The Relationship between Work Attitudes and Complaints of Musculoskeletal Pain in Laundry Workers

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ABSTRACT

Background: Musculoskeletal pain complaints are complaints in the form of mild to severe pain due to joints, ligaments, tendons, and skeletal muscles disorders. One of the factors causing complaints of musculoskeletal pain is ergonomics or work posture. Jobs that has a high risk of experiencing musculoskeletal pain complaints is the laundry business because the work activities are carried out with poor work postures such as twisting, bending and repeating for a long time. **Objective:** This research aims to understand the correlation between work postures and musculoskeletal pain complaints, especially in laundry workers. **Method:** This research applies a cross sectional approach in analytical observational method. Sampling used purposive sampling technique with a sample of 47 people. Work posture was measured using the Ovako Work Posture Analysis System (OWAS), while musculoskeletal pain complaints were measured using the Nordic Body Map (NBM) questionnaire. **Results:** Based on the results of the non-parametric spearman rank analysis test, the value obtained was $\rho=0.002$ ($\rho<0.05$) and the correlation coefficient r=0.441. **Conclusion:** Based on the research results, it can be concluded that there is a significant relationship, sufficient strength, and the same direction between work postures and musculoskeletal pain complaints among laundry workers in Denpasar, Bali.

Keywords: Musculoskeletal pain complaints, laundry, work posture

INTRODUCTION

Complaints of musculoskeletal pain are complaints experienced in the form of mild to severe pain due to disorders of the joints, ligaments, tendons and skeletal muscles (Tjahayuningtyas, 2019). The Labor Force Survey reports that in 2021-2022 there were 477,000 cases of work-related musculoskeletal disorders in the UK (Health and Safety Executive, 2021). The pain that arises can reduce productivity and lose working hours (Tjahayuningtyas, 2019). Musculoskeletal complaints can reduce performance, work quality and concentration, thereby indirectly increasing the risk of work accidents (Kanti et al., 2019).

There are many factors that influence musculoskeletal pain complaints, but the most important and very influential factor is ergonomics or work attitude (Auliya & Lantika, 2021). Work attitude is defined as a person's body position or posture when doing work (Wahyuni, 2019). Poor working posture causes the body's limbs to move away from the body's centre of gravity. This can increase the risk of complaints of musculoskeletal pain due to excessive muscle contraction (Permatasari & Widajati, 2018; Tjahayuningtyas, 2019).

One of the jobs that has a high risk of experiencing complaints of musculoskeletal pain is the laundry business. The laundry business is a type of business that focuses on textile and clothing washing services (Simargolang & Nasution, 2018). Laundry work activities carried out with poor work attitudes such as twisting, bending and repeating for a long time increase the risk of developing complaints of musculoskeletal pain (Gumilang et al., 2020; Raines Saingo et al., 2022). Raines Saingo et al. (2022) reported that laundry workers in Kupang City carry out their activities with a bent work attitude, so they often experience complaints in the form of cramps, aches and pain in the neck, back, arms and legs.

Currently, laundry businesses are very easy to find, especially in big cities, including Denpasar City, Bali. The Denpasar City Environmental Agency (BLH) reported that in 2013, there were 616 laundry business units and in 2015 the number increased to 762 units (Widiantara et al., 2018). Research conducted by Tampubolon & Adiatmika (2014) stated that 27 out of 30 (90%) laundry workers in South Denpasar experienced complaints of pain based on Nordic Body Map measurements.

Studies that discuss the direction and level of correlation between work attitudes and complaints of musculoskeletal pain in laundry workers have not been widely reported. Activities related to lifting and carrying movements are one of the demanding tasks and activities that are often carried out in laundry work, so they need to be analyzed further (Ulfah et al., 2014). Seeing the negative impact of musculoskeletal pain complaints due to non-ergonomic work attitudes, it is important to understand the relationship between work attitudes and musculoskeletal pain complaints, especially in laundry workers. This study contains new information regarding the work attitudes of laundry workers in Denpasar City and their correlation with complaints of musculoskeletal pain experienced. The bivariate analysis used presents data regarding the direction and level of strength of the relationship between the two variables. This is important as a deepening of understanding, reference and early detection of musculoskeletal pain complaints related to work attitudes, so that further action can be taken.

METHOD

This research applies a cross sectional approach in analytical observational methods. The research was carried out in April-July 2023 in 37 laundry businesses located in the four sub-districts of Denpasar City, Bali. The research population is laundry workers in Denpasar City, Bali. The sample consisted of 47 people who were determined using the purposive sampling method.

The inclusion criteria applied were having active status as a laundry worker in Denpasar City in 2023, having worked ≥1 year, being aged 25-54 years, and agreeing to informed consent. Exclusion criteria consisted of having a history of comorbidities such as gout, cholesterol, tumors and cancer, having a history of contact injury in the last 1 month, and having had surgery in the last 1 year which was discovered through interviews and medical records.

The work attitude analyzed is the movement of lowering items in the form of piles of clothes from the table to the floor, because this is the movement most frequently carried out based on interviews. Work attitudes were analyzed using the Ovako Work Posture Analysis System (OWAS) measuring instrument, with a high validity value ($r=0.802$, $\rho<0.01$), and an average reliability of 57%, with a kappa value of 0.39 (Widyanti, 2020) . OWAS analyzes body position which is a combination of back, arms, legs and loads through video observation.

Musculoskeletal pain complaints were measured using the Indonesian version of the Nordic Body Map (NBM) questionnaire, with a reliability of 0.726 and a validity of each question of 0.501-0.823 (Ramdan et al., 2019). The correlation analysis method used is Spearman rank, which is a non-parametric statistical test to determine the direction and level of strength of correlation between the two variables. This research has been approved by the Research Ethics Commission of the Faculty of Medicine, Udayana University with ethical suitability statement number 1003/UN14.2.2.VII.14/LT/2023.

Results

Table 1. Sample Characteristics

Characteristics	Frekuensi (n)	Persentase (%)
Age		
25-29	13	27,7%
30-34	10	21,3%
35-39	3	6,4%
40-44	9	19,1%
45-49	6	12,8%
50-54	6	12,8%
Gender		
Men	6	12,8%
Female	41	87,2%
Working time (years)		
1-5	37	78,7%
6-10	8	17%
11-15	1	2,1%
16-20	1	2,1%

Table 2. Risk Categories of Work Attitudes and Complaints of Musculoskeletal Pain

Risk Categories	Frekuensi (n)	Persentase (%)
Work Attitude		
1	0	0,0%
2	23	48,9%
3	20	42,6%
4	4	8,5%
Complaints of Musculoskeletal Pain		
Low	23	48,9%
Currently	14	29,8%
Tall	10	21,3%
Very high	0	0,0%

The data listed in Table 1 shows that the research subjects were dominated by the 25-29 year age range, while the lowest number was in the 35-39 year age range. Of the total 47 research subjects, there were 41 female subjects while there were 6 male subjects. In the context of work period, the highest number was found in the 1-5 year range, namely 37 people (78.7%).

Work attitudes were analyzed using OWAS, with output in the form of risk categories for work attitudes towards the musculoskeletal system. There are 4 risk categories, including category 1, which is normal posture without dangerous effects, category 2 posture has some dangerous effects, category 3 posture has clear dangerous effects, and category 4 posture has very dangerous effects (Enggaela et al., 2015).

Table 2 shows that the highest work attitude risk category was found in category 2, namely 23 people (48.9%), then category 3 was 20 people (42.6%), category 4 was 4 people (8.5%), and no category 1 (0%) was found. Table 2 also presents the distribution of risk categories for musculoskeletal pain complaints obtained from the sum of the complaint scores experienced. It can be seen that of the total 47 respondents, 23 people (48.9%) had low risk, 14 people (29.8%) had medium risk, 10 people (21.3%) had high risk, and there were no subjects (0 %) with very high risk.

Table 3. Relationship between work attitudes and musculoskeletal pain complaints

Variable Correlation	Correlation	*P Value*
Work Attitudes towards Musculoskeletal Pain Complaints	0,441	0,002

Table 3 shows that there is a significant relationship between work attitudes and complaints of musculoskeletal pain with a value of ρ=0.002 (ρ<0.05). The correlation coefficient value of 0.441 indicates that there is sufficient strength of relationship between the two variables. A positive value on the correlation coefficient indicates that the two variables have a unidirectional relationship.

DISCUSSION

This research targets laundry workers in Denpasar City with an age range of 25-54 years because complaints of musculoskeletal pain begin to be felt at the age of 25 years, and the body's condition and endurance will decrease as the age reaches ≥55 years (Auliya & Lantika, 2021). The majority of subjects were found to be in the age range of 25-29 years. This age is considered young, has a strong physique and high productivity which is needed by the laundry business as an informal sector that prioritizes physicality in its work (Syairozi & Wijaya, 2020; Auliya & Lantika, 2021).

In terms of subject characteristics based on gender, it was found that the majority of subjects were female. This number is supported by data from the Denpasar City Population and Civil Registration Service (2023), that the population aged 25-54 years is mostly female, namely 152,071 people, while there are 144,180 male people. This finding is also in accordance with previous studies that laundry workers are generally dominated by women (Sari et al., 2017; Gumilang et al., 2020).

In terms of subject characteristics based on work experience, it was found that the majority of subjects had work periods in the range of 1-5 years. This is because the majority of subjects in this study were young and had just worked in the laundry business.

Based on the analysis of work attitudes using the OWAS measuring instrument in Table 2, there were no subjects found in category 1, namely normal posture without harmful effects on the musculoskeletal system. These results indicate that all research subjects have an unnatural work attitude, especially in the movement of lowering objects from the table to the floor. Based on observations, the majority of subjects performed this movement with a bent back posture and tended to twist with heavy loads. Dangerous effects that can occur are lower back pain due to spasm in the paraspinal muscles and the lumbar area which experiences pressure so that lumbar mobility decreases and limits functional ability (Susanti & Septi, 2021; Afifah & Pristianto, 2022).

The musculoskeletal complaint scores experienced are then added up to obtain a risk category for musculoskeletal complaints. Table 2 shows that the subjects are distributed in the low risk category which does not yet require improvement, medium risk with the action category possibly requiring improvement, and high risk with the action category requiring immediate corrective action, while there are no subjects classified as very high risk who require corrective action thoroughly as soon as possible. Some subjects reported that the intensity of the pain they experienced was still within reasonable limits and could be tolerated, but there were also those who reported that the pain caused discomfort and interfered with their work. In this case, the improvement in question can be in the form of pain management with stretching or management of the cause of the musculoskeletal complaint.

The Relationship between Work Attitudes and Complaints of Musculoskeletal Pain

The results of the Spearman rank analysis contained in Table 3 show that there is a significant relationship between work attitudes and complaints of musculoskeletal pain with a value of ρ=0.002 (ρ<0.05). The correlation coefficient value of 0.441 indicates that there is a relationship with sufficient strength between the two variables because it is in the range of 0.26-0.50. A positive value on the correlation coefficient indicates that there is a unidirectional relationship, namely the higher the risk of work attitude, the higher the risk of musculoskeletal pain complaints.

This finding is in accordance with experts' theory that unnatural work attitudes can cause complaints of musculoskeletal pain because they force body parts to move away from their natural position. In general, this unnatural work attitude occurs due to the characteristics of task demands, and equipment or work stations that are not in accordance with the worker's limitations and abilities (Tarwaka, 2015; Hutabarat, 2017).

The results of this research are in line with the study conducted by Ulfah et al. (2014) on 150 laundry workers in North Purwokerto. The results of the chi-square test show that the washing work process carried out by laundry workers has a significant correlation with complaints of musculoskeletal pain (ρ=0.014). Permatasari & Widajati (2018) in their research obtained a Phi and Cramer's V value of 0.394, which means that work attitudes and complaints of musculoskeletal pain have a relationship of moderate strength. These results are also supported by research by Raines Saingo et al. (2022) which states that there is a significant correlation between work attitudes and complaints of musculoskeletal pain in laundry workers at Kupang City hospitals (ρ=0.001).

Unnatural working attitudes such as bending over to adjust the work station can cause compression and the back muscles will contract continuously. In this case, blood flow will be hampered, oxygen supply will be reduced and the carbohydrate metabolism process will be hampered, causing a buildup of lactic acid and ultimately workers will feel pain (Permatasari & Widajati, 2018; Putri et al., 2020). A good and natural working attitude is when the range of movement of the body is not excessive or forced so that it does not cause excessive contraction of the muscles (Putri et al., 2020).

Bending and twisting work attitudes can also cause mechanical stress on the muscles, joints and ligaments in the back and waist area, causing pain. When working in an awkward posture, some parts of the muscles will release more energy, which will increase the work of the heart and lungs. Working in a posture that is not ergonomic for a long duration will increase the energy requirements to maintain that posture and ultimately increase the risk of damage to skeletal muscles (Hasanah & Winarko, 2019).

Based on the analysis of musculoskeletal pain complaints with NBM, subjects mostly complained of pain in the waist, back, right calf, right shoulder and left calf. Complaints of pain in the waist and back can occur due to the work attitude when lowering clothes from the table to the floor in a bent position (Ulfah et al., 2014). The right side of the body in laundry workers predominantly experiences complaints of musculoskeletal pain because activities tend to be carried out with the right side of the body (Tampubolon & Adiatmika, 2014; Sari et al., 2017). Complaints in the right shoulder are related to flexion and abduction movements of the shoulder as well as repetitive movements when lifting clothes (Nasrullah, 2017). Laundry workers do their work predominantly in a standing position for long periods of time, causing pain and fatigue in the calves. This is caused by a combination of the effects of static muscle work, increased hydrostatic pressure in the veins, and narrowed splenic circulation (Tampubolon & Adiatmika, 2014; Nasrullah, 2017).

Lowering objects by bending the body can cause compression on the intervertebral discs, increasing pressure on the nucleus pulposus and tension on the posterior angle which has the potential to cause pain. When lifting, lowering or moving objects by bending or twisting, the joints and muscles involved will experience greater compression compared to a straight back position (Miftahudin, 2016; Riskha, 2017). An excessively flexed back position causes fatigue in the internal oblique and transversus abdominis muscles, which can disrupt the stability of the spine and cause complaints of musculoskeletal pain (Acaröz Candan et al., 2019).

Improvement efforts that can be taken for laundry workers are implementing ergonomic work attitudes. An ergonomic working attitude will significantly reduce workload, fatigue and health problems, as well as create a feeling of comfort when carrying out work that is static and lasts a long time (Wahyuni, 2019). Hutabarat (2017) stated that efforts to reduce fatigue levels include avoiding static work attitudes and seeking dynamic and varied work attitudes so that blood flow and oxygen supply are more optimal for all parts of

the body. When unloading goods, workers are advised to squat and keep their backs straight so they can avoid complaints of pain and other health problems. When lifting or moving an object, it is best to keep the object close to the body to reduce the moment of force and the distance between the object's center of mass and the body's center of mass (Hadyan & Saptadi, 2019).

There are limitations to this research, namely differences in perception and pain tolerance limits of the research subjects. Some subjects admitted that they did not experience pain complaints because they mistakenly felt that the pain they experienced was within reasonable limits and could be tolerated. To avoid these differences in perception, the author made efforts to be more communicative and detailed in explaining the musculoskeletal pain sensations that might be experienced by research subjects.

CONCLUSIONS

Based on the results of the Spearman rank analysis test, it was found that there was a significant relationship (ρ=0.002), the strength of the correlation was sufficient, and the correlation was in the same direction between work attitudes and complaints of musculoskeletal pain in laundry workers in Denpasar, Bali. Future researchers should examine and control other factors that have an influence on musculoskeletal pain complaints such as work duration, work station, smoking habits, physical fitness and workers' physical strength.

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