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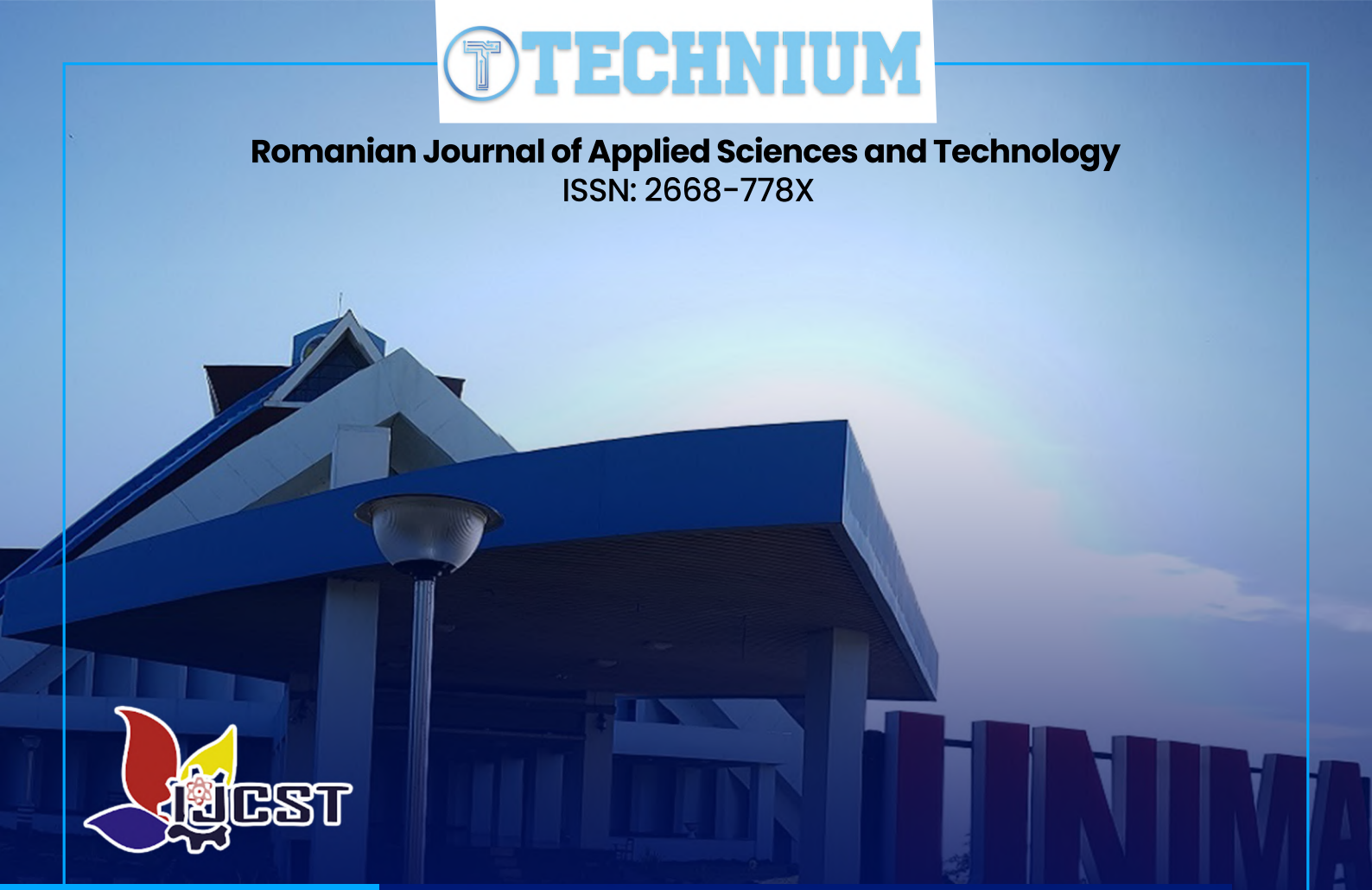

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MENTAL WORKLOAD ANALYSIS USING NASA-TLX METHOD AND MASLACH BURNOUT INVENTORY AT PT. XYZ (EAST KALIMANTAN EXITU DUMPING CASE STUDY)

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Abstract

The performance and productivity of individuals and organizations are greatly affected by workload. Excessive workload can be a serious problem for employees and organizations in an increasingly complex and dynamic world of work. Excessive workload can cause stress, burnout, and even workplace accidents, as well as affect the mental and physical health of employees as well as the quality and safety of goods and services produced by the company. Performance is affected by workload, workplace, and fatigue level. The purpose of this study was to identify factors that affect the level of fatigue of teams working on eksitu dumping activities at PT. XYZ. In this study, there were three variables, with their respective sub criteria: workload, fatigue level, and work environment. In this study, the subjects were all members of the eksitu dumping crew operating on the Balikpapan ship, totalling 32 people. To find out if Maslach's burnout inventory method affected worker burnout, the data was analyzed using NASA-TLX and Borg CR10. The results showed that mental load is a component that has an influence on the level of burnout of workers in dumping.

Keywords: Burnout, Borg CR10*, NASA-TLX*, Maslach burnout inventory*, Physical Workload, Mental Workload, Exitu* Dumping.

1. Introduction

The performance and productivity of individuals and organizations are greatly affected by workload. Excessive workload can be a serious problem for employees and organizations in an increasingly complex and dynamic world of work. Excessive workload can cause stress, burnout, and even workplace accidents, as well as affect the mental and physical health of employees as well as the quality and safety of goods and services produced by the company.

Workload is an important component in the performance of a person and organization. The right level of workload can improve the quality and productivity of work, but too much workload can lead to burnout, stress, and decreased performance. This can have a negative impact on employee well-being, their job satisfaction, and overall organizational performance.

Accidents are events that are not anticipated and do not have an element of intent, Hinze (1997). An accident is an unplanned and uncontrollable event that can result in injury to employees, damage to equipment and other losses. Anton, (1989)

Occupational accidents are unwanted and unexpected events that disrupt the course of an orderly activity (Husni, 2003)

There are two types of causes of work accidents: contributing causes of accidents, namely factors supporting the occurrence of work accidents and immediate causes of accidents, namely factors that directly result in accidents. Contributing causative factors consist of unsafe acts and unsafe conditions in the workplace.

Judging from the table of total work accidents of PT. XYZ in 2022 that there are 2 work accidents that occur, namely first aid incidents where accidents occur that result in workers having to get first aid assistance as soon as possible, 1 case where workers experience eye irritation because they do not use safety goggles and 1 case where because daydreaming a worker's finger is cut by a rotating machine. There are 2 nearmisses in the case above which almost resulted in a fatal accident arising from an unsafe environment, namely 1 case where a worker was almost hit by goods carried by a crane and then there was 1 case where the cable on the machine that was used burned and the machine was in the fire triangle area. Near misses are a serious potential for work accidents that can have fatal consequences. Work accidents can occur due to several factors, including human error, lack of information (lack of understanding of workers about their work) or ignorance, as well as unstable working environment conditions.

2. Literature Review

2.1 Workload

Johari et al., (2016) said that workload includes all activities carried out by employees as well as the time needed to complete these tasks and work, either directly or indirectly. Meanwhile, Yuniarsih and Suwatno, (2011) stated that workload includes various processes or activities that must be completed within a certain period of time to

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find out how efficient and effective an organizational unit is.

According to Hastutiningsih (2019), workloads can be categorized into three levels, including:

1. Workload above normal:
   A situation where the number of available man-hours or the volume of work to be completed exceeds the worker's ability.
2. Normal workload:
   A state in which the amount of time required to complete a task is proportional to the number of available man-hours or the volume of work is proportional to the employee's ability.
3. Sub-normal workload:
   situations where the volume of work is lower than the worker's ability or the time required to complete the job is shorter than the number of available man-hours.

Workload is the amount of work that must be done by a position or unit in an organization, according to Soleman (2011), Multiplying the volume of work by the time norm is a way to calculate this workload. There are two scales for assessing workloads, namely:

1. External Factors: Included in this factor are the tasks assigned, the level of complexity of the work, the length of work time, as well as the required rest period.
2. Internal Factors: These factors include motivation, perception, desire, and the level of satisfaction felt by the individual carrying out the job.

2.2 Burnout

According to Maslach (2005), fatigue is not just about having a bad day or bad feelings. Instead, it refers to a continuously ongoing condition that is related to work and can cause difficulties in one's life. Burnout is a reaction to long-term emotional distress that comes into intensive contact with others, especially when they face problems or difficulties. This syndrome is also known as emotional exhaustion, depersonalization, and decreased personal performance. This condition can be experienced by people who work with others in various types of jobs.

In such a situation, fatigue can be categorized as one type of work stress. Although it has the same negative effects as other stress responses, what differentiates burnout from stress is that it comes from social interaction between people giving and receiving. A person's life is affected by fatigue in the long run. Physical and mental health can be severely impaired, it can even lead to depression or illness.

2.3 Nasa-TLX

Sandra G. of *NASA-Ames Research Center* and Lowell E. Staveland of *San Jose State University* developed the NASA-TLX method in 1981 to measure subjectivity through nine scales of factors that drove the method's development.

According to research conducted by NASA's Performance Research Group in 1988, the Nasa TLX method is a multidimensional tool intended to measure overall mental workload. This method classifies needs into six different categories: mental needs, physical needs, time needs, personal needs, effort, and boredom. The process used to scale workload ratings is described as follows by Hart & Staveland (1988):

1. Select a group of subscales that are most relevant to the problem to be measured.
2. Define ways to connect these subscales in order to generate different workload values, both in the context of the task and in the context of assessments by respondents.
3. Determine the best procedure to generate numeric values for each selected subscale.

There are three categories in sub-scale selection, namely:

1. Task difficulty ratings based on dimensions related to the task show how subjects perceive the level of difficulty they face. Difficulty and time pressure factors provide important information about the workload at scale associated with the task; However, there was no significant relationship between activity type ratings and overall workload. Therefore, one of the key components in assessing workload is comparing the time it takes to complete a task with the time available.
2. The experimental results showed that physical effort did not contribute significantly to the overall workload and did not have a significant correlation. On the other hand, physical workload is still considered a major component of worPDorce evaluation. However, it is related to time pressure (tasks that require multiple responses) and stress (more complex tasks require more supervision). The mental effort factor becomes very important as the number of operational tasks increases. Mental effort and performance ratings in each experimental group had a significant correlation with overall workload ratings. In addition, the second factor that has the highest correlation to overall workload ratings is mental effort.
3. Factors related to the subject (frustration, stress, and fatigue) also affect the value of the workload. The frustration rating affected the overall workload score in all experiment categories, and the stress factor also affected the overall workload score. However, there was no relationship between the fatigue factor and the amount of work done.

3. Research Methodology

This chapter describes the systematic stages carried out by researchers to answer and discuss questions

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appropriately in accordance with existing research problems.

This research was conducted on 4 ships carrying out exit dumping in East Kalimantan. Data collection was carried out by giving questionnaires to 32 workers, consisting of 1 supervisor. 1 Second leader, 13 operators, 16 field engineers, 1 junior engineer.

4. Data Analysis and Discussion

Data collection is an activity to find data in the field that will be used to answer research problems. Sugiyono (2013) revealed that data collection techniques are part of a strategic step in research, because the main purpose of the research is to obtain data. In this study, the data collected in the exitu dumping division were in the form of physiological load data and psychological burden of respondents, as well as Maslach burnout inventory (MBI). From this activity, 32 data were obtained, which is the total number of workers in the dumping exitu.

The data needed in determining the physical (physiological) workload is the value of the physical load experienced by workers when carrying out exitu dumping activities using the Borg CR10 questionnaire. Determination of mental (psychological) workload values using the NASA TLX method. Determination of burnout value with questionnaire maslach burnout inventory (MBI). As well as determining the value of environmental factors against burnout. After that, we see the relationship between the four indicators.

This exitu dumping crew has 32 male workers with the following composition:

Table 1. Labor Amount Table

Position	Total Workforce
Supervisor	1
Second Leader	1
Operator	13
Field Engineer	16
Junior Engineer	1

5. Mental Workload Data Collection

The source of the data obtained came from the NASA-TLX questionnaire, measurement with this method is one of the psychological approaches by making a psychometric scale to measure the mental workload felt by the resource persons. Measurements are carried out in the following way:

1. Providing a NASA-TLX questionnaire related to rating, each resource person was asked to give a score to six indicators of mental workload with a scale value between 0-100. The smaller the value given can mean that the resource person does not feel mentally burdened in carrying out work activities, and vice versa.
2. Calculate the results of filling out the NASA-TLX questionnaire for each resource person regarding the number of ratings and weights.
3. Analyze the results of each volunteer's psychological workload on psychological value indicators.

5.1 Rating Assessment

Table 2. NASA-TLX Questionnaire Scores

Worker's	Score						
	Age	MD	PD	TD	P	E	F
1	38	26	26	26	51	76	76
2	29	80	50	40	80	80	25
3	38	80	70	74	85	90	75
4	30	75	75	75	100	75	25
5	50	76	51	76	76	76	25
6	39	50	50	50	75	75	25
7	48	100	100	100	100	100	100
8	41	100	100	100	100	100	100
9	19	50	50	76	50	76	50
10	30	100	100	90	100	100	25
11	28	78	76	50	50	76	76
12	21	50	80	75	100	75	0
13	27	100	100	100	100	100	100
14	45	90	95	90	90	95	25
15	37	51	51	51	76	76	25
16	38	26	50	51	76	76	26
17	39	60	30	20	70	70	10
18	53	85	85	85	90	85	25
19	34	75	50	75	100	70	90
20	23	100	100	100	100	100	100
21	42	76	0	76	70	80	0
22	51	70	50	75	75	50	25
23	30	78	76	100	78	100	90
24	29	50	70	70	80	90	25
25	26	25	40	40	51	76	20
26	28	70	50	75	75	75	75
27	25	85	90	70	100	100	25
28	32	90	95	90	100	100	15
29	48	80	70	80	100	70	25
30	21	75	75	75	100	75	25
31	29	85	80	75	80	76	75
32	35	75	75	100	75	100	25

Table 3. NASA-TLX Questionnaire Weights

Worker's	Bobot					
	MD	PD	TD	P	E	F

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Worker's	Bobot					
	MD	PD	TD	P	E	F
1	2	3	2	1	4	3
2	2	3	1	5	4	0
3	0	4	2	4	4	1
4	2	4	2	2	5	0
5	4	4	4	2	1	0
6	5	3	4	2	1	0
7	2	4	1	3	5	0
8	5	4	2	1	0	3
9	1	4	5	2	3	0
10	2	2	3	4	4	0
11	3	5	1	4	2	0
12	2	4	2	3	4	0
13	4	3	3	2	3	0
14	3	5	1	2	4	0
15	1	4	4	4	2	0
16	2	5	3	1	4	0
17	1	2	3	3	1	5
18	5	3	1	3	3	0
19	0	5	1	4	3	2
20	2	2	2	5	4	0
21	2	5	1	4	3	0
22	1	4	4	2	4	0
23	2	5	4	1	1	2
24	1	4	3	4	3	0
25	1	3	2	5	4	0
26	0	4	4	4	2	1
27	4	5	3	1	2	0
28	1	3	2	4	5	0
29	2	2	1	4	5	1
30	1	4	3	2	5	0
31	1	4	2	2	5	1
32	2	1	4	3	3	2

5.2. Weighting

After receiving the results of the NASA-TLX questionnaire rating from each respondent, then a calculation of the weight of each scale was carried out in order to determine the perceived mental workload of each respondent. Here is an example of mental workload calculation and analysis for Respondent :

$$\text{Load Score} = \text{Weight x Rating}$$

$$\text{Total Load Score} = \text{Load Score MD} + \text{Load Score PD} + \text{Load Score TD} + \text{Load Score P} + \text{Load Score E} + \text{Load Score F}$$

$$\text{Score Rating} = \frac{\text{Total Load Score}}{15}$$

Table 4. Calculation of Mental Workload Analysis of Respondent Untung

Scale	Bobot	Rating	Load Score
MD	2	26	52
PD	3	26	78
TD	2	26	52
P	1	51	51
E	4	76	304
F	3	76	228
Total	15		765
Score			51

Table 5. Rating of Calculation of Mental Workload of Respondent Untung

<50	Low
50-80	Average
>80	High

Description:

MD = Mental Demand
PD = Physical Demand
TD = Temporal Demand
P = Performance
E = Effort
F = Frustration

Table 6. Workload Analysis Calculations

Worker's	Age	*Rating*	Beban Kerja
1	38	51,00	Average
2	29	71,33	Average
3	38	80,20	High
4	30	78,33	Average
5	50	69,33	Average
6	39	55,00	Average
7	48	100,00	High
8	41	100,00	High
9	19	63,87	Average
10	30	98,00	High
11	28	67,73	Average
12	21	78,00	Average
13	27	100,00	High
14	45	93,00	High
15	37	61,00	Average
16	38	55,67	Average
17	39	34,00	Low
18	53	86,00	High
19	34	74,33	Average
20	23	100,00	High
21	42	49,87	Low
22	51	61,33	Average
23	30	86,27	High
24	29	75,33	Average
25	26	52,27	Average
26	28	68,33	Average
27	25	86,67	High
28	32	97,00	High
29	48	77,00	Average
30	21	78,33	Average
31	29	78,00	Average

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Worker's	Age	*Rating*	Beban Kerja
32	35	80,00	Average

Judging from the results of NASA-TLX calculations, there are 19 people who are in the average criteria, 11 people who are in the High criteria, and 2 people are in the Low criteria. The number of respondents who are in the average and High criteria can be related to the work environment, where they have to stay on the ship for a long time without docking with a high level of work accident risk and unfriendly weather, besides that this high mental burden can also occur due to high pressure between workers because of different opinions. Low value on the mental load of workers can occur because these workers can adapt to the work environment. The advice that can be given by the author is to do some activities that can reduce the potential for high mental workload, such as *sharing sessions*, sports, and so on.

6. Maslach burnout inventory (MBI) Data Collection

Conducted by survey to find out what respondents feel during work. The data that has been obtained is qualitative data

Name	Depersonalixation	Rating	Personal Accomplishment	Rating	Emotional Exhaustion	Rating
Untung Suwito	5	Average	3	High	9	Low
Patrick Natalio Metekohy	9	Average	6	High	12	Low
Rendy Sarungu	19	High	21	High	31	High
Pardy	4	Low	7	High	16	Low
Imansjah	1	Low	0	High	0	Low
Andi Cahyadi Nugroho	14	High	9	High	5	Low
Agus Jaya	5	Average	4	High	12	Low
Nelman Saludu	5	Average	8	High	11	Low
Amran	3	Low	8	High	14	Low
Adryan Desmonda	5	Average	13	High	5	Low
Achmad Ridwan	1	Low	1	High	6	Low
Achmad Imam Zulfahmi	6	Average	1	High	19	Average
Hari Setyawan	0	Low	0	High	4	Low
Surachman	3	Low	1	High	1	Low
Irawan Saputro	9	Average	5	High	15	Low
Sukimin	4	Low	4	High	6	Low
Bernabas GA	3	Low	5	High	5	Low
Arifin Lapala	12	Average	12	High	7	Low
Michael Seraf Lengkong	0	Low	0	High	0	Low
Achbar Risky Wahyudi	12	Average	12	High	18	Average
Fredy	1	Low	0	High	0	Low
Frits Marasi P	6	Average	3	High	5	Low
Rahmat Kusnaedi	1	Low	4	High	16	Low
Andi Eka Putra	5	Average	5	High	5	Low
Aris Kamaluddin	0	Low	0	High	0	Low
Andriyanto	6	Average	0	High	0	Low
Muhammad Siswandi	4	Low	6	High	5	Low
Rahmad Ridwansyah	16	High	13	High	24	Average
Rudy Subroto	0	Low	0	High	0	Low
Muhammad Syuga Riyanda	11	Average	12	High	9	Low
Riadi Akbar	4	Low	13	High	9	Low
Agus Triyanto	18	High	21	High	24	Average

Fig 1. MBI Calculation Results Table

From the table of MBI calculation results, it can be seen that the respondents have a fairly good *burnout* rate, judging from the calculation value of each indicator whose results are relatively Low and average, even though there are some workers who have a high weight value. The worker who has the highest score in this MBI calculation is Mr. Rendy. Looking at the data on this questionnaire respondents are 38-year-old men who serve as *supervisors*, the length of time he has been on the boat is 2 months, the average 38-year-old man already has a family, if viewed from this data there is a possibility that the value of depersonalization and high emotional fatigue can be caused by the length of time he has not seen family, In addition, the pressure he has as *a supervisor* who is responsible for the safety of his colleagues can also affect the high value of depersonalization and emotional exhaustion. The advice that can be given by the author is to make scheduling for workers even though the client does not provide a time limit for workers to be on board.

7. Physical Workload Data Collection

Physical workload data was taken to find out whether there was an influence between the physical load experienced by respondents while working on the level of stress experienced. Physical workload data was obtained from the Borg CR10 questionnaire which measured the physical workload of respondents in each work activity. Measurements are carried out in the following stages:

1. Giving the Borg CR10 questionnaire to each respondent with a total of 6 questions, according to the number of work activities carried out by the respondents
2. After the data is received, the severity of the physical burden experienced by the respondents will be calculated

8. Environmental Factor Data Collection

Environmental influence data was taken to see if there was an influence from the respondents' workplace environment on their stress levels.

9. Data Processing

9.1. Data Validity Test

The data validity test aims to see the measurement result data, whether the data measuring device is valid or not which will then be continued with the next test.

Mental Load Validity Test

Table 7. Mental Load Validity Test Table

Psychology Score			
Scale	R Table	R Calculate	Description
MD	0,349	0,854	VALID
PD	0,349	0,849	VALID
KW	0,349	0,945	VALID
P	0,349	0,697	VALID
E	0,349	0,706	VALID
F	0,349	0,614	VALID

Based on the output the validity of respondents' Psychological Data can be analyzed:

1. Based on the Total column and pearson row, MD correlation shows r count with the number 0.854. Therefore, MD is said to be valid because r counts > r table where r table = 0.3490 because the number of samples is 32 with a confidence level used 95% (α=0.05).
2. Based on the data above the scale MD to TF is declared valid because r calculate > r table.

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Judging from the results of NASA-TLX calculations, there are 19 people who are in the average criteria, 11 people who are in the High criteria, and 2 people are in the Low criteria. The number of respondents who are in the average and High criteria can be related to the work environment, where they have to stay on the ship for a long time without docking with a high level of work accident risk and unfriendly weather, besides that this high mental burden can also occur due to high pressure between workers because of different opinions. Low value on the mental load of workers can occur because these workers can adapt to the work environment. The advice that can be given by the author is to do some activities that can reduce the potential for high mental workload, such as *sharing sessions*, sports, and so on.

10. Maslach burnout inventory Validity Test

The data validity testing steps for respondents' MBI are the same as the previous validity testing steps.

Table 8. MBI validity Test Table

Question	R Table	R Count	Description
2	0,349	0,572	VALID
3	0,349	0,739	VALID
5	0,349	0,465	VALID
8	0,349	0,832	VALID
9	0,349	0,743	VALID
10	0,349	0,774	VALID
11	0,349	0,741	VALID
12	0,349	0,662	VALID
13	0,349	0,45	VALID
19	0,349	0,748	VALID
20	0,349	0,686	VALID
21	0,349	0,545	VALID
22	0,349	0,7	VALID

Based on the output validity of *Maslach burnout inventory* respondents can be analyzed:

1. Based on the Total column and the pearson correlation row, question 2 shows r count with the number 0.546. Therefore, question 2 is said to be valid because r counts > r table where r table = 0.3490 because the number of samples is 32 with a confidence level used of 95% (α=0.05).
2. Based on the data above, questions 2, 3, 5, 8-13, 16, and 19-22 are considered valid because r counts > r table.
3. Based on the data above, questions 1, 4, 6, 7, 14, 15, 17 and 18 are declared invalid because r counts < r table.

After determining all invalid questions, the validity test is repeated with the data that has been eliminated.

After the third validity test, valid questions were found for *Maslach burnout inventory*. Due to the large number of invalid questions, it is necessary to calculate other validity to be able to find out whether the questions used can still be used to continue the research, therefore the KMO method was chosen to support the validity of the *Maslach Burnout Inventory questionnaire*.

KMO and Barlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.734
Barlett's Test of Sphericity	Approx. Chi-Square	56.255
	df	3
	Sig.	.000

Fig 2. KMO MBI Validity Test Results Table

KMO and Barlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.519
Barlett's Test of Sphericity	Approx. Chi-Square	84.605
	df	36
	Sig.	.000

Fig 3. KMO MBI Validity Test Results Table Emotional Exhaustion Subection

KMO and Barlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.633
Barlett's Test of Sphericity	Approx. Chi-Square	77.277
	df	28
	Sig.	.000

Fig 4. KMO MBI Validity Test Results Table Personal Accomplishment Subection

KMO and Barlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.672
Barlett's Test of Sphericity	Approx. Chi-Square	20.377
	df	10
	Sig.	.026

Fig 5. KMO MBI Validity Test Results Table Depersonality Subection

After calculating the validity using the KMO method, it is known that the KMO value for the MBI questionnaire has a value of 0.734 with a significance of 0.000 and the KMO value for each subsection has the following values: the emotional exhaustion subsection on the MBI questionnaire has a value of 0.519 with a significance value of 0.000, the personal achievement subsection on the MBI questionnaire has a value of 0.633 with a significance value of 0.000, and the depersonalization subsection on the MBI questionnaire has a value of 0.672 with a significance value of 0.026 where this number has met the criteria limit and the data is declared valid.

From the table of MBI calculation results, it can be seen that the respondents have a fairly good *burnout* rate, judging from the calculation value of each indicator whose results are relatively Low and average, even though there are some workers who have a high weight value. The worker who has the highest score in this MBI calculation is Mr. Rendy. Looking at the data on this questionnaire respondents are 38-year-old men who serve as *supervisors*, the length of time he has been on the boat is 2 months, the average 38-year-old man already has a family, if viewed from this data there is a

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possibility that the value of depersonalization and high emotional fatigue can be caused by the length of time he has not seen family, In addition, the pressure he has as *a supervisor* who is responsible for the safety of his colleagues can also affect the high value of depersonalization and emotional exhaustion. The advice that can be given by the author is to make scheduling for workers even though the client does not provide a time limit for workers to be on board.

11. Borg CR10 Validity Test

Question	R Table	R Calculate	Description
1	0,349	0,906	VALID
2	0,349	0,906	VALID
3	0,349	0,913	VALID
4	0,349	0,968	VALID
5	0,349	0,723	VALID
6	0,349	0,867	VALID

Fig 6. Borg CR10 Validity Test Results Table

Based on the output of Borg CR10 validity respondents can be analyzed:

1. Based on the Total column and the pearson correlation row, question 1 shows r count with the number 0.906. Therefore question 1 is said to be valid because r counts > r table where r table = 0.3490 because the number of samples is 32 with a confidence level used 95% (α=0.05).
2. Based on the above data, all Borg CR10 questions are declared valid because r counts > r table.

From the results of data processing, it can be seen that the value of the physical workload experienced by workers in each sub-activity is quite the same, where activities 1, 2, 3, 4, and 6 they have a lot of free time to be able to rest, average on activity 5, namely the waste disposal activity itself has a value of 6.95 where they are required to focus and have high concentration because of the work risks that can occur during waste disposal, Activity 5 is also the most energy-consuming activity. The response that fills the highest physical workload value is Mr. Nelman, he is a field engineer who is 41 years old, the amount of physical load that occurs in Mr. Nelman can be caused by irregular rest periods, from the results of interviews with workers, it is known that the rest time given to workers is not used to rest fully, the average worker gets a break often still doing equipment and machine ckeck-ups. Checking machines and equipment is a job based on the initiative of workers so that there are no obstacles when other crews work. The advice that can be given by the author is to make a logbook for all equipment and machines that will be checked so that there is a more structured scheduling.

12. Test the Validity of Work Environment Factors

The data validity testing steps for respondents' MBI are the same as the previous test

Question	R Table	R Calculate	Description
1	0,349	0,617	VALID
2	0,349	0,74	VALID
5	0,349	0,766	VALID
6	0,349	0,782	VALID
8	0,349	0,772	VALID
9	0,349	0,683	VALID
10	0,349	0,744	VALID
11	0,349	0,651	VALID

Fig 7. Table of Environmental Factor Validity Test Results

After the third validity test, valid questions for work environment factors are known

6.1 Normality Test

The data normality test aims to see the distribution or distribution of normal data from measurements of Borg CR10 physical workload, mental workload (psychology), environmental factors and *maslach burnout inventory* (MBI), which will be tested next.

Table 9. Normality Test Results Table

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		32
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	1512971362
Most Extreme Differences	Absolute	.081
	Positive	.077
	Negative	-.081
Test Statistic		.081
Asymp. Sig. (2-tailed)		.200[e,d]

Based on the Kolmogorov-Smirnov column and the confidence level used 95% (α=0.05), the Sig. value of 0.200 > 0.05 then the data is normally distributed (data distribution is even/balanced). So that further testing can be carried out. It can be seen from the output result of normality histogram normally distributed data, because all charts are inside a curve, between the left and right part of the chart are balanced (equal).

6.2 T Test

The T test is useful to see the significance and strength of the low relationship between physical workload (Borg CR10), environmental factors and mental workload (psychology) to the *problem of burnout inventory* (MBI) itself.

Table 10. Table of Test Results T

Coefficients[a]

Model	*Unstandardized Coefficients*		*Standardized Coefficients*		
	B	*Std.*	*Beta*	*t*	*Sig.*

			Error			
1	(*Constant*)	40.156	28.613		1.403	.171
	Borg CR10	.178	.167	-.186	-1.064	.296
	NASA-TLX	.074	.036	.360	2.060	.049
	Lingkungan	-1.312	.778	-.289	-1.686	.103

If the value of t is calculated > t table then there is an influence of variable X on Y. Borg CR10 or physical load has no effect on *burnout* can be seen from t count < t table; -1.064 < 1.7011. Mental load has an influence on *burnout* because t count > t table; 2.060 > 1.7011. Environmental factors that have no influence on *burnout* can be seen from t count < t table; -1.686 < 1.7011

6.3 Test F

Test F is useful to see the significance and strength of the low relationship between physical workload (Borg CR10), environmental factors and mental workload (psychology) to *maslach burnout inventory* (MBI) simultaneously.

Table 11. F Test Results Table

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1806.313	3	602.104	2.376	0.091[b]
	Residual	7096.155	28	253.434		
	Total	8902.469	31			

If the value of f is calculated > f table then there is an influence of variable X on Y. The relationship between physical load, mental load, and environmental factors simultaneously has no influence on *burnout* can be seen from t count > t table; 2.376 < 2.94668.

10. CONCLUSION

1. NASA TLX calculations show that employee psychological scores are divided into 3 categories: Low, average, and High. 19 people are in the average category, indicating that not all staff members experience stress or pressure because of their work. According to the results of Borg CR10 calculations, activities 1,2,3,4, and 6 are classified as average load categories, and activity 5 is classified as strong load categories. Thus, the work activity of the dumping exitu crew is relatively stable for each activity.
2. Due to the very low degree of association with indications, physical workload (Borg CR10) and environmental factors do not have a significant influence on *burnout* rates. The result shows that the table count t is -1.064 below 1.7011 and the table t is -1.686 below 1.7011. In addition, the physical load of staff while working remained High, with activity 5 having a value of 6.95, and often extreme environmental conditions did not greatly affect these two factors. NASA-TLX averages have an influence on the rate as calculations are made.
3. The relationship between physical load, mental load, and environmental factors simultaneously has no influence on *burnout* can be seen from t count < t table; 2.376 < 2.94668

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