



The Influence of Ship Crew Job Involvement on Safety Performance in Enhancing Maritime Safety and Security Systems

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Abstract. Job Involvement is a situation in which an individual feels a psychological attachment to their work and holds a strong belief in completing their tasks to achieve a high level of self-esteem. Safety performance refers to the worker's performance in prioritizing safety in the workplace by adhering to the applicable health and safety regulations. The purpose of this study is to determine the effect of Job Involvement on Safety Performance among ship crew members in improving the safety and security system of maritime operations. The research was conducted at PT. Tonasa Lines, Biring Kassi, Pangkep Regency, South Sulawesi Province. The sample in this study consisted of 100 participants. The sampling techniques used in this research were both probability sampling and non-probability sampling. The method used in this research was quantitative, using the Job Involvement and Safety Performance scales. The data analysis was performed using the Product Moment correlation technique with the assistance of the SPSS 28.0 for Windows program. The results showed a significant positive relationship between the Job Involvement variable and Safety Performance in improving the maritime safety and security system. The significance level was below or equal to 0.040 ($p > 0.01$), so H_a is accepted and H_o is rejected with a 5% margin of error probability.

Keywords Job Involvement, Safety Performance, Maritime Operations

1. INTRODUCTION

Workplace safety on ships must always be maintained to ensure safe, smooth, and successful voyages. Therefore, the implementation of safety measures is necessary, as safety is a key indicator in measuring the success of maritime transportation (Suhartoyo, 2018). The entity responsible for maritime incidents is the International Maritime Organization (IMO), specifically the Maritime Safety Committee, which works to minimize the number of ship accidents (Samangun, 2019). Workplace safety is an effort or activity aimed at creating a safe working environment and preventing all forms of accidents. This also applies to people working aboard ships, whether crew members or not, who face accident risks due to various factors that can hinder the completion of their work. Therefore, any job should be carefully prepared in advance to minimize the risk of accidents.

Methodology. Ship accidents, when generalized based on data, still frequently occur during voyages. According to data from the National Transportation Safety Committee (KNKT, 2023), five maritime accidents were recorded in 2023, four of which were fires, and one involved a sinking. The National Transportation Safety Committee also reported 15 fatalities due to these accidents. Fires are considered more preventable compared to other types

of maritime accidents. Achieving safety and security in maritime operations requires the involvement of all parties. Data from the Directorate General of Sea Transportation indicates that over 80% of maritime accidents are caused by human error, whether from the operator or the regulator.

Many maritime accident victims are caused by a lack of basic safety knowledge, security, and environmental protection, as per IMO data, with most fatalities occurring due to human factors (human error). Human error is the leading cause of ship accidents, making it essential for individuals to implement safety behaviors at work (Wróbel, 2021). Work accidents are generally caused by two factors: the first is unsafe working conditions and mechanical factors (unsafe condition), while the second is unsafe work behaviors (unsafe action) (Suyono & Nawawinetu, 2013). Riyadina (2007) states that several previous studies show that around 80-85% of work accidents are caused by unsafe work behaviors.

Safety behavior, also known as the concept of Safety performance, refers to worker behavior that prioritizes safety by adhering to established health and safety regulations at work (Saleh, 2017). Safety behavior includes using safety equipment and actively participating in workplace safety programs. Previous research has shown that the risk of work accidents can be reduced through the enhancement of safety performance (Ahyar & Sari, 2013).

Safety performance consists of compliance and participation. Compliance refers to adherence to safety procedures and performing tasks in a safe manner. Compliance also involves preparing and using the appropriate safety equipment when working. On the other hand, participation refers to an individual's involvement not just in their own safety, but also in supporting the creation of a safe work environment. A safe environment includes helping coworkers, improving safety programs within the workplace, showing initiative regarding work safety, and contributing to safety improvements in the work environment, as well as attending meetings about safety (Brand, 2010).

Researchers in the field of safety have examined safety performance, focusing on the extent of work involvement, worker participation, and communication related to safety performance (Hofmann & Stetzer, 1996). Jobs with greater hazards are more likely to have higher accident and injury rates. Therefore, safety prevention activities involving work engagement are likely to reduce accidents and injuries and promote more positive safety behaviors (Sauri et al., 2022). Job involvement is known to have an effect on safety performance. Job involvement is a form of work attitude defined as the level of identification

an individual has with their job, their active participation in work, and their belief that job performance is important to their self-esteem (Hiriyappa, 2009; Robbins & Judge, 2011). Job involvement is a situation where an individual feels a psychological attachment to their job and has a strong belief in completing their tasks to achieve high self-esteem. Individuals with job involvement will always optimize their performance in their tasks and are highly motivated and concerned about their work. They will always strive to contribute positively to improving the quality of the company.

Based on the theoretical explanation and the review presented above, the researcher is interested in further examining the influence of job involvement on safety performance among ship crew members in improving the maritime safety and security system.

2. METHODS

Identification of Research Variables

The variables in this study are as follows:

Independent Variable (X): Job Involvement

Dependent Variable (Y): Safety Performance

Operational Definition of Variables

Job Involvement

Job involvement is a psychological state that reflects an individual's active participation in their work, psychological identification with their job, and recognizing job performance as important to their self-esteem. Job involvement includes three dimensions proposed by Kanungo (1982), which are:

- a. Active participation in work indicates that individuals are engaged and attentive to their tasks.
- b. Prioritizing work indicates that individuals always strive to do their best in their work.
- c. Work is important for self-esteem indicates that individuals often think about unfinished tasks.

The level of job involvement can be determined by the score obtained on the scale; the higher the job involvement score, the higher the safety performance among ship crew members. Conversely, the lower the score, the lower the safety performance of the crew.

Safety Performance

Safety performance is a form of employee behavior consisting of safety-related components. This includes behaviors such as using safety equipment and actively participating in safety programs within the organization. Safety performance refers to workplace behaviors related to organizational workplace safety (Griffin & Hu, 2013). There are three dimensions of safety performance (Wu et al., 2011): safety inspection, accident investigation, and safety training. The level of safety performance can be determined by the score on the scale; the higher the safety performance score, the greater the influence of job involvement on the crew. Conversely, the lower the safety performance score, the lower the influence of job involvement on the crew.

Research Location and Time

Research Location

The research will be conducted at PT. Tonasa Lines, Biring Kassi, Pangkep Regency, South Sulawesi Province.

Research Time

The estimated time required for this study includes the following stages: preparing the research TOR, research proposal, proposal seminar, proposal revision, data collection preparation, data collection at the research site, data analysis, drawing conclusions from the research findings, preparing for the research results seminar, and the seminar itself, which is expected to take 10 months (February-October 2024), in accordance with the research schedule matrix.

Population and Sample of the Study

Population

The population of this study consists of ship crew members at PT. Tonasa Lines, Biring Kassi, Pangkep Regency, South Sulawesi Province. The selection of the ship and crew members will be based on considerations such as their characteristics, availability, and the research team's ability to access and collect data from them.

Sample

In this study, the research team will use the simple random sampling technique to collect data. Simple random sampling is a sampling technique in which participants are selected randomly without regard to the strata within the population. The sample size will be calculated using the Krejcie table with a margin of error of 5%. As a result, the research will select 100 participants.

Data Collection Techniques

The data collection technique used in this study will involve utilizing a scale instrument. The scale instrument in this study will represent the variables being researched. The scale used will be a Likert scale, which consists of four or more question items combined to form a score/value representing an individual's characteristics, such as knowledge, attitude, and behavior. The Likert scale is a psychometric scale commonly used in surveys. Each item on the Likert scale typically has five response options: Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), and Strongly Disagree (SD). Scores on the Likert scale are assigned according to favorable and unfavorable items. For favorable items, Strongly Agree (SA) is given a score of 5, and Strongly Disagree (SD) is given a score of 1. For unfavorable items, Strongly Disagree (SD) is given a score of 5, and Strongly Agree (SA) is given a score of 1 (Sugiyono, 2013). The data will be collected through field surveys using the research questionnaire.

Job Involvement Scale

The scale used to measure job involvement will be the Job Involvement Questionnaire (JIQ) developed by Kanungo (1982) and modified by Ansel (2013), which includes three dimensions: active participation in work, prioritizing work, and work as important for self-esteem. This scale consists of 29 items, which were adapted and modified by Ansel (2013) based on the original items developed by Kanungo (1982). The JIQ uses four answer choices: Very Suitable (VS), Suitable (S), Not Suitable (NS), and Very Unsuitable (VUS). The scoring process for favorable items is as follows: Very Suitable (VS) = score 4, Suitable (S) = score 3, Not Suitable (NS) = score 2, Very Unsuitable (VUS) = score 1. For unfavorable items, the scores are reversed: Very Unsuitable (VUS) = score 4, Not Suitable (NS) = score 3, Suitable (S) = score 2, Very Suitable (VS) = score 1.

Table 1: Job Involvement Scale Blueprint

No	Dimension	Item Number		Total
		<i>Favorable</i>	<i>Unfavorable</i>	
1	Active participation in work	1,2,3,6,7	-	5
2	Prioritizing work	4,5,9,8	-	4
3	Work is important for self-esteem	10,11,12,13	-	4
			Total Items	13

2) Safety Performance Scale

The scale used to measure safety performance is an instrument developed by Hadi (2020), which is based on the research conducted by Wu, et al. (2011). This scale includes 3 dimensions: safety inspection, accident investigation, and safety training. The scale consists of 9 items with five response options: Strongly Disagree (STS), Disagree (TS), Somewhat Agree (CS), Agree (S), Strongly Agree (SS) This scale contains only favorable items, and the scoring is as follows: STS = 1 point, TS = 2 points, CS = 3 points, S = 4 points, SS = 5 points

Table 2. Safety Performance Scale Blueprint

No	Dimension	Item Numbers		Total
		<i>Favorable</i>	<i>Unfavorable</i>	
1	Safety Climate	1,2,3,6	-	4
2	<i>Safety Motivation</i>	4,5,7	-	3
3	<i>Safety Compliance</i>	8,9,10,11	-	4
			Total Items	11

Data Analysis Techniques

1) Descriptive Analysis

Descriptive analysis is used to provide an overview and description of the collected data. It helps to transform complex data into a more understandable form. In this study, descriptive analysis will be conducted using SPSS statistical software. The types of descriptive analysis include sum, mean, median, variance, standard deviation, standard error, and crosstab (Azwar, 2015). For this study, crosstab analysis will be used to examine the research variables based on respondent demographics, which include age, gender, education level, years of service, and division/department.

2) Normality Test

A normality test is performed to check whether the data is normally distributed. The normality test also determines whether the residuals in a regression model are normally distributed (Arikunto, 2006). The Kolmogorov-Smirnov test and P-P Plot Test will be used. If

the significance value in the Kolmogorov-Smirnov test is greater than 0.05, it indicates that the residuals are normally distributed. The P-P Plot Test will be considered valid if the points follow a straight line from bottom left to top right, signifying normal distribution.

3) Linearity Test

The linearity test is used to determine the linear relationship between the independent and dependent variables, as well as the significance of any deviation from linearity. If the deviation is not significant, it indicates a linear relationship. A result of $p > 0.05$ in the linearity test suggests that there is a linear relationship between the independent and dependent variables (Hadi, 2000).

4) Hypothesis Test

In this research, the hypothesis test uses simple linear regression analysis. Simple linear regression is a method for modeling the relationship between one dependent variable and one independent variable. In simple linear regression, a linear relationship is assumed if changes in the independent variable (X) result in predictable changes in the dependent variable (Y). The purpose of this analysis is to predict or estimate the dependent variable based on the independent variable, allowing for decisions on the potential impact of changes in the independent variable on the dependent variable (Hadi, 2000).

3. RESULTS

Results of Hypothesis Testing

The hypothesis test in this study uses the Product Moment correlation test. The results of the hypothesis testing can be seen in the following table (which you can include here).

Table 3: Hypothesis Test Results - Product Moment Correlation Test

		Correlations	
		<i>Job Involvement</i>	<i>Safety Performance</i>
<i>Job Involvement</i>	<i>Pearson Correlation</i>	1	.040
	<i>Sig. (2-tailed)</i>		.696
	<i>N</i>	100	100
<i>Safety Performance</i>	<i>Pearson Correlation</i>	.040	1
	<i>Sig. (2-tailed)</i>	.696	
	<i>N</i>	100	100

Based on the table, it is known that the correlation coefficient between the Job Involvement variable and the Safety Performance variable is 0.040, with a significance level of 0.696 ($p > 0.01$).

Table 4. Index of Correlation Coefficient

Interval	Kriteria
0,00-0,199	Very Low
0,20-0,399	Low
0,40-0,599	Moderate
0,60-0,799	Strong
0,80-1,000	Very Strong

Based on the table, it can be concluded that there is a significant positive influence between Job Involvement and Safety Performance variables for the crew members in improving the maritime safety and security system. The significance level is below or equal to 0.040 ($p > 0.01$), which means H_a is accepted and H_o is rejected with a margin of error probability of 5%. The hypothesis proposed in this research is (H_a) there is a positive influence of Job Involvement on Safety Performance for the crew members in improving the maritime safety and security system, which is acceptable. This means that the higher the application of Job Involvement theory, the greater the influence on improving Safety Performance for the crew in enhancing the safety and security system. Conversely, the lower the application of Job Involvement theory, the lower the Safety Performance for the crew in improving the maritime safety and security system.

4. DISCUSSION

Based on the hypothesis test results, it shows that there is a positive influence between Job Involvement and Safety Performance variables for the crew members in improving the maritime safety and security system. The effect size between Job Involvement and Safety Performance variables for the crew in improving the maritime safety and security system is 0.040, with a significance level of 0.696 ($p > 0.01$). The coefficient indicates a positive result, meaning both variables have a positive direction of influence. This result aligns with the statement explaining that Job Involvement has an influence on safety performance. Job involvement is part of the work attitude defined as the degree of identification an individual has with their job, active participation in work, and considering performance as essential for self-esteem, which overall is part of safety performance (Hiriyappa, 2009; Robbins & Judge, 2011).

However, it is also important to note that the positive relationship between Job Involvement and Safety Performance highly depends on several factors, such as skill level based on qualifications (competence), and the division of the research sample (deck and

engine). Indirectly, the competence level of the sample will influence their ability to improve the maritime safety and security system due to different duties and responsibilities. This is in line with the theory of Safety Performance, which refers to activities carried out to protect individuals from workplace accidents and work-related diseases (Bayram, et al., 2018). Safety Performance involves a set of regulations, laws, duties and responsibilities, and activities aimed at improving workplace safety within the organization, as well as promoting occupational safety and health. Characteristically, safety performance is used to refer to the level of safety that determines workplace accident incidents, injuries, and fatalities. Safety performance also reflects the likelihood of accidents occurring, which may or may not result in injury, death, or property damage (Ashour, et al., 2018).

Based on the SPSS test analysis explained earlier, it is known that the correlation coefficient value between Job Involvement and Safety Performance variables for the crew members in improving the maritime safety and security system provides a positive effect. This study proves that Job Involvement contributes positively to improving Safety Performance. However, it cannot be denied that Safety Performance among crew members is not solely influenced by Job Involvement but can also be influenced by other directly related variables that require further research. It can also be concluded that in order to improve Safety Performance, based on the research conducted, it is recommended to apply the principles of Job Involvement theory in improving the maritime safety and security system.

5. CONCLUSION

Based on the discussion and the results of the research conducted, it can be concluded that there is a positive relationship between Job Involvement and Safety Performance variables for the crew members in improving the maritime safety and security system. The effect size between Job Involvement and Safety Performance variables in enhancing the maritime safety and security system is 0.040, with a significance level of 0.696 ($p > 0.01$). The coefficient indicates a positive result, meaning both variables have a positive direction of influence with a margin of error probability of 5%. The higher the occurrence of Job Involvement, the more influential it is on Safety Performance for the crew in improving the maritime safety and security system. Conversely, the lower the occurrence of Job Involvement, the lower the influence on Safety Performance for the crew in improving the maritime safety and security system.

Limitations

In this study, there are several limitations that need to be addressed. First, this study used a quantitative approach with a survey method, which relies on the subjective measurements of respondents (crew members). This could affect the results, as there is potential bias in the responses given, such as the desire to provide more positive answers or those that align with the researcher's expectations. Additionally, while the main focus of the study is the relationship between Job Involvement and Safety Performance, this study only considered two main variables without taking into account other factors that may affect maritime safety, such as safety training, work experience, the role of ship leadership, or the physical and psychological condition of the crew members.

Furthermore, this study is limited to a sample of crew members from one or several shipping companies, so the results cannot be generalized to the entire shipping sector or to crew members with different backgrounds. Variations in safety policies, organizational culture, and the technology used by each shipping company may produce different effects on Safety Performance. The data collection period is also a limitation, as it does not reflect the dynamics of maritime safety over the long term, so the results of this study are only relevant to the period analyzed.

Moreover, external factors such as weather conditions, government policies, and the ship safety technologies used were not considered in this study. These external factors can significantly affect Safety Performance. The measurement instrument used in this study also presents limitations, as the self-report method for data collection may not be entirely valid or reliable. This may lead to respondents providing answers that do not fully reflect the reality. Therefore, to gain a more comprehensive understanding, future research is expected to address these limitations and expand the scope by involving additional variables and using a more holistic approach.

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