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A Cross-Sectional Study on the Level of Knowledge, Attitude and Practice in Fire Extinguisher Management Among Prime Mover Operators in a Container Port

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Abstract

The high possibility of prime mover accident involving fire to be happen could create an immediate hazard and greater consequences in a container port. Thereafter, the fire extinguisher that was placed in every prime mover is indeed considered essential safety equipment and a critical tool for fire prevention and control. An effective fire extinguisher management was also essential to ensure their effectiveness in case of emergency. This study evaluated the level of knowledge, attitude, and practice in fire extinguisher management among prime mover operators in a container port. This is part of a bigger study on the level of KAP in fire extinguisher management among prime mover operators in a container port. For data collection, this study adopted quantitative research which constructed a questionnaire survey. In addition, all data were examined and evaluated by using Statistical Package for the Social Sciences (SPSS) version 29. By using the SPSS software, it was proved that the level of knowledge in fire extinguisher management among prime mover operators was negative which indicate low. Meanwhile it was found that the level of attitude was highly positive which indicate high. The level of practice in fire extinguisher management among prime mover operators in container port was positive (high).

1. Introduction

Safety and health have been a concern in container shipments over the past few decades and this has led to the use of risk management in the decision-making process of health care, environment and physical infrastructure systems. Prime movers are so far more common and dangerous than people think. If an accident happened involving prime movers at port terminal, it's not only led to collision between prime movers but also could lead to fire accident. Fire extinguisher installation in every prime mover was a very important safety feature. This small but powerful piece of fire equipment will act as a first line of defense against costly damage. However, it is important to note that simply having fire extinguisher at every prime mover is not enough. Effective fire extinguisher management involving every prime mover operator were also essential to ensure their effectiveness in case of an emergency.

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1.1 Problem statement and objective research

The problem that has been addressed through this study was the high possibility of prime mover accident involving fire to be happen could create an immediate hazard and greater consequences in a container port especially property, human life and environmental impact. Lack of integrity could also be a failure to be responsible and accountable for actions in fire extinguisher management among prime mover operators. A practical training of fire extinguisher was also not provided by company for prime mover operators.

The objective of this study was:

- To identify the level of knowledge, attitude and practice in fire extinguisher management among prime mover operators in a container port

2. Materials and methods

Research and analysis planning were prepared at the early stage of this study and followed by research design and analysis for the level of KAP in fire extinguisher management among prime mover operators in a container port.

2.1 Materials

To have a better comprehension and understanding in this study, previous studies, articles, journals and past research were reviewed and referred by researcher. All of the materials and sources were related to the level of knowledge, attitude and practice in fire extinguisher management. A conceptual framework was also part of the research planning at the early stage of this study to highlight the independent variables and dependent variables. As shown on the Figure 1 below, shows the independent variables were knowledge, attitude, and practice while the dependent variables were fire extinguisher management. The method and analysis have been employed and the data that has been examined both were built upon this conceptual framework.

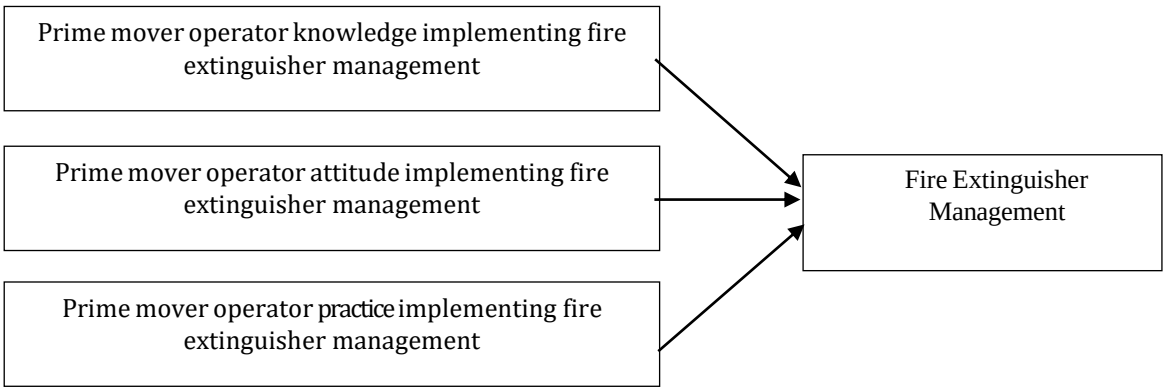

Figure 1 Conceptual framework

2.2 Methods

This study used quantitative method whereby the data was collection using questionnaires survey as details in Figure 2 below. The questionnaire was developed and constructed as the primary method for this study by referred to Yeturul S.K (2016) which study on Assessment of Knowledge and Attitudes of Fire Safety – An Institution Based Study. The questionnaire was constructed using Google Forms platform and distributed through WhatsApp and Outlook Email.

The questionnaire consisted of four sections start with Respondents Information. Every respondent had provided their gender, age, nationality and working experience that helped researcher to categorized them regarding the outcome of this project. Researcher also asked either they have attended any fire extinguisher training or class or not, and status of their driving license. The first section is Section A which consisted of 5 questions to find out the level of knowledge in fire extinguisher management among prime mover operators.

Section B was constructed to identify the level of attitudes among prime mover operators at container port towards fire extinguisher management. Meanwhile, section C determined the level of practice of every prime mover operator that has been selected through this study toward fire extinguisher management. The questionnaire also prepared and written in multi languages, namely Malay, English and Hindi.

Afterwards, researcher discussed about the result from specific survey form that have been conduct throughout the study as well as the data analysis and overall discussion. All data from every respondent in this study collected and was analyze by using Statistical Package for the Social Sciences (SPSS) Version 29 to obtain a clear result.

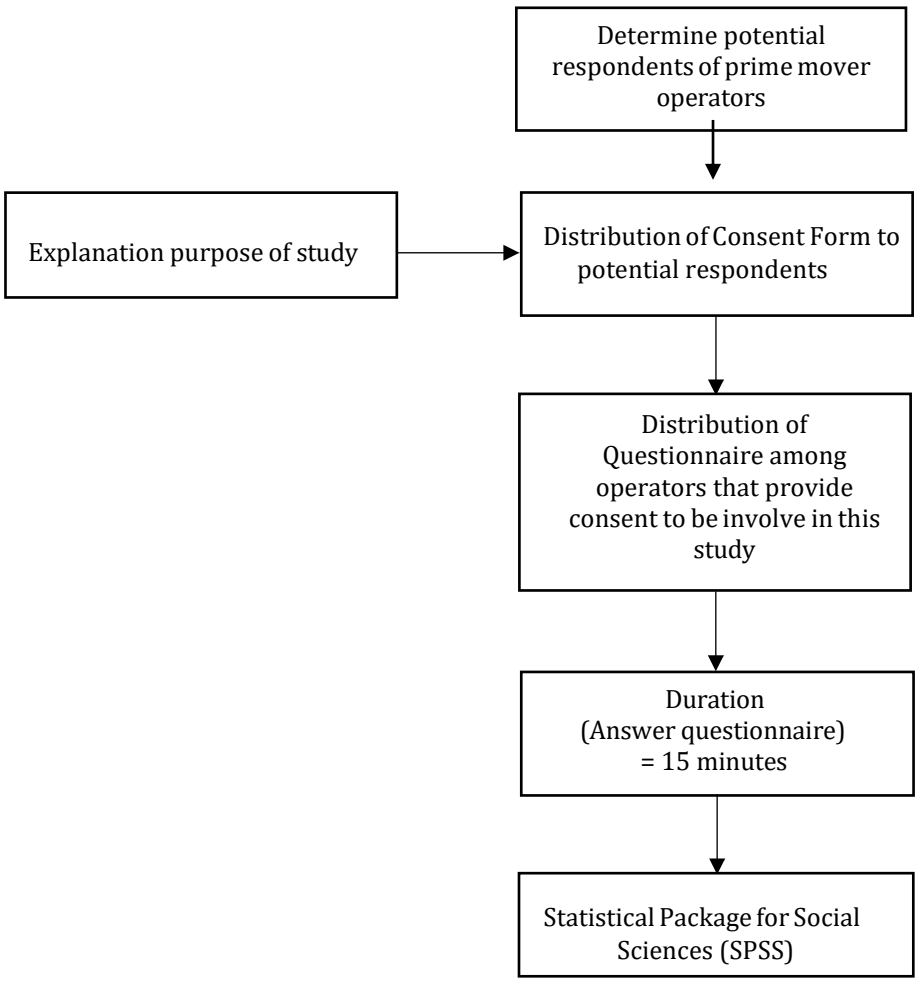

Figure 2 Flowchart of questionnaire process

3. Result & Discussion

For the purpose of achieving the objective, the data has been obtained by researcher through questionnaire survey distribution using Google Forms. It involved a group of prime mover operators as respondents or sample for this study with total of 121 prime mover operators. This survey fully focused on prime mover operators at a container port whether they were foreigner or non-foreigner (Malaysian). It was distributed through WhatsApp and Outlook Email. In addition, researcher also had the opportunity to blast this survey face to face in a short session with prime mover operators to complete this survey during a Theory of Fire Extinguisher training.

The overall mean scores of the prime mover operators' knowledge level, as shown in Table 1, indicated that the total means was 1.25. Based on the interpretation of mean score from a previous study by Haidyanto & Mukminin. A (2013), it was shown that the level of knowledge in fire extinguisher management among prime mover operators at a container port was negative. Based on the table 2 shown below, it was stated that a mean

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score of 1.25 was categorized in range of mean score between 1.00 – 2.33 which in negative level or in other words is low.

Table 1 *Level of knowledge in fire extinguisher management among prime mover operators in a container port*

Variables	Mean	Std. Deviation	Knowledge level
Knowledge	1.25	0.434	Negative

Table 2: *Mean Scores Interpretation for Prime Mover Operators Knowledge Level*

Range of Mean Score	Knowledge Level
1.00 – 2.33	Negative
2.34 – 3.66	Neutral
3.67 – 5.00	Positive

In this study, to evaluate the level of knowledge among prime mover operators at container port, the prime mover operators' scores were interpreted with the help of a previous study by Haidyanto & Mukminin. A (2013).

Table 3: *Level of attitude in fire extinguisher management among prime mover operators in a container port*

Variables	Mean	Std. Deviation	Attitude level
Attitude	4.53	1.017	Highly Positive

The overall mean scores of the prime mover operators' attitude level, as shown in Table 3, indicated that the total means was 4.53. Based on the interpretation of mean score from a previous study by Andamon & Tan (2018), it was shown that the level of attitude in fire extinguisher management among prime mover operators at a container port was highly positive. Based on the table 4 shown below, it was stated that a mean score of 4.53 was categorized in range of mean score between 4.50 – 5.00 which highly positive.

Table 4: *Mean Scores Interpretation for Prime Mover Operators Attitude Level*

Range of Mean Score	Attitude Level
1.00 – 1.49	Highly negative
1.50 – 2.49	Negative
2.50 – 3.49	Neutral
3.50 – 4.49	Positive
4.50 – 5.00	Highly Positive

Prime mover operators' scores on level of attitude in fire extinguisher management were compared and interpreted with the help of ATMI interpretation level adapted from Andamon & Tan (2018).

Table 5: *Level of practice in fire extinguisher management among prime mover operators in a container port*

Variables	Mean	Std. Deviation	Practice level
Practice	4.30	1.181	Excellent

The overall mean scores of the prime mover operators' practice level, as shown in Table 5, indicated that the total means was 4.30. Based on the interpretation of mean score from a previous study by Pahuriray. A & Algara. R (2021), it was shown that the level of attitude in fire extinguisher management among prime mover operators at a container port was highly positive. Based on the table 4.5.6 shown below, it was stated that a mean score of 4.30 was categorized in range of mean score between 4.21 – 5.00 which was excellent.

Table 6: *Mean Scores Interpretation for Prime Mover Operators Practice Level*

Range of Mean Score	Practice Level
4.21 – 5.00	Excellent
3.41 – 4.20	Very Good
2.61 – 3.40	Good
1.81 – 2.60	Fair
1.00 – 1.80	Poor

The findings from the study shows a negative result for the knowledge level of the prime mover operators in fire extinguisher management. Majority of the respondents had a low knowledge about fire extinguisher management. For example, they were not aware of any international or national or local government/ private that recommended a fire prevention or guidelines in fire extinguisher management. They were also not aware or doesn't knew the emergency contact number and doesn't have an understanding in type of fire extinguisher, fire triangle and class of fire. A lack of knowledge in fire extinguisher management needs an improvements and effective initiatives among prime mover operators to ensure they are fully understand the use of fire extinguisher theoretically and practically.

The result indicated that the level of attitude was highly positive. These proved that respondents have a positive attitude and morals when it comes to fire extinguisher management at prime mover. Every prime mover operator should know about do's and don'ts of fire extinguisher management such as ensure that safety pin is properly maintained. To ensure that fire extinguisher properly maintained, they always ensure the fire certificate and renewal sticker display on the fire extinguisher.

For the level of practice in fire extinguisher management among prime mover operators, it's stated an excellent result with mean of 4.30. It's because respondents have been participated on fire drill at company. Majority of the prime mover operators have an effective practice in PASS method which was used for fire extinguisher. PASS method was a procedure or practice on how to use a fire extinguisher which was easy to remember and understand by any individuals with the acronym PASS stands for Pull, Aim, Squeeze and Sweep.

4. Conclusion

It can be conclude that the level of knowledge of prime mover operator on fire extinguisher was negative. However, the attitude was highly positive and the practice was excellent. Fire extinguisher served as first respond in the case of fire accident. Thus, it is very important for prime mover operator to have knowledge in using the fire extinguisher correctly. This study recommended the awareness training on fire extinguisher must be conducted in order to increase the level of knowledge for prime mover operator. A similar study could be conducted with a different group of respondents and a higher number in order to achieve another effective results and research. For example, a study of knowledge, attitude and practices in fire extinguisher management among Rubber Tyre Gantry (RTG) operators.

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Conflict of Interest

I declared that there is no conflict of interests regarding the publication of the paper.

Author Contribution

The authors confirm contribution to the paper as follows: ***study conception and design:*** *Nurul Izzah Mesran, Bohari Holid, Nurrul Hafeezah Sahak ;* ***data collection:*** *Nurul Izzah Mesran ;* ***analysis and interpretation of results:*** *Nurul Izzah Mesran, Nurrul Hafeezah Sahak;* ***draft manuscript preparation:*** *Nurul Izzah Mesran. All authors reviewed the results and approved the final version of the manuscript.*

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