

Fatalities and their Root Causes in Pakistani Construction Industry

Mustafa Shabbir¹, Rizwan U. Farooqui¹, Muhammad Saqib¹

¹ NED University of Engineering & Technology, Karachi, Pakistan
mustafa.shabbir126@gmail.com

Abstract

The Pakistani Construction industry is known to be second hazardous industry after our agriculture industry; reputed highly for its peculiar high rate of injuries, fatalities and deaths on construction sites. ILO (International Labor Office) report such incidences and identifies the type of accidents and their impact on the Labor Safety policies as it estimates 25-40% of occupational fatalities (rounding upto 60,000 fatalities occur on construction sites in industrialized countries which takes place each year throughout the world (ILO, 2005). Similarly, a questionnaire survey was conducted to determine the multiple accidents occurring at construction sites where the data was collected from multiple stakeholders. This research identified multiple occupational accidents like burning, structural failures, falling from height, struck by heavy objects, electrocution from faulty tools and many more; occurring on construction sites with high impact within the Pakistan Construction industry.

Keywords

Fatalities, Root Causes, Labor Safety Policies, occupational hazards, high impact, Pakistan Construction industry.

1. Introduction

The importance of construction industry has been acknowledged by various studies as it plays an imperative part in affecting the financial advancement of any nation. However, it cannot be denied that this industry also one of the perilous business due to its high rate of fatalities, wounds, laborers pay expense and loss of work hours (Amjad, 2005; ADB-WB, 2005). This industry recorded most elevated mishaps on the planet when contrasted with other work escalated commercial ventures (Amjad, 2007). The laborers of this industry are presented to perils as there are various variables like getting slip, trip, struck by/ against heavy items, tumble from stature and electrical perils etc. which are well-known sorts of mishaps occurring at construction site (Amjad., 2007; ADB-WB, 2005), which are very hard to evaluate for various reasons nearly connected with the way development exercises are performed. That is the reason the accidents/ mishaps information is not at all recorded in multiple developing nations including Pakistan (PBC, 2007; PBC 1989).

The developing nations like Pakistan have yet to react to late mechanical enhancements (Yuan et al., 2018; Zou et al., 2010; Hameed, 2007; Kartam, 2001). The absence of reaction to innovation, on the other hand, has failed to bring any secure development destinations where a bigger offer of development work being performed by HR had prompted increased the amount of site mishaps (Yuan et al., 2018; Zou et al., 2010; Ebrat and Ghodsi, 2011). In Pakistan, around 6 to 7% work is straightforwardly appended with the development business (ADB-WB, 2005). Casual appraisals have recognized a couple of significant explanations behind security non-execution which include absence of improvement of development division fit as a fiddle industrialization (Ebrat and Ghodsi, 2011; Kartam, 2001), absence of expert development administration rehearses which has prompted risky task locales as well as brought about development deferrals (Yuan et al., 2018; Zou et al., 2010), expense invades (Yuan et al., 2018; Zou et al., 2010), poor profit (Hameed, 2007) and poor item and procedure quality (Hameed, 2007), deficient wellbeing procurements laid by the current administrative environment which has neglected to secure wellbeing as a real industry objective (Amjad., 2007), lacking and impetus less protection systems (Amjad, 2007; Amjad 2005) which have neglected to build security as a business survival issue and unfavorable business environment which has prompted ill-disposed business connections among partners bringing about debates, clashes, cases and prosecution and henceforth occupying the concentrate far from issues like security (Farooqui et al., 2008).

Work environment security is considered a complex phenomenon and the subject of mind and wellbeing execution in the development business is considerably far more perplexing (Farooqui et al., 2008). The specialists of

this industry are not only ones who experience the ill effects of a mishap (Sana, 2012), however, specifically or by implication the business, builder and general society by and large likewise endures (Sana, 2012). The monetary impacts of a mishap can be crushing, aside from human expense of misery. Mishaps at work spot happens either because of absence of information, or an absence of supervision, or an absence of intends to do the errand securely, or on the other hand, because of a slip of judgment, indiscretion, or aloofness (Sana, 2012). Studies have demonstrated that dangers can be controlled and mishaps can be anticipated through the execution of fundamental security works on prompting a sound wellbeing system (Yuan et al., 2018). Numerous development organizations as far and wide as possible are executing wellbeing and natural administration framework to decrease wounds, take out disease, and to give a safe workplace in their development locales.

Similarly, this research has been focused on accidents occurring since year 2000 A.D in the high-rise buildings and commercial projects which identify the occupational hazards in the industry along with their safety practices followed by the industry as the remedial measures taken to solve these problems.

2. Survey and Data Analysis

Consequently, a questionnaire survey was conducted comprising of multiple questions regarding major fatalities and their occurrence on construction site. Thus, this questionnaire was distributed among 75 experts out of whom 56 responded as shown in Table 1, which as a result, the rate of response is 74.67 percent. The types of project focused were mostly commercial and industrial, whereas the types of respondents were mostly Project Managers and Project Engineers. The Data was collected through ongoing/ completed construction projects in Karachi like Clifton Dolmen Mall, Ocean Tower Mall, Lucky One Mall, Opal Tower (Bahria Town), Telenor Greenfield (MSC), Crescent Bay (D.H.A Phase VIII), Aman IBA – CED, Lakhany Presidency-II, Residential Units (Shah Faisal Colony), Aisha Steel Mills, Afroz Textile Mill, Floating Jetty (Boat Basin), N.M.B Wharf (Keemari), Fixed Jetty (Keemari) and LPG Plant Installation (Karachi-Hyderabad Motorway).

Table 1. No. of Respondents and their Corresponding Experience

Experience	No. of Respondents
0 – 10 years	23
10 – 20 years	21
More than 20 years	12

The multiple fatalities were identified through questionnaire survey as shown in Table 2 which indicates their importance index/ intensity along with their number of occurrences; these mishaps have been observed on construction sites. Based on their importance index and number of occurrences, an average rating of these mishaps was calculated based on which a ranking was formed of each individual mishap occurred on construction site.

Table 2. No. of Accidents/ Mishaps Occurring on-site and their Importance Index

Accidents/ Mishaps	Importance Index	No. of Occurrences on-site	Rating	Ranking
Burning	3.59	4.0	3.7	Rank 8
Caught Between heavy Objects	3.64	3.32	3.2	Rank 12
Crush Injuries	3.27	3.36	3.8	Rank 7
Electrocution	3.32	3.73	3.6	Rank 9
Eye Injuries	4.0	4.14	4.1	Rank 4
Fall from Height	3.09	3.36	3.1	Rank 14
Fall of Heavy Substance from Height	3.09	3.41	3.5	Rank 11
Struck Against Objects	4.0	4.14	4.2	Rank 3
Structure Failure	4.95	3.80	4.5	Rank 1
Sunstroke or Dehydration	3.04	3.95	3.8	Rank 6
Transportation	4.04	4.14	3.2	Rank 13
Unsafe Site Conditions	3.73	4.09	4.0	Rank 5
Wild Animal Attack	4.0	3.95	4.4	Rank 2

Extensive Work Load	4.13	4.04	3.0	Rank 15
Others (Minor Unexpected Accidents)	1.84	1.84	3.5	Rank 10

The easy explanation of the ranking of the above shown accidents/ mishaps occurring on construction sites has been better shown through Figure 1 as shown below.

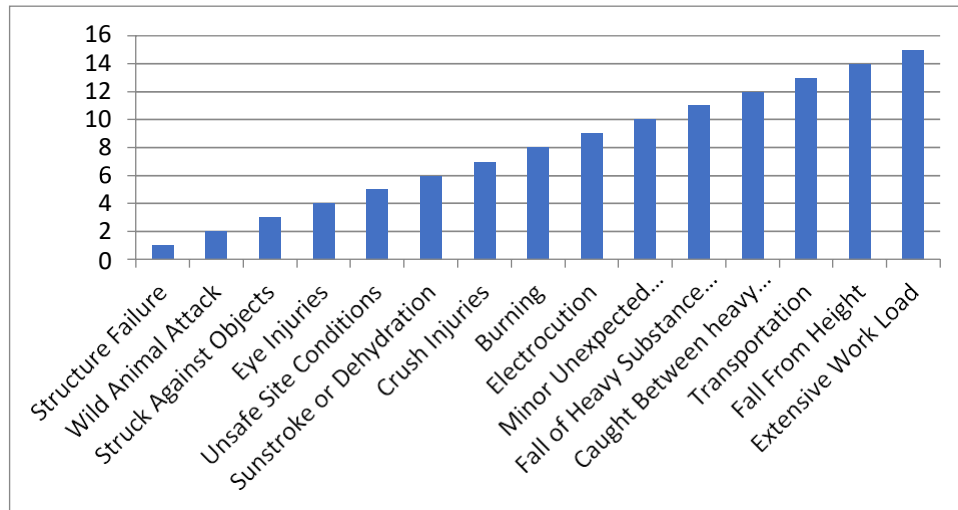


Fig 1. Ranking of Accidents Observed on Construction Site

The Figure 1 shows that the more ranking goes higher, the more chances/ intensity of the accidents occurring is considered low. For example: mostly labors fell unconscious due to extensive workload during working hours in in scorching heat, however it does not necessarily mean that the life of the labor is in danger. However, if a certain part of a structure fails or if a wild animal attacks then the life of the particular labor or laborers is in highly danger. Thus, such incidents that may occur maybe once or twice in the entire duration of the project but its extreme high intensity of danger to a labor's life make these accidents/mishaps ranked above and higher than other such incidences like electrocution and crush injuries which are observed at regular basis on construction sites.

Similarly, the Table 3 identifies the reliability of data acquired by measuring multiple central tendencies. These accidents/ mishaps were evaluated to determine the correlation between each mishap which may affect the safety of the laborers and the probability of how much it may endanger their life.

Table 3. Summary of Importance Index, No. of Occurrences and its Average Rating for the No. of Accidents/ Mishaps Occurring on Site

Accidents/ Mishaps	Importance Index	No. of Occurrences on-site
Mean	2.024	2.219
Standard Error	0.158	0.159
Median	2.14	2.45
Mode	2.5	2.64
Standard Deviation	0.612	0.618
Sample Variance	0.374	0.383
Kurtosis	2.998	5.823
Skewness	-1.513	-2.174
Range	2.29	2.48
Minimum	0.34	0.34
Maximum	2.63	2.82
Sum	30.37	33.29
Count	56	56
Multiple R	0.89	0.29

R Square	0.79	0.084
Adjusted R Square	0.78	0.013
Standard Error	0.29	0.46

The multiple fatalities which were identified through questionnaire survey were presented towards respondents in hope that whether they agree if any of the following accidents/ mishaps have occurred on their respective construction sites as shown in Table 4.

Table 4. Respondents Agreement and Disagreement on Accidents Occurring at their Respective Construction Sites

Accidents/ Mishaps	Yes	No
Burning	34	22
Caught Between heavy Objects	46	10
Crush Injuries	45	11
Electrocution	47	09
Eye Injuries	36	20
Fall from Height	46	10
Fall of Heavy Substance from Height	47	09
Struck Against Objects	34	22
Structure Failure	01	55
Sunstroke or Dehydration	31	25
Transportation	31	25
Unsafe Site Conditions	36	20
Wild Animal Attack	22	34
Extensive Work Load	31	25
Others (Minor Unexpected Accidents)	51	5

As observed from above Table 4, the Minor unexpected accidents on site can be seen on regular basis while also including the falling of heavy objects from height or crush injuries or electrocution which indicates that Labors are getting hurt regularly as fatalities can be observed from the above data. Consequently, the laborers are the walking targets to almost all types of mishaps waiting to transpire during any certain construction activity putting a minor setback in the overall progress of work.

Although, the Structure Failure is considered the most critical factor of the accidents occurring on construction site, almost all project managers and engineers shows reluctance in admitting that their projects may have faced any structural failure on their respective projects whether it concerns to a major structure like column and beams or some minor structure like shear walls of an exterior elevator.

3. Conclusions and Discussion

The results show that the lack of Interest by Project Managers and Engineers is the root cause of the occupational accidents in the Pakistan Construction Industry as their prime concern as professionals has become the sole purpose to achieve the required building as per the client's desired schedule while maintaining the finance budget. Thus, their focus towards the human factor can be observed to be quiet low, which may in result affect the overall safety and performance of the construction industry.

Thus, there is a strong need in the industry to reduce the rate of occupational accidents observed through this study, which can be achieved by multiple methods like having Laborers Insurance Policies to cover for their medical expenses with a security that the laborers can execute their work more productively with in mind that any accidents occurred on construction site shall be covered by their respective contracting firms. However, such practices can be observed are very low as the labors rights are forfeited in the fast development of the project, thus, the matter falls in the hands the regulatory government bodies and institutions to legalized and enforce such policies to be implemented at all organizational levels specially for lower work-class laborers. This can only be achieved if these controlling regulatory offices are ought to be given the power to impose punishments in case of non-compliance (Fang et al., 2003)

References

- ADB-WB (2005). "Preliminary Damage and Needs Assessment - Pakistan Earthquake 2005" by Asian Development Bank and World Bank, Islamabad, Pakistan, November 12, 2005
- Amjad Naseer (2005). "Behavior of Masonry Buildings in Muzaffarabad Earthquake" - October 08 2005
- Amjad Naseer (2007). "Performance of Concrete Buildings in Muzaffarabad Earthquake" - May 2007
- Building Code of Pakistan (1989), Ministry of housing and Works Environment & Urban Affairs Division, Government of Pakistan.
- Building Code of Pakistan (2007), Ministry of housing and Works Environment & Urban Affairs Division, Government of Pakistan.
- Building Code for Quetta Municipality (1937).
- Ebrat, M., & Ghodsi, R. (2011). Risk Assessment of Construction Projects Using Network Based Adaptive Fuzzy System. *International Journal of Academic Research*, 3(1), 411–417.
- Farooqui, R. U., Arif, F., and Rafeeqi, S. F. A. (2008). "Advancing and Integrating Construction Education, Research & Practice." First international conference on construction in developing countries (ICCIDC-I), Karachi, Pakistan.
- Fang, D. P., Xie, F., Huang, X. Y., and H. Li. (2003). "Factor analysis-based studies on construction workplace safety management in China." *Int. J. Proj. Manager.* 22(1), 43-49.
- Hameed, A., & Woo, S. (2007). Risk Importance and Allocation in The Pakistan Construction Industry: A Contractors' Perspective. *Ksce Journal of Civil Engineering*, 11(2), 73–80.
- ILO (2005). "Facts on safety at work" by International labor Organization
- Kartam, N. A., & Kartam, S. A. (2001). Risk and its Management in The Kuwaiti Construction Industry: A Contractors' Perspective. *International Journal of Project Management*, 19(6), 325–335.
- Sana, M. (2012). Development of Computational Model for The Prediction of Labor Concrete Production Rates in Malaysia (Phd Thesis). Universiti Teknologi Petronas Bandar Seri Iskandar, Perak.
- Yuan, J., Chen, K., Li, W., Ji, C., Wang, Z., & Skibniewski, M. J. (2018). Social Network Analysis for Social Risks of Construction Projects in High-Density Urban Areas in China. *Journal of Cleaner Production*, 198, 940–961.
- Zou, P. X. W., Zhang, G., & Wang, J. (2007). Understanding The Key Risks in Construction Projects in China. *International Journal of Project Management*, 25(6), 601–614.