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To cite this article: Cut Khairunnisa 2018 *J. Phys.: Conf. Ser.* **1114** 012124

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# Health Risk Analysis of Workers at Motorcycle Workshop in Lhokseumawe City 2018

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**Abstract.** The risk of occupational accidents and occupational diseases may occur for worker that works in all sectors, including in the automotive sector. This study aims to analyze the health risks that workers may happen in motor vehicle workshops in Lhokseumawe city, using semiquantitative descriptive research methods. Research begins by identifying risk factors that may be cause of accidents and occupational diseases. Risk factors obtained were analyzed by semiquantitatively and 5 activities were found be potential risk to health problems. The risks are fractures, dermatitis, hearing loss, musculoskeletal disorders and respiratory disorders

## 1. Introduction

The development of transportation sector is evident from the increase in the number of motorcycle. The increase in the number of motorcycle also affects increasing number of supporting facilities in the sector, namely the existence of workshops. Motorcycle workshop is one of the workplace that still use human power. Therefore, the implementation of risk management consisting of risk identification and hazard measurement is one way that management or business owners can do to minimize the risk of accidents and work-related diseases in the workplace[1].

The International Labor Organization (ILO) reports that 2,3 million people worldwide die from work each year. This happens because of work-related diseases and accidents. This figure is dominated by occupational disease, which is 2,02 million cases of death[2]. The ILO data report in 2013, every 15 seconds that one worker in the world dies because of work accidents and work-related diseases experienced by 160 workers[3].

Workplace accidents can occur due to the absence of good management to handle risks and occupational hazards, concerns of the owners of companies or places of work regarding safe, comfortable work and a safe working environment culture. Control of risk factors should be known to be controlled to minimize the impact that will occur[4].

Implementation of risk management consisting of identification of work environment risk and hazard measurement is one thing that can be done to minimize risk management at work [5]. Risk management can be done through the stages of Hazard Identification, Risk Assessment and Risk Control. (HIRARC) [6]. Risk analysis can be done by using semiquantitative analysis method based on AS / NZS 4360: 2004 risk management standard to know consequence, exposure and likelihood of work accident and work-related diseases[7].



## 2. Problem identification

Currently, concerns about occupational health and safety are only in big companies, it is rare find in small companies. The possibility for accidents and occupational diseases can occur anywhere. Likewise for risk analysis, any form of employment risk is only a concern in large companies and rarely in small companies such as motorcycle workshops. Therefore, this research tries to analyze the health risks that may arise in motorcycle workshop in lhokseumawe city. So if there are found risk factor which cause health problems, it is expected that the owner of the company can immediately perform risk management in order to maintain and improve the health quality of workers.

## 3. Methodology

This research uses a semiquantitative descriptive research method, conducted in early 2018 in Lhokseumawe. The samples in this study are workers in the motorcycle workshop as many as 14 people from two workshops. Sample selection technique is done by total sampling technique. Risk analysis was performed using semiquantitative analysis method based on AS / NZS 4360: 2004 risk management standard.

## 4. Result

Result of this research based on Table 1, shows several activities in the motorcycle workshop that can cause health problems to workers and the amount of risk that will be faced if there is no risk management.

**Table 1.** Results of Risk Identification and Analysis

No	Identify The Activity	Activity Identify The Hazard	Identify Risks (Associated with each hazard and whom exposed)	Risk Rating			
				(E)	(L)	(C)	Risk Level (ExLxC)
1	Oil Change	slip (spilled oil)	Causing fracture	3	0,6	10	18 High risk
		Splashed into eyes	Causing eye irritation	3	1,0	2	6 Moderate risk
		Inhaled	Causing respiratory disorders	10	0,6	2	12 High risk
		Exposed skin	Contact dermatitis	10	0,1	2	2 Low risk
2	Accu water change	Exposed skin	Skin disorders (blistered skin)	10	1,0	20	200 Extreme
		Inhaled	Causing respiratory disorders	10	1,0	20	200 Extreme
3	Machine service	Noisy	Disturbance of listening	10	1,0	5	50 Extreme
		Vehicle emission	respiratory disorders	6	0,6	2	7,2 Moderate
		Suppressed by machine (jack loss)	Fracture	6	0,6	2	7,2 Moderate
		Thermal	Skin disorders	10	1,0	5	50 Extreme
		Tremor	Neurological disorders and skin metabolism	2	0,1	5	1 Low risk
4	Vehicle brake	Brake fluid spilled	Toxic to bones and muscles, at risk of red	2	0,1	5	1 Low risk

No	Identify The Activity	Activity Identify The Hazard	Identify Risks (Associated with each hazard and whom exposed)	Risk Rating			
				(E)	(L)	(C)	Risk Level (ExLxC)
	inspection		blood cells				
5	Replace the radiator water	Inhaled	Respiratory disorders and poor dating to the kidney	10	0,05	10	5 Moderate
6	Spooing dan Balancing	Thermal	Skin disorders	6	0,6	2	7,2 Moderate
7	Press Velag	Burning	Skin disorders	2	0,3	2	1,2 Low risk
		hammered	Trauma dan fracture	1	0,1	2	0,2 Low risk
8	Tire repair	Exposed grinding	Incision	3	0,1	5	1,5 Low risk
		Burning	Skin disorders	3	0,1	2	0,6 Low risk
9	Tire scamp	Noisy	Disturbance of listening	10	1,0	5	50 Extreme
10	Tire Lifting	The load is too heavy	Musculoskeletal disorders	10	1,0	5	50 Extreme

Explanation:

E= Exposure

L= Likelihood

C= Consequence

Table 2 shows the activities that have high risk and very high risk to cause health problems to workers and forms of risk management that must be done either by t owner or workers.

**Table 2.** Result of risk evaluation and control

No	Occupational	Risk	RiskLevel	Existing Control	Additional Risk Control (Apply the hierarchy of risk controls)
1	Oil Change	respiratory disorders, fracture and dermatitis	High risk	There is no control effort yet	Using Personal Protective Equipment (PPE) in the form of Rubber boots, glasses, particle mask and gloves
2	Accu change water	blistered skin and respiratory disorders	Extreme	There is no control effort yet	Using Personal Protective Equipment (PPE) in the form of Rubber boots, glasses, particle mask and gloves
3	Machine service	Disturbance of listening and skin disorders	Extreme	There is no control effort yet	Using Personal Protective Equipment (PPE) in the form of ear muff or ear plug

No	Occupational	Risk	RiskLevel	Existing Control	AdditionalRisk Control(Apply thehierarchyof riskcontrols)
					andgloves
4	Tire scamp	Disturbance of listening	Extreme	There is no control effort yet	Using Personal Protective Equipment (PPE) in the form of ear muff or ear plug
5	Tire Lifting	Musculoskeletal disorders	Extreme	There is no control effort yet	Using lift aids

Based on tables 1 and 2 above shows that some workplace activities have high risk and very high risk to cause work-related diseases and workplace accidents in workshop workers in the Lhokseumawe. Some of these activities are:

#### 4.1. Oil Change and Accu water change

The activity of oil changing that workers done can lead to the risk of falling due to spilled oil on the floor. The risk of falling can cause a health hazard in the form of a fracture. A fracture is a loss of bone integrity, which may involve the periosteum, bone marrow and surrounding soft tissues. The upper extremity fracture can affect radius, ulna, and carpal bone. Lower extremity fractures include tarsal, metatarsal, tibia-fibula, femur and pelvic bone[8]. Another risk that can arise in oil changing activity is respiratory distress due to the smell of oil inhaled. Oil is a chemical containing sulfur and hydrocarbon compounds. Workers in motor vehicle workshops also have a great risk of exposure to chemicals, which can lead to contact dermatitis because of work. Contact dermatitis in workshop are caused by exposure to the use of accu water (sulfuric acid), and petroleum products such as lubricating oil, gasoline, and coolant[9].

#### 4.2. Machine service and tire scamp

Workshop worker who perform machine service and tire scamp can be exposed to very high noise. Noisy is one of the physical factors in the work environment that can interfere to workers. Noise is an auditory stressor and can cause health problems both directly and indirectly. This happens because the noise produced by engine can cross the threshold of human hearing. The government designated noise threshold value is 85 desible A (dBA), with long exposure time of 8 hours per day[10]. Worker who are constantly exposed to noise will experience hearing loss. High noise intensity can result in sensorineural type hearing loss due to permanent deep hear sensorineural organ damage[11]. The incidence of hearing loss is affected by intensity of noise, age, duration of exposure, length of service and use of ear protection. The longer the worker is exposed by noise without the use of personal protective equipment, so the higher the accumulation of noisy trauma to the worker will lead to deafness ultimately [12].

#### 4.3. Tire lifting

Worker activity that often lifts tires can cause disruption in the musculoskeletal system. This happens due to work attitude that is not accordance with the ergonomics concept and excessive lift load. Any muscle contraction imposed or exceeding its ability or use over its capacity can cause trauma to the musculoskeletal system. The trauma is not only about muscle, but also to nerves, joints, ligaments and other structures. Because in repeated muscle contraction work, the trauma experienced in the musculoskeletal system is repetitive and accumulate that is make result in cumulative trauma abnormalities in the system[13].

Avoiding the risks to accidents and occupational diseases is an important thing that every company should pay attention to prevent accident. For now, the risk control effort that must be done by the motorcycle workshop in Lhokseumawe. That is by providing personal protective equipment (PPE) first, although this effort is the lowest hierarchical risk control[14]. This must be fulfilled by the motorcycle workshop owner because at the time of observation there is no adequate PPE found in the workshop of motorcycle. In Law Undang-undang No. 1 of 1970, the entrepreneur must fulfill the requirement of certain work facility in order to work protection, work safety and health.

If the company or business owner can run a safety and health program well, it can be obtained benefits such as: Decreasing health and insurance costs, lower levels of worker compensation, increasing productivity due to reduced number of working days lost, increased efficiency and quality of worker a more committed work[15]. Other benefits such as better worker selection due to increased corporate image, increased adaptability and flexibility due to participation and ownership, the company will increase profits substantially[16].

## 5. Conclusions

Health risk analysis conducted on motorcycle workshop workers in the Lhokseumawe found some activities that can lead to high and extreme risks to workers. Among oil change activity, replace accu water, machine service, tire scamp and tire lift. The risk may cause disorder in respiration, skin, hearing and musculoskeletal. This may occur due to the absence of prevention efforts against occupational accidents and diseases. In order to avoid the risk of health problems, business owners must fulfill certain facilities in order to create work protection, safety and health in accordance with Law Undang-undang No. 1 of 1970. Currently the form of business risk control that must be done by the owner of a motorcycle workshop is the fulfillment of appropriate personal protective equipment.

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