

Evaluation of a Pilot Promotora Program for Latino Forest Workers in Southern Oregon

Diane E. Bush, MPH,^{1*} Carl Wilmsen, PhD,² Timothy Sasaki, MSW, MPH,¹
 Dinorah Barton-Antonio, MA,¹ Andrea L. Steege, PhD, MPH,³ and Charlotte Chang, DrPH¹

Background *Forest work, an occupation with some of the highest injury and illness rates, is conducted primarily by Latino immigrant workers. This study evaluates a pilot program where promotoras (lay community health educators) provided occupational health and safety trainings for Latino forest workers.*

Methods *Evaluation methods included a focus group, post-tests, and qualitative feedback.*

Results *Community capacity to address working conditions increased through (i) increased leadership and community access to information and resources; and (ii) increased worker awareness of workplace health and safety rights and resources. Fear of retaliation remains a barrier to workers taking action; nevertheless, the promotoras supported several workers in addressing-specific workplace issues.*

Conclusions *For working conditions to significantly improve, major structural influences need to be addressed. A long-term, organizationally supported promotora program can play a key role in linking and supporting change at the individual, interpersonal and community levels, contributing to and supporting structural change.* Am. J. Ind. Med. 57:788–799, 2014. © 2014 Wiley Periodicals, Inc.

KEY WORDS: *promotora; forest workers; workplace health and safety; community capacity; program evaluation; community health worker; lay health educator; social ecological framework*

INTRODUCTION

On a daily basis, forest restoration workers are exposed to extreme occupational hazards with little recourse for ensuring their health and safety. Their work entails intense physical labor including planting trees, thinning and cutting

brush and small trees, piling and burning brush, pest control, and habitat improvement. Workers are exposed to extreme weather, rough terrain, chainsaws, falling trees and branches, poison oak, forest fires, contaminated drinking water, snakes, bears, biting insects, and mountain lions [Knudson and Amezcua, 2005; Sarathy, 2012; Wilmsen et al., 2012]. A lack of industry oversight and regulation [Committee on Natural Resources, 2008; Sarathy, 2012] has resulted in unsafe workplace practices that compound the inherent hazards of forest restoration work. A recent survey of 150 forest workers in southern Oregon found workers subject to unsafe workplace practices. These included assigning inexperienced workers to do dangerous frontline work, forcing them to work too closely together, not allowing crucial rest breaks, pressuring workers to work faster and harder, not providing training on safety, pressuring workers to work when sick or injured, and not providing drinking water at the work site. Workers also reported verbal abuse, harassment, and not receiving earned wages [Wilmsen et al., 2012].

¹Labor Occupational Health Program, University of California Berkeley, Berkeley, California

²Alliance of Forest Workers and Harvesters (Now the Northwest Forest Worker Center), Albany, California

³Division of Surveillance, Hazard Evaluations and Field Studies, National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention, Cincinnati, Ohio

*Correspondence to: Diane Bush, Labor Occupational Health Program, UC Berkeley, 2223 Fulton St., Berkeley, CA 94720-5120. E-mail: dbush@berkeley.edu

Accepted 15 April 2014
 DOI 10.1002/ajim.22347. Published online 2 June 2014 in Wiley Online Library (wileyonlinelibrary.com).

Over the past several decades the forest ecosystem restoration workforce in the U.S. has become largely a Latino immigrant workforce, with many workers here on H2B or “guest worker” visas [McDaniel and Casanova, 2005; Sarathy, 2006; Campe et al., 2011]. These low-wage, seasonal, non-unionized jobs are therefore filled by an economically and socially vulnerable workforce of immigrants with little power to advocate for their health and safety in the workplace [Sarathy, 2012]. Throughout the U.S. workforce, Latino workers, especially immigrant workers, are at higher risk of injury and death [Byler, 2013]. In addition, it is not uncommon for Latino forest workers to work while injured or sick for fear of being fired or for other retaliation [Wilmsen et al., 2012].

Given the many hazards they face and their vulnerable socio-economic status, it is not surprising that forest restoration workers in Oregon suffer very high occupational injury, illness and fatality rates [Howard, 2010; Thompson, 2011; Wilmsen et al., 2012]. These high rates of occupational injury and death point to a critical need for problem analysis and intervention at multiple levels. A social ecological perspective [McLeroy et al., 1988; Baron et al., 2014] suggests that multiple levels of influence affect health outcomes, including *individual factors* (knowledge, attitudes and beliefs that influence behavior), *interpersonal factors* (family, friends and peers), *institutional or organizational factors* (in this case, primarily employers), *community factors* (social networks and norms in the community), and *public policy or structural factors* (laws and regulations) [McLeroy et al., 1988]. This perspective emphasizes the interaction between, and interdependence of, these different levels of influence and therefore the importance of working at multiple levels in order to bring about change [Bronfenbrenner, 1977; McLeroy et al., 1988]. For forest workers, such changes include legal protection, health advocacy, education on health and safety and worker rights, and other measures to ensure they are healthy and safe on the job.

To address these needs, the Alliance of Forest Workers and Harvesters (“the Alliance”), U.C. Berkeley’s Labor Occupational Health Program (LOHP), and the National Institute for Occupational Safety and Health (NIOSH) collaborated to develop a community-based health and safety education program focused on developing the community’s capacity to address health and safety issues among forest workers. The program, *Sí, Sé: Salud y Seguridad en el Trabajo—Yes, I Know: Health and Safety on the Job*, targets Latino forest workers in southern Oregon using a promotora model.

Promotora Programs

Promotora programs—also known as lay health educator or community health worker programs—have been widely

used and promoted as a way for trusted members of the community to provide culturally competent services to hard-to-reach populations. Core promotora roles described in the literature include the following: connecting people with available services; bridging cultural gaps between communities and the health care system; providing culturally competent health education; providing social support and informal counseling; advocating for the needs of individuals and communities; and building the capacity of communities and individuals to get their health needs met [Rosenthal, 1998; American Public Health Association, 2014]. Promotora programs have incorporated some or all of these roles to effectively deliver health and safety information to vulnerable Latino populations [Rhodes et al., 2007; Ayala et al., 2010], including a small number focused on workplace safety. The majority of workplace-focused programs have targeted farmworkers [Forst et al., 2004; Arcury et al., 2010; Monaghan et al., 2011; Quandt et al., 2013]. Promotora programs have also been used to reach Latino poultry workers [Grzywacz et al., 2009] and construction workers [Williams et al., 2010]. The *Sí, Sé* program was the first to target forest workers.

Advocacy and capacity-building roles are clearly critical for promotoras working with low-wage, immigrant workers as they seek to address workplace health and safety conditions that are largely controlled by employers and contractors. The presence of trained promotoras contributes to community capacity, and that increased capacity can play a pivotal role in linking together the different levels of the ecological model. Key components of increased community capacity include the development of *leadership in the community*, *accessible resources*, and *community knowledge about the problem and about existing prevention efforts* [Flaspohler et al., 2008]. Strengthening a community’s ability to support individual and community level actions to protect workers’ health can in turn support needed structural/policy changes. These include improvement in government subcontracting policies and enforcement of, and employer compliance with, existing labor and workplace health and safety regulations.

By taking on leadership roles and undergoing training, promotoras themselves become empowered, and some studies have explored this empowerment and its contributions to community capacity [Booker et al., 1997; Trejo et al., 2013]. Yet, there is little in the literature on the advocacy and capacity-building roles of promotoras in workplace settings. This study contributes to filling that gap.

The *Sí, Sé* Program

The *Sí, Sé* program was conceived to address multiple levels of the social ecological spectrum, promoting *individual* (worker), *interpersonal* (peer educators, family networks),

and *community level* engagement with the long-term goal of reducing job-related illness and injury among forest workers. It emphasizes the interpersonal and community levels by developing local leadership and information resources through a promotora model. The program supports the policy-level efforts of the Alliance that target government subcontracting and labor law enforcement.

The program consists of three primary components: (i) train the promotoras to educate their communities and take on a leadership role; (ii) develop educational tools for the promotoras to use; and (iii) provide training workshops and information sessions for forest workers and their families, conducted by the promotoras. These components are described in more detail in the "Materials and Methods" section.

The *Sí, Sé* program evaluation included three specific aims. The first was to determine whether the promotora program contributes to increasing community capacity to protect workers' health. The focus was on *leadership development* among the promotoras; *accessible resources*; and *knowledge among forest workers and their families* about the problem, their rights, how to protect themselves, and what to do in case of injury or illness. The second aim was to determine whether this led to any changes in the workplace or worker behavior. The third aim was to identify strengths and weaknesses of the program.

MATERIALS AND METHODS

Promotora Intervention

The pilot program was launched in July 2011 in partnership with a community advisory committee (CAC), which comprised forest workers, the promotoras, and other advocates from the community including one non-profit forest management employer. Five Latina promotoras attended initial training workshops; three completed the training, were hired by the Alliance, and went on to conduct educational sessions. In an effort to ensure the program was relevant and responsive to the unique cultural and linguistic characteristics of the Latino forest worker population in Southern Oregon, it was designed to be based in the community and to reflect community input and voice as much as possible.

The promotoras selected were wives of forest workers, identified from a group of women in the forest worker community in Medford, Oregon who had been volunteering with the Alliance for many years. Although the Alliance considered hiring forest workers (who are all men) as promotores (male community health workers), over the past several years women have had a greater interest than their husbands in working with the Alliance. These women typically work as hotel room cleaners or in local pear packing

plants. In addition to their strong interest in community activism, the women are continuously present in the home community; the men frequently work out of state for lengthy periods of time. While the women do not have direct experience with forest work, they frequently hear about working conditions in the woods and work issues their husbands face.

Training materials were developed with the input of the CAC and utilized by the promotoras in their workshops. They included table top flip-charts for 1–2 hr workshops, short "conversation" guides, and a booklet made up of 15 short fact sheets on forest worker health and safety issues and a list of local resources (available at: <http://www.nwforestworkers.org/resources/training.html>). All the materials were designed for low-literacy audiences. Promotoras participated in extensive training (six multi-day training of trainer sessions, for a total of 89 hr from July 2011 through June 2012) provided by bicultural and bilingual LOHP and Alliance staff. As part of this training, Migrant Health Promotion, a nationally recognized promotora training and support organization, led an 8-hr introductory session on promotora roles, popular education, and communication. Promotoras learned about the hazards forest workers face, employer responsibilities, and available resources. They practiced teaching what they were learning using the training tools. Originally, the plan was to provide training on four different topics; however, given their inexperience, it became clear that to provide adequate training, practice and support to the promotoras it would be better to focus on two topics: workers' rights, and what to do if injured on the job. These topics were identified by the promotoras and the CAC as the topics of greatest general interest in the community.

The promotoras used the flip-charts, which contained worker injury stories for each topic, and the short conversation guides to engage workers in conversations about workplace safety rights and resources. Key messages for the workplace rights unit included: employers are responsible for providing safe working conditions; there are workplace laws and agencies that enforce these laws; and workers can seek help through these agencies, each other, and the Alliance. For the injury unit, key messages included: it is important to treat wounds right away; employers are responsible for providing first aid and medical care as needed; and the steps to take if injured on the job. Promotoras emphasized key points that came up in the conversations, added points that did not emerge naturally, and summarized the key messages at the end of each session. The promotoras conducted health and safety training sessions in community-based settings, including community centers, workers' homes, and hotels where workers with guest worker visas reside. Sessions ranged from shorter conversations (1 hr, with two to three workers) to more formal workshops using the guided activities (2–3 hr with between 4 and 15 workers and family members). In order to address concerns raised by the

CAC and promotoras about potential retaliation by employers, the promotoras did not discuss workers’ immigration status, assured workers of confidentiality in all training sessions, and conducted trainings at times and in settings in which the workers (and the promotoras themselves) were most comfortable. During the 9-month study period (January through September 2012), the three promotoras reached 276 workers.

Evaluation

We (project staff from the Alliance and LOHP) conducted the evaluation of the *Sí, Sé* program through a collaborative community-based effort including participation from forest workers, the CAC, three promotoras, the Alliance, LOHP, and NIOSH. Although resource and time limitations precluded the possibility of conducting a full community-based participatory research (CBPR) project, we applied CBPR principles of community empowerment through partnership and collaboration to the program evaluation [Israel et al., 2006; Minkler and Wallerstein, 2008]. All evaluation activities were conducted in Spanish. In the process evaluation, our primary goal was to identify strengths, weaknesses, and areas for improvement in the program. In the outcome evaluation, the goal was to assess changes in community capacity defined as leadership, accessibility of resources, and community knowledge about problems and ways to address them. The outcome evaluation also strove to capture any changes in behavior among those forest workers who attended at least one training conducted by the promotoras. We utilized a mixed-method approach that included a focus group, a community advisory committee evaluation meeting, monthly program debriefings with the promotoras and project managers, and a short post-test with workers after the training workshops (Table I).

Focus group

In June 2012, we conducted a 2-hr focus group with seven participants from the forest worker community (five

workers, and two wives who had participated in the workshops but whose forest worker husbands could not attend). We designed a focus group instrument to assess program efficacy and program impact in terms of knowledge and health and safety behavior changes among forest workers, as well as changes in community capacity. The focus group guide included questions about what participants remembered learning at the training, whether they had used the information in any way (including doing anything differently because of the training), what they thought about having wives of forest workers provide the information, and whether they would recommend the training to others. We provided copies of a Spanish language informed consent document and read it to the participants. With oral consent from participants, we audio recorded the focus group. Each participant received a \$50 gift card as a reimbursement for their time.

Due to the resource and practical limitations in reaching forest workers—who are often either working long hours, resting, or traveling to distant work sites—the promotoras recruited focus group participants using a mix of snowball and targeted sampling. Only participants who had attended at least one training by the promotoras were included in the sample. The Alliance and LOHP co-facilitators took extensive notes during the focus group and LOHP staff later transcribed and analyzed the audio recording. The Alliance and LOHP identified and reviewed major themes, comparing data from the focus group with both the qualitative data gathered during the CAC evaluation meeting, and the promotora program debriefings.

Community advisory committee (CAC) evaluation meeting

The *Sí, Sé* CAC participated in the evaluation of the program by meeting to discuss both process and outcome goals. In June 2012, members of the CAC met for 2 hr and addressed questions about the program’s strengths and weaknesses (process), its visibility, impact in the community, and future directions (outcome). Meeting participants included nine forest workers and their family members and four program collaborators from LOHP and the Alliance. We utilized participatory activities to enhance the discussion and maximize involvement of all members of the CAC. Several members of the committee took detailed notes. LOHP staff subsequently reviewed the notes and identified major themes.

Promotora debriefing

LOHP staff conducted program debriefings with promotoras each month to assess their view of program strengths, weaknesses, and areas for improvement. We asked questions about the utility and cultural appropriateness of the training materials, barriers to reaching forest workers, and

TABLE I. Method of Evaluation, Number of Participants and Type of Data Gathered

Method	Participants	Data type
Post-test	263 forest workers	Quantitative/qualitative
Focus group	7 forest workers and family members	Qualitative
CAC evaluation meeting	9 community members	Qualitative
Promotora debriefing	3 promotoras	Qualitative

interest among forest workers in attending the trainings. The outcome evaluation included questions about changes participation in the program had brought about in the promotoras themselves, as well as about their perceptions of the short-term impact of the trainings on forest worker participants in terms of knowledge, attitude, and behavior changes. LOHP and Alliance staff reviewed the notes and identified key themes.

Post-tests

From January to September 2012, 263 of 276 (95%) participants from the worker training workshops completed post-tests, which included both quantitative and qualitative questions. Administered by the promotoras after each training session, the post-tests were designed to assess knowledge gain, changes in attitudes, and motivation to make changes in the workplace. Based on input from the CAC, we designed the post-test for a low-literacy audience, with visual cues. Promotoras read each question aloud, and explained the cues. Other participants and/or the promotoras assisted participants who were unable to read the evaluation tool. We conducted descriptive analysis of quantitative data using Microsoft Excel, and LOHP staff reviewed qualitative responses to identify common overarching themes and frequency of particular responses. Completion of the post-test was voluntary and anonymous in order to protect the identities of the workers.

The Office for the Protection of Human Subjects (OPHS) of the University of California, Berkeley and the National Institute for Occupational Safety and Health Human Subjects Review Board (HSRB) approved this study. A waiver to use an oral consent process instead of written consent was approved, to protect the anonymity of the focus group participants. No consent process was required for the worker training workshops.

RESULTS

By examining and comparing what was learned through each of the separate evaluation activities described above, several key findings emerged related to our specific program evaluation aims. First, we found that community capacity to address working conditions increased among both promotoras and workers. Leadership and access to information increased, with the promotoras playing a pivotal role, and workers' awareness and knowledge of workplace health and safety rights and resources increased. Second, while fear of retaliation was a barrier to workers acting on this knowledge, the promotoras were able to support several workers in addressing specific workplace issues. These findings are described in more detail below. Table II outlines the most salient information from each evaluation activity.

Community leadership, access to information, and direct assistance on work-related issues to forest workers and their families increased. Changes in the promotoras themselves were central to an increase in leadership in the community and in the community's access to information and resources. In addition, workers who had participated in the workshops, especially the husbands of the promotoras, were also seen as resources. Through the promotoras—who represented the Alliance in the community—the Alliance also began to be seen and turned to as a resource in the community.

The promotoras demonstrated and reported a significant increase in self-confidence and ability to provide information and assistance to community members. The promotoras began the project with no formal leadership experience, no knowledge of workplace rights and protections and no formal skills in delivering information to their peers. After working with the project for 12 months, they reported feeling confident and positive about giving advice to forest workers and no longer being fearful about speaking in front of a group. As one promotora described:

Even when a mayordomo (supervisor) came in during one of our workshops and the workers were nervous, I was not. Before I was afraid of them, but now I am not. You have to learn and help. You have to talk to people. —Promotora

The promotoras also reported that community members came to them or their husbands with questions, and viewed them as resources. The fact that the promotoras were able to refer some workers to legal services for being inappropriately fired likely enhanced this view.

In addition, forest worker focus group participants reported that, after attending one or two of the *Sí, Sé* workshops, they felt that they could now serve as resources for their co-workers.

I am more careful at work. I let people know if I think something is going to be dangerous. I'm not gonna let everyone know there are bees, but if there's something really dangerous I'll tell people. —Focus Group Participant

I feel like a resource for my co-workers. If something happens they know I know what to do. —Focus Group Participant

Another commented on the importance of building worker health and safety capacity.

Since the supervisors don't pay attention, it's good to know other workers will know what to do if something bad happens. —Focus Group Participant

TABLE II. Results of Evaluation Goals by Method of Evaluation

Evaluation goal:	Results by method			
	Post-test evaluation by workers (n = 263)	Focus group (n = 7)	Community advisory committee evaluation meeting (n = 9)	Promotora debriefing (n = 3)
COMMUNITY CAPACITY <ul style="list-style-type: none"> ●Assess changes in: ●Leadership in the community ●Accessible resources 	<ul style="list-style-type: none"> ●Report plan to spread the word about health and safety to co-workers. ●Report plan to seek help from the Alliance. ●Report plan to take care of co-workers and self. 	<ul style="list-style-type: none"> ●Participants view themselves as resources to their co-workers. ●Workers in the community are aware of the program but thought it needed more visibility. ●Participants feel supported by the Alliance and other partner agencies (“back up”). 	<ul style="list-style-type: none"> ●Positive feeling about the workshops in the community (good info, people want it, workers curious). ●New confidence that alliance can provide assistance. ●Program reach needs to be expanded to reach critical mass of workers, which will help overcome collective fear of taking action. ●Suggested marketing to increase program visibility. ●Expressed that supervisors are the ones who need to follow the rules; need more enforcement. 	<ul style="list-style-type: none"> ●Promotoras viewed as community resources. ●Promotoras gained leadership, education, and organizational skills. ●Promotoras have an increased interest in being resources (want more expertise, e.g., first aid, referrals). ●Husbands support their work.
COMMUNITY KNOWLEDGE <ul style="list-style-type: none"> ●Assess increase in knowledge of health and safety among forest workers 	<ul style="list-style-type: none"> ●Most factual questions were answered correctly by at least 90% of participants. ●Most (90%) participants reported that the information was new (72%) or somewhat new (18%). 	<ul style="list-style-type: none"> ●Workers view the information as important. ●Concern about some workers not taking workplace safety and health seriously enough. 	<ul style="list-style-type: none"> ●Workers view the workshop information as important, ask questions. 	<ul style="list-style-type: none"> ●Workers understand the information (especially learning about their rights, and that places exist for help, medical care). ●Workers ask a lot of questions during trainings. ●Some workers don’t care/ aren’t interested.
WORKER ATTITUDE <ul style="list-style-type: none"> ●Assess increase in forest workers’ motivation to make changes in the workplace 	<ul style="list-style-type: none"> ●90% of participants reported they would make health and safety changes at work. ●Reported that they learned they had the right to protect themselves on the job. ●Plan to report injuries in the future. 	<ul style="list-style-type: none"> ●Motivation to take action varies among workers. ●Desires to make changes are stifled by fear of reprisal and peer pressure. ●Workers report a need to make changes as a group. 	<ul style="list-style-type: none"> ●Workers are afraid to speak up for fear of reprisal. 	<ul style="list-style-type: none"> ●Workers are afraid to take action for fear of reprisal.
WORKER BEHAVIOR <ul style="list-style-type: none"> ●Identify actions taken by forest workers to improve workplace health and safety 	<ul style="list-style-type: none"> ●Not applicable 	<ul style="list-style-type: none"> ●Workers report utilizing increased caution but unclear what specific actions are being taken. ●Participants report being more careful, willing to point out serious dangers. 	<ul style="list-style-type: none"> ●A few employers are paying more attention to providing PPE and breaks. ●Few examples of actions taken by workers. 	<ul style="list-style-type: none"> ●Examples of actions: ●One worker told supervisor he must provide PPE; he did. ●Three workers approached promotoras to find legal assistance with wage and wrongful firing.

(Continued)

TABLE II. (Continued)

Evaluation goal:	Results by method			
	Post-test evaluation by workers (n = 263)	Focus group (n = 7)	Community advisory committee evaluation meeting (n = 9)	Promotora debriefing (n = 3)
PROGRAM STRENGTHS ●Identify strengths of the program	●Not applicable	●Workshops conducted at places of residence are effective. ●Workshop materials are good info to have/provide.	●Participants viewed wives of forest workers as effective promotoras.	●Husbands of promotoras support their efforts. ●Training materials are flexible and used according to the promotoras' needs. ●Reaching workers at home is the best option.
PROGRAM WEAKNESSES ●Identify weaknesses of the program	●Not applicable	●Forest workers themselves would be more effective as promotores. ●Program needs broader reach. ●Tip Sheets & Resource list not utilized by workers post-workshop.	●Workers are afraid to attend workshops for fear of reprisal. ●Supervisors/contractors need to be involved in the program.	●Promotoras need success stories to share. ●Some workers don't care/aren't interested.

Advisory group members who were forest workers, reported that their co-workers were curious about the program, and wanted to get more information.

Sometimes people ask me questions about it [the promotora trainings]. I want to invite people to come to the trainings so they can have the information too. –Advisory Group Member

In addition, focus group and advisory committee members reported the community's new confidence in the Alliance to provide assistance if things go wrong at work. As one worker focus group participant put it:

I feel safer because I know I have someone who has my back if something goes wrong. –Focus Group Participant

Having flexible educational materials that could be adapted to the skill and confidence level of the promotoras played an essential role in the effective delivery of information. Over the course of the project, the teaching materials and activities were changed and simplified to better meet the needs of the promotoras as they simultaneously developed their own way of using the materials. By the end of the project, the approach the promotoras described was that they would initiate a conversation with a group of workers using the 2–3 page “conversation guides” developed mid-way through the project. Once the workers were engaged, the promotoras would move to the activity-based flipcharts and

informally talk about the stories. This approach was confirmed by Alliance staff observation. When asked toward the end of the project if the materials could be further improved, the promotoras did not want them changed anymore, even though program planners felt the materials might be more useful if further simplified. Focus group participants reported that the workshops and most of the materials were effective in providing them information. They observed, however, that they did not think people were reading the booklet of fact sheets. One focus group participant underscored the need to tailor training approaches to a low-literacy audience when he observed:

Many of us don't like to read. Maybe it's a cultural thing, but we just don't like to read. –Focus Group Participant

On the other hand, during the course of the project the project manager for a contractor that trains its workers extensively found the booklet very useful and asked for additional copies for each of the company's crew transport vehicles.

Awareness of workplace safety issues, protections, and rights, as well as stated motivation to take action, increased among workers. Voluntary participation of 276 workers in the workshops demonstrates an interest and willingness to learn about the issues on their own limited free time, despite the fear of retaliation described by the promotoras, advisory committee members and focus group participants. The results of the post-tests completed at the end of the workshops also

suggest that worker awareness of safety and health issues increased, as did awareness of their rights on the job (see Tables III and IV). The vast majority of participants answered 7 out of 8 content questions correctly (over 90% for six and 81% for the seventh question). The one open-ended question that only half (49%) of the participants were able to answer correctly (from the workers’ rights workshop) was to name OSHA as the job safety enforcement agency. Due to language and literacy issues, workers were not comfortable with spelling and acronyms. But all workshop participants understood by the end of the workshop that the employer is required to provide workers with safety training, and 97% knew that they cannot legally be fired for being injured on the job. Finally, when asked about future behavior changes, 90% of all participants reported they would make health and safety changes at work. In response to the open-ended follow-up question “what will you do?,” 24% of workshop participants said they would spread the word about health and safety to co-workers, 21% said they would report injuries, and 11% said they would defend their rights. Other responses included seeking help from the Alliance, and working more safely, including using protective gear. Half of those participants who responded to the open-ended question, “What is the most important information you learned today?” wrote about how they have rights as workers to protect themselves. In addition, both focus group and advisory committee participants reported that they and their peers appreciated getting the information, thought it was important, and wanted the program to reach more people and be more visible in the community.

Fear of retaliation and concerns for job security remain major barriers to action. Ninety percent of worker participants reported on the post-tests that they would make health and safety changes at work. Yet, input gathered from the CAC evaluation meeting, the focus group, and the promotora debriefings consistently pointed to the pervasive fear among workers that if they took action, they might endanger their job or immigration status. As one advisory committee member, a forest worker, stated:

We’re always talking about the risks and the need to make reports, but the fear of losing our jobs is too strong. People are not going to make reports or call the resources in the booklet. Yes, people read the booklet but they don’t practice what they read because of the fear they have. –Community Advisory Committee Member

Compounding the problem is the awareness among forest workers of the many other workers, including “visados” or “guest workers,” who are waiting and ready to step into any vacated job regardless of, or without knowledge of, the unsafe working conditions.

It’s hard because the supervisors know there are lots of other guest workers who are available to take your place if they want to fire you. –Focus Group Participant

TABLE III. Participant Post-test Results for the “Rights on the Job” Workshop (n = 37)

Question	Correct	Incorrect	Not sure	No answer	% Correct
1. What is the name of the government agency that protects your health and safety on the job?	18	0	0	19	49
2. Your employer is required by law to train you about the health and safety hazards on your job, and how to work safely.	37	0	0	0	100
3. According to the law, your employer can require you to bring your own protective gear, such as hard hats, chaps and gloves.	30	7	0	0	81
4. According to the law, your employer can fire you if you are hurt on the job.	36	1	0	0	97

TABLE IV. Participant Post-test Results for the “If You Are Injured” Workshop (n = 230)

Question	Correct	Incorrect	Not sure	No answer	% Correct
1. A wound that becomes red, swollen, hot and painful must be treated by a doctor.	218	3	2	7	95
2. In forest work, employers are required by law to make sure all of their employees are trained in CPR and first aid within the first 6 months of starting work.	226	2	0	2	98
3. “Workers’ compensation” is insurance that your employer must carry, that will pay for medical care and some lost wages if you are hurt on the job.	225	3	0	2	98
4. You only have a right to medical care for a job injury if you are a legally documented worker.	210	16	2	2	91

Despite fears about retaliation or job loss and despite the short time frame of the project, several workers took action to address workplace issues utilizing support and information from the promotoras. When the promotoras, CAC members and focus group participants were asked whether they knew of any workers who had made any changes to improve their working conditions or work-related health because of the training (such as asking for training or equipment, or reporting to an enforcement agency), one specific example emerged. A worker told his supervisor that OSHA required the company to provide them with safety equipment and the next day the crew was issued the personal protective equipment (PPE) it needed. Both CAC members and focus group participants described a general feeling that some employers were paying more attention to providing PPE and breaks, and that workers were generally being more careful, but were unable to give any other specific examples during the evaluation activities. However, during the course of the project, several workers did in fact approach the promotoras seeking legal assistance to get wages owed to them (unpaid hours worked, overtime, and vacation leave), as well as to challenge being inappropriately fired (one worker was told he was too fat and another that he was too old). For workers, workplace health and safety issues do not exist independently from other issues of workplace injustice, such as wage theft. The promotoras referred these cases to appropriate legal counsel and the workers have reached settlements with the employers that include monetary compensation. The promotoras became known as community resources for information on workplace problems, and they were able to provide information that was needed.

Advisory committee members and focus group participants also reported the need for greater visibility of the program and the need to reach more workers, implying that “safety in numbers” might lead to a greater likelihood of workers taking action in the future.

If we reached enough people, the supervisors and employers would be forced to make changes in the workplace. But, when you only reach a few people here and there, there's not enough of a demand for the supervisors to do anything. No one is forcing them to do their job the way it should be done.

–Focus Group Participant

DISCUSSION

Many complex factors underlie the health and safety problems forest workers face, and therefore, complex interventions that act on multiple levels are needed. With a focus on increasing community capacity, the *Sí, Sé* program demonstrates that a promotora model, where information is delivered to the community by fellow community members,

is a good way to begin to build leadership even where barriers to change are formidable. The selection of promotoras from the community offered the program several critical advantages but it also presented challenges.

A key advantage was acceptance of the promotoras by the community. Promotoras from the community know the culture and the language, can tap into large networks of workers that they know and can establish trust with the community relatively quickly [Rosenthal, 1998; Swider, 2002; Pallas et al., 2013]. These capabilities are especially critical among immigrant, non-English speaking workers including forest workers, due to ever-present fears of retaliation at work as well as fears related to immigration status. Even when trusted members of the community serve as promotoras, however, these fears present significant challenges to community acceptance.

An issue related to community acceptance that we explored in our evaluation was whether women could be effective promotoras when targeting male workers. While some focus group participants thought that having forest workers themselves serve as promotores might be more effective, others in the focus group and in the CAC said that they felt the women were just as capable and accepted as men would be, and in some cases might be more willing than men to talk about the problems workers faced. It is much more common for women to be lay community health educators than men and few studies have assessed the effectiveness of programs in which lay community health educators target the opposite sex [Rhodes et al., 2007]. It is therefore important to explore the possibility of recruiting forest workers themselves to serve as promotores in future efforts and evaluate this approach, despite the inherent challenges.

Another advantage of selecting promotoras from the community was that they were each part of a large kinship network, which allowed them to reach a significant number of forest workers. Extended families are an important part of these forest workers' lives. Forest workers turn to people in these networks when they need to get something done in their personal lives. Indeed, the predominant pattern of recruitment for forest work among Latino immigrants is through kinship networks [Moseley, 2006; Sarathy, 2012]. Conducting outreach through kinship networks thus came naturally to the promotoras. On the other hand, reaching workers outside the known family networks was a challenge for the promotoras.

Another lesson learned was that the promotoras, like the workers they serve, have low levels of literacy and educational attainment (none of the promotoras had completed high school, and one had not completed primary school). This meant that project managers devoted much more time than anticipated in training the promotoras, helping them practice using the educational materials, guiding them in developing organizational and leadership skills, and in building their self-confidence. The latter included supporting

and encouraging their contributions to the development of training materials and program design.

We also concluded that a flexible approach with the educational materials was needed. Not only do the materials need to be tailored to the learning styles and educational level of the intended recipients, but also to those of the trainers (in our case, the promotoras). It was equally important for the promotoras to make the materials their own. In taking this approach, we came to view the educational materials as works in progress. They needed to be developed through an iterative process in which they were continually updated as the trainers learned more, encountered new situations and found training techniques that worked best under particular conditions in the field.

The training and guidance was a two-way exchange of information. The promotoras expressed their observations about what worked best in the educational materials when actually training workers, as well as about what outreach methods were most effective. The promotoras needed to find the outreach methods with which they and the workers were most comfortable. This included conducting trainings with small groups in workers' homes or in the hotels where foreign temporary laborers stay, and engaging workers in conversations in laundromats and other public venues. Our experience underlines the importance of dedicating significant resources to community-building and leadership development in any future efforts, as well as considering outreach and training tools that are not literacy-based, such as interactive programs that include videos.

Despite the challenges, the *Sí, Sé* program was successful in developing leadership among the promotoras and establishing them as resources in the community. The program also impacted the workers themselves. The fact that even a small number of workers in the program have taken individual action indicates that the program succeeded in increasing the motivation, willingness, and confidence of some workers to address health and safety issues in spite of the culture of fear. Our results are consistent with other studies that have found that lay community health educator programs can be effective in changing worker behavior with regard to occupational safety and health [Grzywacz et al., 2009; Marín et al., 2009; Arcury et al., 2010].

The formidable structural barriers facing the community reinforce the need for integrated, multi-level approaches, despite the inherent challenges in implementing them [Israel et al., 2006; Minkler et al., 2010; Golden and Earp, 2012]. Workers and other community members reported fear of retaliation, blacklisting and threats related to immigration status throughout the evaluation activities. This mirrors the experience of other programs targeting low-paid temporary workers. Even after receiving health and safety training, low-paid temporary workers are more likely than workers with greater job security and pay to feel constrained from advocating for their health and safety, and less likely to

participate in community-based participatory efforts [Benach et al., 2002; Rotenberg et al., 2009; Landsbergis et al., 2012]. Additionally, the promotoras made it clear that occupational safety and health issues are not isolated from other issues that workers face at work and in their personal lives. Wage theft, family health, domestic violence, immigration and landlord-tenant relations are all issues that many workers deal with in their lives. Intervention efforts addressing these issues, not specifically targeted in this project, are needed. A more comprehensive approach that includes issues beyond job safety and health might be more effective in building community solidarity and confidence and has been found to be successful in other arenas [Baron et al., 2014]. It could also help in diversifying funding sources, a measure that is crucial to long-term sustainability of promotora programs [Pallas et al., 2013].

A social ecological perspective underlines the critical importance of working at all levels of intervention—from the individual to the structural/policy-level. The *Sí, Sé* project shows promise in its ability to bring about change at the individual, interpersonal and community levels. Three promotoras increased their self-confidence, knowledge and skills, and all three have expressed a desire to learn even more, and provide more resources to the community. Almost 300 workers voluntarily attended training workshops and demonstrated increased health and safety knowledge. Through the focus group and advisory committee, community members reported a desire for even more program visibility and reach.

Strengths and Limitations

To our knowledge, this is the first promotora program that has been established in a forest worker community and designed around workplace issues. We approached the evaluation from several viewpoints: the promotoras', the CAC's, and the forest worker community's. This gave us a more holistic view of the impact of the program on the community. This project did face some limitations. It was a small pilot project with limited funding for evaluation activities. The timeframe was perhaps too short to be able to see significant changes in community capacity. Threats to internal validity include the fact that the promotoras participated in several of the evaluation activities that included assessment of their efforts. These included administering the post-tests and conducting the focus group recruitment, though they were not present at the focus group. Focus group participants were not recruited through random sampling, however the promotoras recruited only people with whom they had no personal relationship who had attended separate workshops. In addition, participants, due to literacy issues, sometimes assisted each other with the completion of post-tests. Through the evaluation activities we became acutely aware of the climate of fear the workers and their

families were living in that may also have affected participation in the evaluation activities as well as the education activities themselves. Although we cannot generalize our findings to all of the workshop participants, we feel that through the various evaluation activities we heard many of the same themes repeated and feel we have a good understanding of the impact of the program.

CONCLUSIONS

The results of our evaluation underscore a social ecological analysis of the problem: forest workers will not be protected from injury without also addressing major structural level influences. These include social and economic policies that impact immigration, job availability, health care coverage and which businesses are allowed to succeed in the forest management industry. These factors create a climate where some employers do not comply with the law and where workers feel powerless to speak up. Yet, an ecological framework also emphasizes the iterative relationship between all levels of influence, and the need to work at multiple levels to have an impact on health outcomes; policy-level changes are influenced by individual and community action and engagement, and vice versa. With that understanding and the knowledge that community change takes time, we believe that this pilot promotoras program shows promise as one tool that may influence change at the individual, interpersonal, and community levels. With more time and additional focus on community-building activities that go beyond the promotoras, the community may increase its capacity to support change at multiple levels: individual workers taking action for themselves and co-workers, as well as community members participating in and contributing to policy-level efforts by advocacy organizations, all in a supportive environment.

ACKNOWLEDGMENTS

We gratefully acknowledge the support and participation of our advisory committee members, and the hard work and commitment of the promotoras.

REFERENCES

- American Public Health Association, Community Health Worker Section. 2014. Community health workers. Accessed January 19, 2014 at: <http://www.apha.org/membergroups/sections/aphasections/chw/>.
- Arcury TA, Estrada JM, Quandt SA. 2010. Overcoming language and literacy barriers in safety and health training of agricultural workers. *J Agromedicine* 15:236–248.
- Ayala GX, Vaz L, Earp JA, Elder JP, Cherrington A. 2010. Outcome effectiveness of the lay health advisor model among Latinos in the United States: An examination by role. *Health Educ Res* 25:815–840.
- Baron SL, Beard S, Davis LK, Delp L, Forst L, Kidd-Taylor A, Liebman AK, Linnan L, Punnett L, Welch LS. 2014. Promoting integrated approaches to reducing health inequities among low-income workers: Applying a Social Ecological Framework. *Am J Ind Med* 57:539–556.
- Benach J, Amable M, Muntaner C, Benavides FG. 2002. The consequences of flexible work for health: Are we looking at the right place? *J Epidemiol Community Health* 56:405–406.
- Booker VK, Robinson JG, Kay BJ, Najera LG, Stewart G. 1997. Changes in empowerment: Effects of participation in a lay health promotion program. *Health Educ Behav* 24:452–464.
- Bronfenbrenner U. 1977. Toward an experimental ecology of human development. *Am Psychol* 32:513–531.
- Byler C. 2013. Hispanic/Latino fatal occupational injury rates. *Monthly Labor Review* 136:14–23.
- Campe J, Hoare L, Hagopian A, Keifer M. 2011. Using community-based methods and a social ecological framework to explore workplace health and safety of bloqueros on the Olympic Peninsula. *Am J Ind Med* 54:438–449.
- Committee on Natural Resources. 2008. Oversight hearing before the Subcommittee on National Parks, Forests and Public Lands of the Committee on Natural Resources, US House of Representatives, One Hundred and Tenth Congress, Second Session. Serial No. 110-85. “The Piñeros: Reviewing the Welfare of Workers on Federal Lands: Oversight Hearing.” Washington D.C.: Government Printing Office. Accessed June 13, 2013 at: <http://www.gpo.gov/fdsys/pkg/CHRG-110hhrg44485/pdf/CHRG-110hhrg44485.pdf>.
- Flaspohler P, Duffy J, Wandersman A, Stillman L, Maras MA. 2008. Unpacking prevention capacity: An intersection of research-to-practice models and community-centered models. *Am J Community Psychol* 41:182–196.
- Forst L, Lacey S, Chen HY, Jimenez R, Bauer S, Skinner S, Alvarado R, Nickels L, Zaroni J, Petrea R, et al. 2004. Effectiveness of community health workers for promoting use of safety eyewear by Latino farm workers. *Am J Ind Med* 46:607–613.
- Golden SD, Earp JA. 2012. Social ecological approaches to individuals and their contexts: Twenty years of health education and behavioral health promotion interventions. *Health Educ Behav* 39:364–372.
- Grzywacz JG, Arcury TA, Marín A, Carrillo L, Coates ML, Quandt SA. 2009. Using lay health promoters in occupational health: Outcome evaluation in a sample of Latino poultry-processing workers. *New Solutions* 19:449–466.
- Howard K. 2010. Oregon forest industry: A comparison of occupational safety and health measures, 2008: Information Management Division, Department of Consumer and Business Services. Accessed May 8, 2013 at: http://www.cbs.state.or.us/ind/rasums/4840/08web/08_4840.pdf.
- Israel BA, Krieger J, Vlahov D, Ciske S, Foley M, Fortin P, Guzman JR, Lichtenstein R, McGranaghan R, Palermo AG, et al. 2006. Challenges and facilitating factors in sustaining community-based participatory research partnerships: Lessons learned from the Detroit, New York City and Seattle Urban Research Centers. *J Urban Health* 83:1022–1040.
- Knudson T, Amezcua H. 2005. The Pineros: Men of the pines Sacramento: The Sacramento Bee. November 13–15. Accessed May 13, 2013 at: <http://www.sacbee.com/static/content/news/projects/pineros/c1/>.
- Landsbergis PA, Grzywacz JG, Lamontagne AD. 2014. Work organization, job insecurity, and occupational health disparities. *Am J Ind Med* 57(5):495–515.
- Marín A, Carrillo L, Arcury TA, Grzywacz JG, Coates ML, Quandt SA. 2009. Ethnographic evaluation of a lay health promoter program to

- reduce occupational injuries among Latino poultry processing workers. *Public Health Reports* 124: (Supplement 1): 36–43.
- McDaniel J, Casanova V. 2005. Forest management and the H2B guest worker program in the southeastern United States: An assessment of contractors and their crews. *J Forestry* 103:114–119.
- McLeroy KR, Bibeau D, Steckler A, Glanz K. 1988. An ecological perspective on health promotion programs. *Health Educ Q* 15:351–377.
- Minkler M, Lee PT, Tom A, Chang C, Morales A, Liu SS, Salvatore A, Baker R, Chen FY, Bhatia R, Krause N. 2010. Using community-based participatory research to design and initiate a study on immigrant worker health and safety in San Francisco's Chinatown restaurants. *Am J Ind Med* 53:361–371.
- Minkler M, Wallerstein N. 2008. Introduction to CBPR: New issues and emphases. In: Minkler M, Wallerstein N, editors. *Community-based participatory research for health: From process to outcomes* (pp. 5–23). San Francisco: Jossey-Bass.
- Monaghan PF, Forst LS, Tovar-Aguilar JA, Bryant CA, Israel GD, Galindo-Gonzalez S, Thompson Z, Zhu Y, McDermott RJ. 2011. Preventing eye injuries among citrus harvesters: The community health worker model. *Am J Public Health* 101:2269–2274.
- Moseley C. 2006. Working conditions in labor-intensive forestry jobs in Oregon. EWP working paper number 14, University of Oregon, Ecosystem Workforce Program. Accessed January 21, 2014 at: <https://scholarsbank.uoregon.edu/xmlui/bitstream/handle/1794/3650/wp14.pdf?sequence=1>.
- Pallas SW, Minhas D, Pérez-Escamilla R, Taylor L, Curry L, Bradley EH. 2013. Community health workers in low- and middle-income countries: What do we know about scaling up and sustainability? *Am J Public Health* 103:e74–e82.
- Quandt SA, Grzywacz JG, Talton JW, Trejo G, Tapia J, D'Agostino RB, Mirabelli MC, Arcury TA. 2013. Evaluating the effectiveness of a lay health promoter-led, community-based participatory pesticide safety intervention with farmworker families. *Health Promot Pract* 14:8.
- Rhodes SD, Foley KL, Zometa CS, Bloom FR. 2007. Lay health advisor interventions among Hispanics/Latinos: A qualitative systematic review. *Am J Prev Med* 33:418–427.
- Rosenthal EL. 1998. A summary of the national community health advisor study. Tucson: University of Arizona Press. 48 p.
- Rotenberg L, Griep RH, Fischer FM, Fonseca Mde J, Landsbergis P. 2009. Working at night and work ability among nursing personnel: When precarious employment makes the difference. *Int Arch Occup Environ Health* 82:877–885.
- Sarathy B. 2006. The Latinization of forest management work in southern Oregon: A case from the Rogue Valley. *J Forestry* 104:359–365.
- Sarathy B. 2012. *Pineros: Latino labour and the changing face of forestry in the Pacific Northwest*. Vancouver: UBC Press. 185 p.
- Swider SM. 2002. Outcome effectiveness of community health workers: An integrative literature review. *Public Health Nurs* 19:11–20.
- Thompson R. 2011. Oregon forest industry: A comparison of occupational safety and health measures, 2010: Information Management Division, Department of Consumer and Business Services. Accessed May 8, 2013 at: http://www.cbs.state.or.us/imd/rasums/4840/10web/10_4840.pdf.
- Trejo G, Arcury TA, Grzywacz JG, Tapia J, Quandt SA. 2013. Barriers and facilitators for promotoras' success in delivering pesticide safety education to Latino farmworker families: La Familia Sana. *J Agromedicine* 18:75–86.
- Williams Q, Ochsner M, Marshall E, Kimmel L, Martino C. 2010. The impact of a peer-led participatory health and safety training program for Latino day laborers in construction. *J Safety Res* 41:253–261.
- Wilmsen C, Bush D, Barton-Antonio D, Bey M, Headley C, Osband N, Santos E, Smith D. 2012. Healthy forests, abused workers—Safety, health and working conditions among forest ecosystem restoration workers in southern Oregon: Alliance of Forest Workers and Harvesters, UC Berkeley Labor Occupational Health Program. Accessed May 15, 2013 at: <http://www.nwforestworkers.org/resources/resources.html>.

Institution at which the work was performed: The Alliance of Forest Workers and Harvesters and the Labor Occupational Health Program, UC Berkeley

Disclosure Statement: The authors report no conflicts of interests.

The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the National Institute for Occupational Safety and Health. Mention of company names or products does not constitute endorsement by the National Institute for Occupational Safety and Health.

National Institute for Occupational Safety and Health (NIOSH), Contract for Solicitation #254-2010-34335

U.S. Occupational Safety and Health Administration (OSHA) (2010–2011 and 2011–2012) SH20823SH0 SH-22218-11-60-F-6