



## Original article

Prevalence and associated factors of health problems among Indonesian farmers<sup>☆</sup>Tantut Susanto<sup>a, \*</sup>, Retno Purwandari<sup>b</sup>, Emi Wuri Wuryaningsih<sup>c</sup><sup>a</sup> Family and Community Health Nursing Department, School of Nursing, University of Jember, Indonesia<sup>b</sup> Basic Science Nursing and Nursing Management, School of Nursing, University of Jember, Indonesia<sup>c</sup> Mental Health Nursing Department, School of Nursing, University of Jember, Indonesia

## ARTICLE INFO

## Article history:

Received 3 March 2016

Received in revised form

26 May 2016

Accepted 13 October 2016

Available online 30 March 2017

## Keywords:

Underweight

Overweight

Anemia

Pain

Farmers

## ABSTRACT

**Objective:** This study examined the prevalence of health problems and their associated factors among Indonesian farmers.**Methods:** A cross-sectional study was conducted among 179 farmers who completed a self-administered questionnaire and physical examination. The data were analyzed using descriptive, comparative, and multinomial logistic regression analyses.**Results:** The prevalence of varying health problems was 28.5% underweight, 10.6% overweight, 62.6% anemia, and 50.3% joint and bone pain. These results showed that being older and drinking coffee increased the likelihood of being underweight, while having less than 30 min of recess per working period and working for more than 5 days per week decreased the likelihood of being overweight. Meanwhile, being a younger male and working for less than 5 days per week decreased the risk of anemia. Furthermore, older age and less than 30 min of recess per working period were associated with increased joint and bone pain.**Conclusions:** We recommend the provision of screening programs and health education programs, including dietary programs and physical and exercise programs, by the occupational health nursing (OHN) program, to prevent and reduce health problems in the agricultural sector.© 2017 Shanxi Medical Periodical Press. Publishing services by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## 1. Introduction

The majority of Indonesia's labor force work in informal sectors in rural areas, particularly the agricultural sector. Based on the results of a study by the Occupational Safety and Health Board of the Occupational Safety and Health Agency, workers in the informal economy in Indonesia were found to suffer from malnutrition, diseases caused by parasites (e.g., worms), asthma, skin allergies, cancer, chemical poisoning, food poisoning, disorders of the muscles and bones, respiratory disorders, diseases of the lymph nodes, and blood diseases.<sup>1</sup> This report indicated that Indonesian farmers are vulnerable and at risk for numerous health problems that affect their productivity and long-term health status.

Additionally, there is a large body of evidence from other countries showing that socio-demographics,<sup>2</sup> health and safety at the work environment,<sup>3</sup> psychosocial factors,<sup>4</sup> and hazards<sup>5</sup> influence the health problems among farmers, including malnutrition/being underweight, low back pain, joint and bone pain, and stress of the workload. A previous study illustrated that the musculoskeletal disorder diseases are the most common disorder among farmers, amounting up to 1144 million cases of musculoskeletal disorders.<sup>6</sup> In addition, the agricultural sector has all aspects of workplace safety and occupational risks. The most common workplace risks includes all types of muscle pain due to sprains or sprains from lifting and carrying, repetitive stress disorders, improper ergonomics, and various psychosocial problems.<sup>1</sup> Evidence shows that 23% of workers do not work properly and are absent from work for eight days due to back pain. Furthermore, worker productivity can be decreased by 60% due to sore necks and/or wrists.<sup>7</sup>

Occupational health and safety efforts in an agricultural is an attempt to create a working atmosphere that is safe and comfortable with end goal of achieving higher productivity.<sup>8</sup> The goal is absolute health and safety to be present for any type of fieldwork,

<sup>☆</sup> This project is supported by Ministry of Research, Technology, and Higher Education (KEMENRISTEK-DIKTI) (No. 192/UN25.3.1/LT/2015).

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Peer review under responsibility of Shanxi Medical Periodical Press.

without exception. Health and safety in the agricultural sector is expected to prevent and reduce the risk of accidents or illness because of performing the job.<sup>9</sup> Health and safety in agriculture is an important aspect to support the welfare and increase the productivity of workers and the larger public, as health and safety efforts are considered to reduce the risk of the emergence of occupational diseases.

The agricultural sector is the number one source of commodity exports from Indonesia and contributes significantly to the Indonesian economy. It is necessary to approach occupational health and safety from a primary healthcare perspective when dealing with less tightly organized sectors such as agriculture. However, the low awareness of farmers' current occupational safety and health is a current issue because the work of farmers currently does not have standard occupational health and safety standards. Agricultural workers are an at risk population,<sup>4</sup> and when studying such populations, it is helpful to know the risk factors that are associated with specific health outcomes, as the presence of these risk factors can be used to predict the presence of those health outcomes in the population. Risk factors that influence the presence of health problems fall into several categories among them biological risks, social risks, economic risks, lifestyle risks, and life event risks.<sup>10</sup> Therefore, we used a risk approach as the research framework in this study to identify risk factors among farmers (Fig. 1). Furthermore, more in-depth study needs to be determine the characteristics of malnutrition, joint and bone pain, and anemia in the tobacco farmers, specifically. In the present study, we investigated (1) the prevalence of health problems among Indonesian farmers, including being underweight or overweight, anemia, and joint and bone pain; and (2) the associated risk factors related to these health problems among Indonesian farmers.

## 2. Methods

### 2.1. Study design

This study was a cross-sectional quantitative study.

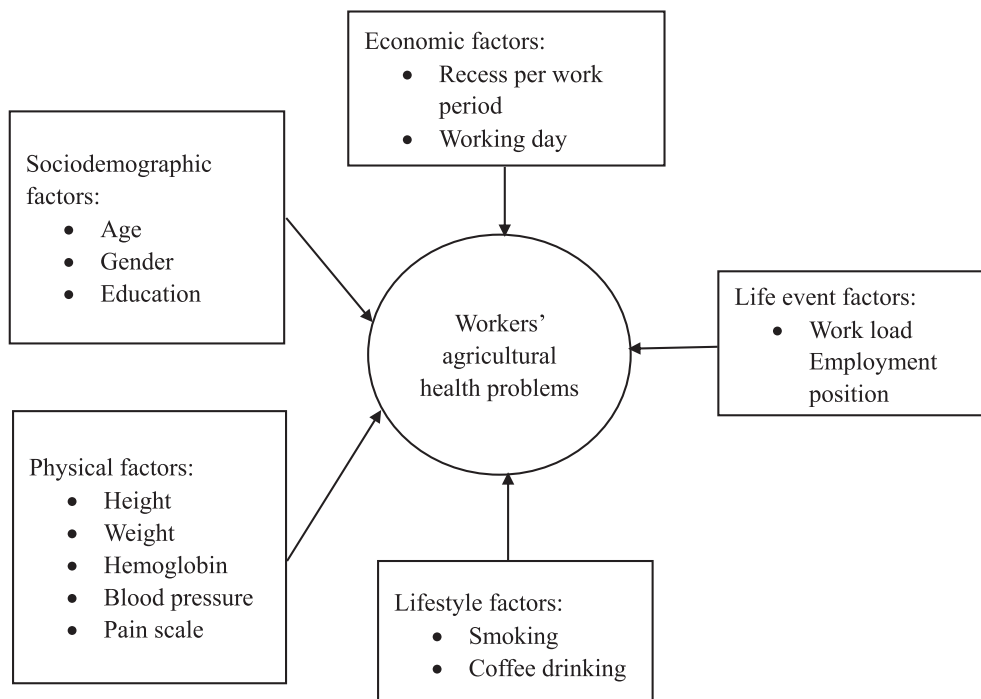


Fig. 1. Research framework of factors related to farmers' agricultural health problems, using a risk-based approach.

### 2.2. Study population

This study was conducted in the rural, agricultural area of Jember, East Java in Indonesia. According to the national statistics data from 2013, the dominant use of land in the city of Jember was for agricultural activities, at 51.47% of the total area of the city. Plantations were devoted to 14.92% of the land, residential areas comprised 27.05% of the land, fishponds covered 0.01% of the land, and other use of the land area were at 4.20%.<sup>11</sup>

In this study, our target sample size was estimated using a 95% confidence interval with a precision of 10%. The Jember database has the proportion of people working in the agricultural sector at approximately 41.20% of the population. Therefore, the required sample size was 169 farmers. We used a multiple-stage, random sampling method to recruit farmers for this survey. In the preliminary stage, we randomly selected an area and then selected farming groups from each area in two of the districts from that area that were in the primary agricultural sector.

### 2.3. Ethical considerations

The study was approved by the Ethical Committee Review Board of the Research of University of Jember. Then, we obtained ethical and administrative approval from the Department of Political Unity for the Protection of the Public, the District National Health Department, and the public health centers. We interviewed and informed public health centers about the study, and then informed the participants about the study in their farming groups in each area. After participants' permission was received, a data collection plan was designed.

### 2.4. Measurements

Metrics used in this study were selected based on a risk assessment approach<sup>10</sup> (Fig. 1). Biological risk factors were assessed via physical factors including height and weight (a measure of nutritional status), blood pressure (reflecting hypertension),

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