



**RELATIONSHIP BETWEEN AGE, SERVICE, AND EDUCATION LEVEL AND
MUSCLE TENSION BEFORE AND AFTER THE APPLICATION OF STRENGTH ON
SAND AND STONE MINING WORKERS**

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ABSTRACT

The informal sector is experiencing a process of growth that is faster than the formal sector, so that it becomes one of the pillars of the economy in Indonesia, one of the informal sectors that exist in the community is traditional sand and stone mining. Muscle tension is one of the effects of work, muscle tension is a condition of muscle injury that

occurs because the muscles are stretched due to physical activity and excessive workload. Things that can be done to reduce or prevent muscle tension, one of which is to stretch. This study aims to determine the relationship between age, tenure and education level with muscle tension before and after stretching. Quasi experiment with the number of respondents 20 workers and data processing using the Wilcoxon test because the data is not normally distributed. The value of muscle tension before stretching is 0.00 while after stretching is 10.50 with a p value of 0.000 (> 0.05). Workers in the sand and rock mining previously experienced severe muscle tension and moderate muscle tension after the stretching intervention.

Keywords: Muscle Tension, Stretch

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INTRODUCTION

The informal sector has an important role in the development process, employment and supporting economic growth (Hermanto de Soto, 1991). In contrast to the formal sector which has a burden and time that tends to be structured and supervised, the informal sector has an excessive workload and time and does not pay attention to occupational safety and health by the owners of the informal sector (Law Number 4. Regarding Mineral and Coal Mining, 2009) .

Based on employment status, in 2014 there were 47.5 million people (40.19 percent) working in the formal sector and 70.7 million people (59.81 percent) working in the informal sector (BPS, 2014). many in the informal sector are traditional sand and stone mining.

Village X has a sand and stone mine which is managed self-sufficiently by the surrounding community, traditional tools were chosen because of the economic limitations of the residents to buy adequate tools and if using a sand loading and unloading machine it will reduce the number of workers and increase the unemployment rate.

This work is not guided by the rules of Occupational Safety and Health with the type of heavy workload and is carried out repetitively so that workers also experience several complaints, the most common complaints experienced by workers are muscle tension, back pain, upper arm pain and leg pain due to the muscle load received. in excess, causing fiber damage to the tendons and obstructed blood flow (Siswanto, Setiawan FB, 2015).

The work process is divided into 3 parts: workers who are in charge of dredging soil, breaking rocks, and lifting materials onto transport trucks in a work environment that has uneven terrain and carries loads with simple tools. simple efforts that can be made by business owners or workers to improve body fitness and increase muscle mass strength are to apply a healthy lifestyle and physical fitness activities such as stretching, swimming, brisk walking which can be done for 150 minutes a week or 30 minutes every day or at least 3-5 days a week (Pekka Oja ST, 2011)



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METHODS

This type of research is a quasi-experimental research with a total sampling of 20 respondents, the approach used in this study is a one group pre-test and post-test design approach. The intervention given was the application of full body stretching using an instrument in the form of a questionnaire to determine the variables characteristic of age, education level, years of service, pre-post scores.

RESULTS

The distribution of respondents by age shows that the most respondents who work are the age group >31 years with 16 respondents with a percentage of 80%.

Table 1.1 Distribution of Respondents by Age

Age	Frequency	(%)
<30	4	20
>31	16	80
N	20	100

The distribution of respondents based on education level shows that the most workers with elementary education are 13 respondents with a percentage of 65%.



Table 1.2 Distribution of Respondents by Education Level

Level of education	Frequency	(%)
Primary school	13	65
Junior high school	7	35
N	20	100

The distribution of respondents based on education level shows that the most are workers with 3 years of service as many as 10 respondents with a percentage of 50%.

Table 1.3 Distribution of Respondents by Years of Service

Years of service	Frequency	(%)
1 year	3	15
2 years	7	35
3 years	10	50
N	20	100

Table 1.4 Normality Test for Muscle Tension Levels

<i>Shapiro-Wilk</i>	<i>Statistic</i>	<i>Df</i>	<i>P</i>
The level of muscle tension before	0,744	20	0,000
The level of muscle tension after	0,695	20	0,000

Based on the normality test of the data before and after the application of the Shapiro-Wilk stretching value (sample < 50), the probability (sig.) is 0.000 and 0.000. And because the probability value (sig.) > 0.05, it is concluded that the two data are not normally distributed, then the data will be processed using the Wilcoxon test. The results of the statistical test of differences in the level of muscle tension before and after the application of tension on sand and stone mining workers in Village X resulted in a mean-rank before stretching of 0.00 while the mean-rank after stretching was 10.50 with a p value of 0.000 (>0.05) Thus it can be concluded that there is a difference between the level of muscle tension before and after the application of stretching.



DISCUSSION

According to the results of research conducted, it is known that the most age is >31 as many as 16 respondents, this shows that the age of 30-50 years shows the nature of mature thinking and has the mentality needed to learn and adapt (Maryam Hanifah, 2010). Age can be an indicator, the older you get, there will be a decrease in physical function marked by a decrease in muscle mass and strength, a decrease in the maximum heart rate, an increase in body fat and a decrease in brain function. The knowledge that a person has is influential in finding decisions for treatment in overcoming a perceived complaint (Azizah LM.2011).

The role of education in terms of choosing pain management is how someone looks for solutions to reduce pain or pain and chooses safe, appropriate and rational treatment by going to seek trusted medical services (Mahendra, A. D, 2014).

Period of work is a risk factor that can influence a worker to increase the risk of pain complaints, especially in jobs that really require energy or types of work that require high physical strength (RI D, 2009). Activities and periods of heavy and long work can be at risk of causing pain complaints which ultimately make you feel uncomfortable at work, the longer you work in unnatural positions, workers experience more severe pain levels (Sum'mamur, 2014). Before stretching, respondents scored 7-9 on the calculations obtained using a numeric rating scale, which indicated that the workers felt muscle tension or pain on a weight scale.

This complaint can arise because of the long frequency of muscle effort in accepting the load during work activities that occur continuously causing sudden damage, so that it can cause muscle tension and during work, lactic acid in the blood and muscles will increase, so the accumulation of acid in the blood will increase. Lactate in the blood becomes a fundamental problem of physical fitness, which causes chronic fatigue, muscle tension, and decreased physical fitness (Kumar S, 2007).

Lactic acid is the end product of anaerobic glycolysis produced by active red blood cells and muscle cells. During muscle contraction, hypoxic muscle and glycogen are converted to



glucose, which in turn is converted to lactic acid. In the muscles, glucose is converted into glycogen and the energy generated from this cycle will be used by the muscles in physical activity (Lestari, S, G.H. Wiknjosastro, D. Prasmusinto JP, 2008). After stretching the workers for 1 month with a duration of 5 days in 1 week and 30 minutes each session during exercise, the workers get results on a scale of 4-5 which means there is a difference in the results before and after stretching by the respondents.

Several steps can be taken to overcome complaints of muscle tension or pain. One of the most common exercises is muscle stretching. Stretching exercises are simple, safe and effective exercises that are performed to maintain and develop flexibility. This is because the stretching that has been done has a positive impact on complaints of muscle tension that have been felt before and can also reduce acute and chronic effects (Wahyuni, Yuliawahidah S., 2020).

After 2 hours the workers will experience pressure that causes muscle contractions which slows blood circulation in the distribution of oxygen into the muscles, it is recommended to do at least 2 times a day to do light stretching for 5 minutes (WHO, 2010).

The effectiveness of the use of temulawak, turmeric, or meniran with a composition of 5 grams of temulawak rhizome, 4 grams of turmeric rhizome, and 3 grams of meniran herbs helps improve cardiovascular fitness components that contain carbohydrates, proteins, alkaloids, and flavonoids that have an effect on immunostimulant activity, including philanthine, hypophilantin, and triacontanal so that it can be a substitute for chemical drugs in overcoming muscle pain, improving body fitness, body composition, muscle flexibility, and muscle strength (Fajar Novianto, Zuraida Zulkarnain, Agus Triyono, Danang Ardiyanto and UF, 2010).

CONCLUSION



Most of the workers in the stone and sand mining in village X are in the age group >31 years as many as 16 respondents (80%), the last education is elementary school as many as 13 respondents (65%) and the longest working period is 3 years as many as 10 respondents (50%)

Rock and sand mining workers in village X experienced severe muscle tension as many as 20 respondents (100%) before stretching. Rock and sand miners in village X experienced moderate muscle tension as many as 20 respondents (100%) after stretching. Wilcoxon test results obtained p value = 0.000 (> 0.05) it can be concluded that there is a difference between the level of muscle tension before and after the application of stretching. Workers pay attention to a healthy lifestyle on a daily basis. Stretch at least after 2 hours of working for 5 minutes Replacement of chemical drugs using herbs

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