Residential Construction Foremen's Fall Prevention and Safety Communication Intervention

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1. Introduction

Falls from heights consistently account for most residential construction worker fatalities. Residential construction crews are small, exposures are high, and conventional methods of fall protection are rarely used. Most residential contractors employ fewer than ten people resulting in the foremen directing both safety and production. (CPWR, 2013). Crew foremen, who direct safety and production, are more safety conscience, yet they rarely correct workers' unsafe behaviors. (Hung et al, 2011).

1.1 Objective

This research aimed to improve foremen's abilities to communicate with their crewmembers about fall prevention. We predicted that the intervention would result in improved fall prevention communication by the foreman and increased crew safety behaviors when working at heights.

2. Methods

We identified training priorities by surveying 429 crewmembers and foremen and conducting four focus groups. Our joint researcher/carpenter trainer team utilized training activities that have been effective with construction workers and adult learners, including participatory activities and problem-driven discussion. After piloting the intervention with ten foremen and making necessary modifications to comply with new federal safety standards that OSHA announced during this project, we recruited foremen from residential contractors in the St. Louis region. Surveys administered twice pre-training and at 6, 12, and 26 weeks post-training measured foremen's and workers on their crews' perceptions of fall prevention behaviors, safety climate, and safety communication. We modified the St. Louis Audit of Fall Risks to comply with the revised federal safety standards and a trained carpentry professional audited participating foremen's worksites at all measurement time-points. Mixed models tested for immediate changes post-training (6 and 12-weeks time-points combined) and sustained changes (6-months post-training). Hierarchical linear models were fit that nested workers under their foreman and foremen under their employer.

3. Results

We held six training sessions with 84 participants from 8 residential contracting companies. The day long training was led by a carpenter trainer with experience as a residential foreman, a member of the research team assisted. Participants actively engaged in demonstrations of fall prevention methods on partially constructed props of a full-scale home and in small group and instructor led discussions targeting each stage of home building. At both post-training time-points, foremen and their crewmembers reported more frequent and increasingly interactive toolbox talks at the workplace. Statistically significant improvements in safety climate were noted post-training and further improvements were reported by foremen and crewmembers after 6-months. Increased crewmembers' fall prevention knowledge post-training and at extended follow-up demonstrate that participating foremen were effectively teaching their crewmembers. Both foremen and crewmembers reported statistically significant increases in safe performance at their worksites when performing activities on elevated surfaces, with activities emphasized during the intervention demonstrating large improvements that remained at 6-month follow-up. Although we were underpowered to detect changes in worksite audit results, increased use of personal fall arrest systems and improved safety when installing roof trusses were observed. Based on associations between safety behaviors and reported falls seen in a previous study of construction workers, the magnitude of the change in fall safety behaviors reported by

crewmembers post-intervention would be associated with a 16.7% decrease in the annual odds of sustaining a fall from height.

4. Discussion

This intervention resulted in sustained improvements in fall prevention behaviors and safety communication in residential construction, an industry sector with high fall rates. After training foremen in both fall prevention and safety communication, their crewmembers reported improvements in fall prevention behaviors, safety communication, and safety climate. Agreement between foremen's self-reports and their crewmembers' reports increase the strength of our findings. Although this intervention did not target safety culture, changes reported by participants suggests that training foremen in safety and safety communication may improve safety culture, an emerging priority for construction safety and health. By delivering this training to crew foremen and including safety communication with crewmembers as a component of the intervention, we were able to reach a large number of construction workers.

This research adds to the growing literature demonstrating that needs-driven training can improve construction worker safety and worksite safety communication. Most residential construction companies are small and their workforce is often transient and widely dispersed, limiting access to effective training. By using innovative delivery methods, we can extend the reach of safety and health training to this sector of construction and the workforce with the greatest exposure to unprotected work on elevated surfaces.

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6. References

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