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Incorporating Occupational Health Interventions in a Community-Based Participatory Preventive Health Program for Farm Families: A Qualitative Study

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ABSTRACT. The purpose of this pilot study was to determine the willingness of the farm community to participate in a farm safety health initiative (expanding a community-based health program to include elements of the Certified Safe Farm program), as well as understand farmers' experiences with participation in the intervention. Focus groups and individual interviews were held to explore farmers' experience with the expanded health screening and on farm safety review. Results indicate that incorporation of the expanded intervention was well accepted amongst participants in this study.

KEYWORDS. Accidents, agriculture, agricultural worker's diseases, community health services, equipment safety, occupational health services, occupational health, preventive health services

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BACKGROUND AND SIGNIFICANCE

Assurance of appropriate health care for farmers and their families is a goal increasingly being pursued in the United States. In addition to the critical role that agriculture plays in supplying food and essential materials for society, there are other reasons to consider the farm community as a special population with regard to health care. Agriculture is the most hazardous industrial sector in the United States based on fatality rates. Farming is one of the few industries in which families, who often share the work and live on the premises, are at risk for fatal and nonfatal injuries. Farmers who employ 10 or fewer individuals (97% of farms in the United States) are exempt from random inspections and enforcement of the Occupational Safety and Health Act (OSHA).¹ In addition, farms and associated personnel often are isolated from the health resources available in larger urban areas. Thus, efforts to develop and demonstrate effective agricultural health programs are well justified.

In the United States, one early development in agricultural health care services is the AgriSafe network that began at the University of Iowa in 1987 and became a nonprofit organization in 2003.² The mission of the AgriSafe network is to support a growing network of trained agricultural health and safety professionals who assure access to preventive services for farm families and the agricultural community. Currently there are 29 AgriSafe Providers/Clinics in 11 states.³

The Certified Safe Farm (CSF) program began in 1998 at the University of Iowa's Iowa Center for Agricultural Safety and Health (I-CASH) as a research program in collaboration with the AgriSafe network. The aim of the CSF program is to reduce the number of injuries and illnesses in program participants by providing occupational health screening, on-farm safety reviews that are scored according to standards (a score of 85% or more is required for certification), personalized education, and incentives such as recognition, cash, discounts at agribusiness, and the possibility of insurance discounts.² A review of the literature related to farm safety interventions indicates that

multifaceted farm safety interventions, like the CSF program, that included safety audits along with education were the most effective at reducing injury.⁴ The program is based upon the Iowa Integrated Model of Prevention, which includes theory from the fields of epidemiology, engineering, social psychology, industrial hygiene, ergonomics, and regulation.⁵ Participation in the CSF study reduced the costs of health care for occupational injuries by 45% (insurers costs). The reduction in costs was related to on-farm safety review scores (the higher the safety score, the higher the savings).⁶ The CSF program has been well accepted by those participating.^{7,8}

The Shawano County (Wisconsin) Rural Health Initiative (RHI) is the result of a grassroots planning team of more than 30 Shawano area residents with interest in farm family health that met between 2002 and 2004. The project was initiated through community-based participation with stakeholders that included farmers, public health, academia, health care systems, agribusinesses, and community leaders. The RHI, a not-for-profit organization, has been funded via local health care systems, agribusinesses, community businesses, private donations, foundations, and congressional grants.

The RHI employs a Rural Health Coordinator (RHC) and contracts with an occupational health nurse. Both make "house calls" to farm families to provide health information, education, health screening, and referrals to area services. The model of service delivery (on the farm) was incorporated as a result of community input and farmers' experience with service delivery methods used by suppliers, veterinarians, nutritionists, and others. The service has become a trusted source of information for farm families and has received state and national recognition. The RHC and occupational health nurse come from a dairy farming background with knowledge and expertise concerning wellness as well as agricultural lifestyle. In addition to farm visits, the RHI organizes health screenings and events throughout the community at events or locations frequented by farmers, and acts as an advocate for farm families in community, state, and national organizations.

The RHI staff and principal investigator completed the Agricultural Occupational Health Training program at the University of Iowa and RHI became an AgriSafe provider in 2006. Prior to training and collaboration with the AgriSafe Network, the RHI had focused primarily on screening and education related to cardiovascular, nutritional, and mental health issues in the farming community. In an effort to expand services related to safety, the operations board of the RHI decided it would be meaningful to participate in a pilot study aimed at revising the health screening and education in an effort to include agricultural occupational health-specific assessment, screening, and education, as well as incorporate the on-farm safety screening. Collaboration with the CSF program provided an effective, previously tested intervention that had been well accepted by the farming community.

RESEARCH QUESTIONS

The research questions for this pilot study were: (1) Are farmers willing to participate in a farm safety health initiative that incorporates occupational health interventions from the Certified Safe Farm (CSF) program (occupationally specific health screening and an on-farm safety review) with the Shawano County Rural Health Initiative (RHI)? and (2) What can we understand about farmers' experiences with participation in the intervention?

METHODS

Design

This is a qualitative case study of the acceptability and perceived utility of a farm health and safety program among a small convenience sample of volunteering farm families.

Setting

The pilot study was conducted in Shawano County, WI. Shawano County is located in northeastern Wisconsin. The estimated population of Shawano County in 2008 was 40,972.⁹

According to the 2007 Census of Agriculture, there were 792 principal operators by primary occupation, and a total of 1450 farms. Over 99% of the operators declare their race as white.¹⁰ Trends in agriculture show a steady decline in the number of farms in Shawano County, with census figures showing a 9% decline in farms between 1997 and 2002, and an additional 1% decline between 2002 and 2007.¹⁰ The majority of farms in Shawano County are dairy farms.

Recruitment

Articles placed in Farm Bureau and University of Wisconsin (UW) Extension newsletters were used to attempt to recruit study participants. They received no response. Alternatively, the primary author, the UW extension agent, and the Rural Health Coordinator developed a list of 10 farm families who would likely participate in the research study. An effort was made to include farms from different areas of the county. Telephone calls were placed to each of these farms by one of the members of the research team. Of the original 10 farms suggested, 2 declined to participate citing lack of time. The members of the research team reconvened to suggest two additional farms, which agreed to participate. If farms agreed to participate, a phone call was made by the principal investigator to explain the study, answer any questions, and schedule an appointment for the occupational health and on-farm safety screening. Each farm was offered a \$50.00 incentive for participating in the study, with an additional \$50.00 incentive if their farm was certified as safe. The incentives were funded by a Centers for Disease Control and Prevention–National Institute of Occupational Safety and Health (CDC-NIOSH) grant through the Great Plains Center for Agricultural Health. This study was reviewed and approved by the Institutional Review Boards of the University of Wisconsin–Milwaukee and ThedaCare Physicians.

Study Participants

The principal operator and one adult family member (spouse, sibling, or children) from nine

farms and the principal operator from one farm ($N = 19$, 13 males and 6 females) were enrolled in the study. The mean age of participants was 44.58 years (median age 48, range of 21 to 65 years). Nine of the farms were dairy farms and one raised row crops. Mean number of workers on the farm was 3.9 with a range of 1 to 7. Mean number of family members working on the farm was 3.4 with a range of 1 to 5. Mean number of hours worked on the farm was 64.5 for male participants and 27.8 for female participants ($p < .05$).

The Intervention

Data Collection Instruments

The initial phase of incorporation of the CSF concept in the RHI was to develop data collection tools for the expanded health assessment. Members of the research team revised the RHI health assessment questionnaire to include occupationally related risk survey questions from the CSF Occupational Health History.³ Questions about occupational exposure and personal protective equipment (PPE) use were added. An effort was made to keep the instrument culturally relevant to a predominantly dairy farming population. Clinical screening was expanded to include pulmonary function, hearing, and vision screening. The revised tools were reviewed for content by the AgriSafe clinical director, as well as piloted by several Wisconsin farmers. The CSF on-farm safety review instrument was used to assess farm safety.

Agricultural Occupational Health Screening

Health screening data were collected via a questionnaire and clinical screening. The questionnaires were mailed to participants who were asked to complete the questionnaires prior to their health screening appointment. Screenings were completed at the participant's farm by a registered nurse (RN) who was trained in agricultural occupational health and certified by examination by the University of Iowa. The RN obtained informed consent. The following tests were included in the screenings: pulmonary function test, hearing testing, height-weight

evaluation, blood pressure, cholesterol measure, diabetes screening (blood glucose), and vision screening.

The occupational health nurse reviewed the questionnaire and screening results with the farmer. Test results guided appropriate preventive health actions and referral if necessary, guided by policies of the program and standing orders approved by the RHI medical director. A summary sheet with recommendations and goals was used as an educational tool by the nurse to educate the farmer and their adult family member. Examples of recommendations included use of personal protective equipment (PPEs) or referral to a health care provider if indicated. The farmer received a follow-up phone call by the RN 3 months later to review progress towards goals.

Education

Safety education occurred via one-on-one consultation with the occupational health nurse during the screening and with the farm safety consultant during the farm safety audit. Each individual's occupational history was reviewed to develop individualized specific preventative measures such as use of PPEs. Appropriate PPE was demonstrated and a list of specific needed items was generated and given to the farmer, along with instructions for care and storage. Educational information was mailed to participating farms on three occasions, which included education on respiratory protection, hearing protection, pesticide application safety, back safety, and sun protection. Each farm received the same educational packet. Education occurred again via the follow up telephone call to assess progress towards goals.

On-Farm Safety Review

Recruitment for farm safety reviewers occurred via flyers placed at farm events and in places of business such as the local cooperative. Individuals were offered a \$100.00 per farm incentive along with payment of mileage. No responses were received. Several local farmers known to the RHI were asked to participate, and declined citing lack of time for training. Subsequently, two health care providers and the

county agent agreed to participate in the farm safety training. The health care providers (an emergency medical technician and a registered nurse) were known to the primary author to have a background in agriculture.

Farm safety reviewers were trained in a 2-day workshop by the University of Iowa staff, and “certified” following testing for comprehension. The CSF on-farm safety review instrument was used. Farm operators received program information and a copy of the CSF on-farm safety review instrument in the mailing that contained the health assessment questionnaire. Following the farm safety review, all farmers received a copy of their results that detailed the areas on their farm that did not meet safety standards. Farms who attained a total farm safety score of 85% or higher (passing) were considered “Certified Safe.”

Data Collection

Two focus groups of participants were held and moderated by the county extension agent and research staff to evaluate participants’ experience with the expanded intervention. Focus group methodology was based on Krueger and Casey.¹¹ Focus groups were held in two different areas of the county for convenience and were expected to last 1 to 2 hours. A focus group interview guide was developed by the research team in accordance with recommendations by Krueger and Casey¹¹ (see Appendix 1). Focus groups included four and six participants, respectively, and represented six participating farms. Notes were taken during the focus group by the research staff and the assistant moderator (principal investigator) who summarized the key findings and verified them with the group for accuracy. Interviews with participants from the four remaining farms who were unable to attend the focus group were conducted separately at the participants’ farm, and the responses were summarized and reviewed with participants for accuracy.

Data Analysis

As a qualitative study, the intent of this research was not to quantify the responses of participants, but to understand the range and

depth of farmers’ experiences with the expanded intervention and their recommendations for implementation. Because the concept of incorporating occupational health and safety interventions is complex, the aim of this study was to observe, listen, document, and report the perceptions of participants.¹¹ The focus groups and interviews were audiotaped and transcribed for analysis. Transcriptions were checked for accuracy and analyzed along with the research staff field notes. A “long-table” approach was used to categorize responses using the computer to code, cut, and paste participants’ responses.¹¹ Themes associated with farmers’ experience with the intervention were then reviewed with research staff to verify accuracy. A summary of themes associated with key questions was synthesized by the primary author and validated by the research team. Following the preliminary data analysis, members of the research staff convened to review the results, engage in process evaluation, and determine future planning and research needs.

RESULTS

The following narrative is provided to highlight some of the common responses/findings arising from the focus groups and interviews. Examples of direct quotes from participants illustrate the experiences of participants with the intervention. Key themes are italicized.

Reasons for Participation

Reasons cited for participation included *trust and loyalty* to the existing RHI program and its staff, a *desire to be a leader* in the farming community, and *interest to improve safety and prevent injury* on their farm. Several of the participants had been previously involved with the RHI as participants or as advisors.

Comments:

- “(Name of staff member) talked to me and I started thinking about it and . . . I might as well go ahead and do it . . . and if they

can use my name to maybe get other farmers that are stubborn and bullheaded . . .”

Occupational Health Screening

All participants described a positive experience and would recommend the occupational health screening to other farmers. There was consensus that providing the screening *at the farm* was an important aspect of the intervention. Participants stated that screening at the farm saved time, worked into their schedule, enhanced privacy, and was more comfortable. Some stated that they would likely not have participated if they would have had to go to a clinic for the screening.

Comments:

- “I like your own place around the farm, because . . . I feel more comfortable asking questions, where in a clinic you feel rushed and you don’t even ask questions.”
- “It is just the privacy end of it . . . It is better at home (than) for me to clean up from the barn and run to town, . . . you can count on three or four hours and it is going to interrupt the day, and with (the nurse) coming out . . . I think within an hour and a half I was done and outside again . . .”

Many participants had not received routine health screening such as cholesterol screening prior. Those who had previous screening found value in the screening for pulmonary function, vision, or hearing, which they hadn’t done before. The occupational health screening was described as *comprehensive*. Many expressed a *fear of the unknown* in regards to their screening, yet many stated they felt reassured after participation in the screening. All participants commented that having the *results available immediately* was valuable. Participants valued the screening in that it provided a *connection* or access to health care.

Comments:

- “I thought it was very thorough. You know, a lot of things we never had done, like the hearing test . . . we never had that done before. I always knew he was hard of hearing.”

- “. . . I did go in for a complete physical after (the nurse) tested us . . . I just went in because of her being out there and showing us some of these tests.”

On-Farm Safety Review

All participants described their experience with the on-farm safety review positively. Participants all agreed that it was valuable to have a safety reviewer, “*a fresh pair of eyes*,” to do the safety inspection. It was agreed that the farm work environment is dangerous, and it is easy to overlook safety hazards due to familiarity with the environment and habit. Participants agreed that the safety reviewer brought up things they hadn’t thought about before in regards to safety.

Comments:

- “Well I would think it is better they (farm safety consultant) looked, because they see the things I take for granted. Another pair of eyes and another person looking at your situation is always better than me looking at it.”

Participants valued the reviewer and occupational health nurse having an agricultural background. Many described some *apprehension* or fear associated with anticipation of the review. Some described “*studying*” or cleaning up prior to the review. Farmers described the review process as a positive experience featuring learning and problem solving. Their fear of critical or judgmental comments was not realized. They appreciated the *positive feedback* that they received when they were doing something well. Participants expressed interest in having a “to-do” list generated after the review as well as long term follow up.

Comments:

- “. . . it is nice that she (the nurse) can relate to . . . agriculture, growing up on a farm, and just her knowing more of where you are coming from.”
- “. . . when I told my dad (what) we were going to do, . . . his first thought was ‘somebody is going to come on the farm

and tells us how we are doing everything wrong . . . as far as safety goes,’ and it was not that way at all . . . it was very good and just common sense.”

Concern About Hired Workers Family

Participants voiced concerns regarding liability and the importance of a safety review as it relates to hired help and younger family members (children) on the farm. It was suggested to include hired farm workers and extended family, especially children in the farm safety review.

Comments:

- “. . . I think (with) the larger farms it is more of a liability issue, I mean if you have employees, you definitely need to do the safety thing. . . . there are so many people that come on your farm now . . . and you don’t want anybody to get hurt . . . you have so many people helping out . . .”
- “Well maybe in our case . . . it would have been helpful if . . . my grandson and (son) . . . would have all been around as you had somebody else pointing things out. It means a little different than if Grandpa said it.”

Change in Safety Behaviors

Several farmers reported increasing their PPE use as a result of the screening for hearing and pulmonary function. Increased use of sunscreen and sunglasses was also reported. Some denied any changes in PPE use and generally cited habit or attempted to rationalize not using PPE, e.g., describing inconvenience or indication exposures didn’t necessitate PPE. Family members reported encouraging PPE use by their spouse or child. Participants reported several specific changes related to improving farm safety. These include decreasing clutter in tractor cabs, gating manure pits, providing first aid or emergency kits, and chaining tires. Several farmers described that participation in the intervention heightened their overall awareness of safety on the farm.

Comments:

- “It is just hard to make a change. You know you are telling a guy after 40 years to change overnight and it is not a possible thing, because this is the way you do it.”
- “. . . I have those things [PPE], but I don’t always use them, but know you have them and you know you are supposed to. So, it keeps your mind going. All summer it has been in the back of my mind every time I am doing something . . . what we talked about that spring, so for that alone [the safety check] was probably well worth it.”

Overall Impression

All participants stated they would recommend the program to other farmers. They described the intervention as having value and adding value to the RHI. Participants described great satisfaction that somebody cared about farmers’ concerns. Many participants expressed that it is necessary to offer the occupational health screening with the on-farm safety review. They described gaining trust through the health screening and described it as an incentive for recruitment. Participants were asked if they would be willing to pay for the service. The majority of participants stated that they would pay a fee for the service. Participants reported a fee of \$50.00 to \$100.00 per participant. In discussion regarding the monetary value of the service, participants discussed comparison of costs to visit health care providers for screening. This reinforces the value of offering the occupational health screening with the onfarm safety review.

Comments:

- “About the only way to appeal to come out to do the farm machinery safety part is to get their trust through the health . . . thing. It would be a way to get in and make them feel comfortable with you and then say ‘Well we can do this . . . inspect your machinery or farm operations too.’ It might be a way to ease your way in . . .”
- “I thought it was really good . . . You take your time . . . but it costs you to get all the

information that we got. It costs you dearly through the doctors . . .”

Recruitment

Participants were asked about their recommendations for recruitment for the intervention. Participants described the occupational health screening as incentive as described previously. They discussed the importance of marketing the program, providing education about the process, in an effort to decrease any concerns or fears potential participants may have. Participants suggested recruitment for the program via the farm community using testimonials or a referral system. Participants all encouraged the RHI to be persistent in reaching the farming community and providing the expanded service.

DISCUSSION

Given the current structure of the RHI, which has been conducting screening and health risk assessments to over 300 farms in the county over the last 5 years, continuation of the expanded occupational health screening was determined to be feasible. The RHI is already recognized in the community as a well-respected source of health and safety education and screening, and has secured funding to continue to increase health screening in the farming community.

Overall response to the expanded intervention was favorable amongst participants. There remain, however, significant barriers related to implementation of the on-farm safety review. Participants described an initial fear of criticism associated with the on-farm safety review, but described their actual experience as positive. Participants, as well as the research team, believe the most significant barrier to implementation of the on-farm safety review outside of an academic setting is recruitment of participants as well as on-farm safety reviewers. There is agreement that this barrier could be overcome using support, referral, and testimonial from within the farming community, along with incentives such as the occupational health screening. The feasibility of continuing the on farm safety screening will require development

of a business plan, along with a well-planned marketing and community education plan. Partnering with current stakeholders such as UW Extension and other agribusiness remains vital to sustainability. The cost associated with adding the on-farm safety review remains a barrier to the RHI. Issues related to potential third party payers will need to be explored. Adding the on-farm safety review may be attractive to additional potential stakeholders, however, such as implement dealers, insurance agents, technical colleges, and groups such as the Future Farmers of America.

Implementing the expanded intervention within a community-based program offers the ability for the farming community to participate in program evaluation and planning, thereby creating a sense of ownership, which enhances value. As a community project, with limited bureaucracy, the ability to respond to changes or needs in the community may be enhanced.

Need for Further Research

Research related to incentives for participation in the CSF intervention such as cost savings on insurance and discounts for farm services and equipment are currently in process at the University of Iowa. Recommendations for further research include evaluation of the occupational health-screening tool in an effort to collect pertinent data necessary for long-term evaluation of the RHI program and allow comparisons with other research studies such as those done by CSF. Additionally, the screening tool should be evaluated using focus groups consisting of farmers in regards to how easily the questions are understood and answered.

The farm safety consultants recommended that the on-farm safety checklist be evaluated for appropriateness for Wisconsin farmers. It was suggested that the review include more information regarding human/livestock interaction and that for primarily dairy farms the review begin in the dairy structure. Reviewers also commented on the need to expand the review to include more specific information related to safety in the milk house, particularly as it relates to chemical storage.

Long-term follow up of occupational health screening and on-farm safety review is indicated to determine program effectiveness. Specific educational interventions can also be evaluated for effectiveness. Specific health and safety measures should be evaluated over time such as screening results, PPE use, and farm safety risk scores. Consideration should be given to include hired farm workers and other family members in the on-farm safety review, as well as exploring the ability to expand services to the growing population of Latino workers in the dairy industry, which has resulted from the increased reliance on hired workers in the dairy industry as farm numbers decline and size increases.¹²

CONCLUSION

Participants' experience with the expanded intervention was positive, with recommendations to continue the program in the future, indicating the CSF intervention can be implemented with a select group of motivated farms. The health screening was the most valued aspect of the intervention. The results obtained in this research are similar to the outcomes of a qualitative study of CSF participants in Iowa.⁷

The most significant barrier discussed in implementing the program was the ability to recruit participants, particularly for the on-farm safety review. Farmers' trust and loyalty to those involved in agricultural safety and health as well as each other appear to be key to implementation. AgriSafe clinics and other grassroots community resources, along with the support of the agricultural community, will likely play an important role in future projects.

This pilot study, with a small number of motivated participants, offers little opportunity to generalize results. The knowledge gained by observing, listening, documenting, and reporting farmers' experience with implementation of the intervention, however, can be used to guide development of processes and research aimed at overcoming barriers of participation. Results of this pilot study indicate that farmers are interested and receptive to participate in an expanded farm safety and health intervention.

Particularly salient findings indicate the need to include trusted agriculturally sensitive health care and safety professionals, recruitment techniques that include the farming community, well-planned public marketing campaigns to alleviate fear of participation, and incentives to participate, particularly health screenings on the farm.

APPENDIX 1

FOCUS GROUP INTERVIEW GUIDE

Introductory/Transition:

- How did you learn about the study?
- Tell me about why you decided to participate in the study?

Key Questions:

- Tell me about your experience with the occupational health assessment/clinical screening.
 - **Probing questions:**
 - What did you like about the occupational health assessment/clinical screening?
 - What did you like most? (e.g. cholesterol screen, pulmonary function, etc.)
 - What did you dislike?
 - What did you dislike most?
 - What changes have you made in your life as a result of participation in the occupational health assessment / clinical screening?
- Tell me about your opinions about the clinical screening at your farm vs. at a community location or clinic?
- Tell me about your experience with the staff e.g. courtesy, knowledge, confidentiality
- How would you describe your experience to other farmers who may want to participate in the program in the future?
- Is there anything else about the occupational health assessment/clinical screening you think would be valuable to improve the program?
- Tell me about your experience with the on-farm safety review.

• Probing questions:

- What did you like about the on-farm safety review?
- What did you like most?
- What did you dislike?
- What did you dislike most?
- Have you made any changes in your work as a result of participation in the on-farm safety review? If so, what changes?
- Tell me about your experience with the staff e.g. courtesy, knowledge, confidentiality.
- How would you describe your experience to other farmers who may want to participate in the program in the future?
- Tell me about what things you think are positive about having a reviewer come to your farm to do the on-farm safety review.
- Tell me about what things are negative about having a reviewer come to your farm to do the on-farm safety review.
- Is there anything else about the on-farm safety review that you think would be valuable to improve the program?

Ending Questions:

- Would you recommend this program to a friend or neighbor?
- Would you pay for this service? If so, how much?
- If you had a chance to give advice to the director of this program, what advice would you give?
- Is there anything that we missed?
- Is there anything that you came wanting to say that you didn't get a chance to say?

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