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How Safety Awareness Affects Safety Citizenship Behavior: The Safety Motivation Mediation Perspective

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Abstract: The ship crew's safety citizenship behavior (SCB) is essential for protecting shipping. Based on the perspectives of safety awareness and motivation, this research aims to examine the SCB issue that mariners encounter while working on passenger ships. This investigation endeavors to assess the impact of safety awareness and motivation on the SCB of ship crews using the mediation mechanism of safety motivation. The research adopts a quantitative approach using a survey method and a causal design. A total of 120 crew members from passenger ships that were operating at Tanjung Priok Port in Jakarta were in the sample. The research instrument employed was a Likert scale-based questionnaire. In the Google Forms format, questionnaires were distributed via WhatsApp and email. Structured equation modeling analysis based on partial least squares (SEM-PLS) was employed to analyze the Data. The research findings show a significant correlation between safety motivation and safety awareness in ship crew SCB. Furthermore, safety awareness substantially impacts the safety motivation of the crew, and safety motivation mediates the effect of safety awareness on SCB. This evidence demonstrates the originality of the mediation concept, which posits that safety awareness impacts the SCB of passenger ship crew members through safety motivation.

Keywords: safety awareness, safety motivation, safety citizenship behavior, ship crew.

INTRODUCTION

Safety issues consistently attract the attention of practitioners and researchers because they relate to human life. When accidents still occur, these issues will arise. In maritime transportation, for example, safety issues are also a concern for shipping stakeholders because ship accidents still frequently occur. As an illustration, the results of investigations by the Directorate of Sea Transportation of the Indonesian Ministry of Transportation (2021-2023) show that there were 272 cases of ship accidents in Indonesia. According to the Indonesian Maritime Council, 72% of this number is caused by human error. Therefore, the study of human behavior is very crucial and urgent. Neal and Griffin's (2006) research findings demonstrate that insufficient safety behavior, especially safety citizenship behavior (SBC), contributes to

accidents. Stewardship, voicing opinions, assisting coworkers, reporting safety violations, initiating workplace change, and shared benevolence are examples of discretionary behavior that is not recognized by the company's formal reward system but can improve performance (Liu et al., 2020). According to Chmiel et al. (2017), SCB can lower infractions and accidents in organizations (businesses). This implies that the absence of SCB for the ship's crew may result in ship accidents. It does not occur randomly; rather, safety motivation and awareness might have an impact. Safety awareness and SCB are significantly correlated, according to research conducted in Norway by Saetrevik and Hystad (2021). Additionally, Uzuntarla et al.'s (2020) study demonstrates a good correlation between safety awareness and safety behavior. Understanding one's rights and obligations regarding safety concerns and potential hazards at work is a prerequisite for safety awareness. Cognitive, behavioral, and assessment components are all included in this awareness (Kiani & Khodabakhsh, 2014; Dursun, 2011). Another study demonstrates how SCB is influenced by safety motivation. Safety motivation considerably impacts employees' SCB (Laurent et al., 2020). Then, Zhang et al.'s (2020) research findings also demonstrate that workers' SCB is highly influenced by safety motivation. A person's willingness to act safely and securely is known as safety motivation. Action preferences, social loafing, and perseverance are all components of safety motivation. Several additional empirical data, however, demonstrate inconsistent situations. For instance, Widyanty et al. (2021) and Hiep and Hien (2023) demonstrate that workers' SCB is unaffected by safety motivation. This circumstance indicates a research gap that has to be filled through investigation. In light of this urgency, this study aims to explore the effect of safety awareness on SCB through a safety motivation mediation mechanism.

Safety Awareness and SCB

Safety awareness and SCB are empirically related. According to a study by Uzuntarla et al. (2020), safety awareness has an impact on SCB. Safety awareness is the capacity to manage, recognize, and assess one's own capabilities and obligations in order to prevent workplace dangers (Dursun, 2011). Liao et al. (2014) define safety awareness as an employee's ability to think about potential risks and safety concerns that could arise at work. Safety awareness, according to Fung et al. (2016), is the comprehension of the importance of safety-related issues. Behavioral safety awareness leads to actions that increase operational safety (Kiani & Khodabakhsh, 2014). Safety awareness is essential for every employee in a business or organization since a lack of understanding can result in poorer safety performance. According to Yilmaz and Celebi (2015), a lack of awareness could be a problem or a factor affecting safety. Numerous indicators, such as cognitive, behavioral, assessment, health and safety awareness, and knowledge of danger, risk, and accident avoidance, can be used to gauge safety awareness (Dursun, 2011; Hussain et al., 2019; Kiani & Khodabakhsh, 2014). If there is a high degree of crew ownership of these indicators, they can promote an increase in the ship's SCB. Thus, it is possible to support the following hypothesis:

H_1: Safety awareness has a positive direct effect on the ship crew's SCB.

Safety Motivation and SCB

Additionally, safety motivation can have an impact on SCB (Panuwatwanich et al., 2016; Laurent et al., 2020; Wang et al., 2023; Liu et al., 2023). Safety motivation is conceptually defined as employees' willingness to perform their work in a safe manner and their readiness to apply work safety-related aspects and efforts (Zhang et al., 2020; Widyanty et al., 2021). Action preferences, social loafing, persistence, encouraging other employees to work safely, and supporting work safety programs are all examples of safety motivation, which is a reflection of an individual's willingness to put forth effort to engage in safe behavior and the values associated with it (Ford & Tetrick, 2008; Widyanty et al., 2021). Assume that these

driving forces are sufficiently and consistently present in the crew across time. As a reflection of SCB, they can then promote the development of safety compliance, safety participation, worker assistance, the relationship between superior and subordinate, civic virtue, and change initiating. Therefore, the following hypothesis can be put forward:
H_2: Safety motivation has a direct positive effect on the ship crew's SCB.

Safety Awareness dan Safety Motivation

Safety awareness, apart from influencing SCB, also affects safety motivation. The study conducted by Widyanty et al. (2021) indicates that safety consciousness, as another word for safety awareness, significantly affects safety motivation. This shows that safety awareness is an essential antecedent for safety motivation. Therefore, crew members with high cognitive, behavioral, assessment, health and safety awareness, and knowledge of danger, risk, and accident avoidance capacities will tend to have social loafing, persistence, encouraging other employees to work safely, and supporting work safety programs the strong one. Thus, a hypothesis can be formulated:
H_3: Safety awareness has a direct positive effect on crew safety motivation.

Safety Motivation Mediation

The results of the previous research show that safety motivation is a unique position between safety awareness and SCB. A study by Widyanty et al. (2021) proves that safety consciousness (awareness) affects safety motivation. Meanwhile, other studies revealed that safety motivation impacts SCB (Panuwatwanich et al., 2016; Laurent et al., 2020). This indicates the strategic position of safety motivation as a mediator for the causal relationship between safety awareness and SCB. However, finding specific research results regarding the mediating role of safety motivation is still challenging, so it is essential to explore it through research. Based on this urgency, the following hypothesis can be promoted:
H_4: Safety awareness have a significant effect on ship crew's SCB through safety motivation.

METHODS

Research's Approach, Method, and Design

This study employs a quantitative approach and survey method, which entails choosing and analyzing a sample of people from a population to ascertain the relationship, frequency, and distribution of variables. Surveys are used to analyze a variety of data, including demographics, behavior, attitudes, beliefs, values, attitudes, opinions, habits, desires, and ideas (Widodo, 2021). The causal design used in this study is operationalized in structural equation modeling (SEM).

Research Participants

The crew of a passenger ship stationed at Tanjung Priok Port in Jakarta served as the study's population. The sample size was determined by multiplying the number of indicators for each variable by 5–10, but not more than 200. In studies employing the SEM technique, particularly chi-square, a good fit (GOF) structural model may be challenging to obtain with a sample size greater than 200 (Hair et al., 2018). The sample size is 120 crew members (5 x 24 indicators) because there are 24 indicators in this study. Men make up the majority (97.5%), they are between the ages of 31 and 40 (35.83% and ≤ 30 years, 35%), educated (ANT III, 30.83%, and 29.17%), married (73.33%), and have worked for at least five years (33.33%).

Procedure and Materials

The survey contained five different Likert scale alternatives: strongly disagree/never (score = 1), disagree/rarely (score = 2), neutral/sometimes (score = 3), agree/often (score = 4), and strongly agree/always (score = 5). Each of these options had a score of one. It was possible to use the WhatsApp app to broadcast the results of the online poll, which was conducted using Google Forms. The questionnaire was produced by the researchers based on the theoretical indications or dimensions provided by the experts. Safety awareness includes cognitive, behavioral, and evaluation aspects of health and safety, as well as awareness of danger, risk, and accident prevention (Kiani & Khodabakhsh, 2014; Dursun, 2011; Hussain et al., 2019); safety motivation includes action preferences, social loafing, persistence, encouragement of other workers to work safely, and promotion of work safety programs (Ford & Tetrick, 2008; Widyanty et al., 2021); and SCB includes safety compliance, safety participation, worker-to-worker relationships, civic virtue, and starting change (Neal & Griffin, 2006; Li et al., 2020; Laurent et al., 2020). A total of ten items make up the safety awareness test. These items' correlation coefficient (CC) ranges from 0.499 to 0.923, and the Alpha Cronbach (AC) total is 0.957. A total of nine components make up safety motivation, which has an AC of 0.923 and CC values that range from 0.577 to 0.877 overall. An AC of 0.945 and CC values that vary from 0.555 to 0.862 are presented by the SCB, which comprises eleven different attributes. Each variable possesses an AC greater than 0.70, and each item possesses a CC greater than 0.361. This indicates that all of the variables are reliable and valid (Widodo, 2021).

Data Analysis

The structural equation model (SEM) was applied to the data analyzed, which was collected through the distribution of the questionnaires, and SmartPLS version 4 was used. Previously, the questionnaire was examined using thirty trial samples to confirm its validity and reliability after being evaluated. In order to collect data from 120 research samples, questionnaires were used, and they successfully passed both the validity and reliability tests. In order to examine the findings, descriptive and correlational statistics were utilized by the SPSS program version 22. This software also had a feature that provided a description of the research variables and an explanation of the link between the variables.

RESULTS AND DISCUSSION

Descriptive and Correlational Analysis

SPSS was used to conduct descriptive and correlation analysis, and the results of those analyses are presented in Table 1. It is common for the mean values to fall between 25.22 and 47.25, but the standard deviation (SD) values, ranging from 3.868 to 6.366, are significantly lower. The conclusion is that it offers a satisfactory overview of the material and is worthy of further research. In the meantime, the outcomes of the correlation analysis between variables together are significant at a level of $p < 0.01$. The correlation coefficient value range goes from 0.894 to 0.959, indicating that the correlation is found to be significant. It illustrates how each variable and every other variable are independent of one another and reliant on one another.

Table 1. The results of descriptive and correlation analysis

Variables	Mean	SD	1	2	3
Safety Awareness (X)	43,08	6,017	1,00		
Safety Motivation (Y_1)	39,30	4,983	0,945	1,00	
SCB (Y_2)	47,25	6,366	0,956	0,959	1,00

Outer Model: Measurement Model

It is the purpose of the outer model, which depicts the measurement model, to test and analyze the link between the constructs that are being measured and the indicators that are being measured. A variable is considered legitimate if it possesses a loading factor value equal to or greater than 0.5. All of the indicators are legitimate or represent variables, as shown by the fact that the loading factor value is more than 0.5, shown by the computation results. For example, the results of the test to determine discriminant validity reveal that the correlation value of each indicator with its own variable is higher than the correlation of the indicator with other variables. This indicates that the discriminant validity of the test is satisfactory. Construct reliability and validity tests, such as Cronbach's Alpha (AC), Composite Reliability (CR), and Average Variance Extracted (AVE), are described in Table 2. The results of these tests are presented in descending order of their respective values. Since every variable's CA and CR values are greater than 0.7, every variable (construct) is likely dependable. Likewise, the AVE value for each variable is greater than 0.5; this demonstrates that the study is genuine (Hair et al., 2018). Because of this, all of the variables included in the research are reliable and valid, making them appropriate for further analysis.

Tabel 2. Construct relaibility dan validity results

Variabel	CA	CR	AVE
Safety Awareness (X)	0,892	0,895	0,700
Safety Motivation (Y_1)	0,831	0,848	0,599
SCB (Y_2)	0,858	0,882	0,596

Inner Model: Measurement Structural Model

Model fit testing, R Square (R^2), and hypothesis testing all fall under the category of structural model measurements. Path coefficient and t-test are two examples of these metrics. A model appropriateness test is performed to establish whether a model is appropriate or in accordance with actual facts. According to the structural equation, the coefficient of determination (R^2) is utilized in order to ascertain the extent to which a number of exogenous factors interact with endogenous variables. In addition to other things, the model appropriateness test can be seen from the value of the Normed Fit Index (NFI), with the range ranging from 0 to 1 being the lowest to the highest possible value available. As the model gets closer to 1, the better it fits the data. When the model is closer to zero, on the other hand, it has a low fit. The value of the NFI that was achieved from this research is 0.657, which indicates that the model fits the data quite well. These findings indicate that the theoretical model that was hypothesized in this research is compatible with the empirical model that was acquired from these data. As for the crew OCB variable, the R^2 value is 0.946 at the moment. According to the findings, safety awareness and safety motivation are responsible for 94.6% of the changes that occur in ship crew SCB. The remaining 5.4%, on the other hand, is due to other factors that were not taken into consideration in this work. While this is going on, the R^2 value for the variable that represents safety motivation is 0.891. According to the findings, safety awareness is responsible for 89.1% of the shifts in safety motivation, while other factors are responsible for the remaining 10.9% of the variation.

Hypothesis Testing

In the research context, hypothesis testing encompasses examining the impact of safety awareness on safety motivation and SCB. Figure 1 and Table 3 provide a summary of the findings obtained from the results of the path coefficients and t-value structural models. To a great degree, all hypotheses, ranging from H1 to H4, were supported, demonstrating significance at t values that exceeded the crucial t table values for p = 0.01. Specifically, the

path coefficients (γ/β) and p-values for safety awareness on SCB = 0.484, safety motivation on SCB = 0.503, and safety awareness on safety motivation = 0.944. In terms of path coefficients, the impact of safety awareness on crew SCB was shown to have less than safety motivation. This indicates that safety motivation has a strong effect on OCB. However, safety awareness has a greater influence on safety motivation than SCB. In addition, the findings of this study also demonstrate that safety awareness has an indirect influence on SCB through the involvement of safety motivation with β = 0.475. At a significance level of p = 0.01, it may be concluded that the indirect influence (mediation effect) of safety awareness on SCB via safety motivation is significant. Clearly, this demonstrates the positive and significant impact that crew safety motivation has in mediating the influence of safety awareness on SCB. It is demonstrated by this empirical fact that a safety motivation mediation mechanism can be utilized to enhance safety awareness among the crew of passenger ships in order to raise the SCB.

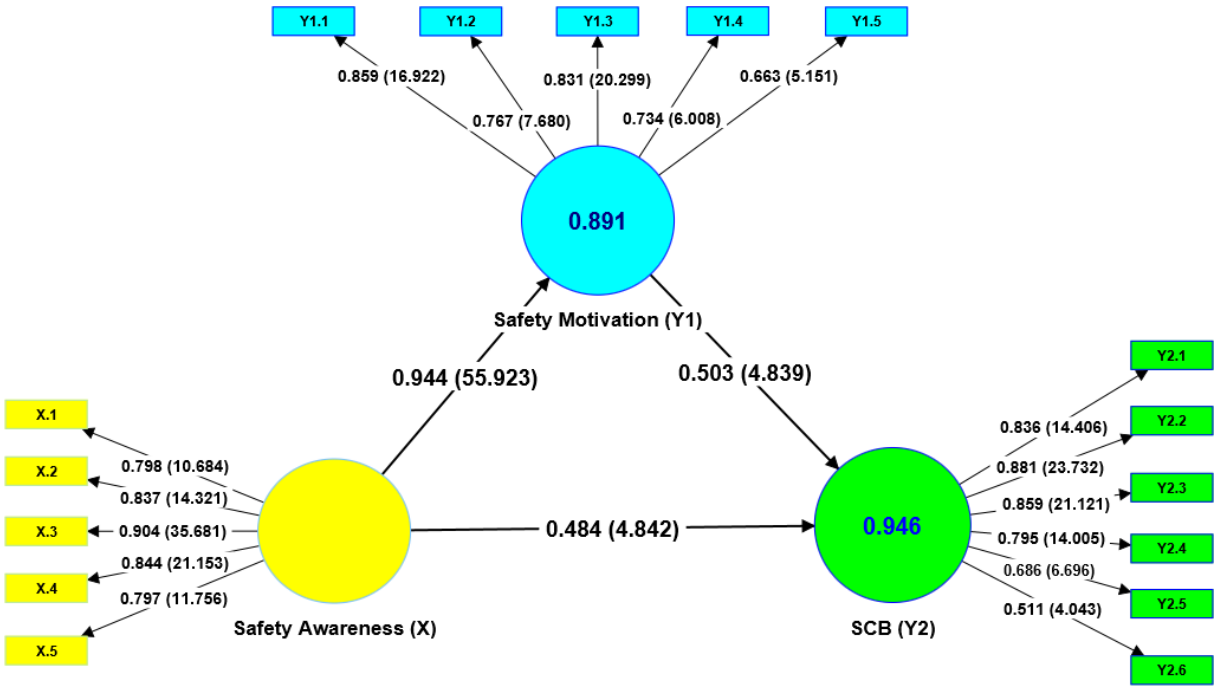

Figure 1. Path coefficient and T-value results

Tabel 3. Hypothesis testing results

Hypothesis	Path Coefficient	T_{value}	T_{tabel} (α = 0,01)	Decision
H_1: Safety awereness on SCB	0.944	55.923**	2.35	Supported
H_2: Safety motivation on SCB	0.503	4.839**	2.35	Supported
H_3: Safety awereness on Safety motivation	0.484	4.842**	2.35	Supported
H_4: Safety awereness on SCB through safety motivation	0.475	4.791**	2.35	Supported

Note: ** p = 0.01.

Discussion

This study demonstrates that safety awareness significantly and favorably affects passenger ship crews' SCB. Increasing safety awareness can have a favorable impact on SCB because it is a necessary tendency for SCB. According to Kiani and Khodabakhsh (2014), Dursun (2011), and Hussain et al. (2019), safety awareness is the state in which everyone, including ship crew, is aware of their rights and responsibilities regarding safety issues and potential dangers that may arise at work or on a ship. This awareness is reflected in their

cognitive, behavioral, and evaluation abilities, as well as their awareness of health and safety, dangers, risks, and accident prevention. These aspects can promote greater SCB if they are present in high and comparatively permanent settings. The results of earlier studies that demonstrate how safety awareness affects SCB are supported by this consistent conclusion (Li et al., 2020; Uzuntarla et al., 2020; Hussain et al., 2019).

This study also discovered that safety motivation significantly and favorably affected the SCB of passenger ship personnel. This empirical finding demonstrates that a critical determinant of SCB is safety motivation. The willingness of individuals (especially ship crew) to practice safe conduct and the values that accompany it is known as safety motivation. This willingness is shown by action preferences, social loafing, perseverance, encouraging other employees to work safely, and supporting work safety initiatives. Under favorable circumstances, these safety motivational factors, such as adherence to rules and involvement in safety initiatives, might encourage a rise in ship crew SCB. These results support and validate earlier research findings that safety motivation affects SCB (Wang et al., 2023; Septian & Budhi, 2023; Liu et al., 2023; Kim (2020).

Furthermore, the study's findings demonstrated that safety awareness also affects safety motivation. It suggests that crew safety motivation is significantly predicted by safety awareness. Consequently, increasing crew safety motivation may benefit from increased safety awareness. Safety awareness encompasses cognitive, behavioral, and evaluation aspects, as well as awareness of health and safety, danger, risk, and accident prevention. It is the state in which individuals, including ship crew, are aware of their rights and responsibilities about safety issues and potential hazards that may arise in their workplace. The crew's motivation for safety may be positively impacted if they have a high level of safety knowledge. These results support the findings of Widyanty et al. (2021), which demonstrate that safety awareness significantly impacts safety motivation.

Finally, through the mediation of safety motivation, this study discovered empirical evidence of the impact of safety awareness on the SCB of passenger ship crew. These findings not only support the findings of earlier studies that served as a reference or foundation for developing research hypotheses, such as the impact of safety motivation on SCB (Laurent et al., 2020) and the effect of self-awareness on safety motivation (Subramaniam et al., 2022; Zhang et al., 2020; Widyanty et al., 2021), but they also discovered a mediation model of the relationship between safety awareness and ship crew SCB through safety motivation. This model was based on data collected from the crew of a passenger ship operating at the Port of Tanjung Priok Jakarta in 2023. As a result, our results favorably advance the field of transportation management research, particularly that which focuses on the function of safety motivation in mediating the impact of safety awareness on ship crew SCB. Therefore, before these findings are adopted, amended, or adapted, they must be critically discussed.

CONCLUSION

The SCB of the crew is of utmost significance for matters about shipping. As a result, it is of the utmost importance to research SCB from the points of view of safety awareness and safety motivation. This study discovered that safety awareness and safety motivation impact the crew's SCB; safety awareness impacts crew safety motivation, and safety awareness impacts the ship crew's SCB with the mediation of safety motivation. In addition to demonstrating new findings concerning the role of safety motivation in mediating the influence of safety awareness on crew's SCB, these findings not only confirm several previous research results, which were used as a reference for developing this research hypothesis but also refute five other research results that contradict each other. For this reason, the findings of this study contribute to the development of a new empirical model of the influence of safety awareness on crew's SCB via safety motivation. Before adopting, adapting, or modifying this novel

model, academics and practitioners might discuss it comprehensively and critically. This discussion should occur without disregarding the fact that this research has numerous limitations. To begin, the scope of this study is limited to a single data source: the ship's crew. However, other data sources, such as colleagues or leaders, can be relied upon. Even if other dimensions and indicators from experts can be considered, this research only considers a few theoretical dimensions and indicators from a few different experts. To add insult to injury, this study exclusively employs a quantitative method, even though other methodologies could be incorporated, such as a qualitative method. In light of this, future studies must consider more data sources, incorporate a variety of dimensions and indicators, and employ a combination of qualitative and quantitative research.

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