



Awareness of Safety Among Construction Workers in the Karnali Province Stadium, Birendranagar-Surkhet

Shovansing Rokaya^{1*}, Asha Bohara¹

¹ Mid-West University, Graduate School of Engineering, Nepal

*Corresponding email: Shovansing.rokaya@gmail.com

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Abstract

The research study involves in the assessment of the level of safety awareness among construction workers involved in the Karnali Provincial Stadium project. A set of structural questionnaire survey consisting of 84 respondents was conducted to examine their work experience, demographic background, and knowledge of safety procedures. Relative Importance Index (RII) analysis method was used to analysis the ten safety factors, such as the usage of Personal Protective Equipment (PPE), toolbox discussions, supervision and housekeeping. Final findings concludes that one-third of the workforce is illiterate, the whole the construction industry is male dominating, and a significant portion has less than two years of experience. The result from RII shows the strong adherence to basic safety procedures, which reflect the high awareness of proper PPE usage, good housekeeping, and positive worker-supervisor relations. However, medium level awareness was noted in the areas such as, regular safety checks, worker behaviour, and PPE provision. Moreover, very low awareness was noted on the terms such as safety signage and formal safety trainings, which highlight for the improvement areas.

The research concludes that the construction workers are highly aware of fundamental safety practices, showing the significant gaps in the knowledge related to insurance, safety communication, and training. Further recommendations includes the implementation of regular safety training, PPE availability, toolbox talks, and enhancing the use of the safety sign and signage.

Keywords: Safety awareness, Construction worker, RII, construction safety, Nepal

1. Introduction

Construction sites have dynamic environments, where worker face multiple ricks and hazards. Continuous safety knowledge and procedures play vital roles for mitigating these hazards and risks, in order to protect worker's health and wellbeing. Safety awareness is main first step in implementing an effectively safety program. Workers are the main agent in the construction industry, and have to involve in highly risky and hazardous workplace. Therefore, regular use of PPE and compliance of the safety procedures is very essential and important. (Ulang, et al., 2014). The critical role of safety awareness is further underscored by

its direct link to worker satisfaction, as poor safety conditions are a significant cause of dissatisfaction in the Nepalese construction industry (Bista, et al., 2024).

Previous research in Nepal highlights that inadequate safety measures, insufficient training, and a lack of safety culture are primary contributors to accidents and injuries (Koirala, 2018); (Giri, et al., 2023). Common incidents include workers being struck by objects, falls from height, and electrocution, often stemming from behavioral factors like risky practices and poor safety enforcement (Arboleda & Abraham, 2004). There is highly need for focused investigation into the on-the-ground safety awareness among construction workers at specific projects, while the studies have begun to explore the boarder critical factors for Safety Management System (SMS) implementation in Nepal (Bhatta, et al., 2025).

This research study mainly focuses on the status of safety measures and protocols, which shows the safety awareness among construction workers involved in the Karnali Province Stadium, as a symbol of progress and community involvement in the region. The workplace consists of challenging environment due to multiple tasks involved, use of heavy equipment, high-rise workstations, and exposure to diverse building materials. The core objective of the study is to examine the level of safety awareness among the construction workers related to safety practices, working in Provincial Stadium, Surkhet.

2. Methodology

2.1 Research Design

The research study includes a quantative research approach to access the level of safety awareness among construction workers, working at the Provincial Stadium in Birendranagar. The main objectives are to collect primary data via a structured questionnaire survey, statistically analyze the responses, and draw conclusions about current safety practices to determine worker awareness levels.

2.2 Research Approach

A quantitative methodology was used to gather data on safety awareness levels. A Likert-scale questionnaire served as the primary data collection tool to capture employees' attitudes, knowledge, and perceptions regarding safety procedures.

2.3 Study Area

The study was conducted at the Provincial Stadium in Birendranagar Municipality, Surkhet District, Karnali Province, Nepal (Figure 1). As one of the province's largest infrastructure projects, the stadium involves a wide range of construction operations.



Figure 1: Study Area

Source: Google

2.4 Study Population, Sample Size and Selection

The study population for the research includes all the construction laborers involving in running construction projects. The total population of the labor involving in the project were approximately 200. The sampling method used in this research study was simple random sampling method. Slovin's formulae was used to find the sample size from the population size as done in (Sambasivan & Soon, 2007), n (Sample size) = $N / (1 + Ne^2)$, Where, n = sample size, N = population size and e = margin of error (taken as 10%). Approximately, 67 number of samples were calculated from the equation. The calculation suggested 67, but the study has considered 84. Details tabulated in table 1.

Table 1: Total Population and sample size used

| S.N. | Respondent types | Calculated Sample Size | Adopted Sample Size |
|------|---------------------|------------------------|---------------------|
| 1 | Construction worker | 67 | 84 |
| | Total | 67 | 84 |

2.5 Data Collection and Analysis

Primary data was obtained by a questionnaire survey. In order to access the safety awareness among the construction workers, a five-point Likert Scale of rating 1-5 was used to examine the data and excel was used to analysis the variable using the Relative Importance Index, RII. The analysis of the data was divided into demographic and RII analysis.

The following formula was used to determine the relative index, as done in (Rooshdia, et al., 2018)

$$RII = \sum W / (A * N)$$

Here,

W is the weight as assigned by each respondent on a scale of 1 to 5 where 1 implies the least and 5 implies the highest.

A = highest weight and N = total number of samples.

Five important levels are transformed from RI values: High (H) ($0.8 \leq RI \leq 1$), High-Medium (H-M) ($0.6 \leq RI \leq 0.8$), Medium (M) ($0.4 \leq RI \leq 0.6$), Medium-low (M-L) ($0.2 \leq RI \leq 0.4$) and Low (L) ($0 \leq RI \leq 0.2$)

3. Results and Discussion

3.1 Demographic Analysis

The survey included 84 respondents working at the stadium. The workforce was predominantly male (75%), with only 25% female participation, reflecting the gender imbalance in Nepal's construction sector. About 35.71% portion of the workforce was illiterate, while 50% had education upto SLC level. Only 3.57% held a bachelor's degree, which shows the large portion of unskilled or semiskilled workforce that may affect the understanding and implementation of the safety practices.

In case of the job experience, 39.28% out of total respondents has less than two years of experience, and 28.57% had 6-10 years. Only, 10.71% had 2-5 years of experience, and 21.43% has over ten years. This mixed result shows the existence of experienced workers as well as relatively new one in the onsite that could influence the overall safety awareness.

3.2 Perception of Construction Workers Regarding Security Measures using RII Analysis

The main research study involves in the access of the level of awareness of construction workers, that can be examine through different safety parameters that is shown in below Table 2. The high value of RII shows the greater awareness and compliance to the safety guidelines.

Table 2: RII Analysis of Safety Criteria

| S.N. | Safety Criteria | RII | Rank | Importance Level |
|------|---|-------|------|------------------|
| 1 | Proper use of PPE | 0.978 | 1 | H |
| 2 | Positive relationship between laborers and supervisor | 0.842 | 2 | H |
| 3 | Provision for toolbox talk at the workplace | 0.814 | 3 | H |
| 4 | Good housekeeping at the workplace | 0.800 | 4 | H |
| 5 | Regular safety inspection and supervision | 0.778 | 5 | H-M |
| 6 | Worker's behavior and action | 0.678 | 6 | H-M |
| 7 | Provision of sufficient PPE | 0.657 | 7 | H-M |
| 8 | Knowledge of labor accident insurance | 0.635 | 8 | H-M |
| 9 | Provision of safety awareness information/ training | 0.585 | 9 | M |
| 10 | Provision of safety signboard and signals | 0.400 | 10 | M |

The highest RII value is 0.978, proper use of PPE, shows that the workers are highly aware of using PPE and the importance of wearing protective gear such as helmets, boots and gloves to prevent possible accident and injuries. The positive relationship between laborers and supervisors stand second position having RII, 0.842, which shows the friendly environment among co-workers.

Next two terms i.e. awareness of toolbox talks and good housekeeping also ranked in good position, shows the regular talk about work routine and safety briefings before the start of work, and suggest the clean, organized workspace to prevent accidents. Knowledge of labor accident insurance shows the moderate awareness level. This result align with the findings done in (Bhattarai, et al., 2024), which identifies gaps in worker's awareness of their rights and entitlements under the Labor Act, including insurance provision.

This suggest a serious issue in construction industry of Nepal, regarding the communication of legal and financial safety nets. Safety trainings and safety signage has lowest ranking, shows the significant gaps in provision of safety trainings to the workers and, lack of use of safety signs and signage that may cause major accident. This deficiency is major issue, as these elements are foundation of safety culture and identified as key factors in the proper implementation of a Safety Management System (Bhatta, et al., 2025).

4. Conclusions

The research study examine the safety awareness of construction workers working at the Provincial Stadium, Birendranagar. The general information shows highly involvement of male, poorly educated workforce with significant sizeable number of new hire workers.

The RII result shows high worker's awareness and adherence of workers towards use of PPE, good housekeeping and in maintain proper relation with co-workers and supervisors. However, from findings, significant gaps were identified in more formal and systematic aspects of safety, such as training, safety signage, and in knowledge of accident insurance. These findings resonate with other research studied that has been done in Nepal, which linked with safety deficiencies are the boarder issues of worker dissatisfaction (Bista, et al., 2024) and highlight areas for the improving the overall Safety Management Systems (Bhatta, et al., 2025).

To address these gaps, the study recommends:

- Implementing regular, structured safety training sessions.
- Improving the visibility and comprehension of safety signage.
- Ensuring consistent and adequate provision of PPE.
- Enhancing the quality and frequency of toolbox talks.
- Integrating specific safety orientation programs for less educated and experienced personnel.

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References

- Arboleda, C. A. & Abraham, D. M., 2004. *Fatalities in Trenching Operations—Analysis Using Models of Accident Causation*. [Online] Available at: [https://doi.org/10.1061/\(ASCE\)0733-9364\(2004\)130:2\(273\)](https://doi.org/10.1061/(ASCE)0733-9364(2004)130:2(273))
- Bhatta, B., Sukamani, D., Bajracharya, K. & Bhattarai, S. K., 2025. Critical Factors for Proper Implementation of Safety Management System in Construction Projects of Nepal: SEM Approach.. *LAENG International Journal of Applied Mathematics*, pp. 1703-1715.
- Bhattarai, S. K., Dahal, D. & Neupane, U., 2024. Assessment of Compliance and Welfare of Construction Workers at Selected Building Construction Project in Kathmandu: Implications for Labor Act Implementation.. *Journal of Recent Activities in Infrastructure Science*, pp. 25-44.
- Bista, B., Neupane, U. & Bhattarai, S. K., 2024. Identifying the Causes of Dissatisfaction of Construction Labour: A Case Study of Building Construction of Jajarkot District Hospital, Nepal.. *Himalayan Journal of Applied Science and Engineering (HiJASE)*, pp. 63-78.
- Giri, O. P., Paudel, K. & Shrestha, S. K., 2023. *Management in Public Building Construction: A Case Study of Pokhara Valley*. [Online] Available at: <https://doi.org/10.3126/jbm.v7i01.54548>
- Keng, T. C. & Razak, N. A., 2014. *Case Studies on the Safety Management at Construction Site*. [Online] Available at: https://www.researchgate.net/publication/283242992_Case_Studies_on_the_Safety_Management_at_Construction_Site
- Kin, D. & Hadikusumo, B. H. W., 2006. *Safety Management Practices in the Bhutanese Construction Industry*. [Online] Available at: https://www.researchgate.net/publication/43245348_Safety_Management_Practices_in_the_Bhutanese_Construction_Industry
- Koirala, M. P., 2018. *Safety Awareness of Workers for Construction Sites in Nepal*. [Online] Available at: <https://doi.org/10.24321/2393.8307.201804>
- Rooshdia, R. R. R. M., Majidb, M. Z. A., Sahamira, S. R. & Ismaila, N. A. A., 2018. *Relative Importance Index of Sustainable Design and Construction Activities Criteria for Green Highway*. [Online] Available at: <https://www.cetjournal.it/index.php/cet/article/view/CET1863026>
- Sambasivan, M. & Soon, Y. W., 2007. *Causes and effects of delays in Malaysian construction industry*. [Online] Available at: <https://doi.org/10.1016/j.ijproman.2006.11.007>
- Ulang, N. M., Salim, N. S., Baharum, F. & Salim, N. A., 2014. *Construction Site Workers' Awareness on Using Safety Equipment : Case Study*. [Online] Available at: https://www.researchgate.net/publication/307831919_Construction_Site_Workers%27_Awareness_on_Using_Safety_Equipment_Case_Study