



The profile of low back pain disability on laborers at Kendari Port Southeast Sulawesi

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ABSTRACT

Low back pain is unpleasant or painful condition that can lead to activity constraints. LBP is a major cause of disability in the world. Based on data from the Port Health Office in 2018, LBP is a condition that is often experienced by porters in Kendari's Port. There are many factors that can affect lower back pain; such of the following is smoking. This study aims to determine the relationship between smoking degrees with disability of lower back pain. This research was an observational analytic study with a cross-sectional approach. 130 samples were obtained through total sampling. Data were analyzed using the Spearman correlation test ($p < 0.05$). The Majority of respondents had mild smoking habits 70.8% and mild disabilities 42.3%. Based on statistical tests, a positive correlation between the degree of smoking and disability of lower back pain was obtained in porters in Kendari's port with p value = 0,000 and a correlation coefficient = 0.524. There is a significant relationship between the smoking degrees and disability of low back pain in the porters of Kendari's port.

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INTRODUCTION

Musculoskeletal disorders suffered by hundreds of millions people that cause chronic pain and inflammation as well as disability or functional limitations, causing psychological and social disorders of patients, one of which is *low back pain* or low back pain which is the most common complaint among other pain complaints (WHO Scientific Group, 2003).

Low back pain is a condition that does not wear or chronic pain with complaints of at least 3 months accompanied by a limited activity caused by pain when moving or mobilizing (Helmi, 2013).

The functional abilities of LBP sufferers are related to daily activities, such as daily activities such as work, activities at home or

activities in the office. Hobbies or sports activities, strenuous activities around the house, looking down, wearing shoes or 23 socks, lifting grocery boxes from the floor, sleeping, standing for 1 hour, walking 1 mile, going up or down stairs 20 steps, sitting for 1 hour, and drive for 1 hour.

Functional limitations or physical disabilities experienced by LBP sufferers can be categorized into 4 namely mild disability, moderate disability, severe disability and total disability.

LBP ranks highest in the world in terms of disability with a prevalence of 9.4%. The number of LBP cases increased from 58.2 million in 1990 to 83.0 million in 2010. In addition, of the 291 diseases studied, LBP was the largest contributor to global disability measured through Years Lived with Disability (YLD) (Hoy, D., March, L. & Brooks, 2014).

Data for the number of LBP sufferers in Indonesia is still not known with certainty, but it is estimated that LBP sufferers in Indonesia vary between 7.6% - 37% of the total population in Indonesia (Rohmawan, Eko Arma., Haryono, 2017). Research conducted by the PERDOSSI Pain Study Group (Association of Indonesian Neurologists) at 14 teaching hospitals in Indonesia, in May 2002 showed the number of pain sufferers was 4,456 people (25% of total visits), of which 1,598 people (35.86%) is a LBP sufferer (Riningrum, Hanif., Widowati, 2016).

One of the factors related to LBP is smoking. The significant relationship between smoking habits and LBP complaints, especially for jobs that require muscle mobilization because nicotine in cigarettes can cause reduced blood flow to the tissues. Nicotine also contained in cigarette smoke can cause vasoconstriction of blood vessels.

Smoking can cause a decrease in perfusion and nutritional deficiencies in muscles and bones due to lack of blood flow to the tissues. In addition, smoking can also cause

inefficient tissue to respond to mechanical stress, which can cause back pain complaints (Tveito, T.H., 2004).

In addition, smoking can also cause a decrease in mineral content in the bones, causing pain due to cracking or damage to the bone (Hadyan, 2015). In a study conducted by Sitepu et al (2015) on 32 citrus farmers in Dokan Village where there was a relationship between smoking and LBP (Sitepu D.S, Sinaga, 2015).

One of the highest risk groups is docker workers, because of the type of work that involves excessive activities such as lifting heavy objects. Especially this happened to the group of ship laborers, because transporting goods off the ship or vice versa was the goal of these workers. This is compounded by the habit of the workers consuming cigarettes. The results of a preliminary survey of workers in the port of Kendari indicate that dominant workers have poor smoking habits.

Smokers can be classified based on many cigarettes smoked per day. Bustan divided it into 3 groups, which said light smokers were smokers who smoked 1 - 10 cigarettes a day, moderate smokers, 11-20 cigarettes a day, and heavy smokers more than 20 cigarettes a day (Alifariki, 2015).

Based on the description above, the authors are interested in conducting research on the relationship between the degree of smoking and the disability of low back pain in loading and unloading labor in the Port of Kendari City. This is done because until now there has been no research using labor or port workers as respondents.

METODE

This type of research is observational analytic using cross sectional study design. This research was carried out in November to December 2018 at the Port of Kendari City and Koperasi Karya Bahari, Kendari City. The sampling technique used in this study

was a total sampling of 130 respondents who met the criteria for inclusion and exclusion criteria.

Data collection was carried out by interviewing respondents using an identical questionnaire, Nordic Body Map (Shonafi KA, 2012) to see whether there were complaints of low back pain and continued with the Oswestry Disability Index questionnaire (Jalajuwita, 2015) to assess the disability caused by low back pain experienced with the criteria of disability, mild, moderate, severe and total disability. Smoking risk assessment is divided into 3 groups, which said light smokers are smokers who smoke 1-10 cigarettes a day, moderate smokers, 11-20 cigarettes a day, and heavy smokers more than 20 cigarettes a day (Alifariki, 2015).

Data analysis was performed using the Spearman statistical test with a p value <0.05 with the help of SPSS 16 (Arikunto, 2010). This research was approved by the Health Research Ethics Commission of the Institute of Research and Community Services at the University of Halu Oleo.

RESULTS AND DISCUSSION

Table 1 shows the results of research on the frequency distribution of research

Tabel 1
Distribusi frekuensi data penelitian

Variable	Frequency	Percentage
Age		
26-35 year	26	20%
36-45 year	42	32,3%
46-55 year	54	41,5%
56-65 year	8	6,2%
BMI		
Lack of Weight	13	10%
Normal Weight	65	50%
Overweight	52	40%
Years of Service		
≤13 Year	23	17,7%
> 13 Year	107	82,3%

components, including age, body mass index, work mass, work duration, degree of smoking and LBP disability among 130 respondents. The results of this study showed that in the 26-35 years age group were 26 people (20%), aged 36-45 years were 42 people (32.3%), aged 46-55 years were 54 people (41.5%) and aged 56-65 years as many as 8 people (6.2%). In the measurement of BMI, 13 people (10%) were underweight, 65 people (50%) were normal weight and 52 people (40%) were overweight. Based on work mass, it shows that from the number of samples in this study as many as 130 people with a work mass of ≤13 years a year as many as 23 people (17.7%) and a work mass of > 13 years as many as 107 people (82.3%). In addition, based on the length of work showed that as many as 64 people (49.2%) with a length of work <8 hours and as many as 66 people (50.8%) with a length of work ≥8 hours. Based on smoking habits, respondents who have a degree of light smoking are as many as 92 people (70.8%) and the degree of heavy smoking as many as 38 people (29.9%) and also who do not experience disabilities as many as 43 people (33.1%), mild disabilities were 55 people (42.3%), moderate disabilities were 31 people (23.8%), severe disabilities were 1 person (0.7%) and none had total disabilities.

Variable	Frequency	Percentage
Work Period		
< 8 Hours	64	49,2%
≥ 8 Hours	66	50,8%
Smoking Degrees		
Mild Degree	92	70,8%
Severe Degree	38	29,2%
Disabilities Level of LBP		
Not disabled	43	33,1%
Mild Disabilities	55	42,3%
Moderate Disabilities	31	23,8%
Severe Disabilities	1	0,8%
Total	130	100%

The results of this research indicate that respondents who have mild degrees of smoking with no disabilities are 39 people (30%), degrees of light smoking with mild disabilities are 46 people (35.4%), mild smoking degrees with moderate disabilities are 6 people (4, 6%) and the degree of light smoking with a severe disability of 1 person (0.8%) followed by the degree of heavy smoking with a disability of 4 people (3.1%),

the degree of heavy smoking with a mild disability of 25 people (6, 9%) and the degree of heavy smoking with moderate disability (19.2%).

Based on this research, the highest presentation was found for respondents who suffer mild disabilities with a degree of smoking that is as many as 46 people (35.4%).

Tabel 2.
Hubungan antara derajat merokok dengan disabilitas LBP pada TKBM di Pelabuhan Kota Kendari

Merokok	Disabilitas								p
	Tidak		Ringan		Sedang		Berat		
	n	%	n	%	n	%	n	%	
Derajat Ringan	39	30%	46	35,4%	6	4,6%	1	0,8%	0,000
Derajat Berat	4	3,1%	9	6,9%	25	19,2%	0	0%	
Total	43	33,1%	55	42,3%	31	23,8%	1	0,8%	

Based on the results of the statistical test analysis, the value of $p = 0.001$ is obtained, which is a significant relationship because the value of p is less than 0.05. So it can be concluded that there is a significant correlation between the smoking degrees with LBP disability where the *coefficient correlation* value is 0.524, which is a relationship with moderate power. There is a relationship between the two, H_0 is rejected and H_a is accepted.

The Correlation of Smoking Degree with Low Back Pain Disability

The results of this research are in line with research conducted by Lincoln (2003)

regarding the correlation of smoking with musculoskeletal disabilities where the results show there is a correlation between the degree of smoking with musculoskeletal disabilities with LBP as the biggest disease in the musculoskeletal disorder section in this research. Heavy smokers have the highest cumulative risk of disability (17.6%), followed by moderate smokers (15.8%), nonsmokers (12.2%) and then ex-smokers (10.3%) (Lincoln, Smith, Amoroso, & Bell, 2003). In addition, another research conducted by Prasarn (2012) showed that there was a significant correlation between smoking history and LBP disability measured using the Oswestry Disability Index (ODI)

where the worst ODI scores were reported by smokers at this time (44.33%), followed by previous smokers (38.11%), and finally by nonsmokers (36.02%) (Prasarn, Mark L., Horodyski, Mary B., Behrend, Caleb., Wright, John., Rehtine, 2012).

Significant correlation between smoking habits and LBP complaints, especially for jobs that require muscle mobilization because nicotine in cigarettes can cause reduced blood flow to the tissues. In addition, smoking can also cause a decrease in mineral content in the bones, causing pain due to cracking or damage to the bone (Hadyan, 2015).

The nicotine content in cigarettes causes vasoconstriction of blood vessels that supply nutrients to intervertebral disc cells, when the supply of nutrients is disrupted, the cells are malnourished, making them vulnerable to damage. The nicotine content in cigarettes also results in thickening of the walls of blood vessels which aggravates the supply of blood and nutrients to the tissues. One of the final results of cigarettes is carbon monoxide poisonous gas. Carbon monoxide produced from burning cigarettes will bind to hemoglobin (Hb), thereby inhibiting and also reducing the release of oxygen (which should bind to hemoglobin) to the tissues, especially the network of intervertebral disc cells that lack nutrients. In addition, nicotine has a negative effect on osteoblast cells, which affects the proliferation and cellular metabolism of osteoblasts and collagen synthesis, resulting in reduced bone mineral density (Patrianingrum, Meliani., Oktaliansah, Ezra., Surahman, 2015).

When inhaled into the body, the nicotine content in cigarettes affects the activity of two proteins that are related to the process of bone formation. The two proteins are osteoblast and osteoclast. In smokers, osteoclast activity tends to increase while osteoblasts tend to slow down. Bones undergo continuous remodeling through the cycle of destruction and formation. Remodeling is mediated by a balance

between osteoclasts that absorb bone and osteoblasts that form new bone. The effect of nicotine on bone cellular is to disturb the balance between bone formation and resorption. Nicotine inhibits the formation of osteoblasts and stimulates the formation of osteoclasts so that the range of bone is damaged (Rocha, 2011).

Pathologically, if there is damage to various tissues and nerve endings, there will be release of chemical mediators and neurotransmitters such as H⁺, K⁺, 5-HT, PG, bradykinin, histamine, neuropeptides such as SP, cytokines, purines, eikosanoid and intracellular. This mediator will bind to specific receptors in the peripheral sensory nerve fibers around nerve endings which later through the process of transduction, transmission and modulation will reach the sensory cortex region and are perceived by the brain as pain (Purba, Jan S., Rumawas, 2006).

Pain can cause impairment and disability. Impairment is an abnormality or loss of anatomic, physiological, and psychological functions, while disability is the result of impairment, which is a limitation or disruption of the ability to carry out daily activities.

This pain can limit the work and functional abilities of workers who usually cause a person to retire early from work, especially in jobs that require energy and muscle mobilization (Shonafi K.A, 2012).

KESIMPULAN DAN SARAN

Based on the results of data analysis from the research conducted, it can be concluded that there is a relationship between the degree of smoking with low back pain disability toward TKBM in the Kendari Port. It is recommended for company researchers to pay attention to the risk factors associated with the occurrence of *low back pain*, especially on individual factors in order to prevent the occurrence of low back pain for workers. In addition, attention needs to be

paid for workers' health by registering workers in health insurance in order to receive health insurance in the future. For further researchers it is recommended that research on individual risk factors such as physical activity, occupational risk factors such as work position, workload and environmental risk factors such as vibration

and noise should be carried out for further research so that they can be compared to see which risk factors are most influential on the occurrence of this *low back pain*. The researchers suggest that for workers who smoke, it is advisable to stop smoking or reduce cigarette consumption.

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