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Occupational Safety Beliefs among Latino Residential Roofing Workers

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Background *This analysis describes beliefs about work safety and personal protective equipment (PPE) among Latino roofing workers, it delineates their perceptions of work environment characteristics that affect work safety and PPE use, and it describes how they experience work injuries and the consequences of these injuries.*
Methods *In-depth interviews were completed with 10 current and former Latino residential roofers. Interview transcripts were subjected to systematic qualitative analysis.*
Results *Participants' valued productivity over safety, and this had a negative influence on their safety behavior and reduced their PPE use. They understood that roofing was hazardous. They limited use of PPE when they felt it reduced productivity and when it was uncomfortable. Work environment characteristics that affected safety included company size, the physical demands of the job, lack of training, the need for work, general life stress, and distractions at work. An injury had to result in lost work time to be considered significant. Access to health care is limited by employers not providing Workers' compensation.*
Discussion *Future research is needed to substantiate these descriptive results and to delineate factors that are associated with safety behavior and use of PPE. Interventions, based on a lay health educator model, are needed to improve safety in this population. Safety regulations need to be evaluated and their enforcement needs to be improved.* Am. J. Ind. Med. 57:718–725, 2014. © *2013 Wiley Periodicals, Inc.*

KEY WORDS: construction; safety beliefs; Latinos; immigrant workers; minority health

INTRODUCTION

Latinos working in residential roofing experience high rates of injury. Latino and foreign born construction workers suffer injury and death due to falls from roofs at greater rates than do non-Latino and native born workers [Dong et al., 2009, 2013]. Greater fatality rates from roof falls are also associated with employment by small establishments (1 to 10 employees) [Dong et al., 2011, 2013]. While occupational injuries in construction on the whole are on the decline, work-related deaths among Latino construction workers have risen by one third [Dong et al., 2010a,b]. A major concern within the construction industry is eroded safety practices such as "cutting corners" relative to safety and health training and safety equipment installation and usage [Dong et al., 2009].

Latino construction workers are typically young, speak only Spanish, have little formal education, and are employed in low-skill, high-risk occupations [Dong et al., 2009]. These

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workers face enormous pressure to work quickly on the jobsite due to their need for employment, perceptions that employers view workers as disposable, and fear of retaliation if they complain about conditions [Roelofs et al., 2011]. Like Latino workers in other industries [Quandt et al., 2006; Grzywacz et al., 2007; Keifer et al., 2009; Arcury et al., 2012a], Latino construction workers are willing to tolerate unsafe conditions due to these pressures [Menzel and Gutierrez, 2010; Roelofs et al., 2011]. Latino roofers have less perceived control over their personal safety then others in the construction trades, and they have lower perceived work safety climate (the perception of supervisor's value of safety relative to production) than other Latino construction workers [Arcury et al., 2012b].

Although Latino roofers have high rates of occupational injuries and they believe they have a poor safety climate at work, little is known about their perspectives and beliefs regarding occupational safety and injuries. The fall-protection training needs of Latino roofers have been documented, as have the format in which training is desired and the barriers to providing this training [Hung et al., 2013]. Hung et al. [2013] reported that the "safety status quo" among Latino roofers is perpetuated by workers' perception that they already know about safety, and that the workers do not value work safety due to their overconfidence. Hung et al. [2013] used a quasi-qualitative approach to document worker preferences, but it was limited as results from American and Latino workers were mixed and all data were collected at the worksite during lunch breaks. Actual beliefs about the importance of training and the on-the-job experiences of Latino roofing workers have not been documented.

This analysis uses a qualitative research design to address three aims. First, it describes beliefs about work safety and personal protective equipment (PPE) among Latino roofing workers. Second, it delineates Latino roofer perceptions of work environment characteristics that affect work safety and use of personal PPE. Finally, it describes how Latino roofers experience work injuries and the consequences of these injuries.

MATERIALS AND METHODS

Sample

Ten Latino immigrant construction workers were recruited to participate in this study in 2011. Participants were recruited from communities in western North Carolina. A single interviewer worked with a local organization serving the Latino community to recruit participants. Members of this organization identified individuals currently or recently employed as roofers. The interviewer contacted identified individuals, explained the project, and answered any questions that they had. Participants were purposively selected to represent a range in ages and experience with roofing, with some of the roofers being crew leaders. The participants had a range of experience in roofing, but all had recent experience in residential roofing. The information provided by participants was used in the design of a fall prevention education program [Lane et al., 2012]. The study protocol was reviewed and approved by the Wake Forest School of Medicine Institutional Review Board. Participants provided signed informed consent.

Data Collection Methods

Each participant was interviewed individually, and each was assured that all information shared would remain confidential. Interviews were conducted in Spanish and lasted about an hour. The interview guide consisted of sections aimed at learning more about workers' perceptions about work safety. These sections included: basic information, risks of injuries in construction, usage of personal protection equipment, work safety, and safety training and regulations. All interviews were audio-recorded.

Data Analysis Methods

Recorded interviews were transcribed and translated to English. Each translation was checked against the original recording for accuracy. The investigators reviewed each transcript and developed a list of themes based on this review. The investigators discussed the themes and agreed about the salience of each. Saliency analysis assesses thematic patterns across all of the interviews by evaluating recurrent themes based upon their frequency of occurrence, the participants' emphasis on the themes, or descriptive capacity of the theme recognized by the research team [Arcury et al., 2001; Buetow, 2010]. A salient theme may not have been discussed by every participant, but it was discussed in detail and with emphasis throughout the sample or it was found to provide insight or explanation of a given phenomenon. Through this iterative process, quotations that demonstrated the understanding of hazards and safety among Latino roofers were identified and analyzed.

RESULTS

Participant Characteristics

All participants were native Spanish speakers with limited English language skills. Their ages ranged from 22 to 44 years old. Participants had been working in the United States for 10.5 years, on average. Seven participants had children. Eight participants were currently employed in roofing, and two had recently been employed in roofing.

Eight participants worked predominantly with asphalt shingles, and two participants worked predominantly with metal roofing.

Beliefs about Work Safety and Personal Protective Equipment

Participants discussed a consistent set of beliefs about work safety and about the use of personal PPE. A general belief underlying views of work safety and PPE use was the expectation that all members of the work group should work equally and that all group members should work at the pace set by the group. One described his crew's value, "We get tired of seeing people who are lazy or aren't giving it their all" (Interview 2). Participants wanted to complete each roof as quickly as possible so that they could move on to the next job. This mindset of working quickly was the dominant reason participants gave for not using PPE.

Beliefs about work safety

Participants agreed that roofing was hard and strenuous work in which the risk of injury was ever present. The occupational risks in roofing were believed to be inherent, and participants were aware of safety hazards related to working at heights. The most strenuous activity was getting the roofing materials up a ladder onto the roof. Working at heights was the most risky part of the job. They discussed different coping mechanisms for dealing with the risks associated with the heights at which they work. Some tried to minimize these risks by posturing as if risks were normal and unavoidable, while others discussed precautions such as the use of PPE.

The participants were aware that American workers perceived safety differently. They understood that American workers took their time to use PPE and did not work as fast as Latino roofers. One participant stated that the work culture in Mexico predisposed Mexican workers to not value safety precautions. Experience was seen as the best guide for safety. Roofers drew on their own experience when making appraisals of the safety risks related to a particular job. Roofers determined the level of risk posed by a job site by eyeing the pitch of the roof and evaluating potential sources of slip hazards (e.g., snow), and then made decisions about action based on these evaluations (e.g., waiting for snow to melt).

Beliefs about PPE

The roofers had a common perception that using PPE was a cost both in purchasing and in reducing their productivity. They also stated that PPE was often uncomfortable and actually increased their risk.

Participants saw the use of PPE as a luxury and felt that the costs of using PPE out-weighted the benefits of its protection. The beliefs about the purchasing and productivity costs of PPE are interwoven: "Because we have to buy [boots]. The boots used on roofs are specially made for that, but they're expensive" (Interview 10). Cost was also affected by who bore the responsibility to provide the PPE. One crew leader vented his frustration at having to continually replenish PPE, "I'd like to tell them to buy their own equipment, but they aren't going to want to spend that much money. They can't fathom spending $250 when that's as much as they make in a week. If their employer doesn't provide it to them, then, there isn't a way that I can get them to buy it" (Interview 8).

Many roofers shared the perspective that, "Without protection and gloves, you can work faster" (Interview 3). Workers perceived PPE as an encumbrance on their time, translating into lost productivity. One roofer tried to encapsulate this concept in stating how workers were caught in the middle of this tension between safety and productivity.

> *It's because our boss, for example, doesn't have the money to buy those things. So, that's something that makes us not use them. Slide guards should be used for our safety. However, they cost money. They could buy them, but you have to take time to install them on the roof that you're about to work on. The time you take to do that makes our boss lose money. (Interview 7)*

The workers had very little tolerance for safety measures if they felt like they were back up measures for other PPE. They did not appreciate redundant PPE. This redundancy was viewed as an even greater cost due to set up time and purchase price.

> *In the type of work we do, we don't have the privilege of using [harnesses] because you need to make money. Thankfully, where I'm working, the roofing market hasn't been devalued that much. But there are places where roofing companies pay an average of $20 a bundle. When it's like that, you don't have the privilege of wasting time putting up slide guards to stay safe when you don't need them because what slide-guards do is serve as a backup for the rope and harness. (Interview 9)*

Because of the complex nature of this cost-benefit approach to safety, many roofers improvised PPE, creating innovative solutions to PPE provision that fit their values. One described a rope system as a work around for a harness system because they needed to be able to "move around." Others were aware of how their improvised approach fell short of the design standards of PPE that was found in the marketplace.

Participants reported that discomfort was another barrier to PPE use. The concept of comfort and the perceived risks that come with wearing PPE were closely linked. These concerns included PPE restricting movement, becoming tangled, being heavy, and impeding communication. Participants believed that restrictions in range of movement were hazards. Many felt less safe wearing PPE because it made their movement awkward. Without PPE they felt more agile and balanced. The effort required to coordinate the various workers who were on a roof and harnessed was perceived as a tangle hazard and waste of time. This constant demand to adjust the PPE was a barrier.

> *It's uncomfortable and heavy. Plus, we also have to be tied to the ropes, which are thick. And if we are working in this area, we have to climb up, which makes us have to constantly move the ropes. (Interview 2)*

One participant reported that hearing protection was a hazard because it impeded communication: "The thing that makes us the maddest is when they wear their earplugs and can't hear us" (Interview 4).

When PPE was not fully provided, the use of certain parts was uncomfortable and gave only the illusion of safety. One participant made this point clear from his experience with improperly provided PPE.

> *The rope we use to tie things with. The rope isn't in good condition all the time. ... So, jobs force us to tether properly, but it's hard to do because the ropes aren't any good.... We work un-tethered a lot because we don't have the anchors. So, the harness and the ropes just become an annoyance because we don't have the anchors. ... So, most of the time, it's lack of proper equipment ... because it doesn't do me any good to wear a harness when I don't have a good rope or an anchor. All it would do is make me uncomfortable as I work. It would bother me. (Interview 1)*

Participants reported that some workers teased and made fun of those who chose to use PPE. Teasing centered on the accusation of being scared, a threat to their masculinity, and looking different from their peers. Not being "scared" was a valued trait that was demonstrated in not using PPE. This participant's perspective on roofing was that the work was very masculine; "They tell you that you're a woman (*senorita*) if you're wearing that on the roof, things like [a harness]" (Interview 10). The participants said that teasing happened when people stuck out or looked different. Some participants reported enduring this ridicule because they felt their safety was more important than their coworkers' assessment of risk.

> *[I use PPE] because I'm interested in staying alive and taking care of myself. I don't want to have an accident and go back to Mexico missing an arm or a finger, or having a bum leg, or being blind in one eye. I want my family to have me back healthy like I was when I came here. (Interview 5)*

The general sense among the participants was they would wear PPE if it was a condition of employment: if an employer provided and required PPE, then they would use it. This system is reinforced with the threat of not working if caught without PPE, "Yes, [the supervisor] tells us that the first person who doesn't have it on will be sent home for 2 weeks because they need to use it. That makes us decide that we should wear it" (Interview 4).

Work Environment Characteristics that Affect Work Safety and PPE Use

Participant discussions indicated several salient factors that affected work safety and PPE use. These included the size of the company that employed them, the physical demands of the job, lack of training, their need for work, general life stress, and distractions at work.

Company size

The size of the construction company affected safety measures. Larger companies had more supervision and enforced safety measures. Participants discussed their experiences working for different companies to make comparisons with their current environments. Larger companies were more likely to have safety training. Smaller companies and "individuals" did not operate at the same level of risk prevention.

Physical demands of the job

The physical demands of roofing work were perceived to be a source of work safety risk. These physical demands included carrying heavy loads, working at heights, climbing ladders, and navigating housing structures. Participants stated that carrying the bundles of shingles up a ladder was a constant hazard that they faced. They referred to this task as the heavy work of roofing. Working at heights presented fall risks. Ladder stability and age of ladders was a concern. "There are people who don't use the proper equipment [ladders] and want to do the job with magic" (Interview 9). Physical demands also came from the structure being roofed; this included the structure having rotted areas and areas that would not bear up under the weight of the work, as well as the pitch of the roof.

Lack of training

The roofers reported receiving little formal training in work safety. Their perspective on training was that experience was the best teacher, that they already knew the necessary information, and that illiteracy was a possible barrier to formal training. Experience in the industry was believed to be the best way to learn about work safety. Participants who had been injured on the job reported using more safety measures, such as hardhats and harnesses; in response to a question about wearing a hardhat, a participant responded, "Yes, but I went and put it on after I got hit" (Interview 10). Participants reported a gradual learning process that often had new roofers start out doing clean up on the grounds as an orientation before they got onto the roof. The general sense was that safety hazards were so obvious that anyone should know how to avoid them. Therefore, they did not need further work safety training. Further, many roofers have little formal education; and illiteracy was a barrier to work safety training based on written materials.

Need for work

The need for work resulted in several types of stressors. These included the fear of reprisal from employers if any safety concessions were requested, willingness to be subjected to hazards for the benefit of gainful employment, pressure to work to fulfill family obligations, and the demands inherent with piece work compensation. Having stable work was highly prized among the participants. Consistent work was one of the main reasons they remained in the industry, and one of the reasons they did not complain when injuries occurred. They reported being "afraid" to make requests of employers because they wanted to keep their jobs. When asked about the difficult working conditions, one respondent stated, "It doesn't matter what conditions I'm faced with, I still have to support my children. That's how the majority of Latinos are. Even if the work is hard, we do it anyway" (Interview 2). Participants felt the need to work fast to secure more work because more work resulted greater job stability. This was true of those paid by the roof and those paid by the hour.

General life stress

The participants reported that general life stress that they experienced was a distraction that increased their risk of injury at work. Life stressors included poverty, work pressure, and personal problems: "Sometimes it can be family problems or problems somewhere else. It can also be a problem if they haven't been working a lot" (Interview 6).

Distractions at work

Participants discussed several sources of general distractions that increase the risk of injury at work. These include coworkers who came to work with hangovers, and the use of cell phones when on the roof. "I think that everyone has some sort of distraction at work. You could be distracted due to stress, a personal problem, or by thinking you can't last until break time. You're forced to keep working. They could be on their cell phone at work" (Interview 9).

The Experience of Work Injuries and Their Consequences

How Latino roofers experienced work injuries includes their definitions of such injuries and the injuries that they commonly experienced. The consequences of these injuries include beliefs about their access to medical care.

Definition of a work related injury

Only occurrences that physically prohibited an individual from working were defined as injuries. Events that did not limit the ability to work were considered to be just part of the job and not real injuries. Participants understood that loss of work time due to an injury meant loss of wages and a financial setback. Most saw themselves as personally responsible for their injuries at work, saying that if they were injured, it was their own fault for being distracted or simply making a mistake. Similarly, participants blamed workers who experienced an injury: "I think it was because he was stupid, since anyone can cut something with a knife" (Interview 4).

Commonly experience injuries

Common injuries enumerated by the participants were puncture wounds from nails, being struck by a falling object, muscle strain, falls from heights, and cuts. Four recounted stories of falls. All reported being cut by either shingles or metal roofing materials. Two discussed muscle strains. Most had experienced with some repetitive motion pain.

> *We've had occasions when a nail has gone in someone's foot. It doesn't matter if you're wearing boots because they can poke you through the bottom. Other people and I have had nails stab our feet. The nails get exposed when we're tearing down. We have to remove the nails ourselves and we can step on them. It doesn't matter if you're wearing boots, even if they're good or special boots because if you step on a nail, it will go through them. (Interview 2)*

Access to care

Participants indicated that little health benefit was provided to workers who experienced work injuries,

including through the Workers' Compensation system. One participant said "Because as workers, we're afraid that if we ask them to do that or if we ask them to help us and pay us that money, when we get better, they aren't going to give us our job back" (Interview 1). A few said that not having Workers' Compensation was part of the terms of employment. Specifically, their prospective employers told them that they would not provide Workers' Compensation; workers who wanted Workers' Compensation would not be hired. One participant reported that at the hospital he denied that his injury was work related to protect his employer.

> *You might get a ride to the hospital where they leave you. That's all that happens. They leave you there so you can be seen, but we're the ones who get the bills. I've been injured when we're nailing, and it was one of the first times that I wasn't using glasses. The nail hit and shot dirt into my eye. I've had that happen to me twice. That's why I started using glasses. So, that was very expensive for me. It came out to be $7,000 or $8,000. My employers asked me why I didn't use glasses, and I told them that it was because they didn't give me any. (Interview 8)*

Consequence of injury

Participants understood that loss of work time due to an injury meant loss of wages and a financial setback. Some employers provided some pay during the days that an injured employee missed work, though the majority did not. If participants did not work, they were not provided any benefits or compensation even though lost work was due to a work related injury. Several were confused about whether undocumented workers qualified for Workers' Compensation. Because of the consequences of injuries and personal experience, a few of the workers had embraced PPE.

> *My main goal is for me to stay safe. If I listen to them and end up falling and hurting myself, they aren't going to help me with my bills. They aren't going to have time to go help me at home and see what I need. If you fall, they send you home; and you have to fix it yourself. So, why would I injury myself if I can avoid it? It's smarter to protect yourself than not to. (Interview 7)*

A crew leader had a different perspective that included shared responsibility among all involved in a workplace injury.

> *My paying for the medicine or taking them to the doctor, if they cut themselves and have to have stitches: I take responsibility for that and for the time he's out of work. I provide some sort of compensation. If you can negotiate that between the worker and the employer, it's good because you maintain a trustful relationship. There are also people who are irrational. They fall when they aren't being careful and want more compensation. (Interview 9)*

DISCUSSION

This analysis delineates the occupational safety experiences of Latino residential construction roofers and the factors that affect their work safety and use of PPE. Although conducted to inform the development of a safety training program to prevent falls among Latino roofers [Lane et al., 2012], it provides information that can be used to address safety training for the array of hazards that Latino residential roofers encounter. Participant discussions provide new insight into how small residential roofing contractors circumvent safety and compensation regulations, thus increasing the risks for occupational injuries and allowing the individual worker to assume the cost of injury. Workers have an accurate understanding of the barriers to safety training [Hung et al., 2013], and they understand that non-Latino workers follow safety procedures and use PPE more often than they do. They believe that safety training is of limited value and that job experience is the best source of safety information [Hung et al., 2013]. The work organization attributes of these vulnerable workers suggest a social ecological approach for addressing the occupational health inequities they experience [Baron et al., 2013]; research and intervention to improve safety for these vulnerable workers should consider individual, work crew, employer, and regulatory factors.

The participants in this study share the attributes reported for other Latino manual workers [Quandt et al., 2006; Grzywacz et al., 2007; Keifer et al., 2009; Arcury et al., 2012a,b]. They fear job loss and they value work and productivity over safety; they believe that this is necessary so that they can take care of their families. A common worldview among immigrant Latino workers, whether or not they are documented, is the desire not to interact with anyone who might represent the government, including safety inspectors and health officials, due to past discrimination and the fear of deportation [Arcury and Quandt, 2007; Arcury et al., 2010]. They also believe that, as men, they should accept occupational hazards and act as if they cannot be harmed by exposure to these hazards. These are vulnerable workers who have little control of safety in the work environment, who have few resources, and who, when injured, are at financial risk [Arcury et al., 2012b].

Occupational safety training targeting these workers is needed [Hung et al., 2013]; these workers also need basic information on occupational safety regulations and their rights as employees in the US. For example, they need to

know that they have a right to Workers' Compensation and that all safety regulations apply to them, whether or not they have documents. This training is needed to prevent injuries of all types, including those resulting from falls, from sharp tools, and from carrying heavy loads. It is also needed to support these workers when they are being treated for occupational injuries so that they know their rights to receive medical care and rehabilitation. Those providing this training should have the characteristics that make them acceptable and credible to Latino construction workers. Lay health educators and peer-led participatory health and safety training have been shown to be appropriate for this population [Williams et al., 2010; Lane et al., 2012; Ochsner et al., 2012]; these lay health educator models have worked with other Latino worker populations [Quandt et al., 2001; Grzywacz et al., 2009; Marín et al., 2009].

Enforcement and evaluation of current safety and insurance regulations are needed. The Occupational Health and Safety Administration expanded fall protection standards for residential construction in 2012 (https://www.osha.gov/doc/residential_fall_protection/ppt/index.html). However, making the standard effective will require sufficient resources to enforce it and an improvement of work safety culture among Latino roofers and their employers [Arcury et al., 2012a]. Workers admit that their use of PPE and adherence to safety procedures is required when they are working for larger employers who demand use of PPE and safety. Employers, who deny they are responsible for providing Workers' Compensation, because workers are "contractors" and not employees, are dishonest. Employers not providing appropriate PPE, encouraging their employees to ignore safety procedures to increase productivity, and not providing insurance that pays for worker injuries are responsible for the greater injury rates among the employees of small construction businesses [Kaskutas et al., 2009; Sa et al., 2009; Smith-Jackson et al., 2011; Grzywacz et al., 2012; Dong et al., 2013; Lipscomb et al., 2013]. Efforts need to focus on small contractors, particularly those that employ non-union workers [Ruttenberg and Lazo, 2004]. If Workers' Compensation regulations are applied equally across all employers, none will have a competitive advantage.

This analysis should be considered in light of its limitation. It is based on a small, non-random sample recruited from one area of one southern state; therefore, its results may not be generalizable. It also does not include specific measures of injuries experienced by the participants.

CONCLUSION

Latino construction workers are proud of their work ethic, enjoy the camaraderie of the roofing crew, and enjoy working outdoors rather than being "cooped-up." However, due to the hazards of this work, they would leave roofing if a better opportunity presented itself. Additional research is needed to document the patterns delineated in this descriptive analysis in a larger sample of Latino roofers. Such research should consider measures from different levels of the social ecological model (individual, work crew, employer, regulatory) in defining the factors that can be addressed in reducing occupational injuries in this population [Baron et al., 2013]. Efforts are needed to develop and implement safety training programs for these workers; such programs should include information on employer responsibilities and the rights of all workers to pursue grievances when employers are not meeting their responsibilities. They need to be culturally and educationally appropriate [Arcury et al., 2010]. Training programs based on lay health educator models [Williams et al., 2010; Ochsner et al., 2012] and social marketing [Menzel and Shrestha, 2012] that have been implemented with Latino construction workers are examples of such culturally appropriate programs. Such programs are needed in more areas of the country, but they should be evaluated to demonstrate the key factors that will improve occupational safety behaviors in this population.

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