**The Effect of Mental Workload on Driver Burnout of Oil and Gas Companies X**

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ABSTRACT

Oil and Gas Company X has the most extensive exploration unit in Indonesia, which has several exploration fields. Operational activities in this company are highly dependent on several positions, such as operators and technicians. Due to the operation area (field) being far from Balikpapan City, the company provides special transportation facilities for going and returning employees on duty in the operating area. So that the role of drivers is crucial in the continuity of business processes in this company, either directly or indirectly, drivers are required to have high concentration and mentality in making decisions quickly and accurately. In addition, monotonous driver activity when road conditions are smooth can cause driver burnout to increase. This study aims to analyze the effect of mental Workload on the level of driver burnout and provide suggestions for improvement to reduce the level of mental Workload and driver burnout. Measurement of mental Workload using the NASA-TLX method while for the level of burnout using the MBI method. Based on the study's results, it is known that the average mental Workload of drivers is 69.1 in the high category, and the average operator burnout level is 14.44 in the low category. Based on the analysis, the regression equation Y = -1.635+0.233X with a correlation value of 0.380 means that the correlation is relatively low. So suggestions can be given in the form of providing supporting facilities and infrastructure, job rotation, and conducting or holding stimulating activities.

KEY WORDS: NASA-TLX; MBI; Driver; Mental Workload; Burnout; Regression; Correlation

INTRODUCTION

Driver burnout is a well-known contributor to potentially fatal car accidents. Williamson et al. (2011) emphasize that burnout has several components, with symptoms including mental, physical, and muscular burnout, which they claim, are the most critical aspects of burnout in a driving context. In addition, burnout can be determined by physiological and psychological factors, which can lead to changes in other harmful states, such as stress (Matthews & Desmond, 1998).

The workload experienced by a worker can be in the form of a physical burden, a mental/psychological burden, or a social/moral burden arising from the work environment. Mental Workload is a person's assessment of the attentional load (between his motivational capacity and the demands of the given task) when someone does a reasonably good job in a motivated condition. Mental Workload is related to mental needs and the availability of human brain resources (Hancock, 1988).

Oil and Gas Companies X has the most extensive exploration unit in Indonesia, which has several exploration fields. The fields are spread over several areas, such as Samboja, Sanga – Sanga, Handil, and Tani Baru. Operational activities in this company are highly dependent on several positions, such as operators and technicians. Due to the operational area (field) being far from Balikpapan City, the company provides special transportation facilities for going and returning employees who work in the functional area. So that the Driver's role is crucial in the continuity of the business processes in this company, either directly or indirectly. For example, an operator position that should be on duty for 3 weeks will be hampered by its departure schedule (because there are drivers who experience problems), besides the Driver is also responsible for the safety of some personnel in the vehicle.

With the physical and mental Workload received by the Driver and the Driver's burnout, it is crucial to know the level of burnout of the Driver so that it can be seen whether the Workload and mentality received are still reasonable or otherwise and to know the Driver's burnout so that the business activity process runs well. Drivers do not get overloaded with work and have good burnout. Therefore, the author will examine the effect of physical and mental Workload and burnout on the boredom experienced by drivers at Oil and Gas Companies X company. To measure mental Workload using the NASA Task Load Index (NASA – TLX) questionnaire method, and for burnout, researchers use Maslach Burnout Inventory (MBI) questionnaire method.

Mental burnout is a psychobiological state caused by demanding cognitive activity over a long period and is characterized by a combination of subjective, behavioral, and physiological manifestations (Cutsem et al., 2017; Pageaux and Lepers, 2018). Subjectively, mental burnout manifests as increased feelings of tiredness and lack of energy. Behaviorally, mental burnout manifests as a decrease in performance in terms of accuracy and reaction time on cognitive tasks. Physiologically, mental burnout manifests as changes in brain activity. To form mental burnout, the three manifestations do not have to exist because someone can compensate for these manifestations (Cutsem et al., 2017). The effects of mental burnout are slower reaction times, loss of attention and alertness, impaired judgment and decision-making, and loss of motivation (Murray & Thimgan, 2016).

According to Bennet (2000), an independent variable was the variable that stimulated the results or the result of the dependent variable. The Workload was the independent variable, and job burnout was the dependent variable in this investigation. According to Nikulin et al. (2019), there were six dimensions to be displayed in the overall Workload (OW).

Job burnout can have some harmful effects on the organization because they will feel fatigued when they are overworked in their job position. They will also feel dissatisfaction among their co-workers when they cannot meet the expectations of their current job demands. Then it will bring the worker toward emotional exhaustion, depersonalization, and personal fulfillment (Maslach, 2005).

Maslach et al. (2005), on the other hand, explained that burnout occurs when a person suffers prolonged exposure to stressful stimuli such as job demands and complexity, with a lack of adequate emotional care provided by the employer and undertaken by the employee, which subsequently leads to emotional emergence.

Emotional exhaustion soon increases and later forms another symptom of detached feelings towards work and creates a sense of depersonalization towards the work systems, the people involved in the workplace, and the organization itself with a negative outlook, prejudices, and other views not complementary to the whole. Organizational structure ultimately leads the employee to encounter problems in achieving particular objectives (Maslach et al., 2005). Thus, it will reduce personal performance at work, so this was a stage where the individual or employee would very quickly experience a decrease in personal achievement, where the sense of interest or the sense of pleasure in performing any task at work does not would still be touched because tasks and duties were performed only to supplement work demands in a combative emotional state, thus causing burnout (Maslach et al., 2005).

Over the past decades, several studies have been conducted to determine the relationship between job stress and burnout. Baker et al. (2005) focused on job stress as one of the main factors affecting job burnout. According to Wu et al. (2018), job burnout affects the daily life of a professional, increases time and costs, reduces employee satisfaction, and ultimately leads to job burnout. According to Hart and Staveland (1988), work can be divided into six categories: mental demand, physical demand, physical demand, productivity, energy, and frustration, so this study uses Hart and Staveland (1988) work sources to determine respondents' work responsibilities. The aim of the present study was to investigate the relationship between mental workload and burnout among drivers in Oil and Gas Companies X.

METHODS

This study used quantitative research to collect quantitative data from the respondents. In addition, a descriptive study was conducted to determine the level of workload and the level of job burnout. Meanwhile, social research examines the relationship between two or more variables within the same group of people. In this study, correlation research was conducted to investigate the strength and direction of the relationship between the independent (Workload) variables and the dependent (job burnout) variables of the driver.

The instrument used in the study was adapted from instruments corresponding to known variables. Questionnaires used to assess performance were the NASA-TLX developed by Hart and Staveland (1988) and the Work Retention Scale developed by Maslach (1981). NASA-TLX was used to store mental workload data. The NASA-TLX has six dimensions related to workload, three of which relate to the demands placed on individuals during work (mental demands, physical demands, and time demands) and the remaining three to job outcomes (performance, motivation, and frustration). The assessment is achieved by requesting the respondents to rate mental, physical, and temporal demands imposed by the completion of the task, as well as the level of frustration they experienced, number of performance concerns they had, and overall effort required to complete the task. Mental and physical demands determine the level of intellectual/perceptual and physical work required for completion of a task, respectively. The temporal demand provide the measure for time pressure during the completion of the task. The effort component assesses mental and physical work required to perform at a certain proficiency level. The frustration component evaluates the level of stress associated with completion of the task. The start and end points for the scales used to quantify each of these five components are low and high, respectively. The sixth component, performance, was developed to assess the degree of the trainee's satisfaction on completion of the task. The endpoints for the performance component are good and poor. The performance dimension is scaled between perfect and fail, but the other dimensions are scaled from very low to very high.

In the first part of the NASA TLX, participants are asked to rate each dimension on a 0–100 scale at five-point intervals. In the second block, the dimensions are compared in a binary comparison and each dimension is selected as more important and effective than the other (according to participants) in the experienced mental workload. The mental workload is calculated. The score interpretation based on calculated WWL are low (0-9), medium (10-29), rather high (30- 49), high (50-79), very high (80-100). Considering the validity and reliability of the NASA TLX used, Mazloumi et al. where Cronbach's alpha was 0.897.

The MBI is a 22-item instrument used to assess burnout in healthcare professionals. The MBI measures three dimensions of burnout: emotional exhaustion (emotionally exhausted, nine items), depersonalization (cynicism, five items), and personal satisfaction ("intelligence," eight items) and uses a Likert scale from 0 (never) to 6 (every day). Scales are scored such that higher scores indicate more of each construct. Higher scores on the EE and DP subscales indicate a higher burnout symptom burden, lower scores on the PA subscale indicate a higher burnout symptom burden. Their range is 0-45, 0-25, and 0-40, respectively. High scores on anxiety (>27) and depersonalization (>13), and self-satisfaction (<31) indicate burnout. The reliability and validity of the MBI and its subscales are well established. The reliability of the MBI in the present study was 0.71 (all scales) (Maslach, 1996).

The collected data were analyzed using SPSS software version 23. Descriptive and analytical statistical tests, such as two-way ANOVA, paired t-test, independent t-test, chi-square, Pearson correlation coefficient, and significant level p ≤ 0.05, were prepared to examine the effect of different variables.

RESULTS

Based on research respondents in this study, population of the driver were male. The results found that some respondents are 30-34 years old (16.6%). Some of them are 35-39 years, 40-44 years, 45-49 years, 50-54 years each with a percentage of 11.1%, 22.2%, 33.3% and 16.6%.

Table 1 illustrates the descriptive statistics on workload among the driver with the total mean was 69.1. The result showed that the driver's mental workload was high. Overall, the majority of the driver showed high levels of mental demand, physical demand, temporal demand, own performance and effort.

There are high scores on all dimensions of mental workload, except for the frustration dimension. Drivers complain about unpredictable road conditions, and require drivers to think quickly to make decisions as the highest factor in mental workload. In the physical workload, drivers complain about some physical activities that must be carried out as part of the job, such as lifting goods to be put into the vehicle and washing the vehicle when finished. For temporal demand, drivers complain about deadlines to deliver passengers safely in the shortest possible time. The pressure to provide the best service for passengers is the highest-burden factor for driver performance, and drivers feel that if they do not provide the best service, passengers will give bad feedback. Because it takes much effort to provide the best passenger comfort and safety, effort is one of the highest-burden factors for drivers. Furthermore, the reason is that drivers do not have a high level of frustration in doing this work. Drivers say that they enjoy doing the work, and a good work environment is also one of the factors that the driver's frustration level is not too high.

Table 1. Level of Workload

|  |  |  |
| --- | --- | --- |
| Dimensions | Mean | Level |
| Mental Demand (MD) | 10.4 | High |
| Physical Demand (PD) | 11.9 | High |
| Temporal Demand (TD) | 12.7 | High |
| Own Performance (OP) | 14.7 | High |
| Effort (E) | 13.1 | High |
| Frustration (F) | 6.2 | Moderate |
| Total | 69.1 | High |

The second objective of the study was to determine the level of job burnout. Table 2 showed the overall mean values and standard deviation analysis on job burnout. There was the low mean score on job burnout which was 14.44. Overall, the majority of the driver showed low levels of emotional exhaustion, low levels of depersonalization, and low levels of personal accomplishment.

Table 2. Level of Burnout

|  |  |  |
| --- | --- | --- |
| Dimensions | Mean | Level |
| Occupational Exhaustion (OE) | 6.61 | Low |
| Depersonalisation (DP) | 2.44 | Low |
| Personal Accomplishment (PA) | 5.39 | Low |
| Total | 14.44 | Low |

The third objective of the study was to determine the relationship between workload and job burnout among drivers. Table 3 presents the correlations analysis between the workload and job burnout among the river. Table 3 showed the overall value of Pearson correlation coefficient and significant value between workload and job burnout (r = 0.50\*\*, p = 0.000). There was no significant relationship between workload and burnout (p> 0.05: Pearson Correlation tests). The workers obtained the highest level of workload in terms of performance. Their workload was the lowest in terms of frustration. From the perspective of mental pressure, physical pressure, time pressure, own performance and effort, their workload was evaluated to be high. In general, it can be concluded that there is no significant association between job burnout and workload.

As explained in the previous table, the low and insignificant correlation between mental workload and burnout in drivers is due to a good work environment, the high sense of tolerance between each driver makes the level of sense of family among the drivers high. This good work environment makes drivers not feel pressured when given a tough job and can do the job well.

Table 3. Correlation between the Mental Workload and Burnout

|  |  |  |  |
| --- | --- | --- | --- |
| Variables | EE | DP | PA |
| MD | 0.857 | 0.799 | 0.603 |
| PD | 0.334 | 0.339 | 0.655 |
| TD | 0.733 | 0.139 | 0.984 |
| OP | 0.888 | 0.257 | 0.778 |
| EF | 0.706 | 0.797 | 0.845 |
| FR | 0.992 | 0.769 | 0.226 |

T-test result showed beta coefficient (β) of mental workload on burnout is 0.233, which means that mental workload has a positive effect on burnout of 0.233. The value of tcount is 0.903, and the score of the t- table is 1.7341, so the value of tcount is less significant than the t-table value. The value of Chi-square is 0.048 means the mental workload only affect 4.8% on burnout. Thus, the mental workload on burnout is 0.380, where this value is higher than 0.05. Therefore, the mental workload has a positive but not significant effect on burnout. In this study the results show that the somewhat high mental workload level variable has no significant effect on the emotional exhaustion, depersonalisation, and personal accomplishment subscale (p> 0.05). This means that the mental workload variable has no significant effect on burnout. This result contrast with Khandan (2015) states that there is a positive correlation between mental workload and burnout, namely a negative correlation between work performance and emotional exhaustion and a positive correlation between the level of frustration and emotional exhaustion.

CONCLUSIONS

Considering the results of the present study, it can be concluded that mental workload is not one of the contributing factors of burnout. The results of the research that have been stated above indicate that the mental workload partially have a negative and significant effect on the job burnout of drivers. Therefore, company management needs to evaluate driver’s mental, and burnout periodically. Mental workload does not significantly affect the burnout of drivers. Given the findings of this study and the importance of the driver profession for this company, it is crucial to address the drivers' problems.

As in literature, this study shows consistent and inconsistent results in several studies variables with previous research. This shows the complexity of the burnout phenomenon and its potential causes, particularly among driver, require further investigation. Therefore, further studies are needed with different designs and a larger number of samples in order to find out more about the factors that influence mental workload with burnout on driver. The relevant authorities must also provide solutions to suit their environmental, management, and personnel requirements.

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