Published in final edited form as:
Cultur Divers Ethnic Minor Psychol. 2008 October ; 14(4): 377–384. doi:10.1037/a0012820.

Measuring Latinos' Perceptions of Depression: A Confirmatory Factor Analysis of the Illness Perception Questionnaire

Leopoldo J. Cabassa,
University of Southern California

Isabel T. Lagomasino,
University of Southern California

Megan Dwight-Johnson,
University of Washington

Marissa C. Hansen, and
University of Southern California

Bin Xie
University of Southern California

Abstract

This study examined the psychometric properties of the Revised Illness Perception Questionnaire adapted for a clinical sample of low-income Latinos suffering from depression. Participants (N = 339) were recruited from public primary care centers. Their average age was 49.73 years and the majority was foreign born females of either Mexican or Central American descent. Confirmatory factor analysis was used to test the factor structure of this measure. Construct and discriminant validity and internal consistency were evaluated. After the elimination of three items because of low factor loadings (< .40) and the specification of seven error covariances, a revised model composed of 24 items had adequate goodness-of-fit indices and factor loadings, supporting construct validity. Each of the subscales reported satisfactory internal consistency. Intercorrelations between the 5 illness perception factors provided initial support for the discriminant validity of these factors in the context of depression. The establishment of the psychometric properties of this adapted measure will pave the way for future studies examining the role illness perceptions play in the help seeking and management of depression among Latinos.

Keywords

depression; illness perceptions; confirmatory factor analysis; Latinos; illness representations

Latinos face substantial disparities in accessing and receiving quality depression treatments (Lewis-Fernández, Das, Alfonso, Weissman, & Olfson, 2005). Explanations for these disparities are multifaceted and include lack of health insurance, cost, stigma, language barriers, and lack of reliable sources of care (U. S. Department of Health and Human Services [USDHHS], 2001). Recent studies suggest that patient-related factors, including perceptions of depression and its treatments and treatment preferences, may contribute to these inequities in depression care (Cabassa, Lester, & Zayas, 2007; Cooper et al., 2003; Givens, Houston, Van-Voorhees, Ford, & Cooper, 2007). For instance, Latinos are less

Correspondence concerning this article should be addressed to Leopoldo J. Cabassa, School of Social Work, University of Southern California, 669 West 34th Street, Los Angeles, CA 90089-0411. cabassa@usc.edu.

likely than Whites to endorse a biological etiology of depression, tend to view antidepressants as addictive and harmful, and prefer counseling over medications. (Cooper et al., 2003; Givens et al., 2007; Karasz & Watkins, 2006). The study of Latinos' perceptions of depression can produce valuable knowledge about how they recognize their need for care and manage this common disorder. It can inform the development of self-management programs and patient-centered interventions aimed at increasing treatment adherence and improving quality of care (Brown, Battista, Bruehlman, Sereika, Thase, & Dunbar-Jacob, 2005).

Illness perceptions are the cognitive and emotional representations that individuals have about their illness (Petrie, Jago, & Devich, 2007) and a core component of the self-regulatory model of illness cognition (Leventhal, Deifenbach, & Leventhal, 1992). According to Leventhal et al. (1992), illness perceptions contain five interrelated yet distinct dimensions. (a) *Identity* refers to the labels and symptoms individuals use to describe their illness. (b) *Cause* is the belief that persons have about what caused their illness. (c) *Timeline* refers to the expectations that individuals have about the course of their illness (e.g., acute, chronic). (d) *Consequence* encompasses individuals' views about the expected outcomes of their illness. (e) *Controllability* refers to individuals beliefs as to whether their illness is amenable to treatment or personal control. The basic premise of this model is that individuals are active problem solvers who rely on their illness perceptions to make sense of their symptoms and cope with illness (Cameron & Leventhal, 2003). Individuals engage in a dynamic process in which they appraise the effectiveness of their coping procedures and use this information to modify their illness perceptions (Hagger & Orbell, 2005). Illness perceptions are shaped by individuals' social and cultural milieu and their experiences with treatment (Deifenbach & Leventhal, 1996).

A meta-analysis of 45 studies examining Leventhal and colleagues' model across 23 physical illnesses (e.g., diabetes, HIV, Asthma) showed that the illness perception dimensions form empirically distinct and interrelated constructs that have little conceptual overlap (Hagger & Orbell, 2003). However, the authors point out that the correlations between these dimensions can be influenced by illness type and that more studies are needed to examine these interrelations across different illnesses.

Since the development of the Illness Perception Questionnaire (IPQ; Weinman, Petrie, Moss-Morris, & Horne, 1996) and its revised version (IPQR; Moss-Morris, Weinmen, Petrie, Horne, Cameron, & Buick, 2002), the study of illness perceptions has proliferated. These instruments provide reliable and valid measures of illness perceptions and can be tailored to different medical conditions and patient populations. The majority of illness perception studies have focused on chronic health conditions (e.g., heart disease, diabetes; Petrie, Broadbent, & Meechan, 2003) and found that illness perceptions are associated with important treatment outcomes, including adherence, functional recovery, coping, and self-management (Hagger & Orbell, 2003; Petrie, Jago, & Devich, 2007).

Studies have begun to examine the illness perceptions of individuals suffering from mental disorders (e.g., Lobban, Barrowclough, & Jones, 2002; Fortune, Barrowclough, & Lobban, 2004). This literature finds that patients' perceptions of depression are significantly related to important outcomes associated with mental health care disparities, such as prior and current use of services, medication adherence, coping strategies, intentions to seek care, treatment preferences, and psychosocial functioning (Brown et al., 2005, 2007; Cabassa & Zayas, 2007). However, findings from this literature have been limited by the lack of studies examining the reliability and psychometric properties of illness perception measures adapted for depression, particularly in the Latino population. To our knowledge, only two studies have reported psychometric properties of the IPQR adapted for depression (Brown et al.,

2007; Fortune et al., 2004). Both studies only used English-speaking participants and their samples were composed mostly of White individuals. For instance, Brown and colleagues (2007) reported that their sample was predominantly White (93.7%) and female (70.7%). Based on a literature search of PsycINFO from 1960 to 2008 using the terms *illness perceptions, illness representations, depression, major depression, affective disorder, Hispanics, or Latinos*, we found no published study that has tested the factor structure and examined the reliability and validity of the IPQR modified for English and Spanish speaking Latinos with depression in the United States.

The aim of the present study is to conduct a confirmatory factor analysis (CFA) of the IPQR adapted for a clinical sample of depressed low-income Latinos served in primary care. The following two hypotheses were formulated to test the psychometric properties of this instrument. (a) The a priori structure of the five IPQR dimensions used in the present study (timeline-acute/chronic, timeline-cyclical, consequence, treatment control, and personal control) will adequately explain the covariance of the IPQR responses for depressed Latino patients. (b) The subscales for these dimensions will have adequate reliability. We also explored the interrelations between the five dimensions and compared them to patterns reported in previous studies (Fortune et al., 2004; Hagger & Orbell, 2005).

Method

Sample and Procedures

Study procedures were approved by the University of Southern California-Health Sciences Institutional Review Board. The Latino sample for the present study was derived from a larger study that examined how to incorporate the preferences of patients, providers, and administrators into the design of depression interventions for public primary care settings. The recruitment sites for the parent grant were three public sector primary care centers in Los Angeles. These clinics provide outpatient medical services and serve mostly a low-income, Latino population. Patients were recruited through waiting room screens and provider referrals. Inclusion criteria for the parent grant were adult patients (18–65 years), ability to speak English or Spanish, and screen positive on the Patient Health Questionnaire-9 for current major depression or 3 additional PRIME-MD items for dysthymia (Spitzer, Kroenke, & Williams, 1999; Spitzer et al., 1994). Exclusion criteria included possible bipolar or psychotic disorders, or acute suicidal ideation at the time of recruitment. There were 1,646 patients screened for depression in the parent grant and 626 (68%) patients screened positive for depressive disorders. Among positive cases, 107 were excluded because they met at least 1 exclusionary and 402 (77%) were enrolled and completed a baseline interview. Following written informed consent, enrolled patients completed baseline and 16-week follow-up structured interviews either in person or by telephone. Data on patients' sociodemographics, acculturation, clinical characteristics, functional status, comorbid medical conditions, knowledge and attitudes about depression and treatments, past and current service use, treatment preferences, and illness perceptions were collected. Only patient baseline data was used for the present report. Of the 402 patients recruited into the parent study, 341(85%) self-identified as Latino. Two Latino participants reported missing values in all IPQR items and were excluded from the analyses. The final sample for the present study was composed of 339 Latino participants.

Measures

Illness Perceptions

An adapted version of the IPQR (Moss-Morris et al., 2002) was used to measure the timeline-acute/chronic, timeline-cyclical, consequence, treatment control, and personal control dimensions. Our versions of the IPQR consisted of 27-items that used a 5-point

Likert-type scale ranging from (0) "strongly disagree" to (4) "strongly agree." High scores in the timeline acute/chronic dimension indicate that the person endorses a chronic view of their depression. For the timeline-cyclical dimension, high scores suggest that the individual views depression as a cyclical, intermittent condition. High scores in the consequence dimension indicate that the person perceives depression as a serious, debilitating illness. For both the personal and treatment control dimensions, high scores suggest the person endorses that depression can be controlled through treatment and personal efficacy. Items were presented sequentially for each of the subscales tested as stipulated by the original IPQR English version. We followed Moss-Morris and colleagues (2002) recommendation for adapting IPQR items to different illnesses conditions by replacing the word *illness* with the word *depression*. For example the original version of an item, such as *illness* is a serious condition, was modified to *depression* is a serious condition. We used standard back translation techniques to translate the instrument into Spanish (Bravo, Woordbury-Fariña, Canino, & Rubio-Stipec, 1993; Brislin, 1986). Before the present study, we pilot tested our translated version of the IPQR with 95 Latino immigrants visiting a primary care clinic and found that the instrument had good face validity and reliability (Cabassa et al., 2007). Based on our pilot testing, we further modified the IPQR items wording from first person (e.g., "My depression") to second person ("Your depression") to accommodate the structured interview context of the present study.

The identity dimension which measures commonly experienced symptoms (e.g., fatigue, pain, nausea) associated with different illnesses was excluded from our version of the IPQR because depressive symptoms were already being collected in the parent study with the Patient Health Questionnaire-9 (PHQ-9), a well validated nine item tool for major depression (see below). We also excluded the cause dimension scale since the original version of this scale list causes that may not be appropriate for depression (e.g., pollution in the environment, altered immunity) and may need to be adapted to include common causes unique to depression (e.g., interpersonal loss).

Demographics

Demographic characteristics included age, gender, and years of education (6 years and below, seven to 11 years, and 12 years and beyond) marital status (married, not married), full-time employment, household gross annual income ($15,000 and below, 15,001 to $25,000, and greater than $25,000), and self-identified Hispanic group that were then coded into three categories (Mexican, Central American, and Others). We also asked participants their language preference (Spanish, bilingual, or English), place of birth coded as foreign or U. S. born and for those who were foreign born (n = 306) how many years they had lived in the U. S. Lastly, we recorded the language of the baseline interview (English or Spanish).

Clinical Characteristics

Depression symptom severity was measured using the Patient Health Questionnaire (PHQ-9), a self-report version of the PRIME-MD, which uses criteria from the Diagnostic and Statistical Manual, Fourth Edition (*DSM–IV*; American Psychiatric Association, 1994) to assess mental disorders in primary care (Spitzer et al., 1995). The PHQ contains a subset of 9 questions (PHQ-9) that assess the presence of major depressive disorder, grade symptom severity, and captures symptom change over time (Kroenke et al., 2001; Kroenke & Spitzer, 2002; Spitzer et al., 1999). The PHQ-9 has been used extensively with primary care patients (Spitzer et al., 1999, 1994), including with low-income Latinos and African Americans (Ell et al., 2002; Miranda, Azocar, Komaromy, & Golging, 1998). We used the PHQ batteries to screen for possible dysthymia, panic and anxiety disorders, and alcohol abuse (Spitzer et al., 1999). The Post Traumatic Stress Disorder (PTSD) Checklist was used to screen for PTSD (Blanchard et al., 1996). Drug abuse was assessed with items adapted

from the Partners in Care study (Wells, 1999; Wells, 2001) and the CIDI (World Health Organization [WHO], 1997).

General health status was measured with a single item in which participants rated their current health status on a 5-point scale ranging from excellent to poor (Fayers & Sprangers, 2002). Participants also reported the presence of any health condition from a list of 11 common chronic health conditions (e.g., diabetes, heart disease, asthma). The total number of chronic health condition endorsed was computed.

Past Mental Health Treatments

Participants were asked to indicate whether they had ever received counseling or psychotherapy from a psychiatrist, psychologist, social worker, or counselor and whether they had ever been an overnight patient in a hospital for any emotional or mental problem. Moreover, participants reported whether they had ever taken prescribed medications for personal, mental or emotional problems, such as depression, anxiety or nerves.

Analysis

Frequencies, percentages, and measures of central tendency were used to describe the sample characteristics. CFA was used to test the hypothesized five-factor measurement structure of the modified IPQR used in our study. CFA is considered the gold-standard method for evaluating construct validity because it enables researchers to specify an a priori measurement model that includes measurement error and empirically tests the model fitness to the data (Hu & Bentler, 1999). Using M-plus 4.0 (Muthén & Muthén, 2006), Maximum Likelihood Estimates (MLS) were used to derive model estimates. A single factor loading was arbitrarily set at unity to define the scale for that factor. The error term associated with each factor loading and the variance of the latent factor were free parameters in the model. Since previous studies (e.g., Brown et al., 2007; Hagger & Orbell, 2005; Moss-Morris et al., 2002) report that the IPQR dimensions are significantly related with each other, the latent variables representing each of the IPQR dimensions tested were specified to covary in the model. In other words, factors were intercorrelated as covariance between each pair of latent variables was constructed. Model fitness was evaluated using the goodness-of-fit chi-square and its degrees of freedom. The Comparative Fit Index (CFI) and the Non-Normed Fit Index (NNFI) were also used to evaluate model fitness since both are less influenced by sample size than the chi-square estimate (Kline, 2005). For an acceptable fit, the CFI and NNFI indices should exceed .90 and values approaching .95 are preferable (Hu & Bentler, 1999). The Root Mean Square Error of Approximation (RMSEA) score was also used to test model fitness. RMSEA values close or below .05 are considered acceptable (Kline, 2005).

In case of model misspecifications, several areas were examined to guide model modifications. Standardized factor loadings and residuals were evaluated. Items with factor loadings below .40 and large standardized residuals were deemed unreliable and removed from the model (Brown, 2006; Gorsuch, 1974). Hagger and Orbell (2005) used similar criteria to test the factor structure of a modified version of the IPQR with women undergoing cervical cancer screening in the United Kingdom. Items face validity, including their redundancy and relevance, was also considered in decisions to remove items. Modification indexes were examined to determine whether correlation of error terms of items within factors needed to be added to the model. Lastly, the chi-square difference test was used to evaluate statistical differences between hierarchical models (Kline, 2005). Along with the other fit indices (e.g., CFI, NNFI), the chi-square difference test enabled us to empirically compare models and identify the best model fit. Cronbach's coefficient alpha (α) was used to evaluate the internal consistency of the five IPQR subscales. Discriminant

validity of the IPQR constructs was evaluated by examining correlations between latent factors.

Results

Sample characteristics are presented in Table 1. Participants were mostly middle-aged, married, females who had less than a high school education. The majority of participants were of Mexican descent, foreign-born, and preferred to speak Spanish (81%). As expected from a sample of low-income primary care patients with depression or dysthymia, most participants reported a number of probable comorbid mental health problems (e.g., generalized anxiety disorder, PTSD), and self-reported poor health and a number of chronic health conditions (e.g., high blood pressure, asthma, diabetes). Few had ever received mental health treatments in their lifetime.

Of the 341 Latino participants included in the present study, two reported missing values in all IPQR items and were eliminated from CFA analyses. Three hierarchical models composed of a five-factor structure were run with our final sample of 339 participants to obtain the best model fit. Goodness of fit indices for each model and chi-square differences are presented in Table 2. The initial model included the original 27-items and the hypothesized five-factor structure. This model resulted in poor fit indices (RMSEA = 0.069; CFI = 0.793; NNFI = 0.768). Evaluation of factor loadings identified three items with factors loadings below the .40 criteria. Two of the items corresponded to the personal control factor (“Nothing you do will affect your depression” and “Your actions will have no effect on the outcomes of your depression”). The other was from the treatment control factor (“There is very little that can be done to improve your depression”).

A second model with these three items removed resulted in a significantly better model ($\Delta\chi^2 = 181.54$, $\Delta df = 72$, $p < .001$) compared to the initial model. However, the fitness indices for this second model were still at unacceptable levels (RMSEA = 0.069; CFI = 0.827; NNFI = 0.802). Evaluation of modification indices suggested seven error covariances between items 2 and 3, 6 and 3, 6 and 5, 10 and 9, 13 and 12, 26 and 24, and 27 and 25.

The final model was composed of 24-items and seven error covariances and resulted in a statistically superior model ($\Delta\chi^2 = 191.09$, $\Delta df = 7$, $p < .001$) compared to the second model. The final model yielded adequate goodness-of-fit indices (RMSEA = 0.051; CFI = 0.908; NNFI = 0.900) and factor loadings. The factor loadings and error variances for each item in the final model are presented in Table 3.

Internal Consistency

Coefficient alphas for each of five IPQR subscales are presented in Table 3. Alphas ranged from .66 for the personal control subscale to .81 for the timeline-acute/chronic subscale. Four of the five subscales had alphas greater than .70, suggesting adequate internal consistency.

Discriminant Validity

Intercorrelations between the five IPQR latent factors from the final model are presented in Table 4. The timeline factors (acute/chronic and cyclical) exhibited significant and positive relationships with the consequence factor. These relationships suggest that viewing depression as a chronic or cyclical condition is related to perceiving depression as a serious, debilitating illness. The timeline-acute/chronic had significant and negative associations with both control factors (personal and treatment). That is viewing depression as a chronic long lasting condition negatively impacts ones views that depression can be controlled through treatment or personal effort. The personal control and consequence factors had a

significant and negative correlation suggesting that viewing depression as a serious and debilitating condition negatively impacts persons' perceptions that they can control their depression through personal efficacy. The personal and treatment control factors were positively related to each other indicating these two control dimensions positively impact one another. Each of these intercorrelations corroborates patterns reported in previous studies (Fortune et al., 2004;Hagger & Orbell, 2003;Hagger & Orbell, 2005;Moss-Morris et al., 2002). The timeline-cyclical factor showed unique relationships with the other IPQR factors that have not been observed in prior studies. It was negatively associated with the timeline-acute/chronic and positively associated with each of the control factors.

Discussion

Since the development of the IPQR, few studies have evaluated the factor structure of this instrument (e.g., Hagger & Orbell, 2005; Vázquez, Alegría, & Ayala, 2005). The present study contributes to this emerging literature by: (a) adapting the IPQR for depression and developing English and Spanish versions of the instrument; and (b) conducting a rigorous CFA to test the construct and discriminant validity of this modified version of the IPQR on a clinical sample of low-income Latinos with depression.

After the elimination of three items because of low factor loadings and the specification of seven error covariances, a revised CFA model (composed of 24-items) exhibited a good fit with the IPQR data, supporting the construct validity of this measure for our sample. Each of the subscales yielded satisfactory internal consistency with coefficient alphas ranging from . 66 to .81. Relationships between the latent factors provide initial support for the discriminant validity of these five dimensions and most replicated the theoretically derived patterns stipulated by Leventhal and colleagues (1992) model (e.g., Fortune et al., 2004; Hagger & Orbell, 2005; Moss-Morris et al., 2002).

Only three items, two from the personal control and one from the treatment control subscales, were dropped from the analysis. These items were all negatively worded (e.g., "There is very little that can be done to improve your depression") and may have confused respondents given that the majority of items in these subscales had a positive connotation. The sequential presentation of items from each subscale may have also heightened respondents' awareness about the uniqueness of these three items in comparison to the other items in these subscales, thus contributing to respondents' confusion and low factor loadings. A possible solution to this issue used in a recent study (Hagger & Orbell, 2005) is to present items in a random order.

Moreover, the personal control scale reported the lowest reliability ($\alpha = .66$) suggesting this scale performed marginally in our sample. Item by item analyses of this scale indicated that over 70% of participants agreed or strongly agreed that they could personally control their depression. The difficulty with this scale does not seem to be a bias toward resisting the concept of personal control but instead may be an issue of comprehending these items. Anecdotally, study interviewers reported that they had to repeat the presentation of these items because participants had difficulty comprehending these three questions compared to other items. To better evaluate the performance of these items, future studies may use cognitive interviewing techniques (e.g., thinking out loud) to directly assess whether participants had any difficulties understanding and responding to these items (Willis, 2005). Cognitive interviewing is a reliable methodology used to obtain information about how individuals understand and answer survey questions and helps identify potential problems that might lead to measurement error (Miller, 2003).

The seven error covariances included in our final model suggest that these items shared measurement error, but the sources of these errors are unknown. We can only speculate as to why these errors are present in our model. Issues, such as similarities in item wording and intent (e.g., “Treatment will be effective in curing your depression;” “Treatment can control your depression”), item placement, interviewers’ bias in reading and presenting items, respondents’ bias in understanding and responding to items, and respondents’ fatigue, could have contributed to these correlated errors. Future studies using this adapted version of the IPQR should evaluate these error covariances and try to minimize sources of measurement error.

The intercorrelations found between the five factors provide initial support for the discriminant validity of these dimensions in the context of depression. Aside from the nonsignificant relationship between the consequence and treatment control constructs, the rest of the relationships were significant and ranged from low to moderate. These findings provide further corroboration for the theoretical assumption that illness perceptions are composed of empirically distinct and interrelated constructs. The majority of the intercorrelations reported in this study are consistent with those found in previous studies for different health conditions (e.g., asthma, diabetes, chronic pain; Hagger & Orbell, 2005; Moss-Morris et al., 2002). For example, similar to Moss-Morris and colleagues we found that an inverse relationship between the timeline-acute/chronic and both control dimensions. Endorsing the belief that depression is a chronic condition was negatively associated with individuals’ sense of treatment and personal control over their illness. Each of these intercorrelations corroborates patterns reported in previous studies (Fortune et al., 2004; Hagger & Orbell, 2003; Hagger & Orbell, 2005; Moss-Morris et al., 2002). These patterns suggest that the majority of associations between the illness perceptions dimensions seem to be consistent across general health and mental health conditions. Future studies are needed to replicate these relationships with other samples of individuals suffering from depression or other mental illnesses.

The findings of the interrelationships that the timeline-cyclical dimension had with the timeline-acute/chronic and the two control dimensions are different from those reported by Moss-Morris et al. (2002). Instead of a positive relationship between the two timeline dimensions, we found an inverse relationship. This association may be unique to our sample of predominantly low-income Spanish speaking Latinos. More studies are needed to empirically test whether this interrelationship is found in other racial and ethnic groups. This negative relationship may also reflect how depression severity may interact with individuals’ perceptions about the course of their illness. For instance, the hopelessness and helplessness characteristic of depressive episodes may overshadow a person’s view that depression is a cyclical condition and strengthen the perception that it is a chronic illness. That is, symptom severity may be positively associated with the timeline-acute/chronic dimension and negatively related to the timeline-cyclical dimension. In an exploratory analysis conducted to test this hypothesis, we found that symptom severity, measured with the PHQ-9, was positively and significantly correlated ($r = .12$, $p = .03$) to the timeline-acute/chronic and negatively correlated yet not significantly ($r = -.04$, $p = .44$) to the timeline-cyclical. Based on the Leventhal’s et al. (1992) model, individuals form parallel emotional and cognitive representations of their illnesses, and emotional representations can influence illness perceptions and coping behaviors. More studies examining the interaction between emotional and cognitive representations are needed, particularly in the area of mental disorders where both emotions and cognition are affected.

In contrast with previous studies (Moss-Morris et al., 2002; Vázquez et al., 2005), we found positive relationships between the timeline-cyclical and the two control dimensions. These findings suggest that for individuals who are depressed, a cyclical perception of their

depression is linked to an optimistic outlook that their condition is amenable to personal or treatment control. In all, the associations with the timeline-cyclical dimension observed in the present study may be unique to depression given the recurrent, episodic nature of this disorder compared to other chronic health conditions. We await future studies to replicate these findings.

Limitations

Several limitations need to be considered when evaluating our results. The generalizability of our findings is limited because our clinical sample was constrained to three urban public health clinics serving mostly foreign-born, Spanish-speaking Latinos. Future studies using the IPQR should aim to recruit a more representative sample of Latinos from different regions of the U. S. (e.g., rural) and include a larger sample of U. S. born Latinos. The exclusion of the identity and cause dimension prevented us from evaluating the psychometric properties of these two illness perception dimensions. By the time our study was in the field (November 2005), we were unable to locate, obtain, back translate and pilot test a published version of the identity and cause dimensions adapted for depression. We recently learned that Brown and colleagues (2007) have created and adapted a version of the identity and cause dimensions for depression and evaluated the psychometric properties in a clinical sample of adult depressed patients, predominantly White females. Future studies are needed to adapt, back translate, and test these two dimensions in the Latino population. Because of the low proportion of English-speaking Latinos (13.27%) in our sample, we were unable to compare the factor structure of the English and Spanish versions of our instrument. We did, however, compare the factor structure, internal consistency, and discriminant validity between the whole sample (N = 339) and a subsample of those participants who completed the IPQR in Spanish (N = 294; analysis available upon request). The replication of the final model (i.e., 24-items and 7 error covariance) with the Spanish subsample yielded adequate goodness-of-fit indices (RMSEA = 0.050; CFI = 0.913; NNFI = 0.897) and factor loadings, and similar Cronbach's coefficient alphas and intercorrelation coefficients between the five IPQR latent factors. These results provide initial evidence confirming the validity of the same factor structure and psychometrics in the Spanish sub-sample. To strengthen the cross-cultural validity and reliability of the IPQR, more studies are needed to test the psychometric properties of this measure across cultural and language groups.

Conclusion

The present study establishes that the IPQR can be applied to depression and that this adapted version of the IPQR had adequate internal consistency and good construct and discriminant validity in a clinical sample of depressed, low-income Latinos. This instrument appears promising for measuring perceptions of depression among Latino populations but these findings need to be replicated with other samples. The establishment of the psychometric properties of the IPQR for depression paves the way for future studies examining role that illness perceptions play in the help seeking and management of depression among Latinos and other individuals suffering from this disabling condition.

Acknowledgments

This study was supported in part by the Larson Endowment for Innovative Research and Teaching grant (PI: Cabassa) from the School of Social Work at the University Southern California and an NIMH grant 5R01MH067949-04 (PI: Lagomasino).

References

American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4. Washington, DC, US: American Psychiatric Association; 1994.

Blanchard EB, Jones-Alexander J, Buckley TC, Fomeris CA. Psychometric properties of the PTSD Checklist (PCL). Behavioral Research and Therapy 1996;34:669–673.

Bravo M, Woodbury-Farina M, Canino GJ, Rubio-Stipec M. The Spanish translation and cultural adaptation of the diagnostic interview schedule for children (DISC) in Puerto Rico. Culture, Medicine and Psychiatry 1993;17:329–344.

Brislin, RW. Field methods in cross-cultural research. Beverly Hills: SAGE; 1986.

Brown C, Battista DR, Bruehlman R, Sereika SS, Thase ME, Dunbar-Jacob J. Beliefs about antidepressant medications in primary care patients: Relationship to self-reported adherence. Medical Care 2005;43:1203–1207. [PubMed: 16299431]

Brown C, Battista DR, Sereika SM, Bruehlman RD, Dunbar-Jacob J, Thase ME. Primary care patients' personal illness models for depression: Relationship to coping behavior and functional disability. General Hospital Psychiatry 2007;29:492–500. [PubMed: 18022042]

Brown, T. Confirmatory factor analysis for applied research. New York: Guilford Press; 2006.

Cabassa LJ, Lester R, Zayas LH. "It's like being in a labyrinth:" Hispanic immigrants' perceptions of depression and attitudes toward treatments. Journal of Immigrant and Minority Health 2007;9:1–16. [PubMed: 17001516]

Cabassa LJ, Zayas LH. Latino immigrants' intentions to seek depression care. American Journal of Orthopsychiatry 2007;77:231–242. [PubMed: 17535121]

Cameron, LD.; Leventhal, H., editors. The self-regulation of health and illness behaviour. London: Routledge; 2003.

Cooper LA, Gonzales JJ, Gallo JJ, Rost KM, Meredith LS, Rubenstein LV, et al. The acceptability of treatment for depression among African-American, Hispanic and White primary care patients. Medical Care 2003;41:479–489. [PubMed: 12665712]

Deifenbach MA, Leventhal A. The common-sense model of illness representation: Theoretical and practical considerations. Journal of Social Distress and Homeless 1996;5:11–38.

Ell K, Vourlekis B, Nissly J, Padgett D, Pineda D, Walther V. Integrating mental health screening and abnormal cancer screening follow-up: An intervention to reach low-income women. Community Mental Health Journal 2002;38:311–325. [PubMed: 12166918]

Fayers PM, Sprangers MA. Understanding self-rated health. Lancet 2002;359:187–188. [PubMed: 11812551]

Fortune G, Barrowclough C, Lobban F. Illness representations in depression. British Journal of Clinical Psychology 2004;43:347–364. [PubMed: 15530206]

Givens JL, Houston TK, Van Voorhees BW, Ford DE, Cooper LA. Ethnicity and preferences for depression treatment. General Hospital Psychiatry 2007;29:182–191. [PubMed: 17484934]

Gorsuch, RL. Factor analysis. Philadelphia: W. B. Saunders; 1974.

Hagger MS, Orbell S. A meta-analytic review of the common-sense model of illness representation. Psychology and Health 2003;18:141–184.

Hagger MS, Orbell S. A confirmatory factor analysis of the revised illness perception questionnaire (IPQ-R) in a cervical screening context. Psychology and Health 2005;20:161–173.

Hu L, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation Modeling 1999;21:485–503.

Karasz A, Watkins L. Conceptual models of treatment in depressed Hispanic patients. Annals of Family Medicine 2006;4:527–533. [PubMed: 17148631]

Kline, RB. Principles and practice of structural equation modeling. 2. New York: Guilford Press; 2005.

Kroenke K, Spitzer RL. The PHQ-9: A new depression diagnostic and severity measure. Psychiatric Annals 2002;32:509–515.

Kroenke K, Spitzer RL, Williams JB. The PHQ-9: Validity of a brief depression severity measure. Journal of General Internal Medicine 2001;16:606–613. [PubMed: 11556941]

Leventhal A, Deifenbach M, Leventhal EA. Illness cognition: Using common sense to understand adherence and affect cognition interactions. Cognitive Therapy and Research 1992;16:143–163.

Lewis-Fernández R, Das AK, Alfonso C, Weissman MM, Olfson M. Depression in US Hispanics: Diagnostic and management considerations in family practice. Journal of the American Board of Family Practice 2005;18:282–296. [PubMed: 15994474]

Lobban F, Barrowclough C, Jones S. A review of the role of illness models in severe mental illness. Clinical Psychology Review 2002;23:171–196. [PubMed: 12573669]

Miller K. Conducting cognitive interviews to understand question-response limitations. American Journal of Health Behaviors 2003;27(Suppl 3):S264–S272.

Miranda J, Azocar F, Komaromy M, Golding JM. Unmet mental health needs of women in public-sector gynecologic clinics. American Journal of Obstetric & Gynecology 1998;178:212–217.

Moss-Morris R, Weinman J, Petrie KJ, Horne R, Cameron LD, Buick D. The revised illness perception questionnaire (IPQ-R). Psychology and Health 2002;17:1–16.

Muthén, L.; Muthén, BO. Mplus user's guide. 4. Los Angeles: Muthén & Muthén; 2006.

Petrie, KJ.; Broadbent, E.; Meechan, G. Self-regulatory interventions for improving the management of chronic illness. In: Cameron, L.; Leventhal, H., editors. The self-regulation of health and illness behaviour. London: Routledge; 2003. p. 257-277.

Petrie KJ, Jago LA, Devich DA. The role of illness perceptions in patients with medical illness. Current Opinion in Psychiatry 2007;20:163–167. [PubMed: 17278916]

Spitzer RL, Kroenke K, Linzer M, Hahn SR, Williams JB, deGruy FV, et al. Health-related quality of life in primary care patients with mental disorders. Results from the PRIME-MD 1000 Study. Journal of the American Medical Association 1995;274:1511–1517. [PubMed: 7474219]

Spitzer RL, Kroenke K, Williams JBW. Validation and utility of a self-report version of PRIME-MD: The PHQ primary care study. Journal of the American Medical Association 1999;282:1737–1744. [PubMed: 10568646]

Spitzer RL, Williams JBW, Kroenke K, Linzer M, deGruy FV, Hahn SR, Brody D, Johnson JG. Utility of a new procedure for diagnosing mental disorders in primary care: The PRIME-MD 1000 study. Journal of the American Medical Association 1994;272:1749–1756. [PubMed: 7966923]

United States Department of Health and Human Services. 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; 2001.

Vázquez MB, Alegría B, Ayala MDG. Estructura factorial de la versión española del Revised Illness Perception Questionnaire en una muestra de hipertensos [Factor structure of the Spanish version of the Revised Illness Perception Questionnaire in sample of subjects with hypertension]. Psicothema 2005;17:318–324.

Weinmen J, Petries KJ, Moss-Morris R, Horne R. The illness perception questionnaire: A new method for assessing the cognitive representation of illness. Psychology and Health 1996;11:431–445.

Wells KB. The design of Partners in Care: Evaluating the cost-effectiveness of improving care for depression in primary care. Social Psychiatry & Psychiatric Epidemiology 1999;34:20–29. [PubMed: 10073117]

Wells KB. The cost-effectiveness of practice-initiated quality improvement for depression: Results of a randomized, controlled trial. Journal of the American Medical Association 2001;286:1325–1330. [PubMed: 11560537]

Willis, GB. Cognitive interviewing: A tool for improving questionnaire design. Thousand Oaks, CA: Sage; 2005.

World Health Organization (WHO). Composite International Diagnostic Interview (CIDI) Core Version 2.1. Interviewer's manual. Geneva: World Health Organization; 1997.

Table 1

Sample Characteristics

	N	Mean (*SD*)	Percent
Demographics			
Age (years)	339	49.73 (12.53)	
Gender (female)	339		83.78
Years of education	339		
6 and below			56.05
7 to 11			20.94
12 and beyond			23.01
Married (yes)	338		47.34
Employed full-time (yes)	339		13.86
Household gross annual income	297		
$15,000 or below			77.44
$15,001 to $25,000			12.79
Greater than $25,000			9.76
Hispanic Group [a]	339		
Mexican			51.33
Central American			37.46
Other			11.21
Foreign born (yes)	339		90.27
Years living in the U. S. [b]	306	22.15 (10.84)	
Language preference	334		
Spanish			81.84
Bilingual			5.09
English			14.07
Interview language	339		
Spanish			86.73
English			13.27
Clinical Characteristics			
PHQ9 Score	339	17.26 (3.91)	
Probable comorbid disorders			
Generalized anxiety disorder	339		61.65
PTSD	339		36.87
Panic disorder	339		17.70
Alcohol abuse	339		6.78
Substance abuse	339		9.14
General health status (poor/fair)	339		79.35
Number chronic health conditions	339	3.46 (2.13)	
Past mental health treatment			
Lifetime mental health treatments			
Counseling (yes)	339		26.55

	N	Mean (*SD*)	Percent
Medication for a mental health problem (yes)	339		39.53
Psychiatric hospitalization (yes)	339		7

Note.

[a] Hispanic Groups included Central Americans (Guatemalan, Salvadoran) and Other (Puerto Rican, Cuban);

[b] Only asked to respondents who reported being foreign born; PTSD = Post Traumatic Stress Disorder.

Table 2

Goodness of Fit Indices and Chi-square Differences

Model	Number of items	χ^2	df	$\chi^2_{difference}$	$df_{difference}$	RMSEA (90% C1)	CFI	NNFI
M_1: Initial Model	27	815.65	314	—	—	0.069 (0.063 – 0.074)	0.793	0.768
M_2: Second Model	24	634.11	242	$M_1 - M_2$: 181.54***	72	0.069 (0.063 – 0.076)	0.827	0.802
M_3: Final Model	24	443.02	235	$M_2 - M_3$: 191.09***	7	0.051 (0.044 – 0.058)	0.908	0.900

Note. N = 339; All models (M_1, M_2 and M_3) tested a five factor structure; M_1= Baseline model includes all 27-items; M_2 = three items were removed including, IP20, IP22, IP23; M_3 = Final model five factor structure with 24-items and 7 error covariances.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 3

Standardized Factor Loadings, Standard Errors and Cronbach's Coefficient Alphas of IPQR Factors

Factor and items	α	λ	*SE*
Timeline: Acute/Chronic	.81		
IP1 … will last a short time.		0.570	0.000
IP2 … likely to be permanent rather than temporary.		0.695	0.148
IP3 … will last for a long time.		0.812	0.155
IP4 … will pass quickly.		0.670	0.136
IP5 … . expect to have depression for the rest of your life.		0.555	0.115
IP6 … . will improve with time.		0.417	0.078
Timeline: Cyclical	.72		
IP7 … change a great deal from day to day.		0.617	0.000
IP8 … symptoms come and go in cycles.		0.681	0.146
IP9 … is very unpredictable.		0.561	0.152
IP10 … go through cycles in which it gets better and worse.		0.538	0.138
Consequence	.76		
IP11 … is a serious condition.		0.691	0.000
IP12 … has a major consequence in your life.		0.624	0.090
IP13 … does not have much effect on your life.		0.402	0.083
IP14 … strongly affects the way others see you.		0.611	0.110
IP15 … has serious financial consequences.		0.539	0.104
IP16 … causes difficulties for those close to you.		0.567	0.117
Personal Control [a]	.66		
IP17 There is a lot you can do to control … .		0.565	0.000
IP18 What you do can determine whether … gets better or worse.		0.584	0.143
IP19 The course of … depends on you.		0.645	0.154
IP21 You have the power to influence …		0.527	0.164
Treatment Control [b]	.76		
IP24 Treatment will be effective in curing (controlling) … .		0.722	0.000
IP25 The negative effects of … . can be prevented (avoided) by treatment.		0.624	0.151
IP26 Treatment can control … .		0.838	0.104
IP27 There is nothing which can help… .		0.623	0.132

Note. N = 339; Items adapted from Moss-Morris et al., 2002; α = Cronbach's coefficient alphas; λ = Standardized factor loading; *SE* = Standard error of factor loading;

[a] Two items deleted from this factor: IP 20: "Nothing you do will affect your depression" and IP 22: "Your actions will have no effect on the outcomes of your depression";

[b] One item deleted from this factor: IP 23: "There is very little that can be done to improve your depression".

Table 4

Inter-Correlations Between Five IPQR Latent Factors

Factors	1	2	3	4	5
1. Timeline: Acute/Chronic	—				
2. Timeline: Cyclical	−0.117*	—			
3. Consequence	0.277***	0.243***	—		
4. Personal Control	−0.309***	0.148**	−0.181**	—	
5. Treatment Control	−0.328***	0.177***	0.001	0.280***	—

Note. N = 339.

* $p < .05$.

** $p < .01$.

*** $p < .001$