

**RISK FACTOR ANALYSIS OF MUSCULOSKELETAL DISORDERS (MSDS) IN WOMEN SHELLFISH PEELERS****Syahadatina**

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syahadatina@helvetia.ac.id**ABSTRACT**

The purpose of this study was to determine the possibility of women mussel fishermen in Tanjung Tiram District, Batubara Regency reporting musculoskeletal diseases. This study aims to determine work attitudes and possible complaints of musculoskeletal problems in women mussel peelers in Tanjung Tiram District, Coal Regency. The number of samples in this study was 45 women shellfish peeler respondents. This type of research uses case investigation methods and is quantitative. Data was collected through document analysis, in-depth interviews with six informants using NBM and REBA techniques, and observation. Using univariate and bivariate analysis tests. It is known that complaints fall into the low and medium categories based on the results of calculations carried out using the NBM method. Medium category work attitude, standing category work attitude, and high category hunched work attitude are the results of calculating sitting work attitude using the REBA strategy. The waist, neck, wrists, shoulders and calves are the areas of the body of workers most commonly affected by musculoskeletal diseases. Risk factors for bone disorder complaints include length of work, age, gender, work attitude, length of work, and anthropometry. Company owners and employees are required to rest and stretch when their bodies ache to reduce potential complaints.

Keywords: women mussel peeler; musculoskeletal disorder complaints; nordic body map; rebal

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INTRODUCTION

Types of Occupational Diseases (PAK) that attack the musculoskeletal system include conditions that attack muscles, tendons, bones, cartilage, ligaments, nerves, and/or spinal discs. Disorders of the musculoskeletal system that can be aggravated by the workplace, excessive exercise, and incorrect work posture. Musculoskeletal diseases characterized by discomfort and loss of bodily functions that limit one's activities are often caused by multifactorial variables influenced by risk factors such as biomechanical, psychological, and individual factors. (Hutting & Johnston, 2019).

Musculoskeletal problems are the diseases that cause the most work-related levels of pain and are still a global problem today (Laksana & Srisantyorini, 2020). Musculoskeletal deficiency accounts for 42% to 58% of all Occupational Diseases (PAK), and the average annual cost of loss is 14,726 USD, or 150 million rupiah (Sekaaram & Ani, 2017). In 2017, 1,144,000 cases of musculoskeletal diseases were reported in workers based on the statistical report of the United Kingdom Labor Force Survey (LFS), which shows a high incidence of musculoskeletal diseases. 493,000 cases involved the back, 426,000 cases involved the neck, and 224,000 cases involved the lower back. (Ferusgel, 2020).

According to the national health diagnosis, the prevalence of complaints of musculoskeletal disorders including joint diseases was 713,783 cases (7.3%), of which 358,057 (85%) occurred in women and 355,725 (6.1%) in men. However, 318,933 (7.83%) and 394,850 (6.9%) cases occurred in rural and urban areas, respectively. Conversely, there were 36,410 (5.35%) cases of joint disease in North Sumatra Province, and 5.38% (Risesdas, 2023) Musculoskeletal disorders usually occur in jobs with unnatural body positions such as lifting, moving heavy objects, working by carrying loads with the head, bending over or looking up with loads, such as checking computer monitors, and checking car engines, jobs with raised right positions such as checking seams, Work with circular movements or there are bending movements in the wrist such as sewing, sorting, checking and assembling, as well as working with work positions standing in the same position for a long time such as assembly, finishing, or machine operation work

Research conducted by Wiranto et al in 2019, risk factors for musculoskeletal disorders in 35 rice milling workers are caused by work posture and the risk of manual material handling (MMH), in general, workers experience moderate complaints on the back, waist and hips (Wiranto, 2019). The results of To's (2020) study stated that work posture is related to complaints of musculoskeletal disorders triggered by incorrect posture such as too bent and head too long while working, resulting in health problems that interfere with work productivity (To, 2020) Work along the coast is often done by those who peel seafood. Shellfish fishing is a unique occupation. The first step in shellfish processing is to provide tauke from the clam pond catch, which is then given to a team of workers who will peel the shellfish (Lestaluhu, 2020). The process of peeling the shell requires workers to sit; Often, this means using a dingklik, a small stool, with the back and neck bent and legs folded or bent. Dangers associated with shellfish capture include the potential for neck, back, and leg pain due to the non-ergonomic positions used in the process. (Kuswana, 2020).

Six meters above sea level, Tanjung Tiram District, Coal Regency, is located on the coast of Sumatra. That is, these people work as fishermen, pond fishermen, shellfish peelers, and other similar jobs related to marine. One of the main livelihoods of Tanjung Tiram Regency residents is the catch of shellfish. Because clam catching requires employees to sit still, repetitive positions, and involves awkward work postures such as bending, bending knees, and hanging hands, there is a danger of work-related distractions. This can lead to symptoms of long-term musculoskeletal conditions. Complaints of musculoskeletal disorders will affect a person's ability to function at work, limit activities, and reduce living standards. (Ulva, 2020)

An initial assessment of five women clam peelers in Tanjung Tiram District, Coal Regency, revealed that the clam shells were peeled off by tapping with tools. The tool used is a freshly cut paralon pipe. To obtain meat ready for processing, the shell must be peeled off the meat. This job involves quick and smooth hand movements. When peeling the shell, a person should sit in a static or stationary position on a bench, with his hands resting on his legs and chest and legs bent. Workers will take a short break when they feel tired because there is no set rest period. In addition, shooting involves repetitive movements that must be performed repeatedly over a period of time. In addition, shellfish stripping requires workers to perform repetitive movements continuously for a long time, which is for 63 hours a week, so based on brief interviews workers experience complaints of musculoskeletal disorders of the neck, hands, back and feet.

Based on the information provided by shellfish peeling workers, the wages obtained depend on the number of shells supplied by the tauke. Shells that are peeled off are paid Rp 7,000 per 1 kg. Based on preliminary data and surveys, it became the basis for researchers to conduct research related to "Risk Factor Analysis of Musculoskeletal Disorders (Msds) in Shellfish Peeling Women in Tanjung Tiram District, Coal Regency"

METHOD

Tanjung Tiram District, Batubara Regency is the location of this quantitative descriptive research involving 45 women shellfish fishermen who are willing to take part in interviews and have a minimum working period of more than one year. Data was collected using a survey approach that involved conducting one-week in-person interviews with respondents at each venue, based on a series of pre-arranged questions and answers from interviewers. Public health center medical records provide inpatient and outpatient data that serve as supporting evidence. Data analysis was obtained using univariate analysis to describe the variables described in the study. Bivariate testing in this study was used to determine risk factors for complaints of MSDs. Testing uses correlation analysis. Univariate and bivariate testing criteria state that if the significance value < a significant alpha level of 5% or 0.05, it is expressed as a risk factor

RESULTS

Univariate Analysis

In this study, univariate analysis was used to describe the variables in this study. Includes a description of respondents' characteristics and a description of research variables. Each of them is described as follows

Table 1
Description of Blood Pressure Categories

Variable	Category	f	%
Age	≤ 30 Years	19	42,2
	> 30 Years	26	57,8
Period of Service	New	22	48,9
	Old	23	51,1
Duration of Work	No Risk	24	53,3
	Risky	21	46,7
Weight	No Risk	25	55,6
	Risky	20	44,4
Work Posture	Very Low Risk	5	11,1
	Low Risk	27	60,0
	Quite risky	13	28,9
	Risky	0	0,0
	Very risky	0	0,0
MSDs Complaints	Low	12	26,7
	Keep	32	71,1
	Tall	1	2,2
	Very High	0	0,0

Table 1 data shows that most respondents are over thirty years old, have worked for a longer period of time (more than five years), and have a low-risk weight and work posture. Despite this, the majority of respondents experienced moderate MSD problems.

Bivariate Test

This study used a bivariate test to identify risk variables associated with complaints of MSDs. Correlation analysis was used in testing. Based on the test criteria, a factor is considered risky if its significance value is less than an alpha level of 5% or 0.05. The findings of the test variables that influence MSD complaints can be found below.:

Table 2.
Risk Factor Testing Results from MSDs Complaints

Variable	Correlation Coefficient	Prob.
Age	0.105	0.491
Period of Service	0.309	0.039
Duration of Work	0.427	0.003
Weight	0.370	0.012
Work Posture	0.424	0.004

The $\alpha >$ significance value (5% or 0.05) is generated from statistical test analysis using Spearman correlation on age variables, as shown in the table above. Thus, it can be concluded that in women shellfish peelers in Tanjung Tiram District, Coal Regency, age is not a risk factor for MSD symptoms. In addition, weight, work posture, length of work, and length of work gave significant values of $<\alpha$ (5% or 0.05). Data shows that in women shellfish peelers in Tanjung Tiram District, Coal Regency, working time, weight, and work posture are risk factors for complaints of minor surgical injuries. Due to the resulting positive significance value, the weight increases.

Characteristics of women clam peelers

who works as a shellfish peeler in Tanjung Tiram District, Batubara Regency is known as a clam peeling woman. The peculiarities of women clam peelers include the age range from 26 to 51 years, and gender. But in fact, in the field, working-age children from elementary to high school also do the task of peeling shells with adults. Women mussel peelers typically have been working in the BMI category of class 1 underweight, normal, overweight, and obese for one to six years.

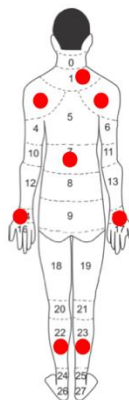
Complaints of musculoskeletal disorders

Complaints of musculoskeletal disorders occur due to excessive contraction and pressure on the muscles due to giving too heavy a workload with a long loading duration. Initial measurement of complaints of musculoskeletal disorders using the Nordic Body Map (NBM) method by asking the body part that experienced pain when the informant worked. Then a score was carried out with a likert scale where a score of 0 means no complaints, a score of 1 means there are few complaints, a score of 2 means the informant feels a complaint, and a score of 3 means the informant feels a very sick complaint. After conducting interviews and filling out the Nordic Body Map sheet, it was found that the results of calculating the total individual scores of all observed musculoskeletal systems obtained low and moderate risk categories. The body parts that experience complaints are in the upper neck, nape, left shoulder, right shoulder, back, waist, hips, left elbow, right elbow, left arm, right arm, left wrist, right wrist, left hand, right hand, left calf, right calf, left ankle and right ankle.

While the grouping of musculoskeletal complaints that are most widely felt are the waist, neck, wrists, shoulders, and calves. As in figure 4.3, the red part of the body is the part of the body that experiences the most complaints. Not much different from the research conducted by Rahman (2020) on concrete maker workers in Samata Village, Somba Opu District, Gowa Regency, the body parts that workers often complain about experiencing musculoskeletal disorders are the back, forearm, left upper arm, right calf, and waist. Similar research results

were also found in research conducted by Permatasari & Widajati (2019), in his research on cottage industry workers in Surabaya that complaints of musculoskeletal disorders are most often found in the back and right shoulders. Complaints on this part of the body are caused by work in an awkward position that is carried out repeatedly for a long time so that workers do not pay attention to ergonomic work positions. The following is an anatomical picture of the body that experiences complaints of musculoskeletal disorders in women peeling shellfish, body parts marked red are the most common parts experiencing complaints.

Figure 1. Body parts that experience complaints of musculoskeletal disorders



Based on the results of interviews and observations at the research site that complaints of musculoskeletal disorders are not only caused by body posture or work posture itself, but there are occupational factors and individual women peeling shellfish experience complaints of musculoskeletal disorders.

DISCUSSION

Risk Factors for Musculoskeletal Disorders (MSDS)

Duration of work

Based on interviews conducted on the main informant in this study that the duration or length of work spent to carry out work in a day is 5-9 hours or 35-63 hours per week. Based on the information that researchers got that workers work 7 days a week. The length of work of women clam peelers can be shorter or longer than usual because the number of shells that must be peeled depends on the amount or lack of water used to boil and clean the shellfish. It is also the Lord who makes day and night one by one a lesson for those who always remember His favor. So came the urge to give thanks for God's favor. If the day and night do not alternate, and the sun continues to shine, it will undoubtedly cause boredom and boredom and fatigue from not being able to rest at night. Similarly, if the night continues without being interspersed with sunlight, it will undoubtedly bring damage to creatures that need it. The existence of day and night provides an opportunity to correct shortcomings in worship

Work tools

Based on the results of interviews and observations conducted on 45 women shells that the tool used to crush the shells was a small diameter paralon pipe filled with pieces of wood to make it feel heavier to hit the shell. The work tools were weighed and it was found that the average work tool weight was 1 ounce. Work tools function to make it easier for workers to complete their work. Work tools have the potential to cause accidents or injuries to workers themselves and their surroundings. The following is a picture of the size of the weight of the tool used to peel shellfish.

Age

Complaints of musculoskeletal disorders are generally felt in working age but the first complaint is usually felt at the age of 35 years with the level of complaints will continue to increase with age. This is because in middle age, muscle strength and endurance begin to decline so that the risk of muscle complaints increases, because maximum muscle strength occurs at the age of 20-29 years. decreased muscle strength as individuals age, where when a person reaches the age of 60 years, muscle strength will decrease by 20%, when muscle strength decreases this is the risk of complaints of musculoskeletal disorders also increases (Shobur, 2019).

Gender

Physiologically, women's muscle ability is lower when compared to muscle ability in men. Women's muscle strength is only one-third of men's muscle strength, so gender greatly affects the risk level of musculoskeletal disorders (Tarwaka, 2020). The gender of the main informant in this study was women where all informants had complaints of musculoskeletal disorders. The body parts that experience complaints are in the upper neck, nape, left shoulder, right shoulder, back, waist, hips, left elbow, right elbow, left arm, right arm, left wrist, right wrist, left hand, right hand, left calf, right calf, left ankle and right ankle. Complaints of musculoskeletal disorders also occur in cleaners at Sibuhuan Hospital in Hasibuan's research (2020), that women cleaners are more likely to experience complaints of musculoskeletal disorders compared to male janitors.

Length of service

Static muscle loading for a long time can cause muscle, bone, and tendon pain due to repetitive work due to activities carried out for a long time. Based on the results of interviews with 5 informants that shellfish peeling workers have worked for 1-6 years, which is classified as a new working period and a medium working period. Based on the information obtained through interviews with workers in one day, workers are able to peel 3-10 kg of shells. Research by Oley et al. (2019) on fishermen in Batukota District, North Lembah Regency, Bitung City, that fishermen who have a moderate working period or 6-10 years experience complaints of musculoskeletal disorders at moderate levels as well. This can happen because the longer it takes to complete the same and repetitive work can increase complaints of musculoskeletal disorders because the length of work is a factor that greatly influences a person to experience complaints of musculoskeletal disorders.

Anthropometry (Body Size)

A person's weight, height and body mass are risk factors that can cause complaints of musculoskeletal disorders even though the influence given is not so great. Women who have fat body size are twice as likely to experience musculoskeletal disorders than thin women (Tarwaka, 2020). Based on the results of observations of Body Mass Index (BMI) measurements in 5 shellfish peeling women, it was found that workers had a Body Mass Index (BMI) in the normal category, underweight, overweight and obesity class I. The risk category is workers with overweight BMI while the non-risk category is workers with normal or underweight BMI. Based on research, workers with the BMI category are overweight and the BMI category, class I obesity experience complaints of musculoskeletal disorders in the waist, hips, neck, and shoulders.

CONCLUSION

Musculoskeletal disorders are one of the Occupational Diseases (PAK) in the form of disorders that occur in the locomotion, muscles, tendons, skeleton, cartilage, ligaments,

nerves and / or spinal discs. The results of observing complaints of musculoskeletal disorders using the Nordic Body Map method are known to be in the category of low complaint which means no corrective action is needed and medium which means corrective action may be needed. The body parts of workers most feel complaints of musculoskeletal disorders in the waist, neck, wrists, shoulders, and calves. The duration of work of crab peelers is 5-9 hours a day and complaints of musculoskeletal disorders. The length of work can change at any time to be shorter or longer depending on the number of crabs to be peeled and the amount of water used to boil and clean the crabs. A tool used to tap the skin of a medium-sized crab that weighs 1 ounce. Musculoskeletal disorders occur due to repetitive or repetitive movements in the wrist. The age of the main informant or women crab peeler is 26-51 years and has complaints of musculoskeletal disorders. Findings at the research site that crab peeling activities are not only adults but school-age children, namely elementary to high school.

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