The Relationship between Age and Working Period with the Incidence of Myalgia in Wates Public Health Center, Mojokerto City

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ABSTRACT

Background: Myalgia is a common complaint among many workers, especially in the informal sector. This study aims to analyze the relationship between age and work period with the incidence of myalgia in patients at Puskesmas Wates, Kota Mojokerto.

Methods: This quantitative research collected data through questionnaires filled out by respondents. Data analysis was conducted using statistical tests to examine the relationship between variables.

Results: The results showed a significant relationship between age and the incidence of myalgia with a p- value of 0.035, indicating that patients aged ≥45 years had a higher prevalence of myalgia, with 25 samples. Additionally, a higher incidence of myalgia was found among workers with a work period of ≥20 years, with 21 respondents experiencing high myalgia and a p-value of 0.014. Patients aged ≥45 years had a 6.571 times greater risk of experiencing high myalgia compared to patients aged <45 years, while patients with a work period of ≥20 years had an 11.667 times higher risk compared to those with a work period

of <20 years.

Conclusions: These conclusions highlight the importance of paying special attention to age and work period factors in efforts to prevent and manage myalgia among workers.

Keyword : Myalgia, Age, Work period, Occupational health, Musculoskeletal disorders

Introduction

Work activities are social activities in which individuals or groups allocate time and energy in a certain space, whether with financial rewards or not, and require skills that must continue to be developed over time [1]. The importance of work lies in the activities carried out, the time used, the effort poured, and the rewards received.

One of the health problems that often arise from long work activities is the risk of interference or injury due to unergonomic working positions. Poor ergonomic factors such as repetitive movements, unnatural and prolonged posture, and sitting or standing for too long are the main causes of Work-Related Musculoskeletal Disorders (WMSDs) [2,3]. Research by Smith et al. [4]found that working duration is significantly correlated with musculoskeletal complaints. This is in line with research by Hernandez et al.[5] which showed that unergonomic working postures increase the risk of WMSDs.

Data from the Ministry of Health of the Republic of Indonesia in 2013 shows that musculoskeletal diseases or muscle pain are most commonly experienced by informal sector workers such as laborers, fishermen, and farmers, with a prevalence of 31.2%[6]. The parts of the body that most often experience musculoskeletal complaints are the back (100%), waist (95.2%), and buttocks (47.6%). Of the 15 respondents studied, 8 people experienced shoulder pain, 4 people experienced neck to shoulder pain, 2 people experienced shoulder pain, and 1 person experienced shoulder to back pain.

Myalgia, or muscle pain, is a symptom that is often complained of in various diseases[7]. Myalgia occurs due to repeated or persistent muscle contractions, which can cause spasms or inflammation in the muscles. When muscles become inflamed, swollen, or stiff due to fatigue, the space between the skin and the muscles is compressed, resulting in a narrowing of the flow of lymph nodes [8]. This pressure also
affects pain receptors under the skin, which send discomfort signals to the brain causing pain.

Myalgia can be short-lived like muscle cramps, or it can continue for several days, months, or even years, which can interfere with daily activities. Although not life-threatening, recurrent myalgia can inhibit work activities and reduce the quality of life of

sufferers [9].

According to the Top Ten Most Diseases Assessment at the Wates Health Center, myalgia is ranked 5th after Primary Hypertension, Non-Insulin Dependent Diabetes, ISPA, and Dyspepsia. This requires more attention by carrying out promotive and preventive activities of Germas to the Wates community according to the recommendations in the profile of the Wates Health Center in 2021.

In this regard, it is hoped that research can contribute to reducing the incidence of myalgia by conducting research on the relationship between daily work and the incidence of myalgia in the work area of the Wates Health Center in Mojokerto City. This research is expected to provide new insights into the importance of ergonomics in daily work activities and how the prevention of musculoskeletal disorders can be implemented in the workplace.

Research Methods

1) Research Type and Design

This study uses a quantitative method with a cross-sectional design. This design was chosen because it allows the collection of data from more than one case or variable at a given time [11].

2) Research Location and Time

This research was conducted at the Wates Health Center, Mojokerto City. The Research Time starts in the period of June 6, 2022 – July 6, 2022.

3) Population and Sample

Population is the overall subject of the study (12). In this study, the population consisted of all people who conducted health checks at the Wates Health Center during the period from June 6, 2022 to July 6, 2022, which amounted to 36 people. Samples were taken from this population of the same number, i.e. 36 people, using the total sampling method [13].

4) Sampling Techniques

The sampling technique used is total sampling or saturated sampling, where the entire population is sampled. This technique is used when the population is relatively small, i.e. less than 100 people (14).

5) Research Variables

In this study, the independent variable (X) is Age and Working Period, the bound variable (Y) is the incidence of Myalgia, and the confounding variable is Gender.

6) Operational Definition

Table 1. Operational Definition

Variable	Variable Definition	Measuring Instrument s	How to Measure	Measurement Results	Scale
Age	Respondents ' age calculated from birth year to last birthday (at the time of study)	Questionnaire	Using the questionnaire	1. <45 years old 2. >=45 years old	Nominal
Gender	Differences in the shape, nature, and biological function of men and women	Questionnaire	Using the questionnaire	1. Men 2.Women	Nominal
Tenure	The period of time a person who has worked	Questionnaire	Using the questionnaire	<20 years old	Nominal

7) Univariate Analysis

Analysis carried out on each variable from the results of the study aims to describe the characteristics of each variable studied in the form of a distribution table of frequency and percentage of each group in the ratio and interval scale.

8) Bivariate Analysis

Bivariate analysis is an analysis that involves an independent variable and a dependent variable. Statistical tests using the chi-square test which aims to test the relationship between age, working period and the incidence of Myalgia in patients at the Wates Health Center, Mojokerto City.

To find out if there is a relationship between the free variable and the bound variable, the p value is used compared to the error rate (alpha) used, which is 5% or 0.05. If the p value ≤ 0.05 Ha (research hypothesis) is accepted, then the hypothesis is proven which means that there is a relationship between Age and Working Period with the incidence of Myalgia in patients at the Wates Health Center. If the p value of ≥0.05 Ho is accepted (the

research hypothesis) is rejected, then there is no relationship between Age and Working Period and the incidence of Myalgia in patients at the Wates Health Center.

Results

The working area of the Wates Health Center covers 1 Wates village with an area of 1.32 Km² with a population of 20,421 people (6,500 families) with the northern boundary being the Brantas River, the East is Ds. Jati Kulon Mojoanyar District, Mojokerto Regency, the South is Kedundung Village and the Balongsari Village and the West is Magersari Village.

Based on the results of the study entitled The Relationship between Age and Working Period with the Incidence of Myalgia in the Working Area of the Wates Health Center in Mojokerto City, data was obtained regarding the characteristics of the respondents as follows:

1. Gender

Table 2. Distribution of Respondents by Gender

Yes	Gender	Frequency	Percentage (%)
1	Man	19	52,8 %
2	Woman	17	47,2 %
	Total	36	100 %

Based on the table above, it can be seen that 19 (52.8%) male respondents and 17 (47.2%) female respondents from the total sample.

2. Age

Table 3. Distribution of Respondents by Age

Yes	Respondent Age	Frequency	Present (%)
1	<45 th	11	30,6 %
2	>=45 th	25	69,4 %
	Total	36	100%

It is known that the age frequency of respondents aged <45 years is 11 (30.6%), respondents who are >=45 years old are 25 (69.4%). So the largest number of respondents was Age >=45 years as many as 25 respondents or 69.4% of the total sample. The least age frequency was <45 years old with a total of 11 respondents or 30.6% of the total sample.

3. Tenure

Table 4. Distribution of Respondents by Tenure

Yes	Tenure	Frequency	Present (%)
1	<20 th	14	38,9%
2	>=20 th	22	61,1%
	Total	36	100%

Analysis carried out on each variable from the results of the study aims to describe the characteristics of each variable studied in the form of a distribution table of frequency and percentage of each group in the ratio and interval scale.

4. Univariate Analysis

Table 5. Frequency Distribution of Myalgia Occurrence

Yes	*Occurrence of Myalgia*	Frequency	Present (%)
1	Low	6	16,7%
2	Tall	30	83,3%
	Total	36	100%

Measurement of the incidence of myalgia in patients at the Wates Health Center, Mojokerto City was 36 patients using the Nordic Body Map questionnaire. Measurements were taken on all patients with the incidence of myalgia on June 6-July 6, 2022. Based on the results of research conducted at the Wates Health Center, Mojokerto City, it was found that the patient had an incidence of Myalgia.

Based on the table above, it can be seen that the frequency of Myalgia incidence in high Myalgia incidence is 30 (83.3%), low Myalgia incidence is 6 (16.7%) of the total samples. So the highest number of Myalgia Incidence is in the High Myalgia Incidence of 30 respondents or (83.3%), and the least frequency of Myalgia Incidence is in the low Myalgia Incidence as many as 6 respondents (16.7%) of the total sample.

5. Bivariate Analysis

Table 6. The Relationship between Patient Age and the Incidence of Myalgia in Patients at Wates Health Center, Mojokerto City

Age of Worker	Complaints of Myalgia Occurrence						p	OR	95% CI
	Low		Tall		Total				
	N	%	N	%	N	%			
<45 yo	4	11,1	7	19,4	11	30,6	0,0035	6,571	0,986-43,784
>=45 yo	2	5,6	23	63,9	25	69,4			
Total	6	16,7	30	83,3	36	100			

The results of the analysis in the table above obtained a p value of 0.035 < (smaller) than 0.05 which means that there is a significant relationship between the age of the worker and the incidence of Myalgia in patients at the Wates Health Center, Mojokerto City.

With an Odds Ratio (OR) = 6.571 which indicates that patients aged >=45 years have an Odds Ratio of 6.571 times higher to experience a high incidence of Myalgia than patients who are <45 years old. In other words, patients aged >=45 years have a 6.571 times greater risk of myalgia than patients aged <45 years. The results of this study obtained a Confidence Interval (CI) of 95% (0.986-43.784) or a 95% truth value in the range of 0.986- 43,784.

This study is in line with the study by Sumigar et al. [15], which found a P value of 0.000 < 0.05 in the variable relationship between age and myalgia complaints, showing a significant relationship between age and musculoskeletal complaints in farmers in Tambelang Village, South Minahasa. The correlation in the study was 0.549, which suggests that the higher the age, the higher the myalgia complaints.

However, this study contradicts the study by Hasibuan [16], which found a P value of 0.685 > 0.05, showing no significant relationship between the age of the worker and myalgia complaints in janitors at Sibuhuan Hospital, Padang Lawas Regency. The study also stated that younger people (29-40 years) have a 1,477 times greater chance of developing myalgia complaints compared to older people (41-52 years). Similar results were also found in a study by Sumardiyono et al. [17], with a P value of 0.154 (> 0.05), indicating no significant association between the incidence of myalgia and the elderly in outpatients at the Matesih Karanganyar Health Center.

Table 7. The Relationship between Working Time and the Incidence of Myalgia in Patients at Wates Health Center, Mojokerto City

Tenure	Complaints of Myalgia Occurrence						p	OR	95% CI
	Low		Tall		Total				
	N	%	N	%	N	%			
<20 th	5	13,9	9	25	14	38,9	0,014	11,66	1,188-114,59
>=20 th	1	2,8	21	58,3	22	61,1			
Total	6	16,7	30	83,3	36	100			

The results of the analysis in the table above obtained a p value of 0.014 < (smaller) than 0.05 which means that there is a significant relationship between the working period and the incidence of Myalgia in patients at the Wates Health Center in Mojokerto City.

With an Odds Ratio (OR) value = 11.66 which shows that patients who have a working period of >=20 years have an Odds ratio 11.66 times higher to get a high incidence of Myalgia than patients who have a working period of <20 years. In other words, "patients who have a working period of >=20 years have a high risk of experiencing a high incidence of myalgia 11.66 times greater than patients who have a working period of <20 years. The results of this study obtained a 95% Confidence Interval (CI) of 1,188-114,590) or a 95% truth value ranging from 1,188-114,590.

This study is consistent with the study by Sumigar et al. [15], which found a P value of 0.000 < 0.05 in the variable relationship between working time and myalgia complaints, showing a significant relationship between working time and myalgia complaints in farmers in Tambelang Village, South Minahasa. The correlation in the study was 0.492, indicating that the higher the age, the higher the myalgia complaints. However, this study contradicts the study by Hasibuan [16], who found a P value of 1.0 > 0.05, showing no significant relationship between working time and myalgia complaints in janitors at Sibuhuan Hospital, Padang Panjang Regency.

Discussion

This study found a significant relationship between age and the incidence of myalgia, with individuals aged ≥45 years experiencing a 6.571-fold higher risk of high myalgia compared to those aged <45 years. These findings are consistent with prior studies, such as that of Sumigar et al., which reported a positive correlation between increasing age and musculoskeletal complaints in agricultural workers. The physiological basis for this trend may lie in age-related degeneration of musculoskeletal structures, including reduced muscle mass (sarcopenia), decreased collagen elasticity, and impaired repair mechanisms, all of

which contribute to greater susceptibility to myalgia even under moderate strain [15].

In addition to age, working period also demonstrated a statistically significant association with myalgia incidence. Individuals with a tenure of ≥20 years exhibited an 11.667-fold higher risk of experiencing high myalgia compared to those with less than 20 years of work experience. Long-term exposure to occupational strain—particularly in ergonomically suboptimal environments—can lead to cumulative microtrauma, repetitive strain injuries, and chronic inflammatory changes within muscle tissues, which may explain the elevated prevalence of musculoskeletal symptoms in this population [18].

Interestingly, although this study's results align with several previous reports, including those by Sumigar and Hernandez, other studies such as Hasibuan and Sumardiyono presented conflicting evidence, suggesting no significant relationship between age or working period and myalgia incidence. These discrepancies may stem from differences in occupational environments, ergonomic exposure, population characteristics, and diagnostic criteria for myalgia [16,17].

The high prevalence of myalgia in this study (83.3%) also emphasizes the urgent need for proactive ergonomic interventions and musculoskeletal health programs in primary healthcare settings, particularly in regions dominated by informal labor sectors. Early preventive strategies, such as workplace ergonomic training, regular physical exercise programs, and access to physiotherapy services, are crucial in minimizing the long-term burden of work-related musculoskeletal disorders [19].

Moreover, gender was not significantly associated with the incidence of myalgia in this study, though prior literature suggests that women may report higher rates of musculoskeletal complaints due to differences in pain perception, hormonal modulation, and musculoskeletal anatomy. This discrepancy invites further research with a larger sample size and stratified analysis [20].

Finally, this study underscores the importance of integrating ergonomic risk assessments into routine occupational health surveillance, particularly for older workers and those with long occupational tenures. Given the growing aging workforce and rising prevalence of chronic musculoskeletal disorders, policymakers and public health professionals must prioritize tailored interventions to enhance worker well-being and productivity [19].

Conclusion

Based on the results of the research and discussions that have been conducted, it can be concluded that there is a significant relationship between the patient's age and the incidence of myalgia at the Wates Health Center, Mojokerto City, with a value of p = 0.035 (p < 0.05). The incidence of myalgia was most common in patients aged ≥45 years, with a total of 25 samples. In addition, the high incidence of myalgia was most common in workers with a working life of ≥20 years, with 21 respondents from the sample. There was a significant association between working time and the incidence of myalgia, with a value of p = 0.014 (p < 0.05). Patients aged ≥45 years had a 6.571 times greater risk of developing a high incidence of myalgia than patients aged <45 years. Meanwhile, patients with a service life of ≥20 years had an 11,667 times higher risk of developing a high incidence of myalgia than patients with a service life of <20 years.

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