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Depression, Stress, and Intimate Partner Violence Among Latino Migrant and Seasonal Farmworkers in Rural Southeastern North Carolina

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Abstract The purpose of the study is to identify the predictors of depression and intimate partner violence (IPV) among Latinos in rural Southeastern North Carolina. A sample of 291 migrant and seasonal farmworkers was interviewed to complete the demographic questionnaire, HITS (intimate violence tendency), Migrant Farmworker Stress Inventory, Center for Epidemiologic Studies Depression Scale (depression), and CAGE/4M (alcohol abuse). OLS regression and structural equation modeling were used to test the hypothesized relations between predictors of IPV and depression. The findings indicated that respondents reporting higher levels of stress also reported higher levels of IPV and depression. The goodness-of-fit statistics for the overall model again indicated a moderate fit of the model to the data ($\chi^2 = 5{,}612$, $p < .001$; root mean square error for approximation = 0.09; adjusted goodness-of-fit index = 0.44; comparative fit index = 0.52). Although the findings were not robust to estimation in the structural equation models, the OLS regression models indicated direct associations between IPV and depression.

Keywords Stress · Depression · Intimate partner violence · Latino farmworkers

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Introduction

Many rural communities in the United States (US) are growing in numbers largely due to the Latino population [1]. It is estimated there are over 4 million farmworkers, mostly Latinos, who live and work in rural areas of 42 of the 50 states [2]. Latino immigrants in the Southeast are likely to be recently arrived and from rural communities in southern Mexico and Central America, and tend to be young and have excessive rates of low literacy [3]. North Carolina (NC) has one of the fastest growing Latino populations in the US [3–5]. Unlike other regions of the US, this growth has not been concentrated in metropolitan areas [5]. NC is the fifth most populous farmworker state in the US, behind California, Texas, Washington, and Florida. There are estimated to be more than 100,000 migrant and seasonal farmworkers working in NC throughout the year. Most of the Latinos in NC are of Mexican origin (65.1 %) [4]. Latinos are present in all NC counties; however, they tend to be concentrated in the Eastern, metro, and military areas of the state [4]. Foreign-born Latino residents in NC appear to be less acculturated than those residing in other states [6].

It has been reported that Latinos generally suffer higher levels of depression than other groups. Mendelson, Rehkopf, and Kubzansky conducted a meta-analytic review to assess the prevalence of major depressive symptoms among Latinos in the US using community-based data [7]. The researchers found that Latinos reported more depressive symptoms than non-Latino Whites, although this effect was small and does not appear to suggest a clinically meaningful preponderance of depressive symptoms among Latinos [7].

A substantial proportion of Latino farmworkers, particularly those in the Midwest and in the eastern US,

compared to California, have higher levels of depression and anxiety [5, 6, 8–10]. Findings from a recent study conducted in NC indicated that over 45 % of farmworkers experience elevated depressive symptoms across the season [8], in contrast to about 20 % of farmworkers in California who reported depressive symptoms [9]. Alderete and colleagues assessed the level of depression using the Center for Epidemiologic Studies Depression Scale (CES-D) for 1,001 Mexican migrant farmworkers in California and reported that CES-D caseness rates (scores of 16 or above) were 21.1 % for men and 19.7 % for women [9]. Using a sample of 45 Mexican migrant farmworkers who are the first generation individuals in the Midwest US, Hovey and Magana found that 29 % of the participants reached the caseness of anxiety [scores of 60 or higher on the Personality Assessment Inventory (PAI)] and 37.8 % reached the caseness of depression (using the CES-D) [10]. Hiott and colleagues interviewed 150 Mexican farmworkers in NC and found that nearly 40 % of participants met caseness of depression (CES-D) and anxiety (PAI) [6]. Although the CES-D has been validated with Latino farmworkers across the US, as of yet there has been no investigation into why depression rates are higher among Eastern farmworkers [11].

Multiple factors seem to affect the level of depression among Latino farmworkers. According to Hiott and colleagues, social isolation and stressful working conditions were associated with greater anxiety scores and depression symptoms among Latinos in NC [12]. Social isolation had the strongest potential effect on farmworker anxiety, but stressful working conditions had the strongest potential effect on depressive symptoms [12]. Hovey and Magana found that acculturative stress, poor family functioning, and the lack of social supports are associated with greater symptoms of depression and anxiety among Mexican farmworkers working in the Midwest [10]. Hovey and Magana used the SAFE scale that measures acculturative stress in social, attitudinal, familial, and environmental contexts during the acculturation process that might causes problems arising from conflicts between the immigrant and US cultures [10]. The researchers found that migrant farmworkers experiencing elevated levels of acculturative stress also reported high levels of anxiety and depression [10]. The previous literature suggests that with increased time in the United States, there are increased levels of depression among people of Mexican origin [12, 13]. From a population survey among Mexican-Americans, Vega et al. [13] reported that younger age of entry and longer residence in the US were associated with increased rates of psychiatric disorders among Mexican immigrants.

Previous research findings indicated high rates of intimate partner violence (IPV) among Latinos in the United States, ranging from 17 to 55 %, with great variability among Latinos of different origin [14–16]. IPV describes physical, sexual, or psychological harm by a current or former partner or spouse. There are four types of IPV including: physical violence, sexual violence, threats of physical or sexual violence and psychological/emotional violence, and this type of violence can occur among heterosexual or same-sex couples and does not require sexual intimacy [17]. Although IPV rates vary widely by urbanism and ethnicity in the United States, it was reported that Latinos in the rural United States may experience a higher prevalence of IPV [15].

Heavy alcohol use among Latino farm workers is believed to be common, and increases the risk of violence [18]. However, the findings of the previous studies are somewhat mixed. Caetano and colleagues examined the cross-sectional association between acculturation, acculturation stress, drinking and IPV among 387 Hispanic couples, and reported that alcohol is not associated with domestic violence [19].

Ingram found that rates of IPV among Latinos increased the longer they lived in the US [20]. Denham and colleagues reported English-speaking female Latinas experience IPV at about twice the rate of Spanish-speaking Latinas [15]. The findings of the study conducted by Caetano and colleagues indicated that acculturation, directly or through acculturation stress, increases the likelihood of IPV [19]. The researchers noted that data for females show an additional path linking higher levels of acculturation directly lead to IPV that is not present among males, and interpreted these findings as the following two mechanisms. First, an increased chance of IPV occurs if the woman is high in acculturation, but the man is low in acculturation but high in stress. Second, when both partners in the dyad are high in acculturation stress, and thus cannot respond appropriately to conflicts in the relationship, IPV occurs. Gender disparities resulting from acculturation, or increased adoption of American values and norms, can lead to higher levels of stress in the Latino immigrant family [16]. This can lead to an increased rate of IPV [21, 22].

In conclusion, the findings of previous studies suggest that multiple factors affect the poor mental health among Latinos; however, their mental health has been studied in a bi-dimensional nature. The present study was conducted to better understand how these interrelated factors influence the mental health of this population. Specifically, the study attempted to identify the predictors of depression and IPV among Latinos in rural Southeastern North Carolina. In keeping with the literature, we expected (1) gender, time in the country, alcohol consumption, and level of stress to affect IPV tendency; (2) IPV tendency and level of stress to affect the levels of depression; and (3) IPV tendency and level of depression to be predictors of one another. IPV tendency excludes sexual violence for the current study and

is measured using the HITS scale, which includes four questions about being hurt, insulted, threatened with harm, and screamed at by a partner in the past year [23].

Methods

Sample

This study is based on a survey of 291 Latino farmworkers in Southeastern NC. The survey data were originally collected to assess the nature of attitudes toward IPV and alcohol use among this population. Participants were recruited and all data were collected during the post agricultural season (September–November) in 2007.

Surveys were completed in Spanish by bilingual interviewers. As previous studies involving Latino migrant farmworkers have noted, this is a difficult population to reach [12, 24]. All interviewers completed a training session that dealt with issues of confidentiality, recruitment, and questionnaire administration. Interviews were completed in migrant worker camps/housing, the local health department, and Hispanic churches in the community. All participants received a retail gift card ($5) at the conclusion of the interview. The study protocol was approved by the University Institutional Review Board.

Dependent Variables

Intimate partner violence tendency was measured using the HITS scale [23]. Responses range from 1 ("Never") to 5 ("Frequently"), or 4–20 overall [23]. The scale has been validated in the family practice setting in a study that compared 160 family practice patients whose abuse status was unknown with 99 self-identified victims of abuse [23]. The cut-off score for the Spanish version of HITS (5.5) is half that of the English version (10.5) of the scale to account for cultural differences [25]. Reliability analysis indicated a high degree of internal consistency among the Latino participants in this sample (Cronbach's $\alpha = .81$).

Depression was measured using the CES-D [26]. The CES-D assesses depressive symptoms using a 20-item questionnaire with individual item responses of how often symptoms were experienced in the past week, ranging from 0 ["Rarely or None of the time (<1 day)"] to 3 ["Most or All of the time (5–7 days)"] and with the summed scale ranging from 0 to 60. Higher scores on the sum of items indicate a greater tendency towards depression, and scores of greater than or equal to 16 on the CES-D, are frequently used as a guide for potential caseness of depression [27]. The scale is not intended as a clinical diagnostic tool [26], however, it minimizes the use of somatic symptoms to assess depression and it relies on short statements that can be administered orally in the low literacy population [6]. The scale remains as one of the most widely used instruments in assessing depression among Latino migrant farmworkers [5, 6, 8–12]. Previous studies have found that the CES-D has adequate internal consistency reliability ($\alpha = .81$–$.90$) and construct validity among Mexican-American samples and migrant farmworker samples [27–29]. Reliability analysis in the current indicated a high degree of consistency in responses (Cronbach's $\alpha = .90$).

Mediating Variable

Stress was assessed using the Migrant Farmworker Stress Inventory (MFWSI), a 39-item instrument that measures the severity of stressors to which adult migrant farmworkers might be exposed [30]. Interviewees rated their degree of stress in response to each item, which ranged from 0 ("Have not experienced") to 5 ("Extremely Stressful"), with the summed scale ranging from 0 to 156. Higher scores indicate stress related to poor working conditions, the physical demands of work, acculturative stressors, and perceived discrimination [12, 24, 30]. Scores higher than 80 are deemed to be indicative of a degree of stress that could pose risks to mental health ($\alpha = .93$). In the multivariate analyses, stress was treated as an endogenous variable to assess its possible mediating effects on depression and IPV.

Independent Variables

Alcohol use was measured using the CAGE, an instrument used in clinical settings to diagnose alcohol abuse. The index consists of four binary (no = 0; yes = 1) items that form the basis of the acronym, CAGE (four questions about cut down drinking, annoyed, guilty, and eye-opener). The Spanish version is known as CAGE/4M, and has been validated with Latino respondents [31, 32]. A score of 1 or higher was 92 % sensitive and 74 % specific for alcohol abuse or dependency [32].

Demographic characteristics were measured using an additional questionnaire that included gender, ethnicity (Mexican, Cuban, or other Latino descent), age, time in the United States, marital status, migrant status (migrant vs. season farmworker), and immigration status (first-, second- or third-generation immigrant).

Statistical Analysis

Following a descriptive analysis of Latino farmworkers' sociodemographic characteristics, we conducted a bivariate correlation analysis between all independent and dependent variables. Significant correlates of both depression and IPV were included in the regression analyses and structural

equation model (SEM). Only gender and time in the United States were significant correlates of these dependent variables, and thus are included in the multivariate analyses. Given its importance in the literature on both IPV and mental health, the index for alcohol abuse (CAGE) is included as well. The SEM simultaneously estimates the three dependent variables, and allows for the estimation of nonrecursive paths between depression and IPV. All analyses were conducted using SAS v. 9.2. The SEM was estimated using the TCALIS procedure in SAS using maximum likelihood estimation. All significance tests were two-tailed, and based on the listwise deletion of missing values. In addition, all multivariate analyses were based on the subset of 245 respondents not reporting marital status as single (i.e., all respondents reporting a current or prior intimate relationship).

Results

Socio-demographic Characteristics

We analyzed the characteristics of 289 respondents who provided responses on the measures used in the study. The majority of respondents was men (53 %) and married (57 %). Most study participants were 30 years old or younger [57 %, range 16–68 years, mean = 31.5 years old, 95 % confidence interval (CI) = 30.3, 32.7]. Almost three out of four respondents were first-generation immigrants to the United States, and nine out of ten respondents claimed Mexican descent (93.4 %). The average amount of time lived in the United States was six and a half years (range 0–49, 95 % CI = 5.8, 7.4) (Table 1).

Mental Status and Behavioral Characteristics

Table 2 reports the means and standard deviations for the main variables of interest in the study. Farmworker depression scores were 13.1 (SD = 10.8) on average, with a range from 0 to 53. Nearly one-third (32.2 %) of the participants had scores of greater than or equal to 16 on the CES-D, which is frequently used as a guide for potential caseness of depression.

Farmworker stress scores were 67.7 (SD = 25.3) on average, with a range from 0 to 141. One in four (25.6 %) respondents scored above the diagnostic cutoff indicating elevated levels of stress. In relation to IPV, average scores (M = 5.0, SD = 2.1) indicated diversity in both the nature and frequency of victimization experiences at the hands of a partner. Just over 20 % indicated at-risk levels of IPV tendency (scores of 5.5 or higher on the HITS index). Finally, the average score on the CAGE alcohol abuse index was 1. Approximately 39 % of respondents scored 1

Table 1 Sociodemographic characteristics of Latino respondents (N = 289)

	No. (%)
Women	135 (46.9)
Men	153 (53.1)
Age[†]	
16–24	66 (24.6)
25–30	87 (32.5)
31–40	69 (25.8)
41–68	46 (17.2)
Time in the US[‡]	
<1 year	51 (18.2)
1–4 years	83 (29.6)
5 or more years	146 (52.1)
Ethnicity	
Mexican descent	267 (93.4)
Cuban descent	13 (4.5)
Other	6 (2)
Religion	
Catholic	200 (69.9)
Protestant	16 (5.6)
Other	31 (10.8)
None	39 (13.6)
Marital status	
Single	44 (15.3)
Married	164 (57.1)
Cohabiting	74 (25.8)
Divorced or widowed	5 (1.7)
Migrant status	
Migrant farmworker	164 (58.2)
Seasonal farmworker	118 (41.8)
Immigration status	
First-generation	209 (73.1)
Second-generation	59 (20.4)
Third-generation	14 (4.8)

[†] M = 31.5 years, SD = 10.1

[‡] M = 6.6 years, SD = 6.7

Table 2 Mental status and behavioral characteristics of Latino respondents (N = 289)

Variable	M	SD	Min	Max	Caseness above cutoff (%)
Intimate partner violence (HITS index)	5.02	2.07	3	17	20.4
Depression Scale (CES-D)	13.09	10.83	0	53	32.2
Stress (MFWSI)	67.72	25.33	0	141	25.6
Alcohol abuse index (CAGE)	0.98	1.38	0	4	38.7

Table 3 Multiple regression analysis of stress, depression and IPV amongst Latino farmworkers

	Stress index				Depression index				IPV index			
	B	SE	B	*p*	b	SE	B	*p*	b	SE	B	*p*
Male	−7.06	4.09	−0.14	0.086	−1.57	1.50	−0.07	0.295	−0.56	0.33	−0.12	0.094
Time in the US	0.05	0.24	0.01	0.848	0.21	0.09	0.13	0.019	0.00	0.02	0.00	0.951
Alcohol abuse index	1.24	1.48	0.07	0.405	0.32	0.54	0.04	0.552	0.15	0.12	0.09	0.217
Stress index	–	–	–	–	0.15	0.02	0.35	0.000	0.00	0.01	0.02	0.747
Depression index	–	–	–	–	–	–	–	–	0.08	0.01	0.42	0.000
IPV index					1.71	0.28	0.35	0.000	–	–	–	–
R^2	0.01					0.34				0.21		
N	231				230				230			

or higher on this index, which implies alcohol abuse or dependency.

Predictors of Depression and Intimate Violence

We included gender among these characteristics as a control variable in our final prediction model, although preliminary analyses indicated some statistically significant variation in depression, stress and IPV tendency across demographic groups.

Table 3 provides OLS regression estimates of the dependent variables of depression and IPV tendency. Since stress was conceptualized as a mediating factor, the first set of findings in the table are coefficients from a model regressing stress on gender, time in the US, and alcohol use. None of these variables were significant predictors of stress, nor were gender and alcohol use significant in the two other models predicting depression and IPV.

In the second model predicting depression, time in the US showed a significant association that both stress and IPV tendency were positive, and statistically significant predictors of depression, controlling for gender, time in the US, and alcohol use. A scatter diagram indicated this to be a linear relationship, such that on average with each year that respondents reported having lived in the US their predicted depression score increased by a factor of 0.21, the net of other predictors in the model ($b = 0.21$; $p < 0.05$). IPV tendency was strongly related to self-reported depressive symptoms ($b = 1.75$; $\beta = .35$; $p < 0.001$). In turn, regressing the IPV index on the remaining variables indicates a net positive influence of the depression scale.

Figure 1 shows the results of the SEM estimation, which includes both a measurement model and path analysis influenced by the preceding OLS regression models. The measurement model estimates paths for three latent endogenous variables—IPV tendency, stress, and depression—using the manifest indicators described in the methods section. Preliminary analyses without the path analyses revealed that all indicators showed significant associations with the latent factors, and goodness-of-fit statistics indicated a moderate fit of the model to the data [$\chi^2 = 5{,}402.5$, $p < 0.001$; root mean square error for approximation (RMSEA) = 0.09; adjusted goodness-of-fit index (AGFI) = 0.45; comparative fit index (CFI) = 0.54].

The path analysis allows the non-recursive paths between the IPV and depression factors to be estimated simultaneously with the other paths, covariances among manifest indicators, and error terms (covariance and residual estimates not shown). The direct effect of gender on IPV tendency is statistically significant, as are the direct effects of stress and IPV tendency on depression. These latter paths are the strongest in the model, indicating that respondents reporting higher levels of stress also reported higher levels of IPV and depression, net of other factors in the model. The goodness-of-fit statistics for the overall model again indicated a moderate fit of the model to the data, although with no improvement over the measurement model excluding fitted paths ($\chi^2 = 5{,}612$, $p < .001$; RMSEA = 0.09; AGFI = 0.44; CFI = 0.52).

Discussion

Using SEM methodology, the current study examined correlates of mental health among Latino farmworkers in rural Southeastern NC. Although our multivariate findings were somewhat mixed, the findings of this study provide valuable insights for community health professionals working with this population. The OLS regression models indicated direct associations between IPV tendency and depression; however, these findings were not robust to estimation in the SEMs, which are able to account for measurement error in the observed variables. In addition, based on our argument that the nature of the relationship between IPV tendency and depression may be reciprocal,

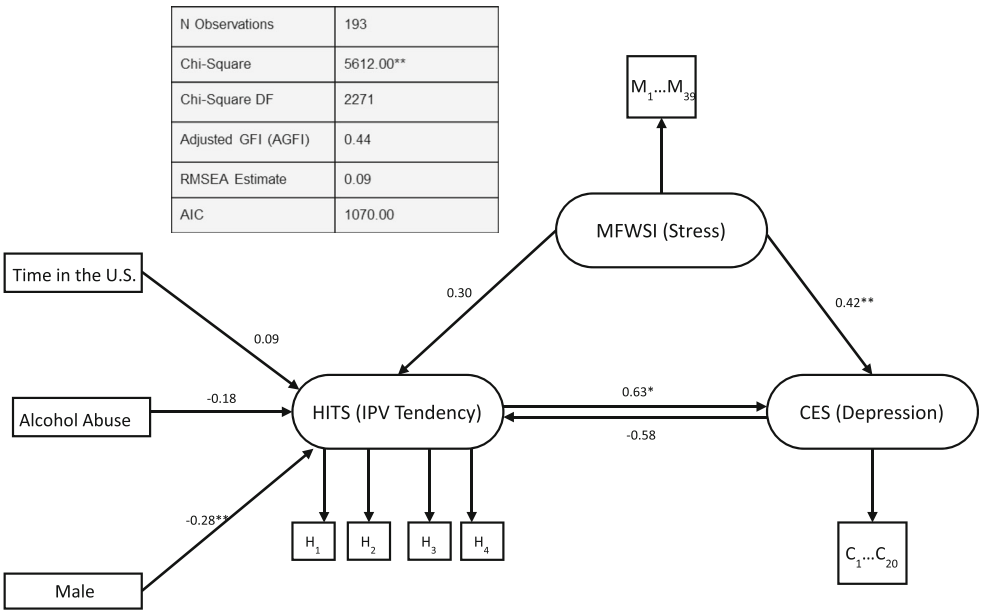

Fig. 1 Relationships between IPV, stress and depression (standardized path coefficients). *$p \leq .05$; **$p \leq .001$ (two-tailed tests) (covariance and residual estimates not shown)

the SEM lent itself to cover this possibility by estimating both possible paths between these variables simultaneously. Consistent with other previous studies, this study suggests that multiple factors are associated with the level of depression. Therefore, there is a need of a comprehensive mental health screening tool that includes depression, IPV, and stress for early detection and referrals. Identification of the risk factors may lead to early intervention.

Based on the literature, we hypothesized the relationship between alcohol use and IPV tendency. Interestingly we found that alcohol use is not associated with IPV tendency. The research evidence concerning alcohol use and IPV among Latinos is mixed. While the findings of a previous study of Latino migrant farmworkers support the strong association between alcohol use and IPV [18], other findings do not support this relationship [19, 33]. Cunradi [33], who conducted a secondary data analysis of a national sample of 1,148 male and 1,399 female Latinos, reported that alcohol use was only associated with IPV victimization for women, not men.

Our findings indicated that the only significant demographic variation among the dependent variables was by gender, with women significantly more likely to report IPV tendency than men. This finding is in line with the mainstream literature on mental health as well as more specialized studies such as ours dealing with marginal or hard to reach populations. It may be that other characteristics were not found to be significant because apart from gender this sample reflects a relatively homogenous population with regard to ethnicity and immigration status. The findings of the study imply that IPV tendency or perceptions may differ between men and women. According to the National Intimate Partner and Sexual Violence Survey (NISVS) in 2010, Hispanic women report higher rates of rape (women 8.4 % and men NA), physical violence (women 35.2 % and men 26.5 %), stalking (women 10.6 % and men NA) and other types of violence (women 37.1 % and men 26.6 %) than Hispanic men [34].

Time in the US showed a significant association that both stress and IPV tendency were positive and statistically significant predictors of depression. Respondents who lived in the US showed higher depression score in the currently study. This finding is consistent with the main stream of previous studies. For example, Caetano and colleagues discussed the association of acculturation with risky and/or aggressive behaviors, such as increased drinking, drug use, alcohol problems, and domestic violence [14]. Latino belief in men's domination (*machismo*) relies mostly on their role of economic and material providers. *Machismo* and male domination are significant components of a culture of honor [35]. Changes resulting from acculturation and new economic demands may be interpreted by them as a threat to their sense of manhood [20–22]. The *machismo* role in Latino culture affects male control of the female partner, which influences as well as perpetuates partner violence [16, 22]. Gender roles and norms, as well as power differentials, influence the perceived power of the female in the relationship [16]. In addition to the *machismo*, the *marionismo*, a term commonly associated with the Hispanic/Latino women's role encourages the submissiveness and obedience of the female [15]. These culturally embedded roles promote an environment where partner abuse may be acceptable to both the male and female. The objectification of women along with a tendency toward sex role differentiation in the Latino culture may encourage more frequent spousal abuse [22].

Therefore, gender specific and culturally tailored intervention need to be implemented for this population. In addition, acculturation stress related to residence in US should be considered. Educational programs for men and women that address what constitutes abuse are critical.

Almost one-third of the sample could be classified as having clinically meaningful depressive symptoms, and about 25 % reported significant levels of stress. These proportions were lower than other studies of Latino farmworkers in NC. For example, recent NC studies reported that 41.6–52.2 % of farmworkers experienced elevated level of depression [5, 8, 36]. This may be due to the fact that the data were collected during the post agricultural season (September–November) in the current study, and during the agricultural season (June–August) in the previous studies [5, 8, 36]. Grzywacz et al. [37] assessed the level of depression using the same CES-D at four times from May through September and found depressive symptoms are at their highest in the beginning of the agricultural season, but then steadily decline until the later stages of the season. These researchers also reported that individual attributes and situational stressors also affected depressive symptoms [37]. In an another NC study conducted during pre-agricultural season (March–April), more than half of the respondents reported high level of stress (casesnees) [24]. Considering that about 60 % of the respondents were married, and over 40 % were seasonal farmworkers in the current study, a lesser proportion of the Latino farmworkers may experience depressive symptoms and individual and structural stressors. The findings suggest that stress reduction programs could be implemented pre-agricultural season.

The limitations of the current study include a relatively small convenience sample and the use of self-reported data. Sampling was purposive in nature; interpretation of results must therefore be treated with caution. Additionally, the use of the HITS scale to measure the IPV tendency also limits the findings. Although the HITS scale has been widely used because of the clinical practicality, it only has four questions. It may be that more detailed scales of IPV (e.g., the Conflict Tactics Scale) are needed to derive more reliable measures of the dimensions of IPV. In addition, as with all translated measures, although there might be semantic equivalence to the English version, the item content and scale of measurement (Likert Scales, binary items) may not be culturally equivalent.

This study was conducted in a local rural community, therefore, results may not be generalized beyond Southeastern NC. Due to the cross-sectional nature of the data, no causal inferences were examined. Future research is needed to compare the differences in the level of stress and depression during pre- and post-agricultural seasons. Although the findings of the current study confirmed the results of previous studies, the findings of this study are not robust to estimation in the SEMs and show some unexpected results.

Further research should build upon these results to develop a better understanding of farmworker mental health. The strength of the study is that the study explains the relationships among interrelated mental health factors, using the SEM method. Considering farmworker mental health remains poorly understood [12], the findings of the current study offer insights for health care professionals on preventions and interventions of mental health issues among rural Latino population.

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