

# RELATIONSHIP BETWEEN DEHYDRATION WITH WORKING WORK ON SAND CARRIER WORKERS IN DEPOT PASIR MUTIARA

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## Abstract

**Background:** Hot working environment could increase heat stress occurrence on workers that could cause dehydration and working fatigue. This study aims to analyze the relationship between dehydration and working fatigue on sand transport workers in Mutiara Sand Depot. **Method:** This study is a cross sectional study with sand transport workers in Mutiara Sand Depot as sample. Sample consist of 65 workers with inclusion criteria workers whom had work for more than 2 years and permanent employee. Dehydration measurement done by using urine color examination that taken after working, meanwhile working fatigue measured based on working fatigue analysis using Subjective Self Rating questionnaire (SSRT). Data analyzed by using chi-square test. **Result:** Based on urine color examination almost all of the workers (95%) were dehydrated, only 5% of the workers were not dehydrated. Working fatigue measurement shows that most of workers (89%) experienced minor fatigue, 10% experienced fatigue, and only 1% experienced major fatigue. Chi-Square test shows that there is a significant relationship between dehydration and working fatigue ( $p=0,00$ ). **Conclusion:** dehydration have relationship with working fatigue on sand transport workers in Mutiara Sand Depot.

**Keywords:** Heat exposure, Dehydration, Working Fatigue

## PRELIMINARY

Physical activity is a movement of the body produced by skeletal muscles that require energy expenditure (WHO, 2011). According to Ministry of Health RI (2007), physical activity is very important for the maintenance of physical health, mental and maintain the quality of life to stay healthy and fit throughout the day. The Ministry of Health of the Republic of Indonesia (2007) recommends people to do regular physical activity at least 30 minutes in a day. Physical activity can be sports such as push ups, light running, tennis, yoga, fitness, gymnastics, tennis, and weightlifting. In addition to sports, physical activity can take the form of daily activities such as walking, gardening, playing and dancing (WHO, 2012). But not all physical activity is always identical with exercise. Because the routine activities that we do when working is also an activity that involves body members. Thus work can also be called physical activity (Alamsister: 2012)

Workers in hot environments are particularly vulnerable to health and injury disorders (Tawatsupa et al, 2013), especially in outdoor workers who work with heavy workloads and are exposed to direct sunlight (Hansen & Donohoe, 2003). Working exposed to direct sunlight results in workers experiencing heat stress. When a person is at work, then the body will interact with the state of the environment consisting of air temperature, humidity and movement or air flow. The metabolic processes of the body that interact with heat in the environment will cause the workers to experience heat pressure (Subaris and Haryono, 2007).

Heat pressure is a combination of heat production by the body of the labor itself, the climate (weather) of work which is a combination of air temperature, humidity, speed of air movement and radiant heat and workload to be borne by labor (Suma'mur, 2009 ). The presence of heat pressure can cause workers to dehydrate due to lack of fluids due to excessive sweating during work. Exposure to long hours disturbs the body's balance system where the body secretes sweat as a compensatory mechanism (Kjellstrom et al, 2009). Dehydration causes the body to become tired, lethargic, weak and drowsiness (Subaris et al., 2007). Dehydration can occur unconsciously during activity and also because of hot weather (D'anci et al., 2009).

In addition to dehydration, heat pressure can also accelerate the occurrence of fatigue in workers. Fatigue is a mechanism of body protection to prevent the body from further damage resulting in recovery after rest. Fatigue affects the loss of efficiency and decreased work capacity and endurance (Tarwaka et al, 2004).

The work environment associated with heat stress is commonly found in outdoor workers, such as sand carriers. This activity is done under direct sun exposure. In the preliminary study at the Mutiara Palembang Sand Depot, it was found that sand transport workers work by moving sand from ships to manual sand dumping depots, using a wheelbarrow, workers have no fixed working hours, workers work more than 8 hours a day with very minimal rest periods. This study aims to analyze the relationship between dehydration with fatigue in sand transport workers in the Depot Pasir Mutiara Palembang.

**Method**  
This research is a cross-sectional study, conducted at Depot Pasir Mutiara Palembang in September 2017. Samples are workers who work as porters of sand totaling 65 people, with the criteria of inclusion of workers who have worked for at least 2 (two) years and are permanent employees . Measurement of dehydration was done through urine color examination and comparing it with urine color chart, whereas work fatigue was assessed based on work fatigue analysis using Subjective Self Rating Test (SSRT) questionnaire. Data were analyzed using chi-square test.

**Results**

Table 1. Frequency Distribution of Dehydration Occurrences in Sand Block Workers at Pearl Depot

NO	Genesis Dehydration	N	F(%)
1	Dehydration	62	0,953846154
2	No Dehydration	3	0,046153846

If seen from the table above, many respondents who experienced dehydration are as many as 62 people (95%) and 3 (5%) of respondents who are not dehydrated.

Tabel 2 Average Conclusion, Sd, Modus, Median, Range And Variances.

**Statistics**

DEHIDRASI

N	Valid	65
	Missing	0

Mean	1.02
Std. Error of Mean	.001
Median	1.02
Mode	1
Std. Deviation	.005
Variance	.000
Range	0
Minimum	1,015
Maximum	1,030
Sum	67

Based on the calculation by using descriptive statistics of SPSS Output. Obtained a mean dehydration average of 1.02. standard deviation 0.005. variance of .000, mode of 1, median 1.02 highest value 1.030 and the lowest value of 1.015

Table 3. Frequency Distribution of Occurrence of Work Fatigue at Workers of Sanders at Pearl Depot

NO	Kelelahan Kerja	N	F(%)
1	Mild Fatigue	58	0,892308
2	Middle Fatigue	6	0,092308
3	Fatigue Weight	1	0,015385

When viewed from the fatigue table above it can be grouped that there are 58 people (89%) have mild fatigue, 6 orang (9%) experience moderate fatigue and there is 1 person (2%) who experienced severe fatigue as mentioned in Muflichatun ( 2006) in blacksmith workers stated that the heat pressure in the workplace can decrease work productivity up to 57.30% fatigue experienced by the respondents. It can be seen in the diagram that this is the percentage of fatigue experienced by workers working in a pearl sand depot.

Tabel 4. Average Conclusion, Sd, Modus, Median, Range And Variances.

Statistics

KELELAHAN FISIK

N	Valid	65
	Missing	0
Mean		49.9538
Std. Error of Mean		1.49638
Median		47.0000
Mode		45.00
Std. Deviation		1.20642E1
Variance		145.545
Range		65.00
Minimum		33.00
Maximum		98.00

**Statistics**

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Std. Deviation		1.20642E1
Variance		145.545
Range		65.00
Minimum		33.00
Maximum		98.00
Sum		3247.00

Based on the calculation by using descriptive statistics of SPSS Output. Obtained a mean of fatigue 49.95. standard deviation 1.49. variance .145.5, mode of 45, median 47.00 highest value 98 and lowest value of 33 Chi-square test results showed that there was significant relationship ( $p = 0,000$ ) incidence of dehydration with work fatigue on sand transport workers in Depot Pasir Boom Baru Palembang

Table 5. Relationship Between Dehydration Occurrences With Work Fatigue At Sand Post Workers at Pearl Depot

NO		Ringan		Sedang		Berat		P
		N	F(%)	N	F(%)	N	F(%)	
1	Dehydration	56	0,903226	6	0,096774	-	-	0,00
2	No Dehydration	2	0,666667	-	-	1	0,333333	

**DISCUSSION**

The results of this study indicate that almost all workers (95%) are dehydrated. Dehydration experienced by workers is caused by exposure to heat from direct sunlight while working. According to Hughes and Ferret (2009), the human body is very sensitive to changes in external temperature. Normal body temperature around 37°C and the body will try to maintain at that level if there is a change in temperature from outside. At high temperatures, the body will be harder to maintain the core body temperature resulting in sweat exposure. Therefore the body needs fluid replacement and electrolyte lost due to sweating. If the fluid is not replaced by drinking, the sweat that keeps coming out will remove fluid from the tissues and cells of the body, which will lead to dehydration. Loss of fluid through sweat to 1.4% of body weight can be tolerated without serious problems. Loss of fluid reaches 3-6% of body weight, work performance will be disrupted, working in these conditions constantly against the incidence of heat exhaustion (Richard and Collipi, 1999).

The results of this study are in line with the results of research conducted by Saputri and Hendra (2014) stating that, exposure to heat pressure on workers in the

production of PT Frisian Flag Indonesia Plant Ciracas resulted in 94.0% of workers feel much sweat and 84% feel fast thirst, which is a sign of dehydration. Research conducted by Maulidiani & Kurniawidjaja (2012) also mentioned that the exposure of heat to the workers in the smelting area and the CNS SSP foundation of PT Krakatau Steel resulted in many workers sweat (96.1%) and often thirst (70.6%) This indicates that signs and symptoms of dehydration due to exposure to heat stress experienced by the workers.

, The results of this study also showed that in addition to dehydration the workers transporting sand in the Depot Pasir Mutiara fatigue work. Most (89%) sand transport workers experienced mild fatigue. Chi-square test showed a significant relationship ( $p < 0.05$ ) between dehydration incidence and work fatigue. Fatigue is the functional reaction of the center of consciousness that is cortex cerebri which is influenced by 2 (two) antagonistic system that is inhibition system and activator system but all of it leads to reduction of work capacity and body resistance (Suma'mur, 2009). Work fatigue will decrease performance and increase the level of work errors (Nurmianto, 2003).

According Tarwaka (2004) one cause of fatigue is work activity. The existence of work activity causes the emergence of workload of the activities undertaken. Work load is a burden or dependents obtained from work activities undertaken. Research conducted by Krisanti in the production CV. Rakabu Furniture Surakarta mentions a significant relationship between heat stress and work fatigue. This is because the higher the heat pressure the higher the level of labor fatigue and the lower the heat pressure the lower the fatigue level.

## **CONCLUSION**

From the above results can be concluded that there is a relationship between dehydration and fatigue due to physical activity of workers who work Dropped the Pearl Sands Boom Baru Palembang that is there The results of this study indicate that almost all workers (95%) dehydrated. Dehydration experienced by workers is caused by exposure to heat from direct sunlight while working.

## **SUGGESTION**

Based on the above conclusions, it can be proposed some suggestions include:

- 1) When physical activity outdoors should mekosumsi enough drinking water so that the body is not easily dehydrated
- 2) When doing physical activity should be adjusted between activities and rest should be balanced so that no fatigue.
- 3) When outdoors activities in order to avoid direct sun sting.
- 4) For further research it is necessary to study the other variable variables related to dehydration and fatigue due to physical activity in order to obtain more complete information..