Examining the Satisfaction Level of Construction Workers on Safety Management in the Kingdom of Saudi Arabia

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ABSTRACT

The importance of the construction industry in Saudi Arabia cannot be overemphasised as it provides the infrastructure required for other sectors of the economy to grow, thus reflecting the level of economic development in the country. However, in Saudi Arabia, the construction industry is recognized to be the one of the most hazardous with high levels of accidents and fatalities. This research aimed to examine construction Health and Safety practices in Saudi Arabia, and to identify means of facilitating improvements within the practices. It also discusses about safety climate. The research adopted a quantitative approach in which a survey questionnaire was distributed and returned at 60% response rate. The survey data was analysed through descriptive statistics using the SPSS statistical software. The findings showed that the Saudi construction industry has made improvements in Health and Safety standards, however there are opportunities for further improvements. There are on-going efforts to maintain reasonable Health and Safety standards of employees on-site, their conditions off-site particularly those of migrant employees on fixed term contract labour are difficult. Unpaid wages and lack of welfare facilities contribute to physical and psychological stresses that are linked to impaired on-site performance, lack of motivation, lack of productivity and a lack of interest in adhering to Health and Safety guidelines. The study concludes that it is possible to improve construction Health and Safety through effective enforcement of existing Health and Safety laws, enacting legislation for off-site Health and Safety for migrant workers, maintaining a fund for social security and improving regulation of commercial and contractual transactions. This study contributes to knowledge in the areas of government policy and decision making in health and safety implementation for the construction industry.

Keywords: Health and Safety Practices, Kingdom of Saudi Arabia, safety climate and Welfare

INTRODUCTION

The construction industry is both economically and socially important. It provides the infrastructure required for other parts of the economy to grow, thus reflecting the level of economic development of the countries (Cole and Lorch, 2003; Hasan, 2011). However, the construction industry is also recognized to be one of the most hazardous (Farooqui, 2008). In Saudi Arabia where this research is focused, the construction industry is classified as a risk industry with high levels of accidents and

fatalities. The Saudi construction sector provides employment for over one million workers and accounts for almost 14.4% of the country's 7.3 million-labour force (Al Shaikh, 2010). Many of those who work in construction confront dangerous working environments and exploitative work practices. The role of Health and Safety therefore is to address both physical and psychological wellbeing of workers on construction sites and other persons whose health is likely to be adversely affected by construction activities (Dryzek and Schlosberg, 2005).

In view of the high accident rate in the construction industry, the Ministry of Labour introduced Safety Management Regulations on 24 November 1999 which is applicable to the construction industry (Saudi Ministry of Labour, 2000); unfortunately the enforcement of safety regulations is not widespread. The industry is characterised by a laxity in implementation of commercial and contractual laws. Furthermore, the industry engages in the traditional approach to solving problems related to labour shortage in which companies recruit fixed-term contract labour as cheaply as possible from underdeveloped nations rather than creating a permanent pool of labour. As a result, there exists a critical need to find means for sustained and continuous improvement in construction Health and Safety. This research therefore aims to examine construction Health and Safety practices in Saudi Arabia, and to identify means of facilitating improvements within the practices.

To address the aims, the following objectives undertaken: (1) To examine the concept and importance of construction health and safety, including existing regulations, policies, and measures through a critical review of the literature. (2) To investigate perceptions and attitudes regarding health and safety at Saudi Arabian construction sites by conducting a questionnaire survey with site workers and managers. (3) To analyze the data from the responses of the questionnaire survey in order to determine industry trends regarding construction health and safety practices in Saudi Arabia. (4) To discuss and conclude how to best bring about improvements in the Saudi Arabian construction industry regarding health and safety.

LITERATURE REVIEW

According to Hughes and Ferrett (2016), the term 'safety', which refers to an absence of danger, is often partnered with the term 'health' within the context of work in general and for construction work. Because human health and welfare are of concern to the society, a corporate responsibility exists to ensure that minimal risks exist to the health and safety of employees so that individuals, families and the society at large receives protection and remains free from catastrophe. Hence, a global concern exists for health and safety in construction and many nations around the world have enacted laws and regulations to emphasise health and safety in occupations, based on recommendations of international organisations, including

the International Labour Organisation (ILO (Coble, 2000). A need therefore exists to ensure that laws and regulations are effective and practical.

The research presented by Jannadi (1998), suggests that the safety and health of construction workers have always been of value in Saudi Arabia where this research focuses. However, the larger and more professional organisations in Saudi Arabia, including firms like Saudi Aramco and SABIC, emphasise excellence for worker health and safety, but the relatively smaller construction firms had performed relatively poorly (Jannadi, 1995; 1998). Thus, Jannadi (1998), had called for the enactment of a safety code for the construction sector in Saudi Arabia and this was apparently implemented in collaboration with the International Code Council for safety in construction (IHS, 2007). However, it is one thing to have laws and regulations for health and safety in construction and another is to have these implemented efficiently to effectively address the problems that they were designed to tackle. Although precise and comprehensive statistics for construction safety and health in the Saudi Arabian construction industry are lacking, Jannadi (2002), suggests that even in Saudi Arabia organisations involved in construction cannot avoid responsibility for safety because construction activities take place on their construction sites. Jannadi (2002) concludes that a consensus exists amongst construction contractors in Saudi Arabia that management involvement, personal protective equipment, and emergency disaster planning and preparation are essential for construction safety, but nationwide statistics related to construction safety, and health are lacking.

Baig (2001) presents a discussion on construction safety in the Eastern Province of the Kingdom of Saudi Arabia with frequencies related to injury and accident from selected firms based on a survey. Nevertheless it appears that there is no authoritative data available from the government of Saudi Arabia for injury and deaths in the construction sector of the country. Thus, if a government cannot maintain statistics for injuries, accidents and deaths then enforcing regulatory action will be difficult.

The Basic Law of Government Document for Saudi Arabia clearly states that the basis of government is on a premise of justice, consultation, and equality in accordance with the Islamic Shari'ah law (Middle East Info, 2011). Chapter 8 of the Saudi Labour Law deals with 'Protection against Occupational Hazards, Major Industrial Accidents and Work Injuries, and Health and Social Services' in the Kingdom. It is possible to sue an employer who has been negligent in adequately providing for an employee in a Saudi Labour or Shari'ah court (Gulf Talent, 2008). A comprehensive social security and benefit system exists for those who are nationals of Saudi Arabia, but migrant workers are not entitled to receiving protection under this social security and benefit system because governments of countries of which they are a national must look after them (World Law Guide, 2010). Although the

government has attempted to ensure that an obligation exists on the part of all those involved in construction to ensure safety and health, there are always opportunities for improvement.

It is clear that construction safety legislation and its enforcement are important for enhancing construction health and safety, what is even more crucial is how to effectively implement and enforce those laws. The safety and health provisions enshrined in the Saudi Labour Law are fairly decent and comprehensive (O'Kane, 2010; Ministry of Labour, Kingdom of Saudi Arabia, 2011). The Labour Law requires employers to maintain the work place in a clean and hygienic condition and to comply with other rules, measures and standards of occupational protection, health and safety in accordance with what is in the Minister's decisions. However, it is pertinent to ask if this requirement extends to the living quarters of the workers sponsored by an employer for work in the Kingdom of Saudi Arabia because most of the complaints that emanate are about the living quarters of sponsored workers. The Law stipulates that employers take necessary precautions to protect workers against occupational diseases, hazards and to provide work safety and protection. Employers must post instructions related to work in a language that the workers understand at prominent locations, and they must inform workers about hazards associated with work. Article 123 of Part VIII of the Saudi Labour Law requires providing protective equipment with appropriate personal gear together with training to workers to avert hazards. Article 124 obliges workers to use the protective gear to ensure safety. Article 125 requires employers to take precautions against fires and Article 126 obligates employers to act appropriately for protection of all those who are not employees, but who must enter work location. Articles 132 - 144, Part VIII of the Saudi Labour Law highlights work injuries and occupational diseases that workers may acquire unintentionally while working for an employer (Ministry of Labour, Kingdom of Saudi Arabia, 2011, 'Labour Law – Part VIII'). Those with work injury or occupational disease must receive treatment at the expense of an employer with full pay for the first thirty days and then at 75% of their salary for the duration of treatment.

Apart from health and safety legislation, it is important to know why construction accidents occur in the first place to help understand accident prevention better. Poor safety management and the failure to control risk during the construction activities may lead to accidents or injuries among construction workers. For that reason, effective safety management is essential to prevent accidents and deaths. In addition, safety contributes to productivity because with a safe work environment workers are able to focus on their jobs better. The major causes of accidents have been identified, and sometimes can be attributed to unsafe design and site practices. Accidents can arise from different causes that can generally be classified as; physical incidents posing hazardous situations, and behavioural incidents caused by unsafe acts (Kartam 1997). Thus an underlying belief is that accidents are not entirely caused by careless workers but sometimes by failure in control, which

ultimately is the responsibility of management. Debobbeleer and Beland (1998) reviewed safety climate instruments and noted that management commitment and worker involvements were the two factors that stood out. Also, Flin et al (2000) reviewed 18 sources to identify the common features for safety climate are related to: management, safety systems and risk. So this raises the question what is safety climate.

Safety Climate

The term safety climate was first coined by Zohar (1980), in his research study. He defined safety climate as a summary of molar perceptions that employees share about their work environments. Following a popular theory, he argued that these perceptions serve as a frame of reference for employees to behave. Zohar (1980) concluded that management needs to change their attitudes and increase their safety commitment to improve safety level in the organisation. He also suggested that safety climate survey is a practical tool to compare safety performance between organisations because it is independent from factors such as technologies and risk levels that have caused difficulties in measuring safety performance in the past. Zohar's work has gained wide recognition and many research studies have been conducted to further investigate the concept of safety climate. As such, different safety climate definitions have been proposed as listed in Table 1.0

Although the list of definitions given in Table 1 may not be exhaustive, there are similarities that can be drawn from them. First, all authors concur that safety climate is about employees' perceptions and attitudes towards safety in the organisation or in their workplace. Second, safety climate only measures perceptions and attitudes towards safety at a certain point in time, that is, during the time when the survey is conducted. This characteristic indicates that safety climate may change over time, thus it is important to measure safety climate regularly to identify trends and problematic areas that need to be addressed (Zou & Sunindijo, 2010). Third, it is important to recognise levels of aggregation of safety climate. There may be more than one level of safety climate in an organisation, such as organisational safety climate and workplace-level safety climate. A study on a multilevel model of safety climate has been conducted by Zohar and Luria (2005). They used two questionnaires that were administered to production workers of manufacturing plants. The first questionnaire measured organisation-level safety climate, whilst the second measured group-level safety climate. The results show that at both levels, the climates are globally aligned meaning that the organisational climate predicts the group climate level, which in turn predicts individual behaviour.

With reference to research studies conducted by Davies *et al.*, 2001; Mohamed, 2002; Seo *et al.*, 2004, Hahn & Murphy, 2008; on safety climate have focused on four areas: -

- 1) Developing safety climate measurement tools and determining safety climate dimensions,
- 2) Developing and testing safety climate theoretical model to discover factors that affect safety behaviour and accidents,
- 3) Finding the relationship between safety climate and safety performance, and
- 4) Investigating the relationship between safety climate and organisational climate

Guldenmund (2000) noted there are six dimensions of safety climate that should be measured, namely, top management commitment, supervisor's involvement, safety training, communication, employee's involvement, and safety rules. Henceforth, in this research the focus is on the supervisors/managers and employee's involvement in health and safety practices in the Saudi construction industry.

METHODOLOGY

The study adopted a quantitative research approach (Creswell, 2014) in order to examine the health and safety practices in the Saudi construction industry. Use of the questionnaire method saves time and provides a reliable approach for conserving quantitative date; it is considered to be a key method among researchers in management (Zikmund, 2000). A questionnaire was designed for data collection and analysis, based on the themes that emerged from the review of relevant literature.

Sampling is of critical importance in research, as in most cases there is a larger population that due to numerous restrictions sampling is the only viable option in obtaining reliable responses that represent the views of the wider population. Sampling methods include two main categories (probability and non-probability-based samples) and in each category there are a number of techniques in order to select the most suitable sample in the context of the given research (Wilson, 2011; Bryman and Bell, 2011; Saunders et al, 2012; Bryman, 2012).

Sample size determination is an important and often difficult step in planning a survey or empirical study because it is not possible to approach the whole population (Dattalo, 2008). Such an effort is likely to become prohibitively expensive, but it is also desirable to maintain accuracy and reliability to ensure that survey

results reflect reality with minimum error. Confidence intervals (CI) are useful for deciding about sample size because a CI is a range of values around which a population parameter (e.g., true mean) is likely to lie in the long run (Dattalo, 2008). Thus, as an example, if samples of the same size are drawn repeatedly from a population after assuming a normal distribution for spread and a 95% CI is calculated around each sample's mean (i.e., plus or minus two standard errors from the mean) then 95% of these intervals should contain the population mean.

A sample size calculator is available online from Creative Research Systems (2011), and this simplifies the process of calculating sample size for a given confidence interval and confidence level described in Dattalo (2008). The number of construction firms working in the Kingdom of Saudi Arabia listed on Saudi Findouter.com (2010), is about 80 and this means that for a confidence level of 95% and a confidence interval of 10%, a need exists for including responses from 44 construction firms.

The questionnaire was administered to construction workers and managers in the Saudi construction industry through probability sampling of Saudi construction companies enlisted on the website database Findouter.com. A total of 150 questionnaires were distributed in 44 construction firms out of which 90 were completed and returned at 60% response rate. 30 responses were managers and the rest were workers on site. The survey data was analysed through descriptive statistics using the SPSS statistical software. The unit of analysis adopted for this study is the 'organisation' and the embedded unit is 'individual employee'. The questionnaire was designed to examine the health and safety practices on construction sites in order and to identify means of facilitating improvements within the practices.

The questionnaire had five parts. The first part was about background information followed by health and safety practices at construction site. Thereafter questions about the effectiveness of health and safety management system were asked. Also questions about effectiveness of Saudi Labour Law and its implementation for improving health and safety on construction sites were asked. Lastly, questions about accommodation, meals and living conditions after work that influenced work performance / attitudes on Construction Site, including those that impinge on Health and Safety.

FINDINGS

The relative size of the construction companies varied significantly. For example, the annual income of the sample ranged from SR 20 million to SR10 billion. The other company characteristics reported which are indicative of a company's size are the number of field workers employed, number of jobs in progress, and number of field

worker-hours worked. Over 50% of the companies reported that they had 300 or less field employees. The total average number of field employees was about 1400. Thus, some firms have a small field employee-to-revenue ratio which would indicate that either a large portion of work is subcontracted or much of the revenue is earned through management services. The typical number of projects in progress ranged from 5 to 700.

Respondents were first asked if there are designated full time health and safety officers on their construction sites. 20% of them responded that they had designated health and safety officers. 30% responded that they often have designated health and safety officers while 30% responded that they rarely have. 20% of the respondents never had designated health and safety officers on site. It was found however that although health and safety supervisors are appointed, in some cases they are not full-time staff but are assigned safety related duties in addition to other works that they must perform as a part of their contract.

Respondents were asked to rate their level of satisfaction with health and safety practices on their construction sites using a four-point Likert scale which was calibrated as follows: 1 – Very satisfied, 2- Satisfied, 3- Less than satisfied, and 4- Very disappointed. A total of 37 practices (see Table2) relating to health and safety were extracted from the Saudi Labour Law document examined in the literature review. They include the measures taken on construction sites for self-protection of workers such as the use of safety helmets, protective footwear, gloves, ear defenders, safety goggles and facemasks. They also include the attitudes of respondents towards health and safety; and their perception on the effectiveness of health and safety management systems on their construction sites.

Table 2: Health and safety practices

The mean ratings for PPE- related practices were found to be 2.4 (See Table 2). The mean ratings for practices such as housekeeping, material storage and working on heights were found to be 2.7 while those for scaffolding and related practices were found to be 2.

In Table 2, the lowest mean ratings are 2.4 for quality of meals provided; 2.3 for satisfaction with accident rates; 2.1 for implementation of Saudi labour law to reduce accidents; and 2.4 for satisfaction with the capacity of Saudi law. While a mean rating of 2.9 was achieved for satisfaction with site inspection by ministry.

The findings show a level of consistency in the respondents' ratings. From Figure 1, the first seven practices (i.e. PPE-related practices) show that 40% of the respondents were less than satisfied with health and safety provisions on their sites; a further 10% were dissatisfied.

The next seven practices show that 40% of the respondents were less than satisfied with practices such as housekeeping, working at heights, and provision of walkways. A further 20% were dissatisfied with the practices. The last seven practices in Figure 1 show that 20% of the respondents were less than satisfied while 10% were dissatisfied. In this case, the majority of the respondents were either satisfied or very satisfied. These were the responses to the survey questions that focused on level of satisfaction with the work arrangements involving scaffolding at the construction site, quality of scaffold platforms, correct placement of scaffold boards, availability of toe boards and base plates for scaffolds together with the safety orientation demonstrated by workers using scaffolds.

40% of the respondents were satisfied and 30% very satisfied with the way in workers approached challenges associated with working at heights including secure use of ladders, use of the right types of ladders and safe use of mobile work platforms or mobile scaffolds.

Figure 2, shows the further sixteen (16) practices which were rated by the respondents. 70% of the respondents stated that they were less than satisfied with the emphasis on health and safety presented by construction site management including worker training, communications emphasising health and safety. 40% of the respondents replied that they were less than satisfied with the level of accident rate for their construction site, including both small and significant accidents. In contrast to this 30% of respondents stated that they were very satisfied with the level of accident rate for their construction site. 60% of respondents are less than satisfied with the level of accident rate for their construction site. 60% of respondents are less than satisfied with the level of accident rate for their construction site. 60% of respondents are less than satisfied with the level of accident rate for their construction site. 60% of respondents are less than satisfied with the level of accident rate for their construction site. 60% of respondents are less than satisfied with the prevalence of unsafe acts on their construction site that could present dangers involving safety and health. Again the majority of respondents were less than satisfied with the effectiveness of the safety management system and the implementation of safety, health and labour standards aspects of Saudi Labour Law on construction sites in terms of increasing worker morale, worker awareness of site health and safety as well as improving worker behavior.

When asked how satisfied the respondents were on the effectiveness of the safety management system at their construction sites and the implementation of Saudi Labour Law to bring about an overall reduction in costs related to accidents at the construction site (e.g. reduction in employee compensation, reduction in damage to equipment and tools, reduction in insurance premiums and reduction in time lost due to accidents and accident investigation), 40% replied as being very satisfied, as compared to 30% of respondents who were less than satisfied.

In addition respondents were asked close-ended questions about Welfare aspects such as: the quality of their accommodation, meals and living conditions after work that influence their work performance and attitudes, including those that impinge on health and safety. It was found that most workers live under tough conditions offsite, without access to decent meals, amenities, recreation or any form of entertainment after work. In addition, because the majority of workers are from developing countries particularly from Asia, they are paid exploitative wages. All these have impact on workers motivation and adherence to health and safety regulations on site.

Most workers live under horrible conditions off-site and cook the most revolting and less than nutritious meals, without access to decent amenities. They lack any recreation, entertainment or opportunities to broaden their horizons. In addition, because a vast majority of workers are poor Asians from third world countries, they have no standards or the pay together with a willingness to improve their lot.

A need exists for standards for worker accommodation, availability of cooked meals and recreation as well as health and sanitation for off-site accommodation. It is possible to learn a lot from workers hostels operated by the more reputed UK and USA construction firms.

DISCUSSION OF FINDINGS

Since 30% of respondents indicated that they rarely had Health and Safety officials and a further 20% indicated that they never had, this supports the notion that health and safety laws are existent but lacks enforcement. Even in the instances where there were health and safety officials, some of them were not professionals but regular site workers who had to combine the role with their day jobs. With 50% of the respondents either was less than satisfied or dissatisfied with their personal protection equipment, there is a possibility that employers are not adequately catering to the health and safety needs of their employees neither are they following the health and safety procedures stipulated by the Saudi Labour Law.

60% were either less than satisfied or dissatisfied with practices such as housekeeping, material storage, working at heights and provision of walkways. This also reinforces the assertion that health and safety practices are not enforced on construction sites. 60% of respondents were less than satisfied with the prevalence of unsafe acts on their construction site that could present dangers involving safety and health. Majority of respondents were less than satisfied with the effectiveness of the safety management system and the implementation of safety, health and labour standards aspects of Saudi Labour Law on construction sites in terms of increasing worker morale, worker awareness of site health and safety as well as improving worker behavior. These findings contradict the role of Health and Safety as a means of addressing both physical and psychological wellbeing of workers on construction sites and other persons whose health is likely to be adversely affected by construction activities (Dryzek and Schlosberg, 2005).

It is surprising however that 40% of the respondents were very satisfied while 30% were less than satisfied with the effectiveness of the safety management system at their construction sites and the implementation of Saudi Labour Law to bring about an overall reduction in costs related to accidents at the construction site. This is because it contradicts the assertion that health and safety laws are typically not well implemented in Saudi Arabia.

The quality of the respondents' accommodation, meals and living conditions after work influence their work performance and attitudes. It was found that most workers live under tough conditions off-site, therefore having impact on their motivation and adherence to health and safety regulations on site. It also has an impact on the dimensions of safety climate of employees involvement.

Improvement in construction health and safety will be possible only by a strict implementation of laws. It is not just the health and safety laws that need strict application, but also laws related to commercial transactions, payments and enforcement of contractual obligations. A culture of strict implementation of laws will serve well the construction industry because cash flows will be available to construction firms for timely payment and investment in a variety of needs, including needs related to health and safety, with accountability on the part of construction firms to deliver on contractual obligations.

Lewis (2010) and Kloss (2010) present a discussion about implementation of health and safety at work in the United Kingdom. In the United Kingdom, the Health and Safety at Work Act 1974 and regulations made under this Act together with the Corporate Manslaughter and Corporate Homicide Act of 2007, the Regulatory Enforcement and Sanctions Act 2008 and the Health and Safety Offences Act 2008 present health and safety regulatory powers to the United Kingdom Health and Safety Executive. The Health and Safety at Work Act 1974 and in particular Construction Design and Management Regulation 2015, deals with poor health and safety situations at a place of work and the main characteristic of the regulatory model is that the manner of definition for offences presents strict liability and the approach taken for enforcement only considers the thinking of regulators for the benefit of the public, employees and employers. Strict liability only considers that death or injury has occurred without delving into matters related to the state of mind of an offender or other excuses. Hughes and Ferrett (2016) discuss the implications of an employer found guilty of maintaining poor health and safety conditions at work that results in injury or death of an employee can expect to pay a hefty fine up to £ 20,000 or 12-month imprisonment on summary conviction by a magistrate. In addition, an unlimited fine and two years' imprisonment for directors found guilty of negligently inducing health and safety violations on indictment under the Health and Safety Offences Act 2008 is an available option for prosecutors. Should the Crown Prosecution Service consider a case serious enough to merit prosecution, the fines are unlimited with stiff personal liability for those involved. Thus, there is no reason why Saudi Arabia while acting to strictly implementing health and safety laws linking it to improving on regulation of commerce.

CONCLUSIONS

The study examined the concept and importance of construction health and safety in Saudi Arabia including existing regulations, policies, and measures through a critical review of the literature. It investigated the perceptions and attitudes

regarding health and safety at Saudi Arabian construction sites through a questionnaire survey of ninety (90) site workers and managers. Respondents were asked to rate their level of satisfaction with thirty seven (37) health and safety practices on their construction sites. From the data analysis, it was found that most respondents were

either less than satisfied or dissatisfied with their health and safety provisions and practices. While many of the respondents did not even have professional health and safety officials on their sites, some had non-professionals playing this role in addition to their site jobs. It was also found that the poor living conditions of workers off-site impacts their health and safety performance onsite.

Employers therefore have a duty to ensure safe, stress free and healthy work environment with competent health and safety officials on site. They also have a duty to improve off-site conditions under which workers live particularly if the employer was responsible for bringing in migrant labour to Saudi Arabia. In general the Saudi authorities have to ensure that the enforcement of safety regulations is more widespread.

This research is limited to the health and safety practices in the construction sector of Saudi Arabia. The participants were managers and construction workers but the intention of the research was not to compare the two groups but to examine the health and safety practices. A need exists for emphasising health and safety issues for the construction sector in Saudi Arabia due to the increased demand for infrastructure throughout the country, guaranteeing the growth of the construction sector in the country.

The implications that can be drawn as an outcome of the study are in relation to construction health and safety management in Saudi Arabia are:

- A need exists for improving the enforcement and implementation of the Saudi Arabian health and safety laws, with better training of regulators and clear instructions to them about what needs doing under specific situations that bring about a violation of prevailing laws. Specified actions that are mandatory for regulators and inspectors under regulations made under Saudi Arabian health and safety laws are necessary and those that must regulate labour and conditions for labour must receive rigorous training.
- Laws and regulations for maintaining health, safety and standards off-site in worker accommodation or camps are necessary for ensuring adequacy of living standards that will help promote nutrition, mental contentment and commitment to work, productivity and progress on-site.

- A need exists to examine how best to improve the mental health of employees working in construction and other sectors of Saudi Arabia to ensure that they deliver productivity, progress and constant improvements.
- A need exists for trying to improve on commercial laws and implementation
 of commercial laws in Saudi Arabia. This will encourage responsibility,
 capacity for recovery of timely cash flows and stability in all sectors. When
 financial planning and financial engineering present less uncertainty due to
 implementation of laws, it is likely that employers will have the funds to pay for
 health, safety and welfare of employees.

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Table 1: Definitions of safety climate

Author(s)	Definition
Brown and Holmes (1986)	A set of perceptions or beliefs held by an individual and/or group about a particular entity [which in this case is safety].
Dedobbeleer and Béland (1991)	Molar perceptions people have of their work settings.
Coyle, Sleeman, and Adams (1995)	The objective measurement of attitudes and perceptions towards occupational health and safety issues.
Williamson et al., (1997)	A summary concept describing the safety ethic in an organisation or workplace which is reflected in employees' beliefs about safety and is thought to predict the way employees behave with respect to safety in that workplace.
Mohamed (2002)	A construct that captures employees' perceptions of the role that safety plays within the organisation [and] a descriptive measure reflecting the workforce's perception of, and attitudes towards, safety within the organisational atmosphere at a given point in time.
Cooper & Phillips	Shared employee perceptions of how safety management

(2004)	is being operationalised in the workplace, at a particular moment in time.
Hahn & Murphy (2008)	Shared perceptions of employees about the safety of their work environment.
Neale and Waters (2012)	Workers's safety values, attitudes and perceptions are part of the psychological elements of safety culture.

Table 2: Health and safety practices

Health and Safety practices on Site	Mean rating on level of satisfaction
1. PPE - Safety helmets	2.4
2. PPE - Protective footwear	2.4
3. PPE - Gloves	2.4
4. PPE - Satety goggles	2.4
5. PPE - Face masks	2.4
6. Attitude of workers to PPE usage	2.4
7. Attitude of management to PPE	2.4
8. Housekeeping	2.7
9. Opening holes	2./
10. Materials stored safely	2./
11. Working on heights	2./
12. Tools and machine not stored	2./
13. Walkways	2./
14. Safety mesh for excavation	2./
15. Arrangements involving scattolaing	2.0
16. Availability of scattolaing boards	2.0
17. Availability of foe boards	2.0
	2.0
19. Ways workers approach challenges	2.1
20. Secure use of ladders	2.1
22. Emphasis on health and safety	2.1
22. Emphasis of fredim and safety	2.0
23. Subside the management of the state of t	2.7
24. Quality means provided on site	2.4
26. Signage to indicate danger	2.0
20. Signage to indicate danger	2.0
22. Subsidiation on medical assistance	2.0
20. Availability of trained pureer	2.0

30. Satisfaction with accident rate	2.3
31. Prevalence of unsafe acts on site	2.9
32. Level of unsafe conditions	2.9
33. Effectiveness of safety management system	2.7
34. Implementation of Saudi labour law to reduce	2.1
accidents	
35. Implementation of Saudi labour law to enhance	2.7
project performance	
36. Satisfaction of safety management system to bring	2.8
improvement	
37. Satisfaction with the capacity of Saudi law	2.4



Figure 1: Respondents' ratings on their level of satisfaction with health and safety practices on site (1)



Figure 2: Respondents' ratings on their level of satisfaction with health and safety practices on site (2)