

THE EFFECT OF PHYSICAL WORK ON URINE COLORS AND HEMATOCRITE CONDITIONS IN HEAT-EXPOSED WORKERS IN DEPOT PASIR MUTIARA BOOM BARU

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Abstract

This study aims to examine the effect of physical work on urine color and hematocrit levels on heat-exposed workers at Depot Pasir Mutiara Boom Baru. The method in this research is cross sectional study and the sample is sand transporter in the Depot Pasir Mutiara. The sample numbered 65 people, with the inclusion criteria of workers who have worked for more than 2 years and are permanent employees. Measurements of dehydration were done through urine color examination taken after work and blood to determine hematocrite levels, whereas physical work was assessed on the basis of work fatigue analysis using the Subjective Self Rating Test (SSRT) questionnaire. Data were analyzed using chi-square test. Based on urine color examination and hematocrite level, the data obtained were almost whole (95%) of workers were dehydrated, only 5% were not dehydrated. The results of physical work measurements (89%) experienced mild fatigue, 10% experienced moderate fatigue and only 1% experienced severe fatigue. The result of chi-square test showed that there was significant influence between physical work on urine color and hematocrite level ($p = 0,00$). The results obtained can be said that the physical work affect the color of urine and hematocrit levels in heat-exposed workers in Depot Pasir Mutiara Boom Baru.

Keywords: Heat Exposure, Dehydration, Work Fatigue

PRELIMINARY

In the tropics the problem of heat exposure is an important factor to be considered. Besides the working weather, actually the body itself when doing activities also emit heat. When a person is at work, the worker's body will interact with the state of the environment consisting of 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. This heat pressure can be caused by a heat source or due to bad ventilation. Excessive heat pressure will cause the worker to run quickly (Subaris and Haryono, 2007).

Heat stress (heat stress) is the work climate load received by the human body and non-climatic factors of body heat metabolism, work clothes and acclimatization level. One of the effects of heat stress on the job is fatigue. Fatigue is a mechanism of body protection to prevent the body from further damage resulting in recovery after rest. Fatigue is regulated centrally by the brain. In the central nervous system there is a system of activity (sympathetic) and inhibition (parasympathetic). Fatigue indicates the different conditions of each individual, and affects the loss of efficiency and decreased work capacity and endurance (Tarwaka et al, 2004). Spending a lot of sweat without balanced with sufficient fluid intake will lead to dehydration which can also result in the incidence of fatigue (Tarwaka, 2004).

Dehydration is a lack of body fluids because the amount of fluid that comes out more than the amount of fluid that enters. water expenditure must be balanced with the inflow of water, if there is imbalance of fluid in the body, will occur the incidence of dehydration (Almatsier, 2009).

To find out dehydration through urine color is done by comparing urine color with urine color chart. Urine collection is then measured by equating the urine chart. In the urine chart there are levels corresponding to the dehydration rate of 1-2 (well hydrated), 3-5 (mild dehydration), 6-7 (severe dehydration) (PDGMI, 2010).

Based on the preliminary study at the New Pearl Boom Depot found that the worker was deployed Pasir Mutiara worked more than 8 hours, the workers transported sand from the ship and moved sand to the sand dumps manually, not using heavy equipment using simple tools such as hoes, shovels and wheelbarrow. Workers who carry out lifting and hauling activities manually, the load intensity is physically high. Physical expenses are found when performing physical-use work as the primary means such as workload removal. Workers continue to move sand from the ship until it is finished and there is no regular rest period so that workers rarely use drinking water during work.

Workers working in hot exposed environments have an impact on the incidence of dehydration, the results of Andayani's study, et al (2013) found that only 28.8% of workers who have good hydration status. The rest were found to be pre-dehydrated (mild dehydration 37.0% and moderate dehydration 15.1%), while those with dehydration of 19.2%. Liquid consumption is associated with hydration status ($r = - 0.319$ and $p = 0.006$).

RESEARCH METHODS

The type of research is analytic cross sectional to know the influence of free variable in the form of physical work to the dependent variable dehydration by way of observation and data collection at one time (point time approach), where the observation and measurement of each subject of research is done only once at the time of examination. Population in this research is all worker of pearl sand depot which also become sample of research (total population) amounted to 43 workers. Inclusion Criteria Workers who work > 5 years, Workers who work 8 hours per day, and Workers who work permanently in the pearl sand depot. After all the data collected, then conducted analysis of research data. This process uses a computerized system of SPSS version 23 for windows with a small p-significance level of 0.05.

RESEARCH RESULT

A. Description of Respondent's Characteristics

Physical work on workers was analyzed using questionnaires. Based on the result of calculation using descriptive statistic of SPSS Output. If seen from average then experiencing fatigue as much as 36 workers (83.7%), moderate fatigue as many as 6 workers (14%) and Heavy Fatigue by 1 worker (2,3%).

Table 1 Distribution of Frequency of Physical Work on Sand Workers in Pearl Depot
Physical work

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid				
Light	36	83.7	83.7	83.7
Medium	6	14.0	14.0	97.7
Weight	1	2.3	2.3	100.0
Total	43	100.0	100.0	

To determine the incidence of dehydration in sand transport workers, urine extraction is done immediately after 4 hours of working workers. Furthermore, urine color compared with urine color chart to know the existence of dehydration. From the data obtained almost all workers (98%) are dehydrated. The frequency distribution results are shown in Table 2

Table 2 Frequency Distribution of Urine Colors in Sand Workers at Pearl Depot
Urine Colors

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Not Dehydrated	1	2.3	2.3	2.3
Dehydration	42	97.7	97.7	100.0
Total	43	100.0	100.0	

Table 2 shows that respondents with dehydration status are 42 respondents (98%), while respondents with non dehydration status (rehydration) are 1 respondent (2%).

In this study, the results of lab tests showed the results of 43 respondents, 35 respondents dehydrated (81%). 8 respondents were not dehydrated (19%).

Table 3 Frequency Distribution of Hematocrit Levels at Sand Workers in Pearl Depot

Hematocrit Levels

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Dehydration	35	81.4	81.4	81.4
Not Dehydrated	8	18.6	18.6	100.0
Total	43	100.0	100.0	

B. Effect Analysis of Fisisk Work on Urine Color and Hematocrit Level

Table 4 Unpaired Test for Knowing the Effect of Physical Work on Urine Color and Hematocrit Levels on Heat Exposed Workers at New Booming Mutiar Sand Depot

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.057	5.567		.370	.714
	warna urine	30.714	5.638	.437	5.448	.000
	Hct	17.257	2.183	.633	7.904	.000

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a. Dependent Variable: kerja fisik

Table 4. above shows that the sig.antara value with Y1 and Y2 shows significant value of 0.00, because the value of sig. > 0.05 means there is a significant influence between physical work (X) with urine warn (Y1) and hematocrit (Y2).

C. Discussion

The results of this study were obtained based on research in the laboratory located in Bio Sain Research Palembang. This research use experimental method with analytic cross sectional approach. Subjects in this study were sand transport workers who worked at the Boom New Pearl Mother Depot. The number of samples in this study amounted to 43 workers with the characteristics of workers Workers who work > 5 years, Workers who work 8 hours per day, and workers who work permanently in the depot sand mutia.

The frequency distribution of respondent's characteristics based on physical work showed that, as many as 36 workers (83.7%) had mild fatigue, 6 workers (14%) were moderate fatigue and 1 (2.3%) had severe fatigue. Fatigue indicates the different conditions of each individual, and affects the loss of efficiency and decreased work capacity and endurance (Tarwaka et al, 2004).

The number of respondent sample based on urine color showed that, respondents with dehydration status 42 respondents (98%), whereas respondents with non-dehydration status (rehydration) silent 1 respondent (2%). Dehydration can occur due to several conditions such as gastrointestinal or gastrointestinal loss easily, vomiting, sweating caused by weight, environment and other stress (Rulyenzy, 2017).

Frequency distribution of respondent characteristics based on urine color showed that, from 43 respondents 35 respondents were dehydrated (81%), and 8 respondents were not dehydrated (19%). Dehydration can cause death because the body loses a lot of fluids.

Dehydration has several levels that can be measured with hematocrit values. The hematocrit value states the amount of red blood cell concentration (erythrocytes) in 100 ml of blood expressed in percent. (Retno 2009).

Results of research on the effect of physical work on urine color and hematocrit levels showed a significant influence seen from the results of data analysis using unpaired t test with $\alpha = 0.000$ which has a value smaller than α that is 0.05 so it shows the effect of physical work on color urine and hematocrit levels in workers exposed to heat at the Boom New Pearl pearl Depot.

Physical work is often also connoted as hard work or rough work can then be formulated as an activity that requires a strong human physical effort during the working period. In terms of physical work, the energy consumption (energy consumption) is the main factor and the benchmark used as the determination of the weight or lightness of the work. The process of working mechanisms in various cases will be applied as a way out to reduce the workload that is too heavy and should be borne by humans

CONCLUDE

This study shows that physical work leads to an increase in urine color and hematocrite levels. There was a significant influence between physical work with urine color and hematocrite level ($p < 0.05$). In this study the characteristics of workers are: Workers who work > 5 years, workers who work 8 hours per day, and workers who work permanently in the depot of sand mutia new boom

BIBLIOGRAPHY

- Flora, Rostika. (2015), "*Jantung & Latihan Fisik*". Unsri Press. Palembang
- Giriwijoyo, Santoso. (2017), "*Fisiologi Kerja Dan Olahraga*". PT. Rajagrafindo Persada
- Kiswar, Rukmani. (2014), "*Hematologi & Transfusi*". Penerbit Erlangga. Jakarta
- Leksana, Eri. (2015), "*Strategi Terapi Cairan Pada Dehidrasi*" CDK.-223/Vol. 42 No.1 th 2015
- Leksana, Eri. (2015), "*Dehidrasi Dan Syok*". CDK-228/Vol. 42. No. 5. Th 2015
- Lalan, Ruslani. dkk. (2015), "*Analisis Beban Kerja Fisiologi Dan Psikologi Karyawan Pembuatan Baju di PT. Jaba Germando Magelang*" Bina Tenia. Volume II Nomor 2, Edisi Desember 2015. 114-123
- Maharani Putri, Renty Anugrah. dkk. (2017), "*Analisis Beban Kerja Dengan Menggunakan Metode CVL dan Nasa-TLX PT. ABC*". Jurnal pektrum Industri. IISN: 1663-6590 Vol.15.No.2.121-255
- Maharji, Rizky. (2015), "*Analisis Tingkat Kelelahan Kerja Berdasarkan Beban Kerja Fisik Perawat Di Instalasi Rawat Inap RSUD Haji Surabaya*" The Indonesian Jurnal Of Occupational Safety And Healt. Vol. 4 No. 1. Jan-Jun 2015: 93-102

- Nurbaiti, Meta. (2012).”*Perbandingan Pemberian Oralit Dan Air Mineral Terhadap Perubahan Berat Jenis Urine Dan Hematokrit Setelah Aktifitas Fisik*”.
- Putriana, Dittasari. dkk. (2014), “*Konsumsi Cairan Pada Latihan Dan Status Hidrasi Setelah Latihan Pada Atlet Sepak Bola Remaja*”. Jurnal Of Nutrition Vollege. Volume 3. Nomor 4. Tahun 2014. Halaman 689-697
- Rumayar, Angely C. (2016), “*Hubungan Derajat Dehidrasi Dengan Kadar Hematokrit Pada Anak Penderita Diare Di RSUP Prof. Dr. D. Kandou Manado*” Jurnal e-Clinic (eCl)Volume 4, Nomor 2, Juli _Desember
- Rulyenzi. (2017), “*Paparan Iklim Kerja Panas Terhadap Setatus Hidrasi Pekerja Unit Produksi Di Pt Arga Pantes TBK Tangerang*”. Jurnal teknik mesin-ITI Vol.1. No. 1
- Sugiyono. (2014) “*Metode Penelitian Kuantitatif, Kualitatif, dan R&D*” Alfabeta
- Suma'mur.(2009). “*Media Kesehatan Masyarakat Indonesi Vol.2 -No1 2012*
- Tilong, Adi D. (2012), “*Deteksi Gangguan Kesehatan Dengan Lida, Bau Napas, Dan Urine*. BUKU BIRU. Jogjakarta
- Tawaka. (2004), “*Ergonomi, Kelelahan Kerja*. Surakarta. UNIBA PRESS.
- Zulkarnain, Muhammad. dkk. (2017), “*Respon Imunitas Pekerja Yang Bekerja Di Lingkungan Terpapar Panas: Analisis Kajian Molekuler Pada Hygiene Industri*. Bidang ilmu keswhatan dan kedokteran