

# Effectiveness of Occupational Health Training on Tea Farmers in Indonesia

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**Abstract**—The plantation sub-sector is the largest contributor to Gross Domestic Product (GDP) in the Indonesian economy. The risk of musculoskeletal disorders (MSDs) in agriculture often occurs in both developed and developing countries. It is necessary to conduct occupational health and safety training for tea farmers in Indonesia to provide an understanding to tea farmers about occupational health. A descriptive research method was used in this study to see whether there was a change in the awareness and knowledge of tea picker workers on occupational health after attending the training. The Wilcoxon signed-rank test difference test was conducted to see the effect of the training carried out. The results of the statistical tests conducted showed an increase in workers' knowledge of occupational health with a significance value of 0.008, the impact that would be felt if not paying attention to occupational health with a significance value of 0.012, and complaints of pain in the body parts during/after work with a significance value of 0.018.

**Keywords**—*musculoskeletal disorders, tea farmers, occupational health*

## I. INTRODUCTION

The plantation sub-sector is the largest contributor to Gross Domestic Product (GDP) in the Indonesian economy. In 2018 the plantation sub-sector contributed about 35% of GDP. Tea is a plantation commodity that plays an important role. This is because tea is an export commodity as a foreign exchange earner, increasing farmers' income, providing jobs, and having a positive impact on the environment to prevent floods and landslides. In addition, tea plantations can also increase tourism potential in mountainous areas [1]. The risk of musculoskeletal disorders (MSDs) in agriculture often occurs in both developed and developing countries. Because in general, the activities carried out in agriculture such as harvesting, carrying loads, pruning, planting, and other manual activities that are carried out with awkward postures, such as bending and kneeling are influenced by individual characteristics and improper tool design that causes MSDs to occur. Disorders that are often felt are in the lower back. This shows the importance of safety and health in agriculture to increase awareness of risk factors associated with MSDs [2]. Joint and bone pain is a health

problem that occurs in 50.3% of 179 agricultural workers in Indonesia. This is influenced by working hours of more than 5 days per week and lack of rest [3]. In tea farmers who still carry out harvesting activities manually, it shows that the highest musculoskeletal prevalence rate is in the stem area, this occurs in both male and female workers [4]. Improper work posture factors and work activities that are repeated for more than 2 hours per day need to be considered to improve processes and improper work postures [5]. Workers with severe musculoskeletal disorders may experience a permanent disability that prevents them from returning to work or performing simple daily activities. Therefore, adequate rest periods, ergonomic interventions, and personal protective equipment are needed to minimize the discomfort of tea pickers [6]. Training of 68 pineapple farmers in Johor, Malaysia can reduce the musculoskeletal complaints of workers after 2 months [7]. The Occupational Health and Safety (OHS) training intervention was also able to increase the knowledge of 75 tea farmers in Assam India [8]. This is the background of the need for OHS training for tea farmers in Indonesia.

## II. METHODOLOGY

The methodology used is the descriptive research method. Aims to get a picture of how the awareness and knowledge of tea picker workers on occupational health. The activities carried out were in the form of training for 35 tea pickers in Neglasari Pangalengan Village, Bandung Regency, which was held on Wednesday, March 31, 2021. The training materials provided were about the importance of occupational health and how to apply manual workload lifting methods. By inviting 2 resource persons, namely the head of the UNISBA Clinical Health Service Unit and the head of the UNISBA Work Design Analysis & Ergonomics (APK & E) Laboratory. The collection of data and information about the participants was done by giving a questionnaire before and after the training. The content of the questionnaire consists of 2 parts, the first contains demographic data of participants, namely name, gender, age, and work experience. The second contains 10 questions then participants choose one of the answers provided. The questions given are:

- 1) Do you know about occupational health? (P1)
- 2) In your opinion, is it important to pay attention to occupational health? (P2)
- 3) Do you know the impact that will be felt, if you do not pay attention to occupational health? (P3)
- 4) Do you know how to lift the right weight? (P4)
- 5) Do you know that lifting weights manually is dangerous for long-term health? (P5)
- 6) Do you think lifting weights manually properly and correctly is necessary for doing the job? (P6)
- 7) Do you know that improper manual lifting techniques will result in injury to body parts? (P7)
- 8) Do you feel pain in any part of your body during/after work? (P8)
- 9) Do you have a desire to know how to use the correct manual lifting technique in carrying out work so as not to cause injury to body organs? (P9)
- 10) After you know the importance of occupational health and good hiring methods, will you apply them in your work? (P10)

Furthermore, from the results of the questionnaire, a different test was carried out, aiming to see whether there was a change in the awareness and knowledge of tea picker workers on occupational health. Before the difference test is carried out, a prerequisite test is carried out, namely the normality of the data to determine what difference test method may be used. If the data is normally distributed, it can use the parametric statistical method with the ANOVA method or the t-test. However, if the data are not normally distributed, the difference test is carried out using non-parametric statistical methods with the Wilcoxon signed-rank test method or Friedman and Mann Whitney U [9].

### III. RESULTS AND DISCUSSION

From the results of the questionnaire given to 35 participants, the demographic data of the training participants can be seen in table 1. The number of male participants is 57% more than female participants, almost 89% of workers are of productive age, and 43% of participants have work experience above 10 years. Then table 2 shows the results of the different tests of participants who have attended the training. The difference test was carried out using the Wilcoxon signed-rank test method because the resulting data were not normally distributed. From the results of the difference test, only 3 questions indicate a change in awareness and knowledge of tea pickers with a significance value (p) less than 0.05. The first question P1 is about knowledge of occupational health with a significance value of 0.008, which shows the effect of the training given to tea pickers on the understanding of occupational health. The second question P3 is the impact that will be felt if you do not pay attention to occupational health

with a significance value of 0.012, which shows the effect of the training given to tea pickers on the impact that will be felt if you do not pay attention to occupational health. In the third question P8 felt complaints of pain in body parts during/after work with a significance value of 0.018, which indicates the effect of training given to tea pickers on complaints of pain in body parts during/after work. The results of the difference test conducted are in line with research conducted by Elnagdy, 2020 [8].

TABLE I. DEMOGRAPHIC DATA OF TRAINING PARTICIPANTS

Participant Demographics		Amount	Percentage (%)
Gender	Female	15	43
	Male	20	57
Age	20 – 30 years	2	6
	31 – 40 years	9	26
	41 – 50 years	14	40
	51 - 60 years	6	17
	61 – 70 years	4	11
Work experience	0 - 10 years	20	57
	11 - 20 years	5	14
	21 – 30 years	7	20
	31 – 40 years	3	9

TABLE II. TABLE 2. STATISTICAL TEST RESULTS

Question	Value Significance (p)	Inference
P1	0,008	Difference
P2	0,275	No difference
P3	0,012	Difference
P4	0,305	No difference
P5	0,334	No difference
P6	0,336	No difference
P7	0,134	No difference
P8	0,018	Difference
P9	0,108	No difference
P10	0,317	No difference

### IV. CONCLUSION

The training conducted for 35 tea pickers about the importance of occupational health can increase workers' knowledge of occupational health knowledge, the impact that will be felt if they do not pay attention to occupational health, and complaints of pain in body parts during/after work. The results of this training can be used as basic information for tea plantation managers to reduce musculoskeletal impacts on workers. For further research, interventions can be carried out in the form of applying K3 to tea pickers and seeing the effectiveness of the interventions carried out.

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