

Factors Affecting the Incidence of Low Back Pain in Cracker Micro Small and Medium Enterprises Workers

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ABSTRACT

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Background: The incidence of low back pain in past workers is increasing. Low back pain is one of the musculoskeletal obstacles characterized by the onset of pain, muscle tension, or stiffness in the region behind the abdomen from the ribs to the pelvis, with or without the spread of pain to the leg zone. The incidence of low back pain is influenced by activity period, activity weight, and age. This study intends to recognize whether there is a link between activity weight, activity period, and age with low back pain events in Micro Small, and Medium Enterprises cracker workers in Wringinagung hamlet. **Method:** The procedure used This research is a quantitative analytic with a cross-sectional concept. Respondents in this study amounted to 78 Micro Small and Medium Enterprises cracker workers. The instruments utilized in this study were SNQ and NRS questionnaires. Information was analyzed using the Chi-Square experiment. **Result:** The results obtained showed an important relationship between age ($p\text{-value}=0.001$), and activity period ($p\text{-value}=0.001$). On the other hand, the result of activity weight ($p\text{-value}=0.222$) means that there is no significant relationship with the incidence of low back pain in workers. **Conclusion:** there is an important bond between age and era of activity with the formation of low back pain in workers. There is no important relationship between the occurrence of low back pain and the weight of the activity.

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Introduction

Occupational Safety and Health, or OHS, is a multi-disciplinary discipline that deals with how to avoid the formation of activity accidents and activity-affected diseases. The International Labor Organization (ILO) speculates that close to 2.3 million women and men across the globe die from work-related accidents or illnesses every year. This is similar to more than 6,000 deaths every day. It is estimated that approximately 340 million activity accidents and 160 million victims of occupational diseases each year in all countries [1].

In Law No. 1 of 1970, it is noted that Activity Security is the right of every worker to obtain protection for security while on duty, as well as every other person located at the place of activity is obliged to obtain collateral for his safety and is obliged to use every base of creation comfortably and efficiently [2]. Not only that, but active health efforts also need to be tried so that workers can live fresh and free from health problems, for Law No. 36 of 2009 [3].

For the regulation of the Minister of Health of the Republic of Indonesia no 56 of 2016 regarding the management of occupational diseases services. Activity-affected diseases are diseases caused by areas or professions that have risk aspects listed in activity-affected diseases. One of the management of occupational diseases caused by non-ergonomic conditions is Musculoskeletal Disorders (MSDs) [4].

Musculoskeletal problems are injuries or problems with muscles, nerves, tendons, joints, cartilage, and vertebrae. A profession-related musculoskeletal problem is a situation of the activity area as well as the ability of the profession to share important participation in the situation, or the situation becomes worse or lasts longer because of the activity situation. Musculoskeletal disorders (MSDs) are a very common profession-related problem in Europe. Almost 24% of workers reported having back pain and 22% complained about muscle pain [5]. Musculoskeletal complaints can be caused by some aspects, such as physical, bodily psychosocial, and personal aspects. Similar positions for a long duration and working in strange positions also contribute to the advancement of musculoskeletal problems [21,22]. The pain that arises in the neck, upper back, and lower back during and after surgery in surgeons is influenced by the shape of the body and the length of time spent performing surgery, so ergonomic aspects need to be examined. Incorrect or unergonomic positions in carrying out the profession often lead to musculoskeletal problems, one of which is low back pain [6,23]. Low Back Pain (LBP) commonly known as waist pain is one of the musculoskeletal problems that is characterized by the onset of pain, muscle tension, or stiffness in the region behind the abdomen from the ribs to the pelvis, with or without accompanying the spread of pain to the foot zone [7].

The prevalence of LBP in the activity area is directly related to the ergonomic situation of the activity, specifically, the umpteenth wave of action, static activity body shapes, awkward body shapes such as bending and twisting, transporting and carrying heavy weights, and exposure to fibrations [24,25]. LBP is one of the important triggers of disease weight in various countries that has an important economic weight in terms of health system costs, lost days of activity, shrinkage of activity productivity, and an increase in worker badness [26,27]. Based on information from the outline of the burden of disease, injuries, and risk factors Study in 2019, LBP ranked 4th out of 369 as a disease that causes disability-adjusted life years (DALYs) in the age group of 25-49 years [8]. LBP also climbed to 8th place as the highest trigger of DALY loss in Indonesia in 2017 with a total increase in problems of 84.1% [9].

LBP accounts for close to 35% of occupational disease problems in food and beverage manufacturing plants. People with LBP in Indonesia are estimated to range from 7.6% to 37% of the total population in Indonesia with a prevalence of LBP in men 18.2% and women 13.6% [7]. Based on the above background, the purpose of this study is to identify whether there is a relationship between age, workload, and tenure in MSME workers in Wringinagung Village.

Materials and Method

This study is a quantitative analytic study with a cross-sectional design. This research was conducted at Micro Small and Medium Enterprises crackers in Wringinagung Village from January to February 2023. Respondents in the study were workers of Micro Small and Medium Enterprises crackers in Wringinagung Village, with a total of 78 workers. The inclusion criteria in this study were workers over 18 years of age with a minimum work duration of 4 months. Exclusion criteria are cracker Micro Small and Medium Enterprises workers who have a history of surgery and trauma to the spine and have heavy work other than in Wringinagung Village cracker Micro Small and Medium Enterprises. Age, workload, and tenure are independent variables, while low back pain is the dependent variable. The instruments used in this study were SNQ and NRS questionnaires. Data were analyzed using the Chi-Square test.

Results and Discussion

Results

Univariate Analysis

Data from Table 1 shows a total of 78 workers. Respondents who experienced moderate pain were 46 workers (59.0%) and mild pain were 32 workers (41.0%). Respondents who have an at-risk age of 30-45 years are 44 workers (56.4%) and age > 45 years are 4 workers (5.1%), while the non-risk age <30 years is 30 workers (38.5%). Respondents who had a work period of >1 year were 49 workers (62.8%) with a work period of 1 year. Fourteen workers (17.9%) and <1 year as many as 15 workers (19.2%). Respondents who had a moderate workload were 46 workers (59%) and workers who had a light workload were 32 workers (41%).

Table 1. Respondent Characteristics

Variable	Total (%)
Age	
<30 years	30 (38.5)
30-45 years old	44 (56.4)
>45 years	4 (5.1)
Length of service	
<1 year	15 (19.2)
1 year	14 (17.9)
>1 year	49 (62.8)
Workload	
Lightweight	0
Medium	29 (76.9)
Weight	49 (62.9)
Pain (LBP)	
Lightweight	32 (41.0)
Medium	46 (59.0)
Weight	0

Bivariate Analysis

Bivariate analysis used a chi-square test to identify each independent variable's association with the dependent variable.

Based on Table 2 shows that moderate pain is felt by workers aged 30-45 years as many as 37 workers aged less than 30 years as many as 5 workers and more than 45 years of age as many as 4 workers. While mild pain is felt by workers with an age of less than 30 years as many as 25 workers and 7 workers aged 30-45 years. Based on the *chi-square results*, the P-value <0.001 means that there is a relationship between age and the incidence of low back pain in cracker Micro Small and Medium Enterprises workers in Wringinagung Village.

Table 2. Bivariate Analysis Results

	Light	Medium	Weight	p-value
Age				
<30 years	25	5	0	
30-45 years old	7	37	0	<0.001
>45 years	0	4	0	
Length of service				
<1 year	11	4	0	
1 year	10	4	0	0.084
>1 year	11	38	0	
Workload				
Lightweight	0	14	18	
Medium	0	15	31	0.222
Weight	0	0	0	

Discussion

The results of this study are in line with the results of previous studies, for example, research conducted by [10]. There is a very significant relationship between age and the incidence of LBP in convection tailors. The activity era is the length of activity of a person in charge calculated from the beginning of the entry until the research is tried. In cracker workers, the results of the activity period of less than 1 year were 11 workers who faced mild pain and 4 activities that faced pain again.

In workers with an activity period of 1 year, there were 10 workers who faced mild pain and 4 workers who faced more pain.

On the other hand, of workers with an activity period of more than 1 year 11 workers faced mild pain, and 38 workers faced more pain. This study is in line with previous research, one of which is the research attempted by [11] that there is an important relationship between the period of activity and the incidence of low back pain felt by tea pickers in the *ciater* tea plantation, Subang Regency. The results of this study prove that there is no relationship between activity weight and low back pain events. The matter is in line with previous research attempted by [12] that there is no association of activity weight with low back pain events.

The results of this study are in line with research conducted by [13] with the title "Factors Associated with the Incidence of *Low Back Pain* in Transport Equipment Operators of PT Makassar Container Terminal" which proves that there is a relationship between age and low back pain in Operators of PT Makassar Container Bus Stop 2018. From these results, it can be known that continuing to be a large age of a person continues to a large level of lower back pain events that he feels [13] Conversely, for [14], in line with the increase in age there will be degradation in the bones and this condition will occur when a person is 30 years old. At this age, there is degradation in the form of tissue destruction, tissue exchange into measurable tissue, and decreased solution. This causes the stability of the bones and muscles to decrease. As a person gets older, there is a greater risk that the person will experience a loss of flexibility in the bones, which is a factor in the formation of lower back pain.

However, this study is not in line with research conducted by [15] with the title "Factors associated with low back pain complaints in skewer makers". Where in Shinta's research it was found that age does not affect the occurrence of low back pain complaints in skewer workers because other factors are more related to the occurrence of low back pain such as length of service.

For the assumption of researchers from the results of the study obtained the results that age greatly influences the formation of low back pain. When workers who have an age above 30 years are vulnerable to low back pain. This matter is due to the power and endurance of the muscles shrinking as a result the risk of forming LBP continues to increase which can have an impact on the usability of activities.

Prolonged activity time will cause the disc bulge to shrink permanently and will cause degradation of the spine which can cause low back pain. This study is in line with the research attempted by Harry [16] where it was found that the time of activity did not have an important association with the formation of low back pain. Because other factors are more influential to the formation of low back pain such as age, body shape, and length of activity on Darci in the current zone district.

This research is also assisted by previous research attempted by [12] where there is no association of activity period with low back pain events because the time of activity greatly influences disciplinary actions due to the experience factor. For the assumption of researchers from the results of the study obtained the result that the activity era is not significantly related to the formation of low back pain because workers feel LBP complaints from the beginning of the activity, the pain after that will disappear when the worker has rested because with rest the pain has disappeared until the worker thinks the pain as a common thing as a result continues to be a long activity era until the pain becomes a common thing [17,28].

Based on the results of research on workload, it was found that there was no significant relationship. This study is in line with the results of research conducted by [12] that there is no relationship between workload and LBP complaints in waste collection officers. This study is in line with previous research conducted by [18, 29-30] that there is no relationship between workload and the incidence of low back pain in nurses in the Bayangkara level III hospitalization room Manado due to the light workload that is obtained.

However, this research is not in line with research that has been tried by [19,31] with the result that there is an important link between the weight of the activity and the event of low back pain. Awaludin et al. reported that if a person performs a sports profession but does not carry out alterations in the task with weights that exceed the limits that have been set by way of then

penetrating until it is about to bring about muscle fatigue which is indicated by the onset of pain in the muscles.

For the researcher's assumption from the results of this research, activities outside the activity area can influence the formation of LBP complaints. Included in Micro Small and Medium Enterprises are shrimp crisp workers who have different weights and hours of activity from one another. As a result, other factors may influence. However, this matter is different from the results of other research that there is a link between the weight of activities and the formation of LBP complaints in executive nurses at EMC Sentul Hospital in 2023 [20].

Conclusion

Based on the results of research, there is a relationship between age because muscle endurance decreases as a result the risk of LBP formation continues to increase which can have an impact on the usability of activities. We advise workers to improve holistic musculoskeletal health through regular and age-appropriate physical activity, including aerobic exercise and strength training, thereby reducing the risk of LBP. Emphasize posture awareness, flexibility training, and ergonomic practices. Encourages health screenings, weight management, core strengthening, and educational programs. Use a multidisciplinary approach, collaborating with healthcare professionals for comprehensive prevention and management of LBP.

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Conflicts of Interest: This research is a big challenge for the author to complete because the author needs an educational background education in the field of occupational health and safety. can be completed well thanks to the direction from Supervisor 1 and Supervisor 2. The author gained a lot of experience and new knowledge during the research process. The author has gained many new experiences and knowledge during the research process, which arouses the author's enthusiasm for studying occupational health and safety.

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