

**A STRATEGIC APPROACH OF SAFE PLACE, SAFE PERSON
STRATEGIES AND OCCUPATIONAL HEALTH AND SAFETY
MANAGEMENT SYSTEM: STUDY AMONG THE CONSTRUCTION
INDUSTRY EMPLOYEES IN AMPARA DISTRICT, SRI LANKA**

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Abstract

The phrase occupational health and safety management system (OHSMS) has developed gradually because the workplace and the workers are the pre-eminent factors in any organization, particularly in the construction sector, which faces hazards and risks. Safe place and person strategies have been essential in implementing a better workplace. As of this, this study finds the impact of the Safe place strategy and safe person strategy on OHSMS to progress the health and safety of construction organizations. The study considered the Ampara District construction workers 200 as the population in Sri Lanka; out of those, 132 workers were selected as the study sample. All the 132 responses were returned, which is 100%. The study's outcome revealed a strong and positive correlation between the safe place strategy and OHSMS. The correlation between the safe person strategy and OHSMS also shows positive, which is significant at 0.000 levels. The result from the regression analysis, adjusted R², discovered the value of 0.628. The safe place and safe person strategies can explain 62% of the variants in OHSMS. In conclusion, to implement a better OHSMS, the organization not only should consider the safety of the system but also the safety of the workplace and workers associated with the entire ground should be considered.

Keywords: Safe place strategy; safe person strategy; occupational health and safety management system; construction workers

Introduction

In today's workplace, the safety of employees becomes a significant threat to both the employees and the organizations; therefore, implementing a safety management system in every occupation becomes necessary. Occupational health and safety are workers' physical, mental, and social welfare. With the

rapid development in the construction industry, the OHSMS requires higher concern than before, as the sector is more complex to hazardous conditions than other sectors.

The building segment in Sri Lanka has massively developed recently, and construction has become a vital part of the country's economy. However, while being healthy and safe is a critical feature of construction, it remains inadequate in the Sri Lankan construction industry, which takes the prime share in construction (Halwatura, 2012). Moreover, one of the previous researchers denotes that the need for occupational health and safety arose because occupational health has a tremendous effect on an individual, families, communities, and the world (Saba, 2019).

Many workers were occupied in construction sites due to their importance. 'Management and technical,' 'Skilled and Semi-skilled,' and 'Unskilled' labor force are the three employment groups in construction sites. Management and technical workers are generally graduates trained to design, manage, and instruct the construction processes with their higher educational qualifications. The skilled workers possess vast knowledge and experience in their construction profession. Semi-skilled and unskilled workers usually are spot laborers based on their little or no construction knowledge. In general, skilled, semi-skilled, and unskilled workers are the vulnerable group of the workforce, who have a high threat of being hurt, death, or various illnesses in the construction place. At the same time, the risk level also differs from the actions they are involved in (Vitharana et al., 2015). In the construction sector, every project is unique, and accidents and illnesses vary from project to project; one site could be more hazardous than another (Seixas, Sanders, & Sheppard, 1998).

Identifying the hazardous conditions by both individuals and organizations at the workplace through hazardous analysis helps to eliminate the risk of accidents and injuries at the workplace. Preventing accidents and hazardous conditions cannot only be done by the organization but also with the cooperation of every individual associated with the organization should be carried out. The implementation of the safe place strategy and safe person strategy may offset the risk of hazards related to occupations as this study applies to the construction sector in Sri Lanka and also provides ways ahead to shorten OHSMS and offer a realistic path for implementing a targeted development.

Therefore, the researchers found that the safe place strategy and safe person strategy may mitigate those conditions and provide a better workplace. Safe place strategy focuses on providing a risk-free environment and effectively eliminating the risks associated with construction works. In contrast, the safe person strategy focuses on effectively managing the people associated with the construction sector to deal with hazards and risks and work productively to accomplish the goals concerning the OHS policy and legislation of OHSMS of the building segment. Thus, this study examines the strategic approach of safe place strategy and safe person strategy to OHSMS of the construction sector in the districts of Ampara in Sri Lanka.

Problem Statement

Preventing accidents and hazardous conditions in the workplace becomes a significant issue for every organization. Safety performance in building places is generally calculated using lagging indicators (accidents) and not the most critical indicators (safe work behaviors). Also, many building workers are inclined to hide their unsafe acts (injuries) to the amount of potential for the reason that until they do not expose their unsafe acts or injuries to top administration, they are expected to be measured as safe workers and will not be punished for unsafe behavior. At the same time, safety is a must for building a workforce. Accidents and safety are general and serious problems in the building sector compared to other sectors. According to the above problem, statement addressed, 'Do safe place and safe person strategy have an impact on OHSMS of the building sector, especially in the District of Ampara in Sri Lanka.'

Research Questions

As evidenced by a thorough review of the literature and conferred statement of the problem, the subsequent questions are defined here:

1. What is the relationship between the safe place strategy and OHSMS of the construction sector in the district of Ampara in Sri Lanka?
2. What is the relationship between the safe person strategy and OHSMS of the construction sector in the district of Ampara in Sri Lanka?
3. How do the safe place and safe person strategies impact the OHSMS construction sector in the district of Ampara in Sri Lanka?

Research Objectives

The study tried to realize the subsequent objectives.

1. To identify the relationship between the safe place strategy and OHSMS of the construction sector in the district of Ampara in Sri Lanka.
2. To examine the relationship between the safe person strategy and OHSMS of the construction sector in the district of Ampara in Sri Lanka.
3. To explore the influence of the safe place and safe person strategies on OHSMS of the construction segment in the Ampara district in Sri Lanka.

Literature Review

In construction segments, the building sector is the major sector out of all the sectors in Sri Lanka. Construction workers face a range of hazards and accidents compared to other workers. Because of that, this sector faces some crucial losses, such as valuable lives, cost overruns, and wasted time, which adversely affect the reputation of this industry (Perera, 2017). Implementing better occupational health and safety practices in building companies remains a critical problem for organizations and construction workers. Construction workers are exposed to diverse, dynamic, and rapidly changing environments that are dangerous for their lives and, as a result, incur disproportionate injury rates annually. The Skills Development and Labor Relations Minister of Sri Lanka states that around 1,300 to 1,500 occupational injuries are reported out of 8.7 million workers annually.

Moreover, there are 2.3 million people, including women and men, all over the world who yield to job-related accidents and illnesses every year and over 6,000 deaths every day (International Labor Organization (ILO, 2019). Also, around 340 million accidents and 160 million illnesses are recorded annually. Furthermore, a country will lose 44% of its national GDP due to work-related injuries. The ILO statistics for 2019 show that the incurable injury rate is one for 100,000 employees in Sri Lanka (Abeyratne, 2021). From a global viewpoint, developing countries like India, Nepal, Bangladesh, Pakistan, Sri Lanka, and Bhutan is more labor-intensive than other developed nations in the construction industry. However, both countries' construction industries are hazardous, based on construction accidents, injuries, and sickness. When compared to European countries, injuries and illness are high because of limited alarms to ensure excellent safety and little or no official records available for the deaths of personnel in construction (Koirala, 2019).

Implementing a better working environment with less hazardous conditions in construction sites becomes a serious component of an effective safety program. Therefore, to prevent injuries and hazards the Safe Place strategy and Safe Person strategy help identify workplace exposures and moderated anger connected with these risks through the use of technical or material controls to provide an enhanced OHSMS in the construction field.

Safe place strategy focuses on providing a safe work culture that is free from dangerous conditions at the workplace and provides a risk-free environment. Safe place strategy may be implemented by “plan-do-check-act” of the Deming cycle at any of the planning, implementing, measuring and reviewing stages but it is more useful for all four stages. Safe place strategy deals with the present physical environment based on best practices (Makin, 2009).

Safe person strategy focuses on implementing best safety practices and procedures for the workers associated with hazardous conditions in workplaces to prevent those conditions. These strategies provide enough safety training, workshops, and control techniques to handle the risks and inappropriate

conditions at the workplace. It focused on the control behavior of employees through a prevention strategy (Gallagher, Underhill, & Rimmer, 2001).

Dimension Affecting Safe Place Strategy

To enhance safety practices in the organization, the management should improvise the physical setting of the work site and provide an adequate awareness program in the organization for employees, especially for the semi-skilled and unskilled laborers. The Safe Place strategy should be developed using the factors that might affect it. Factors such physical setting of the workplace, auditing, worksite inspection, safety policy, and housekeeping are some of the factors that impact on Safe Place strategy. Some safe place strategies have been identified as follows:

Auditing

In OHSMS, an audit is a systematic process of acquiring data and information and evaluating to determine to what extent the defined criteria are satisfied objectively. It cannot be puzzled with the terms ‘workplace inspection’, ‘hazard spotting exercise’, and ‘gap analyses. The occurrence of an audit may differ based on the phase of implementation of OHSMS. Once the OHSMS has been created and applied effectively, validation audits should be used to determine its ongoing suitability. Internal auditing and management reviews form a vital part of the self-regulation procedure. Specialized judgments, objectivity, competence, and experience are all precursors for a consistent audit.

Occupational Health and Safety Policy

The administration’s policy regarding occupational health and safety (OHS) plays a major role in implementing the Safe Place strategy because the OHS policy differs from one organization to another. Therefore, when one employee is appointed from one company to another, the employee will find it a bit hard to adapt to the new environmental setting and get work done. OHS policy statements must be in a nutshell, but they must explain who does what, when, and how they do it. The policy should include the employee’s health and safety. The health and safety policy statement has to record the preparations and dealings for how all OSH matters are managed (Health and Safety Executive, 2007/2008; Jonathan & Mbogo, 2016). It is improved to begin a stable policy to appraise the feelings towards the safety execution plan of project construction firms before giving them a contract to achieve effectiveness and productivity.

Physical Workplace Setting

It refers a suitable housekeeping, and it should have appropriate access, pathways, and travel routes. The often-changing workplace and work activities are the problem; thus, safety and risk management culture should be tidy and well-planned (layout) to achieve increased safety performance. Meanwhile, site constraints, inadequate space, or difficult access contribute to losses (Othman, 2018).

Normally construction sites are under natural and hazardous conditions and far from cities. Employment affairs are predetermined and they occur for the project period only. Complicated territory

makes it impossible for government inspectors, if it wants the trade union organizers to reach the construction sites. Accidents may not get reported, and the work environment is also far from satisfactory. It is a peculiar condition where both employer and employee scheme to comfort labor laws and safety necessities (Koirala, 2019).

Worksite Inspection

Size, Location, labor composition, organizational structures, and logistics management are the unique challenges the construction industry faces (Haro & Kleiner, 2008). The construction sites are vibrant due to chronological work processes, levels of technology, tool iterations, workforce factors, and the various levels of safety understanding and training of workers (Brace, Gibb, Pendlebury, & Bust, 2009). Worksite checks are vital to provide safety controls since the construction workers are exposed to hazards more than other workers; due to the lack of budget, it cannot be appointed fulltime safety personality for worksite inspection (Koirala, 2019).

Housekeeping

Good quality housekeeping improves morale, boosts efficiency, and assists public relations; it is an essential function that can decrease accidents and improve safety performance. The housekeeping practices include appropriate storage, use, cleaning, and disposal of various materials used during construction, i.e., cleaning the construction site should be a part of the operation rather than a separate action. The housekeeping program should be planned well and harmonized as a regular practice. Also, it must be a nonstop process that should absorb everyone on a worksite. Poor cleaning and poor housekeeping create many accidents, such as tripping or slipping. "A proper place for everything and everything in its proper place" is good housekeeping. This implies upholding an arranged environment and clean sanitary worksite (Koirala, 2019).

Dimensions Affecting Safe Person Strategy

A safe person strategy is a means of dealing with outstanding risk. Once the physical hazards of the worksite have been addressed, they cannot be eradicated. Under the safe person strategy, some of the main strategies available are as follows.

Worker Involvement

Management's responsibility is to provide a healthy and safe work environment for the employees; the company should care about their employees' health and welfare by implementing a widespread safety program (Farooqui, Ahmed, Zheng, & Azhar, 2008). Moreover, improved communication is essential for the safety and productivity of workers, and direct participation of the employees in the safety program may work as an excellent motivator for the employees. Lack of knowledge, poor education, unskilled, untrained, and lack of experience concerning safety lead to risk and hazards. Workers should undertake appropriate training and education to increase their awareness regarding the safety issue

(Choudhry & Fang, 2008). As to the above researchers, applying worker involvement properly will be effective in bringing a well-designed OHSMS to the construction sector.

Employee Training

To fulfill the OHS responsibilities, employee education and training are essential. Training on the awareness of workplace hazards will encourage safe practices for workers; they may find the most convenient method for performing the task based on human nature. If construction is to become a safe activity, educating and training the engineers, managers, supervisors, and workers is essential, but very little attention has been paid to this aspect. Civil engineers who manage projects are responsible for the safety of operations and the progress of the work. Security is not taught as a subject in engineering education. In some colleges, it appears as a small component of a one-term course on Construction Management. Safety may receive eight teaching hours during the four years of coursework (Koirala, 2019).

Pre-employment Screening

Most organizations widely use pre-employment screening to select more suitable workers rather than to screen out candidates, which is a high risk for the future due to workers' compensation claims. It's important to prepare a standard list of physical demands applicable to all the tasks to be included in the selection procedure. Persons should be hired for a particular job to be assessed properly. Hiring many people for different positions in general should be avoided. Also, selection criteria should consider the working conditions to which the operators/workers will be exposed. The procedure is called a job analysis, resulting in a job specification. Preparation of job description and job specification, including the requirement the holder of the job should have, is the responsibility of the personnel manager. He should seek expert advice from the safety to incorporate safety requirements in the job description (Koirala, 2019).

Personal Protective Equipment (PPE)

Construction firms have their procedures to facilitate and conduct a worksite analysis throughout a systematic process. Worksite analysis can be done by making an inventory of possible hazards within the workplace of the construction environment by using the Personal Protective Equipment (PPE) evaluation (Gomeseria, 2019). Construction sites may have many types of hazards due to complications of the work environment. All workers should use the required PPE as part of the safety culture because the use of PPE can reduce the worker's contact with hazards. PPE is applicable when engineering and administrative controls are not feasible, but employees may feel some inconvenience in using PPE. Management should often impose the use of PPE. Amongst the safety procedures for construction site workers, PPE is essential (Aloyce, Godbertha, Nina, & Mackfallen, 2022).

Health Surveillance

Health inspection is the process of scrutinizing the health of workers exposed to particular health risks throughout their work. Employers should make health surveillance available to their employees, which must be clearly explained. The health observation of the organization should be incorporated into the occupational health policy, referring to the people considered to be at risk and the form of health surveillance to be done. It should also clearly identify how results will be feedback to employees and managers and describe how grouped non-identifiable results will be handled. Finally, the policy must describe the procedures when a worker is detected with the relevant work-related disease (Occupational Health Standards in the Construction Industry, 2007).

Dimensions Affecting Occupational Health and Safety Management System

Both independent variables, such as the safe place strategy and safe person strategy, focus on providing an improved OHSMS in the construction sectors. Therefore, several dimensions pave the way to providing such a targeted system as follows;

Accountability

- **Senior manager commitment:**

Senior management involvement and commitment to designing a health safety culture in construction organizations plays a vital role. Several safe place strategy and safe person strategy variables adjoin in providing a better OHSMS in the organization through senior management commitment. A visible management commitment must provide their subordinates with the ability to think and believe in the advent of safety programs, not simply promote a “paper” program. Organizations must entrust sufficient resources to fund the program. This includes the salary of the safety supervisor and financial support of safety materials such as CDs, booklets, training courses, guest speakers, safety trade shows, etc., financial rewards and awards, and advances in safety technologies (Farooqui, Ahmed, Zheng, & Azhar, 2008).

- **Company OHS policy:**

The construction companies in Sri Lanka have a high lack of understanding of the significance of the health and safety policy (Democratic, 2009). Execution of effective OHS policies and programs is mutually dependent on the education and awareness of the workers. These should be the center of attention on looking beyond the accidents and more towards human behavior and culture. All employers are responsible for protecting their staff and others from any harm that can arise from work activities. The Act 974 regarding Health and Safety at Work, states that all organizations should have a health and safety written policy when they occupy five or more than five workers (Darshana, 2017).

Consultative Arrangements

Consultation with organizations and workers is very essential to make sure that health and safety are successfully managed (Darshana, 2017). In an organization, safety is first, and safety activities are regular and organized. The OHS has three lines of management, which are top or product manager,

work environment specialist or safety manager, and work environment representative (Hrenov, Paas, Tint, & Reinhold, 2016). According to the previous researcher, Walter argues that consultative arrangements focus on exploring the role of employee representation and consultation and its effectiveness in improving health and safety for workers in the industry (Walters, 2010). Consultative arrangements cover both worker and employee participation in construction works.

Specific Program Elements

Some safety problems addressed in implementing a safety program in the construction industry are; lack of safety policy and regulations, lack of safety training, unfair project schedule, insufficient safety-related resources, little safety commitment, and poor safety knowledge (Walters, 2000).

Role of Organization and Employee in Implementing Safe Place and Safe Person Strategies

Both the organization and employees play a vital role in implementing a safe place strategy and a safe person strategy to design an effective OHSMS in the organization. Because not by the organization itself comes to work for a better management system, the employees' participation and involvement are vital for the success of implementing those strategies effectively. To implement OHSMS, every worker or laborer and other people in the workplace must participate in maintaining and controlling the implementation of OHS (Alfanan & Nugroho, 2019). The management must offer and sustain work locations, machinery and equipment and practice work methods, without the risk to health and as safe as sensibly reasonable for the safe working site (Zimolong & Elke, 2006).

The size, strength, and budget allocation for the health and safety department must be sufficient; the department can purchase personal protective equipment (PPEs) for staff and conduct safety drills and extensive training sessions. Workers must comply fully with the employer in any step that the employer proposes to ensure safety. This can be done by reporting hazards and incidents, using correct PPEs during work, doing work in a safe way, obeying the health and safety instructions and standard operating procedures, and attending safety sessions (Hassan, 2012).

Relationship Between Safe Place, Safe Person Strategies, and OHS Management System

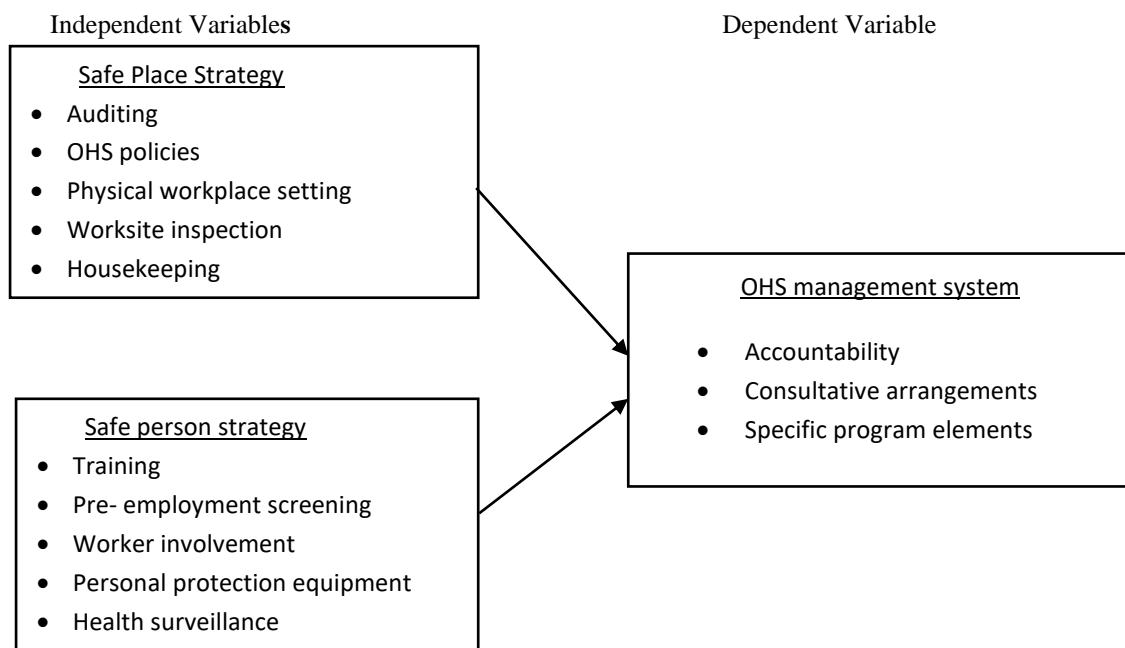
To implement an effective OHSMS in the construction sector, the safe place strategy and safe person strategy play a vital role. Dimensions of both strategies find ways to implement an improvised system. Theoretically, the types identified all meet the basic requirements of an OHSMS, a formalized management system to improve OHS comprising a complex set of interrelated program elements (Gallagher, 2000). The parties who are responsible for occupational accidents and occupational diseases are mainly the employers, employees, relevant authorities, and society as a whole. Although all parties do understand the necessity for mitigating accidents and diseases, so far these have not been adequately addressed. The decision-makers need facts and figures to understand the gravity of the problem and to take appropriate action based on those facts and figures. In general, policymakers will be encouraged to take action to mitigate significant accidents and diseases if they know the significance of these workplace accidents and diseases (Wijekoon, 2016). Through, a safe person strategy, the

organization tends to improve workers’ behaviors, while a safe place strategy tends to improve a healthy work environment setting as these strategies tend to sum up in implementing a well-defined OHSMS (Agwu, 2012). Effective management of employee safety and health protection is a decisive factor in reducing the extent and severity of work-related injuries and illnesses and their related cost impact. The creation of an effective safety and health program forms the basis of good employee protection, which can save time and money, as well as increase productivity, and reduce employee injuries, illnesses, and related workers' compensation costs. Further, The Safe Place, Safe Person, Safe Systems framework provided a way forward to simplify OHS management and also offers practical direction for implementing a targeted OHS improvement program (Makin, 2009). Safe places, safe people and safe practice strategies set out how it will achieve excellence in health and safety, (UWE Bristol, 2013-2020).

Methodology

Conceptual framework of the study

Figure 1: Conceptual Framework



(Source: Developed for this study)

Hypotheses

According to the developed conceptual framework the subsequent research hypotheses are developed for this study:

H1: A significant positive relationship exists between the safe place strategy and the OHS management system.

- H2: A significant positive relationship exists between the safe person strategy and the OHS management system
- H3: There is a significant impact of safe place and safe person strategies on the OHS management system

Tool Used for This Study

Regarding the safe place strategy, safe person strategy and OHSMS the dimensions of (Makin, 2009) and (Gallagher, 2000) were taken and the researcher developed the indicators to develop the questionnaire. A questionnaire regarding the study was developed by the researcher with the support of the work of (Ahamed, Nafeel & Rishath, 2006).

Population and Sample Study

This study targets the population the construction workers in the District of Ampara in Sri Lanka. A self-administered questionnaire is developed to identify the relationship between the Safe Place, Safe Person strategies and OHSMS of the construction sector. The study especially considers engineers, quantity surveyors, surveyors, and engineering supervisors from five construction companies in Ampara District of Sri Lanka such as Sierra Construction, Atham Bawa & Sons, Pearl Construction, CECB, and Koleiga Engineering. The population contains 200 workers, 132 as the sample size considered for the study. The study used a stratified random sampling method and selected the individual respondents from the population.

Data Collection Techniques

A self-administered questionnaire was used as the research instrument for primary data collection and based on the literature review the questionnaire was developed by the researcher and e-mail was used to gather data. The questionnaire has four parts. Part A of the questionnaire assesses personal information, part B assesses safe place strategy, part C assesses safe person strategy and part D assesses the OHSMS.

Method of Data Analysis

Primary data was analyzed by using Statistical Package for the Social Science (SPSS) 26.0. The data is collected by the researcher through physical discussions with construction-related engineers and engineering supervisors in the Ampara district of Sri Lanka. Descriptive statistics of mean, standard deviation and the number of samples are considered for measuring qualities of study variables. Correlation analysis was used to find the relationship between study variables and multiple regression to discover the impact of both independent and dependent variables. Also, ANOVA, Coefficient, and Correlation Statistics were used to explore the results.

Reliability and Validity Analysis

The Cronbach's Alpha test was used for analyzing the instrument's reliability, this model analyses the internal consistency of the instrument. The internal consistency test is important when the alpha value results more than 0.7; it assumes the reliability of questions or statements. George and Mallery (2003),

indicated decision characteristics for data reliability are used in the data analysis. A validity mentions how sound a test measures, what it is supposed to measure.

Results and Discussions

Response Rate

The population of the study concentrated on 200 respondents; out of that expected population, 132 questionnaires were issued and returned in a fully fulfilled manner. It entails a 100% response rate. Accordingly, the response rate is acceptable to develop the conclusion of this study which is excellent basement for data analysis (Mugenda & Mugenda, 2003).

Reliability Analysis

The reliability of the study tools is measured by Cronbach's Alpha analysis; it measures the internal constancy of the tool. Cronbach's Alpha Coefficient (CAC) is calculated for each of the variables. This CAC can differ between 0-1. According to this study, Cronbach's alpha coefficient of reliability analysis for all variables above 0.7 is considered acceptable and quite high. However, this instrument seems to be a fairly reliable measure of evaluating the impact of the safe place strategy and safe person strategy on OHSMS. Results are presented in Table 1.

Table 1: Reliability Analysis

| Variables | No. of items | Cronbach's Alpha value |
|-------------------------------|---------------------|-------------------------------|
| Safe place strategy | 16 | 0.811 |
| Safe person strategy | 10 | 0.752 |
| OHS management system (OHSMS) | 12 | 0.748 |

(Source: Survey data)

Validity of the Scale

Content validity

The degree to which an assessment instrument is relevant and representative of the targeted constructs planned to measure is content validity (Rusticus, 2014). The content validity of the anticipated instrument measuring safe place strategy, safe person strategy and OHSMS are satisfactory enough because the instrument has been carefully constructed based on the designed model (Gallagher, Underhill & Rimmer, 2001; Makin, 2009). All the dimensions and indicators of this model were covered to develop the safe place strategy, safe person strategy and OHSMS for this study. The content validity of the instrument measuring safe place strategy, safe person strategy and OHSMS were

ensured as the dimensions by (Makin, 2009) and (Gallagher, Underhill, & Rimmer, 2001), and the indicators were developed by the researcher.

Factor analysis

The Kaiser- Meyer-Olkin (KMO) measure for sampling adequacy and Bartlett's test of sphericity was done. A minimum KMO value of 0.5 is satisfactory for running factor analysis. KMO lower than 0.5 is not appropriate and factor analysis. The golden rule is that if the values resulting from the KMO test are between 0.5 to 1.0 the factor analysis is considered to be suitable for the study (Williams, Onsmann & Brown, 2010). Field (2005) says that there is an agreement that factor analysis is appropriate when the sample size is more than 50. The reached sample size (132) of this study is above the cutoff value. Therefore, Bartlett's Test of Sphericity is significant at $p < 0.05$ for the analysis to be considered as an appropriate one. This test determines the suitability of factor analysis for the data set of a study (Lombaard, Merwe, Kele & Moutonet, 2011).

Table2: KMO and Bartlett's Test

| Variables | KMO | Bartlett's Test of Sphericity | | |
|-----------------------|-------|-------------------------------|-----|------|
| | | Approx. Chi-Square | Df | Sig |
| Safe place strategy | 0.808 | 1029.097 | 120 | .000 |
| Safe person strategy | 0.820 | 487.970 | 45 | .000 |
| OHS management system | 0.790 | 602.956 | 66 | .000 |

(Source: Survey Data)

Study findings stated the KMO values of safe place strategy, safe person strategy and OHSMS are 0.808, 0.820 and 0.790 correspondingly are above the limit of 0.5 and the recorded chi-square values resulting from the use of Bartlett's test of sphericity of safe place strategy, safe person strategy and OHSMS are 1029.097 (df =120), 487.970 (df = 45) and 602.956 (df = 66) respectively at the significance level of $p=0.000$. The conclusion resulting from the results was that the questionnaire statements were successfully related, suggesting that the factor analysis was appropriate for the data set since each KMO indices is higher than 0.5. Bartlett's Test of Sphericity test confirmed the appropriateness of the factor analysis for the data set in this study.

Descriptive Statistics

Safe place strategy was measured with 16 statements while the Safe person strategy was measured with 10 statements and the dependent variable OHSMS was measured with 12 statements with a 5-point Likert's Scale.

The mean value and standard deviation of the overall safe place strategy are 2.5704 and 0.54387, this indicates a high level of safe place strategy application among the respondents and they perceived the safe place strategy has an impact on OHSMS in the construction sector significantly and the standard deviation denotes a high variation in the levels of applying safe place strategy among the respondents.

The mean value and standard deviation of the overall safe person strategy are 2.0591 and 0.4713, indicating a low level of safe person strategy application among the respondents they perceived the safe person strategy had an impact on OHSMS significantly and the standard deviation denotes that there was a high variation in the levels of safe person strategy application in construction sector among the respondents.

The mean value and standard deviation of overall OHSMS are 2.3429 and 0.45616, this indicates a high level of OHSMS application among the respondents. The standard deviation denotes that there was a low variation in the levels of OHSMS application among the respondents of the construction sector.

Tale 3: Descriptive Statistics

| Variables | No. of Items | Mean | Std. Deviation |
|-----------------------|---------------------|-------------|-----------------------|
| Safe place strategy | 16 | 2.5704 | 0.5438 |
| Safe person strategy | 10 | 2.0591 | 0.4713 |
| OHS management system | 12 | 2.3429 | 0.4561 |

Correlation Analysis

The relationship between the Safe place strategy and OHSMS and the safe person strategy and OHSMS were determined by correlation analysis. Table 4 displays the result of the statistical test of correlation that was performed to determine the relationship between independent and dependent variables involved in this study. The correlation coefficient between the safe place strategy and OHSMS is 0.722 which displays that there is a strong positive relationship between the safe place strategy and OHSMS, with the significance level of 0.000. It shows that the found relationship is statistically significant. The correlation coefficient between the safe person strategy and OHSMS is 0.743 which displays that there is a strong positive relationship between the safe person strategy and OHSM, with the significance level of 0.000. It shows that the found relationship is statistically significant; the following table displays the results.

Table 4: Correlations Analysis

| Variables | No. of response | 'r' Value | Sig. |
|------------------|------------------------|------------------|-------------|
|------------------|------------------------|------------------|-------------|

| | | | |
|------------------------------|-----|-------|------|
| Safe Place Strategy – OHSMS | 132 | 0.722 | .000 |
| Safe Person Strategy – OHSMS | 132 | 0.743 | .000 |

** . Correlation is significant at the 0.01 level (2-tailed).

(Source: Survey data)

Multiple Regression Analysis

The multiple regression analysis finds the relationship among more than two variables by providing an equation for a straight line of the form $Y = a + \beta x$ that carries out the independent variables (x) to forecast the dependent variable (y). Regression analysis includes estimating the values of the gradient (β) and intercept (a) of the line that best fits the survey data.

Table 5: Model Summary of Multiple Regressions

| Model Summary | | | | |
|--|-------------------|----------|-------------------|----------------------------|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1 | .796 ^a | .633 | .628 | .27831 |
| a. Predictors: (Constant), Safe person strategy, Safe place strategy | | | | |

(Source: survey data)

Table 6: ANOVA

| ANOVA ^a | | | | | | |
|--|------------|----------------|-----|-------------|---------|-------------------|
| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
| 1 | Regression | 17.267 | 2 | 8.633 | 111.461 | .000 ^b |
| | Residual | 9.992 | 129 | .077 | | |
| | Total | 27.259 | 131 | | | |
| a. Dependent Variable: OHS Management system | | | | | | |
| b. Predictors: (Constant), Safe person strategy, Safe place strategy | | | | | | |

The model Summary is presented in Table 5. Accordingly, R^2 and adjusted R^2 discovered the values as 0.633 and 0.628 respectively. The adjusted R^2 value of 0.628 shows that nearly 63% of the variation in OHSMS can be explained by the safe place strategy and safe person strategy. This is quite high so calculations from the regression equation are fairly reliable. Further, it is noted that 37 % of the variation is not explained by this study, hence adding some other independent variables might improve the model fit.

The ANOVA table depicted in Table 6, its value of the sum of squares (SS) regression is 17.267 which submits to the sum of squares clarified by the regression equation, followed by SS residual is 9.992 refers to the variability in OHSMS which is left not explained by the regression equation of the study and SS total is 27.259 respectively with 2, 129 and 131 degrees of freedom. Values of MS regression and MS residual are 8.633 and 0.77 respectively. The F statistics is 111.461 which is also significant. Here as F is significant (p-value = 0.000 < 0.05), it can be determined that there is an impact of safe place strategy and safe person strategy on OHSMS, also the regression equation allows us to predict the OHSMS at a high level.

Based on Table 7, standardized beta values for, the safe place strategy and safe person strategy are 0.397, and 0.467 respectively which are significant at 0.000 levels. Therefore, the safe place strategy and safe person strategy have a significant impact on the OHSMS of the construction sector.

Table 7: Coefficients

| Coefficients | | | | | | |
|--------------|----------------------|-----------------------------|------------|---------------------------|-------|------|
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | .556 | .123 | | 4.519 | .000 |
| | Safe place strategy | .333 | .062 | .397 | 5.360 | .000 |
| | Safe person strategy | .452 | .072 | .467 | 6.301 | .000 |

a. Dependent Variable: OHS Management system

(Source: Survey data)

Then the multiple regression equation is $OHSMS = \alpha + \beta_1 + \beta_2$

Where, OHSMS= occupational health and safety management system

SPES= safe place strategy

SPNS = safe person strategy

The resulting regression equation is as follows:

$$OHSMS = 0.556 + 0.333SPES + 0.452SPNS$$

The above equation specifies that if the safe place strategy changes by one unit, the OHSMS will change by 0.333 units. It also demonstrates the direction of the relationship. While the safe person strategy changes by one unit, the OHSMS will change by 0.452 units. It also demonstrates the direction of the impact of a safe place, safe person strategies and OHSMS. The t-value against the safe place strategy regression coefficient in the model is reported to evaluate whether the safe place strategy is a

significant predictor of the OHSMS. Since $t = 5.360$, $p = 0.000 < 0.05$, it can be inferred that the safe place strategy is a noteworthy predictor of OHSMS. The t-value against the safe person strategy regression coefficient in the model is reported to evaluate whether the safe place strategy is a significant predictor of the OHSMS. Since $t = 6.301$, $p = 0.000 < 0.05$, it can be inferred that the safe person strategy is also a significant predictor of the OHSMS.

| Variables | 'r'/R²Value | Sig. | Results |
|--|-------------------------------|-------------|----------------|
| H1: There is a significant positive relationship between the safe place strategy and OHSMS | 0.722 | .000 | Supported |
| H2: There is a significant positive relationship between the safe person strategy and OHSMS | 0.743 | .000 | Supported |
| H3: There is a significant impact of the safe place strategy and safe person strategy on OHSMS | 0.628 | .000 | Supported |

Hypothesis Testing

The hypothesis framework results reveal that there is a significant relationship between the safe place strategy and the OHSMS and there is a significant relationship between the safe person strategy and also safe place and safe person strategies have a significant impact on occupational health and safety management system in construction sector of Ampara District of Sri Lanka.

Findings and Discussion

The objective of this study was to conduct a practical exploration of the influence of the safe place strategy and safe person strategy on the OHSMS of the construction sector in Ampara. District of Sri Lanka.

The first objective of this study is to examine the relationship between safe place strategies and OHSMS of the construction sector in the Ampara District of Sri Lanka. Correlation analysis revealed that the relationship between the safe place strategy and OHSMS has a strong positive relationship with the r value of 0.722 at ($p = 0.000$). This result well demonstrates that there is a strong positive relationship between the safe place strategy and the OHSMS of the construction sector of Sri Lanka. The first objective has been achieved.

The second objective of this study is to identify the relationship between the safe person strategy and OHSMS of the construction sector in the Ampara District of Sri Lanka. Correlation analysis revealed that the relationship between the safe place strategy and OHSMS has a strong positive relationship with the r value of 0.743 ($p = 0.000$). This result well demonstrates that there is a strong positive relationship between the safe person strategy and the OHSMS of the construction sector of Sri Lanka. The second objective has been achieved.

The third objective of this is to identify the impact of a safe place and safe person strategy on OHSMS. The regression analysis revealed that standardized beta values for, the safe place strategy and safe person strategy are 0.397, and 0.467 respectively which are significant at 0.000 levels. Therefore, the safe place strategy and safe person strategy have a significant impact on the OHSMS of the construction sector in the Ampara District of Sri Lanka. The third objective has been achieved.

The findings of the study suggested that the hypothesis developed by the researcher according to (Makin, 2009) that a safe place and safe person strategy have a significant impact on OHSMS. The results of the study are consistent with the prior study of (Gallagher, Underhill, & Rimmer, 2001; Harding, 2011; Waziri, Hamma-adama, & Kadai, 2015; Magar, Kudtarkar, Pachpohe, & Nagargoje, 2021).

Conclusion

When using the strategical approach of the safe place and safe person on OHSMS, the data collected from the construction sector employees to conclude. The safe place, safe person, strategies were particularly useful in illuminating OHSMS concerns that had long-term health implications such as the inappropriate handling and storage of hazardous substances, the lack of health promotion, lack of health and safety training, lack of worker involvement in health and safety practices and health surveillance and further in construction sector of Ampara District of Sri Lanka.

According to the findings, the developed hypotheses were accepted as the safe place strategy and safe person strategy have a strong positive impact on OHSMS of the construction sector and have an impact of safe place, safe person strategy on OHSMS of the construction sector in the District of Ampara in Sri Lanka.

Though fewer studies targeted investigating the health and safety of the construction sector in the Sri Lankan context, therefore the study fills the gap in finding a strategical approach for a safe place strategy and safe person strategy to improve the occupational health and safety management system of the construction sector in Ampara District of Sri Lanka was selected. It exposed OHS responsibilities and obligations and provided a simplified approach to understanding the areas of exposure to OHS hazards and risk conditions whether they pertain to the physical work environment, the people involved and the organization or management practices. This is a more holistic approach that offers opportunities to improve the relevance of OHS issues, acknowledge the value of people's experience and open up channels for OHS dialogue so that higher standards for OHSMS can form part of the construction sector's cooperative realization.

Limitations and Direction for Future Research

All researchers face some kind of limitation in completing their research to ensure the intellectual rigor of the study. These difficulties may be resource availability, the nature of a particular field of research

and the time frame allowable. In line with these, the following are some of the limitations faced by the study and possible directions for future research.

- The major limitation of this study that must be deliberated included the sample. A relatively small sample size of 132 construction workers was only used in the study and the selection of the sample was random sampling. Due to the lack of time, only skilled construction-related workers were involved. So future researchers can reproduce this study with a large number of sample sizes by concerning other districts and provinces.
- The research study focuses on a small area therefore extending the study to different localities would have increased the breadth, richness and transferability of the findings.
- This study has been done with two independent variables and OHSMS, future researchers can develop the research based on the present status of OHS application in the construction sector by adding more independent variables.
- And also, the questionnaire focuses only on the basic data that sticks with the OHS application and how future researchers can use more in-depth questions to identify the potential OHS application.

Recommendations

The findings of this research were able to be investigated through the self–self-administered questionnaire design, it has led to some recommendations that are envisioned to assist the advancement of OHSMS in the construction sector.

- Auditing, OHS policies, physical workplace setting, worksite inspection and housekeeping were the important factors that need to be considered by the organization regarding safe place strategies to improve OHSMS in the construction industry.
- Training. pre-employment screening, worker involvement, personal protection equipment and health surveillance were the important factors that need to be considered by the organization regarding safe person strategies to improve OHSMS in the construction industry.
- It is suggested that irrespective of education level, social group, gender or race all workers should be cared about by the organization by providing slandered support systems to potentially avoid exposure to OHS risks. Support systems to reinforce these high standards must be dependable, consistent and applied to all workers.
- High stress in the organization should provide more protection for workers by the management; they have more control to demand higher OHS standards without the threat of jeopardizing their careers. This workplace provision must care about the contract basis and casual employees especially.
- The organization need to include the worker representatives while making decisions regarding health and safety policy and practice implementation. The management needs to conduct meetings regarding health and safety democratically by accepting workers' opinions and suggestions.
- Every organization should develop policies regarding health and safety practices annually and they should redesign according to the needs.

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