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# A Survey of Awareness and Compliance With Occupational Safety and Health Programs Among Contractors and Field Workers in Negros Oriental

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**Abstract.** The study aimed to determine the contractors' and field workers' awareness of and compliance with Occupational Safety and Health Programs (OSH) in the Department of Public Works and Highways (DPWH). This study employed a descriptive-correlational design. The respondents were eight (8) contractors and fifty-six (56) field workers from randomly selected contractors. The study is descriptive as it aimed to illustrate the level of the respondents' awareness of and compliance with Occupational Safety and Health Programs. It is also correlational as it investigated the relationship between two variables: (a) the extent of the field workers' awareness of and compliance with OSH Programs and (b) OSH compliance and accident rates in the construction site. The researcher used a validated questionnaire and applied statistical tools such as weighted mean, percentage, and Spearman's Rank Order Correlation to treat the data. The findings underscore commendable levels of awareness among the personnel, although challenges leading to non-compliance are identified. Notably, many field workers attribute non-compliance to discomfort with wearing personal protective equipment (PPE). Considering these insights, the study offers recommendations aimed at enhancing safety practices for both the implementing office (DPWH) and contractors.

**Keywords:** Contractors; Field workers; Awareness; Compliance; Occupational safety; Health program.

## 1.0 Introduction

The construction sector has historically and presently remained among the most hazardous industries for employment. Contemporary challenges in management and Occupational Safety and Health (OSH) initiatives persist, including hazards such as accidents and physically demanding labor (Grill et al., 2019). Each year, the Comparative Global Estimates on work-related burdens of accidents and diseases record 2.9 million deaths, resulting in an annual global GDP loss of 5.40 percent (Hämäläinen et al., 2022). According to Abaya and Ondieki (2021), workers are susceptible to various workplace hazards, including chemical exposure, injuries from moving machinery or falling objects, exposure to radiation or harmful gases, slips, and other harmful incidents. This necessitates that employers ensure their working environments are free from potential dangers and that employees comply with the legal requirements outlined in OSH regulations.

The purpose of this research is to determine the contractors' and field workers' level awareness and compliance with OSH Programs. To determine the substantial connection between awareness and adherence, the study builds upon Ajzen's Theory of Planned Behavior (Ajzen, 1991). This theory upholds that an individual's inclination to

follow rules and regulations is shaped by three primary factors: their subjective norms, attitudes toward the behavior, and perceived behavioral control.

The study by Toyado (2021) revealed that while workers in the construction sector are aware of OSH measures, their adherence to these measures is inconsistent. The construction sector has long faced significant challenges regarding awareness and compliance with OSH, especially in developing nations where OSH risks are particularly high. Toyado (2021) also noted that OSH in construction is frequently neglected. In response to this concern, the Department of Labor and Employment (DOLE) has initiated efforts to address the issue by establishing and enforcing comprehensive OSH guidelines and facilitating OSH seminars for workers in construction companies.

The topic of awareness and compliance with OSH standards within the construction industry remains relatively underexplored. Recent research has primarily focused on OSH concerns related to public health (Schulte et al., 2022), underground mining operations (Sadeghi et al., 2022), and the manufacturing sectors (Nuruzzakiyah et al., 2019). Additionally, the majority of previous studies on this topic have been conducted internationally. Therefore, this study is particularly valuable as it offers a new perspective on OSH standards within the local context.

Moreover, the study specifically aimed to evaluate the level of awareness and compliance with Occupational Safety and Health (OSH) Programs among field workers in the District Engineering Office, in light of the substantial expansion of the construction industry. Despite the government's initiatives to promote and sustain awareness of and adherence to safety standards, especially concerning the costs and budget allocations for OSH requirements in construction projects, there are instances where contractors neglect their responsibility to ensure a safe and healthful working environment for the employees. This observation has raised significant concerns regarding the adherence to OSH standards and the associated risks faced by field workers on Department of Public Works and Highways (DPWH) projects. With extensive firsthand experience as a safety officer and OSH program evaluator, the researcher sought to provide insights into these challenges encountered in the construction field.

## 2.0 Methodology

### 2.1 Research Design

This study is a descriptive-correlational type. The descriptive aspect was utilized to characterize and provide an account of the extent of awareness and compliance among field workers regarding Occupational Safety and Health (OSH) Programs. Simultaneously, the correlational component aimed to establish relationships between the following variables: (a) the extent of awareness and compliance of field workers on OSH Programs, and (b) the correlation between OSH compliance and accident rates in the construction site.

### 2.2 Research Locale

The study was conducted at the DPWH 1st District Engineering Office, situated in a third-class municipality of Negros Oriental, Philippines. This office serves as the government's infrastructure arm, with the primary responsibility of continuously advancing its technology to ensure the safety of all infrastructure facilities and achieving optimal efficiency and construction quality for all public works and highways. DPWH is aligned with governmental development objectives and plays a crucial role in the planning and design, construction, and maintenance of all government national roads, bridges, and building infrastructure projects.

### 2.3 Research Participants

The researcher employed the one-stage cluster technique to randomly select eight (8) contractors out of 14. In one-stage cluster sampling, a simple random sample of clusters is chosen, and data are then collected from every unit within the sampled clusters (Britannica, 2018). Fifty-six (56) field workers from those contractors holding an active contract with the Negros Oriental 1st District Engineering Office participated in the survey. Due to the manageable number of respondents, the researcher opted for one-stage cluster sampling. In this approach, the total sample is initially divided into a predetermined number of clusters based on the desired cluster size. Subsequently, random selection and sampling are conducted from the clusters, with data collected from each unit within the selected clusters (Simkus, 2023).

**2.4 Research Instrument**

The research used a researcher-made survey questionnaire with four parts. Part I of the questionnaire includes the disclosure statement, which serves as evidence of the informed consent of the field workers. Part II covers the questionnaire that determines the extent of the respondents' awareness of and compliance with OSH programs.

A rating scheme or table is provided as a reference for answering the questions, with scores ranging from 5 to 1 and varying verbal descriptions from "Very High" to "Very Low," respectively. The research covers areas, such as Construction Safety and Health Program (CSHP), Formal Site Safety and Health Inspection, Factors that Contribute to Health Hazards on Construction Sites, Provision of Personal Protective Equipment (PPE), and Safety Measures in the Workplace.

Part III, on the other hand, identifies the challenges encountered by workers in complying with the OSH program in the workplace and examines accident rates on construction sites. Data for this section were collected using a separate questionnaire, which allowed field workers to honestly report the number of accidents and injuries they experience annually on construction sites, while part IV covers the questionnaires that address the contractors' awareness of and compliance with the OSH Program in the workplace.

The researcher's subject adviser, statistician, thesis adviser, and other domain experts were considered in the validation process, ensuring that the questions are valid and closely aligned with the specific objectives and research issues. Furthermore, the invaluable input provided by these experts was duly taken into account to iteratively refine the questionnaire items, enhancing their precision and relevance.

The validation process involved experts, ensuring precision and relevance. Reliability was assessed using Cronbach Alpha, yielding values > 0.70 in a dry run with thirty respondents, indicating questionnaire reliability. Specific reliability results for areas such as CSHP, Formal Site Inspections, Health Hazards, Provision of PPE, and Safety Measures ranged from 0.815 to 0.922, confirming the consistency of measurements in assessing relevant concepts.

**2.5 Data Gathering Procedure**

The researcher made sure that all recommendations and corrections from the panel members were incorporated into the study. Following the design hearing, a letter was sent to the District Engineer of the First District Engineering Office. Subsequently, the researcher submitted a formal request letter to various DPWH contractors, seeking permission to conduct the study at the district level and distribute questionnaires to the targeted respondents. After obtaining approval, the researcher distributed the questionnaires to the respondents, providing clear instructions on how to complete them objectively and honestly. Upon completion, the data were collected, compiled, and analyzed. To further corroborate the survey results, the researcher conducted random interviews with the respondents, adding an additional layer of validation to the study's outcomes.

**2.6 Data Analysis Procedure**

The researcher employed several tools for data analysis, including the use of percentages to illustrate the relationship of a part to a whole. This was particularly utilized in presenting challenges faced by workers due to non-compliance with OSH Programs and in depicting accident rates in construction sites. Additionally, the weighted mean and standard deviation were employed to assess the extent of awareness and compliance among workers regarding OSH Programs. The Spearman rank correlation coefficient was utilized to identify the degree of relationship between workers' awareness and compliance levels with OSH Programs. Throughout the analysis, the researcher applied specific interpretations to describe the workers' awareness and compliance concerning OSH Programs.

**2.7 Ethical Considerations**

All individuals involved in the study were granted the right to privacy and dignity of treatment. Any information obtained was held in strict confidentiality by the researcher. In addition, the researcher duly acknowledged all assistance, collaborations, and sources from which the information was drawn.

## 3.0 Results and Discussion

### 3.1 Awareness of and Compliance on Construction Safety and Health Programs

***In terms of Construction Safety and Health Program***

Table 1 presents the extent of awareness and compliance among workers regarding OSH Programs, focusing on the Construction Safety and Health Program. The data indicate that workers' awareness in this stage ranges from "high" to "very high," as evidenced by the weighted mean values ranging from 3.82 to 4.41. Moreover, the standard deviations indicate that the workers' ratings do not vary significantly. In contrast, the workers consistently demonstrate a commendable level of compliance during this stage, uniformly rated as "high," as reflected in the weighted mean, values ranging from 3.50 to 4.04. Both the extent of awareness (overall weighted mean, $w\bar{x} = 4.16$) and the extent of compliance (overall weighted mean, $w\bar{x} = 3.76$) in this area attest to a commendable "high" rating.

**Table 1.** Descriptive statistics of the workers' awareness of and compliance with OSH programs in terms of construction safety and health program (n = 56)

| Statements | Awareness | | | Compliance | | |
|---|---|---|---|---|---|---|
| | **$w\bar{x}$** | **VD** | **SD** | **$w\bar{x}$** | **VD** | **SD** |
| 1. Aware that all heavy equipment operators assigned at the project site must be tested and certified by the Technical Education and Skills Development Authority (TESDA). | 4.41 | VH | 0.60 | 4.04 | H | 0.69 |
| 2. Provided knowledge of the proper waste disposal sys. in the construction site. | 4.39 | VH | 0.59 | 3.89 | H | 0.89 |
| 3. Recognize that the CSHP outlines the safety and health policies that the management, supervisory levels, and workers must adhere to and uphold at the construction site. | 4.30 | VH | 0.78 | 3.88 | H | 0.97 |
| 4. Know that all heavy equipment deployed at the site has been checked on a daily routine inspection by duly certified mechanics and operators. | 4.30 | VH | 0.91 | 3.86 | H | 0.94 |
| 5. Know that the contractor/employer provides welfare facilities to ensure humane working conditions. | 4.21 | VH | 0.89 | 3.73 | H | 0.82 |
| 6. Am responsible for ensuring that the CSHP provides clear information regarding the frequency and content of orientation, instruction, and training of all workers. | 4.11 | H | 0.82 | 3.79 | H | 0.85 |
| 7. Know that there is a min. inventory of medicines, medical supplies, & equip. | 4.09 | H | 0.88 | 3.68 | H | 0.77 |
| 8. Attend training, orientation, and toolbox meetings which are conducted by the General Contractor that provide OSH information to the workers about hazards and control measures. | 4.00 | H | 0.91 | 3.57 | H | 0.85 |
| 9. Am subject to the penalties and sanctions outlined in the CSHP for any safety and health violations. | 3.98 | H | 0.84 | 3.63 | H | 0.91 |
| 10. Have undergone the 8-hour mandatory safety and health orientation conducted by the Contractors Safety Officer. | 3.82 | H | 0.97 | 3.50 | H | 0.97 |
| **Composite** | **4.16** | **H** | **0.82** | **3.76** | **H** | **0.87** |

**Note:** 4.21 – 5.00 (Very High, VH), 3.41 – 4.20 (High, H), 2.61 – 3.40 (Moderate, M), 1.81 – 2.60 (Low, L), 1.00 – 1.80 (Very Low, VL)

The findings imply that the field workers are aware of ($w\bar{x} = 4.41$) and compliant with ($w\bar{x} = 4.04$) the requirement that all heavy equipment operators assigned to the project site must undergo testing and certification by TESDA. This practice aligns with the DOLE D.O. no.13 series of 1998 under section 15, which mandates that workers in critical occupations must possess a skill certificate issued by TESDA. This suggests that the regulatory framework is effectively communicated and implemented within the workforce, ensuring that operators are properly trained and certified, thereby enhancing their capability to ensure workplace safety and operational efficiency.

Furthermore, the data reveal that item 10, which pertains to the mandatory 8-hour safety and health orientation program ($w\bar{x} = 3.82$), received the lowest scores for both awareness and compliance. This indicates a potential gap in the workers' engagement with the mandatory training provided by the Contractors Safety Officer or DOLE-accredited institution. According to Friebel, et.al (2024) safety representatives, through education and communication, can enhance workers' awareness and attitudes towards OSH, align safety practices with social norms, and improve workers' confidence in their ability to adhere to safety protocols, thereby increasing overall compliance with safety measures.

With the results, El-Dash, Monem, and Salih (2022) argue that workers should leverage their expertise, seek professional advice, and reference past safety reports to formulate regulations and training strategies customized to address site-specific hazards. Notably, the results further indicate that not all field workers deployed to the project site benefit from the 8-hour safety and health orientation.

***In terms of Formal Site Safety and Health Inspection***

Table 2 illustrates the level of awareness among workers regarding occupational safety and health within the workplace, specifically concerning formal site safety and health inspections. The data indicate that the extent of awareness is from "high" to "very high" as reflected in the values of the weighted mean ranging from 4.07 to 4.55. Furthermore, the standard deviations signify that the workers' ratings are not widely dispersed. The respondents possess very high awareness of item number one "Ensure that the site premises are free of protrusions such as rebars, nails, etc.," which has the highest weighted mean ($w\bar{x} = 4.55$), and high compliance ($w\bar{x} = 4.11$). This implies that the construction sites undergo formal safety and health inspections conducted by official inspectors to proactively prevent accidents (Lim, Oh, Won, & Chon, 2018).

**Table 2.** Descriptive statistics of the workers' awareness of and compliance with osh programs in terms of formal site safety and health inspection (n = 56)

| Statements | Awareness | | | Compliance | | |
|---|---|---|---|---|---|---|
| | **$w\bar{x}$** | **VD** | **SD** | **$w\bar{x}$** | **VD** | **SD** |
| 1. Ensure that the site premises are free of protrusions such as rebars, nails, etc. | 4.55 | VH | 0.60 | 4.11 | H | 0.68 |
| 2. Ensure Orderliness of Material Storage (e.g., Regular disposal of waste and trash) | 4.54 | VH | 0.54 | 4.04 | H | 0.57 |
| 3. Ensure that there are no exposed electrical wires, inspect the plug, cord, and receptacles before plugging in the equipment. | 4.52 | VH | 0.63 | 3.95 | H | 0.77 |
| 4. Ensure that tools materials and products are sorted. | 4.41 | VH | 0.73 | 4.00 | H | 0.85 |
| 5. Ensure that there is an adequate number and type of fire extinguisher(s) available on the project site. | 4.39 | VH | 0.73 | 3.95 | H | 0.64 |
| 6. Maintain a high standard of cleanliness and sanitation in the workplace. | 4.38 | VH | 0.70 | 3.84 | H | 0.78 |
| 7. Ensure that Ladders are inspected & in good condition. | 4.23 | VH | 0.83 | 3.95 | H | 0.62 |
| 8. Ensure that all scaffolds can support twice the maximum load. | 4.23 | VH | 0.87 | 3.89 | H | 0.80 |
| 9. Aware that there is an OSH personnel in the establishment to conduct regular appraisals of the sanitation system in the workplace. | 4.20 | H | 0.55 | 3.95 | H | 0.82 |
| 10. Aware that a scaffold left standing for 4 months shall not be used. | 4.07 | H | 0.83 | 3.70 | H | 0.82 |
| **Composite** | **4.35** | **VH** | **0.70** | **3.94** | **H** | **0.74** |

Conversely, item 10 "Am aware that scaffold left standing for 4 months shall not be used" receives the lowest weighted mean rated as "High" on awareness ($w\bar{x} = 4.07$) and on compliance ($w\bar{x} = 3.70$). According to the Canadian Centre for Occupational Health and Safety (2024), a comprehensive evaluation is crucial for effectively addressing issues observed at the construction site.

The overall weighted mean in this area is "very high" for the extent of awareness ($w\bar{x} = 4.35$) and "high" for the extent of compliance ($w\bar{x} = 3.94$). This suggests that the field workers possess a heightened level of awareness within this area, but there is a disparity in their adherence to safety protocols. According to the respondents, they acknowledge the significance of these measures but occasionally overlook their importance, potentially putting themselves at risk of hazards.

***In terms of the Factors that Contribute to Health Hazards on Construction***

Table 3 illustrates the extent of the workers' awareness of OSH programs in the workplace in terms of factors that contribute to health hazards on construction sites**.** The data show that the extent of awareness is "very high" as reflected in the values of the weighted mean ranging from 4.21 to 4.68. In addition, the standard deviations of the workers' ratings is very close to the composite weighted mean. This finding suggests that the field workers are aware of and compliant with the indicator "Do not drink alcoholic beverages prior to work or avoid working under the influence of alcohol" as signified by the weighted mean of 4.68 and 4.38, respectively. The respondents are cognizant of the consequences of drinking alcoholic beverages.

Furthermore, the data indicate that item 8, "Am provided with adequate training so that I can identify and control the possible hazards in the workplace," received the lowest mean score for compliance ($w\bar{x} = 3.91$). Indeed, this finding strengthens the importance of conducting meetings that promote the field workers' welfare and minimize potential risks (Maliha et al., 2021). Under section 6 of the IRR-RA11058, it is stressed that workers affected by the presence of an imminent danger situation may be temporarily reassigned to other areas within the workplace, provided there are no imminent safety and health concerns.

Overall, both the extent of awareness (overall weighted mean, $w\bar{x} = 4.44$) and extent of compliance (overall weighted mean, $w\bar{x} = 4.27$), rated as "very high" in this area, suggest that the field workers have commendable

levels of awareness and compliance. According to the majority of the respondents, they value these factors that contribute to health and safety in the workplace and these characteristics are driven by their aspiration to sustain on-site work, ensuring the provision of their families' needs.

**Table 3.** Descriptive statistics of the workers' awareness of and compliance with osh programs in terms of factors that contribute to health hazards on construction sites (n = 56)

| Statements | Awareness | | | Compliance | | |
|---|---|---|---|---|---|---|
| | **$w\bar{x}$** | **VD** | **SD** | **$w\bar{x}$** | **VD** | **SD** |
| 1. Do not drink alcoholic beverages before work or working under the influence of alcohol. | 4.68 | VH | 0.54 | 4.38 | VH | 0.62 |
| 2. Provided with necessary fall protection system e.g., fall arrester and full body harness for fall prevention. | 4.55 | VH | 0.57 | 4.23 | VH | 0.66 |
| 3. Am oriented with Chemical hazards in the workplace such as gasoline, paints, and welding fumes. | 4.50 | VH | 0.69 | 4.20 | H | 0.94 |
| 4. Ensure that the hand and power tools to be used are not defective before usage. | 4.48 | VH | 0.57 | 4.07 | H | 0.60 |
| 5. Am oriented with Physical hazards in the workplace such as machinery, exposure to heat, power, and hand tools. | 4.46 | VH | 0.63 | 4.20 | H | 0.80 |
| 6. Thoroughly clean and inspect the area for dropped nails and shards of glass to avoid being pierced. | 4.46 | VH | 0.79 | 4.02 | H | 0.70 |
| 7. Am oriented with biological hazards in the workplace such as gasoline, paints, and welding fumes. | 4.45 | VH | 0.74 | 4.21 | VH | 0.82 |
| 8. Am provided with adequate training so that I can identify and control the possible hazards in the workplace. | 4.34 | VH | 0.67 | 3.91 | H | 0.77 |
| 9. Am oriented with Ergonomics hazards in the workplace such as exertion of force, poor posture, and repetitive motion. | 4.21 | VH | 0.78 | 3.95 | H | 0.90 |
| 10. Informed by the contractors that I have the right to refuse unsafe work and unsafe working conditions. | 4.21 | VH | 0.97 | 3.95 | H | 0.86 |
| **Composite** | **4.44** | **VH** | **0.70** | **4.27** | **VH** | **0.77** |

***In terms of the Provision of Personal Protective Equipment***

Table 4 shows the extent of the workers' awareness of the OSH programs in the workplace in terms of the provision of personal protective equipment. The data reveal that the level of awareness in all areas is "very high," as indicated by the values of the weighted mean ranging from 4.23 to 4.59. In addition, the standard deviations demonstrate that there is little spread in the ratings given by the workers.

**Table 4.** Descriptive statistics of the workers' awareness of and compliance with OSH programs in terms of provision of personal protective equipment (n = 56)

| Statements | Awareness | | | Compliance | | |
|---|---|---|---|---|---|---|
| | **$w\bar{x}$** | **VD** | **SD** | **$w\bar{x}$** | **VD** | **SD** |
| 1. Use safety belts and full-body harnesses when working at heights. | 4.59 | VH | 0.53 | 4.25 | VH | 0.84 |
| 2. Know that the provision of the necessary PPE is at the company's or employer's expense. | 4.55 | VH | 0.60 | 4.30 | VH | 0.78 |
| 3. Wear hard hats to protect my head from falling objects, impacts from falls, and other types of head trauma based on appropriate use. | 4.50 | VH | 0.60 | 4.20 | VH | 0.84 |
| 4. Wear high-visibility clothing or reflectorized vest to alert or caution drivers and other vehicle operators of a worker's presence. | 4.48 | VH | 0.71 | 4.18 | H | 0.86 |
| 5. Use appropriate gloves while operating in areas with a high risk of cuts, abrasions, or burns. | 4.43 | VH | 0.68 | 4.13 | H | 0.72 |
| 6. Do not borrow other PPEs for health and sanitation reasons. | 4.34 | VH | 0.64 | 4.02 | H | 0.67 |
| 7. Wear safety shoes to prevent the potential for puncture or penetration wounds. | 4.32 | VH | 0.64 | 3.88 | H | 0.79 |
| 8. Wear full-sleeved shirts when working on the field. | 4.25 | VH | 0.94 | 3.82 | H | 0.94 |
| 9. Avoid wearing jewels, key chains, or other metallic pieces on your fingers and arms. | 4.25 | VH | 0.61 | 4.02 | H | 0.82 |
| 10. Do not wear defective personal protective equipment (PPE). | 4.23 | VH | 0.79 | 4.00 | H | 0.81 |
| **Composite** | **4.39** | **VH** | **0.67** | **4.08** | **H** | **0.81** |

The findings affirm the assertion of Loibner et al. (2019) that field workers should prioritize safety to the utmost extent through the use of PPE designed to protect them from workplace hazards. Certainly, the respondents of the current study acknowledge that most minor and major accidents in their past experiences occurred due to neglecting the use of PPE.

On the other hand, the extent of the workers' compliance ranges from "high" to "very high." It is likely because the respondents already have PPE on before visiting the site and they know that PPEs, tools, and equipment must

always be prepared before commencing work. PPE significantly reduces the impact of accidents when they occur, as mentioned in the study of Shazwan and Ee (2018).

Correspondingly, the study by Guan et al. (2019) on the effectiveness of PPE for building construction workers underscores the significance of PPE in protecting individuals from exposure to or contact with any harmful materials that may lead to injury, disease, or even death. However, despite PPE's benefits, there is a low level of awareness on PPE among building construction workers.

In general, the extent of awareness, indicated by the overall weighted mean ($w\bar{x}$ = 4.39), is considered "very high," while the extent of compliance, with an overall weighted mean of 4.08, is rated as "high." This implies that the workers demonstrate a commendable level of awareness. According to the respondents, the primary reason for occasional lapses in complying with the use of PPE is discomfort. For example, they find the use of safety shoes tiring due to the latter's weight, which is heavier than regular shoes.

***In terms of Safety Measures***

Table 5 shows the extent of the workers' awareness of OSH programs in the workplace in terms of safety measures in the workplace. The data reveal that the extent of awareness in all areas are "very high", as indicated by the values of the weighted mean, ranging from 4.32 to 4.59, and the overall weighted mean of 4.47. This finding suggests that all field workers are aware of the precautionary measures imposed in the worksite. Furthermore, the standard deviations indicate that the ratings provided by the workers are closely aligned.

**Table 5.** Descriptive statistics of the workers' awareness of and compliance with OSH programs in terms of safety measures in the workplace (n = 56)

| Statements | Awareness | | | Compliance | | |
|---|---|---|---|---|---|---|
| | **$w\bar{x}$** | **VD** | **SD** | **$w\bar{x}$** | **VD** | **SD** |
| 1. Am well informed of the symbols and warning signs used and posted in the workplace. | 4.59 | VH | 0.56 | 4.27 | VH | 0.62 |
| 2. Provided with proper lighting on streets and buildings especially during nighttime work, to improve visibility and ensure that the work area is well-lit for both workers and visitors. | 4.55 | VH | 0.57 | 4.20 | H | 0.64 |
| 3. Make sure that the signages are regularly inspected and maintained in good condition. | 4.54 | VH | 0.66 | 4.14 | H | 0.75 |
| 4. Am trained to use all safeguards and safety devices furnished for workers' protection and that of others. | 4.52 | VH | 0.74 | 4.13 | H | 0.72 |
| 5. Ensure to place properly the traffic devices in designated areas as per the traffic management plan and that signages are posted/placed in prominent positions or strategic locations. | 4.50 | VH | 0.63 | 4.00 | H | 0.74 |
| 6. Ensure the roadworks machinery has a clear path, to ensure the safety of the workers, and of the public. | 4.43 | VH | 0.66 | 4.20 | H | 0.64 |
| 7. Am aware that the project site is provided with different types of signages, devices, warning signs, and other traffic control devices | 4.43 | VH | 0.57 | 4.05 | H | 0.70 |
| 8. Provided with the provision of special PPES according to assigned tasks in the workplace and as per recommendation by the Safety Officer. | 4.43 | VH | 0.57 | 3.96 | H | 0.76 |
| 9. Provided with the use of high-visibility clothing during construction. | 4.36 | VH | 0.64 | 4.07 | H | 0.74 |
| 10. Knowledgeable with signals for Heavy Equipment movements and maneuvers during road construction. | 4.32 | VH | 0.77 | 3.93 | H | 0.76 |
| **Composite** | **4.47** | **VH** | **0.64** | **4.09** | **H** | **0.71** |

In an article by the Global Railway Review (2009), it was emphasized that various guidelines on behavior, roadwork site setups, and technical solutions were formulated and put into practice, thereby reducing and eliminating life-threatening hazards in the workplace.

Meanwhile, the extent of the workers' compliance with OSH programs in the workplace in terms of safety measures in the workplace ranges from "high" to "very high" with weighted mean values of 3.93 to 4.27. It has an overall weighted mean of 4.09, described as "high." The data suggest the need to further strengthen regulatory measures.

Given the persistent challenges in road signage practices, addressing the issue seems most practical through the implementation of regulations, as postulated by Hughes (2022). The respondents in te current study also

acknowledged that they lack knowledge about certain tasks assigned to them, but they express a willingness to learn and are actively managing the process of acquiring the necessary skills.

### 3.2 Relationship Between Workers' Awareness and Compliance

Table 6 presents the data identifying the relationship between the extent of the workers' extent of awareness of and compliance with the OSHP in the workplace. Using Spearman's Rank Order Correlation, the researcher found that all p-values are less than the level of significance (0.05) and all $r_s$-values are within 0.50 to 1.00. These findings are enough evidence to reject the null hypothesis, which means that a significant and strong relationship exists between the workers' awareness of and compliance with OSHP in terms of the following: (a) construction safety and health programs for employees; (b) formal site health and safety inspections; (c) factors that contribute to health hazards on construction sites; (d) provision of personal protective equipment; and (e) safety measures in the workplace. This further connotes that the higher the awareness of the workers is, the higher also is their compliance.

**Table 6.** Correlation analysis for the relationship between the extent of workers' awareness of and compliance with OSH programs in the workplace (n = 56)

| Areas | $r_s$ | Interpretation | p-value | Decision | Remark |
|---|---|---|---|---|---|
| 1. Construction safety and health programs for employees | 0.881 | strong relationship | 0.000 | Reject $H_{o1}$ | Significant |
| 2. Formal site health and safety inspections | 0.818 | strong relationship | 0.000 | Reject $H_{o1}$ | Significant |
| 3. Factors that contribute to health hazards on construction sites | 0.843 | strong relationship | 0.000 | Reject $H_{o1}$ | Significant |
| 4. Provision of personal protective equipment | 0.797 | strong relationship | 0.000 | Reject $H_{o1}$ | Significant |
| 5. Safety Measures in the Workplace | 0.747 | strong relationship | 0.000 | Reject $H_{o1}$ | Significant |

*Level of significance = 0.05

This phenomenon is attributed to the various safety awareness campaigns conducted by safety organizations and providers. To reduce the number of fatalities and losses in the construction industry resulting from accidents, it is crucial to prioritize knowledge sharing and cultivate a culture of heightened awareness of construction safety (Li et al., 2019).

### 3.3 Relationship Between Compliance of Workers on OSH Program and Accident Rates

Table 7 reveals the data identifying the relationship between the workers' compliance with OSHP and the accident rates on the construction sites. As presented, the p-value is greater than the level of significance (0.05). This finding will not allow the rejection of the null hypothesis, which means the data are not sufficient to conclude that the two variables are significantly related. This may also suggest that the extent of the workers' compliance cannot be considered as a factor in the accident rates on the construction sites.

**Table 7.** Correlation analysis for the relationship between workers' compliance and accident rates in the construction site (n = 56)

| Variables | $r_s$ | p-value | Decision | Remark |
|---|---|---|---|---|
| Compliance of Workers on Occupational Safety Health Programs and Accident Rates in the Construction Site | -0.102 | 0.451 | Fail to reject $H_{o2}$ | Not significant |

*Level of significance = 0.05

Moreover, this may imply that there could be other factors contributing to the accident rates. Additional factors might include unsafe acts and unsafe conditions. Unsafe acts undoubtedly play a role, along with other numerous factors that contribute to workplace accidents and injuries, such as insufficient physical fitness, improper techniques for lifting and carrying, excessive force, inadequate awareness of potential hazards, stress, and even the design of the workplace. As supposed by Sun et al. (2018), each of these elements can significantly influence the occurrence of workplace injuries.

Conversely, unsafe conditions pertain to environmental factors within a workplace that present risks, including poorly maintained equipment, insufficient lighting, or cluttered workspaces. These conditions can also arise from the actions of fellow employees, such as leaving spills or obstacles in walkways (HSS Team, 2023). Adebiyi (2020) emphasized the need for comprehensive investigations into the level of construction workers' knowledge of and adherence to OSH in response to the occurrence of accidents on construction sites. This suggests a broader scope of considerations beyond compliance with OSHP when analyzing and addressing accident rates in the construction industry.

### 3.4 Challenges Encountered by Workers for Non-Compliance with OSH Standards in the Workplace

Table 8 on the next page illustrates the challenges faced by workers regarding non-compliance with OSH standards in the workplace. The data indicate that approximately 68% of the workers expressed discomfort with wearing PPE, citing it as a leading cause of their non-compliance. Additionally, 39.29% cited having a lack of awareness of potential safety and health hazards or inadequate debriefing on standard operating procedures as reasons for their non-compliance. Meanwhile, about 28% considered the absence of toolbox meetings as a factor contributing to their non-compliance.

**Table 8.** Descriptive statistics for the challenges encountered by workers for non-compliance with OSH standards in the workplace (n = 56)

| Challenges | | Frequency | Percent |
|---|---|---|---|
| 1. | Not comfortable wearing PPE | 38 | 67.86 |
| 2. | Not informed of potential safety and health hazards to which they may be exposed at their workplace/debriefing of the standard operating procedure. | 22 | 39.29 |
| 3. | Lack of toolbox meeting | 16 | 28.57 |
| 4. | Lack of proper OSH training | 13 | 23.21 |
| 5. | Lack of support from the top management | 13 | 23.21 |
| 6. | Lack of PPEs and other safety devices/equipment | 12 | 21.43 |
| 7. | Provision of PPEs is not free. | 6 | 10.71 |
| 8. | Poor enforcement of safety rules by safety officers/inspectors | 4 | 7.14 |
| 9. | Not seeing the importance of OSH implementation | 4 | 7.14 |
| 10. | Lack of knowledge of a specific task | 3 | 5.36 |

Comparing the perspectives of the respondents with the research findings of Williams et al. (2018), it becomes apparent that the field workers' feeling of discomfort when wearing PPE is associated with their attitudes and practices. This coincides with the broader examination conducted by Williams et al., wherein they identified various factors contributing to non-compliance with Health and Safety (H&S) information, such as bribery, legal concerns, profit motives, funding issues, staffing inadequacies, workplace-related worries, managerial commitment gaps, human rights neglect, industry stakeholders' perceptions, misguided beliefs, concerns about company reputation, and the nature of the tendering process employed. Together, these insights emphasize the importance of addressing both individual attitudes and broader systemic issues to enhance safety compliance in the construction industry.

### 3.5 Contractors' Awareness of and Compliance with OSH Programs in the Workplace

Table 9 reveal that the awareness levels across all areas are exceptionally "very high" with a weighted mean value indicating a maximum score of ($w\bar{x} = 5.00$).

**Table 9.** Descriptive statistics for the extent of contractors' awareness of and compliance with OSH programs in the workplace (n = 8)

| Statements | Awareness | | Compliance | |
|---|---|---|---|---|
| | $w\bar{x}$ | VD | $w\bar{x}$ | VD |
| **Construction Safety and Health Programs for Employees** | | | | |
| Able to submit CSHP to appropriate government agency/ies and approved before the project implementation. | 5.00 | VH | 5.00 | VH |
| Able to provide for penalties and sanctions for safety and health violations. | 5.00 | VH | 5.00 | VH |
| **Formal Site Health and Safety Inspections** | | | | |
| Able to report incidents/accidents immediately to the implementing office | 5.00 | VH | 5.00 | VH |
| Able to provide on-site safety and health promotion and continuing information dissemination | 5.00 | VH | 5.00 | VH |
| **Factors that Contribute to Health Hazards on Construction Sites** | | | | |
| Able to provide training for workers who will be assigned on machinery and equipment used in the workplace. | 5.00 | VH | 5.00 | VH |
| Able to provide provision of transportation facilities for workers in case of emergency, provision of water, and other first aid kit and medicines. | 5.00 | VH | 5.00 | VH |
| **Provision of Personal Protective Equipment** | | | | |
| Able to furnished the workers with PPE to workers or required of other persons in the construction site adequate and of approved type (with test certificate/result). | 5.00 | VH | 5.00 | VH |
| Able to provide all workers the necessary personal protective equipment (PPE) at the company's expense. | 5.00 | VH | 5.00 | VH |
| **Safety Measures in the Workplace** | | | | |
| Able to provide safe and hazard free facilities to the workers during construction activities. | 5.00 | VH | 5.00 | VH |
| Able to provide safety signages and security plan developed by the construction contractor and approved by owner. | 5.00 | VH | 4.60 | VH |
| **Composite** | **5.00** | **VH** | **4.96** | **VH** |

This observation indicates that all contractors recognize the significance of the surveyed areas, aligning with the idea of prioritizing knowledge sharing and cultivating a heightened culture of construction safety awareness highlighted by Li et al. (2019). Furthermore, the data on the extent of compliance indicate that all of the areas surveyed are "very highly" complied with or adhered to. In the findings of Macayan (2023), it is noteworthy that the effective implementation skills of managers are deemed to play a crucial role. Macayan posited that managers who excel in implementing strategies tend to supervise employees who demonstrate a heightened level of compliance.

Based on the current findings, it may be inferred that the observed high level of compliance across all surveyed areas may be attributed, in part, to the proficiency of managers in implementing and overseeing adherence to safety protocols in the construction industry. In a recent interview with a labor inspector from the DOLE assigned to the DPWH Negros Oriental 1st District Engineering Office, it was stated that all contractors comply with the Construction Safety and Health Program. This proof of compliance is based on the submission and concurrence of CSHP by all contractors before the implementation of projects, as approved by the DOLE head. Consequently, their inspections also aim to verify that the field workers' salaries meet the minimum standards.

## 4.0 Conclusion

The high level of awareness of OSH programs in the workplace shows that both the field workers and contractors are mindful of the safety protocols and regulations in the vicinity. Such practices can create a safe and healthy work environment for workers. This, in turn, will lead to reduced occurrences of accidents in the field, enabling workers to focus on their designated tasks, thereby increasing productivity. Moreover, continuous improvement in the field of safety and health encourages a safety culture in the workplace and builds a hazard-free environment for contractors and field workers alike. The high level of awareness and compliance manifested by the contractors can significantly boost the confidence of the field workers as well as promote a positive reputation in the industry and among potential clients. Adhering to safety protocols also minimizes the risk of legal battles between employers and employees. Nonetheless, despite the positive findings, the research also recognizes the challenges faced by the field workers that, at times, contribute to their non-compliance. With the significant number of field workers cited the discomfort of wearing personal protective equipment (PPE) as the primary cause. These challenges are risky and must be addressed immediately. Thus, construction companies should explore and adopt innovative PPEs that enhance both convenience and the safety and health of workers to address the issues of discomfort. Meanwhile, the implementing department (DPWH), should ensure that contractors comply with safety protocols through the conduct of surprise or random site inspections to verify consistency in following and implementing the protocols according to safety guidelines and existing laws.

## 5.0 Contributions of Authors

The authors confirm their equal contribution to every part of this research. All authors reviewed and approved the final version of this paper.


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## 7.0 Conflict of Interests

This study has no conflict of interest of any sort.


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