and second-generation immigrants to the United States. *Psychiatry Research*, 220 (3), 1028-1036.

Santiago, C.D. & Miranda, J. (2014). Progress in improving mental health services for racial-ethnic minority groups: A ten-year perspective. *Psychiatric Services*, 65, 180-185.

Schyve, P. M. (2007). Language differences as a barrier to quality and safety in health care: the Joint Commission perspective. *Journal of General Internal Medicine*, 22, 360-361.

- Sentell, T., Shumway, M., Snowden, L. (2007). Access to mental health treatment by English language proficiency and race/ethnicity. *Journal of General Internal Medicine*, 22 (Suppl 2), 289-293.
- Shattell, M. M., Villalba, J., Stokes, N., Hamilton, D., Foster, J., Petrini, H., . . . Faulkner, C. (2009). Depression in Latinas residing in emerging Latino immigrant communities in the United States. *Hispanic Health Care International*, 7, 190-202.
- *Shattell, M. M., Quinlan-Colwell, A., Villalba, J., Ivers, N. N., Mails, M. (2010). A cognitive-behavioral group therapy intervention with depressed Spanish-speaking Mexican women living in an emerging immigrant community in the United States. *Advances in Nursing Science*, 33, 158–169.
- Simoni, J. M., Wiebe, J. S., Saucedo, J. A., Huh, D., Sanchez, G., Longoria, V., . . . Safren, S. A. (2013). A preliminary RCT of CBT-AD for adherence and depression among HIV-positive Latinos on the US-Mexico border: the Nuevo Dia study. *AIDS and Behavior*, 17, 2816-2829.
- Stacciarini, J. R., O'Keeffe, M., Mathews, M. (2007). Group therapy as treatment for depressed Latino women: A review of the literature. *Issues in Mental Health Nursing*, 28, 473-488.
- Stepler, R., Brown, A. (2016). Statistical portrait of Hispanics in the United States. The Pew Hispanic Research Center. <http://www.pewhispanic.org/2016/04/19/statistical-portrait-of-hispanics-in-the-united-states-key-charts/> (accessed 14.04.2016).
- Stone, L. C., Balderrama, C. H. H. (2008). Health inequalities among Latino: What do we know and what can we do? *Health and Social Work*, 33, 3-7.

- Stone, L. C., Viruell-Fuentes, E. A., Acevedo-Garcia, D. (2007). Understanding the socio-economic, health systems and policy threats to Latino health: Gaining new perspectives for the future. *Californian Journal of Health Promotion*, 5, 82-104.
- Torres, L. (2010). Predicting levels of Latino depression: Acculturation, acculturative stress, and coping. *Cultural Diversity and Ethnic Minority Psychology*, 16, 256-263.
- U.S. Department of Health and Human Services. (2001). *Mental Health: Culture, Race, and Ethnicity: A Supplement to Mental Health: A Report of the Surgeon General*. Rockville, MD: U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Mental Health Services.
- <http://www.ncbi.nlm.nih.gov/books/NBK44243/> (accessed 28.09.2015).
- van Loon, A., van Schaik, A., Dekker, J., Beekman, A. (2013). Bridging the gap for ethnic minority adult outpatients with depression and anxiety disorders by culturally adapted treatments. *Journal of Affective Disorders*, 147, 9-16.
- Vega, W. A., Rodriguez, M. A., Gruskin, E. (2009). Health disparities in the Latino population. *Epidemiologic Reviews*, 31, 99–112.
- Villalba, J. A., Brunelli, M., Lewis, L., Wachter, C. (2007). Examining the academic and personal-social experiences of Latina/o children in Southeastern US rural, burgeoning Latino communities. *Rural Educator*, 28, 12-19. <http://eric.ed.gov/?id=EJ783874> (accessed 11.10.2015).
- Wang, P. S., Beck, A. L., Berglund, P., McKenas, D. K., Pronk, N. P., Simon, G. E., & Kessler, R. C. (2004). Effects of major depression on moment-in-time work performance. *American Journal of Psychiatry*, 161, 1885-1891.

Wojcicki, J. M., Holbrook, K., Lustig, R. H., Epel, E., Caughey, A. B., Munoz, R. F., . . .

Heyman, M. B. (2011). Chronic maternal depression is associated with reduced weight gain in latino infants from birth to 2 years of age. *PLoS One*, 6, e16737.

World Health Organization. (2015). Depression: Key Facts.

<http://www.who.int/mediacentre/factsheets/fs369/en/> (accessed 20.10.2015).

Yancey, A. K., Ortega, A. N., Kumanyika, S. K. (2006). Effective recruitment and retention of minority research participants. *Annual Review of Public Health*, 27, 1-28.

*Studies included in the review

LATINO IMMIGRANTS AND CBT: A SYSTEMATIC REVIEW

Table 1. Characteristics of included studies

Study	Study design	Sample	Intervention	Control	Depressive symptom measure	Assessment time points	Effect size reported	Risk of Bias	Findings
Alegría et al., 2014	RCT	$n = 127^a$ Latinos in urban community healthcare settings. Female = 82%. Age range = 35- 49. Foreign born = 75%.	6-8 individual sessions CBT + case management via phone vs. in person.	Usual care determined by the provider	HSCL-20	Baseline, Post-tx (NR), 2 mo (NR), 4 mo	$d = 0.73$ (phone at 4 mo) $d=0.64$ (in person at 4 mo)	Low Risk	HSCL-20 scores were significantly reduced in the full sample for both treatment conditions compared to usual care at both treatment sites.
Cardemil et al., 2005	Pre-post	$n = 24^c$ Latina mothers recruited from urban health and social service agencies. Mean age = NR. Foreign born = at least 80%.	6 CBT group sessions and 2 family sessions.	N/A	BDI	Baseline, Post-tx	$d = 0.54$	Moderate Risk	BDI scores were significantly reduced from 11.2 at baseline to 7.2 at posttest ($p < 0.05$).

LATINO IMMIGRANTS AND CBT: A SYSTEMATIC REVIEW

Dwight-Johnson et al., 2011	RCT	<i>n</i> = 101 Latinos in rural primary care settings. Female = 78%. Mean age = 39.8. Foreign born = 96%.	8 CBT individual manualized sessions by telephone.	Enhanced usual care determined by the provider	PHQ-9	Baseline, 6 weeks, 3 mo, 6 mo	NR	Low Risk	PHQ-9 scores were significantly reduced from 17.0 at baseline to 5.8 at 6 months compared to the control group (<i>p</i> = .003). Differences at 6 weeks and at 3 months were NS.
Gelman et al., 2006	Pre-post	<i>n</i> = 5 Latina patients seeking urban outpatient mental health services. Mean age = 54.0. Foreign born = 100%.	12 CBT manualized group sessions.	N/A	BDI	Baseline, Post-tx	NR	High Risk	BDI scores were significantly reduced from 34.8 at baseline to 22.8, at posttest (<i>p</i> < 0.01).
Hovey et al.,	Pre-post	<i>n</i> = 6 Mexican	6 sessions of group CBT.	N/A	CES-D	Baseline, Post-tx	<i>d</i> = 1.54 (posttest)	Moderate Risk	CES-D scores were

LATINO IMMIGRANTS AND CBT: A SYSTEMATIC REVIEW

Table 2. Adaptations made to content, delivery, or structure of intervention program explicitly described in included studies

Study (first author, year)	Cognitive-informational		Affective motivational			Environmental				Alteration of the intervention
	Literacy adjustment	Spanish language	Spanish sayings	Latino values	Migration experience	Childcare	Snacks	Transportation	Flexible schedule	
Alegria et al., 2014	X	X	X						X	
Cardemil et al., 2005 ^b		X		X	X	X		X	X	X
Dwight-Johnson et al., 2011 ^b		X	X	X	X				X	
Gelman et al., 2005		X								
Hovey et al., 2014		X		X	X			X	X	
Interian et al., 2008		X	X	X	X					X
Le et al., 2011 ^a	X	X			X					
Miranda et al., 2003	X	X		X						
Muñoz et al., 2007	X	X	X	X	X	X		X	X	
Piedra & Byoun, 2012 ^b	X	X	X		X	X	X		X	X
Shattell et al., 2010 ^b		X				X		X		
Total	5	11	5	6	7	4	1	4	6	3

^aThe cultural adaptations shown here were described in an earlier methods paper (Le et al., 2010) that was cited by the authors.

^bThe study was conducted in “new growth” communities.

LATINO IMMIGRANTS AND CBT: A SYSTEMATIC REVIEW

2014	and follow-up	migrant rural farmworker women. Mean age = 31.8. Foreign born = 100%.				6 mo	$d = 1.60$ (follow-up)		significantly reduced from 34.4 at baseline to 16.6 at posttest ($p = 0.02$), and 15.5 at 6 month follow-up ($p = 0.02$).
Interian et al., 2008	Pre-post and follow-up	$n = 15$ Latinos in urban primary care setting. Female = 93%. Mean age = 36.7. Foreign born = 100%.	12 sessions of individual CBT.	N/A	BDI-S	Baseline Post-tx 6 mo	$d = 2.71$ (posttest) $d = 2.53$ (follow-up)	Moderate Risk	BDI-S scores were significantly reduced from 33.5 at baseline to 14.3 at posttest ($p = 0.0005$) and 15.5 at follow-up ($p = .0005$).
Le et al., 2011	RCT	$n = 217$ Latinas in urban prenatal care setting. Mean age = 25.4. Foreign born =	8 sessions of group CBT. Booster sessions at 6 weeks, and 4 and 12 months postpartum.	Usual care	BDI-II Maternal Mood Screener	Baseline Post-tx; 6 wk postpartum, 4 mo 12 mo	$d = -0.28$ (BDI-II posttest) $d = 0.11$ (BDI-II 12 mo) NR (MMS)	Low Risk	BDI-II scores were significantly reduced from 15.7 at baseline to 10.6 at posttest for intervention group ($p =$

LATINO IMMIGRANTS AND CBT: A SYSTEMATIC REVIEW

		99%.							0.03). Reduced symptoms were sustained but did not differ from controls at 6 week, 4 month, and 12 month follow-up. Incidence of major depressive episodes did not differ between groups.
Miranda , Azocar, et al., 2003	RCT	<i>n</i> = 77 ^b Latinos in urban primary care setting. Female = 80%. Mean age = 49.1. Spanish speaking = 100%.	6 months group CBT + case management.	6 months (12 sessions) group CBT.	BDI	Baseline, 4 mo post-baseline, 6 mo	NR	Moderate Risk	BDI scores for intervention and control groups, respectively, were reduced from 28 and 28 at baseline to 19.5 and 23 at 4 months; and to 19 and 22.5 at 6 months (<i>p</i> values NR).
Muñoz et al., 2007	RCT	<i>n</i> = 41 Women in urban	12 sessions group CBT. Booster	Usual care (provision of	CES-D Maternal Mood	Baseline, Post-tx, 1 mo post-	NR (CES-D) <i>h</i> = 0.28	Moderate Risk	Neither CESD scores nor incidence of

LATINO IMMIGRANTS AND CBT: A SYSTEMATIC REVIEW

		<p>prenatal care setting. Mean age = 24.9. Foreign born Latinas = 76%.</p>	<p>sessions given at 1, 3, 6 and 12 months postpartum.</p>	<p>information on available social services)</p>	<p>Screeners</p>	<p>partum, 3 mo 6 mo 12 mo.</p>	<p>(MMS)</p>		<p>depressive episodes were statistically different at baseline, posttest, or follow-ups. However, the rate of at least one postpartum depressive episode was 14.3% in the intervention and 25% in the control group ($p = NS$).</p>
<p>Piedra and Byoun, 2012</p>	<p>Pre-post and follow-up</p>	<p>$n = 11^c$ Latinas recruited from health and social service agencies in new growth communities. Mean age= 31.1. Foreign born=</p>	<p>10 sessions group CBT.</p>	<p>N/A</p>	<p>CES-D</p>	<p>Baseline, Post-tx, 3 mo</p>	<p>$r = 0.67$ (posttest)</p>	<p>Moderate Risk</p>	<p>CES-D scores were significantly reduced from 25 at baseline to 12 at posttest ($p < .05$) and 11.3 at follow-up ($p < .05$; Cohen's $r = 0.67$, corresponds to $d = 1.8$).</p>

LATINO IMMIGRANTS AND CBT: A SYSTEMATIC REVIEW

		100%.							
Shattell et al., 2010	Pre-post	<i>n</i> = 6 Mexican women living in a new growth immigrant community. Mean age = 30.0. Foreign born = 100%.	8 group CBT sessions.	N/A	CES-D	Baseline, Post-tx	NR	Moderate Risk	CES-D scores decreased from 30.7 at baseline to 22.3 at posttest (p = NS; Cohen's d = .60 based on our calculation).

Note. RCT= Randomized Controlled Trial. PP=postpartum. NR= Not reported. NS=Non-significant. Mo=months. Tx=treatment. HSCL-20= Hopkins Symptom Checklist-20. PHQ-9= Patient Health Questionnaire. BDI= Beck Depression Inventory. BDI-S= Beck Depression Inventory- Spanish version. BDI-II = Beck Depression Inventory- Second edition. Maternal Mood Screener= instrument used to measure major depressive episodes. CES-D= Center for Epidemiologic Studies Depression Scale. Only the depression symptom measures for which findings were disaggregated by US Latina immigrants or based on a sample of >50% Latina immigrants are listed above.

^aSub-sample size of Spanish-speaking participants from US study site.

^bSub-sample size of Spanish speaking participants.

^cThis number denotes the sample that was analyzed rather than the enrollment sample.

LATINO IMMIGRANTS AND CBT: A SYSTEMATIC REVIEW

Figure 1

The following flow chart is based on the 2009 Preferred Reporting for Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines

* This study was identified by reviewing the references of the included studies.