Study of Ergonomic Risks of Maize Farmers in Lampang, Thailand

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Abstract

Maize farmers are agricultural workers who are at risk due to their working conditions—especially, ergonomic problems that result in long-term health complications. The purpose of this study was to assess the ergonomic risks among the maize farmers in the Mueang Pan district, Lampang province. Purposive sampling was used to select 320 participants. This research used measures such as RULA techniques and questionnaires about health hazards and working conditions. The result showed a mean score of 7, using RULA techniques. It indicated that the ergonomic problems are concerning and need improvement urgently. In regard to pain, the study found that about 44.1% of maize farmers reported pain in their lower back and 39.1% on their hands. The analysis of the correlation between personal factors and body pain showed that age and experience of participants were significantly correlated with body pain ($p<0.01$). The results suggested that maize farmers have high ergonomic risks. Stakeholders should seek solutions and cooperate to improve the working environment, encourage proper work behaviours, reduce ergonomic risk factors, and improve the living standard of maize farmers.

Keywords : Ergonomics, Risk assessment, Maize farmers, Working conditions

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1. Introduction

Maize, as livestock feed, is an important economic crop of the world that consistently increased demand. The agriculture ministry of the United States estimated the global demand for maize as animal feed in 2017 to be about 1 billion tons, an increase of 4.62% because of the growth of livestock and grain industry, and the increase of ethanol production [1]. According to the data from Agricultural Economic Officials, Thailand has produced roughly 4 million tonnes with an export value of about 5 billion Thai baht [2]. The majority of maize farming is located in the Northern part of Thailand. Lampang is one of the upper-northern provinces which has the most production. Agricultural sites are scattered around the entire province and this has gradually created jobs for locals.

Nonetheless, agricultural jobs carry ergonomic risks, both from the work environment and behaviour. Both the International Labour Organisation and the International Ergonomic Association have stated that, agriculture is the most dangerous occupational sector in both developing and developed countries [3]. The physical dangers from agricultural work include high risks of using machinery and equipment and the exposure to chemicals. These can cause work-related injuries and illnesses. Specifically, ergonomic risks, which are counted as 54.8% of the total external labour force in Thai farmers [4]. In 2016, the National Statistic Officials revealed that the most problem caused by regular external workforce is an unnatural work posture. It calculated 46.8% of all the problems [4].

According to the study by Chanprasit and Kaewthummanukul [5], they found that maize farmers usually experience work-related musculoskeletal disorders because of inappropriate work postures, repetitive movements, and long hours of working. Thus, these problems can result in the long-term health of the workers as well as on their work efficiency. Based on all of the information above, our team have interests in the ergonomic problems of maize farmers. This study aimed to assess the ergonomic risks among the maize farmers in the Mueang Pan district, Lampang province. The result showed that ergonomic risks can be classified into different levels. This result should be used as a fundamental knowledge to monitor and protect the health of Thai farmers.

2. Materials and Method

2.1 Participants

In the first phase, we surveyed 320 (N=1525) Thai maize farmers in Mueang Pan district, Lampang province, Thailand. The appropriate sample size was determined by the study of Krejcie and Morgan [6]. The farmers answered the modified Nordic Musculoskeletal Questionnaires (NMQ), the more focus version about work-related musculoskeletal disorders for maize farmers [7]. In the second phase, the research team selected 30 farmers from phase one,