The Relationship of Working Period and Low Back Pain Complaints in Weaving Workers at Ulos Sianipar Gallery

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ABSTRACT
Low back pain in Indonesian means lower back pain is a health problem that often occurs in society, especially in weaving workers who carry out repetitive movements. Working for a long period of time is one of the risk factors for low back pain. The aim of this research is to determine the relationship between length of service and complaints of low back pain among weaving workers at the ulos sianipar gallery. This research uses quantitative methods with a cross sectional study. Samples were taken using a total sampling technique. The number of samples used in this research was 45 weaving workers at the ulos sianipar gallery. Data analysis was carried out univariate and bivariate using the chi square test. The results of this study show that there is a relationship between length of service and complaints of low back pain in weaving workers with a p Value of 0.002. It is also hoped that business owners can provide rest time for weaving workers and also provide a special rest room for weaving workers which can be used during rest time to reduce lower back pain.

INTRODUCTION
Occupational safety and health (K3) of workers continues to be a problem in several countries because it is characterized by high rates of work-related injuries and illnesses. In the UK, the Health and Safety Executive states that 6% of construction workers suffer from illness or injury caused by bad behavior in their work every year (Simukonda et al., 2020).

Indonesia has many industrial sectors, one of which is weaving workers. The work and tools used are still used or done manually with human assistance. However, with the limited energy available to humans, it is not uncommon for workers to frequently suffer from occupational diseases (PAK), one of which is low back pain (LBP) or lower back pain (NBP). Every year 15% - 45% of adults suffer from LBP on average at the age of 35-55 years (Ones et al., 2021).

Low back pain is a type of musculoskeletal disorder resulting from an ergonomic work environment. Low back pain in Indonesian means low back pain is a health problem that often occurs in society, especially in adults (Madadi-shad et al, 2020). Low back pain (LBP) is the main cause that affects worker performance and is a very common health problem. In developing and developed countries, low back pain is a phenomenon that is often experienced by workers and the general public.

Risk factors that influence the occurrence of Low Back Pain are gender, body mass index (BMI), years of work, and smoking habits. The most common causes are sitting for too long, wrong sitting position, body
posture that is not ideal, excessive activity (Assyifa, 2021). The pain is felt around the lower backbone to the crease of the buttocks and the pain often spreads to the feet and legs.

Sianipar ulos gallery is an industry that produces ulos and songket. The process of making ulos in this gallery still uses non-machine looms (ATBM), which still requires human power to control it. The operation of this non-machine loom is done manually using feet and hands. A preliminary study was conducted at the Ulos Sianipar Gallery by conducting interviews with 10 weaving workers, and it was found that all 10 workers experienced complaints of low back pain.

Weaving workers work on average 8 hours every day with a break of 1 hour. On average, weaving workers have worked for more than 10 years and experience complaints of low back pain during and after work. Based on the results of observations made during the preliminary study, weaving workers carried out their work with a bent body posture, the chairs they used did not have backrests and their feet and hands made repetitive movements for quite a long time. Stools that are not ergonomic also influence the occurrence of complaints of lower back pain because they do not feel safe while working as a result of which the muscles become stiff (Firdaus, 2020).

Based on the results of the preliminary study that has been carried out, the researcher's aim of this research is to determine the relationship between length of service and complaints of low back pain in weaving workers at the Ulos Sianipar Gallery.

RESEARCH METHOD

This research was conducted in September 2023. Researchers used quantitative research with a cross-sectional study design which aimed to determine the relationship between work period and complaints of low back pain in weaving workers at the Ulos Sianipar Gallery. The population in this study was weaving workers at the Ulos Sianipar gallery totaling 45 people with a research sampling technique using total sampling.

Data were collected directly by researchers from weaving workers at the Ulos Sianipar gallery through direct interviews, as well as using questionnaire tools that asked several questions that addressed research variables such as length of work, work period and work breaks for weaving workers at the Ulos Sianipar gallery. Data analysis uses SPSS to obtain accurate data to determine the relationship between length of service and complaints of low back pain among weaving workers at the Ulos Sianipar gallery.

RESULT

A. Description of the Research Location

The research location for the research was the Ulos Sianipar Gallery which is located on Jalan A.R. Judge Gg. Education No. 130 Medan, North Sumatra. Gallery Ulos Sianipar is a small company engaged in the textile sector to preserve ulos. This gallery was founded by Robert Sianipar and began operating on June 28, 1992 in Medan, North Sumatra - Indonesia.

B. Ulos Cloth Weaving Process at the Sianipar Ulos Gallery

The process of making ulos cloth is divided into 2 processes, namely the process of preparing the material and the weaving process which consists of 3 stages, namely making the ulos motif, pulling or pushing the weaving comb while stepping on the tread, and rolling the ulos cloth.

1. Stage of Making Ulos Motifs

This stage is carried out by tying threads between the threads on the weaving comb and the process of making different woven motifs every day.
2. Stage of Pulling or Pushing the Weaving Comb

The movement of stepping on the wooden steps is like the movement of rowing a bicycle pedal. This stage is the stage of forming woven fabric and forming one complete ulos cloth. The stage of pulling the weaving comb is carried out to bring the formed motif and weft threads closer together and to create a woven space between one motif and another.

C. Characteristics of Research Respondents

Based on the results of research entitled the relationship between length of service and complaints of low back pain among weaving workers at the Ulos Sianipar gallery, data was obtained from 45 female weaving workers. The research characteristics consist of age and education, including:

1. Characteristics Based on Age

The results of the data on the characteristics of respondents are based on age groups, namely the age of the respondents at the time the research was conducted, and the age groups in this study can be seen in the following table:

<table>
<thead>
<tr>
<th>No</th>
<th>Age</th>
<th>Frequency</th>
<th>Persentase</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20-30 years</td>
<td>3</td>
<td>7%</td>
</tr>
<tr>
<td>2</td>
<td>31-40 years</td>
<td>5</td>
<td>11%</td>
</tr>
<tr>
<td>3</td>
<td>41-50 years</td>
<td>27</td>
<td>60%</td>
</tr>
<tr>
<td>4</td>
<td>50 Years and Over</td>
<td>10</td>
<td>22%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>45</td>
<td>100%</td>
</tr>
</tbody>
</table>

Based on Table 4.1, it can be seen that the frequency of respondents aged 20-30 is 3 weaving workers (7%), aged 31-40 is 5 weaving workers (11%), those aged 41-50 are 27 (60%), and those aged 50 years and over of 10 weaving workers (22%), it can be seen that many of the weaving workers in the Ulos Sianipar gallery are aged 41-50 years.

2. Characteristics Based on Education

The education of respondents who work as weaving workers is elementary school, middle school and high school. The distribution of respondent characteristics based on education using data processing can be seen in the table below:

<table>
<thead>
<tr>
<th>No</th>
<th>Pendidikan</th>
<th>Frequency</th>
<th>Persentase</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SD</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>2</td>
<td>SMP</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>3</td>
<td>SMA</td>
<td>44</td>
<td>98%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>45</td>
<td>100%</td>
</tr>
</tbody>
</table>

The educational level of the weaving workers sampled in this study was found to be 0 weaving workers with elementary school education (0%), 1 weaving worker with junior high school education (2%), 44 weaving
workers with high school education (98%), So it can be concluded that the dominant final education of weaving workers is at high school level.

D. Univariate Analysis

Univariate analysis was used to determine the statistical picture of respondents in the form of the relationship between length of service and complaints of low back pain. Measurements were carried out on 45 weaving workers who were the research samples and using a questionnaire sheet.

1. Work Period

The results of research conducted on 45 weaving workers at the Ulos Sianipar gallery showed that the length of service of weaving workers can be seen in the frequency distribution in the following table:

<table>
<thead>
<tr>
<th>Work periods</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baru &lt;5</td>
<td>9</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Lama &gt;5</td>
<td>36</td>
<td>80</td>
<td>80</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>45</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Of the 45 weaving workers who have been studied as a sample, it can be seen from table 4.3 that the frequency of work periods for weaving workers at the Ulos Sianipar gallery is that the number of weaving workers with a new work period is 9 weaving workers (20%), while the number of weaving workers with a long work period is as many as 36 weaving workers (80%).

2. Low Back Pain (Lower Back Pain)

The results of research conducted on weaving workers at the Ulos Sianipar gallery showed that weaving workers affected by low back pain (LBP) can be seen in the frequency distribution in the following table:

<table>
<thead>
<tr>
<th>Low Back Pain</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>7</td>
<td>15.6</td>
<td>15.6</td>
<td>15.6</td>
</tr>
<tr>
<td>Yes</td>
<td>38</td>
<td>84.4</td>
<td>84.4</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>45</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

The 45 weaving workers studied as a sample can be seen based on table 4.4. The frequency of weaving workers affected by Low Back Pain in the Ulos Sianipar gallery is 38 weaving workers (84.4%) and only 7 weaving workers (15.6%) who are not affected by Low Back Pain.

E. Bivariate Analysis

This analysis is a statistical procedure to compare or find the relationship between independent and dependent variables using the chi square test with the help of the SPSS version 23 computer. The test criteria are if H0 is rejected and Ha is accepted if the p value is smaller than $\alpha=0.05$ ($p<0.05$) then there is a significant relationship between the independent variable and the dependent variable. Meanwhile, if H0 is accepted and Ha is rejected if the p value is greater than $\alpha=0.05$ ($p>0.05$) then there is no significant relationship between the independent variables and dependent variable.

<table>
<thead>
<tr>
<th>Work Period</th>
<th>Low Back Pain (LBP)</th>
<th>Total</th>
<th>Odds Ratio</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tidak ada keluhan</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>New</td>
<td>5</td>
<td>55.6</td>
<td>4</td>
<td>44.4</td>
</tr>
<tr>
<td>Old</td>
<td>2</td>
<td>5.6</td>
<td>34</td>
<td>94.4</td>
</tr>
<tr>
<td>Total</td>
<td>7</td>
<td>15.6</td>
<td>38</td>
<td>84.4</td>
</tr>
</tbody>
</table>

Based on table 4.5, it shows that between the period of work and complaints of low back pain that 9 respondents with a new period of work with no symptoms of LBP numbered 5 (55.6%), while of the 36
respondents with a long period of work with no symptoms of LBP there were 2 (5.6%). The results of the chi-square statistical test obtained p value = 0.002 and it was stated that there was a relationship between length of service and complaints of low back pain because the p value was 0.002 (≤0.05). Meanwhile, the odds ratio value shows that respondents with a long work period (>5 years) have a risk of complaints of low back pain that is 21.250 times greater than those with a new work period (<5 years). So it can be concluded that there is a relationship between work period and complaints of low back pain in weaving workers at the Ulos Sianipar gallery.

DISCUSSION

Low back pain is related to weaving workers because a person often works with repetitive movements and by lifting, carrying, pulling and pushing, or bending the body frequently or for a long time. Gradually, tissue elasticity will decrease and ultimately muscle pressure will increase, resulting in complaints of low back pain due to poor working position or ergonomics.

Apart from the problem of activities being carried out repeatedly, the working period can also be a trigger for complaints of low back pain. This is in line with research conducted (Nikmah, 2018) which states that there is a relationship between sitting work periods and the incidence of lower back pain with p = 0.004 (p <0.05). And research conducted (Putri, Saffarina, & Wintoko, 2014) stated that there was a relationship between length of work and the incidence of LBP (p-value 0.001) in onion skin cleaning workers at UD Bawang Lanang, Iringmulyo District, Metro City.

Based on table 4.5 of the weaving workers who have been studied as a sample, it can be seen that 9 respondents with a new work period and no LBP complaints numbered 5 (55.6%), while of the 36 respondents with a long work period with no LBP complaints there were 2 (5.6%). The results of this research showed a p value of 0.002 (≤0.05), meaning that H0 was rejected and Ha was accepted, thus showing significant results. This means that there is a relationship between working years and low back pain in weaving workers at the Ulos Sianipar gallery.

Weaving workers' working periods were grouped into long working periods. It was found that 2 (5.6%) respondents did not have complaints of low back pain because they worked by making good use of rest time. For example, when it's time for rest time, they use their rest time appropriately, such as stretching, drinking enough water, and every 4 hours they do small stretches so that they are far from complaining of low back pain.

The work period of weaving workers at the Ulos Sianipar gallery shows that the majority of respondents worked for quite a long time, weaving workers were found to have worked for 30 years. And the average length of work for weaving workers is more than 7 hours a day. In this case, the length of work of weaving workers at the Ulos Sianipar gallery is not effective in accordance with work standards according to Law no. 13 of 2003 concerning employment, the length of time a person works is 7 hours a day, 40 hours a week for 6 working days a week. Meanwhile, for working time of 5 days in one week, it is better to have 8 hours in 1 day and 40 hours in one week, rest hours are at least half an hour after working 4 hours.

Work period is a period of time or the length of time a worker works in a place which can influence performance both positively and negatively (Riski, 2012). Working period is the accumulation of a person's work activities carried out over a long period of time. If this activity is carried out continuously over a period of years, it can certainly cause disorders in the body such as low back pain.

CONCLUSION

Based on the results of the research above which examines the relationship between working periods and complaints of low back pain among weaving workers in the Ulos Sianipar gallery, conclusions can be drawn, including:  
1. Based on the results of research conducted at the Ulos Sianipar gallery on 45 weaving workers, 9 (20%) respondents with new work periods complained of low back pain, while 36 (80%) respondents with long work periods.
2. Based on the results of research conducted at the Ulos Sianipar gallery on 45 weaving workers, 38 (84.4%) respondents complained of low back pain, while 7 (15.6%) respondents complained of low back pain.
3. Based on the results of the bivariate test, there is a relationship between length of service and complaints of low back pain among weaving workers at the Ulos Sianipar gallery with a p value = 0.002 (≤0.05)
REFERENCES


