

Investigation of Relationship between Demographic Factors and Construction Safety Climate

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Abstract

The construction industry plays an important role in the economic and social development of the world. The construction company deals with the construction projects executed by the number of workers thus the safety of these workers should be investigated and provided properly. In the developed and developing countries the safety in the construction industry is considered a major issue. In Pakistan many construction companies are working on different projects but the safety and health facilities provided to the workers by the organizations are not meeting the standards. In this research an attempt is made by using the safety climate questionnaire and demographic factors having several statements with the Likert scale. Survey was conducted on more than thirty six construction projects in different cities of Pakistan. The main objective of this study was obtained by keeping in view the relationship of demographic factors with the safety climate including construction company type, project types, nature of employee, age and educational level of the workers.

Keywords

Safety, safety climate, Operation and Maintenance, Mean Safety Climate Score, Demographic Factors

1. Introduction

The construction industry keeping in view the serious injuries worldwide is one of the most injury prone industry among the different industries of the world covering the aspects such as disability, mortality, hospitalization and lost work time (Al-Hemoud & Al-Asfoor, 2006). Therefore it is essential to improve

worker safety at project sites. Developments in working environment and advanced equipment which are being used in the construction industry are not sufficient without improving safety performance (Breslin et al., 2007).

The organizational principles and human factors also play vital roles for the improvement of safety climate. For the sake of the safety of the employee at project sites and considering interest for researchers in recent years, safety culture is becoming critically significant due to the variation in workforce behavior which totally depends upon perceptions (Cameron & Duff, 2007). In the world construction industry safety practices are distinctive due to demographics, legislation and stakeholders. Implementation of a health, safety and environmental management system is still uncommon in Pakistan and various developing countries of the world (Clarke, 2006).

Workforce of a country 16% directly and 30% to 40% indirectly associated with the construction industry (Clarke & Ward, 2006). As per report from Survey of Pakistan from the year 2002 to 2009 there is a gradual increase in percentage for occupational health & safety injuries from 12.54 to 14.54 which shows that there is lack of safety culture in Pakistan. Poor safety performances are caused due to the fewer incentive insurance mechanism because the insurance depend on rules and regulations. The workers on site exhibit improper safety behavior due to the lack of awareness about health and safety. Safety climate calculate the observations of the working personnel influenced by demographic factors such as education, experience, age, type of employment, marital status, dependents and habits etc (Cooper, 2009).

2. Safety

Safety is a situation in which risks are managed to the acceptable level. It is the activity that seeks to minimize or eliminate hazardous conditions that can cause injury (DeJoy, 2005).

2.1 Occupational Safety

Occupational safety is related where people work and the corresponding risks in the areas. Normally these areas include construction sites, offices, farms, manufacturing plants and commercial as well as retail facilities (Dickerson, Koch, Adams, Goodfriend, & Donnelly, 2010).

3 Safety Climates

Considering the term safety climate, it was defined as a summary of perceptions that employees share about their work environments (Kines et al., 2010). The term of safety climate with respect to its definition is sometimes used interchangeably with the term safety culture (Kelloway, Mullen, & Francis, 2006). In order to define the attitude of the employees towards safety both safety culture and safety climate terminologies can be accepted widely (Ek & Akselsson, 2007). Safety climate is frequently observed as a reflection of fundamental culture followed by any organization. Safety climate is sometimes also considered as a sub-component of term safety culture, which means the comparative importance of safety inside the organization (Hermann, Ibarra, & Hopkins, 2010).

4. Research Methodology

Mixed or multiple research methods are used in this research study. Main research instrument adopted was the questionnaire survey. Cronbach's Coefficient Alpha method and Shapiro-Wilk Normality Test are performed to check the reliability and normality of data respectively.

4.1 Sample

Questionnaire survey to 36 construction sites has resulted 460 valid responses which is 91.53% of

questionnaire distributed representing true sample of the construction industry. There was least response received from clerk staff (09) which termed to be unclassified categories and discarded from the sample so the sample size reduced to 208 and the ratio of managers, supervisors and workers was about 1.6 : 1.0 : 2.3. 1.3% of the responded workers were found to be younger than 20 years, more than 55.5% of workers were found between the ages of 21 to 30 years old, almost 26.0% of the responded workers were found between 31-40 years, almost 8.20% of the workers were found between the age of 41 to 50 years old and rest 8.6% of the workers were found older than 50 years.

5. Mean Safety Climate Score (MSCS)

With respect to demographical factors the Mean Safety climate score, projects types and company category provides insight for different dimensions.

5.1 Demographic Factors

Demographic factors like employment status, education level, age, marriage status, dependents, education level, and experience in the industry have been considered for this study

It is clear from the Figure 1 that the age group (41 to 50 Years) has better mean safety score among the others and hence this group has strong and better perception towards construction safety on the construction sites.

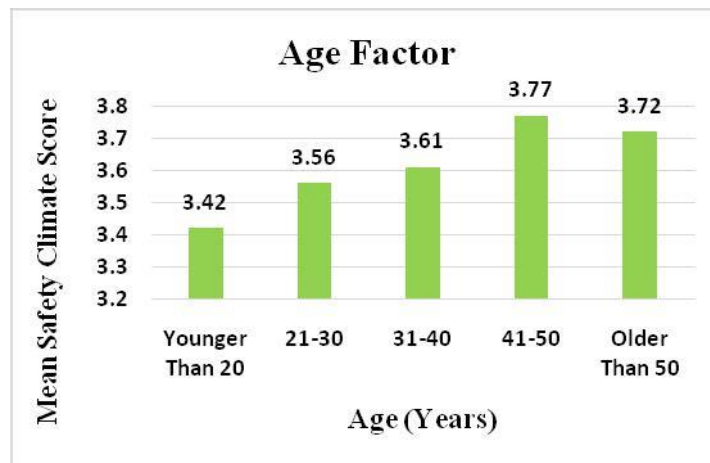


Figure 1: Mean Safety Climate Score – Age

It is clear from the Figure 2 that the married respondents have better mean safety climate score then the single respondents and that is why their perception towards construction safety is much higher and better on construction sites.



Figure 2: Mean Safety Climate Score - Marriage Status

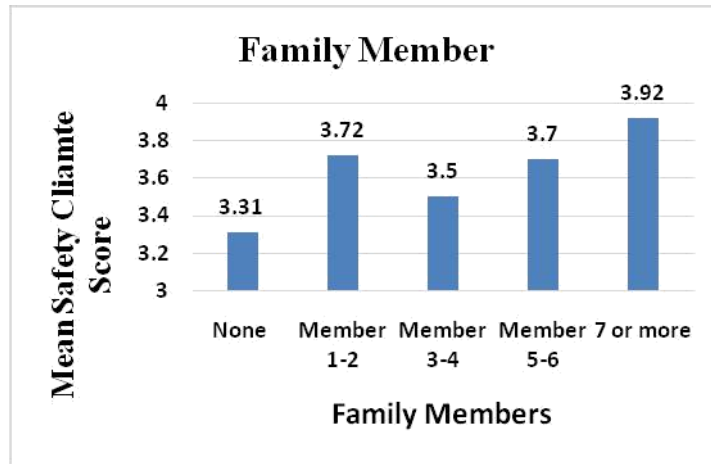


Figure 3: Mean Safety Climate Score - Family members/dependents

It can be seen from the Figure 3 that the respondent having more dependents (>7) have much better mean safety climate score of strong perceptions towards construction safety.

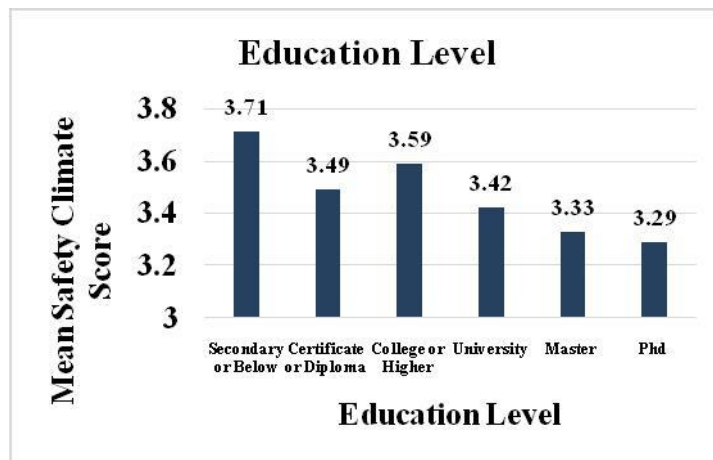


Figure 0: Mean Safety Climate Score - Educational level

In Figure 4 safety climate score is above average for all levels showed each respondent have some knowledge about safety, adequacy not emphasized here.

It is clear from the Figure 5 that the respondents employed in joint venture projects have better mean safety score among the others and that is why they have better perceptions towards construction safety.



Figure 4: Mean Safety Climate Score – Direct Employer

It is clear from the Figure 6 that the respondents having more than 16 years experience have better mean safety score thus having better perceptions towards the construction safety. Employees at initial stage of career take interest in safety but decreases due to company policies. At peak of their career they put individual effort for safety when on higher posts.



Figure 5: Mean Safety Climate Score – Experience

If we talk about the effect of project type on construction safety, from different types of projects at least three projects has been taken. From the data the lowest score (2.35) has been found for the Facility Building projects and Bridge projects found on highest side (4.12) among all the projects types. It is clear from the Figure 7 that Bridge Projects have better construction safety than other projects as the Bridge Projects are very complex in nature and the lot of hazards can be there at the site of Bridge Projects. As there is lesser complexity and lesser hazards in the building projects that is why these projects have lesser construction safety score.

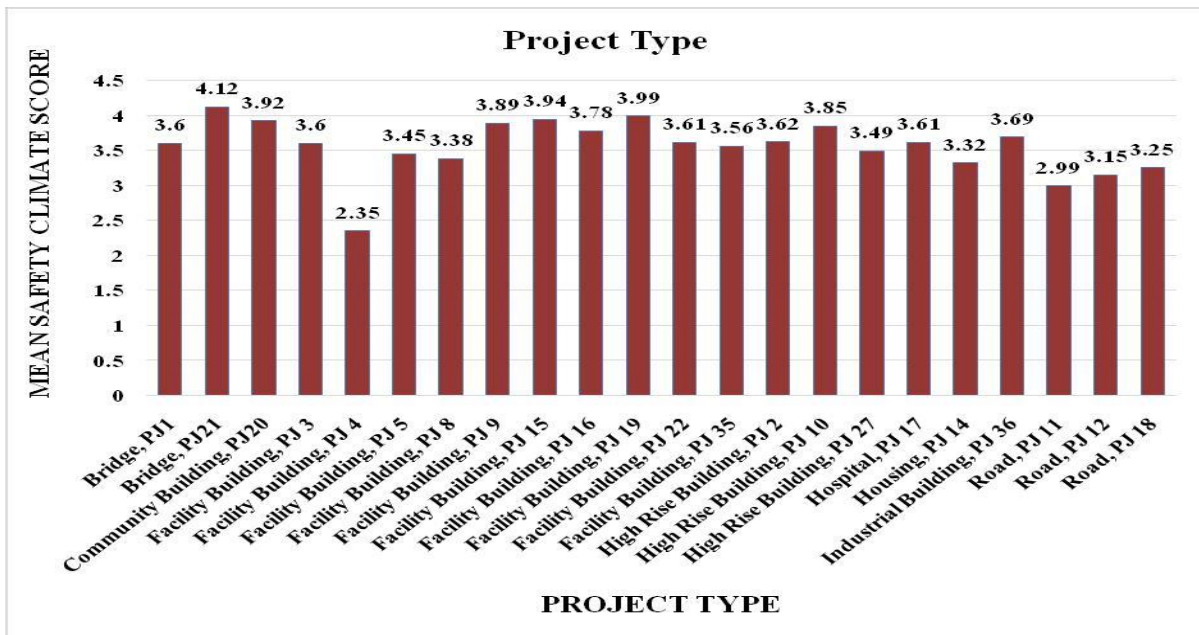


Figure 7: Mean Safety Climate Score – Project Type

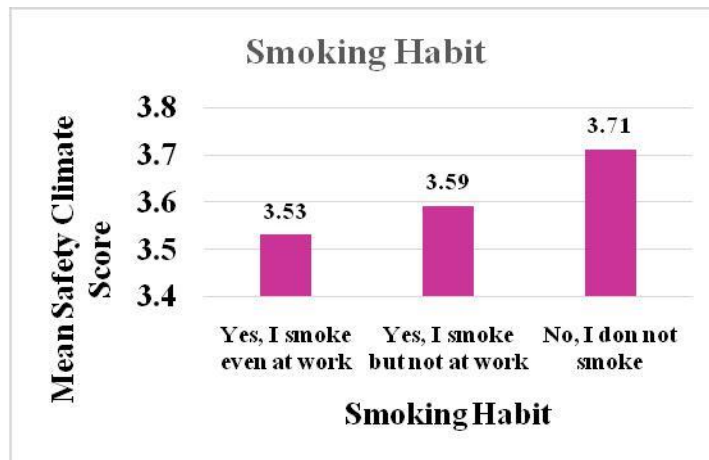


Figure 8: Mean Safety Climate Score – Smoking Habit

It is clear from the Figure 8 that the respondents who do not have smoking habit have better mean safety score and that is why have better perception towards the construction safety at site.

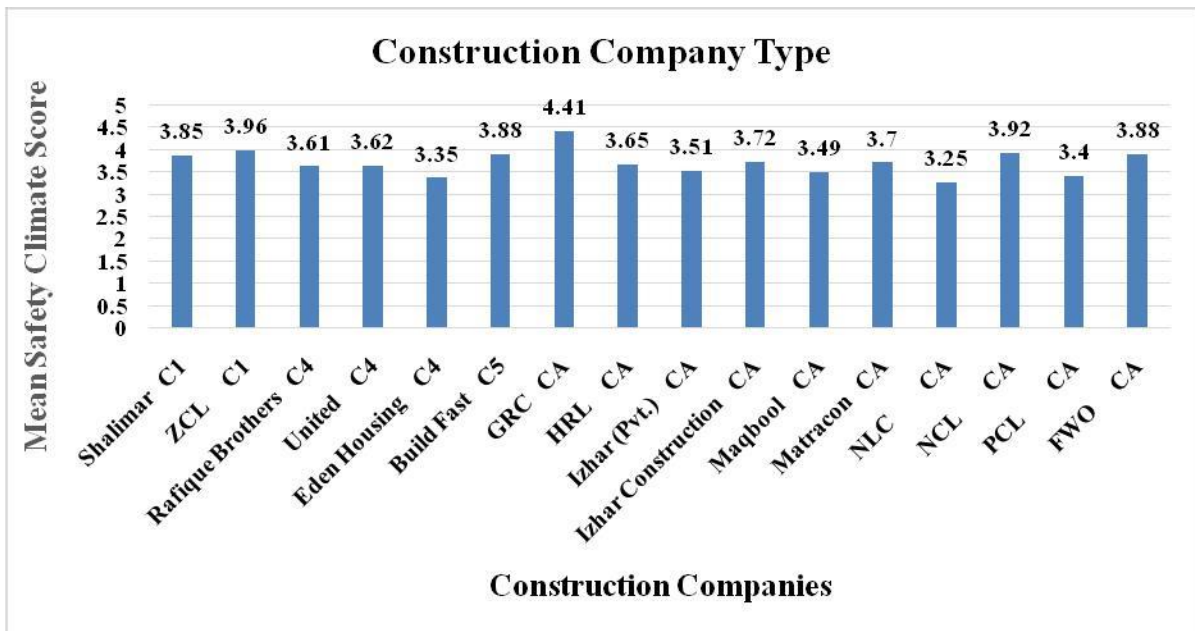


Figure 9: Mean Safety Climate Score – Company Type

It is clear from the data analyzed that among 21 construction companies categories ranged as CA, CB, C1, C2, C3, C4, C5, and C6 by Pakistan Engineering Council (PEC), the construction safety climate level has been investigated. It can be seen from Figure 9 that CA companies have minimum 3.25 construction safety score and CA have maximum construction climate safety score 4.41. Companies in Low category have better perception towards construction climate safety as compare to the larger companies.

6. Concluding remarks

The main objective of this study was obtained by keeping in view the relationship of demographic factors with the safety climate, including construction company type, project types, nature of employee, age and educational level of the workers. In this study the factors which were reviewed were age factors, marriage status, number of family members, educational level, employee type, total experience, smoking habit, project type and the company type. The results showed that age group (41 to 50 years), married respondents, respondents with more than 7 dependents, all respondents with basic education, respondents employed in joint venture projects, respondents having more than 16 years experience, and respondents who do not smoke have clear perceptions. The maturity level of the workers increase at the later stage of their service life and with the help of this experience they address more safety aspects and scrutinize the hazardous situations. The social responsibility which is associated with the life of people has been catered in the better way by married people as compare to the single ones.

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