Currently in the United States (U.S.), Latinos account for approximately 15% of the population. It is estimated that proportion will increase to 30% by the year 2050 (US Census Bureau, 2009). In addition, of the estimated 3-12 million migrant and seasonal farmworkers (MSFWs) living in the U.S., a majority are Latino (Bureau of Labor Statistics [BLS], 2008). The federal definition describes MSFWs as individuals who earn a living in agriculture by migrating, from one place to another, usually annually, in order to find work (Hovey & Magaña, 2002). In general, these individuals live in the southern portion of the U.S. for the winter months and will travel north for the harvest seasons. However, many Latino MSFWs remain in one geographical area, and will supplement income with non-agricultural jobs in the off season. The non-migratory nature of this group excludes them from being classified as “migrants” by the federal definition, and consequently, they are ineligible for federal benefits, such as migrant health services (National Center for Farmworker Health [NCFH], N.D.).

According to Barger and Reza, Rothenberg, and Hovey and Magaña, among others, the lifestyle of MSFWs is one of many noted difficulties (Barger & Reza, 1994; Hovey & Magaña, 2002; Rothenberg, 1998).

Approximately 60% of MSFWs live below the poverty line, with many earning less than $7,500 a year (BLS, 2008). Most are underinsured or uninsured employees, who provide essential services to the multibillion dollar agricultural industry in the U.S., in a very dangerous and hazardous working environment (Hovey & Magaña, 2002; NCFH, N.D.). Farm labor has been documented as having the highest incidence of workplace fatalities (Hovey & Magaña, 2002). Additionally, many MSFWs live in unsanitary conditions and unsafe environments.
physically isolated from mainstream life (Arcury & Quandt, 2007; Hovey & Magaña, 2002; Wallace, 2002). According to researchers Hovey and Magaña (2002), “small homes that lack water and toilet facilities are commonplace and drinking water and toilet facilities are not often readily available in the fields” (p. 225). Finally, with limited access to health and medical care, the health status of MSFWs is among the worst in the U.S., and the average life expectancy is only 49 years of age (Hovey & Magaña, 2002).

The living and working conditions of MSFWs place these individuals at increased risk for moderate to high levels of stress and depression (Hovey & Magaña, 2002). Previous research conducted with MSFWs indicates that one in four has experienced an episode of one or more psychiatric disorders during their lifetime, nearly twice the prevalence in the general U.S. adult population (Alderete, Vega, Kolody, & Aguilar-Gaxiola, 2000). Other studies have revealed that 30-40% of MSFWs report having clinically significant levels of depressive symptoms in the past week (Grzywacz et al., 2006; Hiott, Grzywacz, Davis, Quandt, & Arcury, 2008; Magaña & Hovey, 2003). In a study conducted by Alderete et al. (2000), 21% of the males and 19.7% of the females in the study reported having depressive symptoms related to language conflict, lack of social support, discrimination, and legal residence status. Research conducted by Grzywacz et al. (2008), also indicated that MSFWs are at increased risk for the development of distress that can lead to more severe psychiatric disorders, such as depression. Despite the evidence of the relatively high prevalence of stress and depression in this population, immigrant Latinos are less likely to seek mental health services for treatment of mental health conditions (Lawlor & Hopker, 2001; Pomerleau, Zucker, & Stewart, 2003).

Stress has many effects on the lives of individuals themselves, their relationships with others, and their reactions to situations they encounter in their environment around them (US Census Bureau, 2009). The origins of stress, referred to as stressors, are the internal and/or external demands experienced by an individual that cause distress and disrupt psychological and physical functional balance or homeostasis. When faced with this disruption of homeostasis from their stressors, individuals react through various coping mechanisms (Lazarus & Cohen, 1977).

Although stress does not affect individuals equally, it can lead to illness through the direct physiological effects on blood pressure, or indirectly through negative coping behaviors such as unhealthy eating behaviors, smoking, drug and alcohol use, and violence (US Census Bureau, 2009). Conversely, positive coping behaviors such as exercising, practicing relaxation techniques, and seeking social support can serve as stress moderators (Balk, Chung, Beigi, & Brooks, 2009; Milani & Lavie, 2009; Ng & Jeffery, 2003; Salmon, 2001; Sinokki et al., 2009). Similarly, depression can also have serious negative effects on emotional, psychological, and physical well-being, and is cited as a leading cause of disability as well as a major contributor to the global burden of disease (World Health Organization [WHO], 2009). Negative health outcomes associated with depression include comorbidity with chronic diseases such as heart disease, diabetes, arthritis, and asthma (Moussavi et al., 2007). Depression is a very complex illness, and a person can experience a variety of symptoms over varying periods of time in their life. These symptoms include a depressed mood or loss of interest or pleasure in most activities, accompanied by changes in appetite or weight, sleep, and psychomotor activity; decrease in energy; feelings of worthlessness, guilt, or hopelessness; and difficulty in concentration or decision-making (National Institute of Mental Health [NIMH], 2006). Generally, the severity of the depression is gauged based on the frequency and duration of the depressive episode(s). While persistent or chronic depression usually requires treatment by a health professional, barriers to such treatment may include lack of access to health care services, financial constraints, lack of mental health training among general practitioners, and the stigma associated with depression (WHO, 2009).

Several studies have reported that, similar to those who suffer from stress, individuals with depressive symptoms are more likely to pursue negative behaviors to cope with their depression, such as smoking and substance use (Daniel et al., 2005; Lawlor & Hopker, 2001; Pomerleau, Zucker, & Stewart, 2003). They are also more likely to engage in binge eating and be inactive, which frequently results in weight gain – a comorbidity risk factor found to be correlated with depression (Luppino et al., 2010). Again, as with stress, the pursuit of positive coping behaviors such as regular exercise, a healthy diet, and seeking appropriate treatment can help to prevent or mediate depression (Daniel et al., 2005).

The direct and indirect effects of stress and depression can result in disruptions of an individual’s or group’s mental and physiological well-being, as well as their abilities to perform responsibilities at work and at home (Shih & Eberhart, 2008). Positive versus negative mechanisms pursued by individuals to cope with these conditions can ultimately influence functional status and their overall health. A solid grasp of the relationship between the occurrence of stress, depression, and coping behaviors is important in determining how overall individual and societal health is impacted by these mental health disorders,
and is crucial in providing effective health promotion and intervention programs to address these debilitating conditions.

Despite the limited number of research studies that have been conducted, stress and depression among MSFWs are still not well understood. Few assessments of stress and depression have been developed and validated for use with this population, and very little research has been conducted to identify the coping mechanisms used by MSFWs to deal with these psychological issues (Grzywacz et al., 2008). Grzywacz and colleagues warn researchers to be cautious when selecting instruments to assess MSFW mental health, as working with this population to document mental health issues can present several challenges related to measurement and data collection, including: 1) cross-cultural equivalence of items used for surveillance research, 2) variations in Spanish terms used and spoken by workers from different regions of Mexico or other countries, and 3) low education levels (Grzywacz et al., 2008). In addition, these researchers point to the lack of studies that examine the efficacy of using survey-based research to collect data in this population.

To help address these research issues, Grzywacz and colleagues provide suggestions regarding the methodology that researchers should use in selecting instruments when working with MSFWs and mental health (Grzywacz et al., 2008). These suggestions, coupled with the fact that minimal research has been conducted to examine coping behaviors in this unique population, elevate the need for additional research on instrument development and data collection to assess mental health in MSFWs. To this end, the purpose of this study was to develop a culturally sensitive survey instrument to assess stress, depression, and coping behaviors in Latino MSFWs. The instrument was developed, pilot tested, and used to gather pilot data on stress, depression, and coping behaviors among MSFWs within three agricultural counties in eastern North Carolina.

INSTRUMENT DESIGN FRAMEWORK

The process of test development outlined in the Standards for Educational and Psychological Testing, along with Dillman’s four stages of pretesting, were used to construct the instrument (Dillman, 2000; Standards, 1999).

STEP 1 – PURPOSE OF INSTRUMENT

To begin instrument construction, the Standards suggest identifying the constructs to be measured by the items of the instrument (Standards, 1999). For this instrument, the constructs to be measured are stress, depression, and coping behaviors, along with measures of locus of control. Locus of control explains an individual’s perceptions of where control over their life events resides (Rotter, 1966). In this case, the instrument items measure locus of control in terms of control over stressors, factors contributing to depression, overall health, and coping behaviors. The scope of the measured constructs is based on the work of many researchers, who have measured mental health in Latino MSFWs and/or coping behaviors, particularly, Grzywacz and colleagues, Folkman, Lazarus, Gruen, and DeLongis, Hovey and Magaña, and Cervantes, Padilla, De Snyder, as well as Kung, Castaneda, and Lee, and Moos (Cervantes, Padilla, & De Snyder, 1990; Folkman, Lazarus, Gruen, & DeLongis, 1986; Grzywacz, 2008; Hovey & Magaña, 2002; Kung, Castaneda, & Lee, 2003; Moos, 1993).

STEP 2 – TEST SPECIFICATIONS

The second step in instrument design is to identify the test specifications. According to the Standards (1999), “the test specifications delineate the format of items, tasks, or questions; the response format or conditions for responding; and the type of scoring procedures” (p.38). The items for this instrument are a combination of Likert scale questions, open-ended questions, and check-all-that-apply questions.

The instrument items were formatted and developed with issues of fairness in mind. Issues of fairness refer to the idea “that examinees of equal standing with respect to the construct the test is intended to measure should on average earn the same test score, irrespective of group membership” (Standards, 1999, p.74). Therefore, the instrument was constructed to establish equality of measures and outcomes for respondents, regardless of gender, race, ethnicity, or any other characteristic (Standards, 1999). The population of interest is Latino MSFWs, and therefore, the items were developed with this group, in particular, in mind.

Additionally, issues of bias refer to “construct-irrelevant components that result in systematically lower or higher scores for identifiable groups of examinees” (Standards, 1999, p.76). Content-related bias results when test content is inappropriate for the population of interest; however, test developers can assemble a panel of diverse experts to review the instrument for content, language, and questions that might be offensive or disturbing to groups of test takers. A panel was assembled for this instrument development process, and will be explained in the following steps of pretesting.

STEP 3 – DEVELOPMENT OF A POOL OF ITEMS

Three focus groups were conducted with a total of 29 MSFWs in eastern North Carolina at community sites. One focus group was conducted on a tobacco farm following the worker’s shift (N = 10), the second was conducted in a Latino community clinic...
waiting room after hours (N = 12), and the third was conducted in a closed mercado (market) (N = 7). A trusted community gatekeeper conducted the focus groups in Spanish.

Participants were greeted and welcomed by the research team. All participants provided verbal informed consent. Verbal consent was used per the University's Institutional Review Board to ensure the confidentiality and anonymity of undocumented residents. All participants agreed to allow the focus groups to be audiotaped with a digital audio player. The researcher then labeled the transcribed interview data in NVivo QSR with codes based on thematic representation of participant's meaning.

The final sample included 29 participants. Twenty-six participants were Mexican immigrants, and 3 were from Guatemala. Twenty-three of the participants worked in agricultural farms, 3 were welders, 3 were retired farmworkers, 1 was an outreach worker, and 1 an office worker for a community clinic. The average age of participants was 35 with the range being 18 – 83. There were 15 females and 14 males.

The results of this qualitative data collection will not be discussed in detail here, but four important themes emerged from this data collection that helped in the creation of the instrument items: 1) physical stress related to working conditions; 2) mental stress related to family situations, work environment, documentation status, and the lack of resources; 3) depression related to separation from family and the lack of resources; and 4) use of positive and negative mechanisms for coping with stress and depression. Based on these qualitative findings, along with the work of Grzywacz and colleagues, Folkman, Lazarus, Gruen, and DeLongis, Hovey and Magaña, and Cervantes, Padilla, Snyder, as well as Kung, Castaneda, and Lee, Moos, and Doyle, Rager, Bates, and Cooper, items were developed or chosen based on the constructs to be measured (stress, depression, coping, and locus of control) (Cervantes, Padilla, & De Snyder, 1990; Folkman, Lazarus, Gruen, & DeLongis, 1986; Grzywacz, 2008; Hovey & Magaña, 2002; Kung, Castaneda, & Lee, 2003; Moos, 1993; Doyle, Rager, Bates, & Cooper, 2006).

An initial pool of items was drawn from these sources; in addition, Dillman's Tailored Design Method was used to construct new items (Dillman, 2000). The initial pool consisted of 93 items.

**STEP 4 – DILLMAN’S FOUR STAGES OF PRETESTING**

Once Institutional Review Board approval was obtained, the pool of items was subjected to Dillman’s four stages of pretesting (Dillman, 2000). Methods and results of this four-stage process are outlined below in sequential order.

**Stage 1 – Review by knowledgeable colleagues and analysts**

**Methods**

The initial pool of items was sent to a panel of five national experts to review. Expertise areas included: MSFW mental health, cultural and linguistic challenges in working with MSFWs, survey development, and general mental health issues. The main goal of this stage was “to finalize the substantive content of the questionnaire so the construction process can be undertaken” (Dillman, 2000, p.141). The panel was also responsible for evaluating evidence of content-related bias and cultural sensitivity issues in the instrument. For example, the panel was asked to identify areas where test content appeared inappropriate for the MSFW population.

The panel was asked to review and rank each item on a scale from 1 to 4, with 1 = not important to include in survey, 2 = somewhat important to include in survey, 3 = important to include in survey, and 4 = extremely important to include in survey. Also, to minimize the number of similar items that measured the same construct, panel members were asked to label items as either “keep” or “omit”. As a final task in Stage 1, panel members evaluated the instrument for face validity (i.e. the items appear to be relevant to the constructs being investigated) and content validity (Gomm, Needham, & Bullman, 2000).

**Statistical Analysis/Results**

The results of the panel review for face and content validity indicated that 17 items needed slight wording modifications. An additional 7 items were identified as being either redundant or not adequately measuring the intended construct; therefore, these items were completely deleted. The criteria for deleting other items involved the rankings of panel members. The rankings of each item from panel reviewers were assessed, and if a majority (3 or more reviewers) indicated the item was either important or extremely important to include in the survey and suggested to keep the item, then it was kept and included in the pilot study instrument. In addition, based on recommendations of panel members, 9 new items were added to the instrument. Three of these were demographic questions, four dealt with types of stressors, and the remaining two were items measuring coping behaviors.

Modifications recommended by the panel of experts resulted in a 95-item instrument to be tested in the pilot study, with six subscales and a demographics section. The items were grouped into subscales, based on the authors’ determination of what constructs the items measured. Subscale I (10 items) measured MSFW physical stress levels, by asking farmworkers to think about feelings of stress within
the past 6 months, in relationship to the content in each item (Likert scale items ranging from 1 = not at all to 5 = yes, most of the time). An example of these items is, “In the past six months, have you felt stressed because of painful injuries you suffered at work?” Subscale II (46 items) consisted of mental stress items, which is a rather complex construct to measure; hence, the higher number of items utilized. The first 45 items in Subscale II were Likert-type scale items that inquired about frequency of stress and types of stressors, ranging from 1 = not at all to 5 = yes, most of the time. For example, the respondent was asked, “In the past six months, have you felt stressed because of not having enough work?” The last item in the mental stress scale was an open-ended item that asked respondents to list “other things that caused [farmworkers] to have feelings of stress at work or in [their] personal life.” Items in Subscale III (11 items) were questions designed to assess depression levels in MSFWs. Again, Likert-scale formatting was used in this subscale to assess frequency of depressive symptoms, and the responses ranged from 1 = none of the time to 5 = all of the time. Subscale IV (5 items) was composed of questions on coping behaviors. Four of the five questions were Likert-scale items, measuring general stress levels and perceptions of how well MSFWs cope with stress, and the last item was a “check all that apply” item that listed 34 coping behaviors, cited in the literature as behaviors of MSFWs, and one open-ended item for “other behaviors” to be listed. Respondents were asked to place a check by the behaviors in which they engage to cope with stressors. Subscale V (2 items) measured coping behaviors with depression by asking one general question regarding self-perception of depressive symptoms, and a “check all that apply” question with 33 coping behaviors listed. Respondents were asked to check all behaviors that apply to their situation, and were given the opportunity to list additional behaviors not included in the list. Subscale VI (6 items) consisted of lists of control items that measured MSFWs’ beliefs regarding what/who controls happenings in their life. Six Likert-scale items, ranging from 1 = strongly disagree to 5 = strongly agree, were used. An example item follows, “My life is mostly controlled by accidental happenings.” Lastly, a Demographics section (15 items) composed of demographic questions was included at the end of the survey. The instrument was translated into Spanish and back to English by professional translators proficient in both migrant and health-based language translation, and was reviewed by three community gatekeepers for correct dialect and terminology usage.

Stage 2 – Interviews to evaluate cognitive and motivational qualities

Methods
In this stage, using the 95-item survey, 10 MSFWs, from one eastern North Carolina county were interviewed individually by a bilingual interviewer. The interviewer was considered the gatekeeper of the MSFW population, and was trained on how to conduct the interviews with participants. Respondents were asked to think out loud when answering questions. According to Dillman (2000), the interviewer should probe the respondents “to get an understanding of how each question is being interpreted and whether the intent of each question is being realized” (p.142). Cognitive interviewing, such as this “is designed to produce information when the respondent is confused or cannot answer a question” (Dillman, 2000, p. 142).

Results
The cognitive interviews resulted in minor modifications to wording on 7 items. As an example, one physical stress item asked “In the past six months, have you felt stressed because of pain resulting from laborious work?” It was changed to read, “In the past six months, have you felt stressed because of pain from having to work too hard?” Additionally, minor grammatical edits were made. No item was deleted as a result of the cognitive interview process. The consensus of the 10 MSFW participants was that the instrument was appropriate and items were easily understood. Therefore, the 95-item instrument was administered to a sample population for the pilot test.

Stage 3 – A pilot test

Methods
The pilot study methodology was devised to emulate methods and procedures to be used in follow-up studies. A small convenience sample of MSFWs (n=60) was recruited from an eastern North Carolina migrant farmworker camp to participate in the study. Each participant was given a $10 gift card as incentive for participating. Three bilingual, community gatekeepers administered the instrument to the participants. The gatekeepers were trusted individuals in this population, and were trained in survey administration. An informed consent statement was read in Spanish to the pilot study group, prior to administration of the instrument, and all of them agreed to the statement and participated. Responses were kept confidential, and participants were asked not to put any identifiable information on the surveys.

Statistical Analysis
Due to the vast number of items pooled and developed for the instrument, an investigation into desired variable measurement of a single or mul-
multiple underlying construct(s) was warranted. A principal component analysis (PCA) was utilized to identify factors, using Version 17.0 of the SPSS for Windows, with a direct oblimin rotation (to account for factor correlations) (SPSS, 2007). Additionally, the scree test and Kaiser's criterion of retaining all factors with eigenvalues greater than 1 was used to determine the number of factors to retain (Cattell, 1966; Kaiser, 1960). The purpose of the PCA in the pilot study was only to make reliable generalizations of the measured variables to the sample, not to make inferences to an entire population (beyond the sample). Follow-up studies will be conducted for hypothesis testing and making population-based inferences. Additionally, the oblique rotation technique was chosen to account for correlation between factors. Alpha reliability coefficients were also calculated for the extracted factors (Cronbach, 1951).

Results
Sample Characteristics
An analysis of the pilot group demographics indicated that a majority of the sample was male (91.2%) (Table 1). Age of the participants ranged from 20 to 75 years old, with a majority between ages 24-42. Approximately 67% of participants were married, and over 96.3% were identified as Hispanic/Latino. Approximately 90% of the MSFWs claimed Mexico as their birthplace; Honduras accounted for approximately 8% of responses. Seventy-five percent of participants indicated they did not reside alone. Of that 75%, a majority (58.3%) reported living with at least 5 other individuals. Approximately 46% of the participants indicated having at least some high school education, with over 19% having post high school training. When asked how much work they conducted throughout the past year, a majority of respondents replied they worked either “most of the year” (32.7%) or “half of the year” (47.3%), with 75.4% citing work weeks of 40 or more hours. About two-thirds of the respondents had average monthly salaries of $1,000 or less, with 15.5% earning less than $500, 53.4% earning $501-$1000, and 31% earning over $1000. Approximately 49% of the sample had lived in the United States for less than two years, and over 80% indicated Spanish as their primary language.

PCA Results
Bartlett's test of sphericity was conducted to examine the correlation of variables. The result was statistically significant (p<.001), which indicated that use of factor analysis or PCA to analyze the data is appropriate. Using the PCA method, five factors were identified and explained 50.38% of the total variance. As mentioned previously, the eigenvalues (≤ 1.0) and scree test were used to confirm the factors to retain (Cattell, 1966). The PCA analysis indicated that a five-factor solution would best fit the data. The results of the PCA structure matrix with oblimin rotation are presented in Table 2. The structure matrix is interpreted to account for relationships between factors (Field, 2005). Sixty-seven items assessing stress, depression, coping and locus of control loaded on one of the five statistically extracted factors (F1 = Financial and Family Stress (20 items), F2 = Physical, Work, and Societal Stress (22 items), F3 = Stress due to Lack of Documentation and Resources (8 items), F4=Depression (12 items), F5 = Locus of Control (5 items), with a structure coefficient of at least .30, and were therefore retained. Eleven items, which are italicized in Table 2, produced a high percentage of missing data, and did not significantly load on any factor; therefore, these were excluded from the analysis. Fifteen items remained as demographic questions, and were not included in the PCA. Lastly, the two “check all that apply” coping behavior questions were analyzed based on the frequency of behavior selection by participants.

Reliability Measures
Cronbach’s alpha was assessed for the five extracted factors (Cronbach, 1951). Reliability measures were above the acceptable 0.70 alpha coefficient for Factors 1-4; however, Factor 5, the locus of control subscale, resulted in poor reliability measures (α=0.589) (see Table 3) (Gable & Wolf, 1993). Therefore, these items were deleted from the final instrument. Cronbach’s alpha was also assessed for each scale by eliminating one item at a time to see if reliability improved by deleting items; however, no deletion improved the alpha coefficient significantly (improvement fell between 0.0010 and 0.0162). Therefore, no additional items were deleted from the reliability analysis.

Stage 4 – A final check.
Methods
Finally, test developers should consult with a few people, who have had no part in instrument development, to check for any problems (Dillman, 2000). In the current study, two additional experts were asked to review the survey for problems with wording or content.

Results
The final check resulted in no additional changes or modifications to the instrument. Therefore, the instrument design framework and the statistical analyses yielded a 90-item instrument, as a result of the deletion of the locus of control items. The 11 items that yielded high percentages of missing data were kept in the final form, in order to retest these items in a larger sample. The final instrument mea-
Table 1. Demographic Characteristics of Sample

| Gender       | N   | Valid Percent | Year Living in the United States | N   | Valid Percent |
|--------------|-----|---------------|----------------------------------|-----|---------------|
| Male         | 52  | 91.2%         | Less than 1 year                 | 24  | 42.1%         |
| Female       | 5   | 8.8%          | 1-2 years                        | 4   | 7%            |
| Age          |     |               | 3-5 years                        | 7   | 12.3%         |
| 20-30        | 16  | 31.5%         | 6-10 years                       | 8   | 14%           |
| 31-40        | 14  | 27.0%         | More than 10 years               | 14  | 24.6%         |
| 41-50        | 15  | 29.6%         | Work in the Past Year            | N   |               |
| 51-60        | 3   | 5.9%          | All year                         | 6   | 10.9%         |
| 61-70        | 2   | 4.0%          | Most of the year                 | 18  | 32.7%         |
| Over 71      | 1   | 2.0%          | Half of the year                 | 26  | 47.3%         |
| Years in School |   |               |                                  |     |               |
| 0 to 4 years | 7   | 13.5%         | Daily Work Hours                 |     |               |
| 5 to 8 years | 16  | 30.8%         | 3-5 hours                        | 2   | 3.5%          |
| Some high school | 7  | 13.5%         | 6-8 hours                        | 12  | 21.1%         |
| Completed high school | 12 | 23.1%         | 8-10 hours                       | 24  | 42.1%         |
| Post high school | 9  | 19.1%         | More than 10 hours               | 19  | 33.3%         |
| Race/Ethnicity | N   |               | Salary                           |     |               |
| Hispanic/Latino | 52 | 96.3%         | Less than $500 per month         | 9   | 15.5%         |
| Other        | 1   | 3.7%          | $501 to $1000 per month          | 31  | 53.4%         |
| Birthplace   |     |               | $1001 to $2000 per month         | 18  | 31%           |
| Honduras     | 5   | 8.2%          |                                  |     |               |
| Mexico       | 54  | 90.1%         |                                  |     |               |
| El Salvador  | 1   | 1.7%          |                                  |     |               |

Table 2. Results of a Principal Component Analysis with Oblimin Rotation and Kaiser Normalization

| Survey Item                                                                 | F1  | F2  | F3  | F4  | F5  |
|------------------------------------------------------------------------------|-----|-----|-----|-----|-----|
| In the past six months, have you felt stressed because of painful injuries you suffered at work? | 0.56|     |     |     |     |
| In the past six months, have you felt stressed because of pain caused by your work? | 0.45|     |     |     |     |
| In the past six months, have you felt stressed because your work is too hard (i.e. physically demanding)? | 0.69|     |     |     |     |
| In the past six months, have you felt stressed because of how fast you had to work? | 0.37| 0.47|     |     |     |
| In the past six months, have you felt stressed because you had to work long hours? | 0.65|     |     |     |     |
| In the past six months, have you felt stressed because of the temperature in which you had to work (too hot or too cold)? | 0.45|     |     |     |     |
| In the past six months, have you felt stressed because of how tired you feel during work? | 0.70|     |     |     |     |
| In the past six months, have you felt stressed because your work requires you to stand all day? | 0.62|     |     |     |     |
| Survey Item                                                                 | F1 | F2 | F3 | F4 | F5 |
|----------------------------------------------------------------------------|----|----|----|----|----|
| In the past six months, have you felt stressed because of pain caused by   | 0.62 |
| household duties and/or activities?                                        |
| In the past six months, have you felt stressed because of how tired you    | 0.56 |
| feel while at home?                                                        |
| In the past six months, have you felt stressed because of not having        | 0.55 |
| enough work?                                                                |
| In the past six months, have you felt stressed because of unfair treatment  | 0.51 |
| at work?                                                                   |
| In the past six months, have you felt stressed because of pressure from     |     |
| your boss?                                                                 |
| In the past six months, have you felt stressed because of lack of money?    | 0.59 |
| In the past six months, have you felt stressed because of the current       | 0.61 |
| economic problems in this country?                                         |
| In the past six months, have you felt stressed because of medical bills?    | 0.40 |
| In the past six months, have you felt stressed that you won't get the       | 0.41 |
| medical help you need?                                                     |
| In the past six months, have you felt stressed because of sickness in your  |     |
| family?                                                                    |
| In the past six months, have you felt stressed because members of your      |     |
| family have issues that you cannot solve?                                  |
| In the past six months, have you felt stressed because of family           | 0.57 | 0.43 |
| responsibilities?                                                          |
| In the past six months, have you felt stressed about not being able to send |     |
| money back to your family in your home country?                            |
| In the past six months, have you felt stressed because of house work after | 0.74 |
| work?                                                                      |
| In the past six months, have you felt stressed because of childcare duties? | 0.61 |
| In the past six months, have you felt stressed because of problems with    |     |
| your children?                                                             |
| In the past six months, have you felt stressed because of problems with    |     |
| your spouse?                                                               |     |
| In the past six months, have you felt stressed because of lack of help with |     |
| household chores?                                                          | 0.46 | 0.45 |
| In the past six months, have you been stressed about where to leave your   | 0.65 |
| children while working?                                                    |
| In the past six months, have you felt stressed because your family lives    | 0.72 |
| far away or in another country?                                            |
| In the past six months, have you felt stressed because you are unable to    | 0.73 |
| see your family while working in this country?                             |
| In the past six months, have you felt stressed because there is a lack of   | 0.41 | 0.36 |
| communication in your household?                                           |
| In the past six months, have you felt stressed because of a lack of legal   |     |
| documentation to work in this country?                                     | 0.88 |
| In the past six months, have you felt stressed because you do not have a   |     |
| driver's license?                                                          | 0.88 |
| In the past six months, have you felt stressed because you do not have your|
| own transportation?                                                        | 0.62 |
| Survey Item | F1 | F2 | F3 | F4 | F5 |
|-------------|----|----|----|----|----|
| In the past six months, have you felt stressed because of the time spent going to and from work? | 0.50 |    |    |    |    |
| In the past six months, have you felt stressed because someone in your household has a drinking problem? | 0.48 |    |    |    |    |
| In the past six months, have you felt stressed because someone in your household has a drug problem? | 0.42 |    |    |    |    |
| In the past six months, have you felt stressed because someone in your household has a gambling problem? |    |    |    |    |    |
| In the past six months, have you felt stressed because you think you drink too much alcohol? |    |    |    |    |    |
| In the past six months, have you felt stressed because you think you use too many illegal drugs? |    |    |    |    |    |
| In the past six months, have you felt stressed because you think you gamble too much? |    |    |    |    |    |
| In the past six months, have you felt stressed because of violence in your household? |    |    |    |    |    |
| In the past six months, have you felt stressed because of unfair treatment in your community? | 0.456 |    |    |    |    |
| In the past six months, have you felt stressed because of unfair treatment in this country? | 0.41 |    |    |    |    |
| In the past six months, have you felt stressed because of crime in your community? | 0.44 |    |    |    |    |
| In the past six months, have you felt stressed because you have problems speaking English? | 0.56 | -0.43 |    |    |    |
| In the past six months, have you felt stressed that your job causes you health problems? | 0.55 |    |    |    |    |
| In the past six months, have you felt stressed because you do not enjoy your job? | 0.58 | 0.49 |    |    |    |
| In the past six months, have you felt stressed about not being able to make enough money for your family who lives with you? | 0.82 |    |    |    |    |
| In the past six months, have you felt stressed that you may be deported? | 0.90 |    |    |    |    |
| In the past six months, have you felt stressed that your family may forget the values of your culture? | 0.74 |    |    |    |    |
| In the past six months, have you felt stressed that your children may not have a chance for a better life? | 0.78 |    |    |    |    |
| In the past six months, have you felt stressed because your life at home is not getting better? | 0.43 |    |    |    |    |
| In the past six months, have you felt stressed because your life at work is not getting better? | 0.47 |    |    |    |    |
| In the past six months, have you felt stressed about getting sick and not being able to work? | 0.51 | -0.54 |    |    |    |
| In the past six months, have you felt stressed that you are unable to get the education that you need? | 0.62 |    |    |    |    |
| Over the past six months, how would you describe your level of stress in your personal life? | 0.79 |    |    |    |    |
| Over the past six months, how often have you had trouble coping with stress in your personal life? | 0.42 |    |    |    |    |
Survey Item                                                                                   F1   F2   F3   F4   F5
Over the past six months, how would you describe your level of stress in your work life?    0.59
Over the past six months, how often have you had trouble coping with stress in your work life? 0.46
My life is mostly controlled by accidental happenings.                                      0.55
What happens in my life is mostly determined by other people.                                0.52
God controls most of what happens in my life.                                                0.62
Evil spirits or curses can affect what happens in my life.                                    0.63
My own actions determine my life.                                                            0.46
What happens in my life is mostly controlled by other people.                                0.46
During the past six months, how often have you felt sad, depressed, or hopeless for 2 or more weeks at a time? 0.50
How often in the past six months have you felt sad, depressed, or hopeless due to health problems? 0.41
How often in the past six months have you felt sad, depressed, or hopeless due to living conditions? 0.41
How often during the past six months, have you felt sad, depressed, or hopeless?               0.42
How often in the past six months have you felt sad, depressed, or hopeless due to family problems? 0.40
How often in the past six months have you felt sad, depressed, or hopeless due to work problems? 0.40
How often in the past six months have you felt sad, depressed, or hopeless due to working conditions? 0.40
How often, during the past six months, have you had difficulty carrying out normal activities at home? 0.64
How often during the past six months, have you felt nothing can cheer you up?                  0.60
How often during the past six months, have you lost sleep because of feelings of sadness, depression, or hopelessness? 0.43
How often, during the past six months, have you had difficulty carrying out normal activities at work? 0.42

F1 = Financial, Family Stress (20 items), F2 = Physical, Work, Societal Stress (22 items), F3 = Lack of Documentation and Resources (8 items), F4 = Depression (12 items), F5 = Locus of Control (5 items)

| Scale                                               | Cronbach's alpha |
|-----------------------------------------------------|------------------|
| Financial and Family Stress                         | 0.915            |
| Physical, Work and Societal Stress                  | 0.912            |
| Stress due to Lack of Documentation and Resources   | 0.877            |
| Depression                                          | 0.904            |
| Locus of Control                                    | 0.589            |

Note: Locus of Control subscale was deleted from the final instrument, as the reliability measures were poor.
sures general stress, depression and coping behaviors, the five extracted factors, and demographic information for MSFWs in eastern North Carolina. Future studies are warranted to subject the final form of the instrument to additional model testing, with a larger, more representative sample of MSFWs.

DISCUSSION

The purpose of the study was to develop a culturally sensitive instrument to assess stress, depression and coping behaviors among MSFWs. To that end, the aforementioned instrument design framework was utilized to develop items to be pilot-tested with 60 MSFWs in eastern North Carolina. Factors associated with work-related, family-related, financial-related and societal-related stress and depression were identified, and mechanisms of coping with stress and depression were assessed. Collectively, the results provide researchers with an instrument that produced valid and reliable scores to items measuring the five extracted factors in the study sample; however, further testing of the model needs to be conducted, with a larger sample of MSFWs, to validate the subscales designed in this study. With that being said, the results of this study provide substantial background research for future studies in assessment of the underlying factors associated with these mental health issues in the MSFW population.

The study methodology highlighted and discovered the challenges that Grzywacz and colleagues identified in selecting instruments to collect data on the mental health of farmworkers, as 11 items in the original instrument, mostly measuring negative health behaviors as forms of stressors (alcohol use, gambling, violence, etc), resulted in high percentages of missing data (Grzywacz et al., 2008). Therefore, using such items to collect data on these behaviors, for this sample, may not prove to be the best data collection method with this group. In addition, selection bias due to the small sample size is a limitation to this pilot study. As mentioned previously, the results of this study should be tested with a larger, more representative sample. Lastly, response bias, particularly social desirability of MSFWs in the sample to answer the way in which they perceive appropriate, may play a role in the results. The desirability of this group to avoid reporting actual work-related stressors (as it relates to work conditions, treatment from boss, etc.) may have biased data, as MSFWs do not want to jeopardize their opportunity to continue working (Grzywacz et al., 2008). These realities warrant the question of which data collection method is most appropriate when working with MSFWs. The results of this study support the research findings of Grzywacz and colleagues that when assessing mental health issues in MSFW populations, researchers must be cautious in how data are collected and with what types of data collection tools (Grzywacz et al., 2008). Additional survey research is needed to examine item development and mental health construct measurement.

Notwithstanding the noted limitations of the current study, the resulting instrument contributes to the on-going research in assessment of mental health in MSFWs. In addition, the instrument incorporates the scale for coping behavior assessment, which begins to fill a void in the literature on coping mechanisms used by MSFWs. A key element of the instrument is that development was based on qualitative research, along with a comprehensive instrument design framework, in order to ensure the instrument was culturally appropriate. The researchers collaborated with additional experts, who work with the MSFW population on a regular basis, to ensure the survey was more than a stress or depression inventory instrument that was created for Caucasians and translated to Spanish; it was developed specifically for the MSFW population. With evidence indicating an elevated prevalence of mental health problems and psychiatric disorders in this population, more research needs to be conducted to identify and assess factors associated mental health, in order to provide needed resources to a population that is often forgotten by mainstream society.

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