

An Exploratory Quantitative Survey of Gender-Sensitive Compliance with Construction Health and Safety Regulations in Pakistan

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Abstract

Pakistan's construction industry is widely recognised as one of the country's most hazardous sectors, characterised by weak and inconsistent enforcement of occupational health and safety (H&S) regulations. Although prior research has examined general safety deficiencies, limited empirical evidence exists on how gender shapes compliance with health and safety regulations, by implication, associated practices. This paper presents a exploratory study that investigates the extent to which compliance with construction H&S regulations in Pakistan incorporates gender-sensitive measures. A quantitative, cross-sectional survey was conducted among 23 construction professionals in Pakistan using convenience and snowball sampling and a structured online questionnaire. Data were analysed using descriptive statistics, chi-square tests, and Fisher's exact tests. The findings indicate that safety regulations are implemented inconsistently, enforcement is often perceived as unequal, and women are frequently excluded from training. Gender-specific personal protective equipment (PPE) and adequate sanitation facilities are largely absent, while cultural norms, weak enforcement, lack of training, and cost constraints remain key barriers. Inferential statistical analysis shows significant associations between the provision of gender-specific PPE and sanitation facilities and between the observation of gender-specific safety issues and support for gender-sensitive policies. The study concludes that Pakistan's construction safety system inadequately addresses gender considerations and that regulatory reform, inclusive enforcement, and organisational change are required to promote equitable protection for all workers.

Keywords: enforcement gaps, gender-responsive policies, women in construction, worker protection, workplace inclusion

1. Introduction

The construction industry plays a significant role in Pakistan's economic development, contributing approximately 2.5–3% of the national gross domestic product (GDP) and providing employment across infrastructure, housing, and industrial projects (Pakistan Bureau of Statistics, 2023). Despite its economic importance, construction remains one of the most hazardous industries in the country, characterised by persistent safety management failures and high accident rates (Adekunle et al., 2024). Although several laws and policies exist to regulate occupational safety, such as the Factories Act 1934, Labour Protection Policy 2006, and Labour Policy 2010, their implementation has consistently fallen short of international standards (Government of Pakistan, 1934; Government of Pakistan, 2010).

Construction safety challenges are further complicated by the gendered nature of the workforce. While the industry is male dominated, women participate primarily in low paid, informal roles such as material handling and finishing work (Pakistan Bureau of Statistics, 2022). These workers often face specific risks, including exclusion from training, ill-fitting personal protective equipment (PPE), inadequate sanitation facilities, and discomfort in reporting safety concerns (ILO, 2021; GIZ, 2022). Despite these challenges, empirical studies examining the relationship between gender and health and safety (H&S) compliance in Pakistan remain scarce (Kabeer, 2008). This study (the Lead author's MSc dissertation otherwise research project), therefore, aims to investigate the extent to which compliance with construction H&S regulations in Pakistan incorporates gender sensitive measures.

2. Literature Review

2.1. Regulatory Frameworks and Safety Compliance

Like many developing countries, such as Nigeria, Pakistan's health and safety regulatory system is complex and comprises an array of federal and provincial laws focused on protecting workers (Umar and Umeokafor, 2024). While the Factories Act 1934 forms the foundation of industrial safety regulation and

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governs worker welfare, PPE provision, training, and inspections in the country (Government of Pakistan, 1934), it primarily focuses on factory settings. Umar and Umeokafor (2024) reviewed the Act and found that the term "construction" appears only six times. In fact, Raheem and Hinze (2013) conclude that construction is not governed by any specific legislation in the country. Of the eleven pieces of legislation enacted by national and provincial assemblies that address occupational safety and health more generally, Umar and Umeokafor (2024) demonstrate that only six are applicable to the construction sector. One example is the Sindh Environmental Protection Act, 2014 (Act No. VIII of 2014), which focuses on environmental management and protection within the province of Sindh. Consequently, the authors argue for the introduction of construction-specific legislation. These underline the fragmented and limited nature of the regulatory framework governing construction health and safety in Pakistan.

Following the 18th Constitutional Amendment in 2010, occupational safety and health became the responsibility of provincial governments in Pakistan. These governments are now tasked with legislating, enforcing, and inspecting workplaces, including those in the construction sector (International Labour Organisation (ILO), 2017). The federal government, however, retains a coordinating and standard-setting role (ibid.). Such governance arrangement introduces several limitations, including a lack of uniformity in standards and enforcement, increased costs for organisations, and administrative confusion (Umeokafor, 2017a). Nevertheless, in April 2026, the National Code of Practice on Occupational Safety and Health for the Construction Sector was approved and issued through a Statutory Regulatory Order (Devdiscourse, 2026). As a result, the Code is now legally binding across Pakistan (ibid.).

The complexity of the regulatory regime may explain why research consistently reports weak enforcement, insufficient inspections, and limited safety systems, particularly among small and informal contractors (Ahmed et al., 2018; Josh and Mak International, 2024; Umar and Umeokafor, 2024). Regulatory authorities also face challenges such as staffing shortages, outdated inspection methods, and limited sanctioning powers. These challenges result in enforcement practices that are largely reactive rather than preventive (Umar and Umeokafor, 2024). It is anticipated that the recently approved National Code of Practice on Occupational Safety and Health for the Construction Sector will help address these longstanding regulatory challenges.

2.2. Gender and cultural barriers in construction safety

Beyond regulatory and organisational factors, gender- and culture-related barriers are observed among women in the construction sector. These barriers are reflected in the low participation of women in Pakistan's construction workforce, which remains at approximately 2 to 5 percent of the total workforce, largely due to cultural norms and occupational segregation (Pakistan Bureau of Statistics, 2022). This under-representation is also evident in leadership positions. Moreover, women in the construction sector encounter discrimination, which results in psychosocial risks (Curtis et al., 2018). Tang (2025) found that in the United States of America, women are more susceptible to musculoskeletal disorders because tools are primarily designed for men. Similar patterns have been observed in South Asia, where, despite the small number of women employed in the industry, women are often exposed to greater risks than their male counterparts. Research further indicates that where women are present, safety systems are rarely designed to address gender-specific needs. Studies from South Asia and other regions show that standardised personal protective equipment (PPE) is frequently designed around male body dimensions, reducing its effectiveness for women (Husam et al., 2024; Tang, 2025). Notably, GIZ (2022) reports that in Pakistan, women have limited access to adequate safety gear and are therefore more exposed to dust, heat, and noise. In addition, exclusion from safety training and inadequate sanitation facilities pose significant health and dignity concerns for women (Jayakaviya et al., 2025; ILO, 2021).

More research papers have highlighted that women are less likely to report safety concerns and incidents. The ILO (2021) reports that fear of harassment, loss of employment, and social stigma discourage women from reporting safety incidents, contributing to the under-reporting of accidents. Jayakaviya et al. (2025) found that in India and Nepal, women often lack access to separate latrine facilities, exposing them to the risk of dehydration, as they may deliberately restrict fluid intake to avoid using unsafe or unavailable toilets. This practice results in fatigue and lower productivity (Jayakaviya et al., 2025).

Overall, these barriers are not isolated but interconnected, as cultural norms, gender stereotypes, and structural limitations within the industry collectively restrict women's participation and expose them to higher occupational risks. The persistence of male-oriented safety systems further reinforces these inequalities, resulting in continued exclusion and inadequate protection for women in construction work (Curtis et al., 2018; Umeokafor, 2017a).

2.3. Compliance Gaps and Organisational Factors

Another key factor is poor compliance, where organisational practices and structural conditions negatively affect construction workers' health and well-being. Poor enforcement, limited awareness,

informal labour arrangements, and cost pressures undermine health and safety compliance across construction sites (Umar and Umeokafor, 2024). Cultural beliefs, including fatalistic attitudes toward accidents, further reduce motivation to follow safety procedures (Bajracharya et al., 2023). For example, a study by Shah et al. (2020) indicates that there is a prevailing perception that women are not exposed in high-risk activities in construction and are therefore excluded from safety meetings. This exclusion means that women represent an untapped and potentially important source of learning and information for improving safety practice. Importantly, existing compliance research rarely considers gender differences, thereby treating the workforce as homogeneous and overlooking women's specific vulnerabilities (Kabeer, 2008).

2.4. Conceptual Framework

Drawing on regulatory structures, gender-related safety challenges, and organisational compliance factors, this study adopts a framework linking regulatory environments, organisational practices, gender norms, compliance behaviours, and safety outcomes (Hinze, 2017). Weak enforcement, informal labour, and cost-driven management practices interact with gender norms to influence access to training, PPE, welfare facilities, and hazard reporting, thereby shaping safety compliance and outcomes (Sarvari et al., 2024). The conceptual framework is illustrated in Figure 1.

3. Research Methodology

A positivist philosophy and a deductive approach were adopted (Saunders et al., 2019). A quantitative, cross-sectional survey design was used to capture perceptions of health and safety compliance and gender-specific challenges at a single point in time (Bryman, 2016). Data were collected using an online questionnaire distributed in 2024 to construction professionals in Pakistan, including engineers, supervisors, and safety officers.

The questionnaire comprised sections on respondent demographics, general health and safety practices, and gender-related safety issues. It assessed participants' familiarity with Pakistan's occupational health and safety regulations to establish baseline awareness. The subsequent sections focused on key study constructs, including perceptions of equal enforcement of safety protocols for male and female workers, participation in health and safety training programmes, availability of gender-specific personal protective equipment (PPE), adequacy of sanitation facilities for female workers, willingness of women to report safety issues, and the perceived need for gender-sensitive health and safety policies. All questions were mandatory to ensure complete responses across all variables. Likert-scale items were used to measure perceptions of implementation, enforcement, training, and reporting. Due to access limitations and the exploratory nature of the study, convenience and snowball sampling were employed, resulting in 23 valid responses. Data analysis involved descriptive statistics and non-parametric tests using SPSS and Excel (Field, 2018). Cross-tabulations, chi-square tests, and Fisher's exact tests were conducted, with results interpreted cautiously because of the small sample size. Although exploratory, these analyses provide useful indications of how perceptions and experiences are related within the dataset. Ethical approval for the study was obtained from the University of Greenwich Faculty of

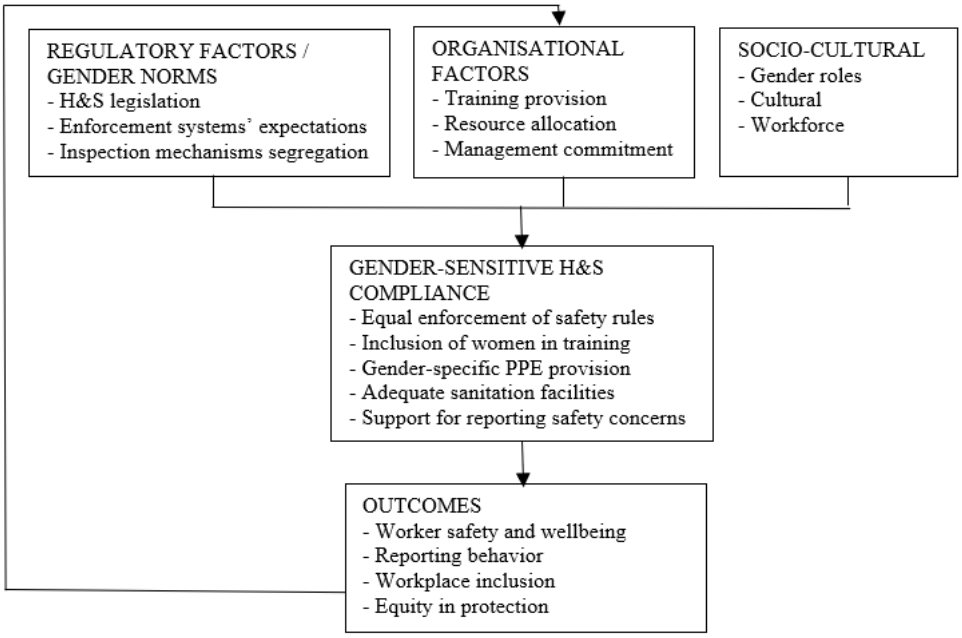


Figure 1: Conceptual framework of the study

Engineering Ethics Committee (reference number: FES-FREC-ENG-25.01.02).

4. Findings and Discussion

A total of 23 participants completed the survey, comprising 19 engineers, one supervisor, one safety officer, and two support or administrative staff. While this distribution is not representative of the full diversity of Pakistan's construction labour force, as an exploratory study it provides insight at that level. Exploring construction health and safety issues using a small sample to generate preliminary insight is consistent with previous studies including Nnedinma (2016) and Umeokafor (2017a). To ensure that respondents possessed an appropriate level of knowledge for the study, they were asked to indicate their familiarity with Pakistan's Occupational Health and Safety Regulations. The results of this assessment are presented in Table 1.

Table 1 shows that respondents demonstrated a relatively high level of awareness of occupational health and safety regulations, as 22 of the 23 participants reported being either "Very familiar" or "Somewhat familiar" with health and safety regulatory requirements in Pakistan. Only one respondent indicated that they were "Not familiar." This does not necessarily imply a complete lack of knowledge or an inability to provide valuable insight. Overall, the responses from 22 informed participants suggest that the dataset largely reflects informed professional opinions rather than views from untrained or inexperienced workers. This adds credibility to the interpretation of findings relating to compliance, enforcement, and gendered health and safety challenges.

4.1. Assessment of gender-sensitive health and safety compliance practices

Table 2 presents a summary of respondents' views across various indicators of gender-sensitive health and safety compliance practices. Although a majority of respondents reported that health and safety enforcement is applied equally to men and women, a substantial proportion perceived inequality in enforcement. This finding highlights persistent gender disparities within a male-dominated industry and is therefore concerning.

While a little over half of the respondents reported having participated in health and safety training, many also indicated the absence of women from the training environment. This suggests structural exclusion of women rather than a lack of training provision itself and is consistent with findings from previous studies in South Asia (ILO, 2021). The extent to which training content is gender-sensitive also remains unclear. The study further identified limited availability of gender-specific personal protective equipment and a high prevalence of inadequate sanitation facilities for women. Although this is not unexpected given the male-dominated nature of the industry, it represents a significant barrier to improving women's participation in construction. Similar patterns have been reported in both regional and international studies, which show that

Table 1: Familiarity with Pakistan's Occupational Health and Safety Regulations

Familiarity Level	n
Not familiar	1
Somewhat familiar	9
Very familiar	13

Table 2: Summary of respondents' views on gender-sensitive H&S compliance

Indicators	Response Category	n
Equal enforcement of safety protocols for male and female workers	No	8
	Not sure	1
	Yes	14
Participation in H&S training	No	13
	Yes	10
Availability of gender-specific PPE	No	13
	Not applicable	3
	Yes	7
Sanitation facilities for female workers	Adequate	9
	Inadequate	10
	Not applicable	4
Women's comfort in reporting safety issues	Don't know	11
	No	5
	Yes	7
Necessity of gender-sensitive H&S policies	Agree	9
	Disagree	2
	Strongly agree	12

the absence of gender-appropriate PPE and welfare facilities contributes to exclusion and increased safety risks for women (Husam et al., 2024; Jayakaviya et al., 2025). Nevertheless, the finding that a majority of respondents recognise the necessity of gender-sensitive health and safety policies is encouraging. This aligns with global calls for more inclusive and equitable safety management practices within the construction sector (GIZ, 2022).

4.2. Relationships Between Key Variables

Table 3 in Appendix 1 is a combined descriptive cross-tabulation of key gender sensitive health and safety indicators. In the table, each block represents a distinct pair of variables assessed in the inferential analysis and therefore must be interpreted independently. The first column identifies the variables being cross-tabulated, while the subsequent columns report the frequencies (n) for each response category of the associated variable. Furthermore, the response category labels differ across blocks because each pairing examines a different aspect of health and safety practice, such as implementation, training, welfare provision, reporting, and policy support. Blank cells indicate that a response category is not applicable for a specific variable pairing. While the table offers descriptive insight into the issues examined, its content underpins the inferential analysis presented in Table 4. The findings suggest differences in the implementation of H&S regulations across roles. Engineers mainly report that regulations are implemented only 'sometimes'. This indicates an inconsistency in translating compliance into practice. This is consistent with the findings of Umeokafor (2017b), who found that compliance with health and safety regulations in Nigeria is formal but not operational, as it is symbolic and supported by documents such as policies and induction records. However, this hardly translates into practice in day-to-day operations on construction site, weak and uneven site implementation (Ibid). Regarding training, the findings in Table 3 indicate mixed experiences with the presence of women on construction sites. In particular, both the trained and untrained respondents note instances in which women were absent from H&S training. However, some reported women's participation or uncertainty about their presence. This is consistent with ILO (2021), which reports that women are excluded from formal health and safety training, overlooked in toolbox talks, and are assumed to pose limited risks in construction.

Table 3 indicates that the level of safety regulation implementation may have no bearing on the extent to which safety issues were observed. This is because observed safety issues were reported across all levels of H&S implementation. This is consistent with the findings of Umeokafor (2017b), who found that disproportionate safety incidents were still occurring on site despite the claimed implementation health and safety regulations in Nigeria. This can be explained by many factors, including the fact that safety measures or compliance actions are not contextualised to address the country's social, economic, political and cultural environments. In the context of the current study, the lack of gender-sensitive measures in compliance with H&S regulations explains why the level of safety regulation implementation does not address safety issues, especially gender-related. The presence or implementation of gender specific safety provisions across the site also differed. Many respondents claimed that gender specific PPE and adequate sanitation facilities for female workers were absent. In fact, on occasion when they were present, the adequacy of the sanitation facilities was more varied. Finally,

Table 4: Summary of inferential analyses of Gender-Sensitive H&S variable

Variables	Test(s)	χ^2 (df)	Fisher p	Sig.	Key Interpretation
Role × H&S implementation	Chi-square; Fisher's exact	2.67 (6)	1.000	No	Perceptions are similar across roles, indicating a systemic issue.
Training × Women inclusion	Chi-square; Fisher's exact	1.56 (3)	0.915	No	Women's exclusion from training is widely reported, regardless of respondents' training status.
Gender PPE × Sanitation facilities	Chi-square; Fisher's exact	10.8 (4)	**0.010**	**Yes**	Gender-specific PPE is associated with better sanitation facilities
Gender issues × Policy support	Chi-square; Fisher's exact	5.75 (2)	**0.029**	**Yes**	Gender-specific safety issues is associated with stronger support for gender-sensitive policies.
Equal enforcement × Reporting comfort	Chi-square; Fisher's exact	3.64 (4)	0.426	No	Equal enforcement alone does not ensure women feel comfortable reporting safety concerns.
H&S implementation frequency × Observed issues	Chi-square; Fisher's exact	5.25 (2)	0.099	No	No significant association.

respondents who reported witnessing gender specific safety issues more frequently expressed strong agreement with the relevance of gender sensitive safety policies. However, those that did not observe such issues showed more mixed views.

Table 4 summaries the inferential statistical analysis of the variables. The table shows that although most associations were not statistically significant, two were. There was a significant association between gender-specific PPE provision and Sanitation facilities that are gender specific. This indicates that construction sites that provide PPE are likely to offer adequate sanitation. This suggests a holistic approach to gender-sensitive safety policies and practices. Conversely, sites that ignore PPE for women also appear to neglect basic sanitation, reinforcing the notion that gender-sensitive safety management is either taken seriously as a whole or largely disregarded. Also, observing gender-specific issues and providing stronger support for gender-sensitive safety policies. This shows that workers who have personally seen or experienced safety issues that impact on women on construction site are more likely to believe that gender specific policies are relevant (Tang, 2025).

5. Conclusion and Further Research

The study has investigated the extent to which compliance with construction H&S regulations in Pakistan incorporates gender-sensitive measures. Drawing on an exploratory study of construction professionals in Pakistan, the findings demonstrate that compliance with construction H&S regulations in Pakistan is inconsistent and insufficiently gender-inclusive. The findings indicate that safety regulations are implemented inconsistently, enforcement is often perceived as unequal, and women are frequently excluded from training. The analysis reveals that gender-specific PPE and adequate sanitation facilities are largely absent, reflecting the construction industry's male-dominated nature. Inferential statistical analysis shows significant associations between the provision of gender-specific PPE and sanitation facilities and between the observation of gender-specific safety issues and support for gender-sensitive policies. The study contributes preliminary empirical evidence on the intersection of gender and safety compliance in Pakistan's construction industry. Given the small sample size, findings should be interpreted as exploratory rather than generalisable. Future research should employ larger, more diverse samples, integrate qualitative methods, and examine sector-specific dynamics to inform inclusive regulatory and organisational reforms.

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Appendix 1

Table 3: Descriptive Cross-tabulated distributions of gender-sensitive H&S variables

Analysis Pair / Indicator	Row Category	Category 1		Category 2		Category 3		Category 4	
		label	n	label	n	label	n	label	n
Role × H&S implementation		Implementation of H&S Regulations							
	Engineer	Always	4	Rarely	6	Sometimes	9	—	—
	Other	Always	0	Rarely	1	Sometimes	1	—	—
	Safety Officer	Always	0	Rarely	0	Sometimes	1	—	—
	Supervisor	Always	0	Rarely	0	Sometimes	1	—	—
Training × Women inclusion				Women on site					
	No training		6	No	5	Not sure	1	Yes	1
	Yes training		5	No	3	Not sure	0	Yes	2

Analysis Pair / Indicator	Row Category	Category 1		Category 2		Category 3		Category 4	
		label	**n**	**label**	**n**	**label**	**n**	**label**	**n**
H&S implementation frequency × Observed issues		Any observed Issues							
	Always	No	3	Yes	1	—	—	—	—
	Rarely	No	5	Yes	2	—	—	—	—
	Sometimes	No	3	Yes	9	—	—	—	—
Equal enforcement × Reporting comfort		Extent of Women's comfort in reporting safety issues							
	No enforcement	Unsure	2	No	3	Yes	3	—	—
	Not sure	Unsure	1	No	0	Yes	0	—	—
	equal enforcement	Unsure	8	No	2	Yes	4	—	—
Gender PPE × Sanitation facilities		Sanitation Facilities for female workers							
	No PPE	Adequate	4	Inadequate	9	N/A	0	—	—
	PPE N/A	Adequate	2	Inadequate	0	N/A	1	—	—
	Yes PPE	Adequate	3	Inadequate	1	N/A	3	—	—
Gender issues × Policy support		Relevance of gender-sensitive safety polices							
	No gender issues	Agree	7	Disagree	1	S. agree	3	—	—
	Gender issues	Agree	2	Disagree	1	S. agree	9	—	—