



Risk Factor Analysis of *Musculoskeletal Disorders (MSDS)* in Woman Shellfish Peeler (*Geloina Erosa*) in Pantai Cermin District

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<p>Track Record Article</p> <p>Accepted: 28 February 2024 Revised: 04 March 2024 Published: 25 March 2024</p> <p>How to cite : Suherry, K., Siregar, P. A., & Arrazy, S. (2024). Risk Factor Analysis of Musculoskeletal Disorders (MSDS) in Woman Shellfish Peeler (<i>Geloina Erosa</i>) in Pantai Cermin District. <i>Contagion : Scientific Periodical of Public Health and Coastal Health</i>, 6(1), 515–525.</p>	<p style="text-align: center;">Abstract</p> <p><i>Woman shellfish peelers (<i>Geloina Erosa</i>) are at risk of developing musculoskeletal disease (MSDS) because of their activities that involve lifting, moving heavy items, carrying weights on the head, bending, or looking up when carrying weights. The majority of women's jobs in Pantai Cermin sub-district are shellfish peelers (<i>Geloina Erosa</i>). This study aims to identify risk factors for musculoskeletal disease (MSDS) in female peelers of Kepah Mussels (<i>Geloina Erosa</i>). Using a cross-sectional study design and quantitative methodology, the population in this study was 45 and The sampling technique used a total sampling of 45 respondents. The data was then analyzed using a correlation test with the help of the SPSS program. The results showed that age, length of work, duration of work, weight, and work posture affect the risk of musculoskeletal disease (MSDs) in female shellfish peelers (<i>Geloina Erosa</i>) in Pantai Cermin District. But years of service are negatively affected This signifies that the longer a person works, the lower their likelihood of experiencing. One strategy to reduce the possibility of musculoskeletal disease complaints (MSDs) is to increase awareness of work posture, comply with occupational safety health regulations, stretch before starting work to reduce pain in parts of the body that experience musculoskeletal disorders, suggestions for improving sitting posture so that the legs are not bent and rest when the body experiences pain to reduce the risk of complaints. The goal is to prevent work fatigue and complaints of MSDs. Women who do kepah peeling work are also expected to routinely stretch, take adequate rest and to reduce soreness in the calves of female shellfish peelers (<i>Geloina Erosa</i>) in Pantai Cermin District It is recommended to use tables and chairs with parallel heights so as not to bend the legs too much and wrap when stripping shells (<i>Geloina Erosa</i>).</i></p> <p>Keywords: <i>MSDS risk, Shellfish peeler (<i>Geloina Erosa</i>), Women, Work Posture</i></p>
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INTRODUCTION

Pantai Cermin is a sub-district that has a population of 50 310.00 with the majority of men making their living as fishermen while the majority of women are workers peeling shellfish (*Geloina Erosa*) who are susceptible to Musculoskeletal Disorders (MSDs). This is what prompted researchers to conduct this research with the aim of reducing the risk of developing MSDS disease. Occupational musculoskeletal disorders (MSDs) are a major source of disorders that affect work ability and quality of life. Ergonomics research is increasingly active these days, aiming to allow effective intervention by examining the causes of different types of MSDs. Common pain that affects muscles, bones, joints, ligaments, and tendons is known as musculoskeletal disease (K. Tang et al., 2022). In the general population, MSDs affect about one in ten people; Its total frequency is estimated at 7.2% in men and 11.2% in women (Andrews et al., 2018). Women regularly report greater rates of musculoskeletal pain than men, according to research looking at both sexes,

according to Andrews (2018) In their systematic analysis of the prevalence of musculoskeletal pain in the general population. Research that explicitly looks at gender variation in MSDs suggests that women are more at risk than men Osinuga (2022), so this claim can be trusted. Most agree that anthropometric and physiological variations between men and women are responsible for most of the gap.

According to previous research, several risk factors influence multifactorial phenomena known as MSDs. These variables can be broadly categorized into individual risk factors, psychological, biomechanical, and social variables (Norouzi et al., 2021). Biomechanical risk factors include uncomfortable posture, carrying large items, and repetitive activities (Tang et al., 2022). Psychosocial risk factors include psychological suffering, insufficient social support, and limited decision-making authority (Keyaerts et al., 2022). Social factors include culture, beliefs, and cultural beliefs Keyaerts (2022), and individual characteristics consist of things like body mass index, age, gender, lifestyle, and living environment (Svensson et al., 2020). Given the influence of various risk factors on the incidence of MSDs, the implementation of prevention and control programs and measures requires the simultaneous identification and control of a series of risk factors (Tang et al., 2022)

Some studies explain that Age, Length of work, Length of work, Gender, Workload, Repetition, Psychosocial factors, Work posture, Work climate, *Stress*, *Body mass Index*, *Exercise frequency*, *History of muscle complaints*, Education *Anxiety*, *Fear*, charity, company size, duration of work can be a risk factor for occurrence *Musculoskeletal Disorders* (MSDs) (Shobur et al., 2019). Therefore, this research is expected to be able to produce a framework to help create a special health promotion model for women peeling kepah. In addition, this study is expected to be able to provide an overview of the experience of women peeling kepah with risk factors for MSDs as the main discussion.

Woman peeler Kepah (*Geloina Erosa*) in Pantai Cermin District have a risk of developing MSDS because they often lift, move heavy items, carry loads on the head, bend, or look up when carrying loads (Yosineba et al., 2020). Peeling is generally an easy task. Typically, workers sit on a dingklik, a small bench, with their backs and necks bent, and both legs bent or folded. Because peeling requires an awkward position, there are dangers posed by the work posture, including pain in the neck, back, and legs. Improper sitting position raises the risk of musculoskeletal disorders and fatigue (Ariyo et al., 2022).

Based on a preliminary survey of two woman peelers at Pantai Cermin on January 10, 2024, it was found that shells were peeled by tapping with tools. The tool used is a paralon pipe that has been cut into pieces. To get ready-processed meat, the shell must be peeled. This job involves quick and smooth hand movements. When peeling, one should sit in a static or stationary position on a bench or small chair, with one's hands resting on one's feet, torso and knees bent. Women who peel kepah will take a break when they feel tired because there is no set rest period. In addition, repeated stripping of the kepah over a long period of time—more than 50 hours per week—has resulted in musculoskeletal diseases of the hands, neck, back, and feet of the peeling women.

Ultimately, research shows that *Musculoskeletal Disease* MSDs are chronic physiological problems that adversely affect daily activities, physical health, mental relationships with friends, family, and work (Lim et al., 2022). It is still unknown exactly how much the habit of peeling women has to do with MSDs. In Indonesia, it is natural for women to have jobs outside. One of the main motivations for women to choose this career is economic factors. Women are usually highly motivated to work even though they are aware of the many risks involved in the job. This decision is very important because working mothers can support their families in the future, which is why it is important to conduct research on the concerns of MSDs among peelers.

The Islamic view of diseases arising from work is reflected in Surah Ar-Ra'd verse 11, this verse reminds us that Allah SWT has provided protection through angels who always protect humans from various threats. However, as humans, we also have the responsibility to try to change our circumstances to improve our condition and health. In this study, efforts to identify and overcome MSD risk factors in shellfish schoolgirls are a form of effort to improve their condition and hopefully get protection and help from Allah SWT. Therefore, this study reflects the application of Islamic teachings to maintain health and happiness, while following its wisdom and protection.

METHODS

This research uses a cross-sectional research design and is a type of quantitative research. This research is located in Pantai Cermin District, the research will begin on January 10, 2024. The sampling technique used a total sampling of 45 respondents. This study used primary data obtained directly from women who were selected as respondents who carried out stripping kepah at Pantai Cermin Beach.

Data on risk factors and the magnitude of musculoskeletal disease complaints (MSDs) per body part felt due to stripping activities (kepah) were obtained using the Nordic Body Map questionnaire. The score used consists of 0 to 3 with the assessment criteria of no complaints to very sick complaints. Four processes are used in data processing: coding, editing, data entry, and cleaning.

Data analysis in this study was conducted to assess the level of risk of musculoskeletal diseases (MSDs) based on many occupational variables, complaint rates and the distribution of individual components. In this study, the data will be processed using the SPSS Version 20 application. The Nordic Body Map questionnaire data will be processed and analyzed, with univariate and bivariate analysis using Correlation.

RESULTS

This study examined the risk factors for musculoskeletal disorders (MSDs) in female shellfish peelers (*Geloina Erosa*) in Pantai Cermin District. However, before testing the influence, an analysis of the description of research variables was carried out.

Univariate Analysis

Table 1. Descriptive frequency variables

Variable	Category	Frequency	%
Age	≤ 30 Years	19	42.2
	> 30 Years	26	57.8
Period of Service	New (1-5 years)	22	48.9
	Old (5≥ years old)	23	51.1
Duration of Work	No Risk (≤ 8 hours)	24	53.3
	At risk (≥ 8 hours)	21	46.7
Weight	Not at Risk (48 – 59 kg)	25	55.6
	At risk (62 -70 kg)	20	44.4
	Very Low Risk (1)	5	11.1
	Low Risk (2-3)	27	60.0
Work Posture	Moderately risky (4-7)	13	28.9
	At risk (8-10)	0	0.0
	Very risky (>11)	0	0.0
MSDs Complaints	Any Complaints	12	26.7
	No complaints	33	73.3

Source: Primary Data, 2024

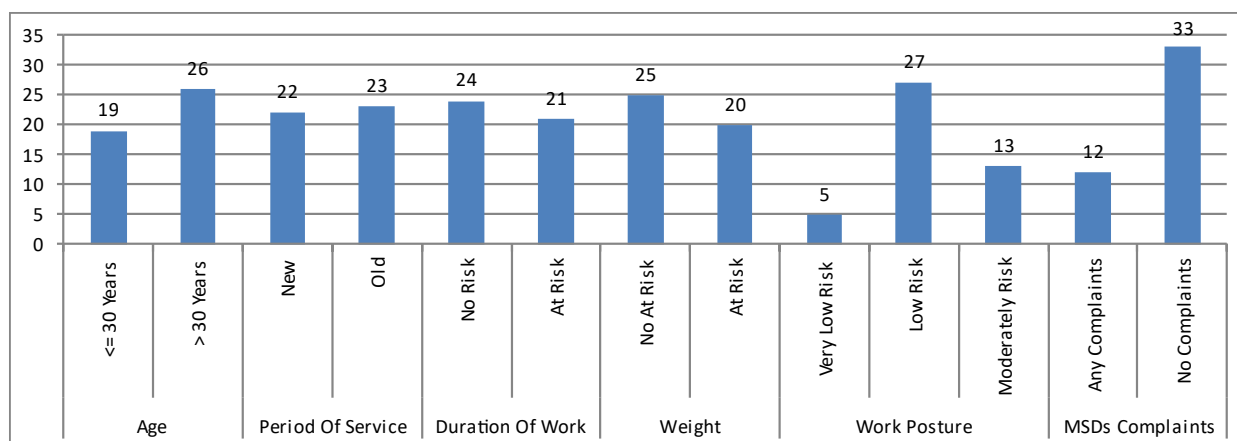


Figure 1. Variable Frequency Distribution Histogram

Based on the presentation of data in Table 1.2, it is known that most respondents aged > 30 years obtained a value of 26 respondents of 57.8%, had a long working period (> 5 years) obtained as many as 23 respondents of 51.1%, had a duration of Non-Risky work (<8 hours) obtained by 24 respondents, Non-Risk weight (48 kg) obtained by 25 respondents of 55.6%, work posture in the low risk category (2-3) was obtained by 27 respondents by 60%, and MSDs complaints were obtained by 33 respondents by 73.3%.

Bivariate Analysis

Table 2. Risk Factor Testing For MSDS Complaints Among Women Shellfish Peelers In The Pantai Cermin District

Variable	R	P Value
Age	0,251	0,011
Period of Service	-0,338	0,023
Duration of Work	0,361	0,015
Weight	0,420	0,004
Work Posture	0,429	0,003

Source: Primary Data, 2024

Based on the table above that Variable X1 age significant value of $0.011 < 0.005$ then H_a is accepted which means that there is a significant relationship between age and MSDs Complaints obtained a correlation coefficient value of 0.251 which states a weak relationship.

The variable X2 service life significant value of $0.023 < 0.005$ then H_a is accepted which this means that there is a significant relationship between the length of service and complaints of MSDs ,a correlation coefficient of -0.338 is obtained which indicates a weak relationship.

The variable X3 work duration significant value of $0.015 > 0.005$ then H_a is accepted, which means that there is a significant relationship between the duration of work and MSDs complaints obtained a correlation coefficient value of 0.361 which states a weak relationship.

The variable X4 body weight significant value of $0.004 < 0.005$ then H_a is accepted which means that there is a significant relationship between body weight and complaints MSDs obtained a correlation coefficient value of 0.420 which states a moderate relationship.

The variable X5 work posture significant value of $0.003 < 0.005$ then H_a is accepted, which means that there is a significant relationship between work posture and MSDs complaints obtained a correlation coefficient value of 0.429 which states a moderate relationship.

DISCUSSION

The results of the analysis that has been carried out, it is known that this study proves age, long working period, duration of work, weight, and work posture are significant risk factors in the occurrence of complaints of MSDs in woman shellfish peelers (*Geloina Erosa*) in Pantai Cermin District. Thus, it can be concluded that the hypothesis proposed in this study is declared acceptable. This is in line with research conducted by Rahim (2022) namely individual factors related to MSDs including age, duration, working hours, nap time, teaching load. Physical factors, such as posture, often lifting, carrying, and moving things. Other studies also mention occupational factors that cause the occurrence of musculoskeletal disorders in the agricultural sector, including work posture, workload, work duration, repetitive movements / reps and manual handling materials (Maulana et al., 2021).

According to the theory of overexertion, in the context of occupational health and safety, refers to the concept that too much or too strenuous physical activity can cause injury or fatigue. This has to do with understanding that the human body has limits in terms of how much physical activity it can do without experiencing excessive damage or fatigue. MSDs are often caused by fatigue or overloading of muscles and soft tissues due to repetitive or strenuous physical activity. Occupational health experts such as Dr. Nortin Hadler and Dr. Stuart McGill have examined the relationship between excessive physical activity and the development of MSDs.

This research is also supported by research Aprianto (2021) MSDs in workers have several risk factors that are divided into two, namely, individual factors and occupational factors. Individual factors include age, gender, psychosocial factors. While job factors include, workload, working period, work posture, work climate, working time, and repeated work movements. The above factors can increase the risk of serious MSDs complaints. And also supported by research Nurftah (2021) there is a relationship between age and complaints of musculoskeletal disorders in tea picking workers at PT X Kayu aro, this is proven to be

significant with a value (p-value 0.032), meaning that as a person gets older, the level of complaints will increase.

Research findings also show that there is a relationship between complaints of musculoskeletal diseases with working time, duration of work, and workload. Long working hours, especially in jobs that require large amounts of physical exertion, increase the risk of musculoskeletal complaints. In addition, there is a significant relationship between body weight and work posture where weight is also a risk factor for MSDs. Shellfish peeling workers who have a disproportionate weight tend to be more susceptible to fatigue and complaints of MSDs. Non-ergonomic work postures, such as slouching and bending forward positions, also contribute to the occurrence of MSDs complaints in workers. In binary logistic regression analysis, age was positively associated with MSDs in the neck, shoulder, or elbow regions, while lower back MSDs were not positively associated with age (Kim et al., 2022). Frequent awkward postures are a factor associated with significantly higher reported rates of MSDs in the past 12 months (Astin et al., 2023)

In a study of Risk Factor Analysis of *Musculoskeletal Disorders* (MSDS) in Women Peeling Shellfish (*Geloina Erosa*) in Pantai Cermin District, it was found that the most complaints were in the calves or feet, this was not far due to posture when sitting that was too bent legs. This is in line with previous research, namely female carrying workers in the main market of Giwangan has the most complaints on the legs, this is not far from the influence of manual handling because activities carried out manually will have risks, lifting or carrying goods will certainly rest on the feet if the lifting is done incorrectly it will make a complaint (Puspitasari et al., 2022). Body posture when working is not ergonomic is one of the causes of musculoskeletal complaints. Most workers complain of pain in the neck, back, thighs, and legs. This can occur because the majority of body positions when working are stacked on one leg and squat for too long, bend, and the neck position is often facing down for a long time (Oley et al., 2018).

The women workers peeling shells of Kerang Kepah (*Geloina Erosa*) in Pantai Cermin sub-district do not have a definite rest period, they will take a break when they feel tired because there is no set time. This causes workers to experience complaints of MSDs. This opinion is supported by previous research, namely, the use of uncontrolled muscle work, continuous activity, static body position for a long time can cause complaints in skeletal muscles known as musculoskeletal complaints (Siregar et al., 2020).

Although MSDs often appear by age 30 and are more common after age 40, physical sensitivity to MSDs is predicted to increase with age. The age group over 30 years has the

highest risk of developing MSDs due to repetitive movements and uncomfortable posture. In addition, research shows that there are different risk factors for MSDs at different phases of work life (Dyana et al., 2023).

Research findings also show that there is a relationship between complaints of musculoskeletal diseases with working time, duration of work, and workload. Long working hours, especially in jobs that require large amounts of physical exertion, increase the risk of musculoskeletal complaints. As for working period, it shows a significant negative relationship between working time and MSDs complaints, this indicates that the longer a person works, the lower their likelihood of experiencing MSDs complaints. In addition, there is a significant relationship between body weight and work posture where weight is also a risk factor for MSDs complaints. Shellfish peeling workers who have a disproportionate weight tend to be more susceptible to fatigue and complaints MSDs. Non-ergonomic work postures, such as slouching and bending forward positions, also contribute to the occurrence of MSDs complaints in workers.

To overcome this problem, ergonomic and task-related strategies are needed to reduce the risk of MSDs. Work system improvements and workload monitoring can help reduce the negative impact of long working life. In addition, regular exercise can also be an effective preventive measure in reducing complaints of MSDs in Kepah Shell Peeler workers (*Geloina Erosa*). As instructed in Surah Ar-Ra'd verse 11, it reminds us that Allah SWT has bestowed angels as human guardians at His command. In addition, regular exercise is also necessary as an effective preventive measure to reduce MSDS complaints. Therefore, this strategy is not only a human effort to improve working conditions and physical health but also a form of our efforts in changing our own circumstances in accordance with the efforts of help made and the wisdom that Allah gives us, as stated in Surah Ar Ra'd verse 11.

CONCLUSION

Based on the analysis and presentation of the findings, it was concluded that age, length of work, duration of work, weight, and work posture affect the risk of musculoskeletal disease (MSDs) in female shellfish peelers (*Geloina Erosa*) in Pantai Cermin District. But the length of work is negatively affected This indicates that the longer a person works, the lower their chances of experiencing complaints of MSDs. Therefore, it is recommended that all women peeling shellfish (*Geloina Erosa*) in Pantai Cermin District, raise awareness of work posture, comply with occupational safety health regulations, stretch before starting work to reduce pain in the body that experiences complaints of musculoskeletal disorders, suggestions for

improving sitting work posture so that the legs are not bent and resting when the body experiences pain to reduce the risk of complaints, suggestions for improving work posture when doing activities to take shells from the basket in a bent position are recommended better started with a squatting movement. The goal is to prevent work fatigue and complaints of MSDs. Women who do kepah peeling work are also expected to routinely stretch, take adequate rest and to reduce soreness in the calves of female shellfish peelers (*Geloina Erosa*) in Pantai Cermin District It is recommended to use tables and chairs with parallel heights so as not to bend the legs too much and wrap when stripping shells (*Geloina Erosa*).

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