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Impact of Safety Climate on Safety Behaviour in Construction Projects: Mediating Mechanism and Interacting Effect

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Abstract: This study aimed to investigate the impact of safety climate on safety behaviour with the mediating role of safety attitude and mediating role of safety-specific transformational leadership. Data were collected from 294 respondents from different construction projects in Pakistan. The study employed an analytical descriptive approach as its research methodology. The results revealed that safety climate exhibits a significant positive correlation with safety behaviour in projects, as well as with safety attitude. Moreover, the findings demonstrated that safety attitude and safety-specific transformational leadership do not mediate the relationship between safety climate and safety behaviour in projects. In this study, the implications for the project managers and employees as well as future research directions are discussed.

Keywords: Safety climate in projects, Safety behaviour in projects, Safety attitude in projects, Safety-specific transformational leadership, Construction projects

INTRODUCTION

In Pakistan, the largest and most important sector that has consistently demonstrated the highest number of employment opportunities is the construction sector (Maqsoom, Charoenngam and Awais, 2013). According to the *Pakistan Economic Survey 2016–17* (2017), the growth of construction industry has increased from 9.05% in 2016 to 14.6% in 2017. The construction industry indeed plays a significant role in the economic and social upheaval of a nation (Coble and Haupt, 1999). The Pakistan Bureau of Statistics (2014) stated that this industry alone in Pakistan employed 7.3% of the total labour force. However, the accident rate in this industry stands miserably at 14.1%, which is much higher than those in other industries. Construction has been ranked as the third most injury-prone industry; however, paradoxically, its employment rate is also the highest among others. The safety and health standards in construction projects have become an international concern (Maiti and Choi, 2019). According to Zahoor et al. (2015), majority of the accidents occurred due to electrocution, lifting activity and falling from height. Moreover, safety climate in construction industry is unsatisfactory in developing countries, such as Pakistan, India, Nepal and Bangladesh, thus creating environmental risk (Rana and Bhatti, 2018; Iqbal et al., 2015). The main reason for the unsatisfactory environment of construction projects is the lack

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of interest of the client to allocate safety budget. In fact, it has been reported that 61.8% of construction companies do not have a policy for the safety of workers (Zahoor et al., 2017a; Ogundipe et al., 2018). In construction, safety has been considered as a second factor that contributes to the danger in a project environment (Khan et al., 2019). Safety climate inside the organisations is becoming the main focus for a safer work environment in projects (de Koster, Stam and Balk, 2011).

Griffin and Neal (2000) defined safety climate as employees' perceptions of the values, policies and procedures related to safety within an organisation, as well as the priority that organisation places on safety versus production. Specifically safety climate is applicable to construction projects owing to its characteristics, such as high turnover rate, decentralisation, environmental complexity, mobility and temporality (Fang and Wu, 2013). Nevertheless, some research has attempted to investigate the safety climate factors (Glendon and Litherland, 2001) and the course of action for their measurement and improvement (Zhou, Fang and Wang, 2008). However, it has been argued that equipment innovations and working condition improvement are not sufficient to enhance performance, as leadership and employees' attitudes and behaviours play a significant role. Similarly, Poon et al. (2013) contended that construction is an industry where intensive human interaction occurs. In addition, Tam and Fung (1998) previously established a link between the involvement of senior management and safety performance. These arguments indicate that leadership and senior management play a significant role in engrossing the safety attitudes and behaviours of employees.

The current study aimed to contribute to the literature in several ways. First, to our knowledge, this is a very rare study that links safety climate with the safety behaviour of employees in construction projects. Some studies have found that safety climate promotes and enhances safety behaviour (Lyu et al., 2018; Neal, Griffin and Hart, 2000); however, some studies have found no correlation between safety climate and safety behaviours (Cooper and Phillips, 2004; Glendon and Litherland, 2001). Therefore, to address these inconsistencies, the current study investigates the direct link between safety climate and safety behaviour in construction projects. Second, the current study contributes to the literature by including safety attitude as a mediator between safety climate and safety behaviour. Previously, attitudes were considered as a weak predictor of behaviour (Eagly, 1992). From then on, various studies documented that attitudes influence behaviour. Studies found that attitudes are significant predictor of inducing behaviour (Glendon, Clarke and McKenna, 2006) and more particularly, safety behaviour (Donald and Canter, 1993). Third, this study makes a contribution to the literature by investigating the mediating role of safety-specific transformational leadership, as it is evident that leadership is linked with safety (Dunbar, 1975; Butler and Jones, 1979). Organisations enjoy more safety whose leaders encourage occupational safety (Shannon, Mayr and Haines, 1997). Furthermore, it has been demonstrated that safety-specific transformational leadership increases safety outcomes, such as safety behaviours, safety climate and safety consciousness (Mullen, Kelloway and Teed, 2011). Clarke (2013), in his meta-analytical study, discussed in detail the influence of safety-specific transformational leadership on safety climate and behaviour outcomes across various occupations and industries, but excluding project-based organisations and specifically construction projects. Given these evidences, we expect that

safety-specific transformational leadership will positively mediate the relationship and enhance the relationship between safety climate and safety attitude.

Pakistan is considered as a developing country where projects have been rapidly growing in both private and government sectors. However, according to Choudhry, Fang and Rowlinson (2008), in Pakistan, safety regulations are not extensively implemented and the enforcement of safety management system on construction sites is not visible. Therefore, the construction industry in Pakistan is considered as the second most injury-prone industry, following agriculture (Zahoor et al., 2017b). These accidents and injuries cause construction delays, cost overruns, conflict between stakeholders and lower productivity (Farooqui, Ahmed and Lodi, 2008). Moreover, the data related to fatalities and injuries are not available and published research on construction safety is very scarce. In addition, majority of the studies on safety climate has been conducted in developed countries with the same cultural environment (Barbaranelli, Petitta and Probst, 2015). However, some were conducted in eastern countries (Goh and Chua, 2013). More surprisingly, very limited concentration has contributed to the generalisation of safety climate research across various languages, cultures and regions (Zohar, 2014), more particularly Pakistan. Such situations support the investigation of safety climate and its possible outcomes in the construction industry in Pakistan.

LITERATURE REVIEW

Impact of Safety Climate on Safety Behaviour in Projects

According to Cohen and Jensen (1984), safety behaviours are practical actions taken by employees with respect to the company's safety procedures. The two basic safety behaviours are safety participation and safety compliance (Neal, Griffin and Hart, 2000). Under safety compliance, there are in-role safety-related actions, such as noticing safety regulations and following safety instructions. Conversely, safety participation is an out-role safety-related behaviour, which is discretionary to assist co-workers. It includes active participation in training activities related to safety and further safety suggestions (Clarke and Ward, 2006). Moreover, Fung and Tam (2013) argued that in construction, safety behaviour refers to the response of construction employees to hazardous working conditions. In the context of implementing a strong safety climate, organisations have goals related to the possible means and strategies of accomplishing such goals. A strong safety climate is linked with the perceptions of safety values and priority between subordinates in the project environment (Zohar, 2003).

According to Schneider (1990), organisational climate is linked with particular procedures, practices and policies, such that the perceptions of organisational climate can steer subordinates and apprise them of the expectations for prudent behaviour that should be demonstrated. Based on this, safety climate potentially strengthens the influence of subordinate predictors on safety behaviours by rendering contextual cues to subordinates. This leads to the prioritisation of safety behaviour. Drawing on social exchange theory (Emerson, 1976), social exchange includes a series of interactions that engender obligations. As time passes, it advances to interchangeable commitments that hinge on "rules" of exchange (Emerson, 1976), the most renowned of which is

reciprocity (Cropanzano and Mitchell, 2005). The workplace or in this case project environment is surrounded by diverse social exchanges among the project organisation and members as a whole, among supervisor and subordinates and among the individual and his/her peer group (Settoon, Bennett and Liden, 1996). The dynamics of social exchange facilitate the members in cultivating beliefs to the extent to which leader/project organisation/fellow members value their contribution and care about well-being. These beliefs foster feelings of responsibility that encourage the workers to reciprocate through both extra-role and in-role behaviours, springing into positive organisational outcomes (Cropanzano and Mitchell, 2005). Based on these arguments, we contend that if proper safety climate is provided in the project environment, the subordinates will possibly demonstrate that in their behaviour, which will ultimately result in less injuries and mishaps. Therefore, we hypothesise that:

H1(a): Safety climate exhibits a significant and positive correlation with safety behaviour in projects.

H1(b): Safety climate exhibits a significant and positive correlation with safety attitude in projects.

Mediating Role of Safety Attitude in Projects between Safety Climate and Safety Behaviour in Projects

According to Henning et al. (2009), safety attitude exhibits subordinate feelings and beliefs about safety procedures and policies. It is comprised of four parts: (1) Safety software and concepts, (2) Safety hardware and physical hazards, (3) Risk and (4) People (Cox and Cox, 1991). Moreover, to recognise the significance of safety attitudes in the enhancement of safety in construction, Steers (1981) defined attitude as a tendency to respond in a favourable or unfavourable way to a person or objects in an environment. It has been argued that attitudes play a significant role in the regulation of behaviours (Biggs, Sheahan and Dingsdag, 2007) and workers' attitude regarding safety will not only prompt them whether to safely behave in the workplace but also encourage them to adhere to the formal instruction in the workplace and, when needed, implement the informal practices to achieve the goal (Lingard and Rowlinson, 2005). Safety attitudes significantly affect subordinate safety behaviour, which is important to prevent accidents. According to Eid et al. (2012), the excellent safety attitudes of subordinates will reduce the prevalence of unsafe behaviours, thus facilitating in the prevention of accidents without the support of any direct supervision. Moreover, is has been demonstrated in the literature that positive attitudes positively motivates employees, which change their overall behaviour towards safety in projects. Cheyne et al. (1999) stated that workers' attitudes and co-workers and supervisors' response towards safety and hazards predict safety behaviour in projects. The literature on social psychology has found a correlation between safety behaviour and safety attitude in organisations. According to Ajzen (1991), an individual's behaviour is determined by his/her subjective norms and normative beliefs influenced by supervisors and co-workers. Employees' attitudes towards safety while performing workplace tasks are influenced by their safety knowledge and behaviour. This safety behaviour tends to be repeated again and again. Biggs, Sheahan and Dingsdag (2007)

have indicated that safety attitude plays a significant role in defining safety behaviours. Previously, numerous studies have demonstrated the effect that employee's safety climate have on workplace accidents and safety behaviours (Neal and Griffin, 2006; Varonen and Mattila, 2000). Some of them have even determined a direct connection between organisational safety climate and safety behaviours (Glendon and Stanton, 2000; Cooper and Phillips, 2004). However, some studies have found that this relationship only exists in the presence of other mediating variables (Barling, Loughlin and Kelloway, 2002; Zohar and Luria, 2004). For example, safety climate in the presence of co-worker and supervisor safety interventions affects safety behaviour, which facilitates the prevention of workplace accidents in a timely manner. Similarly, another study found the same impact, as when employees perceive that their organisation cares about their safety and well-being, their positive safety attitude and safety obligation to practice safety behaviour will be improved (Behm, 2005).

This study also proposes that positive attitude towards safety greatly motivates the employees to safely perform their project tasks. Having a positive safety climate in the workplace where workers demonstrate favourable safety attitudes results in less unsafe behaviours. Conversely, unfavourable safety attitudes lead to negative safety behaviours in projects, such as feeling uncomfortable with the use of personal protective equipment. We argue that if proper safety climate prevails in the project environment, the responses of the subordinates will be favourable and hence it may become part of their behaviour. Therefore, we hypothesise that:

H2(a): Safety attitude has a significant and positive impact on safety behaviour in projects.

H2(b): Safety attitude in projects mediates the relationship between safety climate and safety behaviour in projects.

Mediating Role of Safety-Specific Transformational Leadership between Safety Climate and Safety Attitude in Projects

Safety-specific transformational leadership consolidates transformational leadership strategies and tactics but accentuates occupational safety (Barling, Loughlin and Kelloway, 2002). Transformational leadership was first introduced by Burns (1978) and later broadened by Bass (1985). Bass defined it as an approach that improves performance through motivation rather than reward or wage. The purpose is not to exert control directly on subordinates but to create a change in the follower's climate perceptions (Rainey, 2009). It is initiated by establishing a clear and engaging vision, effectively communicating vision and the way of achievement, acting optimistically and confidently, showing confidence in subordinates and empowering others to accomplish goals and vision and leading by example and motivating followers to pursue needs (Yukl, 2006). Safety-specific transformational leadership has gained considerable attention in the literature on workplace safety (Avolio, Bass and Jung, 1999). This style of safety leadership delivers a shared vision of safety to subordinates and inspires them to exercise their self-efficacy, skills and energy to achieve their vision. In practice, this leadership style improves subordinate's safety performance, such as compliance with safety regulations and safety participation *via* idealised intellectual

stimulation and inspirational motivation (Inness et al., 2010). According to Lu et al. (2019), subordinates in projects with this style of transformational leadership place a high level of energy into safety management, detecting any possible safety menace. Moreover, leaders show consideration for individuals when they identify followers with unique abilities. The respective leaders then address the needs of the followers and provide training and coaching, so that they may reach their full capabilities.

Similarly, the idealised influence of leaders is a trust-based relation that occurs when leaders demonstrate and adapt high morals and standards in their own behaviour and try to become role models for their followers. When leaders encourage followers to share their thoughts on organisational issues, it encourages them to question things and develop creativity in them. As a result, leaders exhibit intellectual stimulation. Conversely, inspirational motivation is a process that occurs when leaders promote communication and help employees in creating a clear and positive vision for their future. It challenges employees to step outside of their comfort zone and self-interest, and perform in such a way that provide benefits to individual and organisation as a whole (Hoffmeister et al., 2014). Furthermore, with proper safety climate in the project environment and high level of transformational leadership, the subordinates are expected to go beyond the requirements of their work role and enhance the safety in the project environment. Based on the arguments, we hypothesise that:

H4: Safety-specific transformational leadership mediates the relationship between safety climate and safety attitude in projects, such that it will strengthen the relationship.

Research Model

Figure 1 presents the theoretical model of this study.

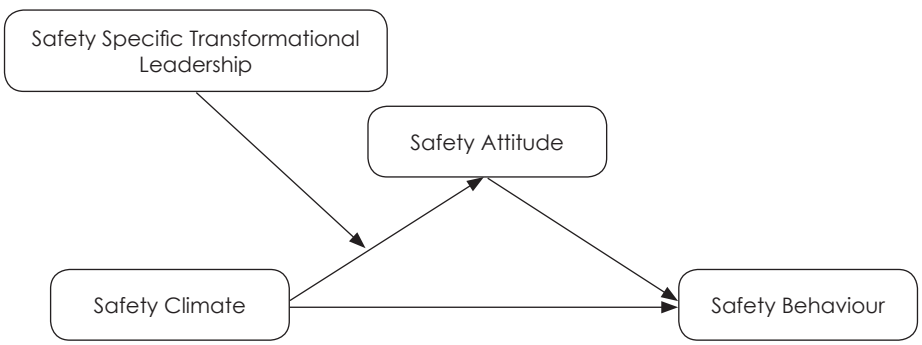

Figure 1. Theoretical model

METHOD

Population and Sample

The present study focuses on both government and private sectors in Pakistan. The population for data collection includes different employees and managers in project-based organisations. The data for this study were obtained from seven project-based organisations in Lahore and Islamabad. Both national- and international-level project-based organisations, which run various construction projects in Pakistan, were included. Around 25 projects were selected from these organisations for data collection. In Pakistan, the English language is widely spoken; therefore, the questionnaires were administered in English following the lead of Khan et al. (2018) and Khan, Quratulain and Bell (2014). Contacts were identified to facilitate data collection from the selected organisations. These contacts referred us to the respondents working on the projects. We asked for their direct support. Each questionnaire has a cover page that describes the study purpose and procedure. The survey includes the measure of safety climate in projects, safety attitude, safety-specific transformational leadership, safety behaviour in project and demographic variables. The respondents were requested to complete and return the questionnaire. A total of 400 questionnaires were distributed to the selected project-based organisation for the data collection. However, only 310 complete responses were obtained. For data consolidation, the final number of sample for data analysis was 294, which resulted in the total response rate of 74%. It has been recommended that a sample size of 200 can guarantee reliable results if the dataset is analysed *via* confirmatory factor analysis (Hair et al., 2010; Oke, Ogunsami and Ogunlana, 2012). More recently, the study by Zahoor et al. (2017b) followed the same criteria for conducting a study on the construction projects in Pakistan. Majority of the respondents were male, which accounted for 64.3% and the female respondents accounted for 35.7%. Most of the respondents were aged 26 years old to 33 years old, which accounted for 65%. Similarly, majority of the respondents (51%) had a Master of Philosophy degree. Furthermore, most of the respondents (47.6%) had job experience of 6 years to 10 years.

RESULTS

Analysis for this study was conducted using different analytical tools, such as SPSS and Amos. Statistical Package for Social Sciences (SPSS) was used for computing descriptive statistics, correlations and reliabilities, while IBM SPSS Amos was employed for confirmatory factor analysis and path analysis.

Common Method Bias

According to Podsakoff et al. (2003), the common method bias is the factitious "variance attributable to the measurement method rather than to the constructs the measures represent". The major source of measurement error is method bias, which has a negative impact on the validity of empirical findings, thus leading to spurious conclusions (Campbell and Fiske, 1959). The most widely used technique

to test the common method bias is the Harman single-factor test (Khan and Mir, 2019). As the current study data was self-reported, therefore, we conducted the Harman single-factor test (Harman, 1960) and estimated the common method variance. The results revealed that there is 40% variance explained. For a single factor, the threshold for the variance explained should be less than 50%. This indicates that in our study, the measurement of research indicators has no issue of common method bias.

Descriptive Statistics

The descriptive statistics, mean, standard deviations, correlations and reliabilities are presented in Table 1.

Table 1. Means, standard deviation (SD) and correlation

Variables	Mean	SD	1	2	3	4	5	6	7	8
Gender	1.54	0.51								
Age	1.18	0.51	–0.15*							
Qualification	1.13	0.41	–0.04	0.38**						
Experience	1.33	0.78	–0.11	0.61**	0.53**					
Safety climate	3.56	0.76	0.04	–0.15*	–0.10	–0.13*	(0.94)			
Safety attitude	3.64	0.75	0.00	–0.01	–0.09	–0.08	0.69**	(0.95)		
Safety-specific transformational leadership	3.66	0.79	0.05	–0.13*	–0.08	–0.11	0.80**	0.71**	(0.89)	
Safety behaviour	3.62	0.89	0.02	–0.15*	–0.10	–0.14*	0.94**	0.73**	0.93**	(0.85)

Multicollinearity

Due to the high value of correlation, the variance inflation factor was calculated to investigate whether the issue of multicollinearity exists in the data or not. According to Ho (2006), multicollinearity is a situation in which independent variables are highly correlated. This situation may disturb the data and the statistical inferences from such data are doubtful. Therefore, a multicollinearity test was conducted. The tolerance and variance inflation factors were utilised to examine the multicollinearity in data. According to Hair, Ringle and Sarstedt (2011), a value below 0.1 for tolerance and a value below 5 for variance inflation factor (VIF) indicate that no issue of multicollinearity exists in the data. The values presented in Table 2 indicate that the data is free of multicollinearity. The VIF for safety climate was 3.08, safety specific transformational leadership was 3.23 and safety attitude was 2.23. Moreover, the tolerance values for all independent variables were less than 0.1. The results proved that the data is free of multicollinearity and that the statistical inferences from this data are reliable. The results are presented in Table 2.

Table 2. Multicollinearity

Variables	Tolerance	VIF
Safety climate	0.324	3.08
Safety specific transformational leadership	0.309	3.23
Safety attitude	0.446	2.23

Confirmatory Factor Analysis

For measurement model validation, confirmatory factor analysis was conducted. Following the suggestions of Anderson and Gerbing (1988), the hypothesised model was composed of four latent variables: (1) Safety climate, (2) Safety attitude in projects, (3) Safety-specific transformational leadership and (4) Safety behaviour in projects. Different fit indices were utilised to check the model fitness, such as chi-square, incremental fit index (IFI), Tucker–Lewis index (TLI), comparative fit index (CFI) and root mean square error of approximation (RMSEA). For the model fitness, the acceptable value for chi-square is less than 3 and those for CFI, TLI and IFI are greater than 0.90 (Hinkin, 1998; Steiger, 1990). In addition, the acceptable value for RMSEA is less than 0.80 (MacCallum, Browne and Sugawara, 1996). Our model was found to be an excellent model fit, as demonstrated in Table 3, with the value of chi-square being 1.428, CFI = 0.937, IFI = 0.938, TLI = 0.931 and RMSEA = 0.044. All values are in an acceptable range, which means that the model had satisfactory discriminant validity. The results are provided in Table 3.

Table 3. Confirmatory factor analysis

	CMIN/DF*	CFI	IFI	TLI	RMSEA
Initial model	1.920	0.829	0.830	0.823	0.056
Hypothesised model	1.428	0.937	0.938	0.931	0.044

**Note:* CMIN/DF = Chi-square fit statistics/degree of freedom

Hypothesis Testing

For the testing of the hypothesised model, Amos was utilised. The results of the path analysis are presented in Tables 4 and 5. Hypothesis 1(a) stated that safety climate exhibits a positive and significant correlation with safety behaviour in projects. The results provided justification for its support, as indicated by the coefficient (*B* = 0.686***). Similarly, Hypothesis 1(b) stated that safety climate exhibits a positive and significant correlation with safety attitude in projects. The results support this hypothesis, as indicated by the coefficient (*B* = 0.698***). Furthermore, Hypothesis 2(a) stated that safety attitude exhibits a positive and significant correlation with safety behaviour in projects. The results provided in the table support this hypothesis, as indicated by the path coefficient (*B* = 0.261***). Also, Hypothesis 2(b) stated that safety attitude mediates the relationship between safety climate and safety behaviour. To enable the occurrence of mediation, there should be no zero between the lower- and upper-level

confidence interval. The results support this hypothesis as there is no zero between upper level confidence interval (ULCI) (0.119) and lower level confidence interval (LLCI) (0.261) and both has the same sign. Last but not the least, Hypothesis 3 stated that safety-specific transformational leadership mediates the relationship between safety climate and safety attitude, such that the relationship is strengthened when the mediation is high and vice versa. The results provided in Table 5 did not justify this hypothesis, as indicated by the path coefficient (B = −0.074) which is insignificant. Hence, Hypothesis 3 is not supported.

Table 4. Path coefficients

Structural Path			**B**
Safety climate → Safety behaviours			0.685***
Safety climate → Safety attitude			0.698**
Safety attitude → Safety behaviours			0.261***
Indirect Effects of Safety Climate on Safety Behaviour			
Bootstrapping			
	Effect	**ULCI**	**LLCI**
Safety climate → Safety attitude → Safety behaviour	0.181	0.119	0.261

Notes: N = 294; 5,000 Bootstrapping; LLCI = Lower level; UL = Upper level; CI = Confidence interval.

Table 5. Path coefficient for moderation

Structural Path	**B**
Safety climate*Safety specific transformational leadership → Safety attitude	–0.074

Note: N = 294

DISCUSSION

This study aimed to investigate the impact of safety climate on safety behaviour with the mediating mechanism and interacting effect of safety-specific transformational leadership. Most of our results were consistent with the hypothesised model. Hypothesis 1(a) stated that safety climate exhibits a positive and significant correlation with safety behaviour in projects. The results are in congruence with the research by He et al. (2020), which states that safety climate has a positive association with both safety compliance and participation behaviour. Moreover, we argue that if proper safety climate and safety culture exist in the project environment, project employees will develop responsible behaviour towards safety. Similarly, Hypothesis 1(b) stated that safety climate exhibits a positive and significant correlation with safety attitude in projects. Kundu, Yadav and Yadav (2016) argued that safety climate is linked with safe workplace environment. When employees perceive that organisations have adopted safety-related practices, their attitude towards safety increases, thus ultimately increasing the firm's performance.

We argue that if proper safety is in place in project environment, it becomes part of individual attitude. Hypothesis 2(a) stated that safety attitude exhibits a positive and significant correlation with safety behaviour. When subordinates adopt a given situation which befalls them, consistently following the organisation safety rules and regulations and orchestrating safety practices in project environment becomes part of subordinate behaviour. Moreover, Hypothesis 2(b) stated that safety attitude mediates the relationship between safety climate and safety behaviour. The results are consistent with the hypothesised model, as we argue that in construction projects, the certainty that workers and subordinates face accidents potentially prevails. However, it is worth noting that if proper safety culture is observed and established in an environment, subordinates will adopt that culture and ultimately, it will become their innate nature or behaviour.

Last but not the least, Hypothesis 3 stated that safety-specific transformational leadership mediates the relationship between safety climate and safety attitude. However, the results did not support this hypothesis. The reason may be that in Pakistan, leaders are not willing consume time on implementing safety related practices in project environment. Zahoor et al. (2016) contended that poor management control usually results in swelled compromises and work pressure on safety compliance in Pakistan. This indicates that leadership does not focus on the safety practices and their implementation in the project environment.

RESEARCH IMPLICATIONS, LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

The current study has implications, both theoretically and practically. Safety is considered as an important factor in construction projects, as these projects are considered to be labour-intensive. Moreover, majority of the work involves the use of different equipment and machineries that increase the chances of accidents and injuries. The current study contributes to the literature in various ways. First, the study provided clear evidence that safety climate and environment can improve the behaviour of employees towards safety. Moreover, we have also found that safety attitude mediates between safety climate and safety behaviour, indicating that to improve behaviour regarding something attitude play an important role. Furthermore, our study did not support the mediating role of transformational leadership, which may be due to the possibility that the required safety environments need some specific leadership, such as safety leadership, which we argue should be investigated in future studies. The current study has also some implications for managers and project-based organisations. Maiti and Choi (2019) argued that the cost of megaproject construction is very high, though the inherent risk linked with this constantly remained as the centre of attention. The main reason for this is that megaprojects have high mortality and injury rates compared with other industries. Similarly, Tam and Fung (2012) argued that the development of a dynamic culture of safety entails significant investment of time and money for the planning, inspection and execution of safety measures. Nonetheless, these costs are still very negligible compared with human life and health.

Furthermore, construction is contemplated as the most unsafe and vicious industry to work in. Therefore, health and safety standards should be elevated to at least satisfactory, if not commendable, levels. This would certainly act as a

positive catalyst and encourage more professionals and employees to pursue promising careers in this industry (Teo and Ling, 2009). Similarly, the managers need to provide good project environment to reduce the accident rates. This will ultimately enhance the project performance. Furthermore, our study established that to develop and achieve the desired attitudes and behaviours of project employees, it is important to implement the much-needed safety practices important for the employees' safety. Also, Fung et al. (2016) argued that organisations should devote resources to improve and increase the positive perceptions of workers regarding safety.

Similarly, safety managers should be officially designated to enable effective planning, execution and implementation of safety-related practices. It is also very important for organisations and governments to work on employees' attitudes towards health and safety in the construction sector through workshops, trainings and awareness seminars. This can be done by companies and governments by issuing official orders and notifications for employees to follow procedures. In addition, they should increase employees' apprehension of the significance of safety measures (Fung and Tam, 2013).

The current study has certain limitations. Firstly, the nature of the study was cross-sectional, which hinders drawing causal inferences. Therefore, in the future, a longitudinal approach may be adopted to make clear inferences about the causality of the inferences. Moreover, a self-reported approach may influence the accuracy of safety behaviour due to risk identification. Therefore, to mitigate this affect, some strategies may help, such as incentive measure, confidentiality statements and clear investigation procedures (He et al., 2020). Future safety research should adopt some other data sources, such as archival research and other methodologies on the lines of qualitative and mixed-method approach. Secondly, the issue of generalisability needs to be considered, as the data for the current study was obtained from only project-based organisations in Pakistan. Therefore, the findings are not generalisable on other industries and contexts. Future studies should employ a rigorous approach for data collection from other industries and contexts to make the findings more generalisable.

Furthermore, the current study employed social exchange theory as an underpinning theory. It is recommended that future studies should explore other avenues, such as self-determination model and personal motivation. In addition, the current study utilised safety attitude as a mediating variable. It is suggested that future studies should use some other mediating variables, such as safety motivation, safety compliance and safety participation (Kundu, Yadav and Yadav, 2016). Moreover, the identification of leadership abilities that have the potential to implement safety practices in the project environment is greatly needed. This is critical to avoid lethal accidents and injuries in a project. As the research indicated, a positive top-tier and mid-tier leadership is indispensable for fostering organisational health and safety practices and also for promoting a collective behaviour that is conducive to safety for construction workers (Musonda, Lusenga and Okoro, 2018).

CONCLUSION

The current study aimed to investigate the impact of safety climate on safety behaviour with the mediating mechanism of safety attitude and safety-specific transformational leadership in the construction projects in Pakistan. This study was conducted in the construction industry as such industry contributes more significantly to the country's employment compared with the others. Social exchange theory was adopted as an underpinning theory for the current study. The implications of this research for the project managers and overall construction industry are of considerable practical significance. The implementation of proper safety policies and practices in the project environment influences the attitude and behaviour of project employees. This will ultimately reduce the accident rates and avert human losses. Moreover, its influence will be reflected in the overall project performance.

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