HEALTH PROMOTION PROGRAM FOR THE SAFE USE OF PESTICIDES IN THAI FARMERS

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Abstract. The purpose of this study was to determine the knowledge, attitudes and practices (KAP) concerning the safe use of pesticides of Thai farmers in Don Kha subdistrict, Bang Phae district, Ratchaburi Province. Thirty-three voluntary Thai farmers of thirty-three farming families, recruited by convenience sampling, participated in a training program for six months. Data were collected by questionnaire interviews, and KAP on the safe use of pesticides were compared by paired *t*-test. Research findings showed that the mean scores of KAP in the posttest were significantly higher than the pretest. The results of this study provided health professionals with information to develop more effective prevention and intervention programs. To prevent illness, the most important role of health officers should to be focus on education and information for individuals, families, and communities.

INTRODUCTION

Thailand is a country that produces food to supply the world's population. However, the country has a significant problem of pesticide poisoning. Pesticide poisoning illness ranked the highest, when compared with all occupational diseases, , ranging from 71.7% to 93.2%. The death rates from pesticide poisoning were also the highest, ranging between 84% and 100% of the total occupational deaths (Division of Epidemiology, 2001). Approximately 42.4% of the total working population of Thailand are farmers (Department of Labor Protection and Welfare, 2001). Thai farmers are concerned about methods to obtain an economic return on their agricultural production, including control weeds, pathogens, and insect pests. The use of pesticides is one of the methods that they use to control pests.

According to the World Health Organization (1997), poisoning can be prevented if pesticides are used safely and proper precautions are taken. To overcome the health problem of pesticide poisoning, a health promotion program for the safe use of pesticide was conducted for a group of voluntary farmers. This health promotion program was modified from the Supportive Environments Action Model (SESAME), which was one of the models presented at the International Conference on Health Promotion in Sundsvall, Sweden, in 1991 (WHO, 1996). The SESAME model is based on the participation of communities and individuals. The study activities followed the steps of the SESAME model: 1) identify needs and problems; 2) build alliances; 3) set targets, develop strategies, and plan evaluation; 4) design implementation and mobilize resources; 5) implement the creation of a supportive environment; 6) create maintenance structures; 7) monitor and evaluate; and 8) renew, reinforce, and reorient. The objectives of this study were to examine the knowledge, attitudes, and practices (KAP) concerning the safe use of pesticides through the implementation of a six-month training program on safe use of pesticides.

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Conceptual framework

A conceptual framework was used in the implementation steps of the SESAME Model. The independent variables (Fig 1) included the health education training program on the safe use of pesticides for voluntary farmers. Training techniques included group discussion, lectures with a slide presentation, a video demonstration, first aid training with role-play, a special training mannequin for CPR practice (life-size model), and sending appointment reminder cards. The health promotion program was hypothesized to effect the dependent variables of increased knowledge, attitudes and practices (KAP) on the safe use of pesticides. For statistical analyses, the mean scores of KAP on safe use of pesticides between pretest and posttest were evaluated by paired *t*-test.

MATERIALS AND METHODS

The study site was located in Don Kha subdistrict, Bang Phae district, Ratchaburi Province, Thailand. Before implementation, the researchers met and

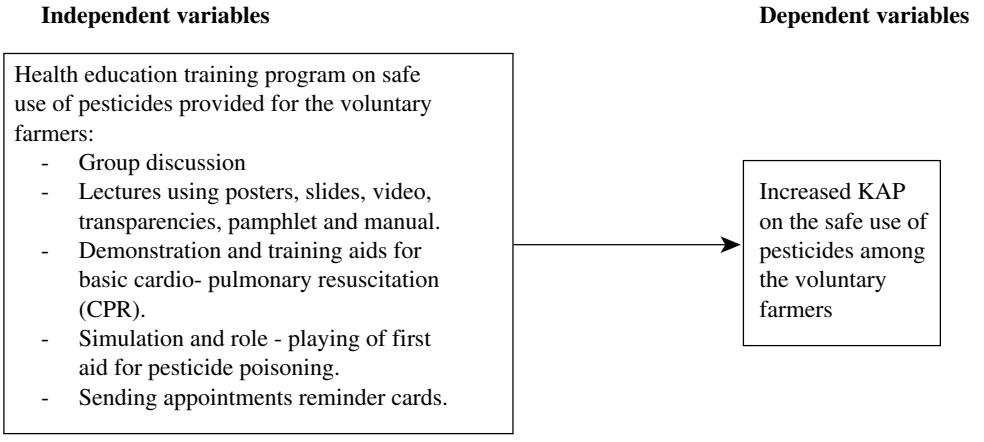

Fig 1- Conceptual framework of the study activities that was a part of the SESAME model.

identified problems of pesticide use with farmers. Finally, an agreement was reached to put together a training program that was to be given as much priority as production, quality, and safety in order to solve those problems.

The 33 voluntary representatives from 33 farming families were approved by the subdistrict Administrative Organization to be trained with this program. The research design was a Quasi-Experimental One Group Pretest-Posttest Study (Kleinbaun *et al*, 1982). Questionnaire interviews and home visits were used to collect KAP on safe use of pesticides. Cronbach's alphas of reliability on the knowledge, attitudes and practice were 0.78, 0.72, and 0.79, respectively. Content validity of the KAP was confirmed by five experts.

The training program conducted over a six-month period. The topics of the eight sessions included 1) pesticide use and pesticide problems in Thailand, 2) classification of pesticide hazards, 3) impact of pesticides on health and the environment, 4) types of pests, 5) guidelines for the safe use of pesticides, 6) first aid for pesticide poisoning and the patient transfer systems, 7) basic cardiopulmonary resuscitation (CPR) training, and 8) EM biotechnology for decreasing pesticide use.

RESULTS

The mean scores for knowledge on the safe use of pesticides increased from 13.3 to 18.7 (maximum score = 20), attitude scores increased from 32.2 to 38.9 (maximum score = 40), and practice score also increased from 23.4 to 35.5 (maximum score = 42) in pretests and posttests, respectively (Fig 2).

Post-implementation, the KAP on safe use of pesticides increased significantly (Table 1). After training, the farmers changed their behavior to a more appropriate use of pesticides. They wore long-sleeved shirts, long pants, and a hat while spraying the pesticides on plants. They always took a bath, washed their hair with soap and shampoo, and changed into clean clothes after spraying. They showed the ability to read pesticide labels and to select a lower concentration pesticide formula before purchasing a pesticide.

DISCUSSION

After attending the training program, the voluntary farmers changed their knowledge and attitudes concerning the safe use of pesticides. For example, harvesting fruits was done correctly, 7-10 days after spraying with pesticides, instead of harvesting when the products would get a good price or was beautiful, without waiting for the required period restriction. Almost all the trained farmers were aware of the risk of death, so they were careful about handling the pesticides. After work, they washed their bodies and hair with shampoo and soap, and they changed into clean clothes.

As the chief goal of the education process is to bring about changes in human behavior (Scotney, 1976), a six-month training period was an important method to help the voluntary farmers to change their behavior in the proper use of pesticides. One topic of health promotion program was first aid for pesticide poisoning, whereby a farmer could react to the actual

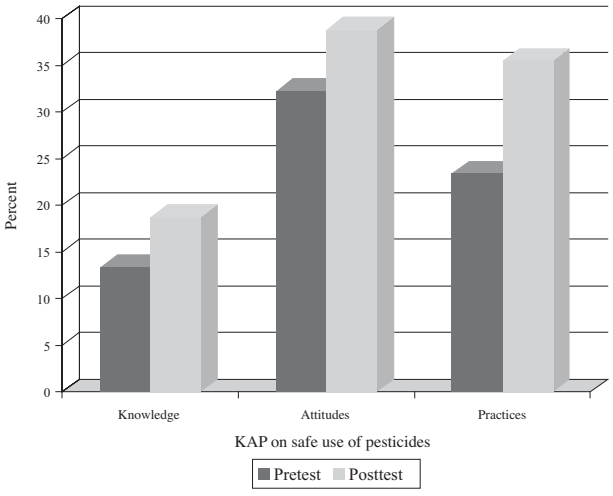

Fig 2- Comparisons of pretest/posttest KAP on safe use of pesticides of the voluntary farmers.

Table 1
Comparison of the mean scores of KAP on safe use of pesticides between pretest and posttest by paired *t*-test (n = 33).

	X	SD	*t*	p-value
Knowledge on safe use of pesticides				
Pretest	13.33	2.63	9.990	.000
Posttest	18.73	1.04		
Attitudes to safe use of pesticides				
Pretest	32.24	4.70	7.180	.000
Posttest	38.85	1.64		
Practices on safe use of pesticides				
Pretest	23.42	5.56	9.829	.000
Posttest	35.48	4.27		

situation. The trained farmers had self-belief and faith. For example, a grape farmer, 36-years-old said, *My dog had wet mouth, weakness, and labored breathing. I guessed that the dog ate something that was contaminated by pesticides. I recalled the knowledge from the training program. Therefore, I gave three raw white eggs to the* dog, *and then the dog vomited. Now the dog is all right. I am glad to have participated in the training program. It was useful, not only to man, but also to my pet animals"*.

Confidence and trust were essential for health education, when we were seeking to persuade people to change their habits, to do things differently, and often to change their views on the importance of specific activities. Health educators who are credible, friendly, and persistent can establish confidence and trust (Scotney, 1976). Six months of the training program and the home visit were used to establish such trust. The health educators had shown that they were people in whom the farmers could place their confidence, and that we truly wanted to help them. Obviously, the results of other studies have shown the similar findings by which health education could significantly improve KAP about the use of pesticides (Kaewchareon, 1990; Noosorn, 1997). There is no longer any doubt that the health of populations can be significantly improved with the active efforts of a variety of people, communities, and organizations including government, non-government, and private sectors. There is also no longer any doubt that the processes used to bring about change, the active engagement of people and communities in making their own choices about

priorities and about solutions, was critical to bringing about sustained and sustainable changes (Wise and Hearn, 2004). The evidence is strong, and this study has confirmed it.

In conclusion, the results indicated that the training program was effective. Significantly, the voluntary farmers had increased scores for KAP and pesticide use behaviors. This health promotion program is useful for farmers to improve their health, to change traditional methods of pesticide utilization, and to provide a self-help program of first aid and basic CPR for poisoning cases. This program was an effective intervention for farmers and it could be replicated in other settings.

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