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A Study on The Occupational Safety Perceptions of Employees in Istanbul's Tuzla Shipyards

Özgür ÇELİK¹  | Abdurrahman ASAN^{2,*} 

¹Hitit University, Master Student in OHS, Corum, 19100, Türkiye.

²Hitit University, Faculty of Engineering and Natural Science, Corum, 19100, Türkiye.

Corresponding Author

Abdurrahman ASAN

E-mail: abdurrahmanasan@hitit.edu.tr Phone: +90 364 227 70 00 ROR: <https://ror.org/01x8m3269>

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¹Hitit University, Master Student in OHS, Corum, 19100, Türkiye.

²Hitit University, Faculty of Engineering and Natural Science, Corum, 19100, Türkiye.

Abstract

This study was conducted to assess the current status of occupational health and safety (OHS) practices in the shipbuilding industry among workers employed at shipyards located in the Tuzla district of Istanbul. The study analyzes the effectiveness of OHS practices, awareness levels, and risk perception through a survey administered to 57 shipyard workers engaged in various tasks such as shipbuilding, maintenance-repair, and dismantling. The survey results revealed that although the majority of participants (79%) stated that they had received OHS training, only 47% found their working environment safe. While 64.91% of participants believed that personal protective equipment was used regularly, 40.35% thought that the risk of occupational accidents was high. Furthermore, high levels of uncertainty regarding issues such as the adequacy of emergency plans and the frequency of inspections indicate that employees do not always find OSH practices to be transparent and consistently applicable.

The findings also reveal that subcontracted workers may not fully benefit from OSH services and that long working hours and heavy workloads may negatively affect safe behavior. Differences in risk perception were also observed among workers in different departments, such as ship dismantling, construction, and maintenance and repair.

In conclusion, the study revealed that OSH culture is developing in the shipyard industry, but there are significant shortcomings in ensuring the coordination and sustainability of these practices. Accordingly, it is recommended to increase the content and frequency of training, strengthen control mechanisms, and develop risk-focused preventive strategies.

Keywords: Shipyard, Occupational Health and Safety, Marmara Region, Emergency Plans, OHS Practices, Employee Perception.

INTRODUCTION

Occupational health and safety (OHS) is a discipline that functions both technically and legally to ensure that employees work in a safe and healthy environment. Occupational accidents and occupational diseases are serious problems that threaten the mental and physical integrity of employees. Globally, millions of occupational accidents occur every year and hundreds of thousands of employees suffer from occupational diseases (Enginel & Toptancı, 2017). This situation not only affects the quality of life and safety of individuals, but also leads to disruptions in the production processes of enterprises, decreases in productivity and serious financial losses. Preventing occupational accidents and occupational diseases, ensuring safe working conditions in workplaces and developing awareness and culture in this field are among the main objectives of occupational health and safety.

Accidents occur worldwide and, in every sector, employees are injured, disabled and unfortunately lose their lives. As in other business lines, the shipbuilding sector is a highly dangerous and risky area and the probability of accidents in this sector is quite high. It is theoretically aimed at preventing accidents completely, but it is quite difficult to achieve this goal. Therefore, the main objective is to minimize future accidents by drawing lessons from existing accidents. When all elements in the sector fulfil their duties completely, it will be easier to prevent accidents and deaths. The first step in preventing occupational accidents is a detailed examination of existing accidents. Accurate determination of the causes of accidents forms the basis of the measures to be taken to prevent the recurrence of similar accidents. The approach accepted worldwide is based on this simple principle. Many rules and criteria of the International Maritime Organization (IMO) have been developed following major accidents in line with this main principle. However, the ideal is to identify the possible risks at work in advance and take measures to prevent accidents in advance, rather than taking lessons from

accidents that constantly occur (Taylan, 2008).

The shipbuilding industry is one of the heavy industry branches with a high risk of occupational accidents and occupational diseases. Preventing accidents and occupational diseases, protecting employees from hazards and ensuring safe working conditions in this sector is of critical importance both to improve the quality of life of individuals in the sector and to make the development of the sector sustainable. Considering that 90% of occupational accidents in the shipbuilding industry are caused by employee errors, the importance of the human factor is clearly evident. 60% of occupational accidents are directly and 30% are indirectly caused by human error. (Taylan, Occupational Accidents in Shipyards and Occupational Safety, 2008) Therefore, the establishment of an occupational safety culture and continuous and sustainable training of employees play a fundamental role in preventing accidents and occupational diseases. In order to create an effective OHS culture, it is important for everyone in the workplace to make safe behavior a habit, to recognize and control hazards and risks (Tutar, Nam, & Nam, 2019).

The Occupational Health and Safety Law No. 6331 in force in Turkey regulates the duties, authorities, responsibilities, rights and obligations of employers and employees in order to ensure occupational health and safety in workplaces and to improve existing health and safety conditions. Within the framework of this law, employers are required to take all kinds of measures, including prevention of occupational risks, training and information, organization and provision of necessary tools and equipment to ensure the health and safety of employees. Employers are obliged to monitor and inspect whether the occupational health and safety measures taken in the workplace are complied with and to ensure that nonconformities are eliminated. In addition, they must take the necessary precautions by making a risk assessment in the workplace, taking into account the suitability of employees for work in terms of health and safety. Employees are obliged not to jeopardize their own health and safety and the health

and safety of other employees affected by their work.

The impact of occupational accidents and occupational diseases on enterprises is large and multifaceted. For example, the cost of occupational accidents and occupational diseases in Turkey in 2011 was calculated as approximately 7.7 billion TL, and according to the International Labour Organization (ILO) data, the ratio of occupational accidents and occupational diseases to GDP varies between 1% and 3% in developed economies, while this ratio is between 4% and 6% in developing countries. When this ratio is taken into account for Turkey, it is seen that the total cost reaches 44 billion TL. These costs include not only economic but also social dimensions. Injury, disability or death of employees as a result of occupational accidents can lead to large-scale social and economic problems by directly affecting the families of employees. The importance of OHS is critical in terms of protecting the labour force and increasing productivity (Menteşe, İnce, & Özcan, 2017).

In conclusion, occupational health and safety has a great importance in the protection of individual and social welfare, sustainability of enterprises and development of national economies. Effective implementation of OHS practices in high-risk areas such as the shipbuilding industry is a vital requirement for minimising occupational accidents and occupational diseases. This study aims to determine the risks in the shipbuilding industry, to contribute to the awareness of employees, to prevent occupational accidents and to provide safer working conditions.

METHODOLOGY

This study was conducted to evaluate occupational health and safety (OHS) practices in various shipyards operating in the Marmara Region. A Likert-type, closed-ended survey was used as the data collection tool. The survey included questions about workplace emergency plans, management's commitment to OHS, the condition of health and safety equipment, and the reportability of health and safety issues.

The surveys were administered online via the Google Forms platform during January and February 2025. The aim was to ensure participant anonymity and easy accessibility. A total of 57 employees from different shipyards in the Marmara Region participated in the research. The majority of participants were male (89.5%), and most had a university-level education or higher. Additionally, 40.4% of the participants were sub-contracted employees working in various operational departments (e.g., construction, maintenance, dismantling).

The collected data was transferred from Google Forms to an Excel spreadsheet, where it was evaluated using basic frequency and percentage distribution analyses. No advanced statistical methods were used. The findings were interpreted through descriptive analysis. This method was employed to determine how employees perceive OHS practices in Marmara Region shipyards and to identify areas for improvement.

RESULTS

In the study, the demographic status and occupational health and safety perceptions of the employees were determined

by questionnaire method. In the questionnaire, basic demographic information such as age, gender, marital status, educational status, working period and working status of the participants were determined. This information helps us to understand the structure of the workforce in the sector, which groups are over-represented and which groups potentially require special training or safety measures.

Determining the Demographic Status of Employees

When the age distribution of the employees in shipyards is analysed, it is seen that the 26- 35 age group (33.3%) constitutes the highest rate, followed by the 18-25 age group (29.8%). This shows that the sector is largely composed of young and middle-aged employees. The 36-45 age group (24.6%) represents the most experienced employees, while the rate drops significantly in the 46-55 age group (12.3%). The fact that there are no employees aged 56 and above indicates that the harsh working conditions in shipyards drive employees away from the sector as they get older. This situation reveals that young employees should be made aware of occupational health and safety, experienced employees should be directed to transfer knowledge and ergonomic arrangements should be increased for older employees.

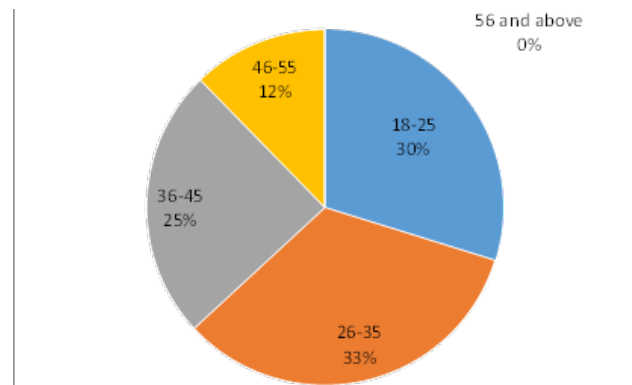


Figure 1. Age Distribution of Participants

The gender-based results of the survey show that men constitute the majority. According to the data, 89.5 per cent of the employees are male and 10.5 per cent are female. This distribution reflects the fact that male employees are more likely to work in areas such as shipyards, which require physical labour and have difficult working conditions.

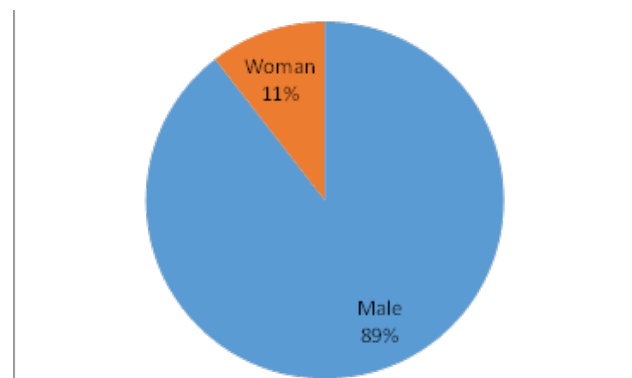


Figure 2. Gender Distribution of Participants

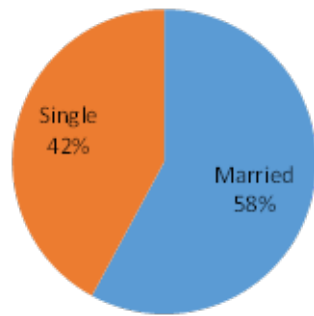


Figure 3. Marital Status Distribution of Participants

According to the marital status of the questionnaire, the results show that most of the employees are married. According to the data, the proportion of married employees is 57.9% and the proportion of single employees is 42.1%. This distribution can help us to understand how the personal life situation of employees in the workplace can affect their occupational health and safety perceptions and needs. The high rate of married employees indicates the existence of a labour force structure with more family responsibilities. Family obligations may cause employees to be more concerned about occupational safety or to approach safety measures more carefully.

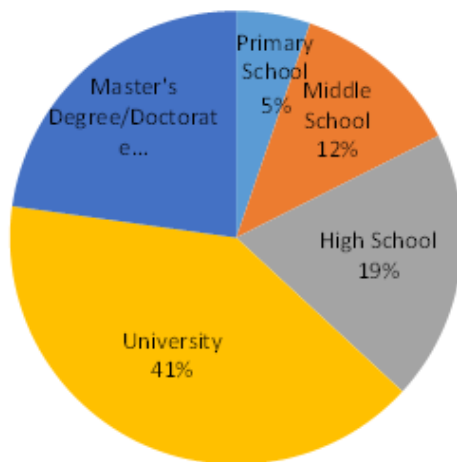


Figure 4. Distribution of Education Level of Participants

According to the data on the educational level of shipyard employees, the largest proportion of the participants are university graduates (40.4%), followed by master's/doctorate graduates (22.8%). This shows that a significant portion of shipyard employees have a high level of education. High school graduates (19.3%) also constitute a significant group, while secondary school (12.3%) and primary school graduates (5.3%) are represented at lower rates. This distribution shows that the level of education in shipyards is generally high and it can be said that as the level of education increases, the awareness and knowledge of employees on occupational health and safety also increases. However, targeted training programmes and safety measures should

be developed for each group.

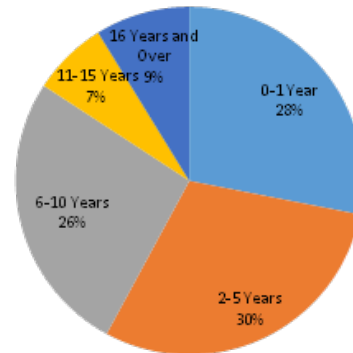


Figure 5. Distribution of Participants' Working Period in Shipyards

According to the duration of employment in the shipyard, it is observed that the largest portion of the employees have 2-5 years of experience (29.8%) and 0-1 year (28.1%). This shows that the sector is generally dominated by a labour force with new or mid-level experience. The proportion of employees with 6-10 years of experience is also quite high (26.3%), but 11-15 years (7%) and 16 years and above (8.8%). It can be said that as the working time in the shipyard increases, employees gain experience and become more conscious about occupational health and safety. However, as the working time increases, safety risks may also increase due to physical fatigue and habits. Therefore, special health monitoring, safety drills and ergonomic arrangements should be made for experienced employees. On the other hand, intensive training programmes and increased inspections for new employees are critical for raising safety awareness at an early age. As a result, separate safety strategies should be developed for employees with different working hours. Training for beginners, continuous supervision and health monitoring for experienced workers, and special ergonomic and safety measures for long-term workers should be prioritised.

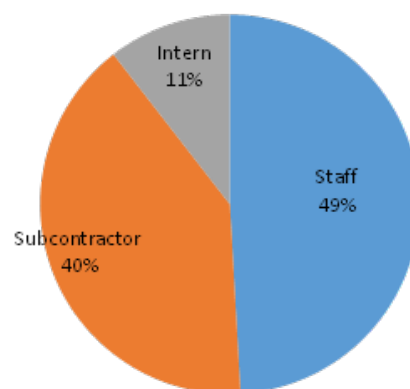


Figure 6. Distribution of Participants by Employment Status

According to the data on employment status, almost half of the respondents (49.1%) are permanent employees, while the proportion of subcontracted workers is quite high (40.4%). This shows that subcontract labour is a common practice in the shipyard sector. The rate of interns is lower with 10.5

per cent. Considering that subcontracted workers may be disadvantaged in accessing occupational health and safety standards compared to permanent workers, it is important to develop special policies to raise awareness and protect this group. While permanent employees constitute the largest group of the workforce and the most integrated into the safety culture, it is important to increase safety measures and training for subcontracted and trainee workers. It should not be forgotten that subcontracted employees may have lower safety awareness and interns require extra attention due to their inexperience.

According to income level data, the majority of respondents (70.2%) earn a monthly income of 30,001 TL and above, while other income groups are represented at lower rates. The rate of those with a monthly income between 20,001-30,000 TL is 15.8 per cent, and between 17,001-20,000 TL is 5.3 per cent. This distribution shows that the shipyard sector is dominated by employees with high income levels. This situation can be associated with the high rate of employees with higher education level and the knowledge demanded by the sector.

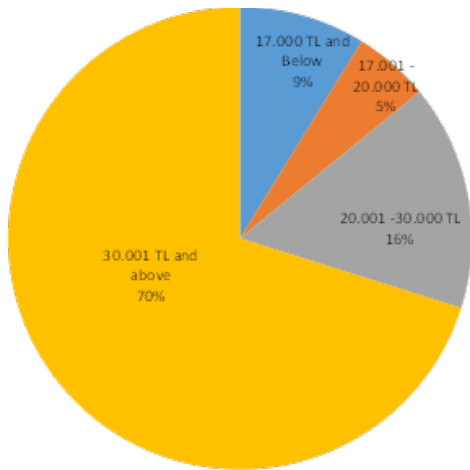


Figure 7. Distribution of Monthly Income Level of the Respondents

According to income level data, the majority of respondents (70.2%) earn a monthly income of 30,001 TL and above, while other income groups are represented at lower rates. The rate of those with a monthly income between 20,001-30,000 TL is 15.8 per cent, and between 17,001-20,000 TL is 5.3 per cent. This distribution shows that the shipyard sector is dominated by employees with high income levels. This can be attributed to the high proportion of employees with higher education levels and the know-how demanded by the sector.

According to the distribution by departments, shipbuilding (29.8 per cent) and ship maintenance and repair (31.6 per cent) departments have the highest rates. This shows that the labour force in shipyards is largely concentrated in these two fields. Ship dismantling and other departments are represented in equal proportions (19.3 per cent). The occupational health and safety needs of workers in each department are different and this makes it necessary to provide specialised training on a departmental basis. For shipbuilding workers, information on high physical safety

precautions and working with hazardous materials should be provided. Ship maintenance and repair workers should receive specialised training in electrical safety, working with chemicals and maintenance of machinery. For the ship dismantling department, special attention should be paid to safety, the use of heavy machinery, hazardous materials management and fire safety. Although other departments have lower risks, general occupational health and ergonomics trainings are important.

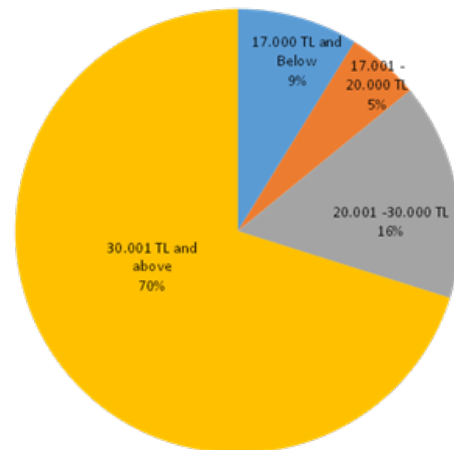


Figure 8. Distribution of the Departments of the Participants

Data on working hours show that the majority of workers (49.1 per cent) work between 41- 50 hours per week, followed by 24.6 per cent working 51 hours or more. This reveals that intensive and long working hours are common in shipyards. The rate of those working between 31-40 hours is lower with 14 per cent, while those working 30 hours or less constitute the lowest group with 12.3 per cent. Long working hours can increase occupational health and safety risks and trigger physical and mental fatigue. Therefore, it is critical to increase workload balancing and rest arrangements, especially for the group working 50 hours or more.

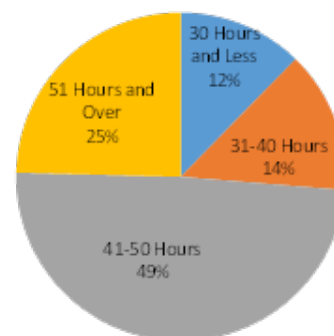


Figure 9. Distribution of Average Working Hours of Participants in the Work Area

Evaluation of Occupational Health and Safety Perceptions of Employees

Employees' occupational health and safety (OHS) perceptions and knowledge form the basis of safety

culture in the workplace. The better employees understand potential hazards, the more likely they are to avoid risky behaviours and adopt safe working methods. A well-informed employee helps to protect not only themselves but also their colleagues from potential accidents. Unfortunately, in many workplaces, employees' knowledge of OHS may remain superficial or may not be sufficiently reflected in daily practices because it is only at a theoretical level. This may be due to lack of training, complexity of safety procedures, or lack of attention to OHS by managers. Employees' perceptions of OHS are generally shaped by their personal experiences, past accident rates in the workplace and the general attitude among their colleagues. If safety measures are consistently ignored or accidents are frequent in a workplace, employees may perceive OHS as a bureaucratic burden and this may negatively affect compliance with safety standards.

For this purpose, these questions were asked to the participants to determine the perceptions of employees on occupational health and safety. In their answers to the question "My working environment is safe", 38.60% of the participants said "agree" and 8.77% said "strongly agree". These results show that approximately 47% of the employees find their working environment safe. On the other hand, 26.32% were undecided, 17.54% "disagree" and 8.77% "strongly disagree". The total of those who expressed negative opinions is 26.31%. This situation shows that the perception of safety is not equal among all employees and some employees find occupational health and safety practices inadequate. The rate of undecided respondents also indicates that there is a lack of awareness or knowledge on this issue. In general, making OHS practices more transparent and permanent is important in terms of strengthening employees' perception of safety.

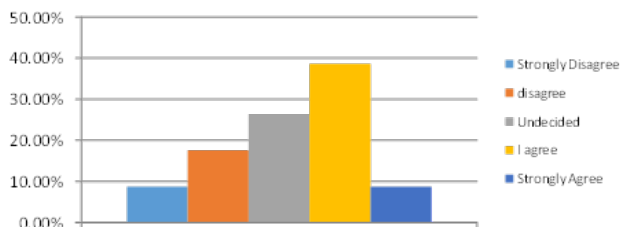


Figure 10. Bar graph representation of the answers of the participants to the question "My working environment is safe"

To the question "I received adequate training on occupational health and safety", 68.42% of the participants answered "agree" and 10.53% answered "strongly agree". This indicates a satisfaction rate of approximately 79% in total. This high rate shows that OHS trainings are generally effective in shipyards and the majority of the employees feel adequate in this regard.

On the other hand, 15.79% of the participants answered "undecided" and stated that they could not make a clear judgement about the adequacy of the training. In addition, a small group of 5.26% responded "disagree" and stated that they thought that the trainings were inadequate. The fact that there was no one who said "strongly disagree" shows that the negative perception in this area is quite low.

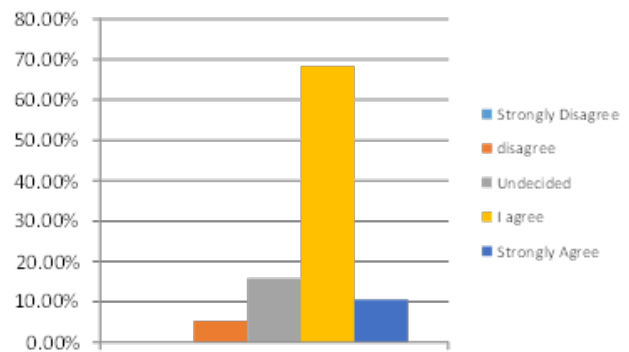


Figure 11. Bar graph representation of the answers of the participants to the question "I received adequate training on occupational health and safety"

In general, it is understood that occupational health and safety trainings are provided in a widespread and effective manner, but considering the rate of undecided respondents, it may be useful to re-evaluate the content, practical parts or frequency of the trainings.

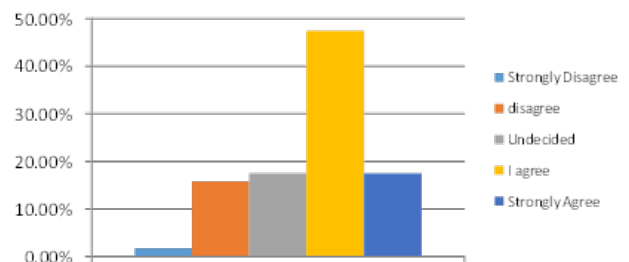


Figure 12. Bar graph representation of the answers of the participants to the question "Personal protective equipment (PPE) is regularly used in my workplace"

To the question "Personal protective equipment (PPE) is used regularly in my workplace", 47.37% of the participants "agree" and 17.54% "strongly agree". This shows that there is a positive perception that the use of PPE is regular at a rate of approximately 64.91% in total. This rate indicates that most of the shipyard employees think that there is sufficient organisation in the use of personal protective equipment.

However, the "undecided" answer of 17.54% indicates that there is a significant uncertainty and PPE use may not be regular enough in some cases or in some areas. In addition, 15.79% "disagree" and 1.75% "strongly disagree" indicate a significant negative perception of 17.54% in total. This result suggests that there are implementation or supervision deficiencies in the use of PPE.

In general, although there is a positive awareness on the use of PPE, as the undecided and negative responses together exceed 35%, it would be beneficial to improve and conduct strict inspections on the prevalence and regularity of PPE use. In addition to the trainings, it is important to continuously monitor the use in the field and eliminate the deficiencies.

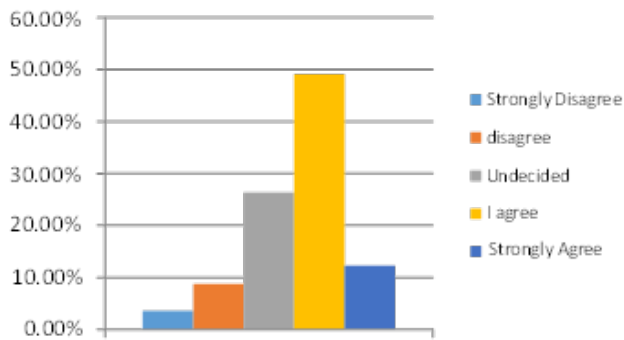


Figure 13. Bar graph representation of the answers of the participants to the question “My colleagues comply with occupational health and safety rules

To the question “My colleagues comply with occupational health and safety rules”, 49.12% of the participants answered “agree” and 12.28% answered “strongly agree”. This shows that the majority of the employees, approximately 61.4% in total, think that their colleagues comply with OHS rules. This positive opinion indicates that there is a general compliance with OHS rules in shipyards.

However, the “undecided” response with a rate of 26.32% indicates the existence of a significant uncertainty and reveals that approximately one fourth of the employees do not have a clear opinion on this issue. This situation suggests that there may be a lack of consistency in the implementation or follow-up of OHS rules.

On the other hand, the responses of 3.51% “strongly disagree” and 8.77% “disagree” indicate that approximately 12.3% of the employees have a negative perception that their colleagues do not comply with OHS rules. This indicates that there are still some deficiencies and risks in compliance.

In general, although there is a general positive perception about the compliance of colleagues with OHS rules, the fact that the undecided and negative responses exceed 38% in total indicates that the consistency of OHS practices and employee awareness should be increased. In this respect, it is important to strengthen OHS culture and to activate inspection mechanisms.

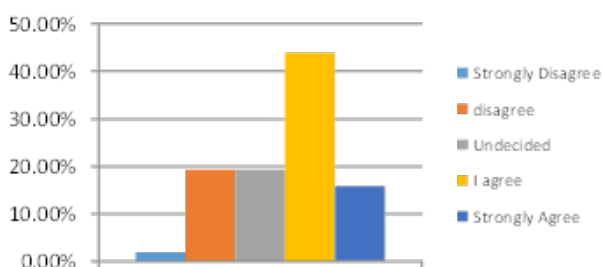


Figure 14. Bar graph representation of the answers of the participants to the question “Occupational health and safety inspections are carried out regularly at my workplace

To the question “Occupational health and safety inspections are carried out regularly in my workplace”, 43.86% of the

participants answered “agree” and 15.79% answered “strongly agree”. In total, approximately 59.65% positive responses indicate that inspections are generally carried out and that a significant portion of employees are aware of this issue.

However, the “undecided” response of 19.30% shows that there is a certain uncertainty among the employees about the frequency and effectiveness of audits. In addition, 19.30% of “disagree” and 1.75% of “strongly disagree” responses indicate that a total of 21% perceive that inspections are not conducted regularly enough.

These data suggest that OHS inspections are generally carried out, but improvements are needed in terms of regularity and effectiveness. The frequency of inspections should be increased and the results should be shared with employees so that OHS culture can be further strengthened.

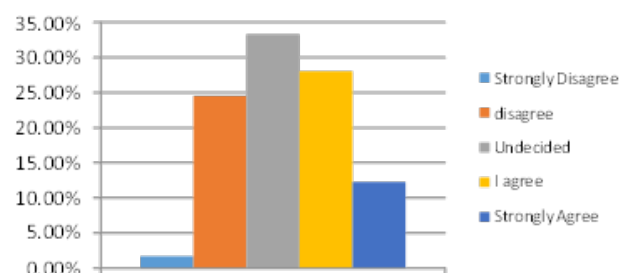


Figure 15. Bar graph representation of the answers of the participants to the question “I am likely to have an occupational accident at my workplace

To the question “I am likely to have an occupational accident at my workplace”, 1.75% of the participants answered “strongly disagree” and 24.56% answered “disagree”. In total, approximately 26.31% of the employees think that the probability of occupational accidents is low.

On the other hand, 28.07% “agree” and 12.28% “strongly agree” that the risk of occupational accidents at work is high. This shows that approximately 40.35% of the respondents perceive the risk of occupational accidents as high.

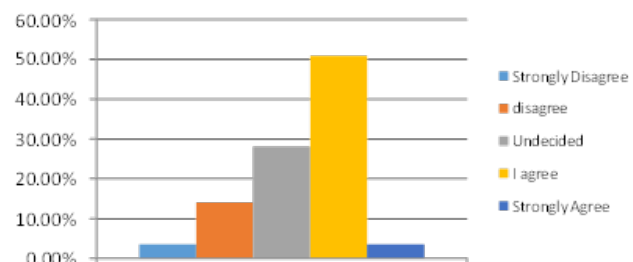


Figure 16. Bar graph representation of the answers of the participants to the question “Emergency plans and procedures are adequate in my workplace

The 33.33% “undecided” response shows that approximately one third of the employees have difficulty in expressing a clear opinion about the risk of occupational accidents.

In general, a significant portion of employees perceive the risk of experiencing an occupational accident at work as high. Considering the rate of undecided respondents, it can be said that the perception of occupational accident risk is serious and preventive measures should be increased to reduce the risks. Effective training and supervision mechanisms need to be increased in order to strengthen the occupational health and safety culture and reduce the risk perception of employees.

To the question “Emergency plans and procedures are sufficient in my workplace”, 50,88% of the participants answered “agree” and 3,51% answered “strongly agree”. The positive rate of 54.39% in total shows that emergency plans and procedures are considered sufficient by the majority of employees.

On the other hand, the “undecided” response of 28.07% indicates that a significant number of employees do not have a clear opinion on the adequacy of emergency plans and procedures. This may mean that the plans are not sufficiently publicized to the employees, or the implementation practices are not effective.

In addition, 14.04% “disagree” and 3.51% “strongly disagree” rates show that a significant portion of 17.55% in total find emergency plans inadequate.

In general, it can be said that emergency plans and procedures are available and accepted by the majority. However, the fact that the total number of undecided and negative responses is around 45% indicates that information, implementation and updating activities in this field should be increased.

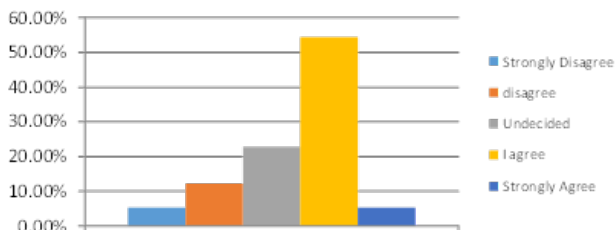


Figure 17. Bar graph representation of the answers of the participants to the question “Top management attaches importance to occupational health and safety”

To the question “Top management attaches importance to occupational health and safety”, 54.39% of the participants answered “agree” and 5.26% answered “strongly agree”. In total, 59.65% of the respondents answered in the affirmative, indicating that the majority of the employees believe that senior management attaches importance to OHS.

However, the 22.81% “undecided” response indicates that a significant portion of the employees do not have a clear opinion on this issue and there is uncertainty about the management’s attitude towards OHS. This situation suggests that there may be communication or perception differences between management and employees.

On the other hand, the responses of 5.26% “strongly disagree” and 12.28% “disagree” reveal that a total of 17.54% of the employees perceive that the management does not give enough importance to OHS. This shows that there are situations where management support is not fully felt.

As a general evaluation, although the perception that senior management attaches importance to occupational health and safety is generally positive, the sum of undecided and negative responses approaching 40% indicates that management policies should be better communicated to employees and supportive practices should be increased.

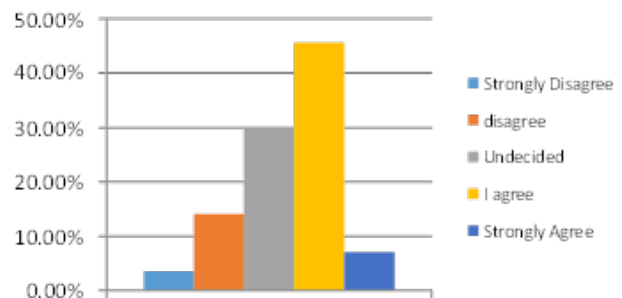


Figure 18. Bar graph representation of the answers of the participants to the question “Health and safety equipment at my workplace is adequate and well maintained”

To the question “The health and safety equipment at my workplace is adequate and well maintained”, 45.61% of the participants answered “agree” and 7.02% answered “strongly agree”. In total, approximately 52.63% of the respondents answered in the affirmative, suggesting that health and safety equipment is largely adequate and well-maintained.

However, the “undecided” response of 29.82% indicates that a significant proportion do not have a clear view on the adequacy and maintenance of the equipment. This indicates that there may be a lack of knowledge or observed variability among employees about the condition of the equipment.

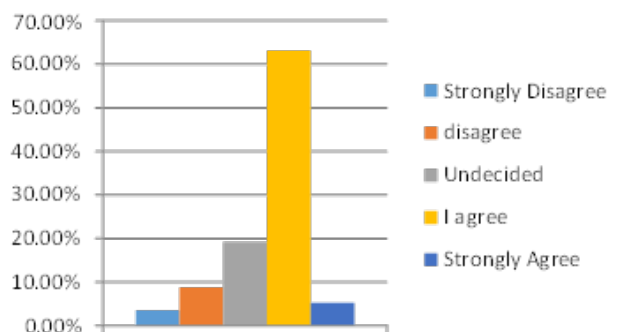


Figure 19. Bar graph representation of the answers of the participants to the question “I can easily report the health and safety problems I encounter in my workplace”

In addition, the responses of 14.04% “disagree” and 3.51% “strongly disagree” reveal that a total of approximately 17.55% think that the equipment is inadequate or poorly maintained. In general, although there is a positive opinion about the

condition of health and safety equipment, the fact that the total of undecided and negative responses is approximately 47% shows that improvement and information activities should continue in this area.

To the question "I can easily report the health and safety problems I encounter in my workplace", 63.16% of the participants answered "agree" and 5.26% answered "strongly agree". In total, approximately 68.42% of the employees feel competent and comfortable in reporting health and safety problems.

On the other hand, the "undecided" response of 19.30% indicates that some employees are hesitant about the ease of the reporting process. This may indicate that the reporting mechanism should be made more transparent and accessible. In addition, 8.77% "disagree" and 3.51% "strongly disagree" responses indicate that a total of approximately 12.28% of employees have difficulties in reporting. This situation reveals the need for improvement and support in reporting systems. In general, although the majority of employees feel adequate in reporting health and safety issues, considering the sum of undecided and negative responses, it is important to make reporting processes more user-friendly and to inform employees.

CONCLUSION AND RECOMMENDATIONS

Shipyards are workplaces where shipbuilding, maintenance-repair and dismantling activities are carried out intensively and physical, chemical and ergonomic risks are high. This study aims to evaluate the current status of occupational health and safety practices in shipyards through literature and field research. The literature review showed that shipyard environments harbor various hazards due to their complexity and multidisciplinary nature; accidents are largely caused by human error, equipment deficiencies and managerial inadequacies. The survey confirms that this general observation is in line with the perceptions and experiences of shipyard workers.

According to the data obtained, most of the participants (89.5%) are male and it is seen that the sector has a gender-based labor force distribution. Considering the level of education, the fact that the rate of university (40.4%) and master's/doctorate graduates (22.8%) is quite high supports the high level of awareness of employees towards OHS practices in general. As a matter of fact, approximately 79% of the participants stated that they received adequate training on occupational health and safety. However, there is a lower perception of confidence in the safety of the work environment; only 47 per cent of the respondents consider their work environment safe, while 26.3 per cent have a negative opinion. This situation indicates that even if OHS training is widespread, the deficiencies in implementation are felt by the workers.

It has been determined that subcontracted workers (40.4%) have a significant place in terms of employment status, and it has been evaluated that OHS practices are weaker for this group, and they cannot benefit from inspection processes sufficiently. As a matter of fact, it is frequently emphasized

in the literature that subcontracting increases the risk of accidents by leading to audit weakness and organizational deterioration. In addition, it was observed that a significant portion of the employees worked more than 50 hours per week (24.6%), indicating that physical and mental fatigue may negatively affect safe behaviors.

The risk distribution varies according to the departments, and ship dismantling activities involve serious environmental and health threats, especially asbestos and heavy metal exposure. According to the survey results, the risks faced by workers in different departments such as dismantling, maintenance and construction vary, and this situation necessitates the development of specialized training and supervision systems based on departments.

In conclusion, this study on occupational health and safety in shipyards shows that the OHS culture in the sector is being institutionalized, but there are still many areas that need to be improved. In this respect, the following recommendations can be made:

Strengthening Supervision Mechanisms: It is essential to establish independent and regular audit mechanisms in order to ensure equal implementation of OHS practices for all employees, especially subcontracted workers.

Differentiation of Training Content: Developing OHS training courses customized according to education level and working hours will contribute to raising awareness, especially among new workers.

Regulation of Workload and Working Hours: In order to prevent fatigue caused by long working hours, shift systems should be reviewed, and adequate rest periods should be provided to employees.

Department Based Risk Assessments: Separate risk analyses should be conducted for different operational areas such as shipbuilding, maintenance-repair and dismantling, and preventive strategies should be determined accordingly.

Monitoring Occupational Health Indicators: Continuous monitoring and reporting systems should be established on issues such as health screenings, use of PPE, and follow-up of occupational diseases; thus, early warning mechanisms should be activated.

Supporting Female Employees: Although the rate of female employees in the sector is quite low (10.5 per cent), both physical conditions and social prejudices need to be re-evaluated in order for women to be more involved in the sector.

In conclusion, establishing a sustainable occupational health and safety culture in shipyards is of strategic importance not only in terms of regulatory compliance but also in terms of increasing productivity and employee welfare in the sector. The findings of this study aim to contribute to the consideration of OHS practices in the shipyard sector in a scientific framework and to provide data-based policy

development opportunities for decision makers.

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