Safety observance when spraying pesticide and pesticide related symptoms among Korean farmers

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Abstract. The purpose of this study was to examine safety observance when spraying pesticide and pesticide related symptoms among Korean farmers. As a cross-sectional study, a questionnaire survey was conducted in rural communities and an investigation carried out by a structured survey of 135 farmers. The results are as follows: The mean of safety observance when spraying pesticides was 3.05±0.58 (range: 1.31~4.00). The mean score of pesticide related symptoms was 1.44±0.38 (range: 1.00~2.71) and this indicates that subjects only occasionally display symptoms. The study found that farmer’s safety observance when spraying pesticide showed a significant correlations with their pesticide related symptoms.

Keywords: Farmer, Safety, Pesticide, Symptom

1 Introduction

Farmers have suffered from a variety of work-related injuries and diseases. They are exposed to a number of hazards related to farming activity. Pesticide exposure is a dominant concern among farmers that can result in acute poisoning or some chronic health outcomes such as neurological diseases or some types of cancer [1]. The improper handling of some pesticides may result in severe acute poisoning; in some cases, adverse health effects may also result from long-term, low-level exposures [2]. Therefore, it is important to educate farmers to receive treatment when they display symptoms of poisoning by pesticides and teach farmers to handle pesticides safely for managing their health properly. Education of pesticide users should be directed towards the avoidance of unnecessary use of pesticides, the adoption of a safe practice of application, and the defense of the crop, the consumers, and the environment. Educational activities should help farmers to understand the health hazard of pesticides, adopt the proper work practices, use their protective equipment properly, practice personal hygiene measures, recognize early symptoms of over-exposure or poisoning, and obtain first aid as soon as possible [3]. Previous studies have suggested that pesticide safety education among farmers could raise awareness of both pesticide exposure risk [4] and the adverse health consequences associated with acute pesticide poisoning [5].

Unless it is a case of known oral ingestion or eye contact, acute spraying pesticides is often overlooked as a cause of illness of farmers. What is even more alarming is...
that chronic illness related to long term pesticide exposure is even less likely to be identified. It is poorly documented in literature and studies [6].

One particular risk for farmers that must be assessed is the potential of poisoning related to pesticides. Observing safety guidelines when spraying pesticides and understanding pesticide related symptoms should be considered as an essential element when dealing farmers’ health.

This study is to examine how much farmers follow the safety guidelines when handling pesticides and to examine correlation between safety guideline observance and farmer’s syndromes. This study is also to determine the importance of observing safety guidelines when handling pesticides and to create basic data for farmer’s health management related to pesticides symptoms.

2 Methods

2.1 Research procedure

This study was aimed to provide basic data, yet accurate farmer’s health management through the evaluation of safety observance when spraying pesticide and pesticide related symptoms among rural farmers in Korea. As a cross-sectional study, a questionnaire survey was conducted in rural communities. Investigation was carried out by a structured survey with 135 farmers who submitted written consent that they understand and participate in study. We surveyed the safety guidelines observance when spraying pesticide, and their pesticide related symptoms.

The survey was conducted with participants who submitted signed consent that the survey results may be used only for study and guarantees all participants’ anonymity.

SPSS program 19.0 (SPSS Inc., Chicago, IL, USA) was used to analyze the data. Descriptive statistics were used to identify the general characteristics of the participants, the mean of farmers’ safety guidelines observance when spraying pesticide, and their pesticide related symptoms. Additionally, the Pearson correlation coefficient was used to determine the relationship between safety guidelines observance when spraying pesticide and pesticide related symptoms among farmers. A value of p < 0.05 was considered statistically significant.

2.2 Survey instruments

This study was conducted by using questionnaire that Lee [7] used in her study ‘the analysis of health condition and work related disease of farm workers’.

Measures of safety guidelines observance when spraying pesticide.

There were 13 components in questionnaire related to safety guidelines observance when spraying pesticide and this is a 4 point scale (1 point means “never observe” and 4 point means “must observe”). This means as the point is higher, subjects observe the safety guidelines. Cronbach's alpha for the present study was 0.89.
Measures of pesticide related symptoms.
There were 7 components in questionnaire when examining pesticide related symptoms and it was 3 point scale meaning 1 point (rarely/never), 2 point (occasionally), and 3 point (always). This indicates that as the point is higher, subjects display more pesticide related symptoms. Cronbach's alpha for the present study was 0.84.

3 Results

3.1 General characteristics and farming related characteristics of subjects
The total number of participants in this study was 135 farmers; 70 men (51.9%) and 65 women (48.1%). Seventy-four participants (54.8%) were below 60 years of age and 61 participants (45.2%) were over 61 years. The mean number of family members in the household was 2.8. 57.8% of subjects were middle or high school graduates and 33.3% of subjects were elementary school graduates or below elementary school education level. About type of agriculture, 19.3% of participants were rice farming; 54.8% were field agriculture; 14.1% fruits agriculture; and 11.8% others. About agricultural working period, 17.0% of participants were below 10 years; 26.7% were in the range between 11 and 20 years; 20.7% were 21 to 30 years, and 35.6% were over 31 years.

3.2 Safety observance when spraying pesticides
The components that are more than 10%, the subjects did not observe the safety as follows; ‘I wear mask even when diluting pesticide’ (11.1%), ‘I wear newly cleaned clothes whenever spraying pesticide’ (13.3%), and ‘I do not spray pesticide during the day’ (12.6%). The components that 21.5~57.7% of subjects indicated that they must follow the safety guideline when spraying pesticides and this percentage is considerably low. The mean of safety observance when spraying pesticides 3.05±0.58 (range: 1.31~4.00) and the mean of each component was 2.70~3.40.

3.3 Pesticide-related symptoms
Among pesticide related symptoms, tiredness (11.1%) was the most common symptom that more than 10% of subjects always expressed. The total mean of pesticide related symptoms was 1.44±0.38 (range: 1.00~2.71) and there were two components displayed more than mean (more than 1.5) and they are as follows; tiredness was 1.73 and eye disturbance was 1.54.
3.4 Relationship of safety observance when spraying pesticide and pesticide related symptoms

The Pearson correlation coefficient showed a significant association between safety observance when spraying pesticides and pesticide related symptoms ($r=-0.18$, $p=0.03$), that is, as the subjects observed the safety guidelines when spraying pesticides, the subjects displayed pesticide related symptoms less often.

4 Conclusions

Subjects of this study showed that they observe the safety guidelines when spraying pesticides sometimes or usually depending on items of safety guidelines. This explains that some subjects did not follow the safety guideline strictly as directed. There are more pesticides symptoms when farmers do not observe safety guidelines when handling pesticides. Therefore, the farmers need to be educated and assessed for the potential of poisoning injury related to pesticide exposure. The information obtained from this study is useful for pesticide related symptom management in the agricultural community. It also provides baseline information for local and national government to make decisions relevant to farmer health.

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References