

Effectiveness of Community Health Workers for Promoting Use of Safety Eyewear by Latino Farm Workers

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Background To evaluate The Community Health Worker “promotor de salud” (CHW) model is evaluated as a tool for reducing eye injuries in Latino farm workers.

Methods In 2001, 786 workers on 34 farms were divided into three intervention blocks: (A) CHWs provided protective eyewear and training to farm workers; (B) CHWs provided eyewear but no training to farm workers; (C) eyewear was distributed to farm workers with no CHW present and no training.

Results Pre- and post-intervention questionnaires demonstrated greater self-reported use of eyewear in all blocks after the intervention ($P < 0.0001$), with Block A showing the greatest change compared to B ($P < 0.0001$) and C ($P = 0.03$); this was supported by field observations. Block A showed the greatest improvement in knowledge on questions related to training content.

Conclusion CHWs were an effective tool to train farm workers in eye health and safety, improving the use of personal protective equipment and knowledge. *Am. J. Ind. Med.* 46:607–613, 2004. © 2004 Wiley-Liss, Inc.

KEY WORDS: farm workers; agricultural workers; Latino workers; Hispanic workers; promotores de salud; community health workers; safety eyewear; eye injury intervention

BACKGROUND

Community Health Worker (CHW) models have been in existence for over 300 years, originally conceived to extend the work of formally trained health practitioners in diagnosis and management of disease to communities with limited access to health care [Sidel, 1969]. Since the prototypic

“barefoot doctors” of mid-20th century China, the role of CHWs has evolved to include, connecting people with available services, bridging cultural gaps between communities and the health care system, providing health education that is culturally appropriate, providing social support and informal counseling, advocating for the needs of individuals and communities, and building capacity of communities and individuals to get their own health care needs met [Wiggins, 1998].

In 1994, the National Center for Chronic Disease Prevention and Health Promotion of the CDC surveyed and compiled information on 140 CHW programs nationwide [CDC, 1994]. They noted that very few of these programs had evaluation plans in place. A recent review of 275 citations related to CHWs identified 20 articles reporting 19 studies that actually measured and reported outcome effectiveness [Swider, 2001]. All were published after 1989. The eight studies designed as randomized clinical trials used access to

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care and behavioral change as the outcome measure in the realms of child development [Black et al., 1995]; gynecologic and breast examination [Sung et al., 1992, 1997; Navarro et al., 1998]; hypertension control [Krieger et al., 1999]; primary care utilization [Butz et al., 1994]; cancer screening [Margolis et al., 1998]; health care access and fewer symptoms in homeless, mentally ill citizens [Wolff et al., 1997]; completion of a program, knowledge, and blood sugar control in diabetics [Corkery et al., 1997]. Five studies had a quasi-experimental design that measured behavioral change related to phenylketonuria control [St. James et al., 1999], hypertension control [Bone et al., 1989], gynecologic examination [Bird et al., 1998], and protective measures for HIV prevention [Birkel et al., 1993; CDC, 1999]. Most of these studies are limited by small sample-sizes, lack of control groups, and minimal follow-up [Swider, 2001].

The Federal Migrant Act of 1962 mandated establishment of migrant clinics and required outreach services in migrant labor camps, stimulating the development of CHW programs. Over the past 20 years, this has led to the development of *promotores de salud* ("health promoter") programs for farm workers throughout the United States. Scattered publications and websites describe these programs [Baker et al., 1997; Booker et al., 1997; Cooper et al., 2001; Ramos et al., 2001], however, we have found no published, experimentally designed outcome studies evaluating the CHW (*promotores de salud*) model as an intervention technique for reducing work-related injury or illness, in general, or in the migrant and seasonal farm worker population.

The overall goal of this project was to evaluate the *promotor de salud* (CHW) model to reduce eye injuries and illnesses in Latino migrant and seasonal farm workers.

METHODS

A partnership of university faculty/staff and two community-based organizations was developed to address eye health and safety issues faced by Latino farm workers in southeastern Michigan and northern Illinois. Eye injuries were chosen because of the high incidence of eye injuries in agriculture [Blake, 1969; Quandt et al., 2001; DOL, 2003], the concern about eye injuries on the part of Latino farm workers [Quandt et al., 2001], and the ability to implement and test an inexpensive, simple, and effective intervention that was easy to observe. In the spring of 2001, 16 *promotores de salud* in two states were recruited from among actively employed farm workers in the service areas (four counties) of the community-based organizations. Criteria for selection included: interest in health, demonstrated leadership and communication skills, demonstrated respect for farm workers and farm owners, ability to read and speak Spanish, and transportation to bi-weekly meetings. Training of the *promotores* for this project took place in 20 h over a 2-week period in each of the two states; the training content was

standardized for the two sites. A *promotor-coordinator* from each of the community-based organizations organized the training sessions. Other members of the study team, including graduate students, staff and faculty were brought in for specific training topics and language interpretation. After the initial training, the *promotores* met with the coordinators once per week during the 16-week study period to discuss issues and problems related to carrying out this project and to turn in completed forms.

Thirty-six farm owners in the same service areas were approached for participation; 34 agreed either to actively participate or to allow the project to be conducted on their farms. Two owners who were approached did not agree to participate because they felt it would be too disruptive to work. All of the owners were familiar with the outreach done by the two migrant service organizations in the past. Farm workers (employees) were provided free eyewear and none of the training was conducted officially during work hours. Characteristics of the participating farms are shown in Table I.

From prior work in these communities, we found that 90% of the farm workers are Mexican and 10% are Mexican-American. One hundred percent speak Spanish, 77% read Spanish, 16% read English; 75% had less than 8 years of school; and 25% had fewer than 4 years.

Train-the-trainer materials were developed in English and in Spanish by health educators, public health graduate students, occupational health and safety personnel, university researchers, and a physician. They were used in sessions to train the *promotores* in ethics of community-based research, eye illnesses and injuries, training of farm-worker peers in eye injury and illness prevention, and data collection. They were piloted in training sessions and modified based on *promotor* input. The eye illness/injury prevention training tools used in *promotor* training were then used by the *promotores* for training of participating farm workers.

A variety of tinted and clear safety glasses were purchased. Choices of styles and sizes were based on prior focus groups of *promotores* and non-*promotor* farm workers, where these workers were asked to comment on attractiveness and fit. Eyeglass straps were also purchased.

The 34 farms were divided into three intervention blocks, based on: (1) the farms where *promotores* worked; (2) the housing of the subjects (to avoid contact between subjects

TABLE I. Approximate Distribution of Farm Workers in This Study by Farming Operation; Illinois and Michigan

Farm type	Michigan	Illinois
Orchard	50	0
Greenhouse (flowers, house plants)	200	120
Vegetables	200	100
Sod	0	30
Tree nursery	0	120

in different blocks, they could not live in the same camps); and (3) equalizing the number of subjects in Blocks A and B. Block C was smaller because farms that were recruited had no promotor employed, only 149 workers. In all three blocks, farm workers received safety glasses and cords, as well as an information sheet on preventing eye injuries and illnesses in agriculture. Block A farms had a promotor that worked side-by-side with the subjects as a farm worker and who recruited subjects, trained farm workers on eye health, and safety using training materials; they were involved with developing and collecting questionnaire data. On the Block B farms, the promotores recruited subjects, distributed safety glasses, and collected data; they did not conduct training in Block B. In Block C farms, members of the study team from the university recruited subjects, passed out safety glasses, and conducted the research; there was no training offered.

Promotores were required to conduct at least two training sessions for each farm worker in Block A—at least one individual training session and at least one group session. The promotores were trained as trainers; they were given all the training tools and instructions for use in the field, as well as a reference manual on eye injuries and illnesses in agriculture. Training materials included enlarged photographs and fotonovelas from the program, Ojo Con Tu Vista (<http://www.rwhp.org>) and a tool kit that included presentation outlines, instructions, and a variety of hands-on tools to demonstrate eye injuries and hazards.

After publicizing the project by word of mouth, any farm worker that was present on the day of recruitment and expressed an interest in participating, was given an orientation to the project verbally, and given an informed consent document in Spanish (approved by UIC Institutional Review Board, Protocol #2001–0223). Every subject was fitted with safety glasses (as was any farm worker who requested glasses even if he/she did not want to participate). We were unable to determine how many farm workers were working in the 34 farms over the season, but did not participate as the owners were not willing to divulge this information. Eyewear was distributed to 1,000 farm workers and 786 workers volunteered to participate.

Outcome evaluation was conducted in three ways. First, a 20-item questionnaire was administered to each participating farm worker before and after the intervention. Piloted on the promotores prior to use in the field, this queried demographics, self-reported use of safety glasses, knowledge about eye injuries, and risk beliefs in a Likhert scale format.

Second, observation of use of safety glasses was conducted by the study team at the beginning and the end of the season on each farm (two times total on each farm). Third, the promotores carried around eye problem forms throughout the season and recorded any eye injury or illness reported to them by study participants.

The outcomes to be measured included:

- percent of farm workers wearing safety glasses at the end of the study compared to the beginning of the study, within and between blocks (by self-report in questionnaire and by observation);
- knowledge of subjects regarding eye injuries and their prevention within and between blocks (by questionnaire);
- risk perception of the farm workers around eye injuries from the beginning to the end of the season, within and between blocks (by questionnaire); and
- number of eye injuries over the season (by promotor surveillance).

Analysis of co-variance (ANCOVA) was used to analyze the questionnaire (Likhert) data to examine changes before and after the intervention within and between groups, controlling for age, gender, and state. Since the block assignment was done at the level of “farm,” we made the assumption that farms having different characteristics are balanced in each treatment group, suggesting that the average effect of “farm” is zero. The variation of individual farm effect is assumed to be the same across all individuals within each treatment group and across all treatment groups. Therefore, the random effects model was used in the analysis. Results obtained were adjusted for multiple comparisons.

RESULTS

Approximately 1,000 workers received safety glasses and an information sheet and 786 agreed to participate in the study. Two hundred and fifty-six were assigned to the group that received training (Block A). In the end, 83 participants were excluded from the analysis because one promotora admitted to having completed the forms herself. Missing responses in demographic information resulted in reporting of results on 703 workers. Demographic characteristics of the subjects are shown in Table II. Subjects who answered the

TABLE II. Characteristics of Farm Worker Subjects by Block; Illinois and Michigan

Block	Illinois	Michigan	Total	Average age	Male (%)
A. Eyewear, promotor, training	141	115	256	33.5 ± 13.7	76
B. Eyewear, promotor, only	179	119	298	32.4 ± 13.1	81
C. Eyewear, only	78	71	149	32.8 ± 12.7	85

TABLE III. Self-Reported Use of Safety Glasses By Latino Farm Workers, Within and Between Intervention Blocks; Illinois and Michigan

Block	Average change	P-value
A	-1.48	<0.0001
B	-0.71	<0.0001
C	-0.96	<0.0001
A versus B	-0.7663	<0.0001
A versus C	-0.5241	0.03
A + B versus C	-0.6452	0.0004

I always use safety glasses when working in agriculture.
 Strongly agree 1 2 3 4 5 Strongly disagree.

first round of questions and then left before the post-intervention questionnaire were included in the analysis.

As shown in Tables III and IV, participants in every block were more likely to wear protective eyewear following the intervention, as compared to preceding it, suggesting that simply passing out safety glasses and making farm workers aware of workplace risks to the eyes improves the use of protective eyewear. However, worker-participants in Block A, with training by the promotores, had a greater increase in eyewear use than Block B (promotores involved, but no training), and B had a greater increase than C. These results are from self-reported safety glasses use. Although the field observation data points are few, they verified this result.

Six questions were designed to assess knowledge about eye health and safety. Those who received training by promotores had the greatest improvement in knowledge as determined by the pre- and post-intervention questionnaire (Likert responses to the following statements: “I am well trained in preventing eye injuries,” “rays of the sun can cause cataracts,” “if I get something in my eye, I should immediately wash with clean water,” “if I splash my eye with chemicals, the first think I should do is wash my eyes out with water,” “wind, dust, and chemicals can cause eye problems,” “safety glasses should be cleaned and inspected for damage regularly.”).

“Risk belief” questions showed patchy significance in multiple directions and were thus impossible to interpret.

Surveillance of co-workers by the promotores turned up 11 cases of pterygium in the Illinois population and no other cases. In Michigan, there were four reported cases. Follow-up

TABLE IV. Observed Use of Safety Eyewear by Latino Farm Workers on Study Farms; Illinois and Michigan

Block	Pre-intervention	Post-intervention
A	2/186 (1.1%)	24/67 (36%)
B	0/198 (0%)	9/172 (5.2%)
C	0/107 (0%)	11/76 (14%)

discussions with farm owners after the season showed that this surveillance method missed most of the cases.

DISCUSSION

Lipscomb [2000] identified seven intervention studies in manufacturing settings that looked at provision of safety glasses, training, and policy changes as interventions to reduce eye injuries. While several of these reported an increase in the use of safety glasses and a decrease in the number of eye injuries, none was a controlled trial, and none was reported with enough information about the sampling strategy and the sample-size to independently determine the success of the interventions. Our intervention trial with control groups showed a clear value in distributing protective eyewear, and in training by promotores on eye injury/illness prevention when use of safety glasses was the measured outcome. Knowledge about eye health and safety also improved in the group that received training by promotores.

Sampling and block designation strategies are complicated in migrant farm workers by the following features. Different types of farming operations expose workers to different degrees of risk, which could affect eyewear use. Different farming operations may select workers with certain characteristics (e.g., tree nurseries require heavy lifting and packing houses lighter but repetitive work, selecting males and females, respectively, due to muscle mass). Additionally, farms hire variable numbers of workers—some less than 10, some more than 100—and the culture and supervision structure vary accordingly; workers tend to be employed in a “snowball” approach, bringing on friends and family members of supervisors and workers who are already employed. Housing may be provided by employers or not, and several employers may provide housing in a single camp leading to potential contact between intervention block members. Workers may work for more than one employer in a small geographic area during the harvesting season. Workers come and go throughout the season and may not come back in subsequent years, making it difficult to follow a cohort over time or to ensure that they have not participated in training/intervention programs elsewhere.

The sampling strategy for this study entailed grouping the units by farm, equalizing the number of employees and representing all farming operations in each block so that the blocks would be similar. Although general characteristics (age and gender) were similar, it is impossible to say that this led to true randomization of the farm workers in the study. It may be impossible to do a pure intervention study with sub-cohorts employed in multiple small businesses (farms).

It was impossible to tease out the contribution of training alone to increased use of protective eyewear, since we had no group that received training without promotor de salud involvement. Because of the importance of preventing communication between farm workers assigned to different

treatment groups (i.e., they could not work together or live in the same migrant camps), and the fact that Block A and Block B farms had to be ones where we were able to recruit promotores, interpretation is limited by opportunistic group assignment. Although farm owners on the Block C farms were open to our distributing safety eyewear, by administering the questionnaire before and after this intervention, and conducting field observations, we are unable to say whether those farms were different from the others in terms of safety culture, or in other ways. The presence of members of the study team for the purpose of observation might be expected to increase the number of subjects in Block C who were wearing the glasses on the days they were observed; with this potential for observer effects, it is more striking that Block C users were lower than Blocks A and B. Unfortunately, the number of observations in C was limited as well.

Because of the nature of hired seasonal farm work, some of the workers began employment (and enrollment) later or left earlier than others. We were able to document that each farm worker did receive glasses and a fact sheet about eye health and safety and that at least two training sessions occurred during the period of work of each farm worker in Block A, though we did not have records of the individuals' attendance. The time from entry into the study until the follow-up ranged from 4 to 12 weeks. The transience of research subjects is one of the difficulties in studying this population, even for brief periods of time. Although external validity could have been compromised, measurement of an effect in this brief time period suggests that acute interventions can be successful. It would be valuable to know whether farm worker-subjects continued to use protective eyewear in the study farms in subsequent summers and in other farms as they migrated between the Southern and Midwestern US. The potential for influencing the use of personal protective equipment and the safety culture in farms along migrant "streams" is great, though difficult to study.

Based on our observation of questionnaire administration, we discovered that the Likhert scale may not be the best style of question to use for this group; in general, farm workers seemed to want to "agree" with the statements in the questionnaire, and needed to be reminded that there was no "correct" answer to any of the questions. The inconsistent results on the "risk belief" items may have been due to this problem. Alternatively, it is possible that 4 months is too short time to see an impact in this area. Qualitative assessment (interview style) may be a better technique to ascertain risk beliefs.

The number of observations on the farms in all three blocks was limited by difficulty in traveling to the farms and in observing "unannounced." It is possible that the increase in observed use of safety eyewear after the intervention was due to wanting to comply with the study team. It would be best to have regular observations without the awareness of the study subjects in all three blocks. This could be carried out by the promotores in the future.

Beside the study outcomes, the partnership of university faculty and community-based organizations was able to collaborate with worker representatives and small business owners in conducting an intervention study in occupational health and safety. The university partners provided expertise and support for conducting a study to evaluate programs of interest to the migrant organizations, farm workers, and farm owners. The migrant organizations were familiar to the local owners and were able to connect with the worker population; they were able to improve skills of 16 promotores—farm workers who took on additional work as CHWs—in training and in conducting research. In addition to the local migrant organizations and the CHWs, the ability to implement the intervention and evaluate the project would have been nearly impossible without the participation of employers and worker-representatives.

The expanded scope of farm owners in the realm of workplace health and safety was not measured in this project, although their positive responses and stated willingness to conduct a similar project the next year demonstrates their "buy in." We did not objectively measure the impact of the project on promotores, except in the willingness of more than half of them to return the next season and in their positive comments in a de-briefing session at the end of the season. The skills they developed for this project may be utilized to address other health and safety issues related to farm work. Demonstrating long-term impact of CHWs as an intervention tool would take several years of observation. Such a longitudinal study could look at continued use of protective eyewear in the study farms as well as other farms to which this population migrates, and could include interviews of farm workers and owners. Other measures of improvement of safety practices, as influenced by the CHWs in this project could be evaluated longitudinally, as well.

Finally, the surveillance of eye injuries by promotores was inadequate to determine the true number of injuries or to establish a surveillance program to evaluate trends. CHWs in other studies have been more successful in field surveillance. The difference in this study was that the CHWs worked as full-time farm workers, in addition to their work as CHWs. In the Block B farms, they had very limited access to workers at the times they may have sustained an eye injury. In Block A farms, they may not have received reports because they were not at the side of the farm workers at the time of injury, or workers may not have wanted to report injuries to co-workers. Alternative surveillance techniques should be tried.

CONCLUSION

Sixteen CHWs, promotores de salud, were part of an eye injury/illness intervention project in the workplace; they were able to guide practical matters related to data collection, and to collect data themselves. Just as CHWs extend the expertise of health practitioners, they also have the ability to

extend the work of researchers. Furthermore, in translational research, they are able to inform the questions asked as well as the study protocol to improve health and safety for themselves and their communities. The CHW model should be extended to occupational settings to prevent workplace illness and injury.

According to this study, distribution of safety eyewear reinforced by training by peer-health educators is the best way to assure its use. Additionally, training on eye health and safety improves workers' knowledge about work-related eye injuries and illnesses. A better way of determining the degree of effectiveness (actual use of eyewear) would be to have the promotores conduct frequent observations, unannounced.

Although the training tools designed and utilized for this study were based on prior interviews of this population, as well as years of experience in working with Latino farm workers and other worker groups, it was not possible to evaluate the training alone as an intervention, as it was always conducted by the promotores who could be considered an intervention variable, themselves. Design of a study that evaluates training alone would be useful, given that most farm workers are employed in settings without promotores. In those cases, training might be conducted by farm owners or supervisors. Additionally, the farms that did not participate, may in some ways, be different than those that did. The research needs to be conducted in other settings in order to demonstrate generalizability of the findings.

Surveillance of eye injuries/illnesses was not adequate when using promotores for collection of this data, and in one season, we could not demonstrate a reduction in eye injuries. In the prior year, we examined the possibility of using sentinel physician-based reporting, hospital emergency room records, or records of the local ophthalmologist. None of these techniques was useful, since these entities did not identify Latino farm workers by occupation. The potential use of the farm owner as the sentinel data provider of eye injury information should be explored. Following trends in eye illnesses and injuries over time is the ultimate measure of effectiveness of the interventions conducted in this study. Use of protective eyewear and evaluation of knowledge about eye health and safety are surrogates for this outcome.

CHWs were an effective tool to conduct research and to train farm workers in eye health and safety, improving in this case the use of personal protective equipment and knowledge about work-related injuries. They may serve as a tool for reducing other occupational illnesses and injuries in other worker populations and other economic sectors across the US.

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REFERENCES

- Baker EA, Bouldin N, Durham M, Lowell ME, Gonzalez M, Jodaitis N, Cruz LN, Torres I, Torres M, Adams ST. 1997. The Latino health advocacy program: A collaborative lay health advisor approach. *Health Edu Behav* 24(4):495–509.
- Bird J, McPhee S, Ha N, Davis T, Jenkins C. 1998. Opening pathways to cancer screening for Vietnamese–American women: Lay health workers hold a key. *Prev Med* 27(6):821–829.
- Birkel RC, Golaszewski T, Koman JJ, Singh BK, Catan V, Souply K. 1993. Horizon AIDS education project: The impact of indigenous outreach workers as change agents for injection drug uses. *Health Edu Quarterly* 20(4):523–528.
- Black MM, Dubowitz H, Hutcheson J, Berenson-Howard J, Starr RH. 1995. A randomized clinical trial of home intervention for children with failure to thrive. *Pediatrics* 95(6):807–814.
- Blake J. 1969. Ocular hazards in agriculture. *Ophthalmologica* 158: 125–135.
- Bone LR, Mamon J, Levine DM, Walrath JM, Nanda J, Gurley HT, Noji EK, Ward E. 1989. Emergency department detection and follow up of high blood pressure: Use and effectiveness of community health workers. *Am J Emer Med* 7(1):16–20.
- Booker VK, Robinson JG, Kay BJ, Najera LG, Stewart G. 1997. Changes in empowerment: Effects of participation in a lay health promotion program. *Health Edu Behav* 24(4):452–464.
- Butz AM, Malveaus FJ, Eggleston P, Thompson L, Schneider S, Weeks K, Huss K, Murigande C, Rand C. 1994. Use of community health workers with inner city children who have asthma. *Clin Pediatr* 33(3): 135–141.
- CDC. 1994. Community Health Advisors: Programs in the United States, Parts I and II. Atlanta: USDHHD, PHS.
- CDC, AIDS. 1999. Community-level HIV intervention in five cities: Final outcome data from the CDC Aids community demonstration projects. *Am J Pub Health* 89(3):336–345.
- Cooper SP, Burau K, Hanis C, Henry J, MacNaughton N, Robison T, Smith MA, Sweeney A, Vernon SW, Zahm SH. 2001. Tracing migrant farm workers in Starr County, Texas. *Am J Ind Med* 40(5): 596–591.
- Corkery E, Palmer C, Foley ME, Schechter CB, Frisher L, Roman SH. 1997. Effect of a bicultural community health worker on completion of diabetes education in a Hispanic population. *Diabetes Care* 20(3): 254–257.
- DOL. 2003. Bureau of Labor Statistics. Data on workplace injuries. (<http://data.bls.gov/labjava/outside.jsp?survey=cd>, accessed 5/29/03).
- Krieger J, Collier C, Song L, Martin D. 1999. Linking community based blood pressure measurement to clinical care: A randomized controlled trial of outreach and tracking by community health workers. *Am J Pub Health* 89(6):856–861.
- Lipscomb H. 2000. Effectiveness of interventions to prevent work-related eye injuries. *Am J Prev Med* 18(4S):27–32.
- Margolis K, Lurie N, McGovern P, Tyrell M, Slater J. 1998. Increasing a breast and cervical cancer screening in low-income women. *J Gen Intern Med* 13(8):515–521.
- Navarro A, Senn K, McNicholas L, Kaplan R, Roppe B, Campo M. 1998. Por la vida model enhances use of cancer screening tests among Latinas. *Am J Prev Med* 15(1):32–41.
- Quandt SA, Elmore R, Arcury T, Norton D. 2001. Eye symptoms and use of eye protection among seasonal and migrant farmworkers. *South Med J* 94(6):603–607.

- Ramos IN, May M, Ramos KS. 2001. Environmental health training of promotoras in colonias along the Texas–Mexico border. *Am J Pub Health* 91(4):568–570.
- Sidel VW. 1969. Lessons from abroad: The feldsher in the USSR. *Ann NY Acad Sci* 166:957–966.
- St. James PS, Shapiro E, Waisbien SE. 1999. The resource mothers program for phenylketonuria. *Am J Pub Health* 89(5):762–764.
- Sung J, Coates R, Williams J, Liff J, Greenberg R, McGrady G, Avery B, Blumenthal D. 1992. Cancer screening intervention among black women in inner city Atlanta—Design of a study. *Pub Health Rep* 107(4): 361–368.
- Sung J, Blumenthal D, Coates R, Williams J, Alema-Mensah E, Liff J. 1997. Effect of a cancer screening intervention conducted by lay health workers among inner-city women. *Am J Prev Med* 13(1):51–57.
- Swider SM. 2001. Outcome effectiveness of community health workers: An integrative literature review. *Pub Health Nur* 19(1):11–20.
- Wiggins Noel. 1998. Core roles and competencies of community health advisors. In: *The Final Report of the National Community Health Advisor Study*. Rosenthal EL, project director. Baltimore, MD: Annie E. Casey Foundation.
- Wolff N, Helminiak TW, Morse GA, Calsyn RJ, Klinkenberg WD, Trusty ML. 1997. Cost-effectiveness evaluation of three approaches to case management for homeless mentally ill clients. *Am J Psych* 154(3):341–348.