



Research

The Relationship Between Working Posture and Working Duration with Musculoskeletal Disorders (MSDs) Complaints Among Tope Le'Leng Sarong Weavers of the Kajang Ammatoa Tribe in Bulukumba Regency

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ABSTRACT

The occupation of weaving Tope Le'leng sarongs among the Kajang Ammatoa tribe carries a high risk of developing Musculoskeletal Disorders (MSDs). This study aims to examine the relationship between occupational factors, specifically working posture and duration of work, and the prevalence of MSDs among Tope Le'leng weavers. This is a quantitative study using a cross-sectional design. The population consisted of all Tope Le'leng sarong weavers in the Kajang Ammatoa tribe, Bulukumba Regency, totaling 42 individuals, with total sampling technique employed. Data were collected using the Nordic Body Map questionnaire to assess MSD complaints and the Rapid Entire Body Assessment (REBA) method to evaluate working posture. Data were analyzed using the Chi-Square test with a significance level of $\alpha = 0.05$. The results showed a significant relationship between working posture and MSD complaints ($p = 0.000$), as well as between duration of work and MSD complaints ($p = 0.017$). Based on these findings, it is recommended that workers take breaks every 1-2 hours during or after weaving for stretching exercises, and use seating cushions and backrests to reduce MSD risks.

1. Introduction

The development across all sectors of industry and service activities has continued to increase in line with economic growth. However, this growth not only brings positive impacts but also negative consequences, particularly in the form of increased risks to workers' safety and health. The informal sector represents the most common form of household industry found in society. This type

of business is often run by individuals with limited capital, relies on simple production equipment, and lacks standardized working hours. The informal sector is accessible to anyone and relatively easy to establish, making its exact number difficult to quantify. Nevertheless, the proliferation of such businesses contributes significantly to labor absorption and reduction of unemployment (Habibie, 2017).

According to the latest estimates by the International Labour Organization (ILO), approximately 2.78 million workers die each year due to occupational accidents and work-related diseases. Of these deaths, around 2.4 million (86.3%) are caused by work-related illnesses, while more than 380,000 (13.7%) result from workplace accidents (ILO, 2018). Data from the Labour Force Survey (LFS) in Great Britain in 2017 reported that musculoskeletal disorders ranked second among occupational diseases, with an average prevalence of 469,000 cases or 34.54% over the past three years (Wiranto et al., 2019).

According to the 2018 Indonesian Basic Health Research, the prevalence of musculoskeletal diseases diagnosed by health professionals was 11.9%, and based on symptoms or self-reports, the prevalence reached 24.7%. Although the exact number of people suffering from lower back pain in Indonesia is unknown, estimates range from 7.6% to 37%. Data from the Central Bureau of Statistics (2018) also reported that 26.74% of the working population aged 15 years and above experienced health complaints or disorders, primarily due to declining muscle strength with increasing age (Ministry of Health of the Republic of Indonesia, in Kumbea et al., 2021).

Non-ergonomic working postures force workers to adopt unnatural body positions during their tasks. This continuous strain in awkward positions places excessive load on muscles, potentially leading to injuries or trauma involving muscle tissues, soft tissues, and the nervous system. Such conditions are likely contributors to Musculoskeletal Disorders (MSDs). The resulting trauma may manifest as pain, tingling sensations, swelling, or muscle weakness. These tissue injuries generally result from chronic exposure, excessive stretching, or prolonged pressure on specific areas of the body (Mallapiang, 2020).

Working duration refers to the length of time an individual is exposed to occupational risk factors, typically measured in hours per day. The longer the exposure, the higher the risk of adverse health effects (Septiani, 2017:20). Generally, a person can work effectively for about 6 to 8 hours per day, or 40 hours per week (Suma'mur, 2014:411, in Kusumalinda, C. 2017). When working hours exceed an individual's capacity, it often results in reduced efficiency, increased fatigue, health problems, and a higher likelihood of accidents, ultimately lowering work productivity.

A preliminary survey conducted on January 20, 2022, involving ten Tope Le'Leng sarong weavers in Dusun Benteng, Tana Toa Village, revealed complaints of pain in various body parts during or after work. Approximately 80% of the respondents reported experiencing pain, particularly in the back (30%), neck (20%), and legs (30%). The typical weaving posture involves sitting on a wooden platform with legs extended forward and the head bent downward, performing repetitive movements for unpredictable durations ranging from 8 to 10 hours per day. Weavers usually take a 1-2 hour break for midday prayer and lunch.

Based on the background described above, the authors were motivated to conduct a study entitled: "The Relationship Between Working Posture and Working Duration with Musculoskeletal Disorders (MSDs) Complaints Among Tope Le'Leng Sarong Weavers of the Kajang Ammatoa Tribe in Bulukumba Regency."

2. Method

This study employed a quantitative approach with an analytical design using a cross-sectional study method. The population consisted of all Tope Le'Leng sarong weavers from the Kajang Ammatoa tribe residing in Tana Toa Village, Kajang Subdistrict, Bulukumba Regency, totaling 42 individuals. A total sampling technique was applied to include all participants in the study.

The research instruments used were as follows:

- Nordic Body Map questionnaire – to identify and assess musculoskeletal disorder (MSDs) complaints;
- REBA (Rapid Entire Body Assessment) form – to evaluate workers' body posture during weaving activities;
- Camera – to capture the body posture of weavers while performing their tasks;
- Protractor – to measure the angle formed by body posture during work.

3. Results & Discussion

The study results contain 400-900 words describing the overall information obtained during the research process. Research results can be arranged based on the research variables/objectives and the information the researchers found during the research. The study results include an explanation of the contents of the table row or a picture of the study's results accompanied by the table number or picture as a description. The maximum number of tables and/or images is five pieces placed on the article's last page.

Discussion of the results of research and testing obtained in the form of theoretical explanations, the discussion text contains 1000-1500 words. Things to note are: Does not display/repeat research data. Each research finding is compared or synthesized with the results of other research and is linked to the relevant theory. In this sub-chapter describes the strengths and limitations of this research, and the possibility of further development.

Table 1. Respondent Characteristics

Characteristics	Respondents	Frequency (n=42)	Percentage (%)
Working Duration	Meets Standard	23	64.8
	Does Not Meet Standard	19	45.2

Characteristics	Respondents	Frequency (n=42)	Percentage (%)
Additional Occupation	Housewife (IRT)	27	64.3
	Unemployed	12	28.6
	Farmer	3	7.1
Working Posture	Low Risk	25	59.5
	Moderate Risk	17	40.5
MSDs Complaints	Mild Complaints	26	61.9
	Moderate Complaints	16	38.1

Table 2. Relationship Between Variables

Variable	MSDs Complaints			
		Mild	Moderate	Total
Working Posture	Low Risk	23	2	25
	Moderate Risk	3	14	17
Working Duration	Meets Standard	10	13	23
	Does Not Meet Standard	16	3	19

1. The Relationship Between Working Posture and Musculoskeletal Disorder (MSDs) Complaints Among Tope Le'Leng Sarong Weavers of Kajang

According to Grandjean (1993), as cited in Tampubolon (2020), posture is defined as the average orientation of body parts. A person's working posture is determined by their body dimensions and the size or configuration of the tools or equipment used during work. While working, the body posture must remain in balance to allow for comfort and endurance. Body equilibrium is influenced by the base of support (e.g., floor area) and the height of the center of gravity. When a worker's posture significantly deviates from the natural or neutral position, it can cause localized mechanical stress on muscles, ligaments, and joints. This may lead to injuries in the neck, spine, shoulders, wrists, and other areas. An unnatural working posture refers to a body position in which parts of the body

move away from their natural alignment. The further a body part is from the center of gravity, the greater the skeletal muscle complaints experienced.

Based on the analysis of respondent distribution, the relationship between working posture and MSDs complaints among Tope Le'Leng weavers in Kajang shows that among 25 respondents categorized as having a low-risk posture, only 2 respondents (8%) experienced moderate complaints. This may be due to pre-existing conditions, such as muscle fatigue or general body aches. Meanwhile, among the 17 respondents with moderate-risk posture, 3 respondents (17.6%) reported only mild complaints. This may be attributed to their longer weaving experience and higher skill level, which helps them reduce potential hazards and prevent occupational accidents.

Based on the results of the Chi-square test, the p-value obtained was 0.000 ($p < 0.05$), indicating a statistically significant relationship between working posture and MSDs complaints among Tope Le'Leng sarong weavers in the Kajang Ammatoa tribe, Bulukumba Regency. These findings are consistent with the study by Tampubolon (2020), which also found a significant relationship between working posture and musculoskeletal disorders ($p = 0.036$). Similarly, Sulasmi (2020) reported that posture was associated with musculoskeletal disorders among nurses, and Adriansyah (2019) demonstrated a significant relationship between MSDs complaints and working posture among traditional weavers ($p = 0.005$).

2. The Relationship Between Working Duration and Musculoskeletal Disorders (MSDs) Complaints Among Tope Le'Leng Sarong Weavers in Kajang

Working duration refers to the total length of time a person is exposed to occupational risk factors. It can be measured by the number of hours worked per day or cumulative exposure over months or years, depending on the nature of the job and associated risks. Islam places great emphasis on time management and productivity, both in performing acts of worship and in engaging in beneficial activities. As stated in the Qur'an (Surah Al-Inshirah: 7):

"So when you have finished [your duties], then stand up [for worship or other endeavors]."

This verse highlights the Islamic principle of prioritizing essential duties and balancing time between work, worship, and rest.

Based on the analysis of Tope Le'Leng weavers in Kajang, it was found that among the 23 respondents categorized as meeting the recommended working duration, 13 (43.5%) experienced moderate MSDs complaints. This may be attributed to the fact that most of these respondents were of older age, which likely contributed to quicker fatigue. In contrast, among the 19 respondents categorized as not meeting the recommended working hours, 16 respondents (84.2%) reported only mild complaints. This may be due to their adherence to reasonable working hours and better posture during weaving activities.

Statistical analysis using the Chi-Square test showed a p-value of 0.017 ($p < 0.05$), indicating a significant relationship between working duration and MSDs complaints among Tope Le'Leng sarong weavers of the Kajang Ammatoa tribe in Bulukumba Regency.

These findings are consistent with previous studies. Ardiansyah (2018) reported a significant relationship ($p = 0.000$) between working duration and MSDs among traditional weavers. Similarly, Utami et al. (2017) found a significant association between working duration and musculoskeletal disorders among rice farmers in Ahuhu Village.

According to Suma'mur (2009), as cited in Annisa (2019), the longer a person works, the more they are exposed to occupational hazards. Musculoskeletal complaints often arise from non-ergonomic working postures, repetitive motions, and prolonged static load on the body. As exposure time increases, so does the risk of experiencing musculoskeletal injuries.

4. Conclusion

Based on the results of this study, it can be concluded that there is a significant relationship between working posture and musculoskeletal disorder (MSDs) complaints among Tope Le'Leng sarong weavers of the Kajang Ammatoa tribe in Bulukumba Regency. There is a significant relationship between working duration and musculoskeletal disorder (MSDs) complaints among Tope Le'Leng sarong weavers of the Kajang Ammatoa tribe in Bulukumba Regency.

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