

# Correlates and Predictors of Alcohol Consumption and Negative Consequences of Alcohol Use Among Latino Migrant Farmworkers in Nebraska

**Athena K. Ramos, Natalia Trinidad,  
and Antonia Correa**  
University of Nebraska Medical Center

**Gustavo Carlo**  
University of Missouri

Alcohol is a significant issue among the Latino farmworker population. This study used cross-sectional data from the Nebraska Migrant Farmworker Health Study, 2016 ( $N = 241$ ) to (1) describe drinking behavior, (2) evaluate associations between alcohol consumption and negative consequences from alcohol use and various social and demographic variables, and (3) assess contextual and interpersonal predictors of alcohol consumption and negative consequences from alcohol use. Descriptive, bivariate statistics and hierarchical multiple regression were used. Results indicated that over 30% of participants had engaged in heavy drinking in the last year. Alcohol consumption was significantly positively associated with negative consequences of alcohol use and significantly negatively associated with work safety climate and age. Negative consequences from alcohol use was significantly negatively associated with work safety climate. Significant predictors of alcohol consumption included work safety climate and age. Being married or in a relationship, alcohol consumption, and work safety climate were significant predictors of negative consequences from alcohol use. This study highlights the potential positive spillover effect of work safety climate on worker drinking behaviors. Implications and recommendations for agricultural employers, farmworker health advocates, and social service agencies are discussed.

## *Public Policy Relevance Statement*

Fostering positive work safety climate could reduce alcohol consumption and associated negative consequences among Latino migrant farmworkers. Engaging with agricultural employers to encourage regular safety training, change social norms related to alcohol, and improve health education may be critical elements to reducing hazardous drinking. Appropriate staffing, funding, and outreach are necessary to ensure adequate prevention and treatment services are available for the migrant farmworker population.

**A**lcohol abuse is a significant public health issue. In fact, alcohol is the third leading cause of preventable death in the United States (National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2018). Although drinking alcohol is often viewed as a social activity, it is associated with many health and social

problems including addiction, violence, crime, child abuse, and lost productivity (Seid, Hesse, & Bloomfield, 2016). Alcohol use can also be a major risk factor for vehicle accidents, injuries, serious health conditions, and premature death (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001; Daniel-Ulloa et al., 2014).

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Athena K. Ramos, Department of Health Promotion, University of Nebraska Medical Center; Natalia Trinidad and Antonia Correa, Center for Reducing Health Disparities, College of Public Health, University of Nebraska Medical Center; Gustavo Carlo, Department of Human Development and Family Science, University of Missouri.

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Correspondence concerning this article should be addressed to Athena K. Ramos, Center for Reducing Health Disparities, College of Public Health, University of Nebraska Medical Center, 984340 Nebraska Medical Center, Omaha, NE 68198-4340. E-mail: [aramos@unmc.edu](mailto:aramos@unmc.edu)

Patterns of alcohol use differ by gender, education, socioeconomic status, marital status, nativity, culture, and age. Nationally, alcohol use is more common among men, people with lower educational attainment, those who are single or divorced, and young people (Vaeth, Wang-Schweig, & Caetano, 2017). Among immigrants, alcohol use may be influenced by cultural norms from that person's country of origin (Sánchez, 2015; Vaeth et al., 2017) and their level of acculturation, a process of psychological and cultural adjustment resulting from direct contact with different groups or individuals (Birman & Simon, 2014, p. 207). Acculturation to mainstream U.S. culture is linked to increases in alcohol consumption (Arcury et al., 2016; Cherry & Rost, 2009; Galanti, 2003; Vaeth et al., 2017). In fact, based on a recent meta-analysis, acculturation among Hispanics was associated with being a drinker, drinking intensity, and hazardous alcohol use (Lui & Zamboanga, 2018). Although alcohol use is prevalent in the U.S., about 30% of the total adult population abstained during the past year (NIAAA, 2018).

### Alcohol Use and Latino Farmworkers

Over 70% of crop workers in the United States are foreign-born Latinos (U.S. Department of Labor, 2016). According to the U.S. Department of Labor (2017), a migrant farmworker is defined as "a seasonal farmworker who travels to the job site so that the farmworker is not reasonably able to return to his/her permanent residence within the same day." These farmworkers often work long hours in dangerous conditions while earning low wages, many without any type of benefits or job protections. They may be unauthorized to work in the United States and have limited English proficiency, thereby creating additional structural vulnerabilities (Ramos, 2017). Therefore, it is not surprising that many migrant farmworkers have high levels of stress, mental health concerns, and high rates of occupational injury (Ramos, Carlo, Grant, Trinidad, & Correa, 2016).

Alcohol abuse and dependence are significant public health issues among the Latino farmworker population in the U.S., affecting worker safety, productivity, and community life in migrant camps (Arcury et al., 2016). Even though farmworkers tend to have higher overall alcohol abstinence rates (Grzywacz, Quandt, Isom, & Arcury, 2007; Worby & Organista, 2007), those that do drink alcohol tend to have higher binge drinking rates (Grzywacz et al., 2007; Nielsen, 2000). For example, in North Carolina, nearly 50% of Latino farmworkers had engaged in heavy episodic drinking in the previous three months, and farmworkers were more than twice as likely to be at risk for alcohol dependence compared to non-farmworkers (Arcury et al., 2016). Alcohol is frequently used by workers to relax; build comradery; cope with stress, boredom, and other difficult circumstances; or to gain access to promotion opportunities to be able to move up the work hierarchy (Ornelas, Allen, Vaughan, Williams, & Negi, 2015; Worby & Organista, 2007). Supervisors also use alcohol as a reward or incentive for good performance (Worby & Organista, 2007). Although drinking usually decreases with age, research has shown that Latino workers are less likely to age out of drinking compared to non-Hispanic Whites (Nielsen, 2000).

Protective factors may decrease alcohol consumption among this population. For example, the collective nature and role of family support within Latino cultures may result in reduced risky

behaviors (Sánchez, 2015). Being married has been associated with lower alcohol consumption (Green, Freeborn, & Polen, 2001). Family support, a dimension of social support, has also been found to be important, particularly for men, in lowering alcohol use severity (Cano et al., 2018). Unfortunately, many Latino migrant farmworkers travel unaccompanied and may lack such family-based support (Sánchez, 2015). Therefore, exploring other types of social support, instead of just family-based support, may be necessary.

There are limited studies assessing alcohol use and its consequences among Latino immigrants and workers (Cano et al., 2018) and particularly those focused on Latino migrant farmworkers in the Midwest. Most existing studies are descriptive in nature and lack a theoretical foundation. Therefore, we adapted four theoretical frameworks to create a culturally focused, ecological model of worker health and safety. First, social ecology theory posits that various factors influence health outcomes including the characteristics of the individual and his or her cognitive interpretive processes, family and other relationships, work context, and the community (Bronfenbrenner, 1979). Second, Berry's model of acculturative stress proposes that acculturative stress is contingent on a number of moderating variables including characteristics of the receiving society, the acculturating group, modes of acculturation, and demographic, psychological, and social characteristics of the individual (Berry, Kim, Minde, & Mok, 1987). Third, according to Lazarus and Folkman's cognitive-based model, the relations among personality, environmental characteristics, and stress responses are linked to appraisal processes (Lazarus & Folkman, 1984). As such, anticipating losses tends to result in stronger negative emotional and physiological reactions, and anticipating gains tends to result in more positive reactions (Tomaka, Blascovich, Kelsey, & Leitten, 1993). Finally, patterns of interpersonal behavior and cultural values are developed through a process of socialization, and particularly important are the environmental cues in the settings where a person typically interacts, such as in the family or within the workplace, which may lead to adjustments in behavior (Whiting, 1980). For present study purposes, we selected specific aspects of the integrative model to provide a preliminary test of the model. Thus, we examined intrapersonal characteristics (age, sex, relationship status, nativity, acculturation), work context (work safety climate), culture-related values (traditional machismo), and social context (social support) as predictors of alcohol consumption of farmworkers.

Although the relationship between some demographic characteristics of farmworkers and alcohol has been studied, the relationships among intrapersonal characteristics, safety climate, and predictors of alcohol consumption and associated negative consequences from alcohol use have not. This represents a significant gap in the farmworker health literature. Therefore, in this study we explore not only some of the demographic characteristics of study participants, but also their work and social context and intrapersonal variables that may be related to alcohol use among this worker population.

### Machismo

Machismo is a dynamic concept that is shaped and transformed through how one experiences and embodies identity as well as through interactions with others (Chávez & Altman, 2017; Stergiou-Kita, Lafrance, Pritlove, & Power, 2017). Endorsement of masculine ideologies such as machismo may differ by culture,

ethnicity, and age (Courtenay, 2000; Levant et al., 2003). For example, machismo is considered part of a traditional male gender role in many Latino cultures. Men are to act tough, be emotionally detached, financially support their family, and “act like men” (Galanti, 2003). In return for a man fulfilling his obligations, he is entitled to obedience and respect from his spouse and children (Panitz, McConchie, Sauber, & Fonseca, 1983).

Machismo has been portrayed in the literature as at least a two-dimensional construct (Arciniega, Anderson, Tovar-Blank, & Tracey, 2008; Torres, Solberg, & Carlstrom, 2002). Although two dimensions are described below, machismo may in fact be multi-dimensional and thought of as a continuum from positive to negative. Individuals may also embrace both positive and negative elements of machismo concurrently, thereby not ascribing to either exclusively positive or negative traits (Torres et al., 2002). The two dimensions of machismo described by Arciniega et al. (2008) consist of traditional machismo and caballerismo. Traditional machismo (hegemonic masculinity) is typically viewed as a negative trait within the literature, and it has been positively associated with fights, arrests, alcohol abuse, and alexithymia, and negatively associated with other group orientation (Arciniega et al., 2008). The relationship between alexithymia and machismo may be due in part to the socialization of males in Latino cultures (Levant et al., 2003). Traditional machismo may affect decision making and risk assessment, and increase the potential for mental health concerns and participation in risky behaviors (Chávez & Altman, 2017; Courtenay, 2000). As such, cultural values like traditional machismo may reinforce or encourage drinking (Panitz et al., 1983; Seid et al., 2016), particularly among men (Chávez & Altman, 2017; Seid et al., 2016; Stergiou-Kita et al., 2017). Higher levels of traditional machismo have been associated with fewer help-seeking behaviors (Chávez & Altman, 2017). On the other hand, caballerismo or chivalry has been portrayed as a positive trait and is associated with emotional connectedness, responsibility, other group orientation, self-esteem, and problem solving (Arciniega et al., 2008; Ojeda & Piña-Watson, 2014).

## Work Safety Climate

Workplaces are complex human systems, and understanding an individual's assessment of social organizational factors that affect their behaviors is important. Work safety climate, the shared perceptions regarding safety policies, procedures, and practices and the relative priority of safety in relation to other competing priorities (Zohar, 2014), can have a positive effect on worker health and safety (Arcury, O'Hara, et al., 2012; Gillen, Baltz, Gassel, Kirsch, & Vaccaro, 2002). Work safety climate has at least two factors: (1) management's commitment to safety and (2) employee engagement in safety (Gillen et al., 2002). Safety climate has been consistently positively associated with engaging in safety behaviors on the job (Arcury, Mills, et al., 2012; Toppazzini & Konrad Wiener, 2017; Zohar, 2014). According to Toppazzini and Konrad Wiener (2017), “By creating and promoting a safety climate within an organization, employers are sending implicit and explicit messages to employees regarding their expectations related to safety behavior” (p. 10). Most workers tend to develop reasonable patterns of behavior in response to such expectations (Zohar, 2014).

However, it is unclear if work safety climate may have an effect outside of the work environment by changing a worker's perceptions about safety, risk, and socially acceptable norms of behavior. Arcury, O'Hara, et al. (2012) found that safety climate among Latino migrant farmworkers in North Carolina was poor and was associated with working while injured, a decision that puts the worker at additional risk and has consequences not just at work, but also in a worker's personal life (Arcury, O'Hara, et al., 2012). Therefore, it is plausible that work safety climate could affect farmworkers' behaviors both on and off the job. In a recent study with construction workers, safety climate was significantly positively related to life spillover, and demonstrating management's commitment to safety was particularly important to such spillover (Wu, Yin, Wu, & Luo, 2017). Few studies have assessed work safety climate among Latino migrant farmworkers, and no studies to our knowledge have explored its potential spillover effects outside of the work environment with this population.

## Social Support

Social support and the perception of social support has been found to have protective health benefits (Held, 2018; Panchang, Dowdy, Kimbro, & Gorman, 2016) and be an important predictor of health and well-being (Held, 2018). The term “social support” refers to a network of family, friends, and other community members that is available to help a person. Social support may differ by type and function (e.g., emotional, instrumental, or informational; Green et al., 2001) and can be found in many different environments including the workplace. Social support may buffer stress by helping individuals to cope more effectively, thereby reducing the use of negative coping strategies such as drinking (Cano et al., 2017; Cooke, Dahdah, Norman, & French, 2016). Health behavior theories also suggest that social support may be useful for changing subjective norms related to alcohol consumption (Cooke et al., 2016). Generally, higher levels of social support have been associated with lower alcohol consumption (Cano et al., 2017; Cano et al., 2018; Held, 2018). For example, Kissinger et al. (2013) found that membership in an organization or club decreased the odds of binge drinking among Latino migrant men. Membership was protective because it provided a sense of belonging and support, especially in the physical absence of family or friends (Kissinger et al., 2013). Cano et al. (2017) found that social support mitigated the negative effects of immigration stress on alcohol use severity. Social support has also been found to reduce the negative influence of traditional machismo on health behaviors (Cano et al., 2018).

## Purpose

This article adds to the emerging literature on farmworker alcohol use as well as expands on risk and protective factors associated with farmworker health behaviors. To that end, the current study had three aims: (1) to describe drinking behavior among this population, (2) to evaluate associations between alcohol consumption and negative consequences from alcohol use and various social and demographic variables, and (3) to assess contextual and intrapersonal predictors of alcohol consumption and negative consequences from alcohol use. We hypothesized the following:

(H1:) Men would report consuming alcohol more frequently and having more negative consequences from alcohol use than women.

(H2:) Alcohol consumption and negative consequences from alcohol use would be positively associated with being male, traditional machismo, and acculturation (risk factors) and negatively associated with being an immigrant, work safety climate, and social support (protective factors).

(H3:) Traditional machismo (risk factor), work safety climate (protective factor), and social support (protective factor) would be significant predictors of alcohol consumption and negative consequences from alcohol use.

## Method

The present study draws on data collected through the Nebraska Migrant Farmworker Health Study, 2016 (Ramos, 2017), which sought to describe demographic, occupational, health, and social characteristics of migrant farmworkers in Nebraska and assess the impact of identified risk and protective factors on health outcomes, one of which was related to alcohol (Ramos, 2017).

## Participants

A total of 241 individuals participated in the Nebraska Migrant Farmworker Health Study, 2016 (Ramos, 2017). To be eligible to participate in this study, a person had to be of Hispanic/Latino descent, be at least 19 years of age or older (the legal age of majority in the state of Nebraska), and currently be employed as a migrant farmworker in Nebraska.

## Procedures

The Nebraska Migrant Farmworker Health Study, 2016, employed a cross-sectional design using convenience sampling procedures. Research team members conducted oral interviews with farmworkers after working hours at farmworker camps throughout Nebraska between July and September 2016. Informed consent was obtained from each participant before starting the interview. All interviewers were bilingual and bicultural; therefore, participants could choose to be interviewed in their preferred language, English or Spanish. Only 21 participants (8.7%) chose to be interviewed in English. Interviews were based on a standard questionnaire that consisted of valid and reliable measures. The questionnaire was developed in English; however, standard Spanish translations that had been previously validated for use with Latinos were used for all measures in this analysis. Research team members read each question to participants and marked the appropriate responses on the questionnaire. The study was approved by the University of Nebraska Medical Center's Institutional Review Board (IRB # 436-16-EX), and participants were given \$20 cash for their time (Ramos, 2017).

## Measures

**Alcohol.** Alcohol use was measured with the Alcohol Use Disorders Identification Test (AUDIT), which is a 10-item screen-

ing tool that assesses hazardous or risky drinking, harmful patterns of alcohol use, and symptoms of dependence (Babor et al., 2001). The first 3 questions, "How often do you have a drink containing alcohol?" (frequency), "How many drinks containing alcohol do you have on a typical day when you are drinking?" (quantity), and "How often do you have six or more drinks on one occasion?" (frequency of heavy drinking), comprise the AUDIT-C, which was used to determine alcohol consumption. Items were scored on a 0 (no or low alcohol consumption) to 4 (frequent and high alcohol consumption) scale. Item scores were summed, and cutoff scores of 3 for women or 4 for men were used to indicate that the individual met the threshold for hazardous or harmful drinking (Bush, Kivlahan, McDonell, Fihn, & Bradley, 1998). The AUDIT-C had adequate reliability in this sample,  $\alpha = .73$ . The remaining 7 items were used to indicate negative drinking consequences. Sample items included, "How often during the last year have you found that you were not able to stop drinking once you had started?" "How often during the last year have you failed to do what was normally expected from you because of drinking?" and "Have you or someone else been injured as a result of your drinking?" Again, item scores were summed. Higher scores indicated a greater likelihood of alcohol-related problems. The negative drinking consequences scale had adequate reliability in this sample,  $\alpha = .65$ . This separation between assessing alcohol consumption and negative drinking consequences is consistent with current approaches (Kaya, Iwamoto, Grivel, Clinton, & Brady, 2016; Mallett et al., 2017).

**Traditional machismo.** Traditional machismo was measured with the Traditional Machismo subscale from Arciniega et al. (2008). This scale consists of 10 items that measured negative aspects of machismo, including hypermasculinity, aggressiveness, and paternalism. Sample items included, "It is important to not be the weakest man in the group" and "Real men never let down their guard." The items were scored on a 7-point Likert-type scale from very strongly disagree (1) to very strongly agree (7). Higher scores indicated a higher level of machismo. Scores ranged between 10 and 66,  $M = 28.6$ ,  $SD = 12.1$ . The scale had excellent reliability in this sample,  $\alpha = .90$ .

**Work safety climate.** Work safety climate was assessed using a modified version of Gillen's Safety Climate Measure (Gillen et al., 2002), which consisted of 9 items that addressed management's perceived commitment to safety and workers' involvement in safety. Sample items included, "Worker's safety practices are very important to management" and "Employer has regular safety meetings/talks." Items were scored on a Likert-type scale from strongly disagree (0) to strongly agree (3). Higher values indicated a perceived stronger safety climate. Scores ranged between 9 and 35,  $M = 29.0$ ,  $SD = 5.1$ . The scale had excellent reliability in this sample,  $\alpha = .93$ .

**Social support.** Social support was measured using the 12-item Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet, & Farley, 1988). Sample items included, "I get the emotional help and support I need from my family" and "I can count on my friends when things go wrong." Items were scored on a 7-point Likert-type scale from very strongly disagree (1) to very strongly agree (7). Higher scores suggested greater



levels of perceived social support (Edwards, 2004). Scores ranged between 16 and 84,  $M = 71.7$ ,  $SD = 12.2$ . The scale had good reliability in this sample,  $\alpha = .87$ .

**Demographic covariates.** Demographic variables included sex (female = 0, male = 1), age (continuous variable), years working in agriculture (continuous variable), and nativity (nonimmigrant/born in the U.S. = 0, immigrant/born outside of the U.S. = 1). Being married or currently being in a relationship was coded as 1 and not being in a relationship, being divorced or separated, or any other response was coded as 0. Education was an ordinal variable and response options included never attended school, completed Grades 1–8, completed some high school, high school graduate or completed GED, some college or technical school, and college graduate. Finally, because research has shown that acculturation may negatively affect immigrants' health status and increase risky behaviors (i.e., Healthy Immigrant Paradox or Hispanic Paradox), acculturation was assessed using the Brief Acculturation Scale for Hispanics (BASH), a 4-item language-based measure of acculturation (Norris, Ford, & Bova, 1996). The items addressed the primary language that a person reads and speaks, speaks at home, and speaks with friends, and in what language the person usually thinks. Response options included (1) Spanish only, (2) more Spanish than English, (3) both equally, (4) more English than Spanish, and (5) only English. Items were summed, and higher scores indicated a greater level of acculturation. Scores were also dichotomized into high acculturation (scores  $> 3$ ) and low acculturation (scores  $\leq 3$ ). The BASH had excellent reliability in this sample,  $\alpha = .93$ .

## Data Analysis

This analysis used descriptive statistics to report demographic and drinking-related behavior among this population. A maximum likelihood chi-square test was used to assess significant associations between each of the AUDIT-C questions and sex. A non-parametric Wilcoxon's Rank-Sum test was used to assess the relationship between sex and the AUDIT-C scale and the negative consequences from alcohol use variable, because the sample size was not balanced and the assumptions of the  $t$  test were not met. Because so few female workers met the threshold for hazardous or harmful drinking on the AUDIT-C, they were dropped from any further analysis. Bivariate correlations were used to assess associations among alcohol consumption (AUDIT-C), negative consequences from alcohol use (AUDIT questions #4–10), and social and demographic variables including traditional machismo, work safety climate, social support, age, years worked in agriculture, nativity, relationship status, education, and acculturation among male workers. Hierarchical multiple regression was used to predict alcohol consumption and negative consequences from alcohol use. Two models were developed using the total scores of the AUDIT-C and the negative consequences from alcohol use variable as the outcome variables. For the AUDIT-C model, the demographic covariates were entered in the first step, and traditional machismo, work safety climate, and social support were entered in the second step. Finally, the interaction work safety climate  $\times$  traditional machismo and the interaction work safety climate  $\times$  social support were entered in the third step. For the negative consequences from alcohol use model, the demographic

covariates were entered in the first step, and alcohol consumption was entered in the second step. Traditional machismo, work safety climate, and social support were entered in the third step. Finally, the interaction work safety climate  $\times$  traditional machismo and the interaction work safety climate  $\times$  social support were entered in the fourth step.

## Results

Of the 241 migrant farmworkers who participated in the Nebraska Migrant Farmworker Health Study, 2016, the sample was mainly male (78.8%), immigrants (83.8%), from Mexico (81.3%), who were married or in a relationship (70.7%), and who had limited English proficiency (79.7%). The mean age of participants was 36.4 years old, and more than 70% had not completed a high school education. Most participants had household incomes of less than \$25,000 per year and had worked as migrant farmworkers for more than 5 years.

Nearly half of participants had drunk alcohol during the last year, and over 31% had engaged in heavy drinking. On average participants had a total score of 2.3 ( $SD = 2.6$ ) on the AUDIT-C, but scores ranged between 0 and 9 out of a maximum of 12. There were significant differences in frequency of drinking and heavy drinking, AUDIT-C score, and negative consequences from alcohol use scale between males and females. Hazardous drinking (AUDIT-C score of 4 or above for males and 3 or above for females) was found among 33.3% of participants, and 65 men (38.2%) and 4 women (10.8%) met these criteria. Nearly 85% of females and 41% of males abstained from alcohol during the past year (see Table 1).

Correlations indicated that the AUDIT-C was significantly associated with negative consequences from alcohol use,  $r = .56$ ,  $p < .01$ , work safety climate,  $r = -.22$ ,  $p < .01$ , and age,  $r = -.20$ ,  $p < .01$ , among male workers. Negative consequences from alcohol use were significantly associated with the AUDIT-C and work safety climate,  $r = -.32$ ,  $p < .01$ . Traditional machismo was also significantly associated with work safety climate,  $r = -.29$ ,  $p < .01$ , and social support was significantly associated with work safety climate,  $r = .16$ ,  $p < .05$ .

Two hierarchical multiple regression models were used to predict alcohol consumption (Model 1) and negative consequences from alcohol use (Model 2). Demographic covariates entered in Step 1 of each model were not significant. For Model 1, steps 2 and 3 were significant. Both age and work safety climate were significant predictors of alcohol consumption, but social support, work safety climate  $\times$  traditional machismo, and work safety climate  $\times$  social support were not (see Table 2). For Model 2, steps 2–4 were significant. Being married or in a relationship, alcohol consumption, and work safety climate were significant predictors of negative consequences from alcohol use. Both being married or in a relationship and work safety climate were protective against negative consequences from alcohol use. Work safety climate was significant above and beyond alcohol consumption and increased the total explained variance from 34.6% to 38.7% (see Table 3).

## Discussion

Few studies have explored alcohol use among Latino migrant farmworkers, particularly among those in the Midwest. This was

**Table 1.** *Alcohol Use Indicators of Sample*

Variable	Total		Males		Females	
	<i>N</i> (%)	Mean ( <i>SD</i> )	<i>N</i> (%)	Mean ( <i>SD</i> )	<i>N</i> (%)	Mean ( <i>SD</i> )
Frequency of Drinking*						
Never	121 (50.2)		78 (41.1)		43 (84.3)	
Monthly or Less	55 (22.8)		49 (25.8)		6 (11.8)	
2–4 Times a Month	36 (14.9)		34 (17.9)		2 (3.9)	
2–3 Times a Week	17 (7.1)		17 (8.9)		0 (.0)	
4 or More Times a Week	12 (5.0)		12 (6.3)		0 (.0)	
Typical Quantity Drank (on a typical drinking day)						
Less than 5 drinks	168 (80.3)		133 (78.2)		35 (89.7)	
5–9 Drinks	30 (14.4)		26 (15.3)		4 (10.3)	
10 or More Drinks	11 (5.3)		11 (6.5)		0 (.0)	
Frequency of Heavy Drinking*						
Never	160 (68.7)		117 (62.6)		43 (93.5)	
Less than Monthly	46 (19.7)		43 (23.0)		3 (6.5)	
Monthly	17 (7.3)		17 (9.1)		0 (.0)	
Weekly	10 (4.3)		10 (5.3)		0 (.0)	
AUDIT-C Score (AUDIT Questions 1–3)*		2.3 (2.6)		2.7 (2.6)		.6 (1.4)
Positive AUDIT-C* (Score of 4 or more for males; 3 or more for females)	69 (33.3)		65 (38.2)		4 (10.8)	
Negative Consequences from Alcohol* (AUDIT Questions 4–10)		.9 (2.0)		1.1 (2.2)		.0 (.2)

*Note.* For AUDIT-C calculations, valid male responses = 170 and valid female responses = 37. For Negative Consequences from Alcohol Use calculations, valid male responses = 179 and valid female responses = 41.

\* Statistically significant difference between males and females.

the first study to assess alcohol consumption and negative consequences of alcohol use as distinct outcomes among migrant farmworkers. Our results indicated that more than half of participants abstained from alcohol, which is a higher abstinence rate than what others have found among Latino migrant workers (Sánchez, 2015). Hypothesis 1 was supported. Consistent with previous literature, female farmworkers were much less likely to drink alcohol than males (Cano et al., 2017; Green et al., 2001). The females that did drink consumed alcohol less frequently, which may point to a protective behavior expectation of Latina women (Ricciardelli, Connor, Williams, & Young, 2001) and a gendering of drinking behavior (Lebreton, Peralta, Allen-Collinson, Chervenak Wiley, &

Routier, 2017) based on a patriarchal social system. Unfortunately, hazardous drinking among this sample of migrant farmworkers was nearly five times the rate found in the general population in Nebraska, 33.3% compared to 6.8% (Substance Abuse and Mental Health Services Administration, 2017). Alcohol consumption and negative consequences from alcohol use were positively associated with being male and negatively associated with work safety climate; however, contrary to other studies, there was not a significant association between traditional machismo, acculturation, social support, or nativity (Cano et al., 2017; Daniel-Ulloa et al., 2014; Lui & Zamboanga, 2018; Sánchez, 2015). Therefore, hypothesis 2 was only partially supported. This study found a poten-

**Table 2.** *Multiple Hierarchical Regression Model Predicting Alcohol Consumption*

Variables	Step 1				Step 2				Step 3			
	<i>B</i>	<i>SE B</i>	$\beta$	95% CI	<i>B</i>	<i>SE B</i>	$\beta$	95% CI	<i>B</i>	<i>SE B</i>	$\beta$	95% CI
Age	-.05	.02	-.25*	[-.09, -.001]	-.05	.02	-.24*	[-.09, -.01]	-.05	.02	-.24*	[-.09, -.01]
Years worked in agriculture	-.01	.02	-.04	[-.06, .04]	-.01	.02	-.06	[-.06, .03]	-.02	.02	-.07	[-.06, .03]
Immigrant	-.19	1.01	-.02	[-2.18, 1.80]	-.45	1.01	-.06	[-2.45, 1.55]	-.31	1.02	-.04	[-2.32, 1.69]
Married or in a relationship	.19	.50	.03	[-.79, 1.17]	.27	.49	.04	[-.69, 1.23]	.26	.48	.04	[-.70, 1.22]
Education	-.35	.25	-.12	[-.84, .15]	-.46	.25	-.17	[-.97, .04]	-.40	.26	-.14	[-.91, .11]
Acculturation	-.06	.47	-.02	[-.99, .87]	-.07	.47	-.02	[-.99, .86]	-.16	.47	-.04	[-1.09, .77]
Traditional machismo					-.02	.02	-.09	[-.06, .02]	-.02	.02	-.07	[-.05, .02]
Work safety climate					-.14	.05	-.26**	[-.23, -.05]	-.12	.05	-.21*	[-.21, -.02]
Social support					.12	.26	.04	[-.40, .64]	-.02	.29	-.01	[-.58, .55]
Work Safety Climate $\times$ Machismo									-.01	.00	-.12	[-.01, .00]
Work Safety Climate $\times$ Social Support									-.04	.06	-.06	[.15, .07]
Constant	5.39	1.63		[2.18, 8.60]	5.87	1.64		[2.62, 9.11]	5.69	1.66		[2.42, 8.96]
<i>R</i> <sup>2</sup>			.06				.12				.14	
<i>F</i>			1.67				2.27*				2.15*	

\*  $p < .05$ . \*\*  $p < .01$ .

**Table 3.** Multiple Hierarchical Regression Model Predicting Negative Consequences From Alcohol Use

Variables	Step 1				Step 2				Step 3				Step 4			
	B	SE	B	95% CI	B	SE	B	95% CI	B	SE	B	95% CI	B	SE	B	95% CI
Age	-.02	.02	-.10	[-.06, .02]	.01	.02	.07	[-.02, .04]	.01	.02	.04	[-.02, .04]	.01	.02	.04	[-.03, .04]
Years worked in agriculture	-.02	.02	-.09	[-.06, .02]	-.02	.02	-.09	[-.05, .02]	-.02	.02	-.09	[-.05, .02]	-.02	.02	-.09	[-.05, .02]
Immigrant	.61	.89	.08	[-1.15, 2.38]	.61	.75	.08	[-.87, 2.09]	.81	.76	.11	[-.68, 2.31]	.86	.76	.12	[-.65, 2.36]
Married or in a relationship	-.77	.44	-.14	[-.68, .20]	-.87	.37	-.16*	[-1.60, -.13]	-.80	.36	-.15*	[-1.52, -.08]	-.80	.37	-.15*	[-1.52, -.07]
Education	-.24	.22	-.10	[-.35, .14]	-.07	.19	-.03	[-.44, .30]	-.08	.19	-.03	[-.46, .30]	-.06	.20	-.02	[-.45, .33]
Acculturation	.53	.45	.14	[-.35, 1.41]	.38	.37	.10	[-.36, 1.12]	.50	.37	.13	[-.24, 1.24]	.47	.38	.12	[-.27, 1.22]
AUDIT-C					.49	.06	.56***	[-.37, .62]	.45	.06	.51***	[-.33, .57]	.44	.06	.50***	[-.32, .57]
Traditional machismo									.01	.01	.07	[-.02, .04]	.02	.02	.08	[-.01, .05]
Work safety climate									-.09	.04	-.18*	[-.16, -.02]	-.08	.04	-.16*	[-.15, -.00]
Social support									-.02	.20	-.01	[-.42, .39]	-.07	.23	-.02	[-.52, .38]
Work Safety Climate × Machismo													.00	.00	-.04	[-.01, .00]
Work Safety Climate × Social Support													-.02	.04	-.03	[-.10, .07]
Constant	1.92	1.45		[-.95, 4.78]	-.57	1.25		[-3.05, 1.91]	-.70	1.29		[-3.24, 1.85]	-.71	1.30		[-3.23, 1.86]
R <sup>2</sup>			.06				.35				.39				.39	
F			1.64				11.24***				9.20***				7.64***	

\*  $p < .05$ . \*\*\*  $p < .001$ .

tial protective spillover effect of work safety climate on both alcohol consumption and negative consequences from alcohol use. This may be in part because of the normative value of safety to which workers have been socialized within the work environment. We did not find traditional machismo or social support to be significant predictors in either model, so hypothesis 3 was only partially supported. Overall, the findings are consistent with a culturally sensitive, ecological model of farmworkers' adjustment and helps better understand alcohol consumption patterns among Latino migrant farmworkers.

Social environments can instigate and perpetuate drinking behavior. Although this study included both women and men in similar circumstances, their patterns of use were quite different. Men were more frequent drinkers and were likely to drink greater quantities. Among male farmworkers, alcohol can oftentimes be a way to bond with other men (Chávez & Altman, 2017; Stergiou-Kita et al., 2017). Male farmworkers, particularly when only men live together in a camp, may develop a "drinking culture" based on the uniting factor of hegemonic masculinity, whereby many social and recreational activities revolve around the use of alcohol (Worby & Organista, 2007). Based on our observations at farmworker camps during outreach, many farmworkers gather together after work to eat, relax, and talk, oftentimes accompanied by alcohol. As a reward for a job well done, a supervisor might buy a case of beer for the workers to share. Changing these social norms around drinking and promoting healthier incentive structures that do not use alcohol as a reward may decrease alcohol consumption (Lebreton et al., 2017).

Given the globalized labor market, farmworkers may be motivated to engage in risk-taking behaviors to prove themselves to their supervisor or employer in an effort to maintain their employment (Arcury, O'Hara, et al., 2012; Stergiou-Kita et al., 2017). The results of this study indicate that a positive work safety climate may reduce alcohol consumption and the associated negative consequences among migrant farmworkers, thus indicating a potential positive spillover effect. Creating an environment where workers feel valued and empowered by management and their immediate supervisors may have benefits outside of the work environment. Therefore, training agricultural employers about safety, how to develop safety culture, and human resources management techniques could be important steps to fostering a positive work safety climate (Arcury, O'Hara, et al., 2012). As a result, such actions may improve farmworker health and reduce alcohol use among this population. Farmworker advocates should try to engage with agricultural employers to promote health and safety training at the workplace, to develop alcohol-free worksite policies, and to increase opportunities for culturally and linguistically appropriate substance use education for farmworkers.

Farmworker health advocates and social service providers need to better understand the subcultural aspects of alcohol use and abuse among this population and what workers may perceive are the benefits of alcohol use such as job-related rewards and promotion opportunities, bonding with other workers, and being regularly accepted as part of family or community celebrations (Worby & Organista, 2007). Understanding intrapersonal cognitive processes such as these may aid in developing appropriate evidence-based interventions. With such information, social service and health outreach workers would be equipped to implement alcohol education and intervention programs with farmworkers.

Because Latino men often have limited knowledge about what is unhealthy drinking, they may be unsure about what actions to take to change their behavior (Ornelas et al., 2015). Therefore, gender-specific, culturally, linguistically, and literacy-appropriate health education materials and programs are warranted (Arcury et al., 2016).

Latino migrant farmworkers are a structurally vulnerable group of workers (Arcury et al., 2016). Because many workers are undocumented, they may believe that they do not have any rights or protections. They may be culturally, linguistically, emotionally, and physically isolated. They may lack access to health care services and limit help-seeking behaviors, especially relating to issues that may induce stigma or negatively affect one's pride such as alcohol abuse. Rural communities, especially those in nontraditional settlement areas, should explore opportunities to integrate farmworkers into community life by developing systems that enhance access to health and social information, appropriate services, and relevant community resources (Ramos, 2016).

These results should be interpreted with caution as there are some limitations to note. First, the study was cross-sectional and represents only a snapshot in time; therefore, it is not possible to determine causality or direction of effects. For example, it might be that alcohol consumption impacts work safety climate rather than work safety climate affecting alcohol consumption, or there may be bidirectional effects. Future research is needed using more rigorous study designs (e.g., longitudinal studies, intervention studies) to better inform causality and directionality. Next, this study only assessed traditional machismo and not caballerismo; therefore, we are unable to determine the full dynamic construction of machismo and its role on alcohol consumption and related negative consequences. Farmworkers in Nebraska may not be representative of farmworkers in other areas of the United States or representative of other Latino migrant workers. Because there were few female participants, it was only possible to describe their alcohol consumption patterns. Data were based on self-reports, and there is the possibility that some workers may have responded in a socially desirable manner. However, other studies have found that self-reports have approximated actual biological reports of alcohol consumption (Simons, Wills, Emery, & Marks, 2015). Additionally, this study used the AUDIT standard questionnaire, which has been shown to have a lower sensitivity among Latino populations than other alcohol screening tools such as the Rapid Alcohol Problem Screen 4 – Quantity/Frequency (Cherry & Rost, 2009). Although there are some limitations associated with this study, we believe that it also had important strengths to note including the use of validated measures, face-to-face interviews with workers to verify understanding of the questions, and a sufficient sample size.

This study fills a void in the literature about alcohol use among Latino migrant farmworkers in the Midwest. It evaluated associations between alcohol consumption and negative consequences from alcohol use and documented that alcohol abuse is an important public health issue to address, particularly among male farmworkers. The findings are in accord with integrative ecocultural models that highlight the roles of personal (e.g., age, sex, relationship status) and social contextual (e.g., work safety climate) characteristics as correlates of behavioral outcomes among farmworkers. Although much more research is needed to examine other predictors (e.g., community characteristics, cultural stress, coping)

of health outcomes in farmworkers and to further examine the roles of culture-related factors (e.g., nativity, machismo, acculturative status), these preliminary findings provide an avenue for future research with this understudied population.

Importantly, the findings suggest that a strong work safety climate could be protective in reducing both consumption and negative consequences from alcohol use—indicating a spillover effect from work safety climate on workers' behaviors outside of the work environment. Indeed, there are opportunities to reduce alcohol consumption and related negative consequences among farmworkers such as by working with agricultural employers, farmworker health advocates, and social service agencies to change social and cultural norms related to drinking.

Future research should use objective measures of work safety climate and assess differences between objective measures and subjective worker reports. Research should explore how different types of machismo interact with work safety climate to affect alcohol consumption and its consequences on the lives of farmworkers. Lastly, studies assessing the role of caballerismo on alcohol use frequency and severity are also warranted.

**Keywords:** farmworker; Latino/Hispanic; alcohol; safety climate; spillover

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