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Health Hazards Associated With Self-Protective Behavior of Farmers Field Crops in Suanphueng District, Ratchaburi Province, Thailand

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ABSTRACT

This cross-sectional descriptive study aimed to examine the level of self-protective behaviors and to investigate their associations with personal factors, knowledge, and constructs of the Health Belief Model among field crop farmers in Suan Phueng District, Ratchaburi Province, Thailand. A total of 96 farmers aged 18 years and older were recruited using purposive sampling. Data were collected using a structured questionnaire and analyzed using descriptive statistics, including frequency, percentage, mean, and standard deviation. Associations between variables were examined using the chi-square test. The results indicated that the overall level of self-protective behaviors was high (mean = 3.93, SD = 0.46). Significant factors associated with self-protective behaviors included marital status (χ^2 = 11.04, p = 0.011), perceived susceptibility to health hazards (χ^2 = 22.07, p = 0.005), perceived benefits of self-protective behaviors (χ^2 = 58.48, p < 0.001), and perceived barriers to self-protective behaviors (χ^2 = 40.14, p < 0.001). These findings provide evidence to support the development of occupational health interventions and educational programs to enhance appropriate work practices and reduce exposure to health hazards among field crop farmers.

Keywords: Ergonomic risk, Municipal solid waste collectors, Significant fatigue

INTRODUCTION

Agricultural work is widely recognized as a high-risk occupation due to continuous exposure to physical, chemical, biological, and ergonomic hazards. In Thailand, field crop farmers are commonly exposed to adverse environmental conditions, including heat stress, extreme weather, pesticides, fertilizers, dust, noise, and hazardous working postures. These occupational exposures contribute to a wide range of adverse health outcomes, such as acute and chronic pesticide poisoning, musculoskeletal disorders, respiratory problems, heat-related illnesses, and occupational injuries.

Despite the availability of personal protective equipment (PPE) and safety guidelines, many farmers continue to experience preventable occupational health problems due to inadequate knowledge, low risk perception, limited access to protective resources, and behavioral barriers. The Health Belief Model (HBM) has been widely applied in occupational and public

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health research to explain and predict health-related behaviors. The model emphasizes perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action as key determinants of preventive behaviors.

Understanding the relationships between occupational health hazards, HBM constructs, and self-protective behaviors is essential for designing effective interventions tailored to agricultural workers. However, empirical evidence focusing on field crop farmers in rural districts of Thailand remains limited. Therefore, this study aimed to assess self-protective behaviors and examine their associations with personal characteristics, knowledge, and HBM constructs among field crop farmers in Suan Phueng District, Ratchaburi Province, Thailand.

LITERATURE REVIEW

Agricultural workers are widely recognized as a high-risk occupational group due to their frequent exposure to multiple physical, chemical, ergonomic, and biological hazards (International Labour Organization [ILO], 2011; Rautiainen et al., 2004). In developing and middle-income countries, small-scale and field crop farmers are particularly vulnerable because of limited access to occupational health services, inadequate training, and inconsistent use of personal protective equipment (PPE) (Ngowi et al., 2007; WHO, 2017).

Farmers are commonly exposed to excessive heat, ultraviolet radiation, noise, vibration, and dust, which may lead to heat-related illnesses, dehydration, hearing loss, and respiratory problems (Kjellstrom et al., 2016; Xiang et al., 2014). Heat stress is a major concern in tropical countries such as Thailand, where high ambient temperatures and humidity significantly increase physiological strain and reduce work capacity (Tawatsupa et al., 2013; Kjellstrom et al., 2014). Pesticide exposure remains one of the most critical occupational health risks in agriculture. Numerous studies have documented associations between pesticide exposure and acute symptoms (e.g., dizziness, nausea, skin irritation) as well as chronic outcomes, including neurological disorders, respiratory diseases, and certain cancers (Alavanja et al., 2013; Damalas & Koutroubas, 2016). In Thailand, inappropriate pesticide handling practices and insufficient use of PPE have been reported among small-scale farmers, increasing the likelihood of occupational poisoning and long-term health effects (Sangchan et al., 2012; Kachaiyaphum et al., 2010). Agricultural work is characterized by repetitive motions, awkward postures, heavy lifting, and prolonged manual labor, which substantially increase the risk of work-related musculoskeletal disorders (WMSDs) (Osborne et al., 2012; Punnett & Wegman, 2004). WMSDs are among the leading causes of disability and reduced work productivity in agricultural populations (Fathallah, 2010). Studies in Southeast Asia have reported high prevalence of low back pain, shoulder pain, and knee disorders among farmers, reflecting the ergonomic burden of field-based tasks (Kaewdok et al., 2020; Choobineh et al., 2014). Self-protective behaviors, such as the consistent use of PPE, adherence to safe work practices, and engagement in preventive health behaviors, are critical for reducing occupational health risks. The Health Belief

Model (HBM) has been widely applied to explain and predict health-related behaviors in occupational and environmental health contexts (Rosenstock et al., 1988; Glanz et al., 2015). According to the HBM, individuals' perceptions of susceptibility, severity, benefits, barriers, and self-efficacy influence their likelihood of adopting protective behaviors. Prior studies among agricultural workers have demonstrated that higher perceived risk and greater perceived benefits are positively associated with PPE use and safer pesticide handling practices, whereas perceived barriers and limited access to resources are negatively associated with protective behaviors (Adejumo et al., 2019; Damalas et al., 2019).

Despite extensive evidence on occupational hazards in agriculture, limited research has simultaneously examined multiple categories of health hazards and their association with self-protective behaviors among field crop farmers in Thailand. Moreover, few studies have integrated occupational health risk assessment with behavioral models such as the HBM to explain farmers' preventive practices. Therefore, the present study aims to address these gaps by investigating health hazards and their association with self-protective behaviors among field crop farmers in Suan Phueng District, Ratchaburi Province, Thailand, providing empirical evidence to inform targeted occupational health interventions and policy development.

METHODOLOGY

A descriptive cross-sectional study was conducted to examine self-protective behaviors and their associated factors among field-crop farmers in Pa Wai Subdistrict, Suan Phueng District, Ratchaburi Province, Thailand.

Participants and Sampling

The study population comprised farmers aged 18 years and older. A total of 96 participants were recruited using purposive sampling based on eligibility criteria. All participants were actively engaged in field-crop cultivation at the time of data collection.

Data Collection and Instrument

Data were collected using a structured questionnaire. The instrument consisted of sections assessing personal characteristics, knowledge, and Health Belief Model (HBM) constructs, including perceived susceptibility, perceived benefits, and perceived barriers, as well as self-protective behaviors. The questionnaire was administered through self-report.

Statistical Analysis

Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarize participant characteristics and key study variables. Associations between independent variables and self-protective behaviors were analyzed using the chi-square (χ^2) test. Statistical significance was set at $p < .05$.

DISCUSSION

Overall, self-protective behaviors among field-crop farmers in Suan Phueng District, Ratchaburi Province, Thailand were at a high level (M = 3.93, SD = 0.46), indicating generally favorable occupational health practices. This finding is consistent with previous studies reporting moderate to high levels of preventive behaviors among farmers exposed to occupational health risks.

Chi-square analyses showed that marital status was significantly associated with self-protective behaviors ($\chi^2 = 11.037$, $p = .011$). In addition, key Health Belief Model constructs—perceived susceptibility ($\chi^2 = 22.066$, $p = .005$), perceived benefits ($\chi^2 = 58.477$, $p \leq .001$), and perceived barriers ($\chi^2 = 40.143$, $p \leq .001$)—were significantly related to self-protective behaviors. These results support the Health Belief Model, indicating that higher perceived risk and benefits, along with lower perceived barriers, are associated with better preventive practices.

Overall, the findings highlight the importance of theory-based health promotion strategies that enhance risk perception, emphasize benefits, and reduce perceived barriers.

CONCLUSION

This study demonstrates that self-protective behaviors among field-crop farmers were generally at a high level, indicating a favorable pattern of occupational health practices. Significant associations were observed between self-protective behaviors and key Health Belief Model constructs, including perceived susceptibility, perceived benefits, and perceived barriers, as well as marital status. These findings support the applicability of the Health Belief Model in explaining preventive behaviors in agricultural settings.

The results highlight the importance of strengthening farmers' risk perception, emphasizing the benefits of protective practices, and reducing perceived barriers to enhance sustained adoption of self-protective behaviors. Theory-based health promotion interventions that target these cognitive and practical factors may improve the effectiveness of occupational health programs. Future research should consider longitudinal designs and broader samples to better establish causal relationships and enhance generalizability.

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