Latinos' Conceptualization of Depression, Diabetes, and Mental Health–Related Stigma

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Abstract

Depression and diabetes are two of the most common health conditions experienced by those from Latino backgrounds. However, community-based stigma toward these health conditions may discourage those experiencing symptoms of depression or diabetes from seeking professional assistance. To assess stigma in the Latino community toward these common health conditions, a community-based sample of 469 Latino participants in a major urban area in the [Southwestern United States — Houston, TX] completed a face-to-face survey using an experimental vignette methodology. Participants were asked to name the problem that the subject of the vignette was experiencing based on the symptoms described in the vignette. This survey also inquired about public stigma toward individuals experiencing symptoms of depression and/or diabetes. Results indicate that although the majority (60%) of the sample were able to correctly identify symptoms of depression, it was more difficult for them to identify symptoms of depression with co-occurring diabetes. Overall levels of public stigma toward those experiencing depression were moderate, and co-occurring symptoms of diabetes did not moderate stigma toward those experiencing depression. These findings indicate a need for intervention approaches within the Latino community to increase health literacy related to depression and type 2 diabetes, as well as an ongoing need to reduce stigma toward those experiencing symptoms of depression. Implications for future research, practice, and health promotion are discussed.

Keywords Depression · Diabetes · Treatment · Stigma · Latino/Hispanic

Depression is one of the most common mental health conditions impacting the Latino community.[1] As the Latino community continues to grow and become increasingly more diverse due to the ongoing influx of immigrants from Central and South America seeking to escape violence and political unrest, more and more Latinos in the United States (U.S.) are experiencing symptoms of mental health conditions, such as depression [1]. While rates of depression for Latinos overall tend to be consistently lower than those for non-Hispanic Whites, native-born Latinos, particularly those born in Puerto Rico, report higher rates of depression than both non-Hispanic Whites and their peers born outside of the U.S. [1]. Based on 2019 data from the National Survey on Drug Use and Health, an estimated 6.8% of the sample of Latinos reported experiencing a major depressive episode with severe impairment during the last year [2], which puts estimated prevalence rates at approximately 4.1 million Latinos experiencing a major depressive episode annually. However, only 66.9% of those experiencing a severe major depressive episode reported receiving any treatment [2], indicating that even for those reporting severe symptoms, barriers to treatment still remain.

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1 The authors recognize that the term "Latino community" actually encompasses a number of distinct communities, and the term "Latino" may not be used or embraced by all individuals originating from North, South, and Central America who have indigenous and/or mixed indigenous/European ancestry. However, for the purposes of this work, the authors use this term to refer to any individual from this geographic region or identifying with this cultural heritage who may also self-identify as "Latinx," "Chicana/o," "Tejana/o," or "Hispanic.".

Type 2 diabetes is another of the most widespread chronic health conditions impacting Latino communities in the U.S., impairing the way the body regulates and metabolizes glucose [3]. It is estimated that approximately 2.5 million Latinos in the United States are diagnosed with type 2 diabetes [3, 4]. Type 2 diabetes may result in elevated risk of kidney failure, cardiovascular disease, diabetes-related vision loss, impaired glucose tolerance, and increased mortality [2–4]. Latinos from any background (immigrants and native born) are twice as likely as non-Hispanic Whites to develop type 2 diabetes, having over a 50% chance of developing type 2 diabetes at some point during their lives. Latinos are also at elevated risk of developing this diabetes at an earlier age than non-Hispanic Whites [4]. Medical management of diabetes via medication can be costly, particularly for those who are uninsured or underinsured. Moreover, attending regularly schedule medical appointments is essential for diabetes management, often resulting in lost wages due to time away from work for metabolic testing and ongoing medication checks. Diabetes management can also be psychologically demanding due to the long-term lifestyle modifications required to successfully manage the disease such as adjustments to meal plans that avoid culturally accepted foods and beverages [5].

A number of meta-analyses suggest that co-occurring diabetes and depression can have a significant and ongoing negative impact on one's health [6–9]. Nouwen and colleagues [6] indicate that there is a bidirectional relationship between diabetes and depression. However, prior work by Van Dooren and colleagues [7] indicates that those with co-occurring depression and diabetes have 1.5 times increased risk of mortality than those with diabetes alone. Nouwen and colleagues [5] also found that those with type 2 diabetes have a 24% increased risk of developing depression, while Elamoshy et al. [8] found that those with diabetes have between 1.49 (cohort studies) and 2.04 times the odds (cross-sectional studies) of developing depression, as well as 1.89 times the odds of suicidal ideation and 1.45 times the odds of attempted suicide, making diabetes a significant risk factor for negative mental health outcomes.

Despite the negative health impacts, many Latinos who experience depression or depression and diabetes and are in need of treatment do not actively seek professional help. Stigma toward mental illness is one of the most well-documented barriers to depression treatment among Latinos [9–14]. For many, the intersection of multiple marginalized identities (for example, being Latino, immigration status, and experiencing depression) may exacerbate the impact of mental health–related stigma [9]. Moreover, gender-based differences in expectations related to help seeking rooted in cultural values such as *machismo* (men being able to handle their own problems without external help), *marianismo* (self-sacrifice for those one cares about even to the detriment of oneself), as well as *familismo* (successfully fulfilling family obligations before all else) and *fatalismo* (accepting God's will or fate) may further impact Latinos' perceptions of people with depression [10, 11] and also their willingness to seek professional help [12–14].

In addition to stigma related to mental health conditions such as depression, certain health conditions, such as obesity and type 2 diabetes, may also result in public stigma, due in part to perceptions that individuals living with these conditions "brought it on themselves" as a result of unhealthy lifestyle choices like poor diet and limited exercise [15–20]. Stigma is often associated with psychological distress, thus exacerbating symptoms of pre-existing depression, and putting those without pre-existing depression at increased risk of developing it during the course of their diabetes management [17, 19, 20]. Accordingly, it is imperative for mental health providers to better understand public stigma related to depression and depression with co-occurring diabetes within Latino communities. There also remains a need to assess Latino's ability to correctly identify symptoms associated with depression and/or diabetes and if stigma is related to one's ability to correctly identify a physical or mental health condition. Finally, a deeper understanding if certain sociodemographic characteristics of community members are predictive of their stigma toward these with depression and/or diabetes is needed in relation to stigma which may impact help seeking and long-term health outcomes for Latinos.

Study Aims

The primary aim of this study was to examine Latinos' knowledge, attitudes, and stigma-related beliefs concerning depression and diabetes. More specifically, the research team investigated the following questions:

1. Are respondent sociodemographic characteristics predictive of if they can correctly identify the mental (depression) and/or physical (diabetes) health concern of the vignette subject?
2. Are respondent sociodemographic characteristics predictive of the various domains of public stigma in relation to depressive symptomology?
3. Does the co-occurrence of symptoms of diabetes differentially impact levels of stigma toward those experiencing depression?

Methods

Participants and Procedures

A convenience sample of 469 self-identified Latino participants from [Southwestern United States — Houston, TX]

were recruited to take part in a study using an experimental vignette methodology investigating perceptions of people experiencing symptoms of mental illness. Participants were recruited from various organizations serving the Latino community, including non-profit organizations, churches, social service agencies, and English as a second language (ESL) classes by members of the bilingual English/Spanish research team. Those indicating an interest in participation were given information as a group on eligibility criteria, time of participation, measures, and potential risks and benefits. Potential participants met the eligibility criteria if they self-identified as Hispanic/Latino(a), Chicano/a, Tejano/a, or Latinx, were over the age of 18 years, and resided full time in the U.S. (were not a visitor or migrant worker residing in another country). Immigration status was not a determining factor for eligibility to participate in the study. A waiver of documented written consent from the [third author's institutional review board — Houston, TX] (IRB) had been obtained prior to the initiation of study recruitment to ensure the privacy and anonymity of potentially undocumented participants. Those meeting all eligibility criteria then provided verbal consent to participate. Upon completion of verbal consent, each participant was given a paper and pencil survey instrument to complete in their preferred language (English or Spanish). Participants with vision impairment or the inability to read or write in English or Spanish were given the option of having a research assistant read the survey questions in his/her preferred language and then the research assistant would record his/her responses. Each participant received a $15 Walmart gift card to compensate them for completion of the 45-min survey instrument.
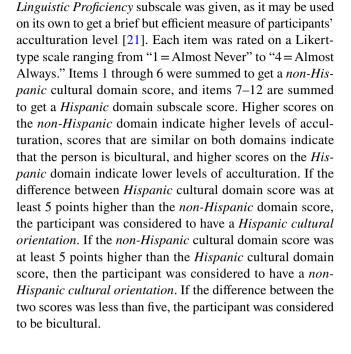
Measures

Demographic Characteristics

Participants were asked a number of demographic questions, including age; gender marital status; level of education; employment status; number of children; subjective financial circumstances; whether they lived in an urban, rural, or suburban area; generation of immigration (for those not native born); and region of origin (U.S. born, Central America, South America, or the Caribbean). Participants were asked additional questions concerning whether or not they knew anyone with a mental health problem, whether a family member or close friend had experienced a mental health problem, or if they themselves had ever experienced a mental health problem.

Acculturation

Acculturation was assessed using the Bidimensional Acculturation Scale for Hispanics (BAS) [21]. The 12-item

Linguistic Proficiency subscale was given, as it may be used on its own to get a brief but efficient measure of participants' acculturation level [21]. Each item was rated on a Likert-type scale ranging from "1 = Almost Never" to "4 = Almost Always." Items 1 through 6 were summed to get a *non-Hispanic* cultural domain score, and items 7–12 are summed to get a *Hispanic* domain subscale score. Higher scores on the *non-Hispanic* domain indicate higher levels of acculturation, scores that are similar on both domains indicate that the person is bicultural, and higher scores on the *Hispanic* domain indicate lower levels of acculturation. If the difference between *Hispanic* cultural domain score was at least 5 points higher than the *non-Hispanic* domain score, the participant was considered to have a *Hispanic cultural orientation*. If the *non-Hispanic* cultural domain score was at least 5 points higher than the *Hispanic* cultural domain score, then the participant was considered to have a *non-Hispanic cultural orientation*. If the difference between the two scores was less than five, the participant was considered to be bicultural.

Religiosity

Religiosity was measured through six items taken from the Daily Spiritual Experiences Scale [22]. Items were rated on a 6-point Likert-type scale ranging from "1 = Never or almost never" to "6 = Many times a day." Scores on each of the six items were then summed to represent a total religiosity score. Higher scores are indicative of higher levels of religiosity.

Experimental Vignette Conditions

Each of the participants was randomly assigned two different clinical vignettes featuring mental health symptomology which included depression, psychosis, suicidal ideation, or alcohol misuse. A total of 169 participants received one of the experimental vignettes focused on depressive symptomology. This vignette was varied to produce four versions based on the gender of the subject (male, female) and the presence of co-occurring symptoms of diabetes (diabetes, without diabetes).

Vignette Stem Example The following is a version of the vignette for depression without diabetes.

> Juana is a Hispanic woman. During the last two months Juana has felt really weak. She wakes up in the morning with a sensation of flat heaviness that lasts with her all day. She is not enjoying the things he/she normally would. In fact, nothing gives her pleasure. Although when good things happen, they do not appear to make

Table 1 Public stigma instrument questions and domains

Domain	Items
Personal level	How likely it is that you would accept [vignette subject] going to the same school as your child?
	How likely it is that you would allow [vignette subject] to be your friend?
	How likely it is that you would hire [vignette subject] to work with you?
	How likely it is that you would allow [vignette subject] to marry your child?
Community level	How likely it is that [vignette subject] will have difficulty making friends?
	How likely it is that [vignette subject] will have difficulty finding a job?
	How likely it is that [vignette subject] will have difficulty finding a spouse?
Engagement with law enforcement	How likely it is that [vignette subject] will end up in trouble with the law?
	How likely it is that [vignette subject] will do something violent toward other people?
Future possibility	How likely it is that [vignette subject] will become a successful person?
	How likely it is that [vignette subject] will be respected in the community?
	How likely it is that [vignette subject] will be happy?
Change potential	How likely it is that [vignette subject] will be able to change?
	How likely it is that [vignette subject] will be able to change with help?

Juana happy. She makes an effort every day, but it is very difficult. Even the smallest chores are difficult to accomplish. It turns out it is difficult to concentrate on anything. She feels she has no energy or steam. And even though Juana feels tired, when he/she arrives at night he/she cannot sleep. Juana feels very useless and discouraged. Juana's family has realized that she has not been the same during the last month and has distanced herself from them. Juana simply does not feel like talking.

Mental Illness Awareness and Related Stigma Following the presentation of the vignettes, participants were asked two questions concerning awareness and knowledge of the mental health problem, which included the following: (1) Do you think that Juana has a problem? (2) What would you call Juana's problem? Participants were then asked to complete a 14-item measure of mental health–related stigma [23]. The 14 items represented five distinct dimensions of perceived public stigma including the following: (1) personal-level stigma (4 items) which measured stigma the participant holds toward the vignette subject, (2) community-level stigma (3 items) which measures the level of stigma that participants think community members would express toward the vignette subject, (3) potential for future success (3 items) indicating how optimistic the participant was concerning the vignette subject's ability to be successful in his/her future live, (4) potential for engagement with law enforcement (2 items) indicating how likely the participant thinks that the vignette subject will become involved with law enforcement, and (5) change possibility (2 items) indicating the participant's level of optimism concerning the vignette subject's ability to change their behavior in the future. Each item was measured on a 7-point Likert-type scale with "1 = Very unlikely" to "7 = Very likely." Nine items were reverse coded as recommended [23], and then summed, with higher scores representing higher levels of stigma. The questions that were associated with each domain of public stigma can be found in Table 1.

Data Analysis

Analyses were conducted using *SPSS* 26 and *MPlus* 8.4. In total, 169 participants were randomly assigned one of the depression vignettes. All subsequent analyses are based on this subset of participants. Full Information Maximum Likelihood (FIML) was used to handle missing data. Univariate analyses were used to examine the distributions of each variable. Descriptive statistics were then calculated for all continuous variables, while counts and percentages were calculated for all categorical variables.

Confirmatory factor analysis (CFA) was conducted to further examine the five-factor measurement model for the stigma measure. Two factors (*change potential* and *engagement with law enforcement*) were omitted from the factor analysis due to the skewness of the items (the two indicators for change potential were more positively skewed than the rest of the items) and that each of these two factors only contained two items. A factor with only two items tends to be problematic in relation to low determinacy and Heywood cases (i.e., inadmissible solutions) [24]. Accordingly, a three-factor CFA model was fit using the ten remaining items measuring three domains of public stigma: personal-level stigma, community-level stigma, and future potential. Next, as the sample size was not sufficient for full structural equation modeling ($n = 169$), estimated latent factor subscale scores from the CFA were used as the outcome variables for each of the three subscales. This approach accounts for the

residual correlations among the three subscale factors when simultaneously estimating the three regression models using the same participants, permitting a more efficient estimation of parameters when each outcome was predicted by different predictors.
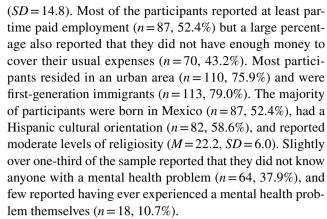
To further increase the overall statistical power to detect the experimental effect, the path model was refined to a seemingly unrelated regressions model that consists three related outcome variables: personal-level stigma, community-level stigma, and future potential. Each of the outcome variables was allowed to be predicted by different covariates via linear regression. The unique covariates for each regression were screened and selected following the guidelines offered by Tabachnick and Fidell [25]. Bivariate correlations between demographic variables and study measures of religiosity and acculturation were first estimated in relation to the three remaining domains of stigma. Variables that were significantly correlated with the outcome variables were included as covariates in the sequential analyses. If multiple covariates were identified, bivariate correlations between the covariates were estimated to ensure the two variables were not highly correlated. If so, the one with a higher correlation with the outcome variable was chosen as a covariate. It is expected that the covariates and the experimental manipulation are not correlated [26].

Finally, further bivariate analyses were conducted to determine if participant sociodemographic characteristics predicted their (1) response concerning if they saw the vignette subject as having a problem and (2) if they were able to correctly identify the problem as depression, diabetes, or depression plus diabetes. Significant bivariate predictors ($p < 0.25$) [25] were then modeled in a regression analysis to determine if when controlling for all other variables they significantly predicted participants' response concerning if the vignette subject had a problem as well as their ability to correctly identify depression, diabetes, or both.

Results

Descriptive Analysis

Table 2 provides the demographic characteristics of the participants who received a vignette depicting a person experiencing depressive symptomology ($n = 169$). The majority of the demographic variables had low levels of missingness ($< 5\%$) except the generation of immigration (15.4%), religiosity (10.1%), acculturation (17.2%), and current residential status (14.2%). The participants in this sample were mostly female ($n = 117$, 69.9%) and married ($n = 104$, 62.3%) and had on average slightly more than two children ($SD = 1.7$). The majority of participants had a high school education or less ($n = 101$, 60.9%) with a mean age of 42.1 years

($SD = 14.8$). Most of the participants reported at least part-time paid employment ($n = 87$, 52.4%) but a large percentage also reported that they did not have enough money to cover their usual expenses ($n = 70$, 43.2%). Most participants resided in an urban area ($n = 110$, 75.9%) and were first-generation immigrants ($n = 113$, 79.0%). The majority of participants were born in Mexico ($n = 87$, 52.4%), had a Hispanic cultural orientation ($n = 82$, 58.6%), and reported moderate levels of religiosity ($M = 22.2$, $SD = 6.0$). Slightly over one-third of the sample reported that they did not know anyone with a mental health problem ($n = 64$, 37.9%), and few reported having ever experienced a mental health problem themselves ($n = 18$, 10.7%).

The majority of participants ($n = 136$, 80.5%) indicated that they thought the subject of the vignette had a problem. For those receiving the depression only vignette, 60% of those who responded to this question ($n = 44$) correctly identified the subject's problem as depression. Of the participants who received the vignette indicating that the subject had symptoms of depression and co-occurring diabetes ($n = 81$), only one participant correctly identified both diagnoses, with 30.2% of respondents ($n = 29$) correctly identifying the person as experiencing depression (but not diabetes) and 15.6% ($n = 15$) indicating that subject in the vignette had symptoms of diabetes (but not of depression).

Detailed in Table 3, scores for the three domains of public stigma were all in the moderate range, with the items related to personal-level stigma exhibiting the highest level of stigma ($M = 4.42$, $SD = 1.36$) followed by community-level stigma ($M = 4.28$, $SD = 1.66$) and stigma related to future possibility ($M = 3.56$, $SD = 1.52$). All three of these subscales were significantly correlated, with the highest correlation ($r = 0.55$, $p < 0.001$) between personal-level stigma and stigma related to the vignette subject's potential for future success, indicating that those who expressed more stigma toward the vignette subject themselves also expressed more optimism about their ability to be successful in the future (Table 4). However, a negative relationship was found between community-level stigma and personal-level stigma ($r = -0.38$, $p < 0.001$) as well as with potential for future success ($r = -0.35$, $p < 0.001$), indicating that those who indicated "others" would express high levels of stigma toward the vignette subject reported lower levels of personal stigma toward the vignette subject, and less optimism about the vignette subject's ability to be successful in the future.

Regression Models

Regression Models Predicting Problem Awareness and Correct Identification of the Problem

Bivariate analyses indicated that familiarity with someone with a mental health problem ($p = 0.003$), region of origin

Table 2 Sociodemographic characteristics of participants

Categorical variables	n	%
Gender		
Female	117	69.6
Male	51	30.4
Current marital status		
Single/separated/widowed	63	37.7
Married/common law	104	62.3
Level of education		
Primary school or less	28	16.9
Secondary school	35	21.1
High school	38	22.9
Some college and higher	65	39.2
Employment		
Full-time	61	36.3
Part-time	27	16.1
Unpaid employment	54	32.1
Not employed	26	15.5
Financial circumstances		
Not enough money	70	43.2
Breaking even	57	35.2
Extra money	35	21.6
Location of residence		
Rural	12	8.3
Urban	110	75.9
Suburban	23	15.9
Generational status		
First generation	113	79.0
Second generation or future	30	21.0
Region of origin		
United States	27	16.3
Mexico	87	52.4
Central America	21	12.7
Caribbean	25	15.1
South America	6	3.6
Acculturation		
Hispanic cultural orientation	82	58.6
Non-Hispanic cultural orientation or bicultural	58	41.4
Familiarity to mental health problems		
Did not know anyone	64	37.9
Knew someone but not family or friend	19	11.2
Family or friends had mental health problems	68	40.2
Experienced mental health issues by him/herself	18	10.7
Aware that there was a problem presented in vignette (either in vignette of depression or vignette of depression + diabetes)	136	80.5
Awareness of depression (either in vignette of depression or vignette of depression + diabetes)	79	46.7
What would you call this problem (in vignette of depression)[†]		
Did not identify an problem or answered "I don't know"	13	17.8
Depression	44	60.0
Other	11	15.1
Mental health problem (but not depression)	3	4.1
Physical health issue	2	2.7

Table 2 (continued)

Categorical variables				n	%
Awareness of diabetes (in vignette of depression + diabetes)*				15	8.9
What would you call this problem (in vignette of depression + diabetes)*					
Did not identify a problem or answered "I don't know"				31	32.3
Depression				29	30.2
Diabetes				15	15.6
Other				12	12.5
Mental health problem (but not depression)				6	6.3
Physical health issue				3	3.1
Continuous variables		n	M	SD	Range
Age (years)		163	42.1	14.8	18–84
Religiosity		151	22.2	6.0	1–30
Number of children		165	2.3	1.7	0–5

Note. $N = 169$. [†]The sample size for respondents with vignette of depression is 88. *The sample size for respondents with vignette of depression + diabetes is 81. Not all participants answered all questions

Table 3 Intercorrelations among public stigma subscales

	n	Mean	SD	1	2	3
Personal-level stigma	158	4.42	1.36	1		
Community-level stigma	160	4.28	1.66	−.38***	1	
Future possibility	155	3.56	1.52	.55***	−.35***	1

Note: Correlation is significant at ***$p < .001$

Table 4 Parameter estimates from path analysis of personal-level stigma, community-level stigma, and future possibility

	Personal-level stigma				Community-level stigma				Future possibility			
	b	SE	z	p	b	SE	z	p	b	SE	z	p
Gender of the vignette person	0.32	0.20	1.58	.12	−0.46	0.20	−2.25	.03	0.20	0.19	1.03	.31
Presence of comorbidity (diabetes)	0.27	0.20	1.40	.16	−0.25	0.21	−1.20	.23	0.17	0.18	0.93	.35
Interaction between gender and comorbidity	−0.48	0.28	−1.70	.09	0.44	0.28	1.61	.11	−0.34	0.26	−1.31	.19
Thought there was a problem	−0.50	0.22	−2.32	.02	0.15	0.19	0.80	.42	−0.20	0.20	−0.99	.32
Accuracy of the mental health problem	0.05	0.19	0.27	.79	0.15	0.17	0.89	.37	0.31	0.18	1.76	.08
Married/common law	NA				NA				−0.16	0.11	−1.39	.16
Region of origin (U.S. as reference)	NA				NA							
Mexico									−0.26	0.15	−1.79	.07
Central America									−0.37	0.18	−2.03	.04
Caribbean area									−0.45	0.18	−2.47	.01
South America									−0.16	0.17	−0.92	.36
Number of children	NA				−0.09	0.04	−2.37	.02	NA			
Education (primary school as reference)	NA								NA			
Secondary school					0.34	0.19	1.82	.07				
High school					0.37	0.20	1.82	.07				
Some college					0.32	0.18	1.75	.08				
Constant	0.18	0.17	1.02	.31	−0.02	0.25	−0.08	.94	0.26	0.19	1.37	.17
R^2	.06	0.04	1.56	.12	.11	0.05	2.07	.04	.07	0.04	1.88	.06

Note: SE = standard error. NA indicates that the variable was not included in the specific regression. Adjustments for multiple tests were performed on the significant parameter estimates. Using the BH procedure [39], each of these estimates remained significant at $p < .05$

($p=0.235$), and religiosity ($p=0.215$) were potentially associated with participants' responses concerning whether the vignette subject had a problem. However, when all of these predictors were included in the regression model, only familiarity with someone experiencing a mental health problem was significant. Among people who were familiar with someone with mental health problems, the odds of identifying the person in the vignette as having a problem were over three times higher than people who reported not knowing anyone with a mental health problem ($OR=3.05$, $p=0.008$).

Bivariate analyses further identified eight unique factors associated with respondent's ability to correctly identify the problem in the vignette as depression: age ($p=0.004$), number of children ($p=0.050$), religiosity ($p=0.048$), current area of residence ($p=0.071$), employment status ($p=0.005$), generation ($p=0.125$), acculturation ($p=0.197$), and familiarity with someone with a mental health problem ($p=0.06$). However, when those predictors were all included in the regression model, none of them significantly predicted one's ability to correctly identify depression ($p>0.05$). Similarly, bivariate analyses indicate that three variables (current area of residence ($p=0.229$), financial status ($p=0.127$), and generation ($p=0.228$)) might be associated with the respondent's ability to correctly identify the problem in the vignette as diabetes when bivariate associations were tested. However, when those predictors were included in the regression model simultaneously, none of them significantly predicted one's ability to correctly identify diabetes ($p>0.05$).

Path Analysis on Personal-Level Stigma, Community-Level Stigma, and Future Potential

Next, the research team examined if there were any differences on any of the three domains of public stigma based on the gender of the vignette subject, the presence of co-occurring symptoms of diabetes, or their interaction, while controlling for demographic characteristics of the participants. In addition to participants' sociodemographic characteristics, participants' awareness of the vignette problem and the accuracy problem identification were also used to predict the three domains of stigma toward a person with depression. A measurement model of the three subscales was first estimated. The final measurement model showed an adequate fit: $\chi^2(32)=69.32$, $p<0.001$; RMSEA $=0.083$, 90% CI [0.056, 0.11]; CFI $=0.929$; TLI $=0.900$; SRMR $=0.049$ [27]. The factor subscale scores were then calculated based on the final measurement model.

Personal-Level Stigma None of sociodemographic characteristics of the participants was correlated with personal-level stigma. Neither the vignette subject's gender, co-occurring diabetes, nor the interaction between gender and comorbidity was significantly associated with different levels of personal-level stigma. However, problem awareness significantly predicted personal-level stigma toward the vignette subject. Participants who indicated that the subject in the vignette had a problem, on average, scored 0.5 ($p=0.02$) point lower on the factor score of personal-level stigma than participants who did not think the subject of the vignette had a problem.

Community-Level Stigma Participants' gender and number of children were significantly correlated with community-level stigma. If the vignette subject was female, community-level stigma was on average 0.46 ($p=0.03$) points lower than for vignettes featuring males. Similarly, community-level stigma decreased as the number of children a participant had increased. For each additional child, the participant reported on average 0.09 point ($p=0.02$) lower community-level stigma. Participant's awareness of the problem and correctly identifying the problem as depression did not significantly predict community-level stigma, nor did the interaction of gender and comorbidity or any other demographic characteristics.

Future Potential Participant's region of origin was significantly correlated with stigma related to the vignette subject's potential for future success. When compared to those who were born in the U.S., those born in Central America scored 0.37 point lower ($p=0.04$) on stigma related to the vignette subject's potential for future success. Similarly, participants who were born in the Caribbean area scored 0.45 point lower ($p=0.01$). The vignette subject's gender, co-occurring diabetes, nor the interaction between gender and comorbidity was associated with different levels of stigma related to the vignette subject's future potential. Similarly, neither the participant's awareness of the problem nor correctly identifying the problem as depression or depression and diabetes significantly predicted stigma related to one's possibility of future success.

Discussion

This study begins to address gaps in the existing literature in relation to Latinos' knowledge about the symptoms of depression and/or diabetes and how their sociodemographic characteristics may be associated with different types of public stigma related to depression. The majority of participants in this sample were able to correctly indicate that the subject of the vignette had some kind of "problem" that needed attention, and individuals who knew someone with a mental health concern were more likely to indicate that the subject of the vignette had a problem. However, overall, only about 60% of the sample were able to correctly identify a vignette subject who was experiencing depression and only 15% of

participants were able to correctly identify symptoms of diabetes, particularly if they were occurring concurrently with depressive symptomology. Surprisingly, factors highlighted in previous literature that have been associated with higher levels of health literacy, such as education level, income level, and acculturation, were not associated with participants' acknowledgement of the problem or their ability to correctly identify the problem based on the symptom presentation [30, 32, 33]. It is possible that these null finding are due to our samples' homogeneity in terms of low levels of formal education and financial stability. However, these findings indicate an ongoing need for increased health literacy broadly within the Latino community as a whole in relation to these common physical and mental health conditions.

Overall, levels of stigma toward someone experiencing symptoms of depression were in the moderate range across the three dimensions of public stigma, indicating that participants did report some stigma toward those experiencing symptoms of depression, believed that others in the community would stigmatize those experiencing symptoms of depression, and felt that individuals experiencing depression may have some difficulties regarding their future success.

Results of the path models indicate that different sociodemographic characteristics were predictive of each of the three different domains of stigma. Problem awareness significantly predicted personal-level stigma, but not community-level stigma or stigma related to the future, meaning that those who thought the person in the vignette had a "problem" directly expressed lower levels of stigma toward the vignette subject. It is possible that by acknowledging the person in the vignette had a health-related condition, as opposed to a difficult personality or unusual behavior that had no "cause," respondents were more able to contextualize the vignette subject's symptoms in more positive ways.

Levels of community-level stigma toward the subject of the vignette varied based on gender of the vignette subject. This means that respondents reported that they felt that others in the community would hold higher levels of stigma toward men with depression than women with depression. This result is consistent with prior work in this area indicating that men who are thought to be experiencing depression experience higher levels of stigma than women thought to be experiencing depression [28, 29]. This may be in part due to the cultural expectations for men to be self-sufficient, and that experiencing a mental health problem had the potential to bring shame to the family [30, 31, 35]. However, this gender-based difference was not significant when the subject of the vignette was experiencing both depression and diabetes, indicating that if there is a physical health condition occurring in addition to a mental health condition, the stigma toward men and women experiencing these conditions is not different. Levels of community-level stigma toward the subject of the vignette also varied based on the

number of children reported by the respondent for community-level stigma. It is possible that this variable may reflect the lived experience of the participants, who through having children (and more children) may have greater potential of being exposed to others with depression and had seen or heard about the stigma toward those people from other community members. It is possible that with more children, there is a higher likelihood of having a child who experienced symptoms of depression and thus having understood firsthand how those in the community have stigmatized their child in a way that could also apply to the subject of the vignette. Additional research in this area is needed to more fully understand the relationship between number of children and community-level stigma toward those with depression.

Region of origin was the only significant predictor of future possibility, with those from Mexico, Central America, and the Caribbean reporting less stigma about the vignette subject's potential for future success than those born in the U.S. or in South America. The heterogeneity of the Latino community in relation to stigma around mental health disorders has been highlighted by Sanchez and colleagues [34] as well as Adames and Chavez-Dueñas [36], underscoring the importance of considering both between-group and within-group differences when engaging in mental health research with Latino communities. Respondents originating from Mexico may have more similarities to American-born (Houston, TX) Latinos than those who originated from the Caribbean or Central America in terms of culture and traditions, which may, in part, explain these differences. However, the authors are still unclear as to why those originating from South America also reported similar level of stigma toward future success as those from Mexico or who were native born. These findings warrant additional research focusing on how Latinos' region of origin and associated cultural nuances may impact mental health–related stigma.

Limitations

This research has some limitations; notably, these data were derived from a convenience sample of self-identified Latinos in [Southwestern United States — Houston, TX], a large urban and suburban metroplex. Thus, the findings from this sample may not generalize to the larger population of Latinos residing in rural areas or in other parts of the U.S. All measures were self-reported; thus, social desirability bias may be at play in relation to reporting of stigma one may hold toward those experiencing depression or diabetes. Also, data for this study was collected prior to the COVID-19 pandemic. Experiences related to the pandemic, such as social isolation, have brought heightened attention to mental health issues, particularly depression, and results obtained in future research in this area may reflect this increase in mental health awareness.

Conclusion

Overall, participants awareness of a "problem" related to symptoms of depression and/or diabetes was high but their ability to correctly identify the "problem" based on the symptoms presented, particularly in relation to diabetes, was lower than anticipated. These results highlight areas of opportunity related to health literacy around two health-related conditions prominent in the Latino community. Depression and diabetes are both chronic health conditions that, if identified and treated early, can be effectively managed and the potential harm associated with each of these conditions can be mitigated. These findings underscore the need for additional school and community-based education and awareness on the symptoms of these common health conditions along with information on how they often co-occur with one another [5]. Educational efforts in this area should also include information on how cultural factors may influence the development and progression of these conditions [3]. These findings also have implications for engagement with appropriate treatment. Often, the first place that Latinos seek treatment for any health-related or mental health–related condition is through a primary care provider [37, 38]. Thus, it is important for health-related information to be readily available not only in primary care offices, but also at locations within the community, such as schools, churches, and social services agencies, in order to widely disseminate materials describing the symptoms of these widespread health conditions to those who may not present in formal healthcare settings. Increasing community health literacy will hopefully, in turn, increase the number of individuals seeking treatment and also increase the capacity of their friends and family and others to recommend the most appropriate type of care for their symptoms. Moreover, a more complete examination of how Latino cultural values may impact perceptions of mental health and mental health help seeking is warranted at this time.

Study findings also indicate that levels of stigma toward someone experiencing symptoms of depression were in the moderate range across the three dimensions of public stigma, demonstrating that participants did report some stigma toward those experiencing symptoms of depression and indicated that these individuals may have some difficulties regarding their future success. Distinct demographic and vignette-related factors were predictive of the various domains of public stigma, which suggests that mental health–related stigma reduction efforts should be designed in such a way that all dimensions of public stigma are addressed, and different approaches to stigma management may be indicated for each of the domains of public stigma.

Finally, these findings illustrate the need to look at both between- and within-group differences when trying to understand the various domains of stigma related to depression within the greater Latino community. Prior waves of Latino immigrants to the U.S. have been largely comprised of those from Mexico, Cuba, and the Caribbean. However, the Hispanic/Latino community continues to grow and become increasingly more diverse with the ongoing influx of immigrants fleeing from violence and political unrest in Central and South American countries such as El Salvador, Guatemala, Honduras, and Venezuela. Thus, moving forward, researchers may consider not conceptualizing all those of Latin/Spanish/Hispanic origin as a monolithic group, but rather explore the more nuanced differences within the larger community of "Latinos" which may have important implications for building health literacy and decreasing mental health–related stigma.

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