

Redesign of the Traditional Handloom for Sarong Female-Weavers Based on Anthropometric Data

Iwan Muhamad Ramdan¹, Krishna Purnawan Candra², Dina Lusiana¹, Krispinus Duma³

¹Fac. Public Health, ²Dept. Agricultural Product Technology, Fac. Agriculture, ³Dept. Public Health Science, Fac. of Medicine, Mulawarman University, Samarinda, Indonesia

Abstract

Introduction: Poor working posture due to non-ergonomic handloom design might be a cause of musculoskeletal disorders (MSDs) in Samarinda Sarong weavers.

Objectives: This study describes the inconsistency of the present handloom used with weaver anthropometry data and presents a new design of handloom based on anthropometric dimensions.

Method: An anthropometric survey was carried out to determine the anthropometric dimensions of 50 female weavers. The existing handloom dimensions were also measured. The data were analysed using descriptive statistics (min., max., mean, median, mode, standard deviation and 5th, 50th and 95th percentiles), as well as distribution and uniformity. The Indonesian Standard for Workstation Design (ISWD) was used to redesign the chair and table of the traditional handloom.

Results: The traditional handloom dimensions were found to be incompatible with the body dimensions of the female weavers. This suggests that the weavers MSD exhibited could be due to this incompatibility. Based on the anthropometric data collected, we have redesigned the traditional handloom.

Conclusions: The anthropometric data of the Samarinda Sarong female-weavers revealed body dimensions ill-suited to current traditional handloom dimensions. We have redesigned the traditional handloom based on these findings.

Keywords: *Anthropometric dimension, musculoskeletal disorders, ergonomic, working posture, redesign handloom.*

Introduction

In several countries, the rising of musculoskeletal disorders (MSDs) prevalence resulted considerable costs for both health and the weaving industry.^{(1),(2)} Recently, we reported that 85% of Sarong Samarinda weavers in Indonesia experienced MSDs prevalence, with incidence of low, moderate, and high ratings at 15.0%, 7.5% and 77.5%, respectively.⁽³⁾ Skeletal muscle pain was primarily detected in the lower neck, shoulders, upper hands, bottom, waist, thighs, calves and ankles.

MSDs were found to be associated with the education level, work experience, prolonged sitting time, work posture and body anthropometry. Work posture was the dominant variable responsible for MSD prevalence. Poor work posture may be caused by the ill-suited fit of the handlooms' design to the anthropometry dimensions of the weavers.⁽³⁾

The risk factors of MSDs for the weavers are include awkward and static work postures, twisting and lifting motions, pushing and pulling motions, and repetitive work.^{(2),(3),(4)} Awkward and static posture problems are generally caused by non-ergonomic work equipment and workstation design,⁽⁵⁾ which greatly affected on performance and work productivity.⁽⁶⁾ This research describes the redesign of traditional handlooms, which is used by Samarinda Sarong weavers based on their anthropometric data.

Corresponding Author:

Iwan Muhamad Ramdan

Fac. Public Health, Mulawarman University,
Samarinda, 75123, Indonesia

e-mail: iwanmuhamadramdan@gmail.com