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Safety Improvement for Sea Taxi Association in Doom Island, Sorong City, Southwest Papua

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ABSTRACT

Most members of the community on Doom Island, also known as Dum Island in Sorong Islands District, Sorong, provide local transportation and tourists by sea taxi. The well-being of passengers and crew is the most critical aspect of water transport. The level of passenger safety assurance for travel between Dum Island and Sorong City, as well as to other islands, still needs to be improved, according to field observations. Observations show that certain shipping conditions often require more attention to load capacity, passenger positions, and the lack of adequate shipping safety equipment. This socialization is expected to raise awareness of providers of maritime transport services for tourism and the importance of safety in all activities of range. Socialization is a method of implementation of PKM programs, with stages of preparation, performance, and evaluation. The providers of maritime transport services for tourists and the population of Dum Island will get comprehensive information on marine safety regulations, together with the procedure of safety tools for instance sockets, sackcloth jackets, and other life-saving equipment. It is intended to increase their awareness and preparedness in the face of emergencies at sea. With a greater understanding of risks and preventive measures, a safer and more sustainable maritime environment can be achieved.

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INTRODUCTION

Doom Island, Dum Island, is in Southwest Papua, Indonesia. Doom Island has been inhabited since the Dutch colonial period and served as the administrative center for the Sorong region. Currently, the island is transforming into a residential area to meet the local community's needs. The shift above is accompanied by an increase in residential development, which directly responds to the ongoing population growth (Johansz; et al., 2017).

In addition, Doom Island houses many architectural structures that are a legacy of the colonial period, specifically designed to facilitate and support Dutch activities on the island (Sukandar, 2012). As a result, several relics from the colonial era have been converted into tourist attractions. The island's appeal lies in its rich historical heritage and stunning natural scenery. The island is located directly in front of Sorong City. The island attracts a large number of tourists, mainly from among the residents of Sorong City and surrounding districts (Kakisina, 2018). As a result, there is significant demand for maritime transportation to travel from Sorong City to Doom Island or vice versa.

Sea transportation is a relevant and efficient mode of transportation for Dum Island, which is located in the Sorong Islands District (Rusmin et al., 2022). As a sea taxi, sea transportation is a means of transportation used to travel on water (Albasri et al., 2022). A fishing boat can reach the distance between Sorong Harbor and the destination in approximately 10 to 15 minutes (Karouw, 2022). Therefore, most residents in the Dum Island area are engaged in fishing as their primary occupation and provide transportation services for tourists and the people of Dum Island through boat-operated sea taxis.

Undeniably, the safety of passengers and crew is crucial in using water transportation. Based on observations in the field, it can be concluded that the level of passenger safety assurance for travel between Dum Island Sorong City and other islands still needs to be improved. These observations reveal that certain loading conditions often ignore factors such as transportation capacity, passenger placement, and the availability of shipping safety equipment, which still needs to be improved.

FIGURE 1. Doom Island Sea Taxi Condition

Since 2000, there have been several shipping accidents across the country. Often, shipping safety needs to be paid more attention, so the organization of sea transportation finds that shipping safety needs to be paid more attention (Malisan, 2019). In addition, based on the results of the Shipping Court decision, there were 49 accidents with 59 fatalities in 2014, 19 accidents with seven fatalities in 2015, 33 accidents with 36 fatalities in 2016, 28 accidents with 92 fatalities in 2017, and 33 accidents with 37 fatalities in 2018 (Kementerian Perhubungan, 2018).

Furthermore, according to the International Maritime Organization (IMO), human error is the cause of about 80% of all accidents, with most of the responsibility for these incidents attributable to mismanagement, which fosters an environment conducive to accidents (Blanc, 2006). Furthermore, the crew of KL. Frans Kasiepo needs to implement work safety procedures optimally, including the lack of

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skills or knowledge and socialization of work safety for ship crews (Gumelar et al., 2021). Therefore, it is imperative to circulate information relating to safety aspects in shipping.

Shipping safety and security refers to the compliance and fulfillment of safety regulations that pertain to transportation in waters, ports, and maritime areas. In addition, the seaworthiness of a ship refers to its condition and compliance with various criteria related to ship safety, water pollution, crew, loading lines, loading operations, crew prosperity, passenger safety, legal standing, safety and pollution governance, and security governance. These factors together determine a vessel's sustainability in navigating specific waters (Peraturan Menteri Perhubungan Nomor 20 Tahun 2015 Tentang Standar Keselamatan Pelayaran, 2015).

In addition, transportation observer Dedi Darmawan said it is essential to continue to spread information about shipping safety (Naomy, 2022). Furthermore, Sri, the Head of the Facilities and Infrastructure Sub-directorate of the Directorate of Sea Transportation expressed her optimism that the efforts made by the Directorate General of Sea Transportation to promote shipping safety will yield good results. In particular, Sri hopes that this initiative will raise awareness and foster a sense of responsibility among service users and operators of public transportation services, such as people's shipping and fishermen's transportation (Direktorat Jenderal perhubungan Laut Kementerian Perhubungan Indonesia, 2018).

In conclusion, shipping safety and security can be significantly improved by involving government, industry, and the general public. This can also be achieved through continuous socialization. Some of the shipping safety socialization activities implemented in Indonesia (Chairunnisa et al., 2021; Purwanto et al., 2020; Suganjar et al., 2022; Umar et al., 2021). This will protect businesses and consumers, encourage tourism growth, and safeguard the maritime environment that is essential for an archipelago like Indonesia.

Based on the description of the problems above, it is necessary to hold a socialization activity on shipping safety for fishermen or tourist transportation service providers and the community on Dum Island. This socialization will likely increase fishermen's and tourist transportation providers' understanding of the importance of safety in every shipping activity.

Comprehensive information on maritime safety regulations, including safety equipment such as lifeboats, life jackets, and other rescue devices, will be provided to fishermen and tourism transportation service providers. This aims to increase their awareness and preparedness in dealing with emergencies at sea. With a deeper understanding of risks and preventive measures, a safer and more sustainable shipping environment is expected.

METHOD

Sorong Merchant Marine Polytechnic seeks to disseminate knowledge about shipping safety as a form of community service using the principles of Tridharma of Higher Education. The sequence and critical points of community service activities are illustrated in Figure 2.

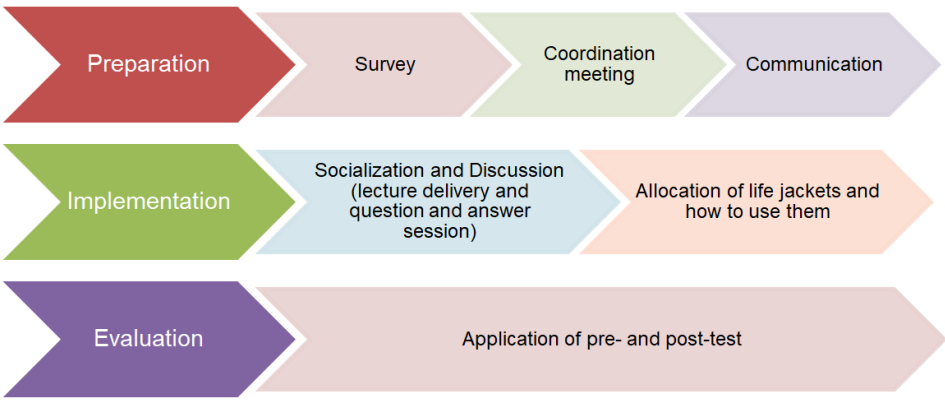

FIGURE 2. Activity Stages Chart

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The preparation stage included surveys, coordination meetings, and communication. Furthermore, the team began to determine the time and develop a schedule of activities. The activity was held on July 03, 2023, starting at 08.00 WIT until completion. The implementation stage involved disseminating information through lectures and facilitating question-and-answer sessions directly at the designated activity location. Furthermore, the allocation of life jackets to the participants, coupled with a comprehensive explanation of the proper use of life jackets in an emergency. The evaluation stage in this activity includes tests done before and after teaching (pretest and posttest). The success of the intervention provided to participants can be evaluated by analyzing the development of test scores before and after the intervention (Damayanti et al., 2017). A pretest and posttest evaluation methodology is used daily to measure changes in a variable of interest before and after an intervention or treatment. The pretest is administered before the intervention to establish an initial variable measurement. In contrast, the posttest is administered after the intervention to assess potential changes that may have occurred (Fendrian et al., 2023; Ilhami & Tutiliana, 2021; Merlinda & Jurniarni, 2022; Palupi et al., 2023; Wiratma et al., 2021). So, pretest and posttest data are needed to evaluate whether there is an improvement in the participants' evaluation stage after implementing the action. It aligns with the assertion made by (Oktavia & Wahyuni, 2023) that conducting assessments prior to and subsequent to socialization is intended to distribute the participants' comprehension of the subject matter.

The Wilcoxon test compares paired data from one or two related samples for pretest and posttest evaluations (Corder & Foreman, 2011) . Non-parametric statistical tests can be applied when the data does not follow a normal distribution or when the measurement scale is ordinal (Garren & Davenport, 2022). The number of samples for the pretest and posttest were 20 people each. The Wilcoxon test was conducted by determining H_0 and H_a, collecting data and making pairs, calculating the difference between each pair, ranking the differences, calculating the number of positive and negative ranks, calculating the U value, calculating the Z value, and comparing the Z value with the standard regular distribution table to determine whether or not to accept the null hypothesis (Corder & Foreman, 2011).

RESULTS AND DISCUSSION

The initial activity in the service activity is preparation, which covers meeting the organization and forming an internal task team for implementation. To collaborate, the committee communicated with the intended agencies, associations, and other universities. In this case, the Sorong Islands District, East Dum Village, Sorong Marine and Fisheries Polytechnic, and the Sorong Dum Island Sea Taxi Association agreed to participate in the shipping safety socialization activities. As shown in Figure 2, the community service implementation team conducted the survey twice on June 14 and 22, 2023.

FIGURE 3. Field survey before service activities

On the first day of the survey, the implementation team coordinated with the head of the Sorong Islands District and the Dum Island Sea Taxi Association chairman regarding the plan to organize

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community service activities and collected the identity of association members who might participate in the activity. In the second survey, the team reconfirmed the association members who would participate in the activity and coordinated the loan of the activity venue. The team also coordinated the completeness of equipment and items such as chairs, tables, and loudspeakers that would be used during the event. Then, a letter requesting the implementation of the activity was submitted to the local government and the coordinator of the Dum Island Sea Taxi Association. On July 2, 2023, the team went to the location of the activity to bring the necessary equipment and supplies. In addition to the committee members, the Sorong Sailing Polytechnic cadets also participated in the activity.

FIGURE 4. The process of moving equipment and supplies to the activity site

The committee from the Sorong Merchant Marine Polytechnic collaborated with the Research and Community Service Unit of the Sorong Marine and Fisheries Polytechnic to facilitate the preparation of materials and presenters. Sorong Merchant Marine Polytechnic and Sorong Marine and Fisheries Polytechnic cadets collaborated with these higher education institutions.

A series of community service activities were carried out on Dum Island to commemorate the 17th anniversary of the Sorong Merchant Marine Polytechnic. The schedule of activities on Monday, July 3, 2023, included opening sessions, material delivery, evaluation, and closing sessions, starting at 08:00 Eastern Indonesian Time (WIT) and closing upon completion. Eighty-eight sea taxi workers attended, including owners, conductors, and drivers. In addition to outboard engine maintenance counseling and marine environmental pollution prevention counseling, the schedule of activities also included socialization of shipping safety. The head of the Sorong Merchant Marine Polytechnic delivered a welcome speech and introduced the event. Then, the chairman of the Dum Island Sea Taxi Association was allowed to speak at the opening session of the event. Figure 5 illustrates the opening session of the community service program.

FIGURE 5. Opening of the shipping safety socialization event

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After the opening ceremony, the community service team continued to provide shipping safety socialization material, such as the importance of shipping safety equipment that must be used. In a voyage, various safety equipment must be used to ensure the crew's safety and the voyage's continuity. Lifebuoys or ring buoys are circular safety equipment that rescues individuals who fall overboard. Flares are also significant; they are usually used to signal danger or call for help. Additionally, a fire extinguisher is an indispensable piece of equipment that should always be on board. It is used to put out the fire in the event of a fire on board, ensuring the entire crew's safety and the voyage's continuation. Additionally, life jackets are must-have safety equipment.

Life jackets, also known as life vests, are essential safety equipment on board vessels, especially in potentially hazardous situations. The primary purpose of these buoyancy suits is to support individuals, both conscious and unconscious, allowing them to maintain buoyancy on the water while ensuring their nose and mouth are above the water's surface. The device in question has been specifically engineered to enhance marine vessel safety measures (Aprizawati et al., 2022).

Minister of Transportation Budi Karya Sumadi emphasized to the general public the importance of using life jackets to increase awareness of safety in transportation (Biro Komunikasi dan Informasi Publik Kementerian Perhubungan Republik Indonesia, 2018). On the other hand, a life jacket considered compliant with the Solas standard meets all the specified characteristics and requirements outlined in the LSA Code. The life jacket shall not exhibit sustained burning or melting when fully immersed in fire for 2 seconds (MaritMeculture, 2022). The presence of this equipment and the knowledge of how to use it are essential to maintaining safe shipping.

Presenters from the Sorong Merchant Marine Polytechnic presented shipping safety information. The committee prepared a presentation of the socialization material using presentation slides displayed on the monitor screen. An example of a slide presentation of the material displayed in the lecture session is shown in Figure 6.

FIGURE 6. Slide presentation of shipping safety material

The speaker presented the material using the lecture method using a portable loudspeaker. This is shown in Figure 7. After the presentation, a question and answer session was held to clarify concepts still unclear to the participants. The presenters understood that the main actors, especially members of the Sea Taxi Association, are very knowledgeable about shipping safety, especially equipment. However, theoretical understanding and refreshers are still needed to ensure that shipping safety factors are implemented to keep everyone safe.

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FIGURE 7. Providing shipping safety material

Overall, participants were enthusiastic during the socialization. This activity aims to maximize the mind and preparedness of individuals in dealing with emergencies in marine waters. With a deeper understanding of risks and preventive measures, a safer and more sustainable shipping environment is expected. Sorong Merchant Marine Polytechnic provided life jackets to the participants to encourage critical players to prioritize safety in sailing. By wearing life jackets, the participants could directly experience how this safety equipment can increase their chances of survival in an emergency. This valuable experience can increase their awareness of sea dangers and their vigilance in sailing. Thus, Sorong Merchant Marine Polytechnic hopes that the participants will prioritize sailing safety in every voyage to reduce the risk of accidents and ensure the continuity of safe travel.

The pre-test was given before the presentation of the material, while the post-test was given afterward to assess the effectiveness of the socialization activities related to shipping safety. Figure 8 illustrates the participants of the socialization activities filling out the evaluation form. The participants were given evaluation forms with the help of cadets from Sorong Merchant Marine Polytechnic and Sorong Marine and Fisheries Polytechnic. The form filling was limited to 15 minutes for each evaluation. This evaluation was carried out using a sample of 20 participants from the total participants of the activity.

FIGURE 8. Completing the evaluation form

The picture illustrates the test results before and after the delivery of the material from the shipping safety socialization activities for the main actors of the Dum Island-Sorong City Sea crossing

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transportation. The test evaluation results are different before and after the socialization material delivery. Based on the results of the pre-test evaluation, sixteen socialization participants scored below 70. This indicates that participants still lacked a theoretical understanding of shipping safety. Most participants scored in the 26-50 and 51-75 score classes, with 45% of all pre-test participants scoring in each category.

The post-test evaluation showed a significant score increase compared to the pre-test results. 75% of all participants fell into the 76-100 score class. The initial and final tests indicated changes after the delivery of the socialization material. Implementing a planned extension program or socialization activity can increase participants' knowledge. This is by the statement that participants' knowledge can be improved through extension/socialization activities (Hidayat et al., 2019; Widyasari et al., 2022).

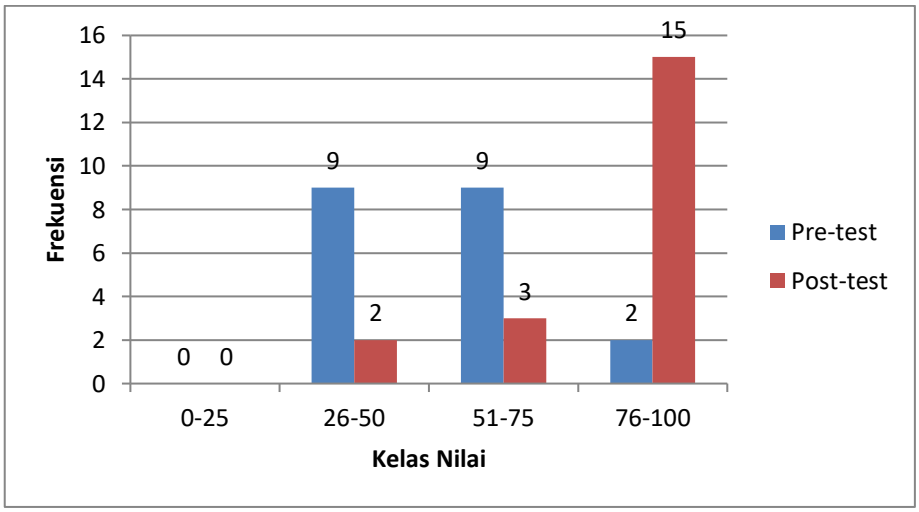

FIGURE 9. Test score results after and before socialization

Parametric or nonparametric statistical analysis can test the accepted hypothesis regarding whether there is a significant difference in the participants' test results after treatment. The researcher must first determine whether a parametric or nonparametric statistical test is more appropriate to test the statistical hypothesis (Supardi, 2013). Before conducting parametric inferential statistical analysis, data with a normal distribution is required as a prerequisite. Analysis of parametric inferential statistical testing results requires an assessment of conformity to a standard curve, uniformity of variance, and linearity as basic requirements (Usmadi, 2020). Table 1 displays the results of the Shapiro-Wilk normality test. This normality test uses a confidence level of 0.95 or 95% confidence level. The normality test data shows that the pre-test results show a normal distribution, as evidenced by the probability/significance value exceeding 0.05. However, the distribution of the post-test results deviated from normality as the probability or significance value was below the 0.05 threshold. Therefore, the hypothesis was further determined using nonparametric statistical analysis, specifically the Wilcoxon test.

TABLE 1. Shapiro-Wilk normality test results

Tests of Normality

		Shapiro-Wilk		
	Group	Statistic	df	Sig.
Results of Test	Pre-Test	.952	20	.391
	Post-Test	.838	20	.003

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The Wilcoxon test is used to compare paired data from one sample or two related samples (Corder & Foreman, 2011) . This non-parametric statistical test can be used when the data is not normally distributed, or the scale is ordinal (Garren & Davenport, 2022). The Wilcoxon test is performed by determining the null hypothesis and alternative hypothesis, collecting data and making pairs, calculating the difference between each pair, ranking the differences, calculating the number of positive and negative ranks, calculating the U value, calculating the Z value, and comparing the Z value with the standard regular distribution table to determine whether or not to accept the null hypothesis (Corder & Foreman, 2011).

The Wilcoxon test results in Table 2 show that the (negative) difference between the results of shipping safety socialization for test results before and after treatment is 0 for the N value, Average Improvement, and Total Improvement. The value of 0 indicates no reduction between the test scores before and after the socialization. Furthermore, the difference (positive) indicates 18 positive data (N), which indicates the test results of 18 participants before and after receiving shipping safety knowledge. The average increase value is 9.50, and the total increase in the difference (positive) is 171.00. In addition, the Ties value is 2, indicating two participants with identical scores on both tests.

TABLE 2. Results of ranks in the Wilcoxon test

Ranks

	N	Average Improvement	Amount of Improvement
Gap (Negative)	0[a]	0.00	0.00
Gap (Positive)	18[b]	9.50	171.00
Ties	2[c]		
Total	20		

In Table 3, the findings from statistical testing show that the two-tailed asymptotic significance level is 0.000. Based on the statistical analysis, it can be concluded that the test results are significantly different before and after running the shipping safety socialization, as the p-value is below the predetermined significance level ($p < 0.05$).

TABLE 3. Statistical test results in the Wilcoxon test

Testing Statistics[a]

	Result of Posttest – Result of Pretest
Z	-3.744[b]
Asymp. Sig. (2-tailed)	.000

CONCLUSION

Community service activities that teach and promote shipping safety among critical stakeholders of Dum Island's marine taxis can be carried out effectively and by the planned activities prepared at the planning, implementation, and evaluation stages. Dissemination of materials was facilitated through the use of lecture-based delivery techniques and interactive Q&A. The lecture sessions included a comprehensive discussion on boating safety equipment, focusing on life jackets. The enthusiasm of the participants who stayed until the end of the allotted time is evidence that the program received a very positive response. The mean score on the evaluation test after the presentation exceeded the mean score on the evaluation test before the presentation. The Wilcoxon test showed that the evaluation results after

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the pilot test differed from those before the pilot test. This finding indicates that the participants gained knowledge through the socialization materials provided.

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