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A Preliminary Analysis of Project Ag Aware: SBIRT in Agricultural Work Settings

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Epidemiology

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Abstract

Background: An increasing number of individuals are being negatively affected by substance abuse in the U.S. and Nebraska communities. These communities are seeing immense increases in opioid prescribing rates, especially in rural areas. The aims of this study are to 1) describe the study population of agricultural workers in Nebraska; 2) estimate the prevalence of alcohol misuse, illegal drug use, and anxiety among agricultural workers in Nebraska; and 3) examine factors associated with alcohol misuse among agricultural workers in Nebraska.

Methods: Adult agricultural workers (N=1,206) completed a paper or online survey for Project Ag Aware. Alcohol misuse, illegal drug use, and anxiety were measured with the English-language survey that included the Alcohol Use Disorder Identification Test (AUDIT), the Drug Abuse Screening Test-1 (DAST-1), and the Generalized Anxiety Disorder Screener (GAD-2). Multivariable logistic regression was used to examine factors associated with alcohol misuse.

Results: Respondents were primarily white (91.7%), married (78.3%), male (75.3%), age 65+ (45.4%), and classified as direct agricultural workers (62.3%). The prevalence of opioid use, alcohol misuse, and anxiety were 1.8%, 6.4%, and 14.2%, respectively. Those aged 19-39 had the highest prevalence for all outcomes (GAD 29.2%, AUDIT 25.0%, and DAST 20.8%). Finally, significant risk factors for alcohol misuse were gender ($p=0.05$), age group ($p<0.001$), and GAD ($p=0.001$).

Conclusion: Age group, gender, and prevalence of anxiety are all important risk factors that should be considered. Future work should monitor trends associated with substance misuse and anxiety among the agricultural community.

Chapter 1 – Introduction

Problem Statement

A growing number of individuals are affected by opioids and substance use in the U.S. In 2018, nearly 20.3 million U.S. residents age 12 and older had a substance use disorder that was related to alcohol or illicit drug use in the past year (Substance Abuse and Mental Health Services Administration, 2019). The United States Department of Agriculture (USDA) reported increased mortality rates among working-age rural adults related to prescription drug misuse and heroin abuse (USDA, 2017). Such trends call for rapid community-based action. Therefore, in an effort to combat the current substance abuse crisis, the overall goal of this project is to provide knowledge and awareness of substance misuse to help enhance rural citizens' health and well-being through the analysis of survey data collected from agricultural workers in Nebraska.

Specific Aims

Aim #1: Describe the study population of agricultural workers in Nebraska.

Aim #2: Estimate the prevalence of alcohol misuse, illegal drug use, and anxiety for different sociodemographic and occupational groups among agricultural workers in Nebraska.

Aim #3: Examine factors that are associated with alcohol misuse among agricultural workers in Nebraska.

Chapter 2 – Background and Literature Review

Substance Use Disorders in the U.S. and Nebraska

The Substance Abuse and Mental Health Services Administration (SAMSHA) reported that in 2018, nearly 20.3 million people aged 12 or older had a substance use disorder related to alcohol (14.8 million) or illicit drugs (8.1 million) (SAMHSA, 2019). An estimated 2.0 million people suffered from an opioid use disorder, including 1.7 million people with a prescription pain reliver use disorder (SAMHSA, 2019). Additionally, the National Institute on Drug Abuse (NIDA) reported that approximately 128 people died each day in the U.S. from opioid overdoses during 2018 (NIDA, 2020a). The economic burden of prescription opioid misuse in the U.S. alone is costing nearly $78.5 billion a year which includes the cost of healthcare, lost productivity, addiction treatment, and criminal justice involvement (NIDA, 2020a). The misuse of and addiction to opioids have created an incredibly serious national public health crisis that requires immediate action.

However, national statistics tell only part of the story. By breaking the statistics down to the state or local level, a tailored intervention can be created and delivered to that specific population. For example, when comparing 2018 national data from the Centers for Disease Control and Prevention (CDC) to that of the state of Nebraska, we can better understand the significance of the substance misuse at the state level. The CDC reported that the prescribing rate in 2018 for the U.S. was 51.4 per 100,000 people which equated to 168,158,811 prescriptions written that year (CDC, 2020). In that same year, Nebraska's opioid prescribing rate was not far behind at 50.6 per 100,000 (CDC, 2020). When this statistic is broken down even further, we can see that 24% of counties in Nebraska are emerging areas for very high prescribing rates (CDC, 2016). Examples include the rural Nebraska counties of Adams, Buffalo, and Harlan, all of

which had increased prescribing rates in 2016. Adams county had a prescribing rate of 67.8 per 100 people (67,800 per 100,000), Buffalo county had a prescribing rate of 68.3 per 100 people (68,300 per 100,000), and Harlan county had a prescribing rate of 80.4 per 100 people (80,400 per 100,000) (CDC, 2016). In Nebraska, the increased prescribing rate trend correlated with hospital discharge numbers reported from the Nebraska Department of Health and Human Services between 2007 and 2014. The data showed that the rate of inpatient hospitalization for substance use disorders increased from 1,150 to 1,474 per 100,000 people (Nebraska Department of Health and Human Services, 2017). The annual opioid-related overdose death rates rose from 2.4 to 3.0 per 100,000 during that same time period (Nebraska Department of Health and Human Services, 2017).

A related problem is alcohol misuse. From 2006 to 2010, excessive alcohol use led to nearly 88,000 deaths and 2.5 million years of potential life lost each year in the U.S. (CDC, 2019). Excessive drinking was also responsible for 1 in 10 deaths among adults ages 20 to 64 years (CDC, 2019). In 2017, Nebraska ranked in the 10th percentile for excessive drinking (County Health Rankings & Roadmaps, n.d.). Additionally, two regions in Nebraska reported having the highest binge drinking rates among adults. Those regions included the Two Rivers Public Health Department District which included Dawson, Buffalo, Gosper, Phelps, Kearney, Harlan, and Franklin Counties at 23.2%, and the Northeast Public Health Department District which included Cedar, Dixon, Wayne, and Thurston Counties at 23.0% (Nebraska Department of Health and Human Services. BRFSS Reports, n.d.).

Substance Abuse and Rural Populations

Nebraska, being a rural farming state, faces different issues and stressors when it comes to substance use, anxiety, and the opioid crisis. Farming is a high stress occupation and changes

in farming practices have negatively affected traditional farming stressors. A few examples of changes in farming practices include climate changes, and larger farm operations (Daghagh, Wheeler, & Zuo, 2019). One specific example of changes in farming practices includes reduced number of hired employees. When farmers experience significant financial losses, significant changes can often occur. One of these changes is reducing the number of hired hands employed, which can increase the farmer's workload. Another example of changes in farming practices includes a reduction in the number of family-owned farms. Some older-generation farmers have needed to sell their farms due to their children deciding to leave the farm operation in the pursuit of other career paths.

Previous studies on mental health in farming communities have identified several common farming stressors that can affect an agricultural worker's mental health. According to a systematic review, traditional farming stressors can include commodity prices, debt, climate change, drought, government regulations, role conflict, isolation, and overwork (Daghagh, Wheeler, & Zuo, 2019). These work-related stressors create an increased amount of stress in the life of a farmer because work and home life often collide in agricultural communities. Not only can this affect male farmers, but female farmers as well. For example, long workdays may diminish time to fulfill familial roles as husband or father (Daghagh, Wheeler, & Zuo, 2019). Female farmers who lack their husbands' support or are in conflict with their husbands about farm roles tend to report more stress-related health symptoms (Daghagh, Wheeler, & Zuo, 2019). Additionally, female famers have reported higher depressive symptoms when their husbands worked more hours on the farm (Daghagh, Wheeler, & Zuo, 2019). Constant stress could lead to various problems that are not only physical (i.e., headaches, sleep issues), but also mental (i.e., anger, anxiety, depression) (Daghagh, Wheeler, & Zuo, 2019). In the same study, it was found

that the most common mental disorders in agricultural workers were anxiety and depressive disorders (Daghagh, Wheeler, & Zuo, 2019).

Additionally, anxiety disorders have been frequently associated with substance misuse. One study explained the association in terms of three different models: the shared vulnerability factors model, the self-medication model, and the substance-induced model (Vorspan et. al., 2015). The study also determined that the most frequently used substances associated with anxiety disorders were tobacco, alcohol, cannabis, and opiates (Vorspan et. al., 2015). Of all the substances listed, alcohol was the most widely used with a prevalence of nearly 80% in developed countries (Vorspan et. al., 2015). The researchers also described their findings in terms of clinical samples. In samples of patients with anxiety, nearly 50% of patients reported that they self-medicate their anxiety with alcohol (Vorspan et. al., 2015).

Although there is evidence of a correlation between substance use and anxiety in the general population, there is scarce research on agricultural workers. For example, in a scoping review titled, "Substance use disorders in farming population: Scoping review," the researchers found that a gap does in fact exist between alcohol and substance related research among farmers and farmworker populations, which suggests the need for future research on this topic (Watanabe-Galloway, Chasek, Yoder, & Bell, n.d.). Nevertheless, previous studies indicate that anxiety is very prevalent in agricultural communities. For example, Rudolphi, et al., conducted a cross-sectional study to estimate the prevalence of anxiety and depression among a younger farming and ranching population (Rudolphi, Berg, & Parsaik, 2019). The survey was used to identify different sources of stress and symptoms of anxiety and depression among the study population which included 170 respondents (Rudolphi, Berg, & Parsaik, 2019). Nearly 71% of study respondents met the criteria for a generalized anxiety disorder (GAD-7 score $\geq$ 5). The

prevalence of anxiety among the study participants was much greater than in the general U.S. population (18.1%) (Rudolphi, Berg, & Parsaik, 2019).

Additionally, substance use and the opioid crisis are troubling where resources are limited. The opioid crisis has struck farm families much harder than other rural areas according to the American Farm Bureau Federation and National Farmers Union (American Farm Bureau Federation/National Farmers Union, 2018). Nearly 74% of farmers have been impacted by the crisis directly and about 77% of farmers stated that it would be easy to access a large amount of prescription painkillers or opioids without a prescription (American Farm Bureau Federation/National Farmers Union, 2018). A large reason for this statistic can be traced back to the agricultural job description itself. Farming is a career that is among the highest risk groups for occupational injuries and illnesses (Daghagh, Wheeler, & Zuo, 2019). The nature of the job requires physical labor which comes with the potential for injuries which could lead to an increased number of prescribed medications such as painkillers or opioids. The USDA Economic Research Service also reported that mortality rates are increasing amongst working age adults in rural America due largely to the rising rates of prescription drug misuse and heroin abuse (USDA Economic Research Service, 2017). All of these issues create a large need for prevention and intervention efforts that are aimed at educating the population about the dangers of illegal drug use.

Project Ag Aware

Dr. Christine Chasek of the University of Nebraska at Kearney and her team are conducting a research project that aims to provide essential knowledge and awareness of stress and of substance use and misuse, to help enhance rural citizens' health and well-being through education and prevention efforts. The long-term objectives of the project are to 1) increase rural

citizens' knowledge of substance use and misuse through outreach, education, and prevention strategies using an Extension model, and 2) determine the risk level of opioid and alcohol misuse among adults in agricultural communities in Nebraska and surrounding rural states by gathering data from the screenings.

The research team used a novel approach to address the stigma that surrounds substance misuse and bring awareness to the issue. The purpose of the Screening, Brief Intervention Referral to Treatment (SBIRT) surveys were to increase rural citizens' awareness of their stress and substance use levels. By taking the SBIRT screenings out of the clinic and into agricultural work settings, rural workers were able to receive immediate information about substance misuse and interventions associated with their own level of risk. Also, the team used an Extension model to educate participants of the study. The goal of agricultural extension is to pursue lifelong education. By using the Extension model, educational materials were provided to participants following survey completion, which allowed for education on opioids, alcohol, and stress in rural agricultural communities.

This approach allowed at-risk individuals to receive materials and referrals about next steps without having to wait or been seen by a specialist in a clinic. Additionally, offering the screenings in agricultural work settings raised awareness of the issue and provided an opportunity for educating rural agricultural workers about substance misuse. Due to the COVID-19 pandemic, the approach was modified during the data collection phase. Surveys were mailed instead of being administered in-person. Individuals who participated in the mail survey still received screening results and educational materials, but they lacked the face-to-face interaction. All participants were able to reach out to the project if they had any questions.

For the purpose of this capstone, a preliminary analysis of the data that was collected by Dr. Chasek and her team was assessed (N=1206). This preliminary analysis may provide useful information for tailoring further iterations of the project. For example, by determining if there is a relationship between substance misuse and anxiety among agricultural workers, the research team can tailor future educational projects and programs to address this and bring awareness to the co-occurring problem. Also, this project aims to identify factors associated with alcohol misuse among agricultural workers. By identifying risk factors, individuals will be more aware of their health practices.

Overall, this project will provide supplemental information that will contribute to the research team's overall picture of bringing awareness to substance use and misuse in rural Nebraska areas. Agricultural workers' health and well-being will be better understood which will allow for educational and prevention efforts to be created to address substance misuse.

Chapter 3 – Data and Methods

Study Design, Setting, and Population

We used data from Project Ag Aware, a cross-sectional survey among agricultural workers aged 19-90 years residing in Iowa, Kansas, or Nebraska. Participants were recruited through agricultural conventions, conferences, meetings, gatherings, and trainings by the project team members. Posters with a QR code provided a link to an online survey. Additionally, surveys were mailed out to the target audience along with the QR code for the online version of the survey. Mailing addresses were provided by the USDA office located in Nebraska. The mailing of the surveys began on April 20, 2020 and ended on May 26, 2020. None of the addresses or names of the participants were kept or linked to the survey and participation was voluntary and anonymous. The total number of surveys received was 1,206.

Instrument

The English-language survey included the Alcohol Use Disorder Identification Test (AUDIT), the Drug Abuse Screening Test-1 (DAST-1), and the Generalized Anxiety Disorder Screener (GAD-2) as well as basic demographic questions such as age, gender, residential location, and type of work (farmer, farm hand, bookkeeper, farm manager, agribusiness, retired) (Saunders et. all., 1993; Martino, Grilo, & Fehon., 2000; Crocq, 2017). AUDIT was used to screen for a participant's alcohol use. It consisted of 10 questions that asked about alcohol consumption habits such as "How often do you have a drink containing alcohol?" and "How often do you have 5 or more drinks on one occasion?" The participant responded to each question on a scale of 0 (never) to 4 (daily or almost daily), for an overall score range of 0-40. A score of 8 or higher on the AUDIT was considered high and required referral or care. The DAST-1 was used to screen participants for substance misuse. It consisted of one question

asking the participant if they used an illegal drug or a prescription medication for non-medical reasons in the past year. The participant would then answer yes or no based on their history of use. A score of 1 on the DAST-1 was considered to be high and required referral or care. Finally, the GAD-2 was used to screen for potential anxiety disorder. The GAD-2 consisted of two questions that asked the respondent's history of feeling anxious or worrisome in the last two weeks. Response options ranged from 0 (not at all) to 3 (nearly every day), for an overall score range of 0-6. A score of 3 of higher on the GAD-2 was considered high and required referral or care.

Variables

A variety of variables were included in the study. Continuous variables consisted of age and AUDIT score. Categorical variables consisted of age group, gender, marital status, race, occupation, and residential location. In addition, the outcome variables for DAST, AUDIT, and GAD were dichotomized as high vs. low risk as previously described. Age group was recoded into three categories: 19–39, 40–64, and 65 and older. Residential location was also recoded so the option "other" included responses from Kansas, Iowa, as well as those who responded "other." To describe the occupation distribution of the study population, participants were categorized as a "direct" or "indirect" agricultural worker. Direct workers were considered farmer/rancher, farm hand/ranch hand, or agribusiness, while indirect included bookkeeper, farm manager, or retired.

Analysis

Analysis was conducted using SPSS Statistics Version 24. The Appendix outlines the aims and associated methods. For Aim 1, the study population was described by frequency (count, percent) for categorical variables and mean with standard deviation (SD) for continuous

variables. For Aim 2, prevalence of alcohol use disorder, illegal drug use, and anxiety for different demographic and occupational groups was estimated by cross-tabulation based on percent of returned surveys which were classified as high risk.

For Aim 3, the dependent variable was the dichotomized AUDIT score while the independent variables were demographic and anxiety scores. Logistic regression analysis was used to compute the crude and adjusted odds ratios with 95% confidence intervals.

Chapter 4 – Results

Aim 1 - Study Sample Description

From April 20, 2020 to May 26, 2020, Project Ag Aware sent out a total of 4,000 SBIRT surveys to agricultural workers of Nebraska, Iowa, and Kansas residents. Of those surveys that were sent out, nearly 30% or 1,206 surveys were returned to the team and analyzed in this report. All the returned surveys were used to report the descriptives in Table 1; however, those surveys with missing information were excluded case-wise from later analysis.

Table 1 describes the study sample. The majority of the participants were males (75.3%). With a mean age of 64.3, the majority of participants were older adults: 45.0% of participants were aged 40 to 64 and 45.4% were 65 and older. Nearly 78.0% (944) of the participants identified as being married while 121 (10.0%) identified as being single or not married. Almost the entire study sample identified as Caucasian (91.7%) A vast majority of participants were located in Nebraska with about 30.0% residing in Central Nebraska, 18.0% in Northeast Nebraska, and 20.0% residing in Eastern Nebraska. Only 1.9% of respondents identified as other. When looking at occupation, nearly 62.0% (751) of the study participants were direct agricultural workers while 30.5% (368) were classified as indirect agricultural workers.

Table 1 also depicts the SBIRT survey results for the outcome measures of DAST-1, GAD-2, and AUDIT. Most respondents did not use opioids (n=1,103; 91.5%), were low-risk for anxiety (n=995; 79.2%) and were low-risk for alcohol abuse (n=1,049; 87.0%).

Table 1. Characteristics of Project Ag Aware Participants

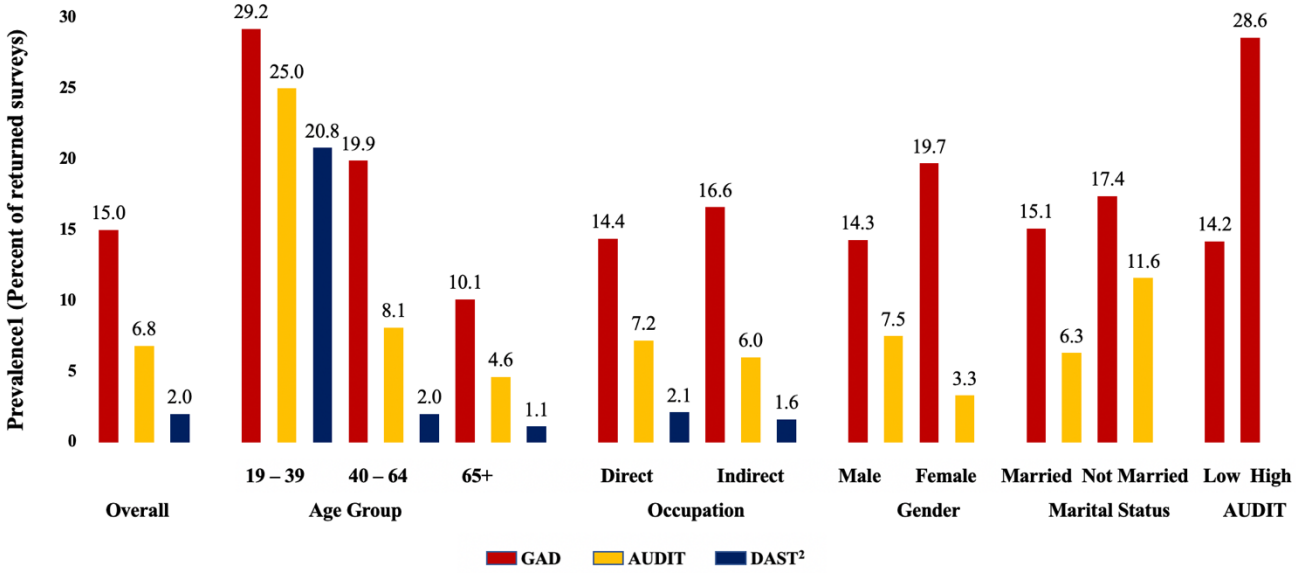
Characteristic	n (%) N = 1,206	Mean (SD)
Age		64.3 (9.7)
Age Group		
Ages 19 – 39	24 (2.0)	
Ages 40 – 64	543 (45.0)	
Ages 65+	547 (45.4)	
Missing	92 (7.6)	
Gender		
Male	908 (75.3)	
Female	183 (15.2)	
Missing	115 (9.5)	
Marital Status		
Married	944 (78.3)	
Not Married	121 (10.0)	
Missing	141 (11.7)	
Race		
Caucasian	1106 (91.7)	
African American	1 (0.1)	
American Indian	1 (0.1)	
Asian	1 (0.1)	
Latino/Hispanic	2 (0.2)	
Missing	95 (7.9)	
Occupation Type		
Direct (Farmer/Rancher, Farm/Ranch Hand, Agribusiness)	751 (62.3)	
Indirect (Bookkeeper, Farm Manager, Retired)	368 (30.5)	
Missing	87 (7.2)	
Location of Residence		
Central NE	365 (30.3)	
Panhandle NE	68 (5.6)	
Northeast NE	217 (18.0)	
Southwest NE	74 (6.1)	
Southeast NE	247 (20.5)	
Eastern NE	122 (10.1)	
Other[2]	23 (1.9)	
Missing	90 (7.5)	
DAST_1		
Yes – Used Opioids	22 (1.8)	
No – Did Not Use Opioids	1103 (91.5)	
Missing	81 (6.7)	
GAD_Total_Grouped (Range 0-6)		1.20 (1.6)
Low Risk ($\geq$2)	955 (79.2)	
High Risk (<3)	171 (14.2)	
Missing	80 (6.6)	
AUDIT_Total_Grouped (Range 0-32)		2.57 (3.2)
Low Risk ($\geq$7)	1049 (87.0)	
High Risk (<8)	77 (6.4)	
Missing	80 (6.6)	

[1]Respondents could indicate more than one occupational category, so responses sum to more than 100%
[2]Location categories that were included in "other" were Kansas, Iowa, and the option to just choose other

Aim 2 - Prevalence of alcohol use disorder, illegal drug use, and anxiety disorders

Figure 1 summarizes the prevalence of high-risk scores for GAD, AUDIT, and DAST by different sociodemographic and occupational groups.

Figure 1. Prevalence of GAD, AUDIT, and DAST Categories by Sociodemographic and Occupational Groups



[1] Cut points for high risk were as follows: a score of 3 or higher on the GAD, a score of 8 or higher on the AUDIT, and a score of 1 on the DAST-1

[2] DAST was not reported for marital status and gender due to low frequency/cell counts

GAD. Overall prevalence of high-risk GAD score was (15.2%). By subgroup, the highest prevalence of high-risk GAD score was among those aged 19-39 (29.2%) and those who were at high-risk for AUDIT (28.6%). High-risk GAD decreased by age group, with 19.9% prevalence for those aged 40-64, and 10.1% for ages 65 and over. Prevalence was similar between those in direct (14.4%) and indirect (16.6%) agricultural work, males (14.3%) and females (19.7%), and between married (15.1%) and not married (17.4%)

AUDIT. Overall prevalence of high-risk AUDIT score was (6.8%), with largest subgroup differences by age group. The youngest respondents (aged 19-39) had the highest prevalence at 25.0%, followed by age 40-64 at 8.1% and aged 65 and over at 4.6%. When looking at marital status, there was a higher prevalence of those who were not married (11.6%) when compared to

those who were married (6.3%). Prevalence among males was 7.5% compared to females at 3.3%. By occupation type, prevalence was slightly higher among direct workers (7.2%) compared to indirect (6.0%).

DAST. Overall high-risk DAST prevalence was (2.0%). The age group 19-39 had the highest prevalence rate at 20.8%. For those aged 40-64, the prevalence of high risk was 2.0% and in the age group 65 and higher, it was 1.1%. Rates were similar between direct (2.1%) and indirect (1.6%) workers. Due to the small sample size, an analysis was not conducted for gender and marital status.

Aim 3 - Factors that Are Associated with Alcohol Abuse Among Agricultural Workers

Table 2 summarizes the crude and adjusted odds ratios of having a high-risk AUDIT score for different risk factors. Risk factors that had a significant p-value for the crude odds ratio were gender ($p=0.05$), marital status ($p=0.03$), age group ($p<0.001$), and GAD ($p=0.001$). However, in the adjusted model, marital status ($p=0.16$) was no longer significant. When compared to females, the adjusted odds for males are 3.47 times higher (OR 3.47; 95% CI 1.29, 9.36). For the age group category of 19-39, the adjusted odds ratio was 7.78 which indicates a 7.78 increase in the likelihood of being high-risk for alcohol misuse compared to ages 65 and over. When looking at the adjusted odds ratio for the GAD, those who scored high risk on the GAD were 2.04 times more likely to have a high AUDIT score than compared to those who had a low-risk GAD score.

Table 2. Crude and Adjusted Odds Ratios of AUDIT: High Risk Classification

Risk Factors	Crude Odds Ratios			Adjusted Odds Ratios		
	Odds Ratio	95% CI[1]	P-value	Odds Ratio	95% CI[1]	P-value
Gender			0.05			0.01
Male	2.38	1.02 – 5.59		3.47	1.29 – 9.36	
Females	Reference	-		Reference	-	
Marital Status			0.03			0.16
Married	Reference	-		Reference	-	
Not Married	1.96	1.06 – 3.64		1.66	0.82 – 3.35	
Age Groups (years)			<0.001			0.002
19 – 39	6.96	2.54 – 19.06		7.58	2.19 – 26.25	
40 – 64	1.84	1.11 – 3.05		1.91	1.10 – 3.31	
65+	Reference	-		Reference	-	
Occupation Type			0.45			0.26
Direct	1.22	0.73 – 2.03		0.72	0.41 – 1.27	
Indirect	Reference	-		-	-	
Residence			0.29			0.13
Central NE	1.28	0.16 – 9.95		0.98	0.12 – 8.25	
Panhandle NE	1.02	0.10 – 10.27		1.08	0.10 – 11.83	
Northeast NE	1.99	0.25 – 15.63		2.08	0.25 – 17.45	
Southwest NE	0.61	0.05 – 7.06		0.62	0.05 – 7.67	
Southeast NE	1.83	0.23 – 14.36		1.74	0.21 – 14.63	
Eastern NE	2.62	0.33 – 21.11		2.73	0.32 – 23.57	
Other[2]	Reference	-		Reference	-	
GAD			0.001			0.02
Low Risk	Reference	-		Reference	-	
High Risk	2.42	1.43 – 4.08		2.04	1.15 – 3.65	
DAST-1			0.21			0.79
Did not use opioids	Reference	-		Reference	-	
Used opioids	2.23	0.64 – 7.70		1.21	0.29 – 5.08	

[1] Confidence Interval

[2] Location categories that were included in "other" were Kansas, Iowa, and the option to just choose other

Chapter 5 – Discussion

This study examined the prevalence of alcohol misuse, illegal drug use, and anxiety by demographic characteristics in the agricultural worker population. Factors that were associated with substance use and anxiety were also analyzed in this report.

When examining variables associated with being at high risk for generalized anxiety, alcohol misuse, and opioid use, our findings suggested that age group was a critical factor that needs to be considered. For example, the youngest age group, defined as ages 19 to 39, had the highest prevalence for all three outcomes: GAD (29.2%), AUDIT (25.0%), and DAST (20.8%). This finding supports previous research studies. In a study titled, "Depression, Anxiety, and Stress Among Young Farmer and Ranchers: A Pilot Study," researchers found that 35.9% of young farmers and ranchers between the ages of 18 and 37 in the Midwest experienced a mild anxiety disorder while 16.5% reported severe symptoms (Rudolphi, Berg, & Parsaik, 2019). In the same study, it was stated that the prevalence of anxiety among the study participants was much greater than in the general U.S. population (18.1%) (Rudolphi, Berg, & Parsaik, 2019). Additionally, the researchers found that 35.9% or respondents reported mild symptoms of depression and 14.7%, 10.0%, and 4.7% reported moderate, moderately sever, and severe symptoms of depression (Rudolphi, Berg, & Parsaik, 2019). While we did not examine depressive symptoms in this study, our results are in line with elevated levels of anxiety. Another study stressed the importance of risk factors that are associated with alcohol misuse, including younger age (Vorspan et. al., 2015).

Our study also examined the association between gender, anxiety, and alcohol misuse. Females (19.7%) had higher prevalence of high-risk for anxiety when compared to males (14.3%). This result supports findings from a study titled "Stress, anxiety, depression, and

resilience in Canadian farmers" which found females reporting higher scores for stress, depression, and anxiety (Jones-Bitton, et. all, 2019). Additionally, when looking at the prevalence of alcohol use, males (7.5%) had an increased prevalence of high risk for alcohol misuse when compared to females (3.3%). This result is comparative to previous findings that indicate males having a higher prevalence of drinking when compared to females (Wilsnack et. all., 2009).

Through multivariable logistic regression, the relationship between anxiety and alcohol misuse was assessed. We concluded that scoring high risk on the GAD was associated with a 2.04 increased risk of being high risk for alcohol misuse. This result indicates that high anxiety is a risk factor for alcohol misuse and should be considered. This result is correlated with the study, "Anxiety and Substance Use Disorders: Co-occurrence and Clinical Issues" which found an association between alcohol misuse and generalized anxiety disorders (Vorspan et. al., 2015).

Strengths and Limitations

This was one of the first studies that examined the prevalence of alcohol misuse, drug use and anxiety among agricultural workers in the Midwest. A relatively large sample allowed us to examine multiple risk factors for these outcomes. Some limitation should be noted. First, since the data are self-reported, underreporting of socially undesirable phenomenon such as alcohol misuse, drug use and anxiety is possible. Also, the study used a convenience sample, therefore, a future study should consider using a population-representative sample to obtain the estimate of these outcomes.

Conclusions

This study found an association between substance misuse, anxiety, and younger age in agricultural workers. Future work should be continued to monitor trends associated with

substance misuse and anxiety among the agricultural community. Our study found that younger age, specifically the age group 19 to 39, was a critical factor when examining high-risk for alcohol misuse even when controlling for other factors. Strategies should be implemented to target this age group. Additionally, we found an association between being at-risk for generalized anxiety and at-risk for alcohol misuse. Overall, it is important to continue to bring awareness to substance misuse and anxiety in the agricultural community so future outreach, education, and prevention strategies can be created to help continue enhancing the health and well-being of rural citizens.

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Appendix

Aim	Statistical Analysis	Dependent Variable	Independent Variable
1: Describe the study population of agricultural workers.	Count (%); mean (SD)		Categorical variables → age group, gender, marital status, occupation type; Continuous variables → age
2: Estimate the prevalence of alcohol use disorder, illegal drug use, and anxiety disorders for different sociodemographic and occupational groups.	calculate proportion (# cases / # completed surveys)	AUDIT (≥8 vs <8) GAD-2 (≥3 vs <3) DAST-1 (1 vs 0)	sociodemographic and occupational groups*
3: Examine factors that are associated with alcohol abuse among agricultural workers	linear or logistic regression	AUDIT (as a dichotomized variable)	Demographic, * GAD-2, DAST-1

* Independent variables will be dependent on the results from the preceding aim

Biography

I am a current student at the University of Nebraska Medical Center pursing my Master of Public Health with a focus in Epidemiology. A few of my current interests include research, agricultural health, community/rural health, emergency preparedness, vaccinations, and health education. Currently, I work for the Davis Global Center where I work with the National Disaster Medical System (NDMS) trainings. I also work on a few other projects through the Davis Global Center that I help coordinate through project management tasks. In my free time, I like to be active outdoors, read, travelling, and spend time with my family and friends.

CV

Professional Summary

I am a current student at the University of Nebraska Medical Center pursing my Master of Public Health with a focus in Epidemiology. I am driven, dedicated, hard-working, and I have a passion for helping others. A few of my current interests include research, agricultural health, community/rural health, and health education.

Skills

Customer and Personal Service
Critical Thinking
Problem-Solving
Time Management
Microsoft Word
Active Listening

Awards

GPA: 3.9
UNO Chancellor's List 2017 – 2018
UNO Dean's List 2017 - 2018

Organizations

Medlife
Pre-Health Learning Community
DCN Research Assistant
Kappa Delta Sorority
Sigma Alpha Pi Leadership Fraternity
Eta Sigma Gamma Honors Fraternity
Eta Sigma Gamma Secretary
Eta Sigma Gamma Vice President

Community Service

Mobile Medical Clinic in Lima, Peru
Haiti Mission Trip
AseraCare Hospice Volunteer
Togo, Africa Mission Trip
Children Matter Benefit Concert & Gala

Education

Bachelor of Science in Public Health
University of Nebraska at Omaha
Completion: December 2018

Certificate in Public Health
University of Nebraska Medical Center
Completion: August 2019

Master of Public Health – Epidemiology
University of Nebraska Medical Center
Expected Completion: December 2020

Experience

University of Nebraska Medical Center
Research Assistant | Mar. 2019 – Dec. 2019

- Team lead on current research project
- Collected qualitative and quantitative data in rural Nebraska communities

Student Worker | Jan. 2020 – Present

- Help set up and work with NDMS Trainings
- Helped with project management and COVID-19 updates

Leukemia & Lymphoma Society
Outreach Assistant | Sept. 2018 – July 2019

- Help run Pennies for Patients Program
- Recruit and communicate with schools to get their participation in the program

Global Partners in Hope
Intern | May 2018 – Aug. 2018

- Help coordinate mission trips out of the country
- Daily duties and tasks at the office