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Factors Related To Subjective Complaint of Heat Pressures in Employees Basement Mtc Karebosi Makassar

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Abstract:- Heat stress is a factor of the physical hazards of work environment that can cause mild to severe of physiological disorders. Makassar Trade Centre (MTC) and Karebosi Link are shopping centers that number of visitors vehicles on weekends reached 6.871 cars and 10.100 units of motorcycle. Heat coming from the vehicle's engine was trapped that potentially cause health problems for employees in the basement parking as a field employee and a computer operator. The aim of this study to find the correlation of heat stress, period of employment, length of work, shift work, and consumption of drinking water with subjective complaints due to heat stress in employees in the basement parking of MTC Karebosi and Karebosi Link Makassar.

The type of this research are analytical survey with cross sectional study design to 98 employees of basement parking obtained with exhaustive sampling. Correlation analysis between variables using chi square test. The results showed that employees who are exposed to heat stress are not eligible more likely to have severe complaints is 67,9% with p value = 0,001, employees with long of employment period more likely to have severe complaints is 42,9% with p value = 1,000, employees with un qualify length of work more likely to have severe complaints is 68,4% with p value = 0,014, employees who are worked to b shift (15.00-23.00) more likely to have severe complaints is 44,4% with p value = 0,731, and employees with not enough of drinking water consumption more likely to have severe complaints is 50,8% with p value = 0,018.

The conclusion, there are correlation between heat stress, length of work, and drinking water consumption with subjective complaints. While periode of employement and shift work have no correlation with subjective complaints. Therefore it is necessary to periodically measure the work climate, review of work length with appropriate threshold limit of heat stress, and lots of drinking water with frequently (every 20-30 minutes)

Keywords:- Heat Stress, Subjective Complaints, Basement Parking Employee

I. INTRODUCTION

The combination of air temperature (wet and dry), humidity, radiant heat, and air velocity that interact with the body's heat production would potentially cause heat stress. The ability of humans to adapt to the environmental temperature is generally seen from the changes in body temperature. Humans are considered able to adapt the changes in environmental temperature when there is no change in body temperature or changes in body temperature that occurs is still in the safe range. As we know that the temperature of the body (core body temperature) or a core body temperature should range between 37-38˚C.[4]

Employees who work in an environment with a temperature above the comfort zone must bear the heat coming from the activity of the body as well as receive an additional burden in the form of heat from its surroundings. Exposed to high temperatures during the work in the room, hot work environment or work in open space with the hot weather is a situation that is potentially causing hazard.[12]

The human body has a temperature control system for a balance between the heat generated from outside the body with the production of heat from the body. System settings are marked with perspiration, the occurrence of vasodilatation (widening of blood vessels), increased body temperature, and increased blood pressure. However, if exposure to heat stress continues, the risk of the occurrence of health problems also increased.

Health problems due to heat stress starts from a physiological disorder that is very simple to very serious disease. Behavioral disorders and work performance as do the rest stolen, dehydration (loss of fluids), thirst, fatigue, nausea, dizziness, fatigue, there are prickly heat, skin feels hot, parched, and the onset of seizures. The increase in body temperature in excess can lead to disease and fatality.[6]

Makassar Trade Centre and Karebosi Link are the Makassar community shopping center managed by PT Tosan Permai Lestari. Available in a variety of needs ranging from the needs of primary, secondary, and even tertiary. Not surprisingly, the number of vehicles on weekend visits reached 6,871 units and 10,100 units of motorcycles. The total number of vehicles stored in several locations both outdoor and indoor parking (basement).

Based on observations, basement air temperature was hot. This probably comes from the accumulation of heat coming from the vehicle engine at any time using this parking facility. Complaints are usually felt thirsty and sweaty. Computer operator and field employees are the group of workers who are considered exposed to heat during the work. Computer operator in charge of taking the data of vehicles going in and distribute the tickets at the time the vehicle will go. The activity was conducted in counters that have been provided. Field employees on duty to direct vehicles into the area which is still empty, adjust the position of the vehicle, and drive a vehicle that will come out.

Based on the above needs to be studied more about the factors related to the complaint due to thermal stress on the employees in the basement parking in MTC Karebosi and Karebosi links shopping center include heat stress, length of employment, length of work, shift work, and the consumption of drinking water.

II. MATERIALS AND METHODS

This type of research is analytic survey research with cross sectional approach. The populations in this study were all employees who worked as an employee parking field and computer operators. Sampling was carried out using exhaustive sampling technique with a sample size of 98 people.

Primary data on age, length of employment, length of employment, drinking water consumption, and complaints as a result of heat stress is obtained from direct interviews of employees using a questionnaire. Data on thermal stress obtained by direct measurement using WIBGET Heat Stress Monitor RSS-214 type.

Secondary data about the profile of the company, number of employees, and employee work time obtained in the HRD and Parking Department. Data processing was performed using SPSS version 16. Presentation of data is using the frequency distribution table and the percentage of dependent and independent variables and cross tabulation between the independent variables and the dependent variable. To determine the relationship between variables using Chi Square test.

III. RESULTS

Collecting data on heat stress using the wet bulb temperature index using a measuring instrument WIBGET Heat Stress Monitor RSS-214 known types of the following results

Table 1 Distribution Characteristics of Employees in Basement Parking Shopping Centre and MTC Karebosi and Karebosi Link of Makassar

No.	Respondent Characteristic	n (98)	(%)
1.	**Age group**		
	15-19	15	15,3
	20-24	49	50
	25-29	26	26,5
	30-34	6	6,1
	≥ 35	2	2
2.	**Gender**		
	Man	28	28,6
	Women	70	71,4
3.	**Education Level**		
	Junior High School	1	1
	Senior High School	95	96,9
	Academy / University	2	2
4.	**Working Unit**		
	Field Employee	28	28,6
	Computer Computer	70	71,4

Based on Table 1 are known most of the respondents (50%) included in the age group 20-24 years, the majority of respondents female sex (71.4%), almost all respondents have a high school education level (96.9%) and most of the work The computer operator working units (71.4%)

Table 2 Distribution of Respondents about Heat pressure, Working Period, Long of working, Working Shift, Water Consumption, Subjective Complaints in the Basement Parking Shopping Centre and MTC Karebosi Karebosi Link Makassar.

No.	Variable	n (98)	(%)
1.	**Heat Pressure**		
	Un qualify	28	28,6
	(≤ 31°C for computer operator and		
	≤ 28°C for field employee)		
	Qualify	70	71,4
	(> 31°C computer operator and		
	> 28°C for field employee)		
2.	**Working Period**		
	New (< 3 years)	77	78,6
	Long (≥ 3 years)	21	21,4
3.	**Length of work**		
	Un qualify (> 8 hour/day)	19	19,4
	Qualify (≤ 8 hour/day)	79	80,6
4.	**Working *Shift***		
	b *Shift* (15.00-23.00)	36	36,7
	a *Shift* (07.30-15.30)	62	63,3
5.	**Water consumption**		
	Sufficient (< 9 cups)	61	62,2
	Enough (≥ 9 cups)	37	37,8
6.	**Subjective complaint**		
	Hard Symptom (>3 complaint)	40	40,8
	Soft Symptom (1-3 complaint)	58	59,2

Table 2 shows the highest heat stress for 30,8˚C with the location in the basement of one computer operator MTC Karebosi on "a" shift, the lowest heat stress is in the basement of 1 MTC Karebosi during the shift b of 29,6˚C. Most respondents experiencing heat stress are not eligible (71.4%). Based on the working lives of the majority of respondents have a new working period (<3 years) a total of 77 respondents (78.6%). Most respondents have a long working qualify (≤ 8 hours / day) with 79 respondents (80.6%). Most respondents work on "a" shift (07:30 to 15:30) as many as 62 respondents (63.3%). Most respondents do not consume enough water (<9 cups) of 61 respondents (62.2%) and the majority of employees experiencing subjective complaints with soft symptom category (1-3 complaints) were 58 respondents (59.2%).

Table 3 Relationship between Heat Pressure, Working Period, length of Work, Shift Work, and Water Consumption with Subjective Complaints Due to Pressure Heat On Employee at Basement Parking Shopping Centre and MTC Karebosi Karebosi Link Makassar City:

No	Independent Variable	Subjective complaint				Number		P-value
		Hard		Soft				
		n	%	n	%	N	%	
1.	**Heat Stress**							0,001
	Un qualify	19	67,9	9	32,1	28	28,6	
	Qualify	21	30	49	70	70	71,4	
2.	**Working Period**							1
	New	9	42,9	12	57,1	21	21,4	
	Long	31	40,3	46	59,7	77	78,6	
3.	**Length Of work**							0,014
	Un Qualify	13	68,2	6	31,6	19	19,4	
	Qualify	27	34,2	52	65,8	79	80,6	
4.	***Working Shift***							0,731
	"b" *Shift*	16	44,4	20	55,6	36	36,7	
	"a" *Shift*	24	38,7	38	61,3	62	63,3	
5.	**Water Consumption**							0,018
	Sufficient	31	50,8	30	49,2	61	62,2	
	Enough	9	24,3	28	75,5	37	37,8	

Table 3 shows that there is a relationship between heat stress with subjective complaints due to heat stress, there is no relationship between working period with subjective complaints due to heat stress, there is a relationship between length of employment with subjective complaints due to heat stress, there is no relationship between shift work with subjective complaints due to heat stress and there is a relationship between water consumption with subjective complaints due to heat stress.

IV. DISCUSSION

1. Pressure Heat

The results showed an association between heat stress with subjective complaints due to heat stress. The results of measurements of heat stress is known that wet bulb temperature index in the basement in the range 29,6-30,8˚C. This suggests there are some locations where the temperature exceeds the threshold value for the workload being but if the workload is light, is still in the range of allowed values. Heat stress threshold value for the workload being at 28˚C and for light workload at 31˚C. Working climate affects the workers as complaining of heat, a lot of sweat, always thirsty, feeling unwell, and loss of appetite caused by the loss of fluid from the body by sweat evaporation.[9]

The results are consistent with research conducted by Hikmah Rida Siregar (2008) in North Binjai cracker industry shows that heat stress average on the "Tiga Bintang" frying is 32,9˚C, subjective complaints that workers often perceived are fatigue 50%, dizziness 27.8%, and stiff / muscle cramps 11.1% .[8]

2. Working Period

The results showed no relationship between working period with subjective complaints due to heat stress. The absence of a relationship between working period with the subjective complaints due to heat stress in this study may be due to the adjustment of labor, which have long worked in the basement so that subjective complaint felt lighter than the new workforce. The longer a person works, the more exposed to various hazards and health problems caused by the work environment, including exposure to the heat stress.[11]

Overall complaints from workers with working period less than one year have the complaints. Then the complaint is reduced to labor after working 1-5 years. However, complaints will increase in labor after working on the working period of more than 5 years. In addition, also known as the theory of physiological acclimatization or adaptation to the working heat environment.[10]

3. Length of work

The results showed an association between long working with subjective complaints due to heat stress. The longer working time will add to the heavy workload of receipt. Extend the working time is more than the ability is usually not accompanied by efficiency, effectiveness, and optimal productivity, even usually noticeable decrease in quality.[9]

During the work, the employee in the parking basement exposed to heat stress continuously. Exposure to heat stress are constantly caused by trapping of heat engine that uses a basement parking facility but the heat will gradually decrease with the number of visits of diminishing returns. Moreover, the employee break time is very short (25 minutes) should be a minimum of 30 minutes after working for 4 hours or adjusted by setting a break by WBGT value. This makes the duration of heat stress interaction with employees longer. The effects of the working environment can be felt influenced by environmental factors, human factors, and occupational factors. Factors consist of complex work tasks, task duration, workload, and skills.[9] Weighing health effects due to higher heat depending on temperature, humidity, and duration exposure.[3]

4. Working Shifts

The results showed no association between working shift with subjective complaints due to heat stress. These results are different with the research conducted by Ramdan (2007) in PT LJP East Kalimantan which states result that there is a relationship between shift work fatigue levels due to the ambient temperature exceeds the threshold value of 33,05˚C. In these studies also show that fatigue level of night shift work is higher than the afternoon shift.[7]

Performance decreases during the night shift work caused by the effects of physiological and psychosocial effects. The decline in performance will give impact in impaired mental capacity that affect the behavior of such employment vigilance, monitoring of quality control that give an effect on the presence of risk factors in the gastrointestinal tractus, nervous system, heart, and blood vessels.

Minor & Waterhouse (1999) in Chandra (2008) suggested that perform work at night more at risk of health problems due to a decline in physical work capacity due to the onset of drowsiness and fatigue. Decreased in appetite and indigestion as well as the cycle changes in cardiac function, respiratory, kidney, blood pressure, and other-factors.[1]

The absence of a relationship between shift work with complaints due to heat stress may be due to employee shift settings basement MTC and Karebosi links applied by the company is working with the system shift rotations per week. For example, the first week of the employee's shift a week later both will work on "b" shift. In addition to the shift rotation system is done, the position of employees every day will change and did not rule out working position today is the same as the previous day. Besides scheduling work shifts which only consists of two groups: "a" shift (07:30 to 15:30) and "b" shift (3:00 p.m. to 23:00). In "b" shift, 15:00 to 18:00 o'clock noon and still countless evenings at 18:00 to 23:00.

5. Water Consumption

The results showed no association between the water consumption with subjective complaints due to heat stress. The results are consistent with Tien Zubaidah's research (2007), suggested that 46 respondents usually drink while working with the frequency of drinking when thirsty mostly alone (40.7%), drinking irregular (25.4%), drink once every hours by 13.6%, while 20.3% do not drink while working. High temperatures trigger sweating if not done rehydration of lost fluids will lead to health complaints.

Subjective complaints that arise related to the water consumption may be due to lack of rehydration with drinking water consumed during the work. The need for water to reduce the thirst to maintain balancing fluid in the body of labor depends on the needs of each individual because fluid needs of each person is different. Harrianto (2010) in his book states that the core temperature of the body, for the same work rate, increases more rapidly with increasing dehidrasi.[2]

Employees tend to only consume water when thirsty are supposed every 20-30 minutes, and even then the number of their water consumption were not enough (<9 cups / 8 hours) should be as much as 9 glasses or more during 8 hours of work, or about 1.9 to 2 liters. In addition, the distance between the guard post office employees with the office relatively remote allows difficulty accessing drinking water to be consumed regularly. The location of drinking water supply is recommended most distant 200 feet (60 meters) from the workplace, this meant that the workforce is easy to reach without too long to leave work (Zubaidah, 2007) .[13]

Then coupled with the absence of a temporary replacement for standby at the checkpoint and provide another opportunity for employees to replenish container or buy drinking water.

VI. CONCLUSION

Based on the results and conclusions of the discussion can be obtained as follows:

a. Heat stress associated with subjective complaints
b. There is no relationship between working period with subjective complaints due to heat stress
c. Length of work associated with subjective complaints due to heat stress
d. There is no relationship between working shift with subjective complaints due to heat stress
e. Water consumption associated with subjective complaints due to heat stress.

VII. SUGGESTION

There was suggestions that can recommend to the company, readers, and respondents on this study as follows:

a. Needs to be checked and regular maintenance of exhaust fanfor reducing exposure to heat stress in the basement.
b. Heat stress measurements were taken periodically, especially in the parking basement so it can be used as a basis for determining the length of work and rest time employees.
c. New employees are given at least 5 working days for acclimatization, starting with 20% of the total working hours a day, and increased 20% every day until the end of the acclimatization period.
d. The location of drinking water supply is recommended most distant 200 feet (60 meters) from the workplace, it is intended to be easy to reach without too long to leave his job.
e. Water consumption of the employee should be increased to 9 glasses for working with the frequency of drinking that often.

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