IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

Determinants of non-compliance to occupational safety and health (OSH) requirements at construction sites : A conceptual framework

Asrul Akmal Bin Mohd Sarjudin
Doctoral candidate
Faculty of Business and Management,
Open University Malaysia (OUM), Selangor, Malaysia
asrulakmal@oum.edu.my

Santhi Raghavan
Professor
Open University Malaysia (OUM), Selangor, Malaysia

Abstract : This paper aims to investigate the underlying factors contributing to non-compliance with OSH requirements at construction sites. Non-compliance often stems from a combination of lack of management commitment, poor employee involvement, improper usage of personal protective equipment (PPE), and improper training and education. Lack of management commitment contributed by improper planning, lack of supervision, and poor enforcement of safety compliance lead workers to perceive safety measures as optional. Poor employee involvement is often contributed by factors such as overconfidence, complacency, or deadline pressure, resulting in the neglect of safety procedures. The improper usage of PPE, whether due to unavailability, discomfort, or misunderstanding, further exacerbates non-compliance. Improper training and education leave workers unprepared to handle safety procedures effectively. This study will propose how decision-making mediates antecedent factors such as lack of management commitment, poor employee involvement, improper usage of personal protective equipment (PPE), and improper training and education, contributing to OSH non-compliance and increasing the likelihood of accidents, injuries, property damage, and environmental harm, thereby endangering the well-being of workers and the community.

***IndexTerms* - non-compliance; construction industry; workplace accident; OSH requirements**

INTRODUCTION

Non-compliance with Occupational Safety and Health (OSH) requirements undermines employee well-being and organizational integrity. It is a type of human unsafe act, defined as deviations from safe procedures, standards, or rules (Lawton, 1998; Reason, 1990). Non-compliance can lead to higher workplace injuries and illnesses, resulting in financial burdens for employers (Robson et al., 2007), including repair or replacement costs (Othman, 2012), and can damage a company's public image, affecting financial growth and reputation (Othman, 2012).

Accidents in construction are common and often result from failing to adhere to Occupational Safety and Health (OSH) requirements, leading to severe repercussions. Hazards include falls, machinery injuries, falling objects, electric shocks, demolition accidents, collapses, and crane incidents (Hughes & Ferrett, 2005). Non-compliance with OSH regulations significantly contribute to these accidents. Construction companies must prioritize OSH compliance by providing safety training, ensuring equipment meets standards, and implementing strict supervision to reduce accidents, protect workers, and create a safer work environment. Construction sites are hazardous, with risks including falls, machinery accidents, and exposure to harmful substances. Safety issues persist due to insufficient employee participation despite strict regulations. The construction sector is vital for national development and economic growth, being a major and rapidly expanding industry globally and a key contributor to Malaysia's economy.

2.0 Problems of non-compliance to OSH at the construction site leading to construction accidents

In 2023, the Malaysian construction industry experienced 45 cases of work-related deaths, which accounted for 32% of the total work-related deaths across various sectors. This represents a slight decrease from the 59 cases (32%) reported in 2022 and a reduction from 65 cases (37%) in 2021. However, it is a notable increase compared to the 58 deaths (27%) recorded in 2020 and remains a significant figure compared to the 84 deaths (32%) in 2019. These statistics highlight a persistent and concerning trend of fatal accidents in the construction industry despite ongoing efforts to improve safety. One of the most prevalent forms of non-compliance with the Occupational Safety and Health Act (OSHA) 1994 involves employers failing to provide a safe work environment and neglecting to report accidents as required. OSHA 1994 establishes several general duties for employees to ensure safety at the workplace. These duties include taking reasonable care for their own safety and health, as well as that of others, cooperating with their employer or any other person to maintain safety, wearing or using protective equipment or clothing provided for their protection, and complying with any safety instructions or measures instituted by their employer or others under the Act. Despite these clear regulations, non-compliance continues to be a significant issue.

The failure to adhere to these requirements often results in unsafe acts and conditions on construction sites. For example, when employers do not enforce safety measures or fail to report accidents, workers are exposed to higher risks of injury or death. Additionally, when employees do not follow safety protocols or use the provided protective equipment, it further exacerbates the risks of accidents and unsafe working conditions. Numerous studies have been conducted to identify the factors contributing to accidents among construction workers, but the frequency of such incidents remains high. Research indicates that the combination of inadequate safety practices, non-compliance with regulations, and insufficient training continues to drive up the rate of workplace accidents. This ongoing problem underscores the need for stricter enforcement of OSH regulations and more effective safety training programs to address the root causes of these accidents.

2.1 Lack of management commitment

Othman (2012) identified several significant reasons for non-compliance with safety and health regulations on construction sites. These reasons include insufficient management commitment, ineffective leadership from safety officers, and a lack of awareness among management and clients about the importance of safety practices. Supervisors often fail to enforce safety procedures, such as the correct use of personal protective equipment (PPE), and the improper selection of subcontractors without adequate criteria also negatively affects safety and health outcomes. Tam et al. (2004) further identified factors contributing to non-compliance in construction safety, including poor safety awareness among senior leaders, insufficient training, reluctance to allocate resources for safety, and careless operations. Their research highlighted issues such as inadequate provision of PPE, inconsistent safety meetings, and flaws in safety training programs, pointing to systemic problems in the construction industry that compromise worker safety.

Management commitment plays a crucial role in the effectiveness of safety programs. According to Garnica and Barriga (2018), poor communication between managers and workers can lead to inferior workmanship, accidents, project delays, and inaccurate reporting. Effective safety management requires that all levels of management demonstrate a unified approach to safety and integrate it into strategic decision-making processes. Alam et al. (2020) emphasized that management's commitment to safety should be demonstrated through both actions and statements, such as creating a safety policy statement. A lack of commitment may result in minimal financial investment in safety, as Bakri et al. (2006) observed that contractors often prioritize time and cost over safety, increasing the risk of accidents.

Neal, Griffin, and Hart (2000) proposed that employees' perceptions of broader organizational factors help assess management's commitment to safety. When employees perceive their organization as supportive of their well-being, they are more likely to view safety as a priority. Job resources, like training, improve employees' safety knowledge and compliance, as confirmed by Neal et al. (2000) and Larsson, Pousette, and Torner (2008). Barling, Loughlin, and Kelloway (2002) suggested that increased job demands might cause workers to perceive safety as less important. Their research showed that high job demands can lead to a belief that management prioritizes productivity over safety. Ford and Tetrick (2008) propose that creating a safety-oriented work environment can encourage employees to engage in safety-promoting behaviors, while Bakker and Demerouti (2007) argue that job resources can motivate employees to maintain safety.

Snyder et al. (2008) found that giving employees more autonomy over safety-related issues can help reduce injuries. In contrast, high job demands can lead to decreased safety priorities, as noted by Hockey & Earle (2006), who found that increased effort to achieve goals can also reduce minor errors. A common issue in organizational settings is the tendency to prioritize productivity over safety, even when both are claimed to be valued (Ford & Tetrick, 2008; Reason, 1990). This is often seen through practices that favor speed over safety, insufficient resources for safety measures, and rewarding productivity at the expense of safety (Flin et al., 2000). Balancing productivity and safety are essential for maintaining a safe work environment (Flin et al., 2000). Research by Paoli and Merllie (2001) found that fast-paced work environments with tight deadlines increase injury risks, while Zohar (2000) linked heavy workloads to minor accidents. Lawton (1998) and Hofmann and Stetzer (1996) also found that time pressure and high workloads lead to safety rule violations and unsafe behaviors.

In the construction industry, Skeepers and Mbohwa (2015) found that management commitment positively affects safety performance. They highlighted that strong safety leadership, effective communication, and a well-established safety culture are vital for improving safety performance. Wei et al. (2018) and Kadiri et al. (2014) showed that leadership commitment to safety is crucial for preventing accidents. Zulkifle & Hanafi (2017) and Bhole (2016) identified inadequate supervision as a major factor in construction site accidents. This problem often arises from using unqualified personnel in supervisory roles and a general lack of dedication to effective supervision practices. Addressing inadequate supervision requires both appointing qualified supervisors and fostering a culture of proactive supervision.

Mouleeswaran (2014) pointed out that gaps in safety promotion and the lack of structured safety management systems are significant challenges. Effective safety management requires proactive efforts to raise safety awareness and clear protocols for managing safety risks. Durdyev et al. (2017) concluded that top management must take a more proactive role in safety by allocating adequate financial resources for safety improvements. Such a commitment promotes a safety culture and supports the implementation of effective safety measures, ultimately reducing workplace accidents and injuries.

2.2 Poor employee involvement

Griffin and Neal (2000) differentiated between two distinct types of safety behaviors: safety participation and safety compliance. Safety participation refers to employees' voluntary engagement in activities aimed at fostering a supportive safety environment, such as voicing safety concerns (Mullen, 2005), promoting safety initiatives within the organization (Cree and Kelloway, 1997), and voluntarily attending safety meetings (Griffin and Neal, 2000). In contrast, safety compliance involves adhering to fundamental safety duties and following established safety protocols and norms at work (Griffin and Neal, 2000). Employee involvement reflects the level of commitment and connection employees have towards their jobs and the organization. Engaged employees show a genuine interest in achieving the company's goals and inspire their colleagues to excel. This engagement is characterized by a strong emotional attachment to their work and workplace, going beyond merely meeting job requirements to consistently delivering their best (Kahn, 1990). Engaged employees demonstrate increased productivity and a positive attitude toward their work.

Employee engagement is vital for gaining a competitive edge. Baumruk (2004) highlighted its significance as a primary indicator of a company's strength. Kahn (1990) initially introduced the concept of engagement as a profound connection between employees and their work, both physically and emotionally. Kahn identified three essential elements of engagement: meaningful work, a safe work environment, and minimal distractions. Buckingham and Coffman (1999) also emphasized that aligning the right individuals with suitable roles under effective management is key to fostering engagement. Work engagement is defined by Schaufeli and Bakker (2010) as the level of energy employees invest in their jobs, reflecting high levels of involvement and care. Fleming and Asplund (2007) elaborated that engagement encompasses more than just a mental and emotional connection; it includes a strong desire to perform at best. Saks (2006) extended Kahn’s concept by incorporating employees' perceptions of their job and organization, emphasizing the role of job nature, perceived support, reward systems, and fairness in fostering engagement.

Joshi and Sodhi (2011) noted that factors such as stimulating work, fair compensation, work-life balance, support from management, career growth opportunities, and positive team relationships are crucial for maintaining executive engagement. The work environment plays a significant role in engagement, as research by Miles (2001) and Harter et al. (2002) shows that supportive environments with positive feedback and growth opportunities enhance job connection and organizational commitment. Effective leadership is also essential for employee engagement. Walumbwa et al. (2008) suggested that good leaders exhibit self-awareness, fairness, transparency, and high moral standards. Wallace and Trinka (2009) demonstrated that inspiring leadership fosters engagement through appreciation and the importance of employees' work. Authentic leadership, as described by Schneider et al. (2009), promotes involvement, satisfaction, and enthusiasm.

Positive relationships with coworkers contribute significantly to employee engagement. Kahn (1990) observed that supportive and trusting relationships within teams enhance engagement. May et al. (2004) suggested that supportive colleagues add meaning to work, further boosting engagement. Training and career development are vital for engagement, as they improve skills and boost confidence (Paradise, 2008). Alderfer (1972) compared growth opportunities to rewards, emphasizing their importance for realizing employees' potential. Compensation, both monetary and non-monetary, is a significant engagement factor. Saks and Rotman (2006) found that recognition and rewards are crucial for maintaining high engagement levels. Kahn (1990) also stressed that employees' perceptions of rewards affect their engagement, whether the rewards are financial or otherwise. Fair organizational policies and procedures, such as equitable recruitment and flexible schedules, also contribute to engagement (Schneider et al., 2009; Richman et al., 2008).

Workplace well-being is a key determinant of engagement. Rath and Harter (2010) defined well-being as the overall perception of one's life experiences. The Towers Perrin Talent Report (2003) and Gallup's data indicate that senior management’s focus on well-being significantly affects engagement levels. The demand for dedicated employees who work efficiently with minimal supervision is growing, as strategic group membership and collective behaviors are essential for firm profitability and effectiveness (Caves and Porter, 1977; Porter, 1979). Cultures that foster strong employee participation promote ownership and responsibility, leading to increased commitment and autonomy (Denison, 1990).

2.3 Improper training and education

Training is an essential element that profoundly influences both employee productivity and safety, particularly in high-risk industries like construction. Effective training is not merely a supplementary activity but a fundamental component of employee development that significantly enhances job performance and safety outcomes. According to Putri et al. (2020), training serves as a critical tool for employees to learn the correct procedures for task execution and to minimize or prevent errors. This process of learning ensures that employees are not only performing their tasks correctly but also actively avoiding common mistakes, which in turn boosts productivity. Djibran (2020) reinforces this perspective by showing that training, when combined with work motivation, has a beneficial and substantial influence on employee performance. The study reveals that comprehensive training programs improve employees' knowledge and skills, which leads to enhanced job satisfaction, inner happiness, and positive feedback, all of which contribute to better performance in the workplace. Halawi (2018) supports this view, noting that training enables employees to achieve a sense of personal fulfillment, produce high-quality work, and pursue career advancement opportunities. This approach aligns with Cavazza's (2010) findings, which indicate a favorable relationship between staff training and safety performance in Italy, underscoring that targeted training interventions can lead to significant improvements in safety practices and outcomes.

In the context of the construction industry, the importance of training extends beyond mere productivity enhancements to encompass crucial safety considerations. Hughes and Ferrett (2007) argue that training must be a fundamental part of the instruction provided to all construction workers, with a particular focus on safety protocols and procedures. The dynamic and hazardous nature of construction environments requires that training programs are not only comprehensive but also adaptable to evolving conditions and emerging risks. Choudhry and Fang (2008) further illustrate that the complexity of construction sites, characterized by diverse tasks, multiple stakeholders, and varying levels of worker experience, necessitates robust and ongoing training efforts. Their research highlights that effective training is integral to managing the risks associated with these environments, thereby reducing the likelihood of accidents and enhancing overall safety performance.

Improper training and education, on the other hand, can lead to severe safety issues and increased accident rates. Gibb et al. (2001) emphasize that without proper training, workers may lack the essential knowledge and skills required to navigate the hazards present on construction sites. For example, workers might be unfamiliar with the correct operation of heavy machinery, the handling of hazardous materials, or the effective use of safety equipment. This deficiency can lead to critical errors, such as improper lifting techniques, inadequate scaffolding, or negligence in electrical safety, which significantly increase the risk of accidents. Chen and Wu (2010) extend this argument by demonstrating that insufficient training in safety and health knowledge often results in workers being unable to predict potential risks or respond effectively to hazardous situations. Workers lacking this training may become complacent, failing to recognize or act upon safety hazards, which exacerbates the risk of workplace accidents.

Training that includes a focus on Personal Protective Equipment (PPE) is also crucial for maintaining safety on construction sites. Mosly (2015) argues that awareness of PPE usage among all key stakeholders is essential for promoting a safer work environment. This view is supported by Al-Khaburi and Amoudi (2018), who identify that a failure to provide adequate PPE and conduct regular inspections, combined with insufficient safety training, can lead to a lack of awareness about the importance of PPE among contractors. Effective training programs should therefore include comprehensive modules on the selection, usage, and maintenance of PPE to ensure that workers understand its importance and are able to use it correctly.

Beyond PPE, a deep understanding of risk management practices is essential for enhancing safety in construction environments. Mohamed et al. (2009) highlights that workers who possess a thorough comprehension of potential risks associated with their tasks are more likely to adopt precautionary measures and adhere to safety guidelines. Training programs should therefore focus on educating workers about risk assessment techniques, hazard identification, and the implementation of control measures. By fostering a thorough understanding of risk management, training helps workers to proactively mitigate hazards and maintain a safe working environment. Furthermore, adherence to safety rules is a critical component of effective training. Workers who are well-versed in safety regulations and guidelines demonstrate a commitment to maintaining safety standards, which helps to minimize the likelihood of accidents and injuries on the job site (Mohamed et al., 2009).

Comprehensive and ongoing training initiatives play a pivotal role in both enhancing employee productivity and ensuring workplace safety. Effective training programs address a range of critical areas including task execution, safety protocols, PPE usage, and risk management. These programs not only improve employees' technical skills and job performance but also foster a culture of safety and risk awareness. By investing in high-quality training and education, companies can achieve significant improvements in safety performance, reduce accident rates, and create a more productive and engaged workforce. This holistic approach to training not only benefits individual employees but also contributes to the overall success and sustainability of organizations operating in high-risk environments like construction (Putri et al., 2020; Djibran, 2020; Halawi, 2018; Cavazza, 2010; Hughes and Ferrett, 2007; Choudhry and Fang, 2008; Gibb et al., 2001).

2.4 Improper usage of personal protective equipment

Personal Protective Equipment (PPE) is an essential component of workplace safety, particularly in the high-risk construction industry, where it plays a crucial role in safeguarding workers against a variety of hazards. PPE encompasses a wide range of protective gear designed to mitigate risks related to hearing, eye protection, respiratory safety, skin protection, and essential clothing to minimize impact (Gunduz and Ahsan, 2018). Safety measures such as helmets, rescue belts, and lifelines are instrumental in protecting workers from serious injuries and fatalities on construction sites (Eberly, 2007). The selection and use of PPE must be tailored to the specific conditions of the construction environment, emphasizing the need for appropriate training and education for workers to utilize this equipment effectively (Choudhry and Fang, 2008). For instance, protective headgear, one of the oldest and most frequently used forms of PPE, defends against impacts, penetration, and shock absorption, crucial for preventing head injuries from falling objects or collisions on construction sites (Eberly, 2007). Respiratory protection is also a critical aspect of PPE, addressing the risks of occupational diseases due to exposure to dust, fumes, gases, and vapors (Eberly, 2007). Furthermore, arm and hand protection through safety gloves shields workers from blisters, wounds, electrical shocks, and chemical exposures (Izudi et al., 2017), while ear protection safeguards against high noise levels that can lead to hearing loss (Suddin et al., 2015). Eye and face protection is vital for preventing serious injuries from hazards like molten metal, chemical splashes, and flying debris (Izudi et al., 2017).

Despite the availability of PPE, its effectiveness is limited and cannot fully eliminate all hazards present at construction sites (Suddin et al., 2015). The proper selection and maintenance of PPE are critical, as is ensuring that workers are adequately trained in its use (Choudhry and Fang, 2008). Historically, the evolution of PPE such as hard hats has demonstrated the advancement of protective technologies from simple tar-coated hats to modern helmets capable of withstanding significant impacts (Eberly, 2007). Today, PPE remains a final line of defense against workplace hazards, complementing other safety measures like engineering controls and administrative procedures (Ganesh and Krishnan, 2016). Effective safety management systems, which include PPE, must be supported by rigorous enforcement of health and safety regulations and ongoing worker education (Jannadi, 1996; Tam et al., 2004).

A significant factor affecting PPE usage is workers' attitudes and behaviors towards safety practices. Research highlights that despite high levels of understanding regarding PPE's importance, actual compliance is often low due to factors like discomfort, perceived ineffectiveness, or negligence (Husna et al., 2019; Tan and Razak, 2014). For example, a study by Fatimah et al. (2019) underscores that raising awareness and ensuring compliance through effective safety training can help mitigate accidents and promote a safer work environment. Additionally, findings from Boakye et al. (2022) reveal that while safety boots are commonly used, there are barriers to PPE use such as inadequate provision and poor maintenance, which undermine its effectiveness. The study recommends that safety training be enhanced to address these barriers and promote better PPE adherence. Furthermore, the role of safety communicators in influencing PPE usage through persuasive techniques has been emphasized, with Syahrodzi and Widati (2016) showing that credibility and effective communication are essential for encouraging compliance among construction workers.

The construction sector is notoriously hazardous, with fatality rates significantly higher than in many other industries (Sousa et al., 2014). Although PPE is a critical component of safety strategies, its effectiveness is contingent upon correct usage and adherence to safety protocols. Historical and contemporary studies underscore that PPE, while not a panacea for all workplace hazards, is vital for protecting workers from severe injuries (Levitt and Samelson, 1993; Rowlinson, 2004). Comprehensive safety management systems that include proper PPE usage, effective training, and consistent enforcement of regulations are essential for improving safety outcomes on construction sites (Gambatese and Hinze, 1999; Farooqui et al., 2007). Moreover, as demonstrated by Tannor et al. (2022), ensuring that PPE is provided, used correctly, and maintained is crucial for reducing accidents and promoting a safe working environment in the construction industry. The ongoing challenge of achieving high compliance rates reflects the need for continuous improvement in safety practices and management strategies to enhance the effectiveness of PPE and overall workplace safety (Zhao et al., 2015; Husna and Azise, 2020).

2.5 Decision-making in relation to Occupational Safety and Health (OSH) requirements

Decision-making in relation to Occupational Safety and Health (OSH) requirements is critical for ensuring safety and compliance on construction sites. This decision-making process involves various levels of construction personnel, each with specific responsibilities and roles in maintaining workplace safety. Understanding how different levels of personnel contribute to OSH decision-making can help in developing comprehensive safety strategies and improving overall safety performance on construction sites. This discussion will explore the decision-making responsibilities of different levels of construction personnel, from top management to frontline workers, and the impact of their decisions on OSH outcomes.

Decision-making is a multifaceted process involving the identification, evaluation, and selection of options based on personal values, goals, and preferences. According to Harris (1998), the essence of decision-making lies in recognizing a range of alternatives and choosing the one that best meets our objectives and values. This process requires more than just logical analysis; it demands a careful consideration of ethical implications and the potential impact of decisions. Professionals often face complex ethical dilemmas where their decisions must balance technical expertise with moral judgments (Goldstein, 1987). Effective decision-making, therefore, is not merely about following logical steps but also involves using systematic methods and tools to guide judgments and minimize biases (Loewenberg & Dolgoff, 1996). Documenting the decision-making process is crucial, especially for legal scrutiny, but many professionals lack adequate training in ethical decision-making, highlighting the need for continuous education and support (Mattison, 1994).

The influence of peers plays a significant role in the decision-making processes of young individuals. Miller and Byrnes (1997) assert that when peers share similar goals, it facilitates the decision-maker's pursuit of their aspirations, creating a supportive environment with fewer distractions. However, conflicting goals among peers can introduce challenges and obstacles, potentially diverting attention from one's own objectives. This dynamic illustrates how peer relationships and shared goals can either bolster or hinder the decision-making efforts of young individuals. Although adults generally have more knowledge and experience, this does not always translate into better decision-making outcomes compared to adolescents. Research shows that knowledge about risks does not necessarily prevent risky behaviors among adolescents, and adults may struggle to apply their experience effectively in certain situations (Byrnes, 1998; DiClemente et al., 1995).

Age-related differences in decision-making reveal that while older individuals often utilize superior memory and decision-making strategies for complex tasks, they do not always excel in simpler decisions or equally familiar scenarios (Bjorklund, 2000). Cognitive biases and heuristics are employed by both children and adults, though older individuals might develop more sophisticated methods to counteract these biases (Kahneman et al., 1982; Baron et al., 1993). Cultural factors also significantly impact decision-making, as norms about individualism versus collectivism shape how decisions are approached and how advice is sought (Chentsova & Vaughn, 2012; Savani et al., 2011). These cultural dimensions affect how people perceive opportunities, threats, and make decisions, indicating that decision-making processes are influenced by a blend of cognitive, cultural, and social factors.

The maximin method, a strategic approach to decision-making, aims to improve outcomes by focusing on the least favorable criteria among options to mitigate risks (Linkov et al., 2004). While this method can be effective in reducing potential negative outcomes, it requires that all criteria be comparable and measurable, which can be a significant limitation in complex scenarios. Fulop (2005) highlights that the evolution of decision-making theories acknowledges both cognitive biases and emotional influences on decisions, moving away from purely rational models (March, 1994). Real-world examples, such as the BP oil spill disaster, demonstrate how overconfidence and negligence in risk management can lead to catastrophic outcomes, underscoring the need for effective risk management and regulatory oversight (Achenbach, 2010; Burdeau & Mohr, 2010). This disaster exemplifies the importance of rigorous safety measures and accountability in decision-making processes.

In decision-making, a structured approach to evaluating and adapting choices is crucial. Baker et al. (2002) emphasize that effective decision-making begins with identifying affected parties, setting goals, and exploring options through methods like pros and cons analysis and multiple criteria optimization (Nemhauser et al., 1989; Steuer, 1986). This iterative process involves continuous reassessment of decisions, adjusting strategies based on outcomes, and learning from past experiences (Hicks, 2005; Kepner & Tregoe, 2005). Decision-making is not a one-time event but an ongoing process of improvement and adaptation (Orasanu & Connoly, 1993). Additionally, post-decision surprises highlight that even well-thought-out decisions can lead to unexpected outcomes, emphasizing the inherent uncertainties in predicting decision results (Harrison & March, 1984). Understanding these dynamics helps decision-makers navigate complex choices and refine their approaches for future decisions.

2.5 Proposed Research Framework and Hypothesis

Figure 1 depicts the proposed research framework of the study between lack of management commitment, poor employee involvement, improper usage of personal protective equipment (PPE), and improper training and education, decision-making and non-compliance to OSH requirements. Moreover, the study's hypotheses were listed below;

Hypothesis 1: Lack of management commitment, poor employee involvement, improper training and education, improper usage of personal protective equipment will influence non-compliance to OSH requirements.

Hypothesis 2: Lack of management commitment, poor employee involvement, improper training and education, improper usage of personal protective equipment will influence decision-making.

Hypothesis 3: Decision-making mediates the relationship between lack of management commitment, poor employee involvement, improper training and education, improper usage of personal protective equipment and non-compliance to OSH requirements.

Hypothesis 4: Decision-making will influence non-compliance to OSH requirements.

In mediation analysis, researcher's goal is to test if there is any statistical significance for the indirect effect and estimate the point effect using the Unstandardized Coefficient Beta and Standard Error for indirect paths A and B, see figure 1 for proposed framework determinants of non-compliance to Occupational Safety and Health (OSH) requirements.

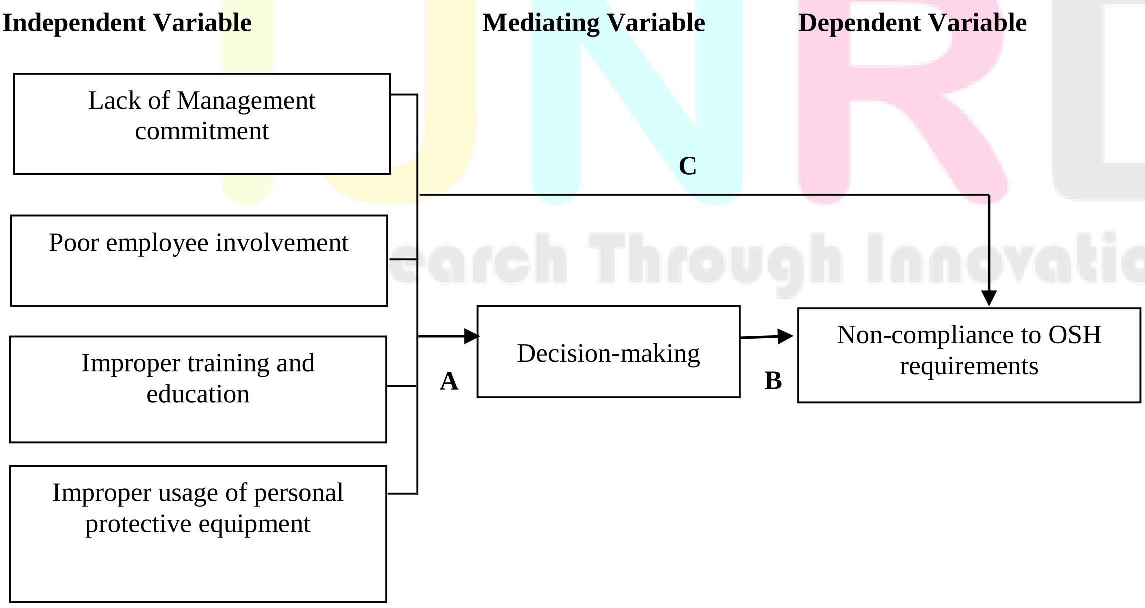

Figure 1: Proposed framework determinants of non-compliance to Occupational Safety and Health (OSH) requirements

3.0 Conclusion

This proposed study aims to comprehensively investigate the mediating role of decision-making in influencing key antecedent factors, including lack of management commitment, poor employee involvement, improper usage of personal protective equipment (PPE), and improper training and education. By exploring how these factors interplay and contribute to occupational safety and health (OSH) non-compliance, the study seeks to uncover critical insights into the underlying mechanisms driving OSH failures. Understanding these dynamics is essential, as OSH non-compliance significantly heightens the risk of accidents, injuries, property damage, and environmental harm. Consequently, these risks pose substantial threats to the well-being of workers and the broader community. The findings from this study are expected to inform targeted interventions and policy recommendations, ultimately fostering safer and more compliant workplace environments.

REFERENCES

[1] Achenbach, J. (2010, May 10). Cascade of mishaps caused oil spill 'Chernobyl'. Toronto Star. Available online at http://www.thestar.com/news/world/article/807138–cascade-ofmishaps-caused-oil-spill-chernobyl

[2] Alam, S., Bashar, A., Hoque, A., & Ridwan Chowdhury, S. (2020). Factors Affecting Occupational Injury and Death: Insights from Ready-Made Garments Industry of Bangladesh. June. https://www.researchgate.net/publication/341997552

[3] Alderfer, C.P. (1972), Human Needs in Organisational Settings, Free Press of Glencoe, New York,NY

[4] Al-Khaburi, S., & Amoudi, O. (2018). Analysis of accident causes at construction sites in Oman. Jordan Journal of Civil Engineering, 12(2), 279-295

[5] Bakker, A. B., & Demerouti, E. (2008). Towards a model of work engagement. Career Development International, 13, 209-223. Available online at http://dx.doi.org/10.1108/13620430810870476

[6] Bakri, A.; Zin, R.M.; Misnan, M.S.; Mohammed, A.H. Occupational safety and health (OSH) management systems: Towards development of safety and health culture. In Proceedings of the 6th Asia-Pacific Structural Engineering and Construction Conference, Kuala Lumpur, Malaysia, 5–6 September 2006; pp. 19–28.

[7] Barling, J., Kelloway, E. K., & Iverson, R. D. (2003). High-quality jobs, job satisfaction and occupational safety. Journal of Applied Psychology, 88, 276–283.

[8] Baron J, Granato L, Spranca M, (1993). Decision-making biases in children and early adolescents: Exploratory studies. Merrill Palmer Q 1993;39:22–46.

[9] Boakye, M. K., Adanu, S. K., Coffie, G. H., Adzivor, E. K., & Ayimah, J. C. (2022). Research article building construction artisans' level of access to personal protective equipment (PPE) and the perceived barriers and motivating factors of adherence to its use. Occup Hazards, 27(29), 37-43.

[10] Bhole, S.A. (2016) Safety Problems and Injuries on Construction Site: A Review. Int. J. Eng. Tech. 2016, 2, 24–35. Available online at [https://oaji.net/articles/2017/1992-1514473699.pdf]

[11] Buckingham, M. and Coffman, C. (1999), First, Break All the Rules: What the World's Greatest Managers Do Differently, The Gallup Organization, Simon and Schuster, New York, NY.

[12] Burdeau, C., & Mohr, H. (2010, May 1). Document: BP did not plan for major oil spill. Businessweek. Available online at http://www.businessweek.com/ap/financialnews/ D9FDULS81.htm>

[13] Byrnes JP. (1998) The Nature and Development of Decision-Making: A Self-Regulation Model. Mahwah, NJ: Erlbaum, 1998.

[14] Byrnes JP, Torney-Purta J. Naive theories and decision-making as part of higher order thinking in social studies. Theory Res Soc Educ 1995;23:260–77.

[16] Cavazza, N. (2010). The impact of safety training programs on workers ' psychosocial orientation and behaviour. Revue Internationale de Psychologie Sociale (2010) 23(2-3) 187-210.

[17] Caves, R.E. and Porter, M.E. (1977), "From entry business: conjectural decisions and contrived deterrence to new competition", Quarterly Journal of Economics, Vol. 91 No. 2, pp. 241-262.

[18] Chen Z., and Wu, Y., (2010) Explaining the causes of construction accidents and recommended solutions, Proc. of the International Conference on Management and Service Science, 1-5.

[19] Chentsova-Dutton, Y. E., & Vaughn, A. (2012). Let me tell you what to do: Cultural differences in advice-giving. Journal of Cross-Cultural Psychology, 43(5), 687–703. http://dx.doi.org/10.1177/0022022111402343.

[20] Cree, T., Kelloway, K.E., 1997. Responses to occupational hazards: exit and participation. Journal of Occupational Health Psychology 2, 304–311.

[21] Denison, D.R. (1990), Corporate Culture and Organizational Effectiveness, Wiley, New York, NY.

[22] Denison, D.R. (2007), "Denison model for organizational culture", Denison Consulting, Ann Arbor, MI, Zurich and Shanghai.

[23] Denison, D.R. and Mishra, A.K. (1995), "Toward a theory of organizational culture and effectiveness", Organization Science, Vol. 62, pp. 204-223.

[24] DiClemente RJ, Hanson WB, Ponton LE. (1995). Handbook of Adolescent Health Risk Behaviour. New York: Plenum, 1995.

[25] Djibran, M. (2020). The Effect of Job Training, Work Motivation, and Health and Work Safety on Employee Performance at Pt. Bank Negara Indonesia. SSRN Electronic Journal, 1–17. *https://doi.org/10.2139/ssrn.3603088*

[26] Durdyev, S., Mohamed, S., Lay, M. L., & Ismail, S. (2017). Key factors affecting construction safety performance in developing countries: Evidence from Cambodia. Construction Economics and Building, 17(4), 48–65. Available online at [https://doi.org/10.5130/AJCEB.v17i4.5596]

[27] Eberly, A., "An Evaluation of Personal Protective Equipment Used with Local Public Health Employees," Local Public Heal. Employees, no. 2007, pp. 1–73, 2007.

[28] Farooqui, Rizwan U., Ahmed, Syed M. and Azhar, Salman (2007). "Safety Management Practices in the Florida Construction Industry." Proceedings of the Associated Schools of construction (ASC) 43rd International Conference, Flagstaff, Arizona, USA, April 11-14, 2007.

[29] Ford, M. T., & Tetrick, L. E. (2008). Safety motivation and human resource management in North America. The International Journal of Human Resource Management,19, 1472–1485.

[30] Ford, R.C. and Fottler, M.D. (1995), "Empowerment: a matter of degree", Academy of Management Executive, Vol. 9 No. 3, pp. 21-31.

[31] Fleming, J.H. and Asplund, J. (2007), Human sigma, Gallup Press, New York, NY

[32] Flin, R., Mearns, K., O'Connor, P., & Bryden, R. (2000). Measuring safety climate: Measuring the common themes. Safety Science, 34, 177–192.

[33] Fulop, J. (2005). Introduction to decision making methods. In BDEI-3 workshop, Washington (pp. 1-15).

[34] Gambatese, J., and Hinze, J. (1999). Addressing construction worker safety in the design phase: Designing for construction worker safety. Automat. Construct. 8, 643–649. doi: 10.1016/S0926-5805(98)00109-5

[35] Ganesh, C. S. and Krishnan, R.,(2016)"A review of occupational injury research in Malaysia," Med. J. Malaysia, vol. 71, no. June, pp. 100–104, 2016.

[36] Garnica, Guilherme & Barriga, Gladys. (2018). Barriers to occupational health and safety management in small Brazilian enterprises. Production. 28. 10.1590/0103-6513.20170046.

[37] Gibb,A., S. Hide, S., Haslam, R., Hastings, S., Suraji. A., and Duff, A., Identifying root causes of construction accidents, (2001) Journal of Construction Engineering and Management, 127, 348-349.

[38] Goldstein, H. (1987). The neglected moral link in social work practice. Social Work, 32, 181–186.

[39] Griffin, M. A., & Neal, A. (2000). Perceptions of safety at work: a framework for linking safety climate to safety performance, knowledge, and motivation. Journal of Occupational Health Psychology, 5, 347–358.

[40] Gunduz, M., and Ahsan, B. (2018), "Construction safety factors assessment through Frequency Adjusted Importance Index," Int. J. Ind. Ergon., vol. 64, pp. 155–162, 2018.

[41] Halawi, A. H. (2018). Effects of Training on Employee Performance. International Humanities Studies. Vol. 5(2), June 2018 ISSN 2311-7796

[42] Harrison, J. R., & March, J. G. (1984). Decision making and post decision surprises. Administrative Science Quarterly, 26-42.

[43] Harter, J.K., Schmidt, F.L. and Keyes, C.L. (2002), "Well-being in the workplace and its relationship to business outcomes: a review of the Gallup studies", in Keyes, C.L. and Haidt, J. (Eds), Flourishing: The Positive Person and the Good Life, American Psychological Association, Washington, DC, pp. 205-224.

[44] Harter, J. K., Schmidt, F. L., Killham, E. A., & Asplund, J. W. (2006). Q12 Meta-Analysis. Retrieved from http://strengths.gallup.com/private/Resources/Q12Meta-Analysis_Flyer_GEN_08%2008_BP.Pdf

[45] Harris, R. (1998) Introduction to Decision Making, Available online at VirtualSalt. http://www.virtualsalt.com/crebook5.htm

[46] Hicks, M. J. (2005). Problem solving and decision making: Hard, soft, and creative approaches. Belmont, CA: Cengage Learning.

[47] Hockey, G. R. J., & Earle, F. (2006). Control over the scheduling of simulated office work reduces the impact of workload on mental fatigue and task performance. Journal of Experimental Psychology: Applied,12, 50 – 65.

[48] Hofmann, D. A., & Stetzer, A. (1996). A cross-level investigation of factors influencing unsafe behaviors and accidents. Personnel Psychology, 49, 307–339.

[49] Hofmann, D.A., Morgeson, F.P., 1999. Safety related behavior as a social exchange: the role of perceived organizational support and leader-member exchange. J. Appl. Psychol. 84 (2), 286–296.

[50] Hughes, P., & Ferrett, E. (2005). Introduction to health and safety at work (2nd ed.). Oxford: Elsevier

[51] Husna,I., Wisnu Handoko,W, Sarifudin, Wijinurhayati,A., (2019)- Effectiveness of the Use of Personal Protective Equipment (Ppe) by Cadet on Board, Proceedings of the 11th Asia Pacific Transportation and the Environment Conference (APTE 2018), Atlantis Press, Page 156- 159 SN - 2352-5401, URL - https://doi.org/10.2991/apte-18.2019.31

[52] Husna, I., & Azise, A. (2020, February). The use of personal protective equipment for reducing accidental risk on board. In 2nd International Symposium on Transportation Studies in Developing Countries (ISTSDC 2019) (pp. 147-150). Atlantis Press.

[53] Izudi, J., Ninsiima,V., and Alege, J. B., (2017) "Use of Personal Protective Equipment among Building Construction Workers in Kampala, Uganda," J. Environ. Public Health, vol. 2017.

[54] Jannadi, M. O., (1996) "Factors affecting the safety of the construction industry," Build. Res. Inf., vol. 24, no. 2, pp. 108–112, 1996.

[55] Joshi, R.J. and Sodhi, J.S. (2011), "Drivers of employee engagement in Indian organizations",The Indian Journal of Industrial Relations, Vol. 47 No. 1, pp. 162-182.

[56] Kadiri, Z.O.; Nden, T.; Avre, G.K.; Oladipo, T.O.; Edom, A.; Samuel, P.O.; Ananso, G.N. (2014) Causes and effects of accidents on construction sites (A Case Study of Some Selected Construction Firms in Abuja, FCT Nigeria). Iosr J. Mech. Civ. Eng. 2014, 11, 66–72.

[57] Kahn, W.A. (1990), "Psychological conditions of personal engagement and disengagement at work", Academy of Management Journal, Vol. 33 No. 4, pp. 692-724.

[58] Kepner, C. H., & Tregoe, B. B. (2005). The new rational manager (rev. ed.). New York, NY: Kepner-Tregoe.

[59] Larsson, S., Pousette, A., & Torner, M. (2008). Psychological climate and safety in the construction industry mediated influence on safety behavior. Safety Science, 46, 405–412.

[60] Lawton, R. (1998). Not working to rule: Understanding procedural violations at work. Safety Science, 28(2), 77-95.

[61] Levitt, R. E., and Samelson, N. M. (1993). Construction safety management. New Jersey: John Wiley & Sons.

[62] Linkov, I., Varghese, A., Jamil, S., Seager, T.P., Kiker, G. and Bridges, T. (2004) ìMulti-criteria decision analysis: A framework for structuring remedial decisions at the contaminated sitesî, In: Linkov, I. and Ramadan, A.B. (Eds.) Comparative Risk Assessment and Environmental Decision Making, Springer, New York, pp. 15-54

[63] Loewenberg, F., & Dolgoff, R. (1996). Ethical decisions for social work practice (5th ed.). New York: F. E. Peacock.

[64] March JG. 1994. A Primer of Decision Making. New York: Free Press

[65] Mattison, M. (1994). Ethical decision making in social work practice, Columbia University, New York

[66] May, D.R., Gilson, R.L. and Harter, L.M. (2004), "The psychological conditions of meaningfulness, safety and availability and the engagement of the human spirit at work", Journal of Occupational and Organisational Psychology, Vol. 77 No. 1, pp. 11-37

[67] Miles, R.H. (2001), "Beyond the age of Dilbert: accelerating corporate transformations by rapidly engaging all employees", Organisational Dynamics, Vol. 29 No. 4, pp. 313-321.

[68] Miller DC, Byrnes JP. (1997). The role of personal and contextual factors in children's risk-taking. Dev Psychol 1997;33:814–23.

[69] Miller, D. C., & Byrnes, J. P. (2001). To achieve or not to achieve: A self-regulation perspective on adolescents' academic decision making. Journal of Educational Psychology, 93(4), 677. Online at *[https://doi.org/10.1037/0022-0663.93.4.677]*

[70] Mohamed S., Ali T,H., an. Tam W.Y.V, (2009), National culture and safe work behaviour of construction workers in Pakistan, Safety Science, 47, 29-35, (2009)

[71] Mosly, I. (2015). Safety performance in the construction industry of Saudi Arabia. International Journal of Construction Engineering and Management, 4(6), 238-247

[72] Mouleeswaran, K. (2014). Evaluation of safety performance level of construction firms in and around erode zone. Int. J. Innov. Res. Sci. Eng. Technol. 2014, 3, 1586–1594.

[73] Mullen, J., 2005. Testing a model of employee willingness to raise safety issues.Canadian Journal of Behavioural Science-Revue Canadienne Des Sciences Du Comportement 37 (4), 273–282.

[74] Neal, A., Griffin, M. A., & Hart, P. M. (2000). The impact of organizational climate on safety climate and individual behavior. Safety Science, 34, 99 –109.

[75] Nemhauser, G.L., Rinnoy Kan, A.H.G. and Todd, M.J. (1989) Handbooks in Operations Research and Management Science: Volume 1 Optimization, North-Holland, Amsterdam.

[76] Orasanu, J., & Connolly, T. (1993). The reinvention of decision making. Decision making in action: Models and methods, 1, 3-20.

[77] Othman, A. A. E. (2012). A study of the causes and effects of contractors' non-compliance with the health and safety regulations in the South African construction industry. Architectural Engineering and Design Management, 8(3), 180–191. https://doi.org/10.1080/17452007.2012.683242

[78] Paoli, P., & Merllie, D. (2001). Third European survey on working conditions 2000. European foundation for the improvement of living and working conditions, Luxembourg: Office for Official Publications of the European Communities.

[79] Paradise, A (2008), "Influences engagement", ASTD, Training and Development, Vol. 62 No. 1,pp. 54-59.

[80] Porter, M.E. (1979), "The structure within industries and companies performance", Review of Economic Statistics, Vol. 61 No. 2, pp. 214-227.

[81] Putri, K. D., Anisa, N., & Sinulingga, B. (2020). The Effect of Training and the Implementation of Occupational Health and Safety Systems on Employee Productivity of PT . PP . London Sumatra Indonesia Tbk Branch Office Medan. 1(1), 66–76.

[82] Rath, T. and Harter, J.K. (2010), Wellbeing: The Five Essential Elements, Gallup Press, New York,NY.

[83] Reason, J. T. (1990). Human Error. New York: Cambridge University Press.

[84] Richman, A.L., Civian, J.T., Shannon, L.L., Hill, E.J. and Brennan, R.T. (2008), "The relationship of perceived flexibility, supportive work-life policies and use of formal flexible arrangements and occasional flexibility to employee engagement and expected retention", Community, Work and Family, Vol. 11 No. 2, pp. 183-197

[85] Robson, LS, Clarke, JA, Cullen, K, Bielecky, A, Severn, C, Bigelow, PL, Irvin, E, Culyer, A & Mahood. (2007). The effectiveness of occupational health and safety management system interventions: a systematic review. Safety Science 45:329-353.

[86] Rowlinson, S. (2004). Construction safety management systems. United Kingdon: Routledge.

[87] Saks, A.M. (2006), "Antecedents and consequences of employee engagement", Journal of Managerial Psychology, Vol. 21 No. 6, pp. 600-619.

[88] Saks, A.M. and Rotman, J.L. (2006), "Antecedents and consequences of employee engagement", Journal of Managerial Psychology, Vol. 21 No. 7, pp. 600-619

[89] Savani, K., Morris, M. W., Naidu, N. V. R., Kumar, S., & Berlia, N. (2011). Cultural conditioning: Understanding interpersonal accommodation in India and the United States in terms of the modal characteristics of interpersonal influence situations. Journal of Personality and Social Psychology, 100(1), 84–102. http://dx. doi.org/10.1037/a0021083

[90] Schaufeli, W.B. and Bakker, A.B. (2010), "Defining and measuring work engagement: bringing clarity to the concept", in Bakker, A.B. and Leiter, M.P. (Eds), Work Engagement: A Handbook of Essential Theory and Research, Psychology Press, Hove, NY, pp. 10-24.

[91] Schneider, B., Macey, W.H. and Barbera, K.M. (2009), "Driving customer satisfaction and financial success through employee engagement", People and Strategy, Vol. 32 No. 2,pp. 23-27.

[92] Skeepers, N. C., & Mbohwa, C. (2015). A Study on the Leadership Behaviour, Safety Leadership and Safety Performance in the Construction Industry in South Africa. Procedia Manufacturing, 4(February 2016), 10–16. https://doi.org/10.1016/j.promfg.2015.11.008

[93] Snyder, L. A., Krauss, A. D., Chen, P. Y., Finlinson, S., &Huang, Y.-H. (2008). Occupational safety: Application of the job-demand-control-support model. Accident Analysis and Prevention, 40, 1713–1723.

Steuer, R. E. (1986) Multiple Criteria Optimization: Theory, Computation and Application, Wiley, New York.

[94] Stokdyk, (1994) No falling back, Building Magazine, June 3: 38-39

[95] Sousa, V., Almeida, N. M., & Dias, L. A. (2014). Risk-based management of occupational safety and health in the construction industry–Part 1: Background knowledge. Safety science, 66, 75-86.

[96] Suddin, K. S., Ani, M., Ismail,A., Ibrahim,M.,(2015) "Investigation the Safety, Health and Environment (SHE) Protection in Construction Area," Int. Res. J. Eng. Technol., vol. 2, no. 6, pp. 624–636.

[97] Syahrodzi, R., & Widati, S. (2016). The Influence of Safety Talk Communicators on Compliance with Personal Protective Equipment (PPE) Use in Construction Project. International Journal of Advanced Engineering, Management and Science, 2(6), 607-610.

[98] Tan, H. C., Ho, J. A., Kumarusamy, R., & Sambasivan, M. (2021). Measuring social desirability bias: Do the full and short versions of the Marlowe-Crowne Social Desirability scale matter? Journal of Empirical Research on Human Research Ethics, 155626462110460. https://doi.org/10.1177/15562646211046091

[99] Tan, C. K., & Razak, N. A. (2014). Case studies on the safety management at construction site. Journal of Sustainability Science and Management, 9(2), 90-108

[100] Tannor, O., Ofori-Darko, J., Alhassan, T., & Boadu, J. (2022). Compliance with welfare facilities and Personal Protective Equipment (PPE) requirements on construction sites in Ghana. Journal of Planning and Land Management, 2(2), 12-26.

[101] Towers Perrin Talent Report (2003),"Working today: understanding what drives employee engagement",available at: www.towersperrin.com/hrservices/webcache/towers/United_States/publications/Reports/Talent_Report_2003/Talent_2003.pdf

[102] Walumbwa, F.O., Avolio, B.J., Gardner, W.L., Wernsing, T.S. and Peterson, S.J. (2008), "Authentic leadership: development and validation of a theory-based measure", Journal of Management, Vol. 34 No. 1, pp. 89-126.

[103] Wallace, R. S. O., & Cooke, T. E. (1990). Nonresponse bias in mail accounting surveys: a pedagogical extension. The British Accounting Review, 22(3), 283- 288.

[104] Wallace, L. and Trinka, J. (2009), "Leadership and employee engagement", Public Management, Vol. 91 No. 5, pp. 10-13.

[105] Wei, T, Chao W., Shih T., Nai, H., (2018). The Impact of Safety Culture on Safety Performance: A Case Study of a Construction Company. The International Journal of Organizational Innovation Volume 11 Number 1 July 2018

[106] Zhao,D., McCoy,A.P., Kleiner,B.M., and Smith-Jackson,T.L., (2015) "Control measures of electrical hazards: an analysis of construction industry," Safety Science, vol. 77, pp. 143–151, 2015.

[107] Zhao, D., McCoy, A., Kleiner, B., Du, J., & Smith-Jackson, T. (2016). Decision-Making Chains in Electrical Safety for Construction Workers. Journal Of Construction Engineering And Management, 142(1), 04015055. *https://doi.org/10.1061/(asce)co.1943-7862.0001037*

[108] Zohar, D. (2000). A group-level model of safety climate:Testing the effect of group climate on microaccidents in manufacturing jobs. Journal of Applied Psychology, 85, 587–596.

[109] Zulkifle, Z.; Hanafi,W.N.W. (2017) - Impact of safety management practices enforcement toward employee safety in construction industry. Future academy. Eur. Proc. Soc. Behav. Sci. 2017, 1330–2357.