

DISSERTATION

LIFE IN THE FIELD: MIGRANT FARM WORKERS' PERCEPTIONS  
OF WORK RELATED INJURIES

Submitted by

Monica S. Rosales

Department of Psychology

In partial fulfillment of the requirements

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Colorado State University

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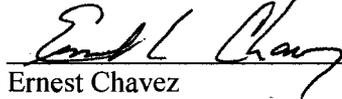
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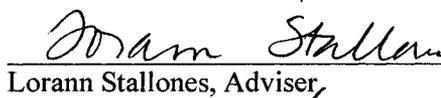
WE HEREBY RECOMMEND THAT THE DISSERTATION PREPARED UNDER OUR SUPERVISION BY MONICA S. ROSALES ENTITLED LIFE IN THE FIELD: MIGRANT FARM WORKERS' PERCEPTIONS OF WORK RELATED INJURIES BE ACCEPTED AS FULFILLING IN PART REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY.

Committee on Graduate work

  
\_\_\_\_\_  
Jim Banning

  
\_\_\_\_\_  
Evelinn Borrayo, Co-Adviser

  
\_\_\_\_\_  
Ernest Chavez

  
\_\_\_\_\_  
Lorann Stallones, Adviser

  
\_\_\_\_\_  
Ernest Chavez, Department Head

ABSTRACT OF DISSERTATION  
LIFE IN THE FIELD: MIGRANT FARM WORKERS' PERCEPTIONS  
OF WORK RELATED INJURIES

A majority of migrant farm workers in the United States are of Latino descent. Agriculture is a hazardous occupation that puts workers at risk for occupational injuries. While migrant farm workers provide an indispensable service they comprise a disadvantaged group. Migrant farm workers' views of work related injuries have not been fully evaluated. Therefore, this study examined migrant farm workers' views and perceptions of work related injuries. The method of analysis consisted of an ethnographic content analysis of migrant farm workers perceptions and views of occupational injuries. Interviews from twelve Colorado migrant farm workers were analyzed. The analysis led to the identification of five main themes 1) Concerns about safety, 2) Characteristics of injuries, 3) Factors contributing to injuries, 4) Injury prevention strategies, and 5) Injury accountability. Each theme was organized into three sub-themes. The findings from this study suggest that the safety level of the working environment needs to be improved.

Monica S. Rosales  
Department of Psychology  
Colorado State University  
Fort Collins, CO 80523  
Summer 2008

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## Chapter I: Introduction

### *Overview*

The majority of migrant farm workers who come to the United States (U.S.) are of Latino descent. Many of them come to the U.S. with the idea of working hard, making money to help the family they have left behind, and being able to return to their home country once the planting and harvesting seasons end. While migrant farm workers probably anticipate encountering many hardships, they may not think about the possibility of suffering a serious injury or illness that may be due to the type of work they perform. Limited information is available about the health status of migrant farm workers, perhaps due to their migratory status. Even though migrant farm workers live portions of their lives in the U.S., when they are here their health status is parallel to that of a developing country.

Research has focused on the hazards that migrant farm workers face each day they work in agriculture, which is considered to be extremely hazardous work. There has also been research focusing on hazards that may lead to injuries. For example, research has revealed that back injuries due to uncomfortable postures like stooping, working in soil, prolonged kneeling, and heavy lifting are prevalent among this group of workers. Injuries due to transportation related to not wearing seatbelts and other risks associated with motor vehicle travel have been reported. Health hazards that have received a lot of attention are acute pesticide exposures including eye irritation, skin irritation, and

breathing problems. Research has also focused on evaluating and examining health care programs and services available to migrant farm workers as well as on developing interventions and programs to provide health services and education to migrant farm workers.

It is important to acknowledge the importance of this research since it advances our understanding of migrant farm workers and what they face in agricultural work. Migrant farm workers have been asked about what kind of safety and protection efforts are missing in their work. Again, this is very important because it gives us a clearer view of what really is happening and helps researchers devise possible solutions or ways of addressing the current problems affecting this group of workers. However, something that we need to be aware of is that there are other factors that also need attention.

Research aimed at gaining a better understanding of farm workers behaviors, perceptions, and interpretations of events related to their job, and at trying to figure out ways to help make their work experiences more pleasant as well as safer, will help provide researchers with the tools to discover ways in which to implement interventions and address issues faced by this group. Therefore, the present study examined possible factors that may contribute to the way in which migrant farm workers perceive and interpret work related injuries. The aim of this study was to gain knowledge and understanding of migrant farm workers' experiences, perceptions, and interpretations of injuries in the work place.

#### Literature review

Agriculture is one of the most hazardous industries in the United States (U.S.) (Arcury, Quandt, Cravey, Elmore, & Russell, 2001; Hansen & Donohoe, 2003; McCurdy,

Samuels, Carroll, Beaumont, & Morrin 2003). Although there has been an increase in the interest to study farm workers hired in the U.S. and even though it has been recognized that hired farm workers need attention from the health community, little is known about this population's health (Villarejo, 2003). Villarejo (2003) found only 151 references related to the topic of migrant families and 51 related to the health of agricultural workers or farmers published from 1966-1989. This number had increased by 2002. Villarejo (2003) found 423 references related to the health of farm workers, from 1990-2002.

A migrant farm worker is an individual whose principal employment is in agriculture on a seasonal basis, who has been employed within the past 24 months, and who establishes a temporary home for work purposes (Arcury, Quandt, & Mellen, 2003; Hansen & Donohoe, 2003). These individuals can migrate from farm to farm within a state, across states, or across international borders (Arcury, Quandt, & Mellen, 2003). A seasonal farm worker is an individual whose principal employment is in agriculture, who has been so employed within the last 24 months, and who does not migrate (Arcury, Quandt, & Mellen, 2003; Hansen & Donohoe, 2003). A seasonal farm worker has, therefore, established permanent residence and works in agriculture during the planting and harvest seasons and works other jobs (e.g., restaurants, hotels) during the off-season. Migrant farm workers come from other countries or other parts of the United States and live in the agricultural areas of the United States only during planting and harvesting and return to their place of origin after the end of the season.

There are 4.2 million seasonal and migrant farm workers and their dependents in the U.S., with 1.6 million identified as migrant farm workers (as cited in Arcury, Quandt, & Mellen, 2003). Estimates from the National Agricultural Workers Survey (NAWS)

indicate that the population has become increasingly Latino during the past decade (Arcury, Quandt, & Mellen, 2003). Latinos comprise an estimated 80-90% of farm workers (Arcury, Quandt, Cravey, Elmore, & Russell, 2001; Arcury, Quandt, & Mellen, 2003). Among Latino migrant farm workers there are people from Mexico, Puerto Rico, Cuba, and Central and South America, with 94% born in Mexico and 5% born in other Latin countries (Bechtel, Davidhizar, & Spurlock, 2000). Non Latino migrant farm workers comprise less than 1% of migrant farm workers and include Black Americans, Jamaicans, Haitians, Laotians, Thai, and other ethnic minorities (Bechtel, Davidhizar, & Spurlock, 2000).

In the past 20 years there has been a shift in U.S. agriculture from an emphasis on grain crops to grocery produce like fruits and vegetables (Culp & Umbarger, 2004). This shift has led to a demand for more manual labor, which in turn has increased the demand for workers who are willing to carry out undesirable tasks under adverse weather conditions (Culp & Umbarger, 2004). The shift in the pattern of agriculture is likely to shift the work related hazards and illnesses.

#### *Health of farm workers*

Migrant and seasonal farm workers are essential to the U.S. economy, yet they represent an underserved population with many unmet medical care needs (Hansen & Donohoe, 2003). Even though migrant farm workers and their families live in one of the richest countries in the world, their poor health parallels that of a developing country (Bechtel, Davidhizar, & Spurlock, 2000). The average life expectancy of migrant and seasonal farm workers is 49 years of age, in comparison to the U.S. average of 75 years of age (Hansen & Donohoe, 2003).

Reliable data on mortality and long term morbidity for this population is difficult to obtain because many return to their homeland at the end of their work lives (Villarejo, 2003). Many farm workers seek medical care in their homeland and therefore medical conditions will not be detected while they reside in the U.S. (Villarejo, 2003). In California, farm workers who sought health care in Mexico rather than the U.S. reported doing so because of language and other cultural barriers (Villarejo, 2003). It appears that farm workers seek medical care in the U.S. only for serious injuries or illness and visit hospitals, emergency rooms, and community clinics only when necessary (Culp & Umbarger, 2004; Villarejo, 2003). Farm workers do not seek medical care in the U.S. due to cost, lack of medical insurance, and having to pay at the time of service (Culp & Umbarger, 2004; Villarejo, 2003). Among female farm workers the main barrier to mammography screening reported was cost (Skaer, Robison, Sclar, & Harding, 1996). In California about one-third of male farm workers had never been to a clinic or to a doctor (Villarejo, 2003). Farm workers who experienced symptoms due to a work-related injury normally continued to work to meet work requirements set by labor contractors (Culp & Umbarger, 2004).

#### *Occupational safety and health hazards*

Farm workers are at risk for a variety of occupational health problems and injuries (Bechtel, Davidhizar, & Spurlock, 2000; Cameron et al., 2006; Elmore & Arcury, 2001; Hansen & Donohoe, 2003). Among these are problems related to pesticides, musculoskeletal disorders, acute traumatic injuries, dermatitis, inadequate field sanitation, and allergic and respiratory conditions (Cameron et al., 2006; McCurdy et al., 2003). Migrant and seasonal farm workers face many hazards due to their environment,

which is seasonal and intensive and outdoors in adverse weather, including extreme heat, cold, rain, and bright sun (Austin et al., 2001; Hansen & Donohoe, 2003).

### *Musculoskeletal injuries*

Frequent requirements of farm work are stooping, working in soil, working with heavy machinery, climbing, carrying burdensome loads, prolonged kneeling, working with arms above shoulder level, and heavy lifting, commonly in postures that are harmful to the body (Hansen & Donohoe, 2003; Schenker, 1996). These can lead to acute problems and long-term disabilities for farm workers (Hansen & Donohoe, 2003; Larson, 2001; Schenker, 1996)

Villarejo and Baron (1999) reported that several studies have found back complaints and other musculoskeletal disorders among the most common health problems reported by farm workers. Factors that increase the risk of lower back pain are incorrect postures and whole body vibration associated with driving tractors and other farm equipment, (Hansen & Donohoe, 2003; Schenker, 1996). Long hours of driving tractors may intensify this exposure in agricultural work (Schenker, 1996). An analysis from a Bureau of Labor Statistics (BLS) survey reported that nationally there were about 1,430 cases of back injuries among farm workers in 1996 (Cameron et al., 2006).

One-half of U.S. workers' compensation claims for agriculture were for back injuries (Schenker, 1996). Fruit and nut tree industry work was particularly associated with sprain and strain injuries, with the highest percentage of these being back injuries caused by lifting (Schenker, 1996). Manual lifting in the field by farm workers has been identified as the greatest risk of lower back pain (Schenker, 1996).

Prevalence of back pain or discomfort among farm workers in Florida was 39% and in Illinois it was 24% in a 12 month period (Cameron et al., 2006). Heavy lifting and working with ladders were related to back pain (Cameron et al., 2006). In California the most common body part injured among Hispanic farm workers involved the back (McCurdy et al., 2003). A total of 54.3% of participants reported never using a back support belt when lifting or carrying heavy objects and only 14% reported always using one (McCurdy et al., 2003). Examining potential causes contributing to the low use of back support belts may increase our understanding of why migrant farm workers are not utilizing this protective device. It is possible that back support belts are not being provided by employers or that workers think back support belts interfere with work duties. Further examination of back injuries among migrant farm workers is needed. Not only to establish what is contributing to these type of injuries but to start deciphering how these injuries are viewed and interpreted by migrant farm workers, which in turn may lead to a clearer understanding of the low use of back support belts.

### *Pesticide exposure*

*Pesticides.* Scientists and health practitioners have recognized that exposure to pesticides and other agricultural chemicals is a human health hazard (Quandt, Arcury, Austin, & Cabrera, 2001). Pesticides are chemical substances used to kill animal, insect, plant, and fungal pests in agricultural, domestic and institutional settings (Arcury, Quandt, & Russell, 2002; Health and the Environment, 1998; Sanborn, Cole, Abelsohn & Weir, 2002). Pesticide toxicity can result from ingestion, inhalation or dermal absorption (Sanborn, Cole, Abelsohn & Weir, 2002). Farm workers are routinely exposed to

pesticides (Arcury, Quandt & Russell, 2002; Coronado, Thompson, Strong, Griffith, & Islas, 2004).

Pesticide poisoning may result from direct spraying of workers, indirect spray from drift, direct dermal contact with residue on crops, bathing in or drinking contaminated water, transfer of residue from contaminated hands while eating or smoking, or from entering treated fields too soon (Hansen & Donohoe, 2003; Quandt, Arcury, Austin, & Cabrera, 2001).

*Pesticide exposure effects on health.* Tens of thousands of farm workers are estimated to suffer from acute pesticide poisoning each year in the U.S. (Hansen & Donohoe, 2003; Jackson, 2002). The acute health effects of pesticide exposure have been well documented and information on the connection between pesticide exposure and chronic diseases (e.g., cancer) continues to emerge (Perry & Layde, 2003). The acute health effects of pesticide exposure can be immediate and include skin rash, eye problems, headaches, nausea, vomiting, disorientation, shock, respiratory failure, coma, and death (Arcury, Quandt, & Russell, 2002; Jackson, 2002; Elmore & Arcury, 2001; Reigart & Roberts, 1999). Among chronic health outcomes are dermatitis, fatigue, sleep disturbances, memory disorders, anxiety, cancer, and birth defects (Elmore & Arcury, 2001).

The actual number of acute and chronic illnesses associated with pesticide exposure among migrant and seasonal farm workers is not known due to lack of formal reporting systems, unwillingness of workers to report poisonings, workers' inability to seek medical treatment, and an absence of physician knowledge and training in recognizing and treating pesticide related illnesses (Hansen & Donohoe, 2003). Migrant

farm workers in the U.S. have been reported to suffer from the highest rates of toxic chemical injuries of any group of workers (Hansen & Donohoe, 2003). Farm workers work in an environment where they are required to hurry and do not have time to take precautions against toxic chemical exposures (Austin et al., 2001). They also do not want to ask questions or to refuse to work in a field because it has recently been sprayed (Austin, et al., 2001).

Pesticides have also been reported to be carcinogens (Hansen & Donohoe, 2003). Migrant and seasonal farm workers have increased mortality rates from cancers of the lip, stomach, skin, prostate, testes, and hematopoietic and lymphatic systems (Von Essen & McCurdy, 1998; Villarejo & Baron, 1999). Members of the United Farm Workers of America were more likely to develop leukemia, stomach cancer, and uterine and cervical cancers than the general population of Latinos in California (Mills & Kwong, 2001). In addition, in comparison to other Latinos in California, Latino members of the United Farm Workers of America were more likely to be diagnosed at later stages of these diseases (Mills & Kwong, 2001).

*Skin and eye irritation.* Effects of pesticide exposure include eye and skin irritation (Schenker, 1996). Compared to workers in other industries, agricultural workers have a higher incidence of skin disorders with dermatitis being the most common occupational health problem (Hansen & Donohoe, 2003; Villarejo & Baron, 1999). Among migrant farm workers, dermatitis occurs more frequently on the hands, leading workers to suffer a reduction in their work capability and their income (Hansen & Donohoe, 2003). A high percentage of Latino migrant and seasonal farm workers reported signs or symptoms of skin disease and among those who reported signs or

symptoms early in the season, 42% also reported them late in the season. (Arcury, Quandt, & Mellen, 2003).

Elevated prevalence rates of eye and skin irritation were associated with applying fertilizers, working in fields while chemicals were being sprayed and early re-entry into sprayed fields among farm workers in Florida and Illinois (Cameron et al., 2006). In Colorado, farm workers and their children have also experienced eye and skin irritation, and reported receiving no training in regard to handling and dealing with pesticides (Jackson, 2002).

Eye problems among hired farm workers have been reported to result from irritation and trauma due to exposure to chemical substances, dusts, plant materials, and other foreign substances (Villarejo & Baron, 1999). In 1996, 9.2% of all injuries occurring to Latino farm workers were to the eyes (Villarejo & Baron, 1999). Eye injuries were more commonly due to pesticide mixing, loading, and application tasks in California workers (Villarejo & Barron, 1999). Reasons for utilizing and not utilizing protective eyewear among Latino farm workers have been studied (Forst et al., 2006). Workers in Illinois and Michigan reported using protective eyewear because it provided protection from hazards, whether it was mandated or provided by the employer, and whether others workers also used protection (Forst et al., 2006). Workers reported not using protective eyewear because it was uncomfortable, interfered with vision, slowed down work pace and was not required by employers (Forst et al., 2006). Forst and colleagues (2006) suggested addressing functional problems with protective eyewear such as eyewear falling off, fogging up, and the slowing of work pace.

*Pesticide exposure and health in Colorado.* An inspection in Colorado by the U.S. EPA in 2001 found that 95% of Colorado growers were in violation of pesticide safety regulations (Jackson, 2002). Violations ranged from failure to warn workers of pesticide use to failure to provide hand-washing water so workers could remove pesticide residue from their skin (Jackson, 2002). In Colorado farm workers frequently experienced pesticide poisoning symptoms and 49% of surveyed farm workers reported never having received training in pesticide safety, 49% reported experiencing skin irritation, headaches, or inflamed eyes after working in the fields, 22% reported difficulty breathing, and 48% said they believed they had been sent to work in a treated field before it was safe to enter (Jackson, 2002).

In Weld County, Colorado, while working in a field, workers were sprayed when an adjacent field received an aerial application (Thompson, 2005). From this occurrence, a woman reported that the plane passed 6 times spraying almost on top of them and wind coming from the North carried a strong odor of pesticides. The woman reported suffering eye irritation for a day and a half, and reported feeling nauseous the following day (Thompson, 2005).

Several of the workers recalled previous times when they had been in a field during an application (Thompson, 2005). Workers also reported that there have been times when their boss sent them to work in a field half an hour after pesticides had been sprayed (Thompson, 2005). While there is evidence of risk, not much is known about efforts to provide pesticide information to farm workers or the workers' understanding of risk (Parrott, Wilson & Buttram, 1999). There are ways in which farm workers can decrease their exposure to pesticides such as wearing personal protective equipment,

frequently washing pesticides from their hands, avoiding eating, smoking, sleeping near pesticides, showering and changing clothes immediately after work, and wearing protective clothing (Jackson, 2002).

*Personal protective equipment.* The U.S. EPA in part 170 of the Worker Protection Standards (WPS) defines personal protective equipment as: devices and apparel that are worn to protect the body from contact with pesticides or pesticide residues, including, but not limited to, coveralls, chemical-resistant suits, chemical-resistant gloves, chemical-resistant footwear, respiratory protection devices, chemical-resistant aprons, chemical-resistant headgear, and protective eyewear (U.S. EPA, 1992). It also states: Long-sleeved shirts, short-sleeved shirts, long pants, short pants, shoes, socks, and other items of work clothing are not considered personal protective equipment for the purposes of this section and are not subject to the requirements of this section, although pesticide labeling may require that such work clothing be worn during some activities. Research on farm workers and their utilization of personal protective equipment (PPE) is limited. Studies have shown that non-pesticide handler farm workers, who have entered the fields after pesticides have been introduced, were more likely to show signs of pesticide exposure than pesticide handlers (Coronado, Thompson, Strong, Griffith, & Islas, 2004; Daniels, Olsban, & Savitz, 1997).

While the Provisions of the Worker Protection Standards aim to limit exposure to pesticides by requiring the use of personal protective equipment and pesticide safety training, personal protective equipment is not required for workers who do not handle pesticides (Cameron et al., 2006; Coronado, Thompson, Strong, Griffith, & Islas, 2004; U.S. EPA, 1992). This may be due to established restricted entry intervals (REIs) for all

agricultural chemical classes; these are time periods during which workers are not to enter a treated field (Quandt, Arcury, Austin, & Cabrera, 2001). Depending on the toxicity category of the chemical, REIs can range up to 72 hours. However, even after the REI has passed, workers can be exposed to residues remaining on plants, soil, and equipment (Quandt, Arcury, Austin, & Cabrera, 2001).

Farm workers should be informed about the application of pesticides where they are working, signs should be posted including information on which pesticides have been applied, when they were applied, and REIs for affected fields (Quandt, Arcury, Austin, & Cabrera, 2001). In one study, 48% of farm workers reported that their employer did not tell them when pesticides were applied (Arcury, Quandt, Cravey, Elmore, & Russell, 2001). A group of farm workers from Florida and Illinois reported that in some situations the employers provided limited PPE (Cameron et al., 2006). PPE use among those whose work tasks involved potential pesticide exposure was lower among workers who entered sprayed fields prior to other workers who were not allowed to return to the field soon after fields had been sprayed (Cameron et al., 2006).

*Other modes of protection.* There are other protective measures that farm workers can take to help protect themselves from pesticide exposure. For example, wearing protective clothing (Arcury, Quandt, Cravey, Elmore, & Russell, 2001; Austin et al.; 2001; Quandt, Arcury, Austin, & Cabrera, 2001). Examples of these types of clothing include work clothes that cover the entire body like long-sleeved shirts, wide-brimmed hats, long pants, socks, and closed shoes (Arcury, Quandt, Cravey, Elmore, & Russell, 2001; Austin et al.; 2001; Quandt, Arcury, Austin, & Cabrera, 2001). However, farm workers in North Carolina have reported difficulty being able to work with shirts on due

to the heat (Austin et al., 2001). In addition, farm workers have mentioned that heavier clothing and gloves can be impractical because they are burdensome and can slow down work pace (Austin et al., 2001).

Another protective measure farm workers can take involves personal hygiene (Austin et al., 2001). Examples of hygiene behaviors are hand washing before eating, smoking, or using the restroom, and changing clothes and showering after work (Arcury, Quandt, Cravey, Elmore, & Russell, 2001; Colt, Stallones, Cameron, Dosemeci, & Zahm, 2001; Elmore & Arcury, 2001; Austin et al., 2001; Jackson, 2002). However, research has found that there are instances when these behaviors can not be performed due to unavailability of water near the fields and a limited number of available showers in substandard housing (Parrott, Wilson & Buttram, 1999; Quandt, Arcury, Austin, & Cabrera, 2001; Thompson, 2005; Vela-Acosta, Bigelow & Buchan; 2002). A factor affecting whether farm workers shower after work may be how many people live in the same house and how many showers are available (Rao et al., 2006). Something that may be a factor for female farm workers is that there may not be private places to change out of their work clothes outside of their homes (Rao et al., 2006).

Another protective measure farm workers can take is washing their work clothes separately from their non-work clothes (Austin et al., 2001). However, many times clothes washing facilities are not available in the camps or in private housing units (Colt, Stallones, Cameron, Dosemeci, & Zahm, 2001; Hansen & Donohoe, 2003; Quandt, Arcury, Austin, & Cabrera, 2001). This becomes a problem because many farm workers do not have enough work clothes to change daily and will wear the same work clothes a second day, which may re-expose the worker to pesticides (Quandt, Arcury, Austin, &

Cabrera, 2001). Among a group of migrant and seasonal farm workers, those who reported re-wearing work clothes were more likely to report signs or symptoms of skin disease than those who did not (Arcury, Quandt, & Mellen, 2003).

Another potential problem with lack of laundry facilities in housing places is that clothes that are contaminated with pesticide residue may be washed in the same sinks in which food is prepared or in the bathtubs in which children are bathed (Hansen & Donohoe, 2003). An additional factor is that when farm workers do their laundry at local laundromats, they do so once a week and they mix work and non-work clothes, which has the potential to transfer pesticide residues to non-work clothes (Quandt, Arcury, Austin, & Cabrera, 2001).

#### *Transportation injuries*

Among migrant farm workers motor vehicle crashes have been found to also be responsible for injury and fatalities (McCurdy & Carroll, 2000). In the United States, motor vehicle crashes have been identified as a leading cause of death, injury, and disability (Harper, Marine, Garrett, Lezotte, & Lowenstein, 2000). One study using death certificates found that farm workers (both White and non White) had high death rates related to motor vehicles crashes (Colt, Stallones, Cameron, Dosemeci, & Zahm, 2001).

In a study of Latino farm workers in California using face-to-face interviews, a low use rate of seatbelts and child car seats was reported (Stiles & Grieshop, 1999). Reasons provided for not using seatbelts or car seats reflected a lack of knowledge and lack of understanding the risk involved with not using these safety devices.

Mexican farm workers were asked when it would be appropriate for passengers to ride in the back of a pick-up truck (Stiles & Grieshop, 1999). Although most respondents

(who were drivers themselves) knew when it was appropriate and inappropriate to ride in the back of a truck, their descriptions of circumstances in which passengers could ride in the back (load space) of a pick-up truck, indicated a lack of awareness of the risk of injury (Stiles & Grieshop, 1999). For instance, respondents said that it would be okay for someone to ride in the back if there was no more room in the front, if the rider was an adult, during short trips, when riding to work, and under good driving conditions (Stiles & Grieshop, 1999). Another study found that 11.8% of migrant farm workers reported ever riding in the back of an uncovered pick-up truck (McCurdy et al., 2003).

Frequently farm workers are transported to and from worksites in unsafe and/or overcrowded vehicles (Larson, 2001). Traveling to the worksite in vehicles not safely equipped may be a contributing factor to the high number of motor-vehicle deaths among farm workers (Colt, Stallones, Cameron, Dosemeci, & Zahm, 2001). Some farm contractors may provide transportation for migrant farm workers (McCurdy & Carroll, 2000). There are times when provision of transportation is a condition of employment. However, this may involve overloaded and unsafe vehicles and inexperienced drivers (McCurdy & Carroll, 2000).

Transport of immigrants from their home country (e.g., Mexico) to the U.S. and transport across states represent another road safety issue for migrant farm workers. The use of *camionetas*, mini-vans that are privately owned and operated as jitney services, (Valenzuela, Schweitzer, & Robles, 2005) was studied. Valenzuela, Schweitzer, and Robles (2005) reported that *camioneta* services may be a form of economic survival for immigrants who are employed in agriculture. Those using *camionetas* reported liking the service because it saved time when traveling because the drivers and passengers speak

Spanish, and because there are flexible stop times and locations, the music and television are in Spanish, and because they are provided with door-to-door service (Valenzuela, Schweitzer, & Robles, 2005).

A high proportion of those who utilized *camionetas* for traveling purposes, reported that they may be exposed to unnecessary high safety risks, that they had few options in the case of a crash, and that at times they encountered higher prices than fixed-route services (Valenzuela, Schweitzer, & Robles, 2005). Farm workers have been exploited by these types of transportation providers (Valenzuela, Schweitzer, & Robles, 2005). Those who utilized this service reported being more concerned about the legal issues related to the mode of travel but not about safety, costs, and time to destination (Valenzuela, Schweitzer, & Robles, 2005).

#### *Cultural health beliefs*

Among Spanish speakers living in the United States, health is equated with the state of being free of pain, of being able to perform one's activities, and of being normal (Baca, 1969). In the Latino culture, the concept of time takes on a "present-time" or "here and now" orientation (Diaz, 2002), which is something that is also seen in health. Health is thought of as the condition the person is in at the present time (Baca, 1969). It is also believed that there is little a person can do about health and that health is due to chance (Baca, 1969). Illness is viewed as a misfortune, an unpleasant experience, and as something that people will resist as long as they possibly can (Baca, 1969). Good health has been associated with the ability to work (Baca, 1969). There also is a belief that there is little a person can do about the course of life events (Baca, 1969). In order to be more

aware of the meaning this population ascribes to health, it is important to understand their culture; that is their shared beliefs, values, and behaviors (Padilla & Villalobos, 2007).

Cultural health beliefs play an important role in the work life of migrant farm workers (Arcury, Quandt, Cravey, Elmore, & Russell, 2001; Baer & Penzell, 1993; Elmore & Arcury, 2001; Quandt, Arcury, Austin, & Cabrera, 2001). Farm workers have been reported to seek medical consultation from traditional healers or use folk remedies to solve health problems (Culp & Umbarger, 2004). Beliefs consistent with the humoral medicine system in Mexico have been described (Arcury, Quandt, Cravey, Elmore, & Russell, 2001; Quandt, Arcury, Austin, & Cabrera, 2001). Migrant farm workers believed that using cold water for hand-washing could lead to arthritis and rheumatism in the hands and that showering before cooling down after work could affect their health (Arcury, Quandt, Cravey, Elmore, & Russell, 2001; Quandt, Arcury, Austin, & Cabrera, 2001). This goes in accordance with folk beliefs about the origin of communicable diseases, with one of the causes of these diseases believed to be taking a cold drink when the body is overheated (Baca, 1969).

It has also been found that migrant farm workers believe that workers vary in their individual susceptibilities to pesticides. They believe that some workers are strong and therefore are less susceptible to chemicals while other workers are weak, therefore more susceptible (Quandt, Arcury, Austin, & Cabrera, 2001). Farm workers have also been found to associate exposure to pesticides with sensory detection (Quandt, Arcury, Austin, & Saavedra, 1998). Farm workers reported not thinking they were exposed to pesticides if they could not feel, taste, see, or smell a pesticide (Quandt, Arcury, Austin, & Saavedra, 1998).

An external belief system regarding coping with workplace injury was found among farm workers in California (Grieshop, Stiles, & Villanueva, 1996). Farm workers placed control over workplace safety outside of themselves by attributing control to God, supervisors or farmers (Grieshop, Stiles, & Villanueva, 1996). Sense of control may be an important component in terms of risk perceptions. For example, Arcury, Quandt, and Russell (2002) mentioned that even if farm workers knew they were at risk of pesticide exposure, they would not take action to reduce the risk if they felt they had no control over their work situation.

An earlier study conducted in Florida found that migrant farm workers attributed symptoms related to pesticide exposure to the Mexican folk illness *susto* (Baer & Penzell, 1993). *Susto* is one of the four illnesses in the Mexican folk medical tradition which is believed to be untreatable by biomedical methods (Baer & Penzell, 1993). *Susto* is considered to be caused by a traumatic, frightening experience, or an emotional shock (Baca, 1969; Baer & Penzell, 1993). Another study found that farm workers were aware that pesticide exposure could lead to health problems, including cancer (Lantz, Dupuis, Reding, Krauska, & Lappe, 1994). Farm workers in this study had fatalistic attitudes (there is little or nothing a person could do to prevent or survive cancer) toward cancer and their responses reflected cultural barriers towards prevention and early detection of cancer (Lantz, Dupuis, Reding, Krauska, & Lappe, 1994). More specifically, participants expressed embarrassment and shame associated with physical examinations, women reported strong discomfort with male clinicians, and males reported that needing medical attention was a sign of weakness, indicating that cultural attitudes toward masculinity

(machismo) may be involved in the decision to seek health care (Lantz, Dupuis, Reding, Krauska, & Lappe, 1994).

It is important to keep these cultural health beliefs in mind when working with sub groups of the Latino population, especially if this sub group is characterized by a migratory status. The Latino population seems to hold on to and have a strong attachment to their cultural heritage, which includes beliefs about health (Applewhite, 1995; Baca, 1969). Taking these cultural health beliefs into account and being aware that these beliefs exist and are prevalent among this population may aid in the evaluation and interpretation of health behaviors. For example, they have the potential of providing possible explanations for why migrant farm workers have certain views about their job and on the type of things they attribute as causes for injuries at work.

#### *Qualitative research*

Qualitative research has been associated with the researcher's concern with meanings, context, and a holistic approach to the material (Hayes, 1997; p. 15). In fact, Creswell (1998) defines qualitative research in the following manner:

Qualitative research is an inquiry process of understanding based on distinct methodological traditions of inquiry that explore a social or human problem. The researcher builds a complex, holistic picture, analyzes words, reports detailed views of informants, and conducts the study in a natural setting.

In qualitative research, the researcher is an instrument of data collection and goes on to describe a process that is expressive and persuasive in language (Creswell, 1998). In addition, qualitative research refers to a type of research that leads to findings that are not arrived at through statistical procedures or other means of quantification (Strauss &

Corbin, 1998). Qualitative data refers to “a nonmathematical process of interpretation, carried out for the purpose of discovering concepts and relationships in raw data and then organizing these into a theoretical explanatory scheme” (Strauss & Corbin, 1998; p. 11). Qualitative data can consist of interviews, observations, documents, and films or videotapes (Strauss & Corbin, 1998).

#### *Qualitative research and farm workers*

Several researchers have taken a qualitative approach when conducting research with migrant farm workers; however, their focus has been broad. Some of this focus has been on available health care services and programs and the development of interventions to aid migrant farm workers. For example, migrant farm workers in Georgia were asked to share their ideas about health and health care service needs (Perilla, Wilson, Wold, & Spencer, 1998), which generated three themes, health care issues (e.g., inadequate services, cost of medicines), living and working conditions (e.g., poor condition of trailers used for housing, inadequate working conditions), and social and community issues (e.g., drug and alcohol use).

A group of researchers in North Carolina collaborated on the development of the Preventing Agricultural Chemical Exposure (PACE) health program designed to reduce exposure of migrant and seasonal farm workers to pesticides and other agricultural chemicals by developing, testing, and disseminating culturally appropriate interventions (Arcury, Quandt, Cravey, Elmore, & Russell, 2001). Data were collected through in-depth individual and group interviews revealing that most farm workers felt that basic safety and sanitation facilities were not available to them (Arcury, Quandt, Cravey, Elmore, & Russell, 2001). Data from the PACE health program also obtained reports

from farm workers, farmers, cooperative extension personnel, and health care personnel regarding factors related to pesticide exposure and health (Quandt, Arcury, Austin, & Cabrera, 2001). Among these factors were behaviors like hand washing, wearing protective clothing, wearing work clothes once before washing, and washing work clothes separately.

Other researchers have taken a different approach when working with this group. Some have focused on migrant farm workers' views and experiences with their work, housing, and behaviors. For example, Latina women who were migrant farm workers or whose partners were migrant farm workers in Michigan reported that among the challenges they had experienced were discrimination and exploitation, dissatisfaction with interactions in health care settings, social agencies and schools (Parra-Cardona, Bullock, Imig, Villarruel, & Gold, 2006).

In North Carolina, Latino farm workers working on Christmas tree farms were asked to report their beliefs about pesticide exposure, susceptibility to pesticide exposure, and the severity of exposures through in-depth interviews (Elmore & Arcury, 2001). A majority of participants reported being concerned about long-term effects of pesticides; however their actions did not reflect their concern. While participants believed they were susceptible to pesticide exposure, they also perceived several barriers to protecting themselves including pressure to work and their need of money (Elmore & Arcury, 2001).

Data collected through the PACE health program was used to examine how a sense of control was related to self-protective behavior (Austin et al., 2001). Farm workers who believed that they knew how to take precautions and implement safe work

practices also felt they had control over the amount of exposures due to their work. PACE health program data also revealed that farm workers were not benefiting from current safety and sanitation regulations designed to reduce pesticide exposure (Arcury, Quandt, Cravey, Elmore, & Russell, 2001). Farm workers reported that they did not have separate washing and drinking water available on a regular basis, that there were no toilets in the field, that they did not have adequate laundry facilities, and that they had not received pesticide safety training (Arcury, Quandt, Cravey, Elmore, & Russell, 2001).

There are other researchers who have focused on the health of migrant farm workers as well as on factors that may affect their health. In Washington State the health of migrant farm workers was examined by following workers for 15 months during migration from the state of Washington to Oaxaca, Mexico and back to Washington (Holmes, 2006). The aim of this study was to identify how the social context of migrant farm workers affected their health. It was concluded that there was a hierarchy dictating who did what type of work and who lived in which type of housing which was based on ethnicity and citizenship, with undocumented indigenous Mexican migrant farm workers at the bottom of the hierarchy. Holmes (2006) concluded that the hierarchy was correlated with health status; those at the bottom of the hierarchy had the poorest health.

It is evident that research has focused on several factors affecting the workplace as well as farm workers themselves. Much of this research has focused on trying to decipher what the working environment of farm workers is really like as well as trying to find ways that might make it more pleasant and safer. However, while farm workers are being asked to report how they see their working environment, what things are lacking, not much of this research has focused on how they view injuries that are related to their

workplace or whether migrant farm workers see injuries as a problem. Of course research has looked at pesticide exposure and its possible health effects but not necessarily on what migrant farm workers think about this type of exposure in terms of whether it is a work hazard that can lead to health problems and who is responsible for these types of hazards.

Focusing on the health of migrant farm workers, injury rates, and what may contribute to their well being is one step to take to increase understanding of this population's health status. While some studies (Austin et al., 2001; Elmore & Arcury, 2001; Holmes, 2006; Perilla, Wilson, Wold, & Spencer, 1998; Parra-Cardona et al., 2006; Quandt, Arcury, Austin, & Cabrera, 2001) that have undertaken a qualitative perspective when working with migrant farm workers provide insights into the life experiences of migrant farm workers, there is still much more to be learned. To expand our knowledge more information about the actual views, thoughts, and experiences of migrant farm workers is needed. Qualitative methods present an appropriate way to explore these issues among migrant farm workers.

#### *Research purpose of present study*

The purpose of this qualitative study was to conduct an in depth analysis to better understand how migrant farm workers in Colorado view their work experiences by focusing on injuries that may result in their work place (i.e., in the fields). The specific goal of this study was to gain knowledge and understanding of migrant farm workers' experiences, perceptions, and interpretations of injuries in the work place. The following research questions were addressed:

1. How do migrant farm workers view safety and work related injuries?

2. What are migrant farm workers personal experiences with work related injuries?
3. How do migrant farm workers protect themselves from injuries?
4. Who do migrant farm workers hold responsible for work related injuries?
5. Do cultural health beliefs play a role in the way that migrant farm workers view and interpret work related injuries?

## Chapter II: Method

### *Participants*

Migrant farm workers from Northern Colorado were recruited to take part in a qualitative study. All of the participants were Spanish speakers and the majority of participants were interviewed in their homes, which were located in migrant camps. Participants who were not interviewed in their homes were interviewed at the house of a friend or relative, with these houses still being located in migrant camps. A purposeful sampling approach had previously been undertaken through which 100 participants were interviewed. From those 100 interviews, 77 had been conducted with males. A random sample of the male interviews was taken and 12 interviews were selected for inclusion in the present analysis. Random selection of the 12 interviews was done by placing small pieces of paper with numbers representing each of the male interviews in a cup and then drawing 12 pieces of paper from the cup. The selected interviews were analyzed using a qualitative approach to search for recurring themes until informational redundancy was achieved.

### *Materials*

In this study semi-structured interviews were conducted with migrant farm workers. The semi-structured interview is composed of a set of questions or topics to be addressed in the interview. This allows flexibility for respondents to expand on topics or bring up new topics (Payne, 1999; Kvale, 1996). Interviewing is a highly skilled activity

necessitating careful preparation and is the most common method used for collecting data in qualitative research (Payne, 1999).

Interviews are an appropriate way for working with the Latino population because it allows the inclusion of several cultural scripts. For example, *personalismo*, which refers to “trust and rapport that is established with others by developing warm, friendly, and personal relationships” (Cora-Bramble & Williams, 2000; p.270). Latinos would rather interact with others in a friendly manner as opposed to a more impersonal manner. *Simpatia* is another cultural script which refers to “the need for behaviors that promote smooth and pleasant social relationships” (Marin & Marin, 1991; p. 12). A person with *simpatia* tends to behave with dignity and respect toward others and tries to maintain harmonious interpersonal relationships (Marin & Marin, 1991). These two scripts give way to *platica* (talk/dialogue), which aids with respondents satisfaction and cooperation and facilitates an empathic relationship between interviewer and interviewee (Marin & Marin, 1991). *Platica* refers to talk about certain things of significance to life (e.g., family) and are relaxed talks between individuals that vary on level of seriousness (Blea, 1985). Therefore, through the interview process, participants engage in a friendly and informal conversation. This approach is appropriate for this population for several reasons. First, it enables the researcher to establish a sense of trust, respect, and *personalismo*, which are important in this culture (Applewhite, 1995). Researchers also get an insider’s perspective on the topic under study through the experiences, thoughts, beliefs, and ideas of participants. In addition, language, literacy, and cultural barriers that had previously isolated researchers from conducting research with the migrant and seasonal farm worker population have decreased due to use of experienced bilingual

interviewers to conduct interviews directly with migrant and seasonal farm workers (Hansen & Donohoe, 2003; Villarejo & Baron, 1999).

In the present study a questionnaire consisting of two sections was utilized when conducting the interviews. The first section asked demographic questions, such as age, education, and number of years worked in agriculture. The second section consisted of seven open-ended questions related to participants' experiences and views of injuries related to their job. Six of the interview questions had 3 additional follow up questions. A list of the interview questions can be found under Appendix A. All of the interviews were conducted in Spanish and were audio-taped. The interviews were transcribed by a graduate student who is fluent in English and Spanish and who can read and write Spanish. The interviews were then translated from Spanish to English by two individuals, both fluent in Spanish and English.

#### *Research Procedure*

*Recruiting participants.* Participants were recruited in Northern Colorado, in Adams and Weld counties. The main interviewer was a physician who works at Salud Family Health Centers. The interviewer's job related tasks involve coordinating and overseeing the migrant health program. The interviewer also oversees the activities related to the mobile health unit. The mobile health unit visits migrant camps to provide primary health care to migrant farm workers and is also involved in medical outreach. Part of the interviewer's job involves visiting migrant farm workers and due to this previous relationship between the interviewer and local farm workers, she was able to recruit them as participants in this study. During the interview process, the interviewer was introduced to other potential participants. The interviewer then explained the purpose

of the interview to them. Besides the main female interviewer, there was also a male interviewer who assisted with interviewing participants.

*Obtaining consent.* Before being interviewed, participants were read a script describing the purpose of the study. Participants were informed that a goal of this project was to gather information regarding work related injuries and illnesses among migrant farm workers. The script included information about the purpose of the study, the need to have participants who were willing to share their experiences in farm work and injuries and illnesses related to their work, and that the interview would be audio-taped, would take approximately half an hour to complete, and that they would receive \$20 compensation for their time. The participants were told that participation would be confidential and no personal information would be collected (e.g., names, addresses). Participants were also told that there were no known risks associated with participating, that they could choose not to participate, and if they decided to participate, they had the right to not answer any of the questions.

#### *Qualitative analysis*

The method utilized to analyze the data was ethnographic content analysis (ECA). ECA allows the researcher to document and understand the communication of meaning, as well as to verify theoretical relationships (Altheide, 1987; 1996; 2004). With ECA, the emphasis is on discovery and description by searching for contexts, underlying meanings, patterns, and processes (Altheide, 2004). In addition, ECA has the aim of being systematic and analytic, though not rigid (Altheide, 1987; 1996). An ECA study is initially guided by categories and variables; however, throughout the study it is expected that other categories will be identified (Altheide, 1987; 1996). Therefore, ECA embodies

an orientation toward constant comparison or constant comparative analysis of relevant situations, settings, styles, images, meanings, and nuances (Altheide, 1987; 1996; Glaser & Strauss, 1967). Constant comparative analysis is the process through which data are ordered into initial codes and are then constantly compared with each other to help establish categories (Glaser & Strauss, 1967). ECA shares this process with grounded theory and with thematic analysis.

*Thematic analysis.* Thematic analysis was the technique used to analyze the data. Thematic analysis identifies, analyzes, and reports patterns or themes within data (Braun & Clarke, 2006). Therefore, ECA was guided by thematic analysis with the aim of identifying themes. The identification of themes focuses on analyzing the primary source of information by reducing the large amount of data into themes that are common to the group under study (Sheppard, 2004). Thematic analysis is a flexible research tool, which has the potential to provide rich and detailed, as well as complex, interpretation of data (Braun & Clarke, 2006). This method requires a constant moving back and forth between the data set (all interviews), the coded segments of data being analyzed, and the analysis of the data you are producing (Braun & Clarke, 2006).

*Research team.* A research team consisting of the researcher and 2 research assistants was involved in the analysis of the interviews. Both research assistants were females attending Colorado State University. One of the research assistants was an undergraduate student majoring in psychology and the other one was a psychology graduate student. Before analysis began, the research team was trained by a researcher who is knowledgeable in qualitative research, in grounded theory principles proposed by Strauss and Corbin (1998) and who has conducted research with Latino groups. In

addition to the training, research assistants were required to read materials related to qualitative analysis following a grounded theory perspective. The researcher became familiar with NVivo version 7; a qualitative data software that was utilized to help analyze and organize the data. In addition, before commencing the second phase of coding, the researcher consulted with a graduate student familiar with the NVivo software, with qualitative data analysis, and with thematic analysis.

*Coding: Phase 1.* During the first phase of analysis, the first step required the team to engage in open coding, which is an analytic process through which data are examined line-by-line (Strauss & Corbin, 1998). All team members were initially assigned the same interview to code individually using a paper and pencil method. The team then met and reviewed the codes and discussed and resolved any concerns that arose during initial coding. During the second step, team members formed 2 groups (1 research assistant and the researcher) to analyze one assigned interview and then met to discuss the codes and resolve any concerns. This procedure was followed with the remaining interviews until all were coded. Two weeks were allotted for team members to analyze the first interview. With subsequent interviews, the analysis took from 1-2 weeks per interview.

*Coding: Phase 2.* The first step in this phase was topical coding which consisted of coding each interview into text segments based on the general topics (e.g., pesticide exposure). Each interview was reviewed and headings describing the topics addressed (e.g., pesticide exposure) were placed in front of each text segment representing the different topics. A project was then created with the NVivo software and the interviews were imported. When the interviews were imported, the software automatically coded

each interview based on the headings previously created, which led to the creation of 9 general codes based on the headings outlining the text segments. This helped to organize and condense the data into units or segments that were easier to manage (Braun & Clarke, 2006; Boyatzis, 1998). Each of these codes was further coded based on the topic being discussed (e.g., prevention of falls). This led to the development of sub-codes for the general codes mentioned above.

Once these codes had been developed, each of the sub-codes was further coded by referring to the initial codes identified during open coding. Codes were arrived at by searching for similar and repetitious topics within and across interviews. For example, when ideas, beliefs, concerns, and issues that were discussed or brought up in one interview were also mentioned in other interviews, this was considered significant because it indicated that a pattern was emerging. The data were coded for as many potential codes or patterns as possible. Coding was inclusive, meaning that surrounding text that was relevant was also coded. This was done to maintain the context of the information coded. Text segments were coded several times when it was appropriate. For example, if a participant mentioned several injury factors, and each of the factors mentioned could be placed under a separate code, then the text segment was coded several times. After every interview was coded, the researcher reviewed the list of codes by returning to the text and ensuring that each code was representative of the text. After this was completed, the research team met to review the list of codes and discuss any possible new codes.

Once the team agreed on a final set of codes (see Appendix B), the process of theme identification began by sorting codes into potential themes. A theme can be

described as “a pattern that at the minimum describes and organizes possible observations, and at the maximum interprets aspects of the phenomenon” (Boyatzis, 1998, p4). Therefore, a theme captures an important aspect of the data as it relates to the research question(s) (Braun & Clarke, 2006). The codes and text were re-read to identify underlying patterns. The purpose of this process is to examine the codes and think about how different codes may combine into overarching themes (Braun & Clarke, 2006) based on similarities. Therefore, at this point, the data was re-read by searching for recurring topics and meanings. This process led to the identification of common and salient themes (see Appendix C).

The research team then reviewed the list of themes and codes represented by each theme. The research team discussed the themes, the labels given to each theme, how well each theme represented the codes and data, whether additional themes and codes could be developed, and whether themes and codes could be collapsed or deleted. Team discussions led to another revision of themes and codes (see Appendix D). At this point, the text was again read to ensure that the themes and codes adequately represented the participants’ views. Revisions led to collapsing and merging several themes and codes, resulting in another revised set of themes (see Appendix E). The themes were once again reviewed and discussed by the research team and the team agreed on the list of themes. During the final step, the themes were examined and organized in a manner that allowed us to see how they combined to form overarching themes. The themes were therefore, assembled into coherent and similar groupings that best represented the participants’ responses (see Appendix F).

## Chapter III: Results

### *Descriptive information*

A total of 12 migrant farm workers participated in this study. All participants were males and all were born in Mexico. Table 1 shows the basic demographic characteristics of the study participants. On average, participants' had an average age of 37.6 ( $SD = 11.1$ ), 5.5 ( $SD = 2.9$ ) years of education, and were 14.6 years old ( $SD = 3.9$ ) when they first started working in agriculture. The first time participants came to the U.S. ranged from 1975-2005 (see Table 2). One participant did not report when he first came to the U.S.

Four participants mentioned that in the previous year (2004) they lived in the U.S. between 4-12 months (see Table 2). One participant did not know how many months he lived in the U.S. the previous year and for one participant it was his first time in the U.S. Seven participants mentioned that in the previous year they had never moved for work purposes and 5 reported they had moved 1-2 times. Seven participants had worked in states other than Colorado and 5 had not.

### *Ethnographic content analysis*

Five main themes were identified from the interviews and are presented below. Each theme is described and presented individually along with its sub-themes (see Table 3). Each main theme had 3 sub-themes, which were representative of topics emphasized in the interviews. Direct quotations from the participants are presented to illustrate each

sub-theme. The quotations are presented in English but were translated from Spanish. All participants were given a pseudonym by the researcher to maintain their confidentiality.

Participants were asked to discuss their views and perceptions regarding specific types of injuries (e.g., back injuries, falls) they had or could suffer when doing farm work. The themes presented here were arrived at by looking at commonalities across the different types of injuries discussed during the interviews.

### *Themes*

#### *Theme: Concerns about safety*

Participants were asked about the concerns they had regarding their safety. Participants brought up several topics in relation to safety concerns. These concerns were arranged in a manner that led to the identification of three sub-themes: home safety, work safety, and transportation safety.

*Home safety.* Participants talked about whether they had concerns about their safety at home. The majority of participants said that they did not have any concerns regarding their safety at home. They mentioned that everything was fine at home and that they got along with the people they shared their houses with. They also stated that they were glad that employers provided housing for them.

In particular here at home, there is no particular concern, you know. So really everything is fine, there is nothing that worries me (Jorge, 50 years old; referring to home safety).

No well here in the house, all goes well here, or say, the coworkers are all friendly...well no, here in the house, no, it is somewhat more, more safe (Alex, 33 years old; referring to home safety).

Well, in the house, here we are all right, all of us, all of us are doing all right and well, happy, in any event, the house is from the same work...the boss's and for that we are glad, well, that is an advancement for us (Mario, 25 years old; referring to home safety).

*Work safety.* In terms of work safety, participants were concerned about suffering an injury at work. Their concerns about work injuries were accompanied by the concern of how such injuries could affect their family's well being. Their main concern was that they did not have medical insurance and therefore would not be able to seek health care while in the U.S.

My main concern is that an airplane could come and spray us while we are planting or cutting the crops. They do not care, but we care because it is bad for us. That concerns me because it could be dangerous for us (Daniel, 45 years old; referring to work safety).

My main concern in the state of Colorado is not to have any kind of insurance. Yes, health insurance, because unfortunately at the clinic we get seen but we make little money and we can't pay a lot of money. The clinics charge a lot when you don't have Medicare or health insurance. So getting sick is my concern (Valentino, 48 years old; referring to medical insurance).

Well yes that my family is left without, or say without me, since they are dependent, I support my wife and son in Mexico. Well that we may end up injured and won't be able to work and since we cannot count on insurance, they won't pay us, we would have to go to Mexico and with nothing...aha, with empty hands... (Alex, 33 years old; referring to family well being and medical insurance).

To have an accident, all the risks that a worker has... a serious accident concerns me more (Santiago, 33 years old; referring to work safety).

*Transportation safety.* Participants expressed concerns about their safety when traveling between their place of employment and residence. The concerns that participants had were mostly in regard to suffering an injury in a motor vehicle crash. In addition, participants also expressed some concerns about their safety during their trip from Mexico to the U.S. Specifically, participants concerns during their trip from Mexico to the U.S. centered on the dangers they face when traveling, not having sufficient water,

getting lost, and not being in good shape to start working in the field as soon as they arrive.

Well an accident while traveling on the highway (Manuel, 32; referring to transportation safety).

Also crossing the border, it is very difficult because we are undocumented. Sometimes we do not have anything, not even water or food. Sometimes we walk two to three days and then we get here. When we get here sometimes we are dehydrated and missing many things. Our bodies are lacking things and we have to work hard, that worries me too (Ricardo, 36; referring to Mexico – U.S. trip).

Well, in regard to my safety, it's that every time that we come [from Mexico] we risk our lives, that is the major concern...yes in the desert, yes...that we might run out of water, that we get lost, that an animal could attack us or say...yes, because we have gotten lost, we have gotten lost for a week, we were lost but we were able to get out, it took us one week to come out of the desert (Alex, 33; referring to Mexico – U.S. trip).

*Theme: Factors contributing to injuries*

Participants were asked to discuss their views on what could contribute to or cause injuries on the job. Specific factors were emphasized by participants regardless of the type of injury being discussed. These factors were organized in a manner that led to the identification of three sub-themes: being careless, type of work, and personal decision. These three sub-themes and how they relate to different types of injuries are highlighted below.

*Being careless.* A contributing factor to injuries mentioned by participants was not being careful when engaging in work activities. Being careless was mentioned for burns, pesticide exposure, falls, and motor vehicle injuries. For burns, responses predominantly focused on burns in the kitchen due to being careless and there were very few comments about sunburns due to carelessness. For falls responses were a matter of not being careful when walking or being distracted.

Because people do not pay attention or because people cook in a hurry and they want to finish fast and do not pay attention to what they are doing. (Daniel, 45 years old; referring to burns).

It would be because you are not careful, without being careful, like here sometimes people leave the stove on (Juan, 56 years old; referring to burns).

For not...I think it's because they don't pay attention to what they're told, or...for disobeying...they tell us something and you don't pay attention (Alvaro, 23 years old; referring to pesticide exposure).

Well...well if you are not being cautious about what you are doing, then you fall (Carlos, 47 years old; referring to falls).

Well, going, for example, if one is walking, and suddenly becomes distracted, it could be because of that (Mario, 25 years old; referring to falls).

Not to take precautions...yes lack of precaution, if people are not cautious then an accident can happen because they are just playing (Jose, 24 years old; referring to motor vehicle).

Because they are not cautious while driving (Ricardo, 36 years old; referring to motor vehicle).

*Type of work.* Another factor that participants mentioned contributed to work injuries was the type of work. Engaging in farm work requires working in conditions that according to participants contribute to injuries. This was mentioned for back pain, burns, pesticide exposure, and falls. For back pain, the type of activities related to farm work that contributed to injuries were heavy lifting, tiredness, working bent over, and work pressures. For burns, the type of work contributed to sunburns from sun exposure. For pesticide exposure discussion focused on contact with pesticides.

It is part of the job...in the field, the excess of work. It is a lot of work, sometimes you do the job of two people and it doesn't matter where you work, it will always be like that...it depends on the job because when we work using a shovel it's different than packing meat. When we work packing meat our hands hurt but then working in the field with the shovel it's different. Not everybody will work in the field...but what can you do, we have to work (Valentino, 48 years old; referring to back pain).

In fact the field is always hard, everything that is done in the field is hard for the back, it is tiring and you are bending over all day long (Santiago, 33 years old; referring to back pain).

But with the sun you can also get burned in your face, like this where I had sun exposure, it burns, it is very hot (Ricardo, 36 years old; referring to burns).

I am in charge of watering as I told you, and I have to grab pipes and sometimes the pipes have some pesticides and the water so you get in contact with them...it has pesticides because when they spray somewhere else it gets there in the water...even if they did not spray where we are, the water brings the pesticides (Valentino, 48 years old; referring to pesticide exposure).

Just the contact with it (Daniel, 45 years old; referring to pesticide exposure).

If you are carrying the pipes and walking at the same time you can't see what you are stepping on. You need to be cautious but when you are putting water in the ditch you need to do it fast and grab many pipes at the same time if not the water will cover everything. Sometimes I carry 30 pipes at the same time and do my job. I need to do it fast if not the water will cover the ditch, that is why it is difficult to avoid (Valentino, 48 years old; referring to falls).

*Personal decision.* Another recurring sub-theme for factors contributing to injuries was actions participants decided to engage in. They stated that these actions had or could lead to injuries at work. Personal decisions were mentioned for motor vehicle injuries and weather conditions. Personal decisions for motor vehicle injuries centered on violation of traffic regulations like drinking and driving and not following road rules. For weather conditions, not protecting themselves from heat and sun exposure and from cold were mentioned as decisions that contributed to injuries at work.

Well, yes, by not putting on...yes not using the safety belt [seatbelt] (Manuel, 32 years old; referring to motor vehicle)

Because people drive very fast, they want to get fast to work (Ricardo, 36 years old; referring to motor vehicle)

The excessive speed and many of the people who drive drunk (Alex, 33 years old; referring to motor vehicle)

Well, I think that it's up to each person, because if I protect myself and my colleagues don't, that would be too bad for their organism or their body (Jorge, 50 years old; referring to the heat)

It could be because you do not wear sweaters, that is why you get colds and things like that (Juan, 56 years old; referring to the cold)

People don't cover themselves, they don't protect themselves. Many people don't even wear a shirt (Valentino, 48 years old; referring to the heat)

*Theme: Characteristics of injuries*

During the interview participants mentioned several characteristics of injuries. These characteristics are representative of their own experiences with work injuries, what they have observed among coworkers, and of what they would expect in the case of being injured at work. The different characteristics that were brought up by participants led to the identification of three sub-themes: injury occurrence, symptom dynamics, and managing symptoms.

*Injury occurrences.* Participants were asked during the interview whether they had experienced any of the injuries that were discussed. Participants' responses covered whether they had suffered an injury at work or not and whether they had witnessed injuries among coworkers. Injuries and exposures mentioned included burns, back pain, pesticide exposure, falls, motor vehicle injuries, and weather conditions.

No participants had suffered injuries due to traveling in motor vehicles to and from work. Most participants stated that they had not suffered burns or falls. Most of the burns participants referred to were burns in the kitchen. While some said they had not suffered any weather or pesticide exposure related injuries, there were others who did mention having suffered or witnessed such injuries. For those who said they had suffered

or witnessed injuries due to the weather, they said that it was normal in their line of work.

Most participants said they had suffered back injuries. In terms of back pain, they also mentioned that feeling back pain was normal, that it was part of the work.

More maybe some backaches because of the work, the tiredness, but not much else...well, yes... it is normal isn't it? For example sometimes you go around bent over all day and, well, when you get up you feel pain...that's normal (Jorge, 50 years old; referring to back pain).

My job is very hard therefore sometimes I suffer back pain, but I have to work and what can I do, just work and work (Valentino, 48 years old; referring to back pain).

Well, you know, no, I have never had anything like that, be it from work to home or from home to work...it's never happened, no...so far everything has been fine (Jorge, 50 years old; referring to motor vehicle).

Not so far. Never any of us that work together...nothing of that sort has happened...no, not so far because we have been entering the fields when they are already disinfected, so the effect of the fertilizers is already passed. So no, so far we haven't heard about any of that (Jorge, 50 years old; referring to pesticide).

I think that yes because sometimes my eyes hurt a lot (Daniel, 45 years old; referring to pesticide).

Yes, sometimes yes. When the sun is too hot I have headaches, I feel dizzy and exhausted, I feel like I am drunk because of the high temperatures (Ricardo, 36 years old; referring to the heat).

Well sometimes we have more problems with our teeth, we have a, something to do with the grains of sand and earth. When you are working out there all the time sometimes it affects your eyes and body. It's normal...that's nature (Jorge, 50 years old; referring to the dust and soil).

No, in fact any person exposed to the sun all day long will get something, it is obvious because it is more than 9 hours and the body starts to react, that is normal...just tiredness (Santiago, 33 years old; referring to the heat).

I have noticed, there are people that I have seen that do get sick because of the sun, right, there are a lot of them that I have seen also, that suddenly when we are working and it is hot, or say, it's like, say, if one is not used to it (acclimated), well it's difficult or hard, well because I was able to see that the people, suddenly it is very hot and I, I have seen them like desperate or anxious, and a lot of them their nose bleeds (Mario, 25 years old; referring to heat).

*Symptom dynamics.* When discussing whether they had experienced any injury at work, participants also talked about the kinds of symptoms they had due to an injury attributed to work. They talked about the types of symptoms they had observed among fellow coworkers and what symptoms would be expected if such an injury were to occur. However, symptoms were mentioned only for back pain and pesticide exposure. In terms of back pain, symptoms were in reference to the areas of the back where pain was felt, how long it lasted, and whether it interfered with work. For pesticide exposure, some participants talked about symptoms they had experienced, including dizziness and nausea and others talked about symptoms they had witnessed among coworkers.

No, well, sometimes only, for example, the day before yesterday, it started, that pain and then it went away but when I get that pain, I cannot, can't even do, like move, nothing but standing up until it goes away, that is it, but it does not last too long, only about 15 minutes, only, and it's on this side only (Jose, 24 years old; referring to back pain).

Sometimes I get pain in the lower area of the back...the pain is after work, when we come back home... [when asked if he had missed work due to the pain he responded] no, no, no...no, you get up the next day and go to work. God will help, I think, what else can I do? (Valentino, 48 years old; referring to back pain)

It's the back and kidneys more than anything because one must drink enough water...sometimes it's at the end of the day or at the beginning, or say, the pain does not cease, one has the backache (Alex, 33 years old; referring to back pain)

I wake up with itchy eyes and that is why I am always scratching my eyes...my eyes get irritated, and something bothers me while breathing (Daniel, 45 years old; referring to pesticide exposure).

With the pesticides, sometimes I get a rash in the...[fingers] yes, it's a rash...now that the airplane comes to spray I feel dizzy because of the pesticides...well when I started I felt dizzy, like vomiting, your eyes hurt very badly and you see everything yellow. I think it's because the pesticides are very strong...your eyes hurt, dizziness and nausea; it's like you ate something that made you sick...they [coworkers] get rashes and vomit, they get dizzy and they get headaches...they

only say that they feel dizzy, like they are drunk and that their head hurts (Ricardo, 36 years old; referring to pesticide exposure).

*Managing symptoms.* Participants discussed management of symptoms. They talked about what could be done to manage symptoms due to the injuries discussed throughout the interviews. Management of symptoms was mentioned for back pain, pesticide exposure, and weather conditions. Management of symptoms for back pain focused on use of medication, not doing anything for the pain, and resting. For weather conditions, management of symptoms focused specifically on symptoms due to working in the heat and dust.

Well, it goes away by itself...yes, just resting and pretty soon it goes away and then we go back out again [to the field]...well, we just deal with it (Carlos, 47 years old; referring to back pain).

Well, they give us stuff...the doctor comes by in the mobile unit, and they apply lotion on us and give us pills, and with that it's enough...then with a little sleep for a while, and then you feel okay (Jorge, 50 years old; referring to back pain).

It is part of the job. We all get tired at some point and if you are suffering then you take medication and the pain will go [away] (Valentino, 48 years old; referring to back pain).

It goes away by itself...yes, it gets better...it goes away by itself...but people say that over time it could be bad for you. Pesticides could cause cancer or other things (Ricardo, 36 years old; referring to pesticide exposure).

Well, we report it to the foreman that we feel bad...well [he] gives us water and takes us away from the field for a while until we feel better, calm (Alex, 33 years old; referring to pesticide exposure)

No, nothing, then when...the temperature comes down...it goes away [headache]...no well, when I get home I take one [pill], but not here (Carlos, 47 years old; referring to heat).

*Theme: Injury prevention strategies*

During the interviews, participants talked about injury prevention. Discussion focused on strategies they use to prevent injuries at work. Several strategies for prevention and protection from injuries were brought up by participants. These strategies were organized into three sub-themes: provision of safety education and safety equipment, safety measures, and being careful.

*Provision of safety education and safety equipment.* Employer provision of safety education and safety equipment was mentioned. Education was mentioned when discussing pesticide exposure. Education on pesticides provided included videos or talks on how to handle pesticides, how to prevent exposure, and what actions to take if exposed to pesticides. Whether safety equipment was provided through work was brought up when discussing back pain and pesticide exposure. When talking about back pain, participants said that no safety equipment (back support belt) was provided to them. Safety equipment for pesticides was mentioned by some of the participants and consisted of coveralls, boot, and gloves. However, there other participants who said safety equipment for pesticides was not provided.

Yes, we are missing that [back support belts] because once in while we carry heavy boxes of 40-50 pounds and we do not have any sort of protection (Daniel, 45 years old; referring to back pain).

They do not provide those (Juan, 56 years old; referring to back pain).

Sometimes we wear a full body suit: boots, mask or glasses. So it's a question of protecting ourselves... [we get it] from the company or from our boss or the foreman, they give us all of those things to protect us (Jorge, 50 years old; referring to pesticide safety equipment).

Yes, they have, well, we have been told that when a field is being sprayed to not, we must not go there, nor pick up any pesticide container, nor touch anything like that, not go into a field that has been sprayed, to avoid, well illnesses and even

death, that is what we have been told...yes, or say that we must be changing often, if it happened that we were sprinkled by the sprayer, to remove that clothing immediately and wash it and wash the face and all, yes, yes, there is water to do all of that (Alex, 33 years old; referring to pesticide education).

Yes, because in fact the people who work here get trained and watch a video of handling pesticides and people do not go into the fields before they can do it...now a day, the new employees always get to watch the video that talks about the exposure and how to do things correctly. Every time somebody gets hired they have to watch that video (Santiago, 33 years old; referring to pesticide education).

*Safety measures.* Safety measures were mentioned for back pain, pesticide exposure, motor vehicle injuries, and weather conditions. Safety measures for back pain consisted of utilization of back support belts. For pesticide exposure safety measures focused on avoiding sprayed areas, compliance with regulations, and taking care of self. For motor vehicle injuries, prevention focused on following traffic regulations such as not drinking and driving, using seatbelts, and following road rules. Protection from weather conditions was based on protecting themselves from the heat and dust. For protection from the heat they mentioned wearing appropriate clothing and drinking plenty of water.

Yes, I use a [back support] belt...when I don't have the [back support] belt I still use something (Valentino, 48 years old; referring to back pain).

Well, yes, well by putting on the safety belt [seatbelt] more often, using the safety belt more often (Manuel, 32 years old; referring to motor vehicle).

Not drinking while you are driving...respecting the limits...those things...respecting all the signs (Alvaro, 23 years old; referring to motor vehicle).

Cover oneself, like this right now, if I'm just wearing a t-shirt and I go out and I'm in the sun well, well it's clear that I will get sick, and it's about covering oneself to go out in the sun...because one goes out and it is hot, one should cover oneself too...[drink] a lot of water, a lot of water...yes, that does help me, because more than anything one has to be thirsty, if thirsty, go and drink water and one is calm even when the heat is unbearable, one is real happy (Jose, 24 years old; referring to the heat).

Well, with the appropriate clothing for the heat as well as drinking lots of liquids so as not to harm yourself, that is the best we can do for ourselves...we wear sunglasses, for example the doctor from the mobile unit from Salud gives them to us to protect ourselves...in order to protect ourselves from the dust or from anything else getting in our eyes that might irritate them, so they don't get red...we are allowed to wear them...the nurses in the mobile unit have even told the foreman "you know, they have to protect their eyesight, you have to let them use them [sunglasses] (Jorge, 50 years old; referring to the heat and dust).

It is my habit to always bathe when I get from work, always, always, always daily, daily and change the clothes also, because sometimes the clothes can affect you, because it's dirty clothes and if you put it back on it affects you, this way when you are done with your bath change to other clothes and when you arrive from work you should bathe and change clothes, you should not put the same clothes back on because also that could mean getting sick too, because one sweats and all that, that stays on the clothes and if you wear the same clothes there is no point in one taking a bath (Jose, 24 years old; referring to self care as safety measure for pesticides).

I mean the employers at the beginning put some signs that tell you if you can get in or not. They also tell us that if the airplane is closed we should not go into the field after 2-3 hours when the odor is gone. When we see the airplane we just leave...yes I leave because that is what they tell us and it is part of the contract we have with them...I don't stay there because it will hurt me. The foreman could be far away but we have to leave, and we haven't had a problem with that because that is what the employer tells is at the beginning...when we see the signs then we don't go in. if you get in is because you want trouble (Valentino, 48 years old; referring to avoiding sprayed areas as safety measure for pesticide).

When discussing prevention strategies for pesticide exposure, participants mentioned that there were times when they could not use these strategies because employers did not comply with regulations. Even if employers told employees what kind of things they could do to avoid pesticide exposures they did not facilitate these strategies.

Yes, they do but they do not follow all the recommendations, they just tell us what we need to do. They just talk...they do not comply...they talk, but nothing else...they [employers] because we cannot follow recommendations if they will not allow us to do it, for instance if I need to wash my hands they will not allow me to do it (Daniel, 45 years old; referring to compliance to regulations for pesticides).

Yes, they tell us but they do not do it. No, it's not done. They only show the video explaining how you handle pesticides, how to protect yourself, wash your hands. The bathrooms should have water the whole time, but they are lying, they do not have all these facilities (Ricardo, 36 years old; referring to compliance as safety measure for pesticides).

*Being careful.* Participants mentioned that being careful could prevent injuries.

This was mentioned for burns, falls, and motor vehicle injuries. For burns, prevention was focused on being careful in the kitchen. There was also mention that sometimes the field is wet and slippery and it is necessary to be extra careful to not slip and fall. When driving, participants said that it was necessary to be careful to avoid crashes and to be aware and watch out for other drivers who may drive irresponsibly.

Well, being careful...being careful not to get too close to the flames...not leaving pots with the stove on (Carlos, 47 years old; referring to burns).

I think that in order to avoid burns you need to be careful (Daniel, 45 years old; referring to burns).

For example, when the field is wet it is very slippery, and one has to be very careful with, sliding, step right, clean the shoes, the boots that we use so that they are free of mud so that we do not provoke an accident (Alex, 33 years old; referring to falls).

I am very cautious traveling from home to work. If you are working you would have to drive even if you don't like it. But I am very cautious and during all these years driving I am fine thanks to God. The first thing is to be cautious, but sometimes other people are not cautious. So sometimes if we are on the highway I am cautious and look around (Valentino, 48 years old; referring to motor vehicle).

*Theme: Injury accountability*

When talking about the types of injuries that occur in the field, there was discussion on the topic of responsibility. Migrant farm workers were asked about their thoughts on who would be responsible for workers being injured at work. Their responses led to the identification of three sub-themes: oneself, others, and the type of work. These

sub-themes indicate that accountability for injuries was attributed to one of these three sources.

*Oneself.* Workers believed that they were accountable for injuries at work. Personal accountability was mentioned for all injuries and causes discussed in the interview: back pain, burns, pesticide exposure, falls, motor vehicle injuries, falls, and weather conditions. Part of this personal accountability was attributed to not being careful, not being aware or not paying attention to what workers are doing or to surroundings, and for not protecting themselves from potential injuries.

Well, that for example if I, if I don't, so say I am working and I am not very comfortable, right, and if I don't wear the back support belt, well I am who, I am who is causing the harm to be more (Mario, 25 years old; referring to back pain).

Oneself, oneself because one provokes it by not being careful (Alex, 33 years old; referring to burns).

Well, yes, oneself, well, for example, if I am distracted and I fall, well I myself am at fault (Mario, 25 years old; referring to falls).

Oneself if we speed excessively, sometimes because it's getting late we go too fast...yes, if one goes fast, and there, well, it is when one can cause an accident (Alex, 33 years old; referring to motor vehicle).

For example, if they say, let's take this square in front of us, this one here in front, that field, the one that is there, if they come and tell us, at that moment that they applied the pesticides, they come and they tell us to not enter over there, and I go and enter, well then, I am at fault there, that an accident occurs (Mario, 25 years old; referring to pesticide)

Well, also our own self because if one does not protect oneself, well you are hurting yourself (Alex, 33 years old; referring to the heat).

*Others.* Participants mentioned other people who they considered could be held accountable for injuries. Employer accountability was mentioned for back pain, pesticide exposure, and weather conditions. With pesticide exposure it was mentioned that the

employer would be responsible because there were times when the workers were required to continue working when fields were being sprayed or to re-enter recently sprayed fields. The other people mentioned were drivers of motor vehicles. Participants said that drivers were not careful, would not wait for people to get on or off trucks completely, and would speed.

I think our employer (Ricardo, 36 years old; referring to back pain).

They [employers] would be responsible because they need to tell us to leave the field, but sometimes they leave us there saying that the airplane is just going around (Daniel, 45 years old; referring to pesticide).

Yes, our employer, because he doesn't remove us when it is too hot. He should say "it is too hot, do not work now." Only when it is too hot, it is better to take, get us out of there when it is too hot, and then make us go back when it cools off (Ricardo, 36 years old; referring to the heat).

I think the drivers are...yes because when we are climbing on the truck he start going, and the same when we are jumping from [off] the truck, he doesn't stop (Daniel, 45 years old; referring to motor vehicle).

The driver...well, the driver is the one responsible of what he is doing, he is not only driving himself (Ricardo, 36 years old; referring to motor vehicle).

*Type of work.* Type of work was also viewed as accountable for work injuries.

However, type of work was only mentioned for two types of injuries: back pain and falls.

Participants said that even if they were careful there were work factors that could be anticipated and therefore some injuries could not be prevented.

I think that...nobody in particular. It has to do with the rhythm of the work (Alvaro, 23 years old; referring to back pain).

The work...no, nobody is responsible, it is the type of work (Juan, 56 years old; referring to back pain)

...because even though you are being careful those are things that happen and you can't avoid. If you are carrying the pipes and walking at the same time you can't see what you are stepping on (Valentino, 48 years old; referring to falls).

A little bit of everything, if a person has excess of work then something wrong could happen to him...there are many factors, the work load, tiredness (Santiago, 33 years old; referring to falls).

## Chapter IV: Discussion

The present study focused on examining injuries that may happen while engaging in farm work. The main goal of this study was to gain knowledge and understanding of migrant farm workers' experiences, perceptions, and interpretations of injuries in the work place. This goal was achieved by analyzing semi-structured interviews conducted with migrant farm workers in Colorado. The analysis led to the identification of 5 main themes: 1) Concerns about safety, 2) Characteristics of injuries, 3) Factors contributing to injuries, 4) Injury prevention strategies, and 5) Injury accountability. Each of the main themes consisted of 3 sub-themes (see Table 3). The research questions addressed in the study will be discussed in relation to the themes that were identified in the analysis.

*Research question 1: How do migrant farm workers view safety and work related injuries?* Two of the main themes that were identified address this research question. The first of these themes is 'Concerns about safety.' This theme represented concerns participants expressed about safety. Participants' discussion about safety concerns centered around three sub-themes: home safety, work safety, and transportation safety. A majority of participants said that they had no safety concerns in their homes. In fact, some participants expressed a relief that they had a place to live and that their employment provided housing for them.

Previous research has reported the poor living conditions among farm workers, however most of the research is based on outsider observations and not on worker reports

(Quandt, Arcury, Austin, & Cabrera, 2001; Quandt et al., 2004). For example, outreach workers who visited labor camps that provide housing for farm workers have reported that often times the housing is in poor condition (Quandt, Arcury, Austin, & Cabrera, 2001). There is concern that dirt contaminated with pesticides and airborne drift can enter migrant worker housing after pesticide applications (Quandt, Arcury, Austin, & Cabrera, 2001; Quandt et al., 2004). While farmers are required to provide information on pesticide risks many do not, and health care providers believe this indicates that farm workers are not well aware of the risks or of safety practices (Quandt, Arcury, Austing, & Cabrera, 2001). Based on walk-through observations, it was found that when a manager lived in the camp or lived nearby, the living conditions of farm workers were better than for farm workers where there was no manager, in which case more safety and sanitary risks were reported (Vela-Acosta, Bigelow & Buchan; 2002).

Migrant farm workers in Georgia viewed the deteriorated state of the trailers they lived in as serious problems for their children as well as the overall state of the camps (Perilla, Wilson, Wold & Spencer, 1998). It is important to note that the researchers mentioned that parents were the ones who were most concerned about the state of their living conditions. Wipe samples have also been taken from farm worker residences in which children between 12-84 months of age lived (Quandt et al., 2004). It is possible that migrant farm workers in the present study did not view the state of their living conditions as a safety concern because there were no children living with them.

Participants in the present study also expressed concerns about their safety at work. These safety concerns revolved around suffering an injury at work. What worried them most was that injuries could prevent them from working, which in turn would

prevent them from making money and providing for their families. Several participants mentioned that they were married with children and that their families resided in Mexico. Not being able to provide for their families appeared to be a major worry for migrant farm workers in this study because they were the main provider for the family. Previous research has reported that reasons why farm workers are in the U.S. are to support themselves, the family members who accompany them, and to also support family members who remained in their home country (Arcury & Quandt, 2007).

Another reason why migrant farm workers were concerned about their safety and suffering an injury at work was related to availability of medical care. They expressed concerns about having to seek medical care because they did not have insurance. They said that they did not make enough money to be able to pay out of pocket for medical services. Villarejo (2003) stated that many farm workers only seek health care in U.S. when they deem it necessary. For example, if they suffer a serious injury. Farm workers mentioned that the most common form of payment for health care services was out of pocket (Villarejo, 2003), which was also a concern expressed by participants in the present study. The lack of medical insurance has been previously reported as a barrier to utilization of health services among farm workers (Arcury & Quandt, 2007; Villarejo, 2003).

Villarejo's (2003) report mentioned that in the California Agricultural Worker Health Survey (CAWHS) one-fifth of workers sought health care in Mexico because of language and cultural barriers. While this was not mentioned by participants in this study, it is possible that they would rather seek health care in a place where they feel comfortable and anticipate they will be understood and will be able to understand the care provider. It

is also possible that they would rather wait until they return home to seek health care so that they can have a family member accompany them and have the comfort of their family. In the Latino culture, *la familia* (the family) is a primary social institution in which member interdependence is valued (Cora-Bramble & Williams, 2000). This concept is also termed *familismo* (Marin & Marin, 1991).

Health decision making is a family affair. The family plays an important role in decision making and the entire family may take responsibility for the healing process. However, migration and geographic mobility can negatively affect the Latino familial support network (Cora-Bramble & Williams, 2000). This is a risk for recent immigrants who experience the loss of familial and community support. It has been reported that *familismo* also encompasses a preference for living near immediate and extended family members (Santiago-Rivera, 2003). Parra-Cardona, Bullock, Imig, Villaruel, & Gold (2006) found that family support was critical, especially in times of crisis and there was also a principle to help family members in need. Since *familismo* holds that there is a need to be near family and it includes reliance on relatives for help and support (Marin & Marin, 1991), migrant farm workers may opt for waiting until they are near family who will provide the support they need when visiting a medical provider.

Migrant farm workers also expressed safety concerns related to transportation to or from work. They expressed concern about the possibility of suffering an injury in a motor vehicle crash. Culp & Umbarger (2004) mentioned that agriculture has continuously been identified as having the highest rates of accident and injury. The authors provided a list of what they called the main causes of agricultural illness and injury (e.g., heat stroke, musculoskeletal disorders, falls) among migrant farm workers

(Culp & Umbarger, 2004). There was no mention of motor vehicle injuries, which was something participants in the present study mentioned. Transportation was reported as a health and social disparity that left migrant farm workers without transportation to be able to frequent clinics for checkups or be able to grocery shop (Culp & Umberger, 2004). There was mention that migrant farm workers travel in crowded and unreliable motor vehicles (Culp & Umberger, 2004), but there was no reference made to the possibility of suffering injuries in a motor vehicle crash.

Another safety concern expressed was related to the trip from Mexico to the U.S. Migrant farm workers talked about their safety when embarking on their trip to the U.S. and about their experiences. For example they described the trip as dangerous and mentioned that sometimes they ran out of water and risked getting lost. It is important to further research this given that approximately 53% of farm workers were in the U.S. without authorization in 2002 (Arcury & Quandt, 2007). Limited literature on the safety of migrant farm workers when they travel across international borders is available. Valenzuela, Schweitzer, & Robles (2005) stated that transportation from the home country to the U.S. posed safety issues for migrant farm workers. However, this concern focused only on motor vehicle transportation, which was not among the concerns expressed by participants in this study related to travel from the home country to the U.S. Risks associated when traveling across countries is something that needs attention. If workers suffer an injury during the trip, this can affect their health. If they don't wait until their injuries heal, the work pace and work requirements may exacerbate their injuries. Villarejo (2003) said that it has been proven that research with difficult to reach

populations like hired farm workers is possible, and that conducting research on farm worker health across borders is also possible.

The second theme identified from the interviews that addressed this first research question is ‘Factors contributing to injuries.’ Participants said that if they were careless while working, that may contribute to the possibility of suffering injuries when working in the fields. Participants also said that the type of work was a factor that contributed to suffering injuries at work. However, back pain was regarded as being part of the work and seen as something normal. This is consistent with reports that farm work requires working in postures (e.g., stooping, prolonged kneeling) that are harmful to the body (Larson 2001; Culp & Umbarger, 2004).

Personal decisions were mentioned as contributors to work injuries. These personal decisions were specific to violating traffic regulations and self protection from weather conditions. Stiles and Grieshop (1999) found farm workers in California claimed to be well aware of legal requirements for safety restraints and 86% reported using seatbelts. However, observations showed that only 37% actually wore seatbelts (Stiles & Grieshop, 1999). The authors also stated that reasons provided for not using seatbelts indicated respondents’ lack of knowledge and understanding of the risk of not using seatbelts. In this study, participants’ responses indicated they were knowledgeable of and had understanding of the risk of not using seatbelts. However, the question of whether they used seatbelts was not asked consistently across participants.

Migrant farm workers have reported difficulty working with a shirt on under extreme heat (Austin et al., 2001). In the present study there was reference made to coworkers who may work without a shirt during extreme heat. However, participants

mentioned personal decisions that can protect them from sunburns. These included protecting themselves from sun exposure by wearing appropriate clothing like long sleeve shirts and caps.

*Research question 2: What are migrant farm workers personal experiences with work related injuries?* The theme that addresses this research question is ‘Characteristics of injuries.’ Participants said they had not suffered any injuries when traveling to or from work in a motor vehicle. This finding is similar to McCurdy et al.’s (2003) in which only 1 injury from a motor vehicle crash was reported. Other researchers found that 21% of farm workers working in California reported having been involved in a motor vehicle crash since living in U.S. and that 39% of crashes led to injuries but did not end in fatalities (Stiles & Grieshop, 1999). The explanation for the discrepancy between these two studies is not clear. In this study, with only 12 participants, the lack of any injury reports is not surprising.

Traveling to or from work in unsafe vehicles is a possible contributor of deaths related to motor vehicle crashes among farm workers (Colt, Stallones, Cameron, Dosemeci, & Zahm, 2001). It is interesting that in this study none of the respondents indicated having been involved in or having witnessed a crash or any injuries related to motor vehicles crashes. Research states that farm workers are often transported to or from work in unsafe or overcrowded vehicles (Larson, 2001), which is something that was not mentioned by participants in the present study. Specific geographic areas may pose different patterns of transportation for farm workers.

Participants in this study said they had suffered back pain when working in the field. The existing literature has identified back pain as a common complaint among farm

workers (Villarejo & Baron, 1999). Therefore, the findings from this study that back pain is common and prevalent among farm workers, is consistent with previous research (McCurdy et al. 2003; Cameron et al., 2006). However, it is important to recognize that the workers viewed this as a normal result of the work and not as an injury which is preventable.

Participants talked about the symptoms associated with back pain and with pesticide exposure. The symptoms reported for pesticide exposure were the acute health effects reported in the literature, including skin rashes, eye problems, headaches, and nausea (Arcury, Quandt, & Russell, 2002; Jackson, 2002; Elmore & Arcury, 2001; Reigart & Roberts, 1999). Symptoms for back pain centered on the areas where pain was felt, like the lower back and the waist. While lower back pain has been described as a musculoskeletal injury (Culp & Umbarger, 2004) and migrant farm workers have previously been asked if they have suffered back pain due to their work, they have not been asked where on their back they have pain or how long they had the pain. Therefore, this study highlights an area that can benefit from further research by considering these findings when developing or updating interventions and information available in regard to back pain among migrant farm workers.

When participants talked about symptoms in general, they also talked about what could be done about those symptoms. The literature mentions that farm workers often opt for traditional healers or folk remedies (Culp & Umbarger, 2004; Perrilla, Wilson, Wold, & Spences, 1998; Arcury & Quandt, 2007), however, that was not mentioned in this study. Participants in this study said that they did nothing to manage their symptoms and would wait for the symptoms to go away on their own, would rest, and would take some

over the counter medication. It is possible that previous studies asked medical care questions in relation to home remedies and folk medicine, therefore prompting these types of responses from participants. It is also possible that previous participants lived with family members and that is a reason why they kept up with traditional remedies.

*Research question 3: How do migrant farm workers protect themselves from injuries?* The theme that addresses this research question is ‘Injury prevention strategies.’ Participants’ ideas on injury prevention and protection were divided into three sub-themes: provision of safety education and safety equipment, safety measures, and being careful. Participants talked about how they had received information on how to protect themselves from pesticide exposure.

EPA and OSHA require that workers be provided with training and information on the safe use of pesticides (Culp & Umbarger, 2004). However, this information and training are not always provided (Arcury, Quandt, Cravey, Elmore, & Russell, 2001; Jackson, 2002). Research has not examined whether migrant farm workers see this type of information as a way of preventing injury. In this study some participants said they had received safety education and others said they had not. Often times farm workers do not have the necessary equipment when laboring in the fields (Cameron et al., 2006). This study’s findings are similar to previous findings in that some participants mentioned that they received safety equipment when working with pesticides, but it is not clear if their work required them to handle pesticides. This is important because previous research has shown that non-pesticide handlers are more likely to show signs of pesticide exposures than pesticide handlers (Coronado, Thompson, Strong, Griffith, & Islas, 2004; Daniels, Olsban, & Savitz, 1997). Therefore, if the workers who said they had received

safety equipment were pesticide handlers, it is possible that equipment may not be provided for workers who do not handle pesticides. This selective provision of safety equipment may be increasing the risk of exposure of non-pesticide handlers. This indicates an area that needs further research to develop programs or interventions that may aid in increasing provision of safety equipment to all workers. It may also call for the work of ergonomists to develop equipment that may be better fitted and more comfortable to work in.

In the past migrant farm workers have not been asked what type of strategies they take to prevent injuries or to protect themselves from injuries. The strategies utilized by participants in this study focused on measures to prevent pesticide and sun exposure including wearing appropriate clothing, using a back support belt to prevent back pain, and following traffic regulations to prevent motor vehicle injuries.

Avoiding sprayed areas was mentioned as a safety measure to prevent exposure to pesticides. This is important because pesticide exposure has been recognized as a hazard to human health (Quandt, Arcury, Austin, & Cabrera, 2001). In addition, elevated symptoms (e.g., eye & skin irritation) have been associated with working in fields where pesticides had recently been sprayed and with early re-entry into sprayed areas (Cameron, et al., 2006). Participants in the present study also said that there were times when workers could not perform safety measures because the employers did not facilitate them. For example, employers would not provide water for hand washing. Similar findings have been reported in that workers cannot perform hygiene behaviors such as washing their hands before eating because water was not available near the fields (Parrott, Wilson

& Buttram, 1999; Quandt, Arcury, Austin, & Cabrera, 2001; Thompson, 2005; Vela-Acosta, Bigelow & Buchan; 2002; Jackson, 2002).

Participants wore clothing and showered after work as a measure of taking care of themselves. Wearing long sleeve shirts was mentioned by participants and has also been previously provided as an example of protective clothing (Arcury, Quandt, Cravey, Elmore, & Russell, 2001; Austin et al.; 2001; Quandt, Arcury, Austin, & Cabrera, 2001). An important observation is that while farm workers used certain clothing as a safety measure for self-protection, this clothing is not considered personal protective equipment (PPE) under the EPA's Worker Protection Standard (WPS) (U.S. EPA, 1992). However, the WPS does state that use of this type of clothing may be printed on the labels of some pesticides. It is possible that this may lead individuals to believe that wearing such type of clothing will be enough to be protected from contact with pesticides.

Following traffic regulations included not drinking and driving. Stiles & Grieshop (1999) also found that the majority of farm workers (60%) said that in order for a person to be able to drive safely, that person should not consume alcoholic drinks. Using seatbelts and following road rules (i.e., speed limit) were included as important traffic regulations to prevent injuries in the present study. For protection from the weather, participants mentioned wearing clothing that provided protection from the sun such as long sleeve shirts, wearing sweaters to protect them from the cold, and drinking plenty of water. This is important especially for sun protection because it has previously been reported that farm workers suffer from heat stroke and heat exhaustion (Cameron et al., 2006).

While participants mentioned that using back support belts was a safety measure to prevent back pain, they also reported that they were not provided back support belts. McCurdy et al. (2003) reported that 54.3% of their study participants reported never using a back support belt when lifting or carrying heavy objects and only 14% reported always using one. Workers may not have enough money to purchase back support belts themselves, which increases the importance of having employers provide them.

*Research question 4: Who do migrant farm workers hold responsible for work related injuries?* The theme that addresses this research question is 'Injury accountability.' Participants said that they could be held accountable for injuries at work. They mentioned this for every injury that was discussed. Interestingly, they said that they could be responsible for work related injuries if they were not careful and did not take care to try to prevent them.

Other people were also mentioned as being responsible for work related injuries. Participants mentioned that the employer did not always tell workers that they needed to leave the field when it was being sprayed. There have been similar findings in which farm workers have reported that their employers did not inform them of the application of pesticides and had them work in a recently sprayed field (Arcury, Quandt, Cravey, Elmore, & Russell, 2001; Thompson, 2005). One reason why employers may require workers to re-enter recently sprayed fields may be restricted entry intervals (REIs), however, workers can still be exposed to residues after the REI has passed (Quandt, Arcury, Austin, & Cabrera, 2001).

Participants said that drivers could be held accountable for injuries when traveling in motor vehicles. Transportation is sometimes provided through the employer but such

transportation has been found to be unsafe and the drivers have been identified as being inexperienced (McCurdy & Carroll, 2000).

Migrant farm workers reported that some of their work could also be responsible for injuries. This was specifically mentioned for back pain. Working in certain postures, like stooping and prolonged kneeling, are required by this type of work and can be harmful (Larson 2001; Culp & Umbarger, 2004). The responses of migrant farm workers in this study do not imply that they adopt a fatalistic view (explained later), they were only indicating that there are times when injuries cannot be avoided.

*Research question 5: Do cultural health beliefs play a role in the way that migrant farm workers view and interpret work related injuries?* For this research question, no theme was identified. However, some of the sub-themes indicated that aspects of cultural health beliefs were present in participants' responses. A relevant belief to this study was an external belief system. An external belief system may be considered in terms of fatalism (Weddle, Bissell, & Shesser, 1996). Fatalism is the belief that some events are inevitable and beyond human control. In the present study, migrant farm workers attributed part of the responsibility for injuries outside their control. They reported that employers, motor vehicle drivers, and the type of work could be held accountable for work related injuries. Previous research has found similar results in which control over workplace safety has been attributed to God and supervisors (Grieshop, Stiles, & Villanueva, 1996).

A sense of control can be important when dealing with risk perceptions. In the past, farm workers who knew they were at risk of pesticide exposure, but felt they had no control over their work situation, did not take actions to reduce their risk of exposure

(Arcury, Quandt, and Russell, 2002). However, in this study some results show the opposite, that cultural health beliefs such as fatalism may not always apply. For example, participants said they could be held accountable for work injuries, especially if they were not careful. This indicates that they hold an internal belief system or locus of control. These findings are consistent with those of Weddle, Bissell, and Shesser (1996) were injured Latinos reported that their injuries could have been prevented and could have been prevented by their own actions. Among Latino migrant farm workers, safety control has been attributed to God and employers but personal actions have also been reported as a source of injury prevention (Grieshop, Stiles, & Villanueva, 1996). The findings from the present study show that Latinos do not necessarily hold a fatalistic view or the belief that they have no control over injuries. The contrary seems to be true, that they believe they have some control and that there are actions they can take to protect themselves and to prevent injuries. However, in considering injury prevention programs this belief will be counter-productive to initiating appropriate training. Belief that carelessness causes injuries tends to undermine the effectiveness of prevention programs because there can be the implication that injuries are inevitable rather than preventable.

### *Limitations*

Like with other studies, this study has some limitations, which are highlighted here. The study focused on current workers and did not include workers who may have suffered an injury that prevented them from continuing to work. This is important because it is possible that migrant farm workers who have suffered debilitating injuries may not be able to continue migrating to agricultural camps or to continue working all

together. This can lead to what has been termed the “healthy worker effect” (Cameron et al., 2006)

The results of this study are based on interviews from Colorado migrant farm workers and they do not represent the views of workers in other areas of the country. Farming areas around the country are different and each probably holds unique characteristics. For example, different crops are harvested in different parts of the country and therefore encompass different harvesting techniques.

Another limitation is that there were instances in which it seemed like the interviewers were leading the questions. For example, they would ask a question and then rephrase it by including a possible response as an example. In turn, several participants’ response to questions would be the suggested response the interviewer previously introduced as an example. Only a few participants discussed what their job tasks were. In the future, participants should be asked about their job tasks and what crops they work with. This may lead to further investigation of the types of work hazards and characteristic of the crops migrant farm workers most commonly work with.

### *Conclusions*

The findings from this study provide a glimpse of Colorado migrant farm workers’ views and perceptions of occupational injuries and safety. Migrant farm workers disclosed their concerns about safety, their experiences with injuries, strategies they utilized to prevent injuries, and who they believed was responsible for injuries. The findings from this study have several implications for future research. Among migrant farm workers in this study, experiencing back pain was common. Participants reported that back pain was part of the work and that often times they did nothing to deal with the

pain, except rest and wait for it to go away on its own and on certain occasions they would take medication. It is unfortunate that the agricultural work environment often requires work that is physically demanding. Given the frequency of back pain prevalence, ergonomic approaches and preventive measures may have a large impact.

Safety regulations designed to reduce pesticide exposure are not being upheld and therefore are placing workers at risk. In this study, as well as in previous research (Arcury, Quandt, Cravey, Elmore, & Russell, 2001; Jackson, 2002), there were reports that not all workers were receiving the appropriate training and information on pesticides and exposure to pesticides. This is of high importance since migrant farm workers are usually exposed to pesticides which are used on most of the crops they work with. Occupational exposure has been reported as a factor of high levels of skin disease among farm workers (Arcury, Quandt, & Mellen, 2003).

Another relevant issue was the provision of safety equipment. All participants in this study reported that back support belts were not provided. Participants also reported that they were not provided safety equipment for protection from pesticide exposure. However, they did mention that to protect themselves they avoided sprayed areas and wore appropriate clothing like long sleeve shirts. For workers who receive training and pertinent information, it may not be enough to only provide them with this type of information. It is also important to provide migrant farm workers with the means to protect themselves by providing them with safety equipment. According to social cognitive theory, to achieve self-directed change, it is necessary to not only give people reasons to alter behavior but also the means, and resources to do so (Bandura, 1998).

Therefore, it would be important to take into account the barriers migrant farm workers face at work by providing more than information.

It has previously been reported that migrant farm workers hold a fatalistic or external belief system. This has been reported because workers have attributed injuries and health problems to God and supervisors. However, in this study it was found that migrant farm workers held both an external as well as an internal belief system. They mentioned that the work and their actions could contribute to injuries and they could also help prevent injuries by being careful. Also, they reported that responsibility for injuries could be attributed to the employer, drivers, the work, and themselves. It is important to note that a possible explanation for these findings may be the length of time participants had been migrating to the U.S. The earliest migration date reported was 1975. It is possible that this migration pattern led several participants to become accustomed to the U.S. lifestyle in which they no longer resorted to their cultural health beliefs. However, better understanding of cultural factors that have the capacity to influence migrant farm workers perceptions about work injuries should go beyond identifying cultural traits. Access to health care plays a more important role in health care decisions than cultural values and health beliefs do (Padilla & Villalobos, 2007). The interaction of cultural health beliefs with social and environmental situations may have an effect on work decisions and behaviors and should therefore be considered in future research.

The findings from this study indicate that there still is a lot of work needed to improve the conditions of the agricultural workplace and to make it safer for migrant farm workers. It has been suggested that different approaches need to be carried out to improve working conditions and not only rely on enforcement, but also consider new

partnerships between investigators, agricultural employers, and farm workers as part of these new approaches (Vela-Acosta, Bigelow, & Buchan, 2002). Suggestions for things to consider when developing new approaches are briefly listed below.

New approaches could benefit from thoroughly evaluating the contents of the materials that are used to train migrant farm workers on pesticide safety. For example, what language are the videos in? Are they only in English? Are they in English with Spanish subtitles? English proficiency of a majority of migrant farm workers is limited. Therefore if the videos that are being shown during trainings are exclusively in English, then it is possible that many of the workers are not benefiting from the training. If the videos are in English but include Spanish subtitles, this also poses a problem. Many migrant farm workers have low education levels. An example is the education level ( $M = 5.3$ ) of participants in this study. A low education level can also indicate a low reading level and therefore workers may not be able to read the subtitles provided in videos which often times are presented quickly.

Something else that could benefit new approaches is providing safety information in relevance to migrant farm workers. For example, providing an explanation as to why and how certain behaviors are important in increasing their safety and in reducing their likelihood of suffering an injury. This could be more beneficial than providing a list of behaviors that are deemed appropriate. If an explanation is provided on the importance of why safety behaviors are important, then workers may be able to understand the behaviors better, be able to relate to them, and in turn may increase their adherence to safety behaviors. Based on findings from this study, it would also be beneficial to further research migrant farm workers' view that some injuries are inevitable. Further research

can clarify some questions about this finding and eventually lead to better understanding of this population's views of occupational injuries.

Austin et al. (2001) reported that having been trained in pesticide safety increases protective measures, but the overall protection rate is very low and that knowledge of protective behaviors does not translate to safer work practices. In an attempt to address this issue, a component that could be included in new approaches is modeling the use of safety equipment. Modeling of protective eyewear influenced the behavior among Latino farm workers (Forst et al., 2006). If this strategy showed some positive results with protective eyewear, then it is possible that it may also work with the modeling of other protective equipment and safety behaviors.

Another strategy that may be worth examining is the direct involvement of migrant farm workers in research. After all, the interventions and programs that researchers will continue to develop will be aimed at improving the working and social environment and the overall life of migrant farm workers. Arcury, Quandt, and Russell (2002) suggest that in order for pesticide safety education to translate into safety behavior, the educational information must address farm worker control of pesticide safety. The inclusion of migrant farm workers as active participants and the incorporation of an injury and safety control component may lead to beneficial outcomes.

The development of programs and interventions that adequately address risk factors for occupational injuries is needed. However, it is just as important to evaluate the effectiveness of these programs and interventions. The best way to expand our knowledge on occupational injuries among migrant farm workers and continue to make progress is to evaluate our current progress. This will aid in improving the methods that

are currently being used to inform migrant farm workers of their injury risks. It is the hope that eventually these methods can be disseminated across the country by tailoring them to different groups of migrant farm workers by considering personal characteristics and regional differences. In conclusion, to assist in the reduction of occupational injuries, the safety level of the agricultural working environment needs to be improved. The findings from this study support the recommendation of other researchers that considerable work is needed in order improve the working conditions of migrant farm workers.

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Table 1

*Demographic characteristics of participants*

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Variable	M	SD	Range
Age	37.6	11.1	23-56
Education	5.5	2.9	2-11
Age at first work	14.6	3.9	10-23

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Table 2

*Time participants spent in the U.S.*

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Variable	n (%)
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First time in U.S.	
Before 1985	3 (25)
1986-1995	2 (17)
1996-2005	6 (50)
Other	1 (8)
Months lived in U.S. previous year	
4-6	4 (33)
7-9	3 (25)
10-12	3 (25)
Other	2 (17)

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Table 3

*Summary of themes*

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Main Themes	Sub-themes
Concerns about safety	<ul style="list-style-type: none"><li>○ Home safety</li><li>○ Work safety</li><li>○ Transportation</li></ul>
Characteristics of injuries	<ul style="list-style-type: none"><li>○ Symptom dynamics</li><li>○ Managing symptoms</li><li>○ Injury occurrences</li></ul>
Factors contributing to injuries	<ul style="list-style-type: none"><li>○ Being careless</li><li>○ Type of work</li><li>○ Personal decision</li></ul>
Injury prevention strategies	<ul style="list-style-type: none"><li>○ Provision of education &amp; safety equipment</li><li>○ Safety measures</li><li>○ Being careful</li></ul>
Injury accountability	<ul style="list-style-type: none"><li>○ Oneself</li><li>○ Others</li><li>○ Type of work</li></ul>

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## Appendices

Appendix A: Interview Questions

Appendix B: Initial list of codes

Appendix C: Initial list of themes and sub-themes

Appendix D: First revised list of themes and sub-themes

Appendix E: Second revised list of themes and sub-themes

Appendix F: Final list of themes and sub-themes

## Appendix A

### **Interview Questions**

1. What is the biggest concern you have about your safety (at home and at work) when you are home (please specify where the person calls home)?
2. Have you ever had an injury when traveling to and from work? If yes, please describe the injury and what happened. In your opinion:
  - a. How do you protect yourself from travel injuries
  - b. What is the primary cause of travel injuries
  - c. What or who is responsible for travel related injuries?
3. Have you ever been burned? If yes, please describe what happened. In your opinion:
  - a. How do you protect yourself from burns?
  - b. What is the primary cause of burns?
  - c. What or who is responsible for causing burns?
4. Have you ever had back pain related to work? To other activities? If yes, please describe the work or activities that caused the back pain and what happened. In your opinion:
  - a. How do you protect yourself from back pain?
  - b. What is the primary cause of back pain?
  - c. What or who is responsible for causing back pain?
5. Have you ever had serious illness from pesticide exposure? If yes, please describe the work or activities that caused the serious exposure and describe what happened.
  - a. How do you protect yourself from pesticide exposure?
  - b. What is the primary cause of illnesses related to pesticide exposure?
  - c. What or who is responsible for causing pesticide exposures that result in illness?
6. Have you ever had a serious injury because of a fall? If yes, please describe the work or activities that caused the fall and what happened.
  - a. How do you protect yourself from falls?
  - b. What is the primary cause of falls?
  - c. What or who is responsible for causing falls?
7. Have you ever been sick from heat, sun or dirt? If yes, please describe the work or activities that caused the sickness, describe the sickness and what happened.
  - d. How do you protect yourself from this kind of sickness?
  - e. What is the primary cause of this kind of sickness?
  - f. What or who is responsible for causing this kind of sickness?

Appendix B

Initial list of codes

**Contribute to injuries**

Back pain  
    Type of work

Burns  
    Careless in kitchen  
    Sun exposure

Pesticide exposure  
    Being careless  
    Contact with pesticides

Falls  
    Careless  
    Distraction  
    The work

MV  
    Being careless  
    Violating traffic regulations

Weather conditions  
    Cold/heat  
    No self protection

**Preventing injuries**

Back pain  
    Safety equipment

Burns  
    Being careful

Pesticide exposure  
    Pesticide education  
    Safety measures

Falls  
    Be careful  
    Just happens?

MV  
    Be careful  
    Follow traffic regulations

Weather conditions  
    Cold/heat  
    Self protection

**Types of injuries**

Back pain  
    areas affected  
    Pain management  
    Pain presence  
    Work interference

Burns  
    kitchen burns?

Pesticide exposure  
    symptoms  
    symptom management

Falls  
    suffered?

MV  
    suffered?  
    work transportation?

Weather Conditions  
    heat/dust\_soil  
    manage symptoms

**Responsible**

Back pain  
    oneself  
    employer  
    the work

Burns  
    oneself  
    adults?

Pesticide exposure  
    oneself  
    employer

Falls  
    oneself  
    the work

MV  
    driver  
    oneself

Weather conditions  
    heat  
    oneself  
    employer

## **Concerns**

Home concerns

Work concerns

    Injury

    Injury affects family

Travel concerns

    MV injury/accident

    Mexico-US trip

Health

    Health insurance

## Appendix C

### Initial list of themes and sub-themes

#### **1. Factors contributing to injuries**

##### *1a. Careless*

Burns –careless in kitchen  
Pesticide-careless  
Falls-careless & distraction  
MV- careless

##### *2b. Work*

Back-work  
Burns-sun exposure  
Pesticide-contact with pesticides

Falls-work

##### *3c. Self-provoked*

MV-Violation of traffic regulations  
Weather/heat\_cold-No self-protection

exposure

transportation?

#### **3. Injury prevention tactics**

##### *3a. Safety dynamics*

Back-safety equipment  
Pesticide-education; safety measures  
MV-follow regulations?

##### *3b. Careful*

Burns-careful  
Falls-careful  
MV-careful

##### *3c. Self-initiated*

MV-follow regulations  
Weather/cold\_heat-self protection

#### **5. Safety concerns**

##### *5a. At home*

##### *5b. At work*

injury in the workplace  
injury impact on family

##### *5c. Transportation*

#### **2. Characteristics of injuries**

##### *2a. Symptom dynamics*

back pain-areas affected  
pesticide-symptoms

##### *2b. Managing symptoms*

back-pain management  
pesticide-symptom management  
weather/heat\_dust-manage  
symptoms

##### *2c. Experiences*

back-due to work  
burns-suffered, kitchen burns  
Pesticide-led to illness,

Falls-suffered  
MV-suffered; work

Weather/heat\_dust-led to illness

#### **4. Responsibility for injuries**

##### *4a. Oneself*

back  
burns  
Pesticide  
Falls  
MV  
Weather/heat

##### *4b. Employer*

back  
pesticide  
weather/heat

##### *4c. Work*

back  
falls

MV injury  
Mexico-US trip  
*5d. Health*  
Health insurance

## Appendix D

### First revised list of themes and sub-themes

#### **1. Factors contributing to injuries**

##### *1a. Being Careless*

Burns –careless in kitchen  
Pesticide-careless  
Falls-careless & distraction  
MV- careless

##### *1b. Type of Work*

Back-work  
Burns-sun exposure  
management  
Pesticide-contact with pesticides

Falls-work

##### *1c. Personal decision*

MV-Violation of traffic regulations  
Weather/heat\_cold-No self-protection

#### **2. Characteristics of injuries**

##### *2a. Symptom dynamics*

back pain-areas affected  
pesticide-symptoms

##### *2b. Managing symptoms*

back-pain management  
pesticide-symptom  
  
weather/heat\_dust-  
manage symptoms

##### *2c. Injury occurrences*

back-due to work  
burns-suffered, kitchen  
burns  
Pesticide-led to illness,  
Exposure,  
Falls-suffered  
MV-suffered;  
work transportation  
Weather/heat\_dust-led  
to illness

#### **3. Injury prevention strategies**

##### *3a. Safety dynamics*

Back-safety equipment  
Pesticide-education; safety measures  
MV-follow regulations?

##### *3b. Being Careful*

Burns-careful  
Falls-careful  
MV-careful

##### *3c. Personal decisions*

MV-follow regulations  
Weather/cold\_heat-self protection

#### **4. Injury Accountability**

##### *4a. Oneself*

back  
burns  
Pesticide  
Falls  
MV  
Weather/heat

##### *4b. Employer*

back  
pesticide  
weather/heat

##### *4c. Work*

back  
falls

#### **5. Concerns about safety**

##### *5a. At home*

##### *5b. At work*

injury in the workplace  
injury impact on family

*5c. Transportation*

MV injury  
Mexico-US trip

*5d. Health*

Health insurance

## Appendix E

### Second revised list of themes and sub-themes

#### **1. Factors contributing to injuries**

- 1a. Being Careless*
  - Burns –careless in kitchen
  - Pesticide-careless
  - Falls-careless & distraction
  - MV- careless
- 1b. Type of Work*
  - Back-work
  - Burns-sun exposure
  - management
  - Pesticide-contact with pesticides
  - Falls-work
- 1c. Personal decision*
  - MV-Violation of traffic regulations
  - Weather/heat\_cold-No self-protection

#### **2. Characteristics of injuries**

- 2a. Symptom dynamics*
  - back pain-areas affected
  - pesticide-symptoms
- 2b. Managing symptoms*
  - back-pain management
  - pesticide-symptom
  - weather/heat\_dust-
  - manage symptoms
- 2c. Injury occurrences*
  - back-due to work
  - burns-suffered, kitchen
  - burns
  - Pesticide-led to illness,
  - Exposure, MV-suffered;
  - work transportation?
  - Weather/heat\_dust-led
  - to illness

#### **3. Injury prevention strategies**

- 3a. Provision of educ & safety equip*
  - Back-safety equipment
  - Pesticide-education
- 3b. Safety measures*
  - Pesticide-safety measures
  - Back-use bsb
  - MV-follow regulations
  - Weather/cold\_heat-self protection
- 3c. Being Careful*
  - Burns-careful
  - Falls-careful
  - MV-careful

#### **4. Injury Accountability**

- 4a. Oneself*
  - back
  - burns
  - Pesticide
  - Falls
  - MV
  - Weather/heat
- 4b. Employer*
  - back
  - pesticide
  - weather/heat
- 4c. Type of Work*
  - back
  - falls

#### **5. Concerns about safety**

- 5a. At home*
- 5b. At work*

injury in the workplace  
injury impact on family

*5c. Transportation*

MV injury  
Mexico-US trip

*5d. Health*

Health insurance

## Appendix F

### Final list of themes and sub-themes

#### **1. Factors contributing to injuries**

##### *1a. Being Careless*

Burns –careless in kitchen

Pesticide-careless

Falls-careless & distraction

MV- careless

##### *1b. Type of Work*

Back-work

Burns-sun exposure

Pesticide-contact with pesticides

Falls-work

##### *1c. Personal decision*

MV-Violation of traffic regulations

Weather/heat\_cold-No self-protection

#### **3. Injury prevention strategies**

##### *3a. Provision of educ & safety equip*

Back-safety equipment

Pesticide-education

##### *3b. Safety measures*

Pesticide-safety measures

pesticide, weather/heat

MV-follow regulations

Weather/cold\_heat-self protection

##### *3c. Being Careful*

Burns-careful

Falls-careful

MV-careful

#### **5. Concerns about safety**

#### **2. Characteristics of injuries**

##### *2a. Symptom dynamics*

back pain-areas

affected,

work interference, pain

presence

pesticide-symptoms

##### *2b. Managing symptoms*

back-pain management

pesticide-symptom

management

weather/heat\_dust-

manage symptoms

##### *2c. Injury occurrences*

back-due to work

burns-suffered, kitchen

burns

Pesticide-led to illness,

Exposure, Falls-

Suffered, MV-suffered;

work transportation

Weather/heat\_dust-led

to illness

#### **4. Injury Accountability**

##### *4a. Oneself*

back

burns

Pesticide

Falls

MV

Weather/heat

##### *4b. Others*

Employer – back,

Driver - Motor vehicle

##### *4c. Type of Work*

back pain

falls

*5a. At home*

*5b. At work*

injury in the workplace

injury impact on family

injury =>health insurance

*5c. Transportation*

MV injury

Mexico-US trip