Workplace Safety and Security Management Practices in the Construction Industry of Nueva Vizcaya

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ABSTRACT

One of the challenges in the modern infrastructure development of the Philippines under the "Build, Build, Build" program is ensuring the safety and security of its workers. The success and implementation of infrastructure projects depend on how the projects are executed, including the management of health and safety standards. Failure to comply with these standards would affect the cost, time, and quality of the project. Hence, the Department of Labor and Employment (DOLE) Department Order (D.O.) No. 13, s. 1998, was created to address issues and concerns related to safety and health management. In Nueva Vizcaya, although safety and health programs and management plans are already incorporated into project activities, there are still skill gaps that need to be addressed, with the ultimate goal of not only sustaining the existing standards but also improving them. The respondents' sociodemographic profiles (Safety Officers, Skilled Workers, and Unskilled Workers) and the profiles of the construction firms operating in Nueva Vizcaya were analyzed and found to be compliant with D.O. No. 13, s. 1998. Likewise, the level of safety and security management practices and the workers' level of satisfaction with safety and security were found to be high. The study also shows a significant relationship between the level of safety and management practices implemented and the level of satisfaction with safety and security among workers in construction firms. Based on the study, monitoring of compliance with safety and health activities in project implementation should be institutionalized not only within internal implementing agencies but also among external monitoring bodies, such as the Regional Project Monitoring and Evaluation Committee (RPMEC), Provincial Project Monitoring and Evaluation Committee (PPMEC), DOLE, and other monitoring bodies. This is aimed at assessing non-compliant contractors for possible sanctions.

Key words: Occupational Safety, Security Management Practices, Construction Industry

INTRODUCTION AND LITERATURE REVIEW

The development of infrastructure is one of the most important activities that can stimulate business growth and contribute to the economic development of a country. Because of this, governments allocate substantial funding for infrastructure development in their annual budgets. Infrastructure projects are often large-scale and complex, involving significant financial investments. Due to their magnitude, these projects are exposed to various challenges such as regulatory clearances, land acquisition issues, material wastage, unforeseen delays, natural calamities, and political concerns, all of which may result in time and cost overruns. In projects where substantial amounts of money are involved, cost overruns can become highly significant (World Bank, 2021).

These challenges in infrastructure implementation may further intensify when safety and security are not properly managed during project execution. As a result, project objectives may not be achieved physically and financially. Hence, studies focusing on occupational safety and health management in the construction industry remain necessary and relevant.

The construction industry continues to be one of the most hazardous sectors worldwide. According to the International Labor Organization (ILO, 2021), construction workers are exposed to high risks of occupational injuries, accidents, and fatalities due to unsafe working conditions, hazardous environments, and inadequate safety practices. Similarly, the Occupational Safety and Health Administration (OSHA, 2022) reported that construction-related incidents remain among the leading causes of workplace fatalities globally. In many

countries, including those in Asia, construction accidents continue to pose major concerns despite the implementation of stricter safety regulations and standards (Lingard & Rowlinson, 2020).

Thus, safeguarding and maintaining occupational health and safety in the workplace are important prerequisites for productive and efficient work processes for both employers and employees. The International Organization for Standardization (ISO) introduced ISO 45001 to provide a framework for occupational health and safety management systems aimed at minimizing workplace hazards, reducing risks, and preventing accidents and injuries (ISO, 2021). The adoption of these standards strengthens organizational commitment to worker protection and continuous safety improvement.

In the Philippines, the government institutionalized Occupational Safety and Health (OSH) Standards to ensure the protection of workers' physical safety, health, and welfare. These standards were further strengthened through Republic Act No. 11058, also known as the "Occupational Safety and Health Law," which mandates stricter compliance with workplace safety regulations and imposes penalties for violations (DOLE, 2020). In addition, the Department of Labor and Employment (DOLE) issued Department Order No. 13, series of 1998, which provides guidelines governing occupational safety and health in the construction industry for the effective enforcement of safety standards in all workplaces and construction sites.

In Nueva Vizcaya, like many other provinces in the country, construction projects were temporarily halted during the implementation of the Enhanced Community Quarantine (ECQ) in March 2020 due to the COVID-19 pandemic. When restrictions were gradually lifted, construction activities resumed subject to compliance with health and safety protocols established by the Inter-Agency Task Force for the Management of Emerging Infectious Diseases (IATF-EID). The Provincial Government of Nueva Vizcaya adopted mandatory health measures such as the wearing of face masks and other protective equipment through Provincial Executive Order No. 103, s. 2020. Likewise, the province implemented national government policies on social distancing, workplace sanitation, proper work attire, and safe delivery of construction materials to ensure the protection of workers (Padilla, 2020). Moreover, the Department of Public Works and Highways (DPWH) issued Department Order No. 35, s. 2020, which established construction safety guidelines for all DPWH infrastructure projects during the COVID-19 public health crisis to ensure workers' safety and security.

Hence, this study aims to determine the status and extent of human safety and management practices in the construction industry in Nueva Vizcaya. Through this study, issues and challenges encountered in the implementation of health and safety measures in construction projects may be identified. Furthermore, the findings may help formulate supplemental plans, programs, and policies to strengthen the effective implementation of occupational safety and health measures that are aligned with existing laws and standards.

METHODOLOGY

In carrying out this study, the descriptive research methodology was adopted to evaluate the human safety and security management practices of selected construction firms in Nueva Vizcaya. Selected construction firms involved in infrastructure projects were evaluated in the study. Contractors accredited by government offices such as the Provincial Local Government Unit (PLGU), Department of Public Works and Highways (DPWH), National Irrigation Administration (NIA), and Local Government Units (LGUs) were chosen regardless of their classification or the size of the projects undertaken.

A total of ninety (90) respondents, composed of safety officers, project engineers, skilled workers, and unskilled workers, comprised the target population of the study. Selected firms had an operational experience of at least three (3) years, while the participating employee-respondents had served their respective employers for at least two (2) years. The Simple Random Sampling (SRS) technique was used in selecting the sample size. The sample size of 90 respondents was considered adequate based on standard sampling procedures for descriptive and correlational research. According to Creswell and Creswell (2021), a sample size ranging from 30 to 500 respondents is generally sufficient for quantitative studies involving correlation and regression analyses. In addition, a statistical power analysis using G*Power indicated that a minimum sample size of 84 respondents was required to detect a medium effect size ($r = 0.30$) at a 0.05 level of significance with 80% statistical power.

Hence, the sample size of 90 respondents was deemed sufficient to ensure the reliability and validity of the study findings.

Survey questionnaires, personal interviews, and site inspections were used as data-gathering instruments. Personal interviews, as well as Key Informant Interviews (KIIs), were conducted to obtain additional information from the respondents. Moreover, site inspections and means of verification (MVs) also served as bases in determining whether firms adhered to safety and security standards. Authorization letters for the conduct of the research and compliance with IATF health protocols were secured before collecting the needed information.

In this research, both qualitative and quantitative approaches were adopted. Quantitative data analysis was conducted using frequency counts, percentages, mean, and standard deviation to establish the profiles of respondents, level of compliance, and workers' level of satisfaction. In identifying the relationship between safety and security management practices and workers' level of satisfaction, Pearson's Product-Moment Correlation Coefficient (Pearson's r), Correlation Ratio (η^2), and Point-Biserial Correlation Coefficient were utilized.

RESULTS AND DISCUSSISONS

Sociodemographic Profile of the Safety Officers, Skilled and Unskilled Workers, and construction Firms

The safety officers were predominantly married men, with a mean age of 46 years and an average work experience of 5.83 years. This finding is consistent with studies conducted in Southeast Asia, where safety officers in the construction industry are generally older and more experienced due to the technical and supervisory nature of their responsibilities (Rahman et al., 2021).

The skilled workers were composed entirely of men, most of whom were high school graduates, with a mean work experience of 9.17 years in the construction industry. Similar findings were reported in developing countries such as Indonesia and Vietnam, where skilled construction workers are predominantly male and possess extensive practical experience despite limited formal education (Nguyen & Pham, 2020). The unskilled workers were likewise male, generally younger than the skilled workers, and were mostly employed as laborers. This reflects the common labor structure observed in many developing economies, where younger workers are typically assigned physically demanding and entry-level construction tasks (ILO, 2021).

The construction firms consisted of organizations of varying sizes, with an average of 34 employees and a mean business operation period of 9.83 years. Comparable studies in Southeast Asian construction industries showed that small- and medium-sized firms dominate the sector and often encounter challenges in implementing comprehensive occupational safety and health programs due to limited resources and manpower (Lingard & Rowlinson, 2020).

Table 1: Profile of safety officers of construction firms in Nueva Vizcaya.

Variables	Categories	Frequency	Percent
Age			
	20 – 29	4	13.3
	30 – 39	7	23.1
	40 – 49	6	19.9
	50 – 59	6	19.9
	60 – 69	7	23.3
	Min = 26		

	Max = 68 Mean = 46.33		
Sex			
	Female	3	10
	Male	27	90
Civil Status			
	Single	4	13.3
	Married	26	86.7
Educational Attainment			
	No formal education	2	6.7
	High School Graduate	4	13.3
	College Graduate	24	80.0
Work Experience	Length of Stay in the Company		
	1<	1	3.3
	1 – 5	16	53.4
	6 – 10	8	26.6
	11 – 15	4	13.2
	16 - 20	1	3.3
	Mean = 5.83		
	Min = 1< Max = 20		
Awards Received			
	None	28	93.3
	1.00	1	3.3
	9.00	1	3.3

Table 6: Profile of skilled workers in construction firms in Nueva Vizcaya.

Variables	Categories	Frequency	Percent
Sex			
	Male	30	100
Age			

	20 – 29	4	13.3
	30 – 39	8	26.6
	40 – 49	11	36.6
	50 – 59	6	19.9
	60 & above	1	3.3
	Mean = 40.9 Min = 22 Max = 62		
Civil Status			
	Single	5	16.7
	Married	25	83.3
Educational Attainment			
	No formal education	1	3.3
	Elementary Graduate	2	6.7
	High school graduate	20	66.7
	Vocational/Technical	5	16.7
	College Graduate	2	6.7
Work Experience			
	<1	1	3.3
	1 – 5	12	40
	6 – 10	9	30
	11 – 15	4	13.2
	16 – 20	2	6.6
	21 – 25	2	6.7
	26 & above	1	3.3
	Mean = 9.17 Min = <1 Max = 26		
Length of Service to the latest company attended			

	<1	4	13.3
	1 – 5	23	76.6
	6 – 10	5	16.6
	11 – 15	1	3.3
	16 – 20	1	3.3
	Mean = 3.75		
	Min = <1		
	Max = 18		
Work classification			
	Laborer	2	6.7
	Mason/carpenter	21	70.0
	Foreman	3	10.0
	Checker	1	3.3
	Equipment operator	1	3.3
	Lead man	1	3.3
	Welder	1	3.3

Table 7: Profile of unskilled workers hired in construction firms in Nueva Vizcaya.

Variables	Categories	Frequency	Percent
Age			
	19 & below	2	6.6
	20 – 29	13	43.3
	30 – 39	9	30
	40 – 49	4	13.2
	50 – 59	1	3.3
	60 – 69	1	3.3
	Mean = 32.03 Min = 18 Max = 62		
Sex			
	Male	30	100.0

Civil Status			
	Widow	1	3.3
	Single	21	70.0
	Married	8	26.7
Educational Attainment			
	No Formal Education	1	3.3
	Elementary Graduate	4	13.3
	High School Graduate	22	73.3
	Vocational/Technical	2	6.7
	College Graduate	1	3.3
Length of Service in the construction			
	<1	1	3.3
	1 – 5	22	73.3
	6 – 10	4	13.3
	12	1	3.3
	11 – 15		
	16 – 20	1	3.3
	21 & above	1	3.3
	Mean = 5.20 Min = <1 Max = 23		
Length of Service to the latest attended company			
	<1	6	20
	1 – 5	21	70
	6 – 10	2	6.6
	11 & above	1	3.3
	Mean = 2.70 Min = <1 Max = 23		

Work Classification			
	Laborer	28	93.3
	Helper	2	6.7

Safety and Security Management Practices Implemented in the Construction Firm

The construction firms in Nueva Vizcaya were generally compliant with the safety and security standards prescribed under DOLE Department Order No. 13, Series of 1998. The findings showed that the firms implemented comprehensive safety and health programs, provided appropriate personal protective equipment (PPE), and employed accredited safety and health personnel. The firms were likewise compliant in terms of safety signages, heavy equipment management, basic safety protocols, TESDA certification of skilled workers, workers' welfare, and pandemic-related health protocols. However, some firms were only partially compliant with the requirement for fully functional health clinics. Overall, the firms obtained a mean rating of 2.70, interpreted as compliant.

These findings are consistent with studies conducted in Southeast Asia and other developing countries, which reported that construction firms increasingly recognize the importance of occupational safety and health compliance in improving worker protection and project efficiency (Rahman et al., 2021). Similar studies in Malaysia, Indonesia, and Vietnam found that compliance with PPE usage, safety signages, and worker safety training significantly reduced workplace accidents and improved employee satisfaction (Nguyen & Pham, 2020). However, inadequate health facilities and limited medical preparedness remain common concerns among small- and medium-sized construction firms in developing economies due to financial and operational constraints (ILO, 2021).

The findings further suggest that compliance with government-mandated occupational safety and health standards has improved following the implementation of stricter workplace regulations and pandemic-related health measures. This supports the observations of Lingard and Rowlinson (2020), who emphasized that stronger regulatory enforcement and organizational commitment contribute to better safety management practices in construction industries.

Table 10: Safety and Security Management Practices Implemented by the Construction Firms in Nueva Vizcaya

Safety and Security Management Practices	**Mean**	**Std. Deviation**	**Qualitative Description**
Comprehensive Construction Safety and Health Program	2.82	0.46	Compliant
Provision for necessary personal protective equipment (PPE) for employees	2.73	0.46	Compliant
Availability of safety and health personnel duly accredited by DOLE	2.69	0.54	Compliant
Health provisions and facilities	2.56	0.54	Compliant
Construction of Safety Signs	2.64	0.89	Compliant
Heavy Equipment and Operators	2.77	0.48	Compliant
Basic Safety Protocols	2.67	0.57	Compliant
Skilled workers for critical jobs duly certified by TESDA	2.67	0.71	Compliant
Workers' Welfare	2.73	0.50	Compliant

Health Protocols during pandemics	2.76	0.47	Compliant
Overall Mean	**2.70**	**0.56**	**Compliant**

Level of Satisfaction on the Safety and Security of Workers in Construction Firms

The level of satisfaction regarding safety and security among workers in construction firms in Nueva Vizcaya was assessed using eight (8) indicators measured through a five-point Likert scale. The results included the responses of both skilled and unskilled workers.

The findings revealed that both skilled and unskilled workers were very satisfied with the provision of personal protective equipment (PPE), particularly helmets, boots, gloves, face masks, and face shields. This indicates that the construction firms provided adequate and quality PPE to workers, which contributed to their sense of protection and security in the workplace. Similar studies conducted in Southeast Asia reported that the availability and proper use of PPE significantly improved workers' perception of workplace safety and reduced exposure to occupational hazards (Rahman et al., 2021).

In terms of health provisions and facilities at project sites, the satisfaction levels slightly differed. Unskilled workers were very satisfied with the availability of emergency medicine supplies and first aid kits, while skilled workers were only satisfied, suggesting that improvements in health facilities and emergency preparedness may still be necessary. Comparable findings were observed in developing countries such as Indonesia and the Philippines, where construction workers acknowledged the importance of medical facilities but expressed concerns regarding the adequacy of onsite healthcare services and emergency response systems (ILO, 2021).

The variation in satisfaction levels between skilled and unskilled workers may be attributed to differences in work responsibilities, risk exposure, and expectations regarding workplace safety measures. Studies in developing construction industries have shown that skilled workers tend to have higher expectations for occupational health and safety standards because of their longer work experience and greater awareness of workplace risks (Nguyen & Pham, 2020).

Table 11: Level of satisfaction on the safety and security of workers in the construction firms in Nueva Vizcaya

Safety and Security Indicators	**Level of satisfaction on the safety and security of workers**								
	Skilled Workers			**Unskilled Workers**			**Combined**		
	Mean	**Std. Dev.**	**Qualitative Description**	**Mean**	**Std. Dev.**	**Qualitative Description**	**Mean**	**Std. Dev.**	**Qualitative Description**
Does the company provide a quality Personal Protective Equipment (PPE)?									
- Maayos na helmet	4.73	0.52	Very Satisfied	4.20	1.03	Very Satisfied	4.47	0.78	Very Satisfied
- Dekalidad na botas	4.40	0.93	Very Satisfied	4.53	0.68	Very Satisfied	4.47	0.81	Very Satisfied
- Maayos na guwantes	4.63	0.61	Very Satisfied	4.40	0.93	Very Satisfied	4.52	0.77	Very Satisfied
- Dekalidad na Facemask	4.30	1.15	Very Satisfied	4.20	1.10	Very Satisfied	4.25	1.13	Very Satisfied
- Dekalidad na Faceshield	4.23	1.25	Very Satisfied	4.20	1.03	Very Satisfied	4.22	1.14	Very Satisfied

Does the company have the required health provisions and facilities on site?									
- Emergency medicine supplies or first aid kit	4.00	0.87	Satisfied	4.47	0.68	Very Satisfied	4.20	1.13	Very Satisfied
- Health facility or clinic	4.33	0.96	Very Satisfied	3.97	1.10	Satisfied	4.15	1.03	Satisfied
- Emergency service during accidents	4.40	0.93	Very Satisfied	4.47	0.73	Very Satisfied	4.44	0.83	Very Satisfied
Are appropriate construction safety signs installed within the construction site, such as;									
- Signage's on usage of PPE prior to site entry	4.13	1.14	Satisfied	4.27	1.11	Very Satisfied	4.20	1.13	Very Satisfied
- Signages on falling/ falling object	4.03	1.00	Satisfied	4.10	1.03	Satisfied	4.07	1.02	Satisfied
- Signages on explosive or flammable substances	4.17	0.95	Satisfied	4.20	0.85	Very Satisfied	4.19	0.90	Satisfied
- Signages where tripping or slipping hazards are located	4.17	0.79	Satisfied	4.20	0.76	Very Satisfied	4.19	0.78	Satisfied
- Signages for toxic or irritant airborne contaminants/substance	4.37	0.81	Very Satisfied	4.30	0.79	Very Satisfied	4.34	0.80	Very Satisfied
- Signages on electrical facility	4.37	0.72	Very Satisfied	4.23	0.82	Very Satisfied	4.30	0.77	Very Satisfied
- Signages on dangerous moving parts of machines	4.17	1.02	Satisfied	4.33	0.84	Very Satisfied	4.25	0.93	Very Satisfied
- Signages on fire alarms/firefighting equipment	3.93	0.94	Satisfied	4.03	0.81	Satisfied	3.98	0.88	Satisfied
- Signages on instructional signs	4.23	0.94	Very Satisfied	4.07	1.01	Satisfied	4.15	0.98	Satisfied
The bunkhouses and storage are secured properly									
- Clean and comfortable bunkhouse	4.37	0.72	Very Satisfied	4.37	0.72	Very Satisfied	4.37	0.72	Very Satisfied
- Building materials is within the industry standards	4.30	0.75	Very Satisfied	4.30	0.99	Very Satisfied	4.30	0.87	Very Satisfied
- Clean and organize stock room	4.33	0.71	Very Satisfied	4.40	0.67	Very Satisfied	4.37	0.69	Very Satisfied

- Stockroom is built properly	4.27	0.83	Very Satisfied	4.40	0.93	Very Satisfied	4.34	0.88	Very Satisfied
- The bunkhouse has a good structure	4.40	0.81	Very Satisfied	4.33	0.84	Very Satisfied	4.37	0.83	Very Satisfied
Protective facilities were provided such as:									
- The way through the project site is safe	4.40	0.77	Very Satisfied	4.47	0.57	Very Satisfied	4.44	0.67	Very Satisfied
- There are barriers on pits	4.47	0.82	Very Satisfied	4.37	1.03	Very Satisfied	4.42	0.93	Very Satisfied
- There is strong fences	4.37	0.67	Very Satisfied	4.20	0.76	Very Satisfied	4.29	0.72	Very Satisfied
- There are signboards.	4.57	0.63	Very Satisfied	4.50	0.68	Very Satisfied	4.54	0.66	Very Satisfied
Were there safety meetings conducted?									
- There are orientations of workers	4.37	1.03	Very Satisfied	4.43	0.94	Very Satisfied	4.40	0.99	Very Satisfied
- Incidents on project sites is properly reported	4.60	0.67	Very Satisfied	4.50	0.68	Very Satisfied	4.55	0.68	Very Satisfied
- There are warning signs to avoid accidents	4.53	0.68	Very Satisfied	4.50	0.68	Very Satisfied	4.52	0.68	Very Satisfied
Were medical equipment and medical employees provided such as:									
- There is complete first aid kit	4.50	0.68	Very Satisfied	4.57	0.63	Very Satisfied	4.54	0.66	Very Satisfied
- Workers are trained for first aid	4.33	0.88	Very Satisfied	4.37	0.85	Very Satisfied	4.35	0.87	Very Satisfied
- There is stand by vehicle incase of accidents	4.43	0.82	Very Satisfied	4.40	0.89	Very Satisfied	4.42	0.86	Very Satisfied
Is safety and security being implemented on various areas, such as:									
- Company is ready to respond to any incidents	4.63	0.56	Very Satisfied	4.43	0.73	Very Satisfied	4.53	0.65	Very Satisfied
- There are plans and policies for workers welfare	4.43	0.68	Very Satisfied	4.40	0.77	Very Satisfied	4.42	0.73	Very Satisfied
- There is allotted fund for workers' incidents	4.60	0.56	Very Satisfied	4.53	0.63	Very Satisfied	4.57	0.60	Very Satisfied

- There is an effective system for workers safety and wellness	4.40	0.72	Very Satisfied	4.47	0.78	Very Satisfied	4.44	0.75	Very Satisfied
- The company management pay attention with workers complaints	4.50	0.68	Very Satisfied	4.57	0.68	Very Satisfied	4.54	0.68	Very Satisfied
- The company has proper corresponding measures for workers affected by Corona Virus									
- Are the workers safe with the effect of pandemic?	4.43	0.68	Very Satisfied	4.47	0.73	Very Satisfied	4.45	0.71	Very Satisfied
Overall Level of Satisfaction	**4.37**	**0.81**	**Very Satisfied**	**4.35**	**0.82**	**Very Satisfied**	**4.36**	**0.82**	**Very Satisfied**

Relationship between level of safety and security management practices implemented and level of satisfaction of workers

The correlation method was employed to determine the association between the safety and security management practices implemented by construction firms and the level of satisfaction among both skilled and unskilled workers. The findings revealed that several safety practices had significant relationships with workers' satisfaction.

Among skilled workers, the presence of DOLE-accredited health and safety personnel showed a significant relationship with satisfaction regarding safety meetings and medical facilities. There was also a positive correlation between the provision of health facilities and workers' satisfaction with available medical equipment and healthcare services. These findings indicate that stronger compliance with occupational safety and health standards contributes to higher levels of worker satisfaction. Similar studies conducted in Southeast Asia found that the presence of trained safety personnel and accessible healthcare facilities positively influenced workers' perceptions of safety and organizational support (Rahman et al., 2021).

For unskilled workers, a positive correlation was likewise observed between the presence of accredited safety personnel and workers' satisfaction with medical services and workplace safety measures. The provision of health facilities and healthcare services was also positively associated with workers' satisfaction regarding health-related support. These findings are consistent with studies in developing countries, which emphasized that visible management commitment to safety and access to medical assistance enhance workers' confidence and satisfaction in construction environments (ILO, 2021).

However, other factors such as the provision of personal protective equipment (PPE), safety signages, workers' welfare programs, and pandemic-related protocols were not found to have significant relationships with workers' satisfaction. This may suggest that these measures were already commonly implemented across firms and therefore were viewed by workers as standard requirements rather than distinguishing factors affecting satisfaction. Similar observations were reported in studies from Malaysia and Indonesia, where workers considered PPE and safety signages as routine compliance measures with limited influence on overall satisfaction unless accompanied by effective supervision and healthcare support (Nguyen & Pham, 2020).

The findings support the argument that effective occupational safety and health management practices contribute not only to accident prevention but also to improved worker morale and organizational trust. As emphasized by

Lingard and Rowlinson (2020), worker satisfaction in the construction industry is strongly influenced by management commitment, safety leadership, and the availability of responsive health and safety systems.

Table 12: Correlation matrix showing the safety and security management practices and level of satisfaction of workers in construction firms in Nueva Vizcaya.

Level of Satisfaction of workers		Safety and security management practices implemented in the construction firms									
		Safety and Health Program	Personal protective equipment (PPE)	Safety & health personnel	Health provisions & facilities	Construction Safety Signs	Heavy Equipment & Operators	Basic Safety Protocols	Workers' Welfare	Health Protocols during pandemics	Overall Mean
Skilled Workers (n = 30)											
Provision for PPE	r	-0.084	0.031	0.010	-0.200	-0.008	0.034	0.000	0.023	0.068	-0.020
	p	0.660	0.870	0.959	0.289	0.966	0.860	1.000	0.902	0.720	0.918
Health provisions and facilities	r	0.128	0.209	0.316	**0.467****	0.180	-0.040	0.049	0.134	-0.018	0.207
	p	0.501	0.267	0.089	0.009	0.341	0.835	0.796	0.481	0.925	0.274
Construction safety signs	r	0.171	0.237	0.310	0.209	0.262	0.226	0.170	0.160	0.181	0.274
	p	0.366	0.207	0.096	0.267	0.162	0.229	0.369	0.398	0.339	0.143
Bunkhouses and storage	r	-0.011	0.066	0.199	0.219	-0.125	-0.108	-0.019	0.128	-0.084	0.027
	p	0.956	0.731	0.293	0.245	0.511	0.568	0.922	0.501	0.658	0.885
Protective facilities	r	0.013	0.088	0.137	-0.011	-0.029	-0.124	-0.054	-0.135	-0.073	-0.025
	p	0.945	0.642	0.470	0.955	0.877	0.514	0.777	0.478	0.700	0.894
Safety meetings	r	-0.072	-0.131	0.110	0.118	0.043	-0.072	-0.078	0.097	-0.104	-0.001
	p	0.705	0.490	0.562	0.535	0.820	0.705	0.684	0.611	0.585	0.997
Medical equipment and medical employees	r	0.201	0.221	**0.389***	**0.389***	0.129	0.054	-0.022	-0.043	-0.003	0.182
	p	0.286	0.241	0.034	0.034	0.496	0.777	0.909	0.822	0.987	0.337
Safety and security measures	r	0.165	0.135	0.347	0.185	0.106	0.104	-0.006	0.140	-0.022	0.161
	p	0.384	0.478	0.060	0.327	0.576	0.586	0.975	0.462	0.909	0.397
Overall Satisfaction	r	0.083	0.143	0.292	0.236	0.097	0.011	0.013	0.090	-0.005	0.137
	p	0.663	0.450	0.118	0.209	0.609	0.952	0.946	0.635	0.981	0.470
Unskilled Personnel (n = 30)											

Provision for (PPE)	r	0.178	0.150	0.206	0.020	0.057	0.086	-0.065	-0.161	-0.033	0.060
	p	0.346	0.429	0.275	0.917	0.765	0.653	0.733	0.395	0.863	0.751
Health provisions and facilities	r	0.091	0.056	0.245	**0.385***	0.184	0.011	0.020	0.084	-0.027	0.152
	p	0.634	0.767	0.192	0.037	0.331	0.956	0.918	0.660	0.888	0.423
Construction safety signs	r	0.140	0.186	0.279	0.087	0.264	0.219	0.094	0.124	0.171	0.226
	p	0.460	0.324	0.136	0.647	0.159	0.245	0.621	0.512	0.366	0.230
Bunkhouses and storage	r	-0.022	0.080	0.167	0.257	-0.065	-0.034	0.105	0.112	-0.044	0.073
	p	0.906	0.674	0.377	0.170	0.732	0.857	0.582	0.555	0.818	0.702
Protective facilities	r	0.121	0.208	0.274	0.055	0.077	0.001	-0.025	-0.079	-0.060	0.082
	p	0.524	0.270	0.143	0.773	0.685	0.998	0.895	0.679	0.754	0.665
Safety meetings	r	0.102	0.140	0.246	0.196	0.248	0.299	0.290	0.331	0.131	0.283
	p	0.590	0.461	0.190	0.299	0.186	0.108	0.120	0.074	0.491	0.129
Medical equipment and medical employees	r	0.116	0.139	**0.387***	0.228	0.117	0.043	0.000	-0.090	-0.008	0.129
	p	0.540	0.465	0.046	0.226	0.540	0.820	0.998	0.638	0.968	0.497
Safety and security measures	r	0.129	0.153	**0.386***	0.229	0.145	0.112	0.083	0.179	-0.019	0.190
	p	0.498	0.420	0.047	0.223	0.443	0.554	0.663	0.345	0.920	0.315
Overall Satisfaction	r	0.125	0.165	0.307	0.211	0.153	0.112	0.081	0.083	0.020	0.181
	p	0.512	0.383	0.098	0.262	0.419	0.556	0.669	0.661	0.916	0.339

*significant at 0.05 probability

CONCLUSIONS OF THE STUDY

1. **Sociodemographic Profile of the Safety Officers, Skilled and Unskilled Workers, and Construction Firms**

The study concludes that the construction labor force in Nueva Vizcaya is dominated by males who have different levels of education, working experience, and employment status. Safety officers were found to be competent enough with the required amount of experience and educational background to manage safety operations. Skilled and unskilled workers were experienced in the construction industry, and construction firms had different sizes, operating experience, and number of completed projects.

2. **Safety and Security Management Practices Implemented in the Construction Firm**

The study concludes that construction companies in Nueva Vizcaya were compliant with the safety and security guidelines set forth by the DOLE Department Order No. 13, Series of 1998. The companies conducted health and safety programs, offered PPE, practiced safety procedures, and took care of the welfare of their workers. Some of them were lacking in having fully-equipped health facilities and clinics.

3. **Level of Satisfaction on the Safety and Security of Workers in Construction Firms**

The study concludes that skilled and unskilled workers were satisfied with the measures taken for their safety and security within the construction firm. They were pleased with the provision of PPE and safety at work. Nonetheless, there was room for improvement with regard to the health facilities and emergency medical services offered to them.

4. **Relationship between the Level of Safety and Security Management Practices Implemented and the Level of Satisfaction of Workers**

The study concludes that there is a significant correlation between certain safety and security management practices and the level of satisfaction of construction workers. The factors affecting the level of satisfaction include the presence of DOLE-accredited safety and health professionals and health provisions and facilities in construction firms.