Elevated Injury among Latino Workers in Small-Scale Residential Construction: Contractor and Worker Perspectives

Joseph G. Grzywacz[1], Shannon C. Montgomery[1], Antonio J. Marín[1], Elsa Nuñez-Reyes[1], Thomas Mills[2], Michael J. Merten[3]

[1] Human Development & Family Science, Florida State University, USA, [2]Myers-Lawson School of Construction, Virginia Polytechnic & State University, USA, [3] Child, Youth and Family Studies, University of Nebraska, USA

Correspondence: jgrzywacz@fsu.edu

ABSTRACT

Purpose. The desired outcome of this study was actionable information that could be converted into intervention strategies that could be deployed with immigrant Latino construction workers in small-scale residential construction and the constructors who employ them to reduce construction-related injuries.

Design. Qualitative data obtained from semi-structured in-depth interviews with n=7 immigrant Latino construction workers in small-scale residential construction and n=5 immigrant Latino contractors in small-scale residential construction were coded and analyzed.

Findings. There was substantial overlap between workers and contractors in the causes of common injuries in small-scale residential construction. There is a general lack of concern with safety attributed to human nature (i.e., That's Just the Way We Are; We're Careless). Safety's relative priority is further diminished by a desire for workers and contractors to make as much money as possible in the shortest amount of time.

Limitations. These data were obtained from workers and contractors in a single urban setting in the southern, midwestern region of the United States. Although the data comport with beliefs reported by immigrant Latinos in other sectors of the economy, the generalizability of the results in the construction industry is unknown.

Implications. These data indicate that small-scale residential construction contractors, like their workers, place a premium on finishing jobs quickly as a matter of keeping their business going. The data also demonstrate an undeniable need to include both workers and small contractors in strategies to improve safety in small-scale residential construction.

Keywords: Accident; Behaviour; Immigrant Latino Workers; Qualitative Research; Safety Education

INTRODUCTION

The disproportionate burden of poor occupational health in construction by immigrant Latino workers is well-documented (Dong et al. 2014; Dong, Men, and Ringen 2010; Dong and Platner 2004). In response to Brunette's (2004) call, several researchers have documented clear and consistent themes that likely contribute to the elevated risk of injury in the immigrant Latino workforce. Research commonly documents that immigrant construction workers work fast and put the speed of work over safety (Arcury et al. 2014; Flynn, Eggerth, and Jacobson 2015; Menzel and Gutierrez 2010; Roelofs et al. 2011). Limited job opportunities for undocumented workers have been reported to contribute to excess injury by impeding concerns over safety (Menzel and Gutierrez 2010; Roelofs et al. 2011). Moreover, immediate financial needs such as repaying debt

from migration (i.e., pay the 'coyote' or smuggler) and sending remittances to family in their home county are argued to fuel excess injury because workers value short-term financial gain over the possibility of injury in the future (Flynn et al. 2015; Menzel and Gutierrez 2010; Roelofs et al. 2011). Indeed, as Arcury and colleagues (2014) reported, "Mexican workers do not value safety or taking precautions" (p. 720).

Implicit in this small but growing body of research is the view that construction contractors or managers (e.g., "foremen") exploit these beliefs for personal gain. The frequently reported observation that work speed is more important than safety is often interpreted as the contractors requiring a faster pace of work (Arcury et al. 2014; Flynn et al. 2015; Menzel and Gutierrez 2010; Roelofs et al. 2011) or indirectly incentivizing it through piece-rate compensation (Flynn, Eggerth, and Jacobson 2015). Similarly, immigrants' employment precarity owing to documentation status and financial need is typically interpreted as exploitative contractors who leverage workers' hardship to maximize their gain. Although this may be true in some situations, the more significant point is that the voices and perspectives of contractors or those who employ workers are missing.

The perspectives of both contractors and workers are sorely needed to develop strategies for eliminating occupational health disparities borne by Latino workers in the U.S. Nowhere is this need more salient than in the small-scale residential subsector of construction, described in the Overlapping Vulnerabilities report (NIOSH & ASSE, 2015) as having the most significant risk of occupational injury and fatality. This subsector has few, if any, supports for attending to occupational safety. The "contractors" are often working side-by-side with hired immigrant workers. Contractors are increasingly immigrants themselves with little or no training on "best practices" for their business or safety within that operation.

The overall goal of this study was to take a first step toward developing materials to reduce injury among immigrant Latino construction workers in the small-scale residential subsector of the industry. The specific aims were to describe attributions of common construction injuries by both workers and contractors and compare and contrast those attributions to identify points of synergy and divergence that can be leveraged for effective intervention.

METHOD & MATERIALS

Study Design

This research is part of ***¡Ponte Listo!***, a sequential mixed-methods study of occupational safety among immigrant Latino workers in the small-scale segment of the residential construction industry in Tulsa county, OK, USA. The data for this analysis are from the qualitative component of the project, including the Latino construction workers and contractors.

Participant Recruitment

Recruitment was facilitated by the research teams' previously established relationships with organizations and agencies serving the immigrant Latino community. The inclusion criterion for construction workers was: (1) self-identify as Latino, (2) employed in the residential construction industry for at least one year, and (3) worked as a framer or roofer in residential construction for 20 hours or more in the past month. The inclusion criterion for contractors was: (1) owner of a construction establishment with fewer than nine workers for at least three years, (2) majority of revenues are from activity in residential construction, and (3) having had one or more immigrant Latino workers for a minimum continuous period of 6 months. All potential participants were referred to study staff by individuals in this network of community contacts and recruited by trained bi-lingual study staff.

Data Collection

An Institutional Review Board approved study procedures. Two trained interviewers collected data from December 2019 through February 2021. Interviews were conducted at locations of the participants' choosing, usually their homes. Before any data collection, participants were informed of the purpose of the research and reminded that participation was voluntary. Signed informed consent was obtained from all study participants. Data collection did span the COVID-19 pandemic, resulting in n=12 interviews (5 contractors, 7 workers) conducted in an in-person, face-to-face environment, and the remainder (n=9) were achieved through Zoom (4 contractors, 5 workers). Participants received a $25 incentive at the end of the interview. Digitally recorded interviews ranged in length from approximately one to three hours.

Interview Content

The qualitative component's goal was to understand the knowledge and beliefs surrounding occupational safety and injury held by workers and their "employer," the contractors. The interview guides for each stakeholder group were distinct, but they shared a common set of content. All interviews began with basic information about the participant. Then the interview moved into questions to probe fundamental beliefs about hazards confronted by workers in small-scale residential construction and the perceived causes of common injuries experienced by construction workers, including falls from heights, strains, and injuries from equipment. A core component of these beliefs was whether injuries were controllable, and if so, who is responsible for avoiding hazards and injuries. Finally, all interview guides asked about barriers and facilitators for working safely.

Analysis

All interviews were digitally recorded. The interviews were transcribed verbatim in Spanish and then translated into English by a professional transcription service. All investigators reviewed each of these transcripts and determined that theoretical saturation was achieved. A coding dictionary was constructed based on a-priori content underlying the construction of the interview guide (e.g., controllability of injury, beliefs about safety) and new ideas that emerged from immersion into the data. Two team members independently coded each transcript. The majority of codes had excellent inter-rater reliability (Cohen's Kappa ranged from 0.8-1.0). Some of the codes had poorer inter-rater reliability, but coding agreement was achieved through discussion.

NVivo 12 (Version 12 QSR International Pty Ltd. NVivo qualitative data analysis software, 2018) was used for data management, coding, and to facilitate analysis. For the analysis described here, segments for three codes; those related to (1) perceived causes of injury (i.e., CAUSES), (2) worker behaviors that may contribute to injury (i.e., BEHAVIOR), and (3) descriptions of experienced or observed adverse events (i.e., ACCIDENTS) were culled from across all transcripts using an NVivo report and subsequently reviewed. Regular meetings were held at which the team identified themes and patterns in a particular code, related it to other codes, and constructed matrices of related ideas. Variations by contractors and workers were noted, and when appropriate, separate matrices were constructed.

RESULTS

Participant characteristics

This study included n=9 Latino small-scale residential construction contractors and n=12 immigrant Latino construction workers. All participants were Latino, male, and the majority of participants did not graduate from High School. Although we anticipated a combination of Latino and non-Latino, we could only locate and recruit Latino contractors in the community. The contractors ranged in age

from 29 to 46 years, had spent on average of 15.3 years in the U.S. and approximately 12.5 years working in construction. Workers ranged in age from 18 to 50 (M=31.2), had been in the U.S for 10.5 years, and had performed construction work for an average of 8 years. Complete descriptive information for the sample is included in Table 1.

Every contractor and worker personally experienced harm while at work that was typically characterized as "nothing serious." Only a portion reported personally experiencing an "injury," which was characterized primarily by whether it resulted in the inability to continue working. About half of the contractors and a quarter of the workers experienced an injury that resulted in lost wages. By contrast, every contractor and nearly every worker knew of a construction worker who was injured on the job.

Contractors Perspectives on Injury

Analysis of the contractors' interviews yielded two primary themes as the significant causes of injury among immigrant Latinos in small-scale residential construction. The first theme, ***That's Just the Way We Are***, reflects what is believed to be a cultural view that safety is unimportant, especially compared to earning money as quickly as possible. For example, when asked, "in your opinion, what are the causes of injury in residential construction," C1 responded:

> *I think it's because we try to show bravery and because we don't wear the protective equipment. I believe most of the accidents could be prevented. I think avoiding accidents is in our hands. Sometimes, the equipment could fail, but most of the accidents could be prevented if we used the appropriate safety equipment.*

And when pressed to determine if training about using protective equipment would help, the same contractor commented:

> *No, I don't believe so. I think the problem is more a cultural one than anything else. People **don't want to be careful** (emphasis added) at work. Even though they will benefit, they know the job is dangerous. They don't see that wearing protective equipment helps them in case they have an accident. They don't want to use it because it's uncomfortable. They feel it hinders them at work. And since **we get paid** (emphasis added) according to what we do during the day, we don't use it.*

C1's point that "…people don't want to be careful…" reflects a dominant sentiment expressed by contractors. Indeed, nearly every contractor referenced "carelessness" or a related term (e.g., "not paying attention" or "distracted") as being the primary reason why Latino construction workers are injured in their work.

Underlying ***That's Just the Way We Are*** were three sub-themes that attribute a "cause" to the effect of not caring about safety or being "careless." The first sub-theme or cause of carelessness is Money Motivated. C1, quoted above, stated that comfort impeded his roofing workers' use of protective equipment. However, he also attributed it to workers' belief that protective equipment hindered their work, whether it is due to the time it takes to put it on, secure it, move it, etc., or the physical restraint it poses to movement. Because the workers are paid by the job, not by the hour, any time not committed to replacing the roof was lost money. Another contractor put it this way:

> *… they work by contract and want to finish it as quickly as possible. Another thing is that those [roofing] jobs are well-paid, and people want to make more money. … Going back to talking about productivity, if you tie off or wear a harness, you won't produce the same amount because you have to be tying and untying anytime you move from one place to another. So, your production is reduced [and you make less money]. C6*

Substance Use is the second subtheme underlying ***That's Just the Way We Are***. Although some contractors attributed workers' substance use to their age, essentially "what do you young,

unattached men do for fun – they party," others intimated that it was embedded in what it means to be Latino. Regardless of the source, substance use or its effects, was used to explain worker carelessness. For example, when asked, "what are the most common causes of injury in residential construction?" C4 responded,

> *Well, because people don't take precautions, because they work hungover, and because they drink on the job. … [preventing injury requires] your five senses all the time … If you're working in a dangerous place, you have to be focused all the time because you can step on a paper, a hose, or anything and slip. So, we need to be focused on what we're doing.*

Finally, contractors consistently alluded to the idea, They Just Don't Listen, which is the third and final subtheme of ***That's Just the Way We Are***. Sometimes the contractors attributed this idea to youthful naivete, like Contractor #4 said, "as I told you, we think we're 'Superman.' We can fly". Others stated it plainly, "Another problem is that Latinos are very stubborn and want to do things their way. We want to do things the way we think is right" (C6).

The second central theme contributing to worker injury in residential construction was ***Insufficient or Inadequate Equipment***. Contractors, all of whom received subcontracts from more significant operations, often talked about not having sufficient equipment or materials for the job. For example, C2 commented,

> *We return to the same thing about the equipment. If a nail gun doesn't work right, you might think you nailed a piece of wood when, in reality, it didn't happen. Then, when you stop holding it, it will come loose and hit you. So, the equipment has a lot to do with that [injuries].*

C2 went on to say,

> *Well, patrons [general contractors] have to be more aware of the situation. If they want the job done quickly, they have to provide all the necessary equipment. Also, we, as [sub] contractors, have to have all the materials and equipment ready before we start the job.*

Workers Perspectives on Injury

Analyses of the workers' transcripts yielded three dominant themes underlying elevated injury among immigrant workers. The first theme, ***We are Careless***, reflects the idea that Latinos do not think about safety or the potential of injury when they work – they "just do it." Indeed, just about every worker used the term *descuidados*, which translates to "careless" or something similar when asked why injuries are common among immigrant Latino construction workers.

> … But, as I told you earlier, they're very careless and don't pay attention to what they're doing. There are workers who, when they are putting down paper on the roof, don't realize they've reached the end of it and fall off. I don't know what they're thinking about. (W8)

> Yes … carelessness because, sometimes, they're working but are not concentrating on what they're doing. And when they try to walk, they slide and fall off. (W2)

Underlying ***We are Careless*** were two primary explanatory subthemes. The first explanatory subtheme, We Don't Think about Safety, was a clear contrast between perceptions of American workers' views on work and safety relative to those of Mexicans. W4, for example, contrasted working for an American versus a Mexican contractor, which in this case was his cousin.

> *I've worked with Americans, and the difference is enormous - in the way they protect us. As I told you, I worked with my cousin in framing. When we're building a frame, he uses a 2 x 6 to walk on. Once, when my cousin didn't have work, I worked for an American and set up my 2 x 6. When he saw that, he told me to stop working. Instead of using a 2 x 6, we used a plywood structure. So,*

we were able to walk freely. And with my cousin, I couldn't take my eyes off my feet. So, there's the difference. Americans take more precautions.

The second subtheme, ***Earning Money Comes First***, establishes the priorities held by Latino construction workers. This subtheme consists of two inter-related ideas. The first idea is working fast equals more money. Workers in the roofing and framing trades were typically not paid by the hour; therefore, in their minds, the quicker they completed one job and moved on to another, the more they could earn. W3 described it this way,

Another reason is because people don't get paid by the hour. We get paid by what we do during the day. Then, we work hard to do as much as we can during the day. That leads to carelessness. We want to make more money by running all the time. If people working in roofing were to get paid by the hour, there wouldn't be so many accidents because everybody would be more careful. If somebody told you to hurry up, you would say, "Why do I have to run? I'm working by the hour." The problem is that people are always running and rushing on the job.

The second inter-related idea is that Safety Slows you Down. This notion was particularly salient for workers in roofing when talking about why harnesses are not typically used.

… it hinders your mobility on the roof. It's very uncomfortable to work with that extra weight because it makes you get tired and exhausts you (W5).

The majority of subcontractors don't have safety equipment for the workers. Or they don't ask us to wear it because, sometimes, it hinders us and decreases production. (W1)

W1's comment foreshadows the second dominant theme presented by workers; Contractors Lack Necessary Equipment. Workers understood that they worked at the bottom of the proverbial food chain. They understood their "contractor" or "patron" – who typically worked side-by-side with the workers – typically received his work from a higher level general contractor or "patron," which often created a situation that no one knew the job until they arrived on the site.

The contractor subcontracts a job, and, sometimes, that subcontractor subcontracts with somebody else. So, since there is no control, the equipment that is used is not appropriate for the job. (W1)

Yes, there are people who build their tools [like ladders or scaffolds] according to their possibilities. Some patrons don't have the resources to contract a company to bring him a scaffold or some machinery. The amount of money they make is not enough to pay for such things. So, they use whatever is available to build what they need. And then, that faulty equipment breaks down, and that is when accidents happen. (W5)

The third and final theme, ***We're Pressured to Produce***, reflects the view that workers attributed the need to work fast to the pressure placed on them by their patron. They understood their "patron" likely underbid another contractor to win a job, and in doing so, that meant that success was driven by volume production. W4 described it this way,

I've seen that Latino contractors take jobs for less money than Americans do. And since they're getting paid less, they have to work very fast to be able to earn money. On the other hand, Americans charge a higher price, and for that reason, they take their time to finish a job.

Similarly, another participant, who was interviewed as a "Contractor" because he managed a small framing crew for his brother-in-law who had a larger business, described how the pressure to produce resulted in a traumatic injury.

Participant: There are patrons who ask workers to do more work than necessary. Once, we were still working, and it was 11 p.m., and we were still building a floor in a town located about one

hour from LOCATION. So, we were all mad and rushing to finish and come home. A man was cutting wood and cut these fingers off.

Interviewer: His thumb and index fingers?

Participant: Yes, the saw cut off his thumb and index finger. And since I was in charge of the group, he came to me bleeding with his thumb cut off. And even though that accident happened, my brother-in-law, who was the contractor, got mad and wanted us to finish the job. I told him that I was not going to keep working. I was very scared. I even cut myself slightly because I was so scared. What I did was take a hammer and destroy the saw with it. Without the saw, we couldn't continue to work.

Similarities and Differences in Contractors and Workers Perspectives on Injury

Several similarities exist in Latino contractors' and workers' beliefs about construction-related injuries. Both contractors and workers believed that Latinos do not value safety, at least not to the same extent as Americans. Contractors' and workers' comments also conveyed similarities in the belief that earning money takes priority over safety and that safety is an impediment to efficient work and subsequent earnings. Contractors and workers also believed that injuries resulted from having inadequate or insufficient equipment on the job site.

However, there were also meaningful differences in how contractors and workers talked about similar ideas. Contractors seemed to attribute what they referred to as "carelessness" as a character flaw of workers that needed to be managed. C6, for example, put it this way,

They take unnecessary risks while they do the job. That's a situation where you have to battle with them (emphasis added). You tell them not to take those risks and to do things the right way, even if it takes longer. But they don't listen. For example, after you've had a safety meeting with them in the morning, later on, the job, you see them doing whatever they want, regardless of what you just told them. They're stubborn, and safety is not something important to them.

By contrast, while workers acknowledged being careless – primarily because they prioritized earning money over safety – they did not view carelessness as a problem. They understood that carelessness could lead to an injury, but their sentiments suggested that lack of training left workers unaware of risks or hazards. For example, W1 said, "…workers don't receive the training they should receive…" in response to a probe about why workers may not use equipment properly. Similarly, W3 commented, put it this way,

The patron says that you don't need to be trained in roofing because what training do you need to carry a bundle to the roof? Or to pick up trash? That's the reason that I say, in roofing, you're responsible for your own safety. But if there were some requirement that forced training, it would be different

Contractors, by contrast, placed the responsibility squarely on workers and argued that training was unnecessary. For example, when the interviewer was trying to summarize several points about the causes of "accidents," including the potential of training, C1 placed responsibility on workers' carelessness, saying:

You could train a person, but I think it's very difficult to try to think the way people think. Our mindset is if we work less, we're going to make less. And the equipment is going to hinder us from doing our jobs. For that reason, we don't use it.

Another contractor went so far as to suggest that training and attentiveness to safety can create the potential for injury.

> *I think training and safety are exaggerated. I think there are too many rules and requirements. Once, I worked in [LOCATION], and the rule there is to anchor off by using a harness. I remember there were six or seven of us. We were pulling off the old tiles - walking from one side to the other, and the ropes all started to get entangled. When I saw that, I said, "An accident is going to happen here because everybody is all entangled." A while later, one of the guys I was working with tripped and almost fell off. (C4)*

A second noticeable difference was apparent in contractors' and workers' explanations for why working fast is typical. Both agreed that working fast lies in the desire to earn more money given the piece-rate compensation system. However, whereas some contractors flatly reject working fast as a potential cause for injury, workers frequently report feeling pressured by their patron to work faster. As outlined earlier, workers understood that their patron would deliberately under-bid to win a job, resulting in a focus on volume production to remain financially afloat. However, this reality reveals yet another similarity between workers and contractors – both prioritize earnings over safety.

DISCUSSION

A small but growing body of research has documented immigrant Latino construction workers' beliefs about injury (Arcury et al. 2014; Flynn et al. 2015; Menzel and Gutierrez 2010; Roelofs et al. 2011). Research to date has not considered contractors' perspectives, especially contractors in the small-scale residential subsector of the industry. Recognizing that an increasing number of contractors in this subsector are Latino, the perspectives of both contractors and workers are essential for the design of effective interventions to reduce elevated injury and fatality (NIOSH & ASHE, 2015).

This study replicates and extends the findings of previous studies whose samples were not restricted to the small-scale residential construction subsector. Like others (Arcury et al.), it was clear that immigrant Latinos in residential construction see limited value in safety or taking precautions. Similarly, like others, we found that speed of work is viewed as being more important than safety (Arcury et al. 2014; Flynn et al. 2015; Menzel and Gutierrez 2010; Roelofs et al. 2011) and that injuries result from inadequate or insufficient equipment (Menzel and Gutierrez 2010; Roelofs et al. 2011).

However, our results go beyond previous research in at least two critical ways by considering both contractors and workers. First, contractors' and workers' attributions about injury and the putative value for safety are very similar. The similarity among contractors and workers may not be surprising, in part because the contractors were also Latino. Indeed, even when contractors were critical of workers' carelessness, they typically used the collective pronoun of "we" in talking about workers, suggesting that contractors identified themselves with being construction workers.

Second, despite substantial similarities among contractors and workers, meaningful differences create a type of "He-Said, He-Said" type of situation. Importantly, and perhaps not surprisingly, there was clear evidence that the often-reported need to work fast (Arcury et al. 2014; Flynn et al. 2015; Menzel and Gutierrez 2010; Roelofs et al. 2011) was both self and contractor-imposed. Similarly, insufficient or inadequate equipment on the job site occurs but is driven at least in part by the thin potential profit margins available to these sub-, sub-, sub-contractors. Narrow margins, of course, do not authorize unsafe work practices, but it also diminishes stereotypes of contractors who exploit vulnerable workers who have few options.

<u>Implications</u>

The potential salience of the observed similarities for improving occupational health among construction workers in this subsector of the industry cannot be overstated. The *Overlapping Vulnerabilities* report (NIOSH and ASHE, 2015), for example, and some of the initiatives that follow

(Eggerth et al. 2018), assume that contractors – like medium and larger businesses – prioritize safety but may not have sufficient resources to enact safety procedures. The results of this study suggest that assumption is questionable. These data indicate that small-scale residential construction contractors, like their workers, place a premium on finishing jobs quickly as a matter of keeping their business going.

Therefore, interventions to enhance safety in small-scale residential construction must include a focus on the worker, but deliberate attention must be placed on contractors. Like workers, contractors must believe that safety matters to model and expect safe behavior from workers. Safety training that acknowledges and accommodates the thin margins any small business experiences would move safety from a theoretical possibility to a lived reality. Although harder to implement, professional standards wherein subcontracting always requires regular worker safety training and specific safety practices would also help. Injury in small-scale residential construction may also benefit from contractors receiving small-business consulting or support in everything from how to design successful bids to advance preparation for executing won jobs and handling payroll. Clarifying business development and sustainability plans may help reduce injury because contractors, like their workers, prioritize earning money. Finally, a small contractor equipment cooperative wherein commonly used but costly equipment can be borrowed or leased at modest expense may help ensure the right equipment on every job site, regardless of the scope of the job.

Conclusion

This study's findings suggest that an increasing number of Latino workers and contractors in the small-scale residential construction industry share highly similar beliefs about the causes of injury and the value of safe work practices. There is a collective view that Latino workers are careless about safety and that carelessness is exaggerated by strong incentives to make as much money as soon as possible. These beliefs have been well-documented among undocumented immigrants in other sectors, and they offer clear, albeit frustrating, insight into the patterns of injury and fatality reported in the Overlapping Vulnerabilities report. The results demonstrate an undeniable need to include both workers and small contractors in strategies to promote workplace safety in workers in this sector of the industry.

Table 1. Description of participating contractors and workers

# Interview	Age	Years in the U.S.	Gender	Marital Status	Years of Education	Years in Construction
			Contractors			
C1	34	14	M	Married	High School	10
C2	29	10	M	Married	11th grade	9
C3	34	13	M	Married	High School	13
C4	31	19	M	Married	5th grade	11
C5	46	19	M	Married		18
C6		17	M	Married		17
C7	32	14	M	Married	9th grade	9
C8	39	15	M	Divorced	High School	10
C9	35	17	M	Married		17
			Workers			
W1	37	19	M	Divorced	Middle school	18
W2	18	2	M	Single		1
W3	50	23	M	Married	3rd grade	15
W4	38	19	M	Married	8th grade	14
W5	25	5	M	Single	Universidad	5
W6	20	4	M	Single	9th grade	4

W7	31	15	M	Married	High School	15
W8	37	9	M	Separated	5th grade	4
W9	32	14	M	Married	9th grade	9
W10	34	1	M	Separated	12th grade	1
W11	28	6	M	Married	11th grade	6

Reference List

Arcury, T A, Summers, P, Carrillo, L, Grzywacz, J G, Quandt, S A and Mills, T H (2014) Occupational Safety Beliefs among Latino Residential Roofing Workers. "American Journal of Industrial Medicine," 57(6):718–25. doi: 10.1002/ajim.22248.

Brunette, M J (2004) Construction Safety Research in the United States: Targeting the Hispanic Workforce. "Injury Prevention: Journal of the International Society for Child and Adolescent Injury Prevention," 10(4):244–48. doi: 10.1136/ip.2004.005389.

Dong, X and Platner, J W (2004) Occupational Fatalities of Hispanic Construction Workers from 1992 to 2000. "American Journal of Industrial Medicine," 45(1):45–54. doi: 10.1002/ajim.10322.

Dong, X, Men, Y and Ringen K (2010) Work-Related Injuries among Hispanic Construction Workers-Evidence from the Medical Expenditure Panel Survey. "American Journal of Industrial Medicine," 53(6):561–69. doi: 10.1002/ajim.20799.

Dong, X, Wang, X, Largay, J A, Platner, J W, Stafford, E, Trahan Cain, C and Choi, S D (2014) Fatal Falls in the U.S. Residential Construction Industry. "American Journal of Industrial Medicine," 57(9):992–1000. doi: 10.1002/ajim.22341.

Eggerth, D E, Keller, B M, Cunningham, T R and Flynn M A (2018) Evaluation of Toolbox Safety Training in Construction: The Impact of Narratives. "American Journal of Industrial Medicine," 61(12):997–1004. doi: 10.1002/ajim.22919.

Flynn, M A, Eggerth, D E and Jacobson C J (2015) Undocumented Status as a Social Determinant of Occupational Safety and Health: The Workers' Perspective. "American Journal of Industrial Medicine," 58(11):1127–37. doi: 10.1002/ajim.22531.

Menzel, N N and Gutierrez A P (2010) Latino Worker Perceptions of Construction Risks. "American Journal of Industrial Medicine," 53(2):179–87. doi: 10.1002/ajim.20735.

National Institute for Occupational Safety and Health and American Society for Safety Engineers [NIOSH and ASSE] (2015) 'Overlapping vulnerabilities: the occupational health and safety of young immigrant workers in small construction firms.', ((NIOSH) 2015-178), pp. 1–39.

Roelofs, C, Sprague-Martinez, L, Brunette, M and Azaroff, L (2011) A Qualitative Investigation of Hispanic Construction Worker Perspectives on Factors Impacting Worksite Safety and Risk. "Environmental Health: A Global Access Science Source," 10:84. doi: 10.1186/1476-069X-10-84.

Conflicts of Interest

The authors have no conflicts of interest to report

Funding and Sponsorship

This research was supported by a grant from the National Institute for Occupational Safety and Health (R01 OH012177).

View publication stats

W099 & W123 Annual International Conference:

9-10 September 2021

W099 IN CONSTRUCTION SAFETY HEALTH WELLBEING

W123 PEOPLE IN CONSTRUCTION

CIB

GCU Glasgow Caledonian University

University for the Common Good