

## Hispanic Adolescent Farmworkers' Perceptions Associated With Pesticide Exposure<sup>1</sup>

Mary K. Salazar  
Marie Napolitano  
Jennifer A. Scherer  
Linda A. McCauley

*The migrant farmworker population in the United States is a vulnerable and understudied population whose characteristics are constantly shifting. The number of youth involved in agriculture work is increasing, and they, in particular, may be at increased risk for occupational hazards, such as pesticide exposure. The present study utilized an ecological framework for focus group discussions with 33 adolescent migrant farmworkers in Oregon. Adolescents' risk perception and health beliefs associated with pesticide exposure are examined on four levels of environmental influence: microenvironment, organizational environment, social/community environment, and macroenvironment. Adolescents provided insight on such topics as perceived vulnerability of illness due to pesticide exposure, attitudes toward farmwork, influence of their boss, knowledge of occupational hazards, safety training, and barriers to occupational choice. Cultural influences on occupational safety and health are discussed and increased attention to safety training is recommended.*

**Keywords:** farmworker; pesticide; agriculture; risk perception; occupational hazard; ecological model; adolescent

Agricultural work is one of the most dangerous occupations in the United States. In addition to suffering a disproportionate rate of occupational fatalities and high rates of disabling injuries (National Safety Council, 2002),

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Mary K. Salazar, Ed.D., R.N., COHN-S, Professor and Director, Occupational Health Nursing Program, School of Nursing, University of Washington, Seattle, Washington; Marie Napolitano, Ph.D., R.N., Associate Professor, School of Nursing, Oregon Health & Science University; Jennifer A. Scherer, M.P.H., Senior Research Assistant, Center for Research on Occupational and Environmental Toxicology, Oregon Health & Science University; Linda A. McCauley, Ph.D., R.N., FAAN, Professor and Scientist, Center for Research on Occupational and Environmental Toxicology, Oregon Health & Science University, Portland, Oregon.

DOI: 10.1177/0193945903259579

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farmworkers are regularly exposed to toxic chemicals designed to kill living organisms. Although the targets of these chemicals are insects, fungi, rodents, and other organisms that interfere with crop production, they can also have detrimental effects on human health (Arcury, Quandt, & Russell, 2002). Acute effects of pesticide exposures include headaches, nausea, eye irritation, skin rashes, and flu-like symptoms. Long-term effects include neurological and reproductive disorders, such as fetal deaths and deformities, liver and kidney disease, as well as various forms of cancer (Davis, 1997; U.S. General Accounting Office [GAO], 2000).

There are approximately 2.5 million seasonal and migrant farmworkers in the United States; approximately 1.8 million work with crops and thus are potentially exposed to pesticides (U.S. GAO, 2000). The extent of pesticide-related illness among these workers is unknown. Although 10,000 to 20,000 incidents of physician-diagnosed cases are reported each year, this number may represent "serious underreporting" (U.S. GAO, 2000). In fact, the U.S. Environmental Protection Agency (EPA) suspects that as many as 300,000 farmworkers suffer from pesticide-related illness each year, and that many of these are children (Davis, 1997). According to Fleming and Herzstein (1997), minority and disadvantaged persons, such as migrant farmworkers, are particularly vulnerable to pesticide health effects. They are likely to have higher home and environmental exposures and are also more likely to have occupational exposures.

In 1992, the EPA revised the Worker Protection Standard so that it would more effectively protect agricultural workers from pesticide exposure. The standard prohibits pesticide spraying when anyone is in the fields, and it restricts treated areas for specified periods of time. It also requires employers to provide workers with pesticide safety training and decontamination supplies (i.e., soap, water, towels) and that workers receive information about when and where pesticides have been applied. The standard applies to all agricultural workers who perform tasks related to the cultivation and harvesting of plants, including children who work in the fields (EPA, 1999; U.S. GAO, 2000).

#### YOUTH WORKING IN AGRICULTURE

Although the number of farmworker youths is not reliably known, estimates suggest that approximately 7% of seasonal and migrant farmworkers are between the ages of 14 and 17 (Acosta & Lee, 2001). Because these youths are smaller and are still developing, they are particularly vulnerable

to the adverse effects of pesticide exposure (Davis, 1997; U.S. GAO, 2000). The adequacy of agricultural safety and health training and the effectiveness of protective standards for youth workers have been questioned (Quandt, Arcury, Austin, & Cabrera, 2001; Shu et al., 1988); furthermore, the practices and training designed for adults may not be adequate for an adolescent population (Committee on the Health and Safety Implications of Child Labor, 1998; McCauley, Sticker, Bryan, Lasarev, & Scherer, 2002). Documented insights into the work lives of migrant adolescent farmworkers as a group are limited; accounts of their work experiences are embedded in the sparse information on farmworkers in general, and much of that information focuses on inter- and intrapersonal influences on occupational health and safety. Few studies examine the multitude of social, organizational, and other external environments that have the potential to affect the health and safety of these young workers. There is a critical need to understand the unique work experiences and perceptions of the migrant youths and to identify the full range of factors that affect their ability to protect themselves from workplace hazards.

#### **PURPOSE AND AIMS**

The purpose of this descriptive study was to elicit migrant adolescent farmworkers' perceptions about pesticide exposures. To capture the full spectrum of factors, an ecological approach was used to guide the collection of data. Ecological theory offers a convenient means to scrutinize the context of human experiences (Bronfenbrenner, 1977). A distinctive feature of an ecological approach is that it does not limit an investigation to personal influences on behaviors (beliefs, knowledge, and attitudes); rather, it provides a means to examine complex interrelationships that occur between humans and their environments (Linnan, Sorenson, Colditz, Klar, & Emmons, 2001; Newes-Adeyi, Helitzer, Caulfield, & Bronner, 2000; Richard, Potvin, Kishchuk, Pric, & Green, 1996). An underlying premise of this theory is that improving health and safety is not just a matter of changing the behaviors of individuals; rather, to be effective, programs must consider and target the multiple influences on behaviors.

An ecological framework typically consists of multiple nested levels of interacting and interconnected systems. For the purposes of the present study, four levels of influence were considered: the microenvironment (immediate surroundings of the worker), the organizational environment (structures and functions that characterize the work organization), the social/

community environment (interrelationships and interaction among various systems in which the organization is embedded), and the macroenvironment (larger context that contains all other levels of the system). The aims of the study were to examine the adolescents' microenvironment, including their personal attributes that may affect pesticide exposure; to identify organizational variables in terms of their influence on exposure occurrence; to describe social and cultural systems that affect the lives and work of these adolescents; and to examine the macroenvironment, including the values, traditions, rules, and regulations that may influence pesticide exposure.

### **Focus Groups**

Because of the paucity of information specific to the adolescent experience with pesticides and the meaning of agricultural work, an exploratory approach using focus sessions was used for the present study. Focus groups have been successfully used as a research strategy with various cultural groups (Anderson, Goddard, Garcia, Guzman, & Vasquez, 1998; Bauer, Rodriguez, Quiroga, & Flores-Ortiz, 2000; Groff et al., 2000; Lalonde, Rabinowitz, Sherfsky, & Washienko, 1997; Williams, Abbott, & Taylor, 1997) including Latino farmworkers (Napolitano & Beltran, 1998; Napolitano et al., 2002; Perilla, Wilson, Wold, & Spencer, 1998; Wilson, Pittman, & Wold, 2000). A key advantage of this technique is that the opinions of several participants can be obtained in a single session. Focus sessions assume the importance of the participants' viewpoints as the meanings of a phenomenon are explored (Benoliel, 1984; Marshall & Rossman, 1989). The group experience can help overcome a reluctance to speak to someone perceived as more powerful and to overcome the limitations imposed by low literacy skills or limited experience thinking and speaking about certain issues. Disadvantages include possible bias or 'group think' responses. Comments may be influenced by the way the questions are asked or how the moderator responds. The potential for socially desirable responses may be especially pronounced because the respondents may attempt to please not only the moderator but also other session participants.

### **SAMPLE**

The study participants consisted of adolescents ranging from ages 11 to 18 years who maintained a migrant lifestyle and who either worked or were planning to work in agriculture. Participants were recruited from a state

TABLE 1: Background Information of Focus Group Participants

	Region A		Region B		Region C	
	Group 1	Group 2	Group 3	Group 4	Group 5	Total
N	6	8	5	6	8	33
Males (n)	2	3	2	5	7	19
Age (mean years)	13.2	15.0	14.2	16.3	17.2	15.2
Self-reported language proficiency (n)						
English	6	8	5	0	3	22
Spanish	6	8	5	6	8	33
Indigenous dialect	1	0	1	4	6	12
Any formal U.S. education <sup>a</sup>	6	8	5	1	3	23

a. Enrollment in regular school year as opposed to only English as a Second Language courses.

Migrant Education Program (MEP), an evening English as a Second Language (ESL) program, or from migrant farmworker housing camps. All participants received pesticide training, as required by the EPA (1990) Worker Protection Act. The training, which was provided by EPA-certified trainers, consisted of a video or flip-chart presentation that described hazards related to pesticide exposure and methods that could be used to reduce risks. The focus sessions occurred approximately 2 weeks following the training. Recruitment was conducted face-to-face by project staff until the desired number of participants was attained. To reduce the tendency for group fragmentation, groups were limited to 6 to 10 adolescents (Krueger, 1994; Morgan, 1998).

#### Description of the Sample

The mean age of the 33 adolescents recruited for the study was 15.2 ( $SD \pm 2.1$ ) with the majority between the ages of 13 and 16 years (Table 1). Nineteen were young men; 14 were young women. All participants were of Hispanic origin; 59.4% were born in Latin America (18 in Mexico, 1 in Guatemala), and 40.6% were born in the United States. Of the participants, 23 (71.9%) had some formal education in the United States; the remaining 28.1% received their education in Mexico. The two predominant languages were English and Spanish; 100% of the participants spoke Spanish, 68.8% spoke English, and 37.5% spoke an indigenous dialect.

During the focus groups, participants were asked to indicate their age when they began working in the fields. Of the 22 who responded, 90%

indicated that they were younger than the age of 13 years when they began working. The average age was 10.9 years; however, four participants indicated that they were 8 years of age. The majority (89.3%) performed fieldwork, such as harvesting and related activities, whereas 10.7% performed other tasks, such as keeping the field clean or picking rocks. Fieldwork consisted of hoeing, planting, pruning, as well as picking crops and loading containers. Some stated that they lifted and carried these containers as well. Other types of work reported included cutting grass and packing crops (on a packaging line). Two participants indicated that they occasionally mix or apply pesticides.

## METHOD

### Data Collection and Analysis

The number of groups needed for focus sessions partially depends on the diversity of the participants. Studies using this technique typically include from three to six sessions (Ludwig-Beymer, Blankemeier, Casas-Byots, & Suarez-Balcazar, 1996; Maynard-Tucker, 2000; Owen, 2001). For the purposes of the present study, five focus sessions were conducted with groups of adolescent migrant farmworkers who were located in three separate regions of Oregon (Table 1). All procedures used in the present study were approved by the Institutional Review Board of Oregon Health & Science University. Prior to data collection, the researchers obtained informed written consent directly from the participants, in keeping with the approved human participants application. A \$5 incentive was offered to compensate the adolescents for their time and effort.

The moderator for the groups was a 23-year-old bilingual/bicultural Hispanic man with extensive experience working with youths, as well as experience working in the agriculture industry. The primary role of the moderator was to establish rapport with the group, ask the interview questions, and keep the discussion focused. The moderator was trained in fundamentals of focus group facilitation, and one pilot session was conducted. An additional research member served as an observer at each group. The primary role of the observer was to assist with the facilitation of the sessions as needed, to oversee the audiotaping, to take field notes, and to respond to questions per the moderator or participant's request. The semistructured interview guide based on the ecological model developed for the present study consisted of questions and probes that were sequenced to capture views through a natural

and logical flow of discussion (Krueger, 1994). For example, participants were asked to describe their perceptions about hazards related to pesticides; they were then asked to describe their personal experiences with pesticides.

Each group determined its language of choice. At the request of participants, 3 of the 5 sessions were conducted primarily in English with some Spanish; two sessions were conducted entirely in Spanish. The sessions were 60 min to 80 min in length. On completion of the focus sessions, the Spanish audiotapes were translated into English, and all sessions were transcribed. Group facilitators and project staff reviewed the transcriptions for accuracy. Three members of the research team reviewed each transcript word by word, line by line. Constant comparative analysis was used to identify codes and categorize the predominant themes. After the first three focus sessions, the identified findings and themes were used to generate a list of follow-up questions to facilitate more information in the final two sessions. This process was intended to ensure as far as possible that an exhaustive list of themes was obtained.

## FINDINGS

### Application of the Ecological Model

The analysis resulted in the identification of a taxonomy of themes that were ultimately categorized under the four ecological levels of influence developed for the present study.

#### Microenvironment

The microenvironment reflects those surroundings that are closest to the lives of these young workers and includes their day-to-day activities and interactions with family, friends, and coworkers. Analysis of the focus group discussions revealed multiple influences on the adolescents' attitudes about work-related hazards, including perceived vulnerability, attitudes about hazards, and attitudes about work (see Table 2 for categories of responses).

*Perceived vulnerability.* Concerns about personal vulnerability to pesticides were related to the participants' knowledge and beliefs about occupational disease. Some identified specific diseases that could be related to occupational exposure to pesticides, whereas others described disease outcomes

**TABLE 2: Categories of Responses**


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Microenvironment
Perceived vulnerability
Protective behaviors
Attitudes about agricultural work
Organization environment
Structural influences
Dealing with the "boss"
The physical environment
Functions influencing health and safety
Health and safety training
Social/community environment
Learning about fieldwork
Knowledge about hazards
Managing work and school
Macroenvironment
Barriers to choice
Traditional values
Rules and regulations

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NOTE: Although the ecological approach provides a useful organizational framework and a systematic and structured way to examine complex phenomena, a high degree of interaction and interrelationship exists between the various levels of the model. In view of this, discrete categorization may not be appropriate for certain factors, and some factors may appear at more than one level.

in more generic terms. Specific diseases mentioned included cancer, skin disorders such as "bumps" and "rashes," high fever, asthma, and other allergic reactions. Perceptions of the relationship between certain kinds of exposures and the occurrence of cancer are reflected by this statement:

Some chemicals are found to be leading to cancer. You can get skin cancer if you have a lot of sunlight exposure, and if you get pesticides on your skin, and if it is not washed right away, I suppose you can get cancer.

One adolescent did not mention any specific conditions but stated that "something serious can happen" when one works in the fields and related this "serious" occurrence to the person's overall status: "If someone is weak, it affects him or her quickly, and little by little, they get sick." One youth indicated that it was important to protect himself because "You are still growing, and you don't have much tolerance to many things." Two participants noted that pesticides were especially dangerous to pregnant women. Consistent in all the focus sessions was the suggestion that getting sick was an inevitable part of the job: "Everybody knows you are going to get sick someday. You are going to get a headache from the sun, or you are going to get sunburn or whatever."



*Protective behaviors.* Although participants indicated that they recognized the importance of protective behaviors, complying with recommendations was another matter, as illustrated by one youth who stated that he recognized that pesticides were around when he ate his lunch, however, "You are like so hungry; you sit down wherever you can . . . sometimes you don't even wash your hands." Participants suggested that failure to wash was a result of time constraints, lack of education about hazards, and in some instances, complacency. "When you go to lunch, you don't have time to wash your hands," stated one youth. Another suggested that "Most people don't have the education or experience [to know about the hazards]. They don't know what's going to hurt them." Participants also stated that they would continue to eat contaminated berries out of the fields without washing them, because "Sometimes we don't care, we are used to it." And besides "It looks clean!" and "It looks delicious!" (For more detailed examples of responses, see the appendix.)

Although some youths stated they would refuse to work in an unsafe environment, others stated that it depended on the benefit derived. As stated by one, "Pay me enough money, then I will do it." Another youth stated that getting sick "is the risk you're willing to take to get money." One group had a discussion regarding the difference in attitudes about contaminants at work compared to other environments. When working in the field, "I don't really care, because when you are in the field, you are all dirty; it is okay if the food is all dirty too." On the other hand, "In your house, if the tortilla falls on the ground, you throw it away because there is more. In the field, it means I am out of food so I just keep it."

Participants also indicated that it was not always easy to wear protective clothing (identified as long-sleeved shirts, pants, hat, bandanas, and thick socks). As an example, a participant stated that he would wear protective clothing when he went into the field; however, when he got hot, he would find it intolerable: "In the morning you . . . are dressed like you are going to ski; by the end of the day, it looks like you are going swimming." Another youth candidly stated that he knows he should keep his protective clothing on, "But knowing me, I would probably change into some shorts and a tank top" if it was hot. It is also difficult to wear respiratory protection, even a simple cloth over one's mouth. As stated by one participant, "We don't cover our mouths because it's hard to breathe."

*Attitudes about agricultural work.* Adolescent farmworkers displayed a wide range of positive and negative opinions about the meaning and value of work in their lives. The positive aspects of fieldwork included working with one's friends and family and working outdoors. Although many viewed the

job as "very hard work," they also perceived it as an opportunity to learn "a lot of things you didn't know." One adolescent stated that he worked "because we need to get ahead, and one needs to be prepared for everything."

The financial rewards of working were perceived in varying ways. In every session, at least some of the youths indicated that they used their earnings to assist their families in some form or another, and several indicated that they had a responsibility to financially contribute to their families: "[I work in order to] help [my] parents with things they don't have." One youth stated that it was the custom for parents to take their children to work at a young age because they need to help their families financially. A youth from Mexico stated that he liked to work because it enabled him to help his parents; and another indicated that he sent most of his money to Mexico. A few youths stated they liked to make money so they could go shopping and "buy things," such as clothing.

Although many adolescents described positive aspects of working, negative themes emerged as well. The physical labor associated with this work was viewed as demanding and arduous. "It is a very hard job," said one. "You get dirty, and then you sweat, and then you get tired," stated another. "You get dirt in your shoes and you feel yuk." Dealing with the weather conditions also affected attitudes about work, and some workers described how weather had the potential to increase worker risk. It often rains when the workers are in the fields, stated one youth, and the ground becomes slippery, leading to a risk for injury. Other days were windy "and you breathe in this dust and everything." Electrical storms, yet another weather hazard, were noted by another participant.

### **Organizational Environment**

The structure and functions of an organization are important determinants of worker health in any setting. The structure includes the management, the rules and regulations, and the physical characteristics of the work setting. The function refers to how the work is done. Functions aimed at protecting workers include health and safety training and education.

### **Structural Influences**

*Dealing with the "boss".* Participants identified an array of people who they perceived as their "bosses" including the farm owner, crew boss, and field boss. Participants typically had some level of contact with the boss. Although some youths described their bosses as "pretty good," others

described them as uncaring: "Some bosses don't care about the workers, they just care about the work to be done. They just care about the money." And another: "They worry about the fruit a lot. They don't worry about the people." In a more dramatic response, one youth stated, "A person could die, and it wouldn't affect [the bosses] at all because there are more people that can do [the work]." When asked how he would react if the boss asked him to do something that may be dangerous at work, another youth responded, "The bosses say they are the ones in charge and that we either take the job or leave it." Participants stated that workers were fearful of the boss, afraid that the boss would get angry at them: "It was all about not to get the boss mad. Don't get fired!" One participant stated that he would not leave his place in the field to wash his hands because "the boss would see you leave and get mad."

*Attitude about the physical environment.* There was a range of opinions about the health and safety effects of the physical environment in this work setting. Participants provided several examples of deficiencies, such as lack of availability of soap and water: We "need more water faucet things where people can wash hands . . . so many workers and not enough water for everyone to wash hands and to drink . . . so people can protect themselves." Often-times, workers will bring bottled water because of concerns about water contamination. "At some point, irrigation water gets in contact with sewage and chemicals and that's not good." Other supplies are also not available. For example, one worker, when describing a lack of toilet paper, stated, "They may stock one day and then it runs out and they don't put anymore." Although the provision of protective clothing, such as long rubber boots, rubber jackets, and pants, was viewed as the responsibility of the boss, with one exception, workers indicated that they provided their own protective garments.

#### **Functions Influencing Health and Safety**

*Health and safety training.* Health and safety training may or may not be provided by the employer. When it was provided, it was not always well understood; as stated by one youth, "Sometimes the boss is talking so fast and using these big words, and I don't understand, and I am just staring at him." In some cases, others said information is provided in English to workers who do not speak English. Although some bosses were described as "good in that they teach you how to use the tools," one youth suggested that others "don't want to waste their time" telling workers about health and safety issues. In some cases, the perceived degree of hazard also seemed to determine whether safety information was provided by the boss. When describing the informa-

tion he received about tractor hazards, one youth stated, "He would teach me precautions for big things, but not . . . for pesticides. I guess pesticides was a small thing." Some participants believed that their immigrant status (lack of documentation) placed them in a powerless position. Because they were perceived as powerless, the boss may feel less compelled to provide pesticide education. In some cases, fear impeded the worker's ability to get desired information. Participants indicated that they would not ask questions regarding pesticides, and they would not ask for clarification if work-related instructions were not understood.

### **Social/Community Environment**

The social/community level of the environment is characterized by the many social networks that support the adolescents' daily life and the work organization. The social and community systems have the potential to either support or impede the adolescent workers' ability to be safe and healthy at work.

*Learning about fieldwork.* The family unit is an important social context for the Latino adolescent; it has a tremendous impact on the work life of an adolescent farmworker. Most participants reported that their family and friends currently worked in the fields. Much of what the adolescent farmworker knows about work and its associated hazards, he or she has learned through observing and listening to his or her parents and other family members. "My father taught me . . . in the fields. We used to sow onions, potatoes, lettuces, all types of vegetables . . . he taught me to plant all types of plants . . . to harvest." Although these youths may not feel that they can ask their bosses questions about work, they can ask family and friends.

*Knowledge about hazards.* Although parents, family, and friends are the primary source of information about pesticide hazards, participants also described various social and community sources of information, such as school, training videos, the Internet, and several media sources. They learned about pesticide exposures from observation of others as well as by being told about them. The adolescents described family members or coworkers who had become sick. One participant stated his mother "got a big rash on her hand" when she sprayed some plants. Another reported that a coworker "passed out" and had to be taken away by an ambulance after exposure in a recently sprayed field. In every focus session, adolescents described how their family members, usually their mother and/or father, told them about the

hazards of fieldwork. Some participants also described school-based clubs and classes at school, such as their health class, that "talk about hazards."

*Managing work and school.* Working in the fields may interfere with school attendance and performance. Some participants complained of being too tired following a long day at work to attend summer night school. Others were too tired to do homework: "I'm tired when I get home, and I can't study because I'm very tired." Another stated, "The truth is, we'd like to study if there's the opportunity, but . . . we have to work." On the positive side, some suggested that learning about hazards through video presentation or group sessions might benefit their ability to participate in school discussions: "It will help us with school because we . . . will already know when they begin to talk about this. We could be the ones out of our class to raise our hands all the time and speaking, you know."

#### Macroenvironment

The macroenvironment, though less tangible than the other levels of influence, is nevertheless likely to have profound effects on the adolescents' work life and their protection (or lack thereof) from hazards. Macroenvironments are reflected in society's attitudes and actions toward these workers. The effects can be direct and indirect.

*Barriers to choice.* Some comments clearly suggested that these adolescents feel stereotyped because of their ethnicity. This was particularly notable among the non-English-speaking group. "You feel like only Mexicans do this [work in the fields] 'cause that is all you usually see, Mexican people around." The ability to choose the type of work one performs is partially related to societal attitudes. "You really don't have much of an option," stated one respondent. Members of their family "are immigrants . . . and [they] don't have papers or whatever; and the only place they can go that would accept them is in the fields." Another stated that because "papers are fake . . . some are afraid." Some participants stated they had to work because they were poor: "The poverty that we have, that is the thing that makes us work."

Other barriers to choice are language and level of literacy. "I don't know English. . . . I think that is the reason some farmers don't really take precautions, because they know [we] are immigrants, and they can get immigrants in a lot of trouble." And another: "When you are working in the field, you feel like you have no rights." A lack of choice results in workers' taking

risks. A sense of powerlessness prevents them from being able to speak out when they perceive that conditions are unsafe because the boss "would probably get mad and fire you right there."

*Traditional values.* According to several respondents, work is highly valued in the Mexican community, and working at a young age is desirable. "It is the custom for the parents to get their children at a young age and take them to work . . . especially Hispanics." Because of the prevailing work ethic in this population, concern about workplace hazards may be less important. During a conversation about the training that was provided, one youth stated, "Over there in Mexico, they don't teach you how to take care of yourself."

*Rules and regulations.* Several youths commented on the importance of having regulations aimed at protecting workers. Hazards should be identified, they stated, and there should be "caution" and "hazard" signs to warn workers of known hazards; protective gear should be provided, and the use of protective equipment needs to be enforced. Training should be mandatory, according to one youth: "They need to develop programs to teach us about the hazards." Regulations should be enforced for all: "It's not right that some have protection and others don't while doing a hazardous job." On the other hand, a disregard for regulations provides these youths with the opportunity to work. To get other types of jobs, one has to comply with the age requirement, stated one: "In the fields, there is no lower age limit."

## DISCUSSION

Although the findings related to the microenvironment indicated that these adolescent farmworkers are aware that there are risks associated with pesticide exposure, there were varying opinions regarding their perceptions of personal vulnerability. There were two lines of thinking. The first suggested that sickness was an inevitable by-product of their work; the second suggested that the "weak" are the most likely to be vulnerable. Both positions may lead to complacency. In the first case, the worker may be saying, "What's the point, I am going to get sick anyhow. Why bother protecting myself?" In the second case, if they see themselves as fit and "strong," they may not see the need for appropriate precautions. These findings confirm reports by Hunt, Tinoco-Ojanguren, Schwartz, & Halperin (1999) whose ethnographic surveys with adult farmworkers in southern Mexico revealed that they considered pesticide illness as part of the job and something that a

healthy person could endure. Other studies have suggested that Mexicans and Mexican Americans often consider the sick and infirm to be vulnerable to pesticide exposure (Lantz, Dupuis, Reding, Krauska, & Lappe, 1994).

Of particular note is the fact that the majority of the barriers to safe work practices seemed to be at the organizational level. Most notable were the struggles with the boss, who was often perceived as demanding and uncaring. Participants also noted environmental conditions that interfered with their ability to carry out safe work practices. Although in several instances, appropriate provisions (i.e., soap, water, washing facilities) were available, there were several reports of inadequate stocking of and inability to access items. Even if supplies were available, the psychological demands of the workplace often precluded these young workers from feeling free to use them. The participants of the present study exhibited a strong sense of responsibility toward their families; these were not a group of self-serving teenagers. Although they expressed a desire to do well in school and to be successful, they accepted their responsibility to their families as a first priority. The majority gave at least a part of their income to their parents or relatives in Mexico. This neglect of self for the good of the greater community may also influence the strength of their resolve (or lack of resolve) to protect their own health.

The descriptions that the adolescents gave regarding the nature of safety training that they have received are particularly disturbing. Castillo, Davis, & Wegman (1999) reported that given the limited experience that youths bring to the workplace, they may require additional time and different approaches to training than adults. Ethnic diversity, language barriers, and low educational attainment of the farmworker population add additional challenges to the task of increasing the occupational health and safety of this working population. Several youths indicated their primary source of information about health hazards and safe work practices were family members, primarily their parents. Recent data indicate that approximately one half of hired farmworkers who are between 14 and 17 years old live on their own, away from their parents (Mines, Gabbard, & Stierman, 1997; U.S. GAO, 1998b). In a 1997 study of adolescent farmworkers in one county in Oregon, McCauley et al. (2002) reported two thirds of the adolescent farmworkers in that study were not accompanied by their parents. Health and safety professionals cannot assume that parents of these adolescent farmworkers will provide agricultural safety education, nor can parents or family members be expected to accurately relay all of the Worker Protection Standard points to teenagers new to the industry.

The comments of several participants suggested that these youths are adapting an identity that defines their roles in society. This is particularly evident at the macroenvironment level. They seemed to say, We are Mexicans; Mexicans are destined to work in the fields, thus my life's work is in the fields. Many feel they have few or limited choices. This sense of powerlessness, coupled with traditional family and cultural values and documentation issues, may serve as major deterrents to self-advocacy in terms of health and safety. Programs targeting health and safety must also serve to empower these workers to stay safe and healthy, to feel that they can speak out on their own behalf, and that they can demand to have training materials that they understand and utilize.

It was interesting that some youths indicated that there should be regulations to protect workers, such as notification signs of dangerous areas, training requirements, and owner-supplied protective equipment, yet these regulations are well articulated in the EPA Worker Protection Standard. These findings along with those of others (Arcury, Quandt, Cravey, Elmore, & Russell, 2001; Larson, 2000; McCauley et al., 2002) suggest that the EPA Worker Protection Standard is not functioning as intended. Larson (2000), in an evaluation report of the Worker Protection Standard, reports that training occurs less frequently among the seasonal and migrant farm laborers than it does among other farmworkers. The health of these youths is further compromised by the fact that many began working in agriculture at such young ages and that this may be in conflict with the child labor requirements under the Fair Labor Standards Act (U.S. Department of Labor, 1984). The act indicates that the minimum age for unrestricted nonhazardous agricultural work is 16. For youths younger than 16, work is restricted to after-school hours. Youths under 14 must have parental permission or work alongside their parents. Minors of any age may work on their own family farm. Compared to other industries, agriculture work maintains an entirely different set of child labor regulations, which may not be strictly enforced. If adolescents perceive a lack of regard for basic labor laws, they may also apply nonregard to other work-related regulations, such as certification for pesticide application or use of personal protective equipment.

#### **Limitations and Strengths of the Study**

The frank and candid responses of these adolescent farmworkers provided a valuable glimpse into the world of these at-risk workers. A major strength of the present study was that data were obtained directly from the



population of interest, and the participants had an opportunity to describe their beliefs, perceptions, and attitudes in their own words. The ability to build on the comments of others served to provide an in-depth understanding of the concerns, as well as the unique strengths that characterize this population. It must be noted, however, that these focus group discussions relied heavily on the skills of the moderator, and in some cases questions were limited due to a defined timeframe. There is also a possibility that moderators or facilitators may have occasionally influenced responses. Although we attempted to obtain variation in the background of the participants by conducting the focus groups in three different agricultural areas, the results cannot be generalized beyond the study participants. The migrant farmworker population is often challenging for researchers to access. Given limited opportunities to obtain more information (as in the present study), researchers may hold findings more sacred than is warranted. Although these limitations were recognized, thoughtful planning of the interview questions and training of the moderator were designed to offset them.

### **Conclusion**

The adolescent migrant farmworker population represents an extremely vulnerable working population. Within the United States, an increasing number of youths working in agriculture are not children working on the family ranch or for small local farms but rather children who work as hired labor on a migrant or seasonal basis or have parents who work as migrant and seasonal workers (U.S. GAO, 1998a). Occupational health and safety professionals maintain that hazards in the work environments must be clearly explained to all workers (Castillo et al., 1999). As was noted in the present study, rote and routine training are not sufficient to protect the health and safety of special populations, such as the migrant adolescent farmworker.

The present study provided an in-depth overview of the perspectives and beliefs of a population that is at high risk for occupational and environmental exposure. Youths in the present study work in a dangerous job that is wrought with short- and long-term risks. During the course of these focus sessions, the need for health education efforts to consider more than personal behaviors and individual change strategies became increasingly clear. A consideration of the multiple influences on health and safety is critically important. The many organizational, social, and cultural barriers that prevent these youths from working safely must be factored into training programs. There is a compelling need to develop and test strategies that will truly be successful in preserving and protecting this vulnerable population.

In addition, further studies are needed to fully understand the unique occupational health and safety needs of these workers.

## APPENDIX

### Examples of Responses by Ecological Level

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#### Microenvironment

**Protective Behaviors:** Even though I know it's not good for me, I will probably eat right out of the fields, like strawberries, you know, or the berries. I would think, I am hungry. I would just go ahead and eat it, even though I know I should have washed it. A lot of people do that, even if they don't admit it. I see a lot of people doing it. I know it is wrong but I still do it, not a lot, but I do it, just because it is there and it is tempting.

#### Organization Environment

**Health and safety training:** I know a lot of farm people give out brochures (that) are in Spanish and English, but come on, some people don't even know how to read. I think there should be groups, like a day before . . . where the owner of the field talks to the workers like a presentation . . . So they talk to them about some things, some kind of training or whatever. So that they are aware of what is going on and what they can do to protect themselves. What they should do if they have a rash or something. A lot of workers are afraid to go up to the owners and say, "I have a rash and do you know what this is from?" They are afraid that they will not be able to come back to work. I think the farmer should take . . . more responsibility than just making sure the work is done. I think they should take the responsibility of the health of the workers.

#### Social and Community Environment

**Managing work and school:** (Discussing challenges of starting work at a young age) Because like I was working, (then) my father and mother put me to study, I almost didn't ever study, because I was working in the field since I was very young, and I kept working and . . . I was never in school. . . . We have to study so we can get ahead, because just working . . . the work is always going to be there.

Mexican children start working very young out of need.

I work and study, work and study. . . I'm tired when I get home, and I can't come (to school) because I'm very tired.

## Macroenvironment

**Barriers to choice:** The poverty that we have, that each person has, that is the one thing that makes us work. There are other people that are immigrants, and those don't have papers or whatever. And the only place that they can go that would probably accept them is in the fields. They really don't have much of an option.

Some are afraid . . . we don't have papers, they are fake and . . . I don't speak English either. So they are scared sometimes. I think that is some of the reasons that farmers don't really take precautions because they know we are immigrants, and they can get immigrants in a lot of trouble.

## NOTE

1. The authors extend their greatest appreciation to the migrant farmworker community and the Migrant Education Program for their collaboration on this study. This work was funded by the Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health (R01 OH04230).

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