

**DIMENSIONS OF HEALTH AND SAFETY STANDARDS AMONG  
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Campus, Davao City**ABSTRACT**

This study investigates the multifaceted aspects of health and safety standards among construction laborers in Davao City. With the construction industry being one of the most hazardous sectors globally, understanding the dimensions of health and safety standards is crucial for ensuring the well-being of workers. Through a Quantitative method approach through conducted surveys, this research explores various dimensions such as physical safety, mental health, access to medical care, training and education, and organizational policies and practices. Findings reveal the diverse challenges faced by construction laborers in adhering to health and safety standards, ranging from inadequate safety equipment to insufficient training opportunities. Moreover, the study identifies socioeconomic factors influencing workers' access to healthcare and their ability to prioritize safety measures. The implications of these findings underscore the importance of comprehensive interventions addressing both individual and systemic factors to enhance health and safety standards in the construction industry. This research contributes to the existing literature by offering insights into the nuanced dimensions of health and safety among construction laborers in Davao City, thereby informing policy and practice aimed at improving occupational health outcomes in this context

**INTRODUCTION**

The construction industry is renowned for its dynamic nature, contributing significantly to economic growth and infrastructure development. However, this sector also carries inherent risks and hazards, making it one of the most dangerous industries worldwide. Construction laborers face numerous occupational hazards daily, ranging from falls and injuries from machinery to exposure to hazardous materials and adverse working conditions. Consequently, ensuring the health and safety of construction workers is paramount to mitigate risks and safeguard their well-being.

That City Building Official of Davao City implements the following safety standards within their jurisdiction, one of which states that "The state shall ensure the safe and healthful workplace for all working people by affording them full protection against all hazards in their work environment. It shall ensure that the provision of the Labor Code of the Philippines, all domestic laws, and internationally-recognized standards on occupational safety and health are being fully enforced and complied with the employers, and it shall provide penalties in violation thereof" (Republic Act 11058).

In Davao City, like many urban centers across the globe, the construction sector plays a pivotal role in shaping the city's landscape and driving economic progress. However, the pursuit of development often comes at a cost, with construction laborers facing a myriad of challenges concerning health and safety standards. Despite regulatory frameworks and safety protocols in place, the implementation and adherence to these standards remain variable, leading to disparities in occupational health outcomes among workers.

This study aims to delve into the dimensions of health and safety standards among construction laborers in Davao City, Philippines. By examining various facets such as physical safety, mental health, access to medical care, training and education, and organizational policies and practices, this research seeks to provide a comprehensive understanding of the factors influencing health and safety outcomes in the construction industry context.

In Department Order No. 198 of Department of Labor and Employment Series of 2018, Implementing Rules and Regulations of Republic Act No. 11058 Entitled "An Act Strengthening Compliance with Occupational Safety

and Health Standards and Providing Penalties for Violations Thereof". The purpose of enforcing rules and regulations pertaining to occupational safety and health is to: provide complete protection against environmental hazards to all workers; safeguard all workers against illness, injury, or death by providing safe and healthy working conditions; and encourage stringent yet flexible, inclusive, and gender-sensitive measures in the development and execution of occupational safety and health policies and programs (DOLE, 2018).

The significance of this study lies in its potential to identify gaps and challenges in current health and safety practices within the construction sector in Davao City. By shedding light on these issues, policymakers, industry stakeholders, and relevant authorities can develop targeted interventions to address systemic shortcomings and improve occupational health and safety standards. Additionally, insights from this research can inform the design and implementation of effective training programs, policies, and initiatives aimed at promoting a culture of safety and well-being among construction laborers.

In conclusion, this study endeavors to contribute to the existing body of knowledge on occupational health and safety by offering insights specific to the context of construction laborers in Davao City. By illuminating the multifaceted dimensions of health and safety standards, this research aims to facilitate evidence-based decision-making and foster collaborative efforts towards creating safer and healthier work environments for construction workers in Davao City and beyond.

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### OBJECTIVES

This research entitled “**Dimensions of Health and Safety Standards Among Construction Laborers in Davao City**” aims to resolve the following problems:

1. What are the current health and safety practices implemented by construction companies operating in Davao City?
  2. What is the level of awareness among construction laborers in Davao City regarding health and safety standards in their workplace?
  3. What are the most prevalent health and safety hazards faced by construction laborers in Davao City?
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### SCOPE AND LIMITATION OF THE STUDY

The respondents of the study will be the construction laborers both in the formal and informal sector who are currently in a construction project within Davao City. It will cover both government projects and private entities. The study will be conducted using the Quantitative Analysis Method through surveys and on-site observation. This study will also focus on a short time scope and cross-sectional survey where the data will be acquired is dependent on the current implementation of health and safety standards of the construction companies that the respondents work for and does not include the data of those who are yet to start their construction projects and finished projects. Limitations encountered by the researchers include the limited time to conduct the study and are applicable to those construction projects immediately available at the time the study was conducted.

### METHODOLOGY

The study was conducted by randomly selecting 150 laborers and construction workers who are working in construction projects all throughout Davao City. The respondents were asked to fill out a 30-item questionnaire as a medium for data gathering. The questionnaire and results were then presented to an examiner for evaluation and validation of the contents.

The researchers used an Exploratory Factor Analysis (EFA) for the study. It was used to identify the various factors affecting both health and safety of construction workers. EFA is a compound multivariate statistical method that entails various linear and sequential steps; it is useful for scale building and when there is a limited theoretical basis for identifying the number and patterns of common factors (Sahibuddin, & Jalaliyoon, 2022). The Keiser Meyer-Olkin (KMO) sampling adequacy measure was used to test the magnitude of partial correlations between variables. To determine the identity of the correlation matrix, Bartlett's test of sphericity was also used. The scree plot graphically depicted the factors that contributed to identifying the dimensions of health and safety standards among construction.

### RESULTS AND DISCUSSION

This section exhibits the analysis and interpretation of the gathered data.

#### KMO AND BARTLETT'S TEST

Shown in the table below is the KMO Measure of Sampling Adequacy and Bartlett's Test of Sphericity. The KMO measures .843 which implies that the samples are in high correlations, that is appropriate for variable analysis that fits the data. As shown, the Bartlett's test of Sphericity yields a value of 2287.267 and a level of significance less than .001 which signifies the suitability of the data to be processed to factor the various aspects of safety and health of construction workers in their respective job sites. Moreover, Bartlett's test of Sphericity implies to reject the null hypothesis, and conclude that there are determinants that affect the safety and health of construction workers.

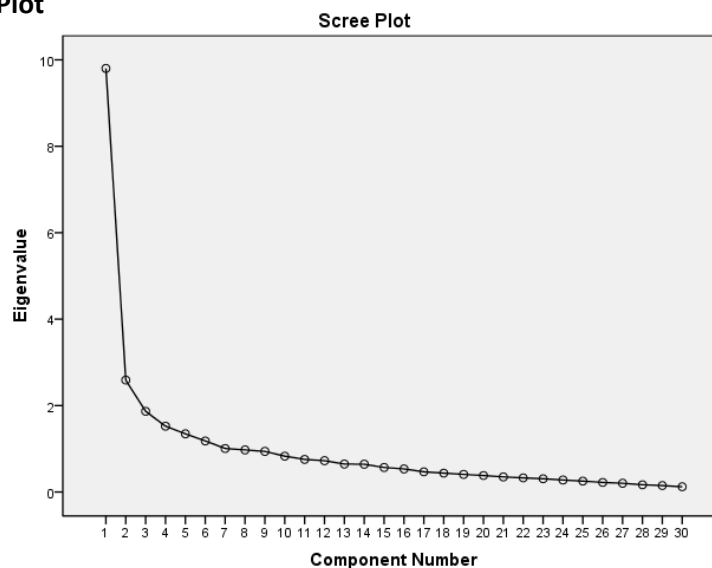
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.843
Bartlett's Test of Sphericity	Approx. Chi-Square	2287.267
	df	435
	Sig.	.000

Table 1. KMO and Bartlett's Test

#### SCREE PLOT

Figure 1. depicts a graphical representation of the total variance explained as well as a graph of Eigenvalues against all factors. It depicts the gradual trailing of the Eigenvalues and determines the relative fit of each component based on its importance. The graph is especially helpful in determining how many factors will be kept. The point of interest is the flattening of the curve. As can be seen, the curve becomes flatter as it approaches component number 8, which is where the Eigenvalue less than one begins. The dimension will be discarded if the items in each dimension are less than the minimum. As a result, only four factors were retained as determinants.

Figure 1. Scree Plot



### COMPONENT MATRIX

**Table 2. Rotated component matrix with grouped attributes of " Physical Safety "**

Physical Safety		
Item No.	Description	Loading
7	Our employer is strict in implementing proper wearing of protective gear.	0.645
11	Our work is suspended during bad weather conditions.	0.590
13	I always wear gloves when welding, mixing concrete and other things.	0.560

#### Physical Safety.

For example, if employees perceive that there is open communication in the organization, then they may also perceive that communication about safety is valued in the organization. Similarly, if employees perceive that the organization is supportive of their general welfare and well-being, they will be more likely to perceive that the organization values the safety of employees. These perceptions of the specific safety climate of the organization, in turn, are hypothesized to influence safety behavior. Physical Safety as a factor presents significant results with loadings ranging from 0.56 to 0.645 which are all above 0.5, being the base value for significance in results. Thus, considering physical safety as an important factor in determining the health and safety of laborers in the construction industry.

According to Section 8 Chapter III of Department Order No. 198, Workers have the right to be provided with Personal Protective equipment (PPE) by the employer, contractor or subcontractor free of charge for any part of the body that may be exposed to hazards. The cost of PPE shall be part of the safety and health program by which it is a separate pay item pursuant to section 21 of this rules (DOLE, 2018).

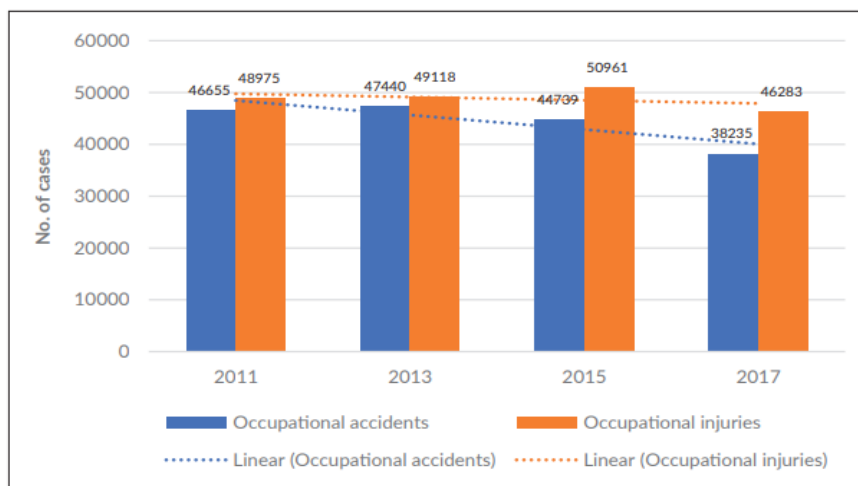
**Table 3. Rotated component matrix with grouped attributes of "Knowledge and Access to Medical Care"**

Knowledge and Access to Medical Care		
Item No.	Description	Loading
6	There is a first aid kit in my workplace.	0.564
15	The workplace is clean and safe from harmful and toxic waste.	0.705
17	We regularly conduct equipment maintenance on site prior to using it.	0.750
19	We were given proper benefits by our employer.	0.538
20	Right tools were provided to the workers.	0.663
22	I have sufficient knowledge in conducting first aid.	0.607
23	I am aware of what to do in responding to emergency situations.	0.519
29	We conduct regular monitoring to our body and health conditions.	0.666

### Knowledge and Access to Medical Care.

That according to Section 11, DO No. 198, Occupational Safety and Health information, “The workers in all projects and sites where work is being done must be given adequate and appropriate information by their employer, contractor, or subcontractor about the control mechanisms in place that limit the risk of exposure to hazards as well as other preventive strategies like training on particular hazards, medical monitoring tests, immunizations, and the control of diseases related to lifestyle choices” (DOLE, 2018).

The results presented great significance in all Question Items ranging from a level of significance of 0.519 to 0.75 Indicating that health is a very detrimental factor for laborers to have to ease their minds in doing their work. Proper Training, knowledge and easily accessible medical care is an important factor that would boost efficiency of work in construction. Occupational accidents in the Philippines show a decreasing trend starting from 46,655 cases in 2011 to 38,235 cases in 2017. On the other hand, occupational injuries show an increasing trend from 48,975 cases in 2011 to 50,961 cases in 2015 but decreased in 2017 with 46,283. Occupational accidents greatly affect work flow in construction and are common causes for delays in work timelines. Superficial injuries and open wounds were still the most common types of occupational injuries that resulted in workdays lost in 2013 at 61.7%, 2015 at 56.2%, and 2017 at 50.8%, and a reduction by 5.4% from 2015 to 2017. The following common type of occupational injuries were dislocations, sprains, and strains at 12.0% in 2017 but decreased from 2015 to around 0.6%. The least commonly reported occupational injuries are traumatic amputations at 0.1% and others at 1.4% (Lu, 2021).



Source: Philippine Statistics Authority, 2019.

Figure 2. Occupational accidents and injuries, Philippines, 2011, 2013, 2015 and 2017.

Table 4. Rotated component matrix with grouped attributes of "Training and Education"

Training and Education		
Item No.	Description	Loading
9	I am complacent in the safety given by our employer.	0.603
10	Unauthorized personnel are prohibited from entering the workplace premises.	0.536
16	I trust and am confident in the scaffolds that we use in the workplace.	0.723

21	I understand the individual health and responsibility in my workplace.	0.586
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### Training and Education.

As discussed in Section 4-b of DO 198, To guarantee compliance with OSH standards, workers must participate in capacity development activities on safety and health, as well as other OSH-related subjects and programs, utilize all safety equipment properly, and follow instructions to avoid accidents. In addition, they must follow prescribed emergency procedures and report any workplace hazards detected to their immediate supervisor or other relevant safety and health staff (DOLE, 2018). Proper equipment, methodology and safety training is essential for any workplace where the loadings of this factor indicate significant results varying from 0.536 to 0.723 loading value.

**Table 5. Rotated component matrix with grouped attributes of " Knowledge on Proper Safety Practices "**

Knowledge on Proper Safety Practices		
Item No.	Description	Loading
8	We're allowed to bring alcoholic drinks.	0.702
25	I experienced being sick caused by the chemicals and waste in the workplace.	0.689
28	I have experienced body pain ever since I started working.	0.676
30	I have experienced physical quarrels in my workplace.	0.845

### Knowledge on Proper Safety Practices.

Section 6, Chapter III states that if DOLE determines that there is an urgent risk scenario, the worker has the right to refuse to work without fear or retaliation from the employer. In circumstances of immediate risk, a safety officer may execute a work stoppage or pause activities as a preventative measure, based on his or her own assessment and without fear of punishment. The employer, safety officer, or worker must promptly contact the DOLE if an impending risk scenario arises in the workplace (DOLE, 2018). The results of the survey presented low ratings on the following items but showed more precise and significant levels of loadings ranging from 0.689 to the highest with 0.845 thus, this indicates that the workers have decent knowledge on Proper Safety Practices within the construction site to avoid the following negative items.

It is widely accepted in the construction industry that training plays an important role in worker safety. Worker training typically begins with worker orientation and continues as workers need to become more informed about certain aspects of the work they are doing. These additional training sessions may include topics such as confined space entry, hot work, traffic control, lockout/tagout procedures, and a wide assortment of other topics, whether to introduce new information or merely to provide a refresher on a subject.

**Table 6. Rotated component matrix with grouped attributes of "Construction Risk Reduction Standards"**

Construction Risk Reduction Standards		
Item No.	Description	Loading
5	We always wear protective gear such as masks, hardhats, gloves among others.	0.527
14	I wear harness in reaching higher elevations during work	0.749
24	I have the confidence that our workplace is safe from accidents.	0.538

Section 4-a. Employers are responsible for providing a safe working environment free of hazardous circumstances that cause or are likely to cause death, disease, or physical injury to their employees. They are obligated to offer

all personnel with thorough job safety instructions and adequate orientation, as well as any other compliance requirements on project sites (DOLE, 2018). In another study, they determined workplace ergonomics such as workplace, tools, jobs, equipment, can be designed taking the comfort of the workers in mind. Using a participatory ergonomic approach, studies have identified more than 130 new equipment and solutions such as portable fold-out bench to improve posture, an assembly seat to minimize kneeling to reduce the risk of lower back disorders that will improve the safety of the work environment. Safety measures need to be made compulsory at worksites (Samanta and Gochayyat, 2021).

The loading value of 0.527 and 0.538 presented a near borderline significance level while the loading value of 0.749 dictates their high significance level showing that risk reduction safety standards greatly affect the confidence of the workers to do their job. Another study presented that development of digital technologies in construction have been in existence since hard hats and protective glasses. In recent times, the combination of big data, tech genius and construction has improved the safety of workers on construction sites (Azmy and Zain, 2016). With the development of new technologies, the use of technology continues to attract attention. A variety of tools have been developed to assist contractors achieve safety on their construction projects. Numerous studies have identified the use of digital technologies such as BIM, VR and AR, drones, GIS, automation and robotics, unmanned machinery, sensing and warning technologies, 4DCAD as effective technologies for accident, prevention and safe project delivery (Haupt et. Al, 2020).

**Table 7. Rotated component matrix with grouped attributes of " Safety Regulations implemented by the Management "**

Safety Regulations implemented by the Management		
Item No.	Description	Loading
1	In my length of years of experience in construction, I can say that I am already familiar with the health and safety standards.	0.657
2	I have observed that there are health and safety practices in my workplace.	0.616
3	We are obliged to wear protective gear when working	0.6
12	I always wear boots in my workplace.	0.542
18	Our employer properly addresses our needs.	0.748

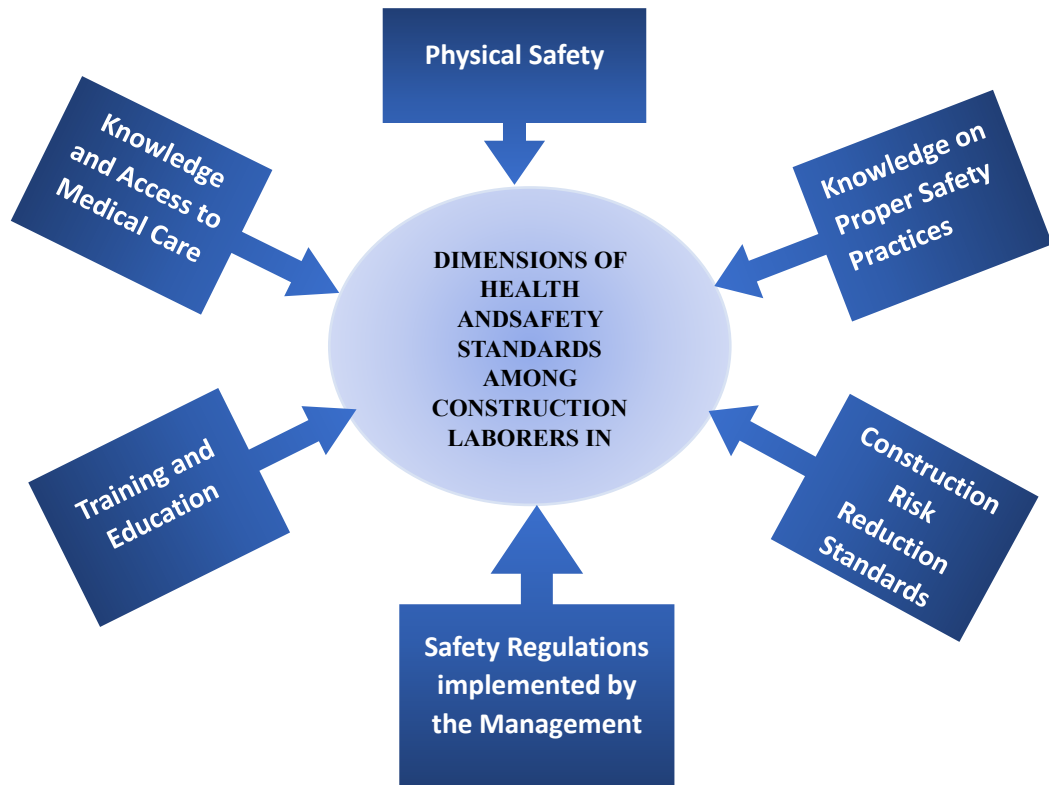
### Safety Regulations implemented by the Management

Section 12 Chapter IV discussed that the company shall review and evaluate the OSH program at least once a year or as necessary, to ensure that its objectives are met towards an improved safety and health performance. (DOLE, 2018). With proper implementation of the rules and regulations of the management, workers properly observe the health and safety standard on the work site. Also, the study conducted in India stated that the workplace needs to have practices that will support all the workers at the time of need. Along with practices discussed here such as employee awareness, and training, a clear communication mechanism regarding hazards, types, their assessment and prevention, safety briefings, rewards and punishment system for compliance and non-compliance of safety standards, practices such as employee counselling, supervisory support, employee motivation, sound interpersonal relationship can be followed to help these workers to manage the impact of stressful work situations on workers' health. Furthermore, the workplace should facilitate the compliance of government legislation for safety (Samanta and Gochayyat, 2021). Thus, safety regulations implemented by the management presented significant loadings with a range of 0.542 to 0.748 stating that the majority of the workers recognize if their owners are consistent in implementing the safety standards in their workplace.

### STUDY FRAMEWORK

Presented in Figure 2 is the Dimensions of Health and Safety Standards Among Construction Laborers in Davao City. This was developed based on the findings of the researchers that the determinants of Health and Safety Practices are Physical Safety, Knowledge on Proper Safety Practices, Knowledge and Access to Medical Care,

Safety Regulations implemented by the Management, Construction Risk Reduction Standards and Training and Education.



### CONCLUSION

Through this study, it was found out that there are multiple factors affecting the health and safety of construction laborers wherein six were identified as primary factors, namely, Safety Regulations implemented by the Management, Construction Risk Reduction Standards, Knowledge on Proper Safety Practices, Training and Education, Knowledge and Access to Medical Care and Physical Safety. These factors, albeit varying in levels of significance, contribute to one's health and safety in a construction site.

### RECOMMENDATIONS

**Managerial Recommendations:** As Construction Managers/Safety Officers, these factors should be always considered as they are necessary knowledge and practices that would ensure that their workers are healthy and safe while doing their respective jobs. Also, a workplace with free of worry from any hazards is an efficient workplace.

**Policy Making/Implementing Recommendations:** As policy makers and implementers of the law, these factors would assist them in checking for any violations that would endanger the workforce of their respective cities. These factors are key points that could be included in their list of things to consider while conducting their inspections and approving construction permit applications.

**Public Knowledge Recommendations:** These factors, if made public, would also allow regular citizens to identify proper and improper safety practices in construction sites most especially those small scale construction projects where the management and owners do not comply with construction permits. This would also allow those regular construction workers and laborers to demand proper construction safety practices from their employers.



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