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Delivering Comprehensive Health Education Programs for
Farmers in a Primary Care Setting

Rural Health Practice Applications

Delivering Comprehensive Health Education Programs for Farmers in a Primary Care Setting*

James K. Hartye and Norma Mathis

ABSTRACT: A comprehensive health education series was provided for a group of farmers from a small farming community in western North Carolina. At one year after the program, the participants were surveyed. Between 70 and 100 percent of them felt that they learned something useful from each of the four sessions. The participants also noted behavior changes since the program; from 26.3 percent based on the pulmonary program to 90.9 percent based on the skin protection program. The retention of information and level of impact on health-related behaviors warrants further development and testing of this approach to agricultural occupational health education.

Practicing medicine in a small rural community, one soon becomes confronted with the particular health risks and health problems of farmers. In serving farming patients, the primary care physician can play an important role in the recognition, treatment, and prevention of health problems peculiar to their occupations and lifestyles. Unfortunately for most physicians, their training does little to prepare them for the care of agricultural health problems. Common farm injuries and infections, as well as problems related to pesticide use and livestock confinement house work are not part of the average physician's training. Even when they are interested, rural physicians find it difficult to locate resource materials for farm-related occupational health problems for their own education, and especially for the education of their patients.

Because farmers are put at specific risk for a number of injuries and illnesses peculiar to their occupation, they have a great need for quality health education (Council on Scientific Affairs, 1988; Coye, 1985; Donham & Horvath, 1987). Understanding the risk of different dust exposures and how to protect themselves is important for farmers, as is understanding the infectious diseases that they can catch from their livestock.

* The authors gratefully acknowledge the assistance of Connie Mutel; Steve Jackson, DVM; Richard Myers; Robbie Griffith, FNP; Carol Edwards; Ron Stanley, MD; Bill Dow, MD; David Pratt, MD; and Mary Anne Attwell Hartye, PhD. Requests for further information should be sent to James K. Hartye, MD, P.O. Box 100, Ronda, NC 28670.

Farmers have not received comprehensive health education programs for a number of reasons. First, the curriculum for comprehensive programs has not been available. Second, in many states, farmers are a scattered minority that is not organized in a fashion to protect its interests. Third, the agribusiness industries often presume to speak for the farmers and lobby effectively to shape national and state agricultural policy. Often they do a good job of representing the interests of the farmers. However, in the area of safety and health they often have a vested interest in avoiding discussion of the risks of farming because they make their living selling the machinery and chemicals that put the farmer at such risk.

The following health education project was designed as an initial step in implementing a community-oriented primary care program for this subset of a rural practice.

Program Development

Initially, it was expected that there would be a ready-made body of health education materials that covered the range of farmers' health issues. Surprisingly, after traveling to the university medical center and calling other centers around the country, it turned out that there was not a comprehensive health education program for farmers at that time. So, in fall 1986 a comprehensive program was put together from a number of sources.

The Institute of Agricultural Medicine in Iowa had created a curriculum for health professionals that provided a place to start (Donham & Mutel, 1978). The institute, together with the Iowa Lung Association, had also produced a series for farmers on respiratory problems in agriculture that was helpful (Mutel, Donham & Merchant, 1986). A local veterinarian, Dr. Steve Jackson, was consulted to put together information on infectious diseases transmittable from animals. Information on pesticides and herbicides used in our part of the county, and research on their toxicology was gathered from many sources, including local pesticide dealers (Morgan, 1982; Wolfshohl, 1982). Information on first aid and safety measures necessary for farmers was gleaned from the *Agri-Safety Newsletter* of the National Safety Council and the *Play It Safe* program of Ford Tractor Operations. Further information was obtained locally from the Agriculture Extension Service, the Farm Bureau, and area agricultural teachers. The rest of the program was brought together from the medical literature.

One of the difficulties in working on the curriculum was the fact that the medical, farm safety, and industrial hygiene literature was in totally different spheres, at times oblivious to each other. Fortunately, there were some places like the University of Iowa where these bodies of knowledge intersect.

Next a basic outline of areas to be covered was developed for four two-hour sessions. A half dozen farmers from around the community who were

respected by their peers were the and the local hardware store. The Then, their comments and suggestions were taken into account. A phone. With their input it was developed. Tuesday nights in January and February at the center. A meal would not be offered. free screening, i.e., cholesterol and tetanus boosters week three, and

Three weeks prior to the sessions about the dates and topics, asking thought could benefit from it. Cards were sent to local farmers based to mail out seed information. Those who might be interested in the program of the county were included in the atmosphere and to have a sense of participants. The press was not to prevent having too large a crowd.

By far, the most labor intensive putting together the curriculum and the creation of the final program. This having been done once, however, a program much easier and well physician's schedule.

Program Content

The first session, "Skin Problems," covered poison ivy and oak, chemical burns, ticks, skin cancers, and other session slides were shown and participants. Pesticides most growers, livestock growers, and with emphasis given to causes and measures when exposure occurred.

"Lung Problems and Infections" Because of the pulmonary function interested in knowing how to prevent ment and dusts from grains, brought in some of the protocols from chicken houses, and information where it might be obtained. The uncommon ones in the general farmers (e.g., leptospirosis, hi

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respected by their peers were then identified by checking with local farmers
and the local hardware store. These farmers were mailed the course outline.
Then, their comments and suggestions were solicited in person or by
phone. With their input it was decided to have the sessions on consecutive
Tuesday nights in January and early February 1987 at the local community
center. A meal would not be offered as enticement, but there would be some
free screening, i.e., cholesterol levels week one, lung function week two,
tetanus boosters week three, and blood pressures week four.

Three weeks prior to the sessions, letters were mailed to key farmers
about the dates and topics, asking them to promote it with those they
thought could benefit from it. One week before the session seventy letters
were sent to local farmers based on a list that the local hardware store used
to mail out seed information. This list was supplemented with other farmers
who might be interested in the programs. Only farmers from the local part
of the county were included in the program in order to maintain an informal
atmosphere and to have a sense of familiar environment and friends for the
participants. The press was not notified until the last night of the program
to prevent having too large a crowd.

By far, the most labor intensive part of the program development was
putting together the curriculum. The telephone work, the literature review,
and the creation of the final product took a considerable amount of time.
This having been done once, however, would make any replication of such
a program much easier and well within reach of the average community
physician's schedule.

Program Content

The first session, "Skin Problems and Pesticides," dealt specifically with
poison ivy and oak, chemical dermatitis, insect stings, scabies and mites,
ticks, skin cancers, and other sun induced skin problems. During this
session slides were shown and well-illustrated brochures were given to the
participants. Pesticides most commonly used in the area by feed-crop
growers, livestock growers, and poultry growers were explored in-depth,
with emphasis given to causes and prevention of exposure and to proper
measures when exposure occurs.

"Lung Problems and Infections" was the subject of the second session.
Because of the pulmonary function testing, the farmers were particularly
interested in knowing how their lungs actually work. Livestock confine-
ment and dusts from grains, silage, and hay were discussed. Farmers
brought in some of the protective equipment they used, especially in
chicken houses, and information was shared on how to use it properly and
where it might be obtained. The infections that were discussed included
uncommon ones in the general population that occurred mostly among
farmers (e.g., leptospirosis, histoplasmosis, New Castle's disease, rabies,

Rocky Mountain Spotted Fever, and ringworm).

The third session was "Farmers' Injuries, First Aid, Arthritis, and Stress-Related Illnesses." Safety while using tractors, power saws, and other farm equipment was discussed, as were common injuries to farmers (cuts, burns, puncture wounds, eye injuries, back strain, and injuries due to heat and cold). Because the farming occupation is so vulnerable to stress, it was felt essential to explore this area. Participants were taught how to recognize the role that stress plays in physical and emotional symptoms, as well as how to use the mental health establishments and some of the basic components of stress management.

In the final session the topic was "Chronic Diseases and Alcohol, Drug, and Medication Problems." Cancer, heart disease, stroke, and high blood pressure were discussed. The session also looked at the abuse of alcohol, drugs, and medications of farmers; explored the myths surrounding these areas; and discussed detection and treatment of problems that might exist.

The entire series was very well received by area farmers. Discussions were lively, and those attending took a great deal of interest in the tests that were made available to them. Handouts of the curriculum being covered were distributed each night and were requested by many farmers who could not attend.

To do this type of program in a different area one could now start with a basic outline and build in the needs of local farmers. The pesticides discussed would vary with the local use patterns. Some locales would accent illnesses related to silo use or hog confinement work or orchard pesticide use, which were not featured in this program because these are not frequently encountered in this community.

Questionnaire Method

The goal of the program was not only information dispersal, but also healthful behavior modification. In an earlier program that trained community health advisors, a pretest and posttest had been used to measure information retention (Hartye & Andrews, 1987). It was felt that there were two problems with that approach. The first problem was that information retention was not as legitimate an end point as behavior change. Second, measurement soon after the course was not as sturdy a measure as checking at some distant time. In the farmer's program the aim was to show a more accurate measure of effect on the lifestyle of the participants. It was decided that a questionnaire would be given approximately one year after the initial program. To use a measure at that point in time would minimize the impact of the program, but would be a more accurate measure of what was actually achieved in the long run.

The questionnaire was designed to avoid leading to specific answers as much as possible. The same pattern was used for the questions related to

each session. The first question was "What was the most important topic (topic)?" The next question was "Did you change any behaviors as a result of this session? If appropriate, a third question was "What symptoms have you experienced since the change in behavior?" They were asked what else they would like to see improve the program, and what

Results

The sessions of the program and injury prevention seem to have had an impact. Nearly all of the respondents found these sessions useful from these sessions (see Table 1). The pulmonary and heart disease sessions had more questions than the other sessions. The questionnaire concerning the session on injury prevention was presented on its effect.

Table 1. Survey Results At One Year

| Program section | Number at session | Learned something useful (%) |
|-----------------|-------------------|------------------------------|
| Skin | 33 | 32 (97.0) |
| Pesticides | 33 | 33 (100.0) |
| Pulmonary | 38 | 30 (78.9) |
| First aid | 25 | 25 (100.0) |
| Heart/HBP | 26 | 20 (76.9) |

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each session. The first question asked "Did you learn anything useful about (topic)?" The next question was "Did you do anything different" or "Have you changed any behaviors as a result of what you learned?" When appropriate, a third question asked if they noted an difference in related symptoms since the change in behavior. Finally, in the summary section, they were asked what else they learned, what they would suggest to improve the program, and what else they would like to hear about.

Results

The sessions of the program on skin problems, pesticides, and first aid and injury prevention seem to have had the most lasting informational impact. Nearly all of the respondents remembered something specific and useful from these sessions (see Table 1). This is interesting to note in that the pulmonary and heart disease sessions generated more comments and questions than the other sessions. By mistake, the questions on the survey concerning the session on infections were left out, so no data can be presented on its effect.

Table 1. Survey Results At One Year Post-Program.

| Program section | Number at session | Learned something useful | Noted behavior change | Most common comments |
|-----------------|-------------------|--------------------------|-----------------------|--|
| Skin | 33 | 32 (97.0) | 30 (90.9%) | Increased use of sun hat (16); long sleeve shirt (5); sun screen (6). |
| Pesticides | 33 | 33 (100%) | 21 (84%) 25 use | More caution (7); skin protection (3); mask for chicken house spraying (4). |
| Pulmonary | 38 | 30 (78.9%) | 10 (26.3%) | Mask use in chicken house (3); mask baling hay (1); quit smoking (2). |
| First aid | 25 | 25 (100%) | 20 (80%) | Recognize poison ivy (2); bought fire extinguisher (1); first aid kit (1); more caution (4). |
| Heart/HBP | 26 | 20 (76.9%) | 15 (57.7%) | Changed diet (6); quit smoking (2). |

As would be expected, behavior change noted by the participants was less widespread than informational impact, especially in the pulmonary section (see Table 1). This probably reflects the difficulty of the main behaviors to be drawn from the pulmonary session, i.e., wearing masks in the chicken houses and smoking cessation. Another factor is that a number of respondents neither smoked nor worked in chicken houses. Better sun protection, improved pesticide use measures, and diet changes were the most widespread behavior changes noted. These changes also have been reflected in the number of inquiries for further specific health information on the topics by course participants and by others in the community who heard some of the course material from neighbors.

With the ever-raging controversy over the safety of pesticide use by farmers it is interesting to note that seven out of 30 farmers noted some physical effect from the pesticide use. While not an overwhelming number, it certainly points to a need for recurrent exposure of farmers to pesticide safety issues, although one could argue that the same could be said for all preventive measures discussed in the program.

When asked for suggestions to improve the program, most respondents felt the course was thorough. They did suggest encouragement of more questions, identification of where to get good quality masks, and availability of the program to more farmers. When asked for topics they would like to hear about, sessions on arthritis, stress, and the effects of chemicals and pesticides on ground water were prominent among the broad range of what they requested.

Conclusion

This study is certainly a simple first attempt at designing and evaluating a comprehensive health education program for farmers. It is important for two reasons. First, it is the first recorded attempt at such a comprehensive program for farmers in this country, although there are numerous examples of programs with narrower focuses, e.g., Iowa's program for hog confinement workers (Mutel, 1986). Second, and more importantly, this study attempted to look at more than just information retention as an evaluation of the efficacy of the program. The Agricultural Extension Service has excellent programming and probably has the most experience in the area of focused education programs for farmers, but has not undertaken critical evaluations of the efficacy of their programs. A recent example of this problem occurred in North Carolina. The head of the extension program for the state reported to a legislative committee that most of the farmers in the state were getting information from his program on alternative methods of pest control. At about the same time a local survey showed that 86 percent of farmers had received no such information despite the fact that 82 percent were interested in learning this information (Hartye & Mathis, 1988).

With the limited financial promotion, it behooves those of the programs have an effect. The from the least stringent to the n self-reported behavior changes: crease in expected morbidity an morbidity and mortality. The pr only at the first two levels. The i year. The change in behavior co one year, especially in the areas the level of evaluation was not the level of impact on health-re ment and testing of this app education. However, further v should move beyond monitoring, to monitoring the improvement

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Another issue of importance primary care (COPC) was self practice. This included the de materials, the cost of testing, tabulation. Such programming

change noted by the participants was impact, especially in the pulmonary. This reflects the difficulty of the main pulmonary session, i.e., wearing masks in a confined space. Another factor is that a number of participants worked in chicken houses. Better sun protection measures, and diet changes were the most noted. These changes also have been discussed for further specific health information and by others in the community who live near their neighbors.

Concern over the safety of pesticide use by farmers. Seven out of 30 farmers noted some concern. While not an overwhelming number, the present exposure of farmers to pesticide use is such that the same could be said for all farmers in the program.

To improve the program, most respondents would suggest encouragement of more use of good quality masks, and availability of more information. When asked for topics they would like to discuss, and the effects of chemicals and pesticides were prominent among the broad range of what

an attempt at designing and evaluating a program for farmers. It is important for the next attempt at such a comprehensive program, though there are numerous examples of such programs, e.g., Iowa's program for hog confinement, and more importantly, this study demonstrates information retention as an evaluation tool. The Agricultural Extension Service has the most experience in the area of health education programs, but has not undertaken critical evaluations of such programs. A recent example of this is the head of the extension program for the advisory committee that most of the farmers in the program on alternative methods of pest control. A local survey showed that 86 percent of farmers had heard of the program despite the fact that 82 percent of farmers had not heard of it (Hartye & Mathis, 1988).

With the limited financial resources for farmers' health and safety promotion, it behooves those of us who provide these services to prove that the programs have an effect. There are several potential levels of evaluation from the least stringent to the most stringent: (a) information retention; (b) self-reported behavior changes; (c) confirmed behavior changes; (d) decrease in expected morbidity and mortality; and (e) decrease in documented morbidity and mortality. The program being discussed in this paper looked only at the first two levels. The information retention was quite good at one year. The change in behavior comments were surprisingly good after nearly one year, especially in the areas of pesticides and skin problems. Although the level of evaluation was not stringent, the retention of information and the level of impact on health-related behaviors warrants further development and testing of this approach to agricultural occupational health education. However, further work in this area of agricultural medicine should move beyond monitoring information retention and behavior change to monitoring the improvement in targeted health outcomes.

Being in the community, it also has been apparent that the program had an even broader effect than registered here. A number of farmers who didn't attend the sessions, but heard from those who did, have requested information. Several farmers requested cholinesterase testing for organophosphate use. The appearance of wide-brim hats around the community last summer was widely noted and discussed. Many more chicken house workers have been asking advice on what masks to get for protection. Also, as a result of requests by participants in the sessions, a follow-up session, "The Farmer's Heart," was given. The response was overwhelming. Based on local interest, annual follow-up sessions have been planned.

A recent conclusion in the national media by some experts that farmers are not interested in health and safety issues is not borne out by this study (McNeil & Lehrer, 1988). The problem may lie in the top-down approach to the dissemination of health education by governmental agencies. The advantage of the program presented in this study is its ability to adjust to attributes of local farming, such as tailoring content to match the local range of farming and timing the program to natural breaks in the farmers' schedule. Another advantage is the program's ability to provide the reinforcement of the educational material in an ongoing and timely fashion at visits to the medical practice, at follow-up sessions based on farmer feedback, and through periodic newsletters from the program. This reinforcement, together with the development of a relationship between health care providers and the farming community can only improve the end points of behavior change and ultimately health outcomes.

Another issue of importance is that this attempt at community-oriented primary care (COPC) was self-supported by a small private community practice. This included the development of the curriculum, the cost of materials, the cost of testing, and the questionnaire administration and tabulation. Such programming is within reach of the private practitioner.

COPC and agricultural medicine need not be restricted to academic or publicly supported medical centers, or to foundation grantees. An advantage of privately done COPC is that its internal funding is not as subject to the vagaries of politics. Another advantage is that internally funded programming can continue for a number of years, rather than being subject to short-term topically popular funding from the government and foundations. Private practice is certainly a viable and, in some ways, a superior setting for carrying out these activities.

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Inpatient Nursing Care Strategy for Rural Hospitals

Richard Sowell and Barbara Fuszard

ABSTRACT: Increasingly, hospitals are experiencing a nursing shortage. The hospitals where nursing staff must operate within the financial limitations of rural areas, with urban centers. Therefore, it is necessary to find new approaches to maximizing the use of nursing staff. We have proposed that one solution is to have RNs to more fully utilize the knowledge and skills of the registered nurses—a system in which the registered nurses develop a plan of care, procure and coordinate the services, and evaluate the evaluation of care—is one strategy to maximize the potential financial benefits to hospitals. This article describes the potential financial benefits to hospitals of patient care activities, nursing care, and organizational resources and includes a case study of a rural hospital system, the hospital's steps of planning, and the associated costs associated with the system.

Changes in the Medicare reimbursement rates have forced hospitals and other health care delivery and organization of the health care system, cost-effectiveness has become a major health care (Bowen, 1987), and the growing challenge for rural hospitals is to maintain quality and cost of care in an environment with diverse interests competing for resources (Donabedian, & Burney, 1987).

The need for innovation in rural health services is nowhere more acute than in rural hospitals. Rural hospitals not only have to respond to the same market conditions as their urban counterparts, they must meet the same demands. Under federal programs, rural hospitals have more health professionals further limited resources than larger urban centers.

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