

The impact of marine safety in improving the management of marine vessels

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Abstract

The aims of current article to activate the maritime safety culture of the Iraqi Oil Tanker Company's naval crews, which is reflected in improving the work of offshore vessels and increasing their operational efficiency, as well as preventing the occurrence of risks through prior assessment of maritime accidents. The researcher distributed the checklist to diagnose the problem for the article survey, and to achieve the research objectives, the researcher prepared the hypothetical chart showing the kind of the association between the primary factors reflected in the dependent variable (maritime management) and the independent variable (maritime safety), and where the study population consist of (300) people and the sample contained (169) people. The sample, which consists of people who work on marine vessels owned by the Iraqi Oil Tanker Company, received the questionnaire. In order to analyze the data, the researcher used statistical software (EXCEL V.10, SPSS.V.23).

The main hypothesis, which seeks to understand the relationship of correlation and impact among the dependent variable (management of marine vessels) and the independent variable (maritime safety) , in addition to identify the flaws which jeopardize the safety of Iraqi marine vessels owned by the Iraqi Oil Tanker Company, was accepted based on the research's findings.

Keywords: Maritime safety culture, personnel training on maritime safety, marine safety equipment, marine classification, risk assessment.

Introduction

The independent variable of maritime safety is addressed as the concept, objectives, and importance of maritime safety are identified, and then its sub-dimensions are represented in (maritime

safety culture, personnel training on marine safety, marine safety equipment) and the dependent variable (management of marine vessels) and its sub-dimensions (maritime classification, risk assessment).

Maritime safety

The concept of maritime safety

The concept of marine safety has undergone major changes in recent years, as marine safety is concerned with protecting lives and property through organizing, managing, and developing technology for all forms of marine vessels. The history of shipbuilding is entire of innovation, successes, professionalism, vision , and serious marine accidents that have notable its course from the times of steamships to the present day (Leoni, 2019: 43). The idea about maritime safety has been fully detailed in the Solas Convention, where the last and its protocols are the most vital international treaties related to the safety of marine vessels in general. Maritime safety means to the technical safety of installations or ships at sea, whether they are utilized for navigation or extraction uses, operating ships, observing international standards with regard to the qualifications and well-being of personnel on board ships, and measures to block the marine environment pollution (Usoro, 2014:4). The researcher also believes that maritime safety is the antithesis of marine risks, as it indicates security, tranquility, and safeguard. Maritime safety can be defined according to a group of researchers' opinions, as shown below.

Table (2-1) Maritime safety as a concept

Researcher/ year	Maritime safety concepts
Nas,2015:53	It is the state of avoiding dangers result from natural forces or random human actions. The source of danger consists of natural forces and/or human errors that affect individuals and marine vessels.
Theophilus c ,et al., 2018 :188	It is the protection of a particular subject from risk or the risk of damaging and accidental loss. Safety represents assurances that infrastructure capital, investment capital, working capital, human capital, the

	environment, and other input and output resources are in good condition, that is, in a state in which they are not threatening by the risks of unforeseen damage, loss, and the negative impacts threatening the work of marine vessels.
Formela , et al., 2019: 286	It is to preserve the maritime system, which is marked in (people, marine vessels, and the marine environment) from any element that threatens maritime safety, to preserve the lives of individuals and their property from the danger resulting from marine accidents.

Source: Based on the researcher's preparation of the aforementioned sources.

Maritime Safety Objectives

Safety at sea targets to protect people and property, prevent human injuries and loss of life, and avoid destroying the marine environment. Among the most important of these main objectives of maritime safety are the following (Daman, 2019: 17).

- Spreading the principles of public safety among the marine crew members.
- Preparing crews familiar with the ship and its equipment.
- Preparing marine crews capable of dealing efficiently with personal safety tools.

The importance of maritime safety

Maritime Safety is concerned with all work and procedures through the management and coordination of these procedures. This requires taking into account the safety policy of the owner's environment and to which the marine vessels are administratively linked, and the importance of maritime safety (Marzouk, 2019: 235).

- Maintaining culture and awareness of actual practices on safety equipment and implementing norms and standards to reduce risks and develop plans to avoid injuries at work, taking into account the provision of instructions and guidance to crew members.

- Obligation to publish instructions and documents related to safety to personnel working in marine vessels.
- Ensure that all records relating to safety and health at work required by legal and inspection bodies are maintained.
- Continuous reminders by senior management of issues related to maritime safety to reduce future injuries.

Maritime Safety Culture

Successful management promotes and improves a positive marine safety culture among individuals through correct attitudes and beliefs and the commitment of managers to implement standards and rules perfectly in all marine vessels. Maritime safety culture has been known as a series of things, standards, attitudes, social and technical roles, and practices that are designed to reduce the exposure of personnel working in marine vessels to risks. Therefore, the maritime safety culture focuses on two important elements: management commitment and control. Therefore, many researchers tried to find a unified definition of the culture of maritime safety by following the previous literature on organizational culture research and instilling an organizational culture that everyone should contribute and participate in, as it was defined as "the way we do things here" and reflects the values, beliefs, and attitudes within the marine vessels. This has a significant impact on what individuals do and when they do so, a mature safety culture contributes to strong and integrated safety performance, as well as culture is a prescriptive term that contributes to an understanding of the key factors that can be experienced daily (Grøn & Richter, 2013:6, 15).

Culture can be defined according to the Oxford dictionary (2012), as the ideas, habits, and social behavior of particular individuals or society. Due to its use of terminology, customs, and traditions that are still used today as well as its emphasis on cultural issues, the so-called safety culture can be traced back to the time of sailing ships. Should not be underestimated, for example, the new safety concepts are implemented from the adoption of many customs and traditions of young sailors by old sailors. It is also called tacit knowledge that is not taught in maritime training institutions (Berg, et al., 2013:26).

Maintaining a strong safety culture is a complex task in the maritime industry that requires the participation of everyone through safety management. It is a shared responsibility among all members the interest

which the responsibilities of safety are common and specifically delegated among the middle management. At the end, the whole grading from the lowest to the highest is achieved as a result of the actual application of safety practices, which gradually manifests itself

in both the collective and individual performance of everyone on board.

Everyone must modify their tasks to comply with the safety regulations, so the safety management perspective has been adopted. This is the systematic approach to understanding and describing safety management, which involves the arrangements performed via the organization to establish and promote a strong safety culture during achieving and monitoring the specified safety performance, and that the detailed objective is to develop, plan, and follow up operations to block accidents (Valdez Banda, et al., 2016:239).

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While (2015: 70, et al., Efiok) defined the culture of maritime safety as a series of beliefs, values, and social norms of individuals in the workplace and standards related to its phenomenon that affect the safety of the workgroup, and are associated with appropriate attitudes and behavior in the marine environment and is considered the correct behavior in response to situations both ordinary and contingent, and is “a sophisticated system of values and attitudes that guide the behavior of groups and individuals at the national, organizational, and professional levels. The socialization of employees in a way that elevates commitment to the objectives of an entity that embodies the philosophy of top management is often referred to as creating a company's culture, which is the glue that holds an organization together.

Training personnel on maritime safety

At the beginning of the twenty-first century, the maritime industry became interested in maritime training, and it was considered a new and challenging positive strategy to solve several current and potential challenges. However, the broader context of training provides for the promotion of expansion, growth, and positive alteration in safety, quality, and environmental friendliness according to the knowledge and skills of the ship industries that can be beneficial to the academic and training institutions the crucial part

they play in the success of the maritime industry in terms of enhancing and amplifying cooperation between the sectors of the marine industry and vice versa. In the case of a One of the contributing factors is the absence of maritime education and training in academic institutions that contribute to a decrease in efficiency, as well as the leakage of seafarers from naval vessels (Basak, 2017: 345).

The development of marine technologies is the result of new issues and difficulties that the maritime industry must deal with. The heartbreaking reality is that significant changes to increase maritime safety were only implemented in response to catastrophes at sea that resulted in the loss of many lives or extensive, long-lasting environmental harm. Such circumstances ought to be avoided by conducting proactive analyses of potential threats and difficulties in maritime navigation, as well as by developing measures to increase shipping safety without having negative effects on passengers, cargo, ships, or the environment. The issue of additional costs associated with supplemental education and training of the workforce is directly related to a serious safety problem in the maritime industry, which encourages the majority of shippers to hire labor that is less expensive, or from developing countries (Bazina, 2004: 144). Training is the process of transforming individuals from knowledge to competence through the training process and the need for continuous professional exercises on safety devices and equipment and adherence to the rules and standards of rehabilitation in accordance with the requirements of the conventions of the Maritime Organization. As confirmed by the International Maritime Organization (IMO), the design of a more systematic training plan in the field of maritime security has been agreed upon with a must receive professional training in relation to the ship security plan, and when on board, all personnel undergo induction training to elaborate the security proficiencies required to provide security for the ship's crew, to defend themselves and to prevent piracy attempts (Ziarati, et al., 2010: 2,4).

ship security officer, the ship personnel who have specific security duties, and for all other ship personnel. It is required that all personnel on board undergo training in basic skills and orientation for maritime security as required, and all personnel on board ships who have specific security tasks

Marine Safety Equipment

Lifesaving equipment is now an integral part of the modern shipbuilding industry. Ships no longer carry just a lifeboat and lifebuoy, they carry automatically inflated lifejackets, reversible liferafts, efficient rescue boats and equipment as well as technology

that has implemented safety standards to make the seafarer's job safer (House, 2004: 226). Every individual working in the field of the sea should be familiar with the marine arts, realizing its technical principles, so that he can perform his duty on the marine vessels efficiently and economically in time, effort, and money. There is no doubt that the continuous development in the manufacture of marine vessels and the diversity of their models and their different equipment with modern equipment and machinery represents a challenge for those working in the sea and requires more effort and knowledge from them to be able to use this equipment with accuracy and high efficiency. Maritime safety equipment is one of the main features of the current development. It is necessary to have marine safety equipment on board all kinds of marine vessels to deal with the various emergencies to which marine vessels are exposed risks. This equipment must conform with the requirements of the International Maritime Organization as discussed in the international maritime conventions and the need to conduct periodic training on this equipment to reach the required efficiency in dealing with accidents to avoid reaching a dangerous situation that leads to a disaster (Mohamed, 2015:27).

Marine vessel management

Classification of Marine

In line with the thriving marine insurance industry, the marine classification first appeared in the seventeenth century AD. The ability of marine vessels to sail was classified in 1652 in England by a marine classification organization, and at the time, the classification was based on the ship age and the level of assurance in the location of construction. The Green Book, a classification record produced by Lloyds bodies, is available. The safety of people and estate as well as the preservation of the marine environment are two of the most crucial objectives of the maritime conventions that the International Maritime Organization (IMO) issued after that, and this was the case when the Red Book of the Lloyd's Maritime Classification Authority was published in 1799 (Min, 2011: 7).

(Lagoni, et al., 2007:5) defined marine classification as non-governmental bodies that provide technical support to determine the degree and arrangement of marine pieces and determine the state they have become after sailing operations. These bodies are non-profit, as they carry out inspection work to determine technical faults. The rating agencies are independent organization that is attractive to ship owners who are concerned about maritime safety. Therefore, a prerequisite for accepting insurance coverage is the existence of a classification for marine vessels that applies international safety standards in marine vessels (Knapp, 2004:13).

The term "classification" means that the ships are arranged and classified in different categories by classification bodies and societies. Previously, the categories depended on the condition of the hull and equipment, so the hull is categorized in accordance with its design and state. The class is denoted by capital letters on the hull (A, E, I, O, U) as specified in the classification certificate and according to the degree and condition of the vessel, either good (G), medium (M) or bad (B). Today, it has been replaced with numbers (from 1 to 3), and it has become, for example, (A1), which means in good condition and suitable for sea navigation.

Risk Assessment

Risk assessment is intended to describe a set of methods that help in determining the occurrence of risks or not and to determine the damages that occur to avoid or reduce them.

Any choice or action that puts the cargo of the marine vessel in danger due to the captain carelessness or the crew exposes the marine vessel to the hazard of further damage due to this hazard was resulting from poor navigation or poor management. In these situations, the risk to the shipment is secondary because it first emerged on the marine vessel and involved a management decision pertaining to the marine piece. Additionally, proving the negligence of an official or member of the administration is necessary to recover damages or losses brought on by a specific accident (Force, 2004:68), and how much damage or other negative effects are caused to the person, the environment, or the property as a result of exposure.

The marine assessment hazards are also depend on guidelines approved by the IMO through international agreements, conventions, and treaties on how to handle transported materials throughout maritime navigation and the level of their harm to marine vessels, as well as the qualifications of people to avoid marine risks through safe driving. In order to prevent or reduce the negative effects on people, the environment, and property while in transit, maritime transport is governed by a number of international regulations. (Hodge, 2014: 4-6-10).

The risk factor and its multidimensionality may require new models and frameworks for risk assessment and management because binary probability models for safety assessment assume that accidents are unintended and undesirable events and that data about past incidents provide useful information about future incidents and in this case the undesirable events are intentional.

In this case, the past will be a guide to the future, and the level of risk associated with each option is evaluated as part of the risk assessment process, which is typically used as a tool to help with decision-making. Risks related to safety, the environment, and

various business risks can all be covered by the risk assessment. The field of risk analysis is not new. With the development of the industrial age came the need for businesses to make significant capital investments, making it necessary to work to understand the risks associated with the marine sector that are taken on and the capacity to manage risks using control and insurance measures by insurance companies.

Formal risk assessment techniques have their roots in the insurance industry (Bichou, et al., 2014: vi). (Demirel, 2019:243) indicated that risk assessment depends and is based on planning, which is one of the functions of management and represents the future vision of the nature of work in marine vessels and the extent of the impact of risks on individuals and property.

Practical Framework

The validity of the data for the descriptive statistical inference procedure

In this paragraph, some statistical steps were taken to ensure the validity of the data for statistical inference calculations. These procedures include tests of the normal distribution of data and ensuring the validity and reliability of the sample answers.

The normal distribution of the data is one of the requirements that must be met for the correlation analysis and regression of the data analysis, and the Kolmogorov-Smirnov test and the Shapiro-Wilk test are utilized to make sure that the normal distribution of the data is achieved. The results of the two tests are shown in the table below. While the null hypothesis of the two tests suggests that the data are normally distributed, the alternative hypothesis suggests that the data are not normally distributed.

Typical data distribution

The normal distribution of the data is one of the requirements that must be met for the correlation analysis and regression of the data analysis, and the Kolmogorov-Smirnov test and the Shapiro-Wilk test are utilized to make sure that the normal distribution of the data is achieved. The results of the two tests are shown in the table below. While the null hypothesis of the two tests suggests that the data are normally distributed, the alternative hypothesis suggests that the data are not normally distributed.

Table (3-1): The sample responses' normal distribution Using the Kolmogorov-Smirnov and Shapiro-Wilk tests

Dimensions	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Maritime safety culture	0.964	169	0.200	0.911	169	0.200
Training personnel on marine safety	0.948	169	0.200	0.804	169	0.200
Marine safety equipment	0.930	169	0.200	0.955	169	0.124
Marine classification	0.804	169	0.060	0.940	169	0.200
Risk assessment	0.806	169	0.061	0.925	169	0.200

Table: Based on the researcher's preparation of the results of (SPSS.V.23).

the outcomes of the distribution of normal test for the sample's responses. From the results, by comparison the sig value of the variables (maritime safety culture, marine safety equipment, management and organization of marine vessels, maritime search and rescue, risk assessment)) with the level of significance (0.05), We discover that the sig value of every variable is higher than the level of significance value, which indicates that the hypothesis that the data are normally distributed has been accepted. As a result, statistical analyses that call for the verification of this hypothesis will be carried out.

Reliability

If all other factors remain constant, reliability is known as the stability of the response when the test is administered at various times. Stability, internal reliability, and inter-observer consistency are a few examples of conditions that need to be tested for reliability.

The safety culture item's applicability

The reliability test (Validity and reliability) results for the safety culture item are displayed in the table below.

The findings of the validity and reliability scale for the safety culture item are presented in Table (3-2).

Table (3-2)

Cronbach's Alpha if Item Deleted	Squared Multiple Correlation	Corrected Item-Total Correlation	Scale Variance if Item Deleted	Scale Mean if Item Deleted	variable
Reliability coefficient					
No. of item=4 Cronbach's Alpha=0.727					

Table: Based on the researcher's preparation of the results of (SPSS.V.23).

If all of the values of the Corrected Item-Total Correlation coefficient are greater than one, then it is evident from the above table that all of the questions related to the Maritime Safety Culture item are significant in measuring the Maritime Safety Culture (0.40). Additionally, we observe that there is convergence in the values of Cronbach's Alpha if Item Deleted and the value of the coefficient generally (0.727), which denotes consistency in the sample's responses.

Validity of the personnel training item on maritime safety:

The validity and reliability test results for this item are displayed below.

Table (3-3) The outcome of the validity and reliability scale for the item on training individuals on maritime safety

Cronbach's Alpha if Item Deleted	Squared Multiple Correlation	Corrected Item-Total Correlation	Scale Variance if Item Deleted	Scale Mean if Item Deleted	variable
Reliability coefficient					
No. of item=4 Cronbach's Alpha=0.784					

Table: Based on the results of research conducted by the researcher (SPSS.V.23).

It is evident from the above table that all questions pertaining to the personnel training item on maritime safety are significant in determining the importance of the safety equipment item if the Corrected Item-Total Correlation is higher than (0.40), the default value for the stability of the answer. Additionally, we observe a convergence between the Cronbach's Alpha if Item Deleted coefficient values and the coefficient value generally (0.784), which suggests that the answers in the sample are stable.

Validity of the marine safety equipment item:

The reliability test results are displayed in the table below (Validity and reliability) for this item).

Table (3-4) the results of the validity and reliability scale for the marine safety equipment item

Cronbach's Alpha if Item Deleted	Squared Multiple Correlation	Corrected Item-Total Correlation	Scale Variance if Item Deleted	Scale Mean if Item Deleted	variable
0.775	0.367	0.508	4.867	11.439	Q9
0.765	0.526	0.714	4.376	11.512	Q10
0.737	0.372	0.581	5.058	11.402	Q11
0.741	0.405	0.571	4.732	11.378	Q12
Reliability coefficient					
No of item=5 Cronbach's Alpha=0.792					

Table: Based on the results of research conducted by the researcher (SPSS.V.23).

If the coefficients of all the values of the Corrected Item-Total Correlation coefficient are greater than (0.40), the default value of the stability of the answer, we can infer from the above table that all of the questions pertaining to the Marine Safety Equipment item are significant questions in gauging the effectiveness of this paragraph. We also observe a convergence between the Cronbach's Alpha if Item Deleted coefficient values and the value of the coefficient generally (0.792), which accounts for the consistency of the study sample's respondents' answers.

Validity of the marine classification item

We include below the results of the reliability test (Validity and reliability) for this item.

Table (3-5) The results of the validity scale for the marine classification item

Cronbach's Alpha if Item Deleted	Squared Multiple Correlation	Corrected Item-Total Correlation	Scale Variance if Item Deleted	Scale Mean if Item Deleted	Variable
Reliability coefficient					
No. of item=5 Cronbach's Alpha=0.788					

Table: Based on the results of research conducted by the researcher (SPSS.V.23).

The (Corrected Item-Total Correlation) coefficient value for the paragraphs of managing and organizing marine vessels are all greater than (0.40), which is the default value for stability verification, which makes it clear from Table (3-5) that all paragraphs of the marine classification are significant questions in describing this paragraph generally. The stability of the sample's responses is explained by the fact that there is confluence between the Cronbach's Alpha if Item Deleted coefficient values and the value of the coefficient generally (0.788).

Validity of the risk assessment item

Through the table, we show the outcome of the reliability test for the risk assessment item (validity and reliability).

Table (3-6) the results of the validity scale for the risk assessment item

Cronbach's Alpha if Item Deleted	Squared Multiple Correlation	Corrected Item-Total Correlation	Scale Variance if Item Deleted	Scale Mean if Item Deleted	Variable
Reliability coefficient					
No of item=5 Cronbach's Alpha=0.796					

Table: Based on the results of research conducted by the researcher (SPSS.V.23).

The table demonstrates that all of the risk assessment paragraphs are significant questions when describing this paragraph in general because all of the values for the corrected item-total correlation coefficient for the risk assessment paragraphs were greater than (0.40). Additionally, there is confluence between the Cronbach's Alpha if Item Deleted coefficient values and the value of the coefficient generally (0.796), which demonstrates the consistency of validity in the sample answers.

Statistical inference and hypothesis testing

Estimating and testing correlations

One of the methods of statistical inference, analysis of correlation is regarded as one of the key statistical methods. Through correlation analysis, estimates of the correlations between variables are made, and these estimations are then tested to secure their statistical significance. The first step in performing a regression analysis is using this technique. As can be seen below, correlation analysis was used to calculate the correlation between the maritime safety dimensions (maritime safety culture, maritime safety training, and maritime safety equipment) and the variable of marine vessel management.

Table (3-7): correlations between the marine vessels management and the aspects of the marine safety variable

dependent variable	Item	Maritime safety culture	Training personnel on maritime safety	Marine safety equipment
Maritime management	correlation coefficient	0.630	0.570	0.63
	Sig	0.000	0.000	0.000

Table: Based on the results of research conducted by the researcher (SPSS.V.23).

the correlation between the dimensions of the marine safety variable (maritime safety culture, training of personnel on marine safety, marine safety equipment) and the marine fleet management variable. It is clear from the results of the table that there is a direct, strong, and statistically significant relationship among the variable of maritime safety culture and this variable given the value of the correlation coefficient, which was (0.63), and the value of Sig = 0.000, which is less than the level of significance. Therefore, the sub-H11a hypothesis regarding the correlation relationship as well as the significance of the correlation coefficient are accepted. The table also shows that there is a statistically significant correlation between the

management of marine vessels and the instruction of people in maritime safety, with a correlation coefficient of (0.57) between the two variables and a value of (sig = 0.000), which is lower than the level of significance (0.05), indicates that the hypothesis is accepted. In addition to the fact that marine safety equipment and marine craft management have a strong and statistically significant correlation, Sub-H11b related to the correlation because the correlation coefficient between the two variables was (0.63) and the value of (sig = 0.000), that is lower than the level of significance (0.05). By doing so, you're endorsing the correlation's H11c sub-hypothesis.

Estimate and Test Impact Relationships

Below is an example of how simple and multiple regression analyses were used to evaluate the fictitious research design and determine the strength of the correlations between the independent and dependent variables.

Simple regression analysis of the independent variable marine safety on the dependent variable marine vessel management

To estimate and test the association among the independent variable of marine safety and the dependent variable of marine vessel management, as shown in the table, a straightforward regression analysis was carried out.

The outcomes of a straightforward regression analysis between a variable measuring marine safety as an independent variable and a variable measuring marine vessel management

Variable	Beta	T	Sig.	Adjusted R Square	F	Sig.
(Constant)	5.642	17.320	0.000	0.60	13.389	0.000
Maritime safety	0.323	3.659	0.000			

Table: Based on the results of research conducted by the researcher (SPSS.V.23).

The outcomes of a simple regression analysis between the variables marine safety as an independent variable and marine vessel management as a dependent variable. With reference to the table's findings, we can see that the effect of the independent variable (maritime safety) was equal to (.323), which represents the amount of growth required by the marine safety variable to increase the marine vessel management variable. Significant influence of the independent variable on the dependent variable is indicated via the value (sig = 0.000). The management of marine vessels, which was the dependent variable, varied and was explained by the independent variable by a determination coefficient of 0.60. (maritime safety). The main hypothesis H11 regarding the impact

relationship is accepted in light of the test value's ($F = 13.389$) and probability value's ($\text{sig} = 0.000$) indications of the model's significance, which includes the marine vessel management variable as a dependent variable and marine safety as an independent variable as well as to the fixed limit.

Simple regression analysis of the safety culture variable on the marine vessel management variable

The effect relationships between the components of the maritime safety variable were estimated and tested using straightforward regression analysis (maritime safety culture, personnel training on marine safety, and marine safety equipment) each separately with the marine vessel management. The outcomes of the simple regression are displayed below.

Table (3-9): findings of the simple regression analysis between the dependent variable, marine vessel management, and the safety culture dimension

Variable	Beta	T	Sig.	Adjusted R Square	F	Sig.
(Constant)	0.293	15.740	0.000	0.400	13.292	0.000
Maritime safety culture	0.074	0.541	0.000			

Table: Based on the results of research conducted by the researcher (SPSS.V.23).

The table displays the findings of a straightforward regression analysis between a variable influenced by marine vessel management and the culture of maritime safety. According to the table's findings, we can see that the effect of the dimension (Maritime Safety Culture) was equal to (0.074), which is the amount of growth required for the Maritime Safety Culture dimension to increase the marine vessel management variable. The significance of the independent dimension's impact on the dependent variable is indicated by the value ($\text{sig} = 0.000$). The management of marine vessels, which is the dependent variable, varied, as indicated by the determination coefficient's value of (0.40), which was explained by the independent dimension (maritime safety culture). The significance of the model, which includes the fixed limit in addition to the variables marine vessel management as a dependent variable and the culture of marine safety as an independent dimension, is indicated by the test's value ($F = 13.292$) and probability value ($\text{sig} = 0.000$).

Simple regression analysis of the dimension of training individuals on maritime safety on the variable Maritime vessel management

As shown in the following table, a straightforward regression analysis was done to estimation and test the effect relationship between

managing marine vessels and training people in marine safety as independent and dependent variables.

Table (3-10): Results of a simple regression analysis between the variable marine vessel management and the dimension of educating people about marine safety

Variable	Beta	T	Sig.	Adjusted R Square	F	Sig.
(Constant)	4.156	12.093	0.000	0.34	12.763	0.000
Training personnel on maritime safety	0.077	0.873	0.384			

Table: Based on the results of research conducted by the researcher (SPSS.V.23)

The table displays the findings of a straightforward regression analysis using the dependent variable, marine craft management, and the independent variable, individual marine vessel training. It is vital to note that the effect of the dimension (Maritime Safety Culture) was equal to (0.077), which represents the amount of improvement required in the dimension of educating people about maritime safety in order to increase the variable of managing marine vessels. A significant effect of the independent dimension on the dependent variable is indicated by the value (sig = 0.000). The determination coefficient's value was (0.34), and it shows how the independent variable (management of marine vessels) explained variations in the dependent variable (training of personnel on marine safety). The significance of the model, which includes the fixed limit in addition to the independent dimension of training people in marine safety, is indicated by the test's value (F = 12.763) and probability value (sig = 0.000). The dependent variable in the model is the management of marine vessels. This implies that the impact relationship's H11b sub-hypothesis is true.

Analyzing the relationship between the marine safety equipment dimension and the marine vessel management variable using simple regression

As can be seen in the table below, simple regression analysis was used to estimation and test the impact relationship between the independent dimension of marine safety equipment and the dependent variable of marine vessel management.

Table (3-11): Results of the simple regression analysis between the dimension of marine safety equipment and the variable of marine vessel management

Variable	Beta	T	Sig.	Adjusted R Square	F	Sig.
(Constant)	5.179	38.898	0.000	0.434	30.941	0.000
Marine safety equipment	0.224	5.562	0.000			

Table: Based on the results of research conducted by the researcher (SPSS.V.23)

the findings of the straightforward regression analysis between the dimension of marine safety equipment and the variable of marine vessel management. According to the table's findings, the independent dimension (marine safety equipment) had an impact of (0.224). The value of (sig = 0.000) denotes the significant effect of the independent dimension on the dependent variable. This is the amount of elevates in the dimension of marine safety equipment to increase the variable of managing marine vessels. The management of marine vessels, which is the dependent variable, varied, as indicated by the determination coefficient's value of (0.43), which was explained by the independent dimension (marine safety equipment). The significance of the model, which includes the independent dimension marine safety equipment as well as the fixed limit and the variable marine vessel management as a dependent variable, is indicated by the test value's (F = 30.941) and probability value's (sig = 0.000) values. This entails endorsing the impact relationship's H11c sub-hypothesis.

The dimensions of the marine safety variable and the marine vessel management variable were both subjected to multiple regression analysis.

As shown in the table, multiple regression analysis was used to estimation and test the impact relationship between the management of marine vessels as a dependent variable and the dimensions of the marine safety variable as independent variables.

Table (3–12) shows the outcomes of a multiple regression analysis using the marine safety variable and the marine vessel management variable as independent variables..

Variable	Beta	T	Sig.	Adjusted R Square	F	Sig.
(Constant)	4.614	11.303	0.000	0.783	31.807	0.000
Maritime safety culture	0.151	4.972	0.020			
Training personnel on	0.024	4.291	0.002			

maritime safety						
Marine safety equipment	0.261	5.841	0.000			

Source: Based on the results of research conducted by the researcher (SPSS.V.23)

the findings of the multiple regression analysis between the dependent variable, marine vessel management, and the independent variables, the dimensions of the marine safety variable. We note an increase in the marine management variable from the table's results. The impact of the marine safety culture should be enhanced by 0.151, that of marine safety training for employees by 0.024, and that of marine safety gear by (0.261). The significance of the model parameters is evident from the sig value corresponding to them, as shown in the table, and if they are less significant than the significant level of (0.05). The management of marine vessels was the dependent variable, and the determination coefficient's value was 0.78; this value represents the variance of the dependent variable, which combined the independent variables to interpret (maritime safety culture, personnel training on marine safety, and marine safety equipment). The three variables' combined significance in explaining the alter in the dependent variable (management of marine vessels) is indicated by this value, and the remaining unexplained variance (22%) is due to additional changes that were not accounted for in the model. The significance of the model, which includes the fixed limit as well as the independent variables maritime safety culture, personnel training in maritime safety, and marine safety equipment, is indicated by the test's value ($F = 31.809$) and probability value ($\text{sig} = 0.000$). The dependent variable in the model is the management of marine vessels. Inferred from this is agreement with the impact relationship's H11 main hypothesis.

Conclusions

1. Through the theoretical side of the research, the focus was on the culture of maritime safety among the marine crews in the Iraqi Oil Tanker Company.
2. The main hypothesis of the research and the associated sub-hypotheses were accepted after conducting the statistical analysis.
3. Shedding light on the Iraqi marine vessels belonging to the Iraqi Oil Tanker Company in all technical and administrative aspects.
4. Existence of risk assessment by individuals working in marine vessels belonging to the Iraqi Oil Tanker Company, which is considered the most dangerous in transporting goods.

Recommendations

1. The researcher recommends spreading the culture of maritime safety among individuals through social media, opening marine channels dedicated to educating marine crews, as well as intensifying training courses for awareness.
2. We suggest training individuals for marine rescue in according to the guidelines and requirements generated by the International Maritime Organization. Paying attention to the technical aspects of marine vessels through the provision of modern and advanced marine safety equipment.

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