THE MODERATING EFFECT OF SOCIAL SUPPORT ON THE RELATIONSHIP BETWEEN SAFETY CLIMATE AND SAFETY BEHAVIOUR: A STUDY OF THE JEDDAH CONSTRUCTION INDUSTRY

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TITLE PAGE

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ABSTRACT

Organizational injuries and accident has become a major issue in many countries especially among foreign workers in the construction sector. Investigating safety behaviour of foreign workers in the construction sectors has therefore become priority. This study aims to examine safety behaviour of foreign workers in the Jeddah construction industry by examining the direct relationships between safety climate (management commitment, priority of safety, safety communication and feedback, safety rule and procedures, safety training, worker's involvement in safety and work pressure) and safety behaviour (safety compliance and safety participation). In addition, social support was tested as moderator on these relationships. Partial Least Square Techniques 2.0 (PLS) approach was used to test the hypotheses. Specifically, management commitment, safety rules and procedures, safety training and worker's involvement in safety significantly predicts safety compliance. With respect to safety participation, the results showed that management commitment, safety communication, safety rules and procedures and worker's involvement significantly predicts safety participation. Results for the moderation effects of social support revealed that the relationship between management commitment and safety compliance, safety training and safety compliance and work pressure and safety compliance were influenced by social support. The results also revealed that social support significantly moderated the relationship between safety communication and safety participation and the relationship between work pressure and safety participation. The finding in this study provides empirical support of social support as moderator and contributes to the role of social exchange theory and can assist construction practitioners in Saudi Arabia on how to improve construction workers safety behaviour. Finally, this study discusses theoretical and practical implications, as well as recommendations for future research.

Keywords: safety climate, safety behaviour, foreign workers, construction industry.

ABSTRAK

Kecederaan dan kemalangan organisasi menjadi isu utama di kebanyakan negara terutamanya dalam kalangan pekerja asing sektor pembinaan. Oleh itu, penyelidikan tentang tingkah laku keselamatan pekerja asing dalam sektor pembinaan menjadi keutamaan. Kajian ini bertujuan untuk menyelidik tingkah laku keselamatan pekerja asing dalam industri pembinaan di Jeddah dengan mengkaji hubungan langsung antara iklim keselamatan (komitmen pengurusan, keutamaan keselamatan, komunikasi keselamatan dan maklum balas, peraturan dan prosedur keselamatan, latihan keselamatan, penglibatan pekerja dalam keselamatan dan tekanan kerja) dengan tingkah laku keselamatan (pematuhan keselamatan dan penyertaan keselamatan). Di samping itu, sokongan sosial diuji sebagai pengantara bagi hubungan ini. Pendekatan Kuasa Dua Terkecil Separa 2.0 (PLS) digunakan untuk menguji hipotesis. Secara khususnya, komitmen pengurusan, peraturan dan prosedur keselamatan, latihan keselamatan dan penglibatan pekerja dalam keselamatan meramalkan pematuhan keselamatan secara signifikan. Dari segi penyertaan keselamatan pula, keputusan menunjukkan komitmen pengurusan, komunikasi keselamatan, peraturan dan prosedur keselamatan serta penglibatan pekerja meramalkan penyertaan keselamatan secara signifikan. Keputusan bagi kesan pengantaraan sokongan sosial menunjukkan bahawa hubungan antara komitmen pengurusan dan pematuhan keselamatan, latihan keselamatan dan pematuhan keselamatan serta tekanan kerja dan pematuhan keselamatan dipengaruhi oleh sokongan sosial. Keputusan juga menunjukkan bahawa sokongan sosial mengantarakan hubungan antara komunikasi keselamatan dengan penyertaan keselamatan dan hubungan antara tekanan kerja dengan penyertaan keselamatan. Dapatan kajian ini memberikan sokongan empirik terhadap sokongan sosial sebagai pengantara dan menyumbang kepada peranan teori pertukaran sosial serta membantu pengamal sektor pembinaan di Arab Saudi tentang cara memperbaiki tingkah laku keselamatan pekerja pembinaan. Akhir sekali, kajian ini turut membincangkan implikasi teori dan praktikal serta cadangan untuk penyelidikan pada masa hadapan.

Kata kunci: Iklim keselamatan, Tingkah laku keselamatan, Pekerja asing, Industri pembinaan.

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LIST OF ABBREVIATIONS

AVE	Average Variance Extracted
CR	Composite Reliability
DOSH	Directorate of Occupational Safety and Health
GDP	Gross Domestic Product
GOSI	General Organization for Social Insurance
ILO	International Labour Organization
JDURC	Jeddah Development and Urban Regeneration Company
MEP	Ministry of Economy and Planning
MLSD	Ministry of Labour and Social Development
NHS	National Health Service
OHB	Occupational Hazards Branch
OHSAS	Occupational Health and Safety Assessment Series
OSH	Occupational Safety and Health
PLS-SEM	Partial Least Squares Structural Equation Modeling
PPE	Personal protective equipment

PTSD	Post-Traumatic Stress Disorder
QWL	Perceived Quality of Work Life
SACM	Arabian Cultural Mission
SET	Social Exchange Theory
SMPs	Safety Management Practices
SMS	Safety Management System
SPSS	Statistical Package for Social Sciences
UK	United Kingdom
US	United States

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

A report presented by the International Labour Organization (ILO, 2012) indicates that approximately 2.3 million people suffer an untimely death annually due to occupational hazards. This means that an average of 6000 people die every day as a result of either a work-related accident or a disease linked to an industrial process or product, which results in a total of 2.3 million work-related deaths worldwide per year (Yun et al., 2013). This figure includes approximately 350,000 deaths that occur following an accident in the workplace and more than 1.7 million diseases that can be directly attributed to work (Bartolo, 2012). The ILO states that a major occupational accident can be classified as an accident that causes injury to three or more people or the death of at least one person at the time it occurs.

Every year, hundreds of thousands of employees are injured at work, while billions of dollars are consumed as a result of medical costs, disability payments, increased insurance premiums and decreased productivity (Mahoney & Marshall, 2010). For example, the financial cost of such safety-related incidents is estimated to be approximately US$1 billion per week (Occupational Safety & Health Administration, 2015). Such occupational accidents are therefore associated with huge economic and social costs. In addition to those costs, accidents result in an increase in the time taken to complete a project

These figures can be broken down further in order to investigate specific types of injury. For instance, when looking at hazardous incidents in China, the figures show that between 2006 and 2010, the Occupational Safety and Health (OSH) Department dealt with 12,774 million cases of hazards, including 160,000 major hazards (Herbert, 2012). Additionally, López-Alonso, Ibarrondo-Dávila, Rubio-Gámez and Munoz (2013) stated that in 2010, Spain registered 582,591 non-fatal occupational injuries that resulted in at least one day's loss of work and 568 fatal occupational injuries. It is also estimated that for each fatality, there are between 500 and 2000 work-related injuries. Occupational safety has thus become an issue of great importance worldwide, since many people on every continent are faced with dangerous working conditions.

The economic costs associated with occupational accidents are not only borne by the injured workers and their families, but also by the organisations that employ them as well as society at large. These costs can manifest as either direct and measurable costs, for example, material damage, loss of production time and financial losses incurred through increased insurance premiums and shared medical expenses, or indirect or hidden costs in the form of a deterioration in industrial relations. In fact, some researchers have estimated that the hidden costs to a given organisation may actually be greater than the direct costs (Feng, Zhang, & Wu, 2015).

A similarly high rate of fatalities and injuries has been reported in the Middle East, where 19,000 deaths and more than 14 million work-related injuries are recorded annually (ILO, 2012). The issue of occupational safety in Saudi Arabia continues to

represent a major challenge. The statistics presented by the General Organization for Social Insurance (GOSI, 2012) show that between 2004 and 2010, the number of serious injuries totalled 261,076 annually, which is equivalent to 3413.9 injuries per 100,000 employees on average. The total number of injuries that resulted in death was 2176, indicating an average rate of 28.3 deaths per 100,000 workers per annum. A comparative study of cases of work-related injury and death worldwide using the available statistical evidence suggests that Saudi Arabia recorded the highest number of major injuries (3117) as well as 28 cases of death out of every 100,000 workers injured in 2008 (Alasamri, Chrisp, & Bowles, 2012).

Bendak (2006) stated that the Saudi Arabian government is committed to guaranteeing safety and minimising work-related accidents by means of thorough and precise safety regulations. Some regulations have indeed been introduced in recent years to improve workplace safety practices for workers. These new regulations include a compulsory medical insurance scheme, the enforcement of safety management training and laboratory safety guidelines. However, despite the introduction of additional safety rules and regulations, the desired level of worker protection has not yet been achieved, particularly in the construction industry. For instance, in 2012 the total number of reported accidents in Saudi Arabia was 65,656 (GOSI, 2012). Prokop (2003) suggested that the safety regulations have not been as successful as anticipated due to the inadequate enforcement of the regulations and a lack of on-going evaluation of safety implementation. Further, Alolah, Stewart, Panuwatwanich and Mohamed (2014) claimed that the numerous accidents and

incidents of work-related injury commonly occur due to poor safety regulations and an inadequate management system.

It is arguable that the rapid increase in industrialisation and urbanisation in Saudi Arabia, which requires the construction of roads, infrastructure and factories, has increased popular consciousness of occupational safety. The Social Insurance Law implemented by the GOSI is one of the regulations designed to ensure employees' safety. This law stipulates that all employers must pay two percent of the wage of each employee in order to be registered with the Occupational Hazards Branch (OHB) of the Social Insurance Scheme. The GOSI is then responsible for meeting the cost of any treatment required by any contributor who sustains a work-related injury. Every member is covered under the scheme and has a right to compensation in accordance with the adopted schedules concerning occupational disability.

Table 1.1 shows that the number of work-related injuries reached a peak in 2009 with 93,285 reported cases, which represented an increase on the 91,822 cases seen in 2008, although the number of injuries subsequently fell from 75,487 in 2010 to 65,656 in 2012. The number of injuries that resulted in a permanent disability was at its highest in 2011 with a total of 3,677 cases, while it was lowest in 2012 with 2,386 cases. The number of injuries that resulted in death was at its highest in 2009 with 646 cases and at its lowest in 2012 with 351 cases. The average number of injury cases for the five-year period (2008–2012) is 80,415 cases.

Table 1.1

Rates of Work-Related Injuries Resulting in Disability, Death and Under Treatment

Injury Status	2008	%	2009	%	2010	%	2011	%	2012	%	Avg	%
Recovery without Disability	66,993	73.00%	58.988	63.20%	59,782	79.20%	61,633	81.30%	44,644	68%	58408	72%
Recovery with Disability	3,538	3.90%	3.675	4%	2,844	3.80%	3,677	4.80%	2,386	3.70%	3224	4%
Death	506	0.60%	646	0.70%	507	0.60%	557	0.70%	351	0.50%	513	1%
Under Treatment	20,785	22.60%	29.976	32.10%	12,354	16.40%	9,958	13.10%	18,275	27.80%	18270	23%
Total	**91,822**	**100%**	**93,285**	**100%**	**75,487**	**100**	**75,825**	**100%**	**65,656**	**100%**	**80415**	**100%**

Source: General Organization for Social Insurance (GOSI), 2012

Table 1.2 presents the incidence of work-related injuries according to the economic sector, with the construction industry recording the highest number of major work-related accidents of the three major economic sectors, namely construction, trade and manufacturing. This is consistent with the general perception of safety in the different sectors. Work-related accidents within the construction industry peaked in 2009 with 44,430 reported cases, which represent 47.6 percent of all accident cases at a time when the trade and manufacturing sectors recorded 22.3 percent and 19 percent, respectively. Likewise, in 2012 the construction industry recorded a total of 31,048 cases of accident-related injuries or 47.3 percent of all accident cases within the three listed sectors.

Table 1.2

Periodic Statistics for Injuries in Three Main Economic Sectors

Economic Activity	2008		2009		2010		2011		2012	
	No of Injuries	%	No of Injuries	%	No of Injuries	%	No of Injuries	%	No of Injuries	%
Construction	38929	42.40%	44430	47.60%	37527	49.70%	36367	48%	31048	47.30%
Trade	25042	27.30%	20766	22.30%	16028	21.20%	19385	25.60%	17275	26.30%
Manufacturing	17570	19.10%	17741	19.00%	12714	16.80%	11921	15.70%	10103	15.40%
Total	**81541**	**89%**	**82937**	**89%**	**66269**	**88%**	**67673**	**89%**	**58426**	**89%**

Source: The General Organization for Social Insurance (GOSI), 2012.

Note: The majority of work-related injuries in Saudi Arabia occur in three main sectors.

It is clear from the statistics presented in Table 1.2 that the Saudi Arabian construction industry has the highest rate of accidents among the three major

economic sectors. This scenario is similar to the situation in Korea, where the highest rate of accidents occurs in the construction industry (Seo, Lee, Kim, & Jee, 2015). Lin, Chen and Luo (2008) also stressed the gravity of occupational injuries in the construction industry in the Southeast Asia region between 1999 and 2008. In a similar vein, in the USA the rate of accidents in the construction sector is reported to be twice that of the industrial average (Irumba, 2014).

The construction industry is one of the major economic sectors in every nation. It plays an important role in economic development because it acts as a catalyst for the development of other sectors due to providing the infrastructure required for other sectors of the economy to grow (Sev, 2009). The construction industry, irrespective of a country's stage of economic development, is considered to be labour-intensive, and it requires the utilisation of numerous mechanical and electrical tools that are handled by construction workers (Ortiz, Castells, & Sonnemann, 2009). This explains why the incidence of occupational hazards is much higher in the construction industry than in any other industry (Sousa, Almeida, & Dias, 2014). The incidence of occupational hazards (injuries) varies from one country to another depending on the existing policies and regulations governing the safety climate.

Table 1.3 shows the distribution of work-related accidents by city in Saudi Arabia between 2008 and 2012. The table reveals that there has been a progressive increase in the percentage of work-related accidents in the construction industry in each of the included cities. Of the three cities, Jeddah recorded the highest number of work-related accidents in 2010 (16.5 percent) and 2012 (22.7 percent).

Table 1.3
Distribution of Work-Related Accidents by City

Office	2008 Construction Accidents		2009 Construction Accidents		2010 Construction Accidents		2011 Construction Accidents		2012 Construction Accidents	
	Rate	**%**	**Rate**	**%**	**Rate**	**%**	**Rate**	**%**	**Rate**	**%**
Jeddah	3,050	3.30%	5,186	5.60%	12,432	16.50%	4,336	11.90%	7,049	22.70%
Riyadh	7,839	8.50%	7,868	8.40%	11,848	15.70%	8,532	23.46%	6,981	22.40%
Dammam	11,045	12%	10,228	11.00%	7,477	9.90%	5,526	15.20%	4,424	14.20%

Source: The General Organization for Social Insurance (GOSI), 2012.
Note: The number of work-related accidents in the three major cities.

Construction activities in Saudi Arabia have rapidly increased over the past twenty years and construction firms from around the world have taken part in various development projects (Al-Haadir & Panuwatwanich, 2011). According to the report on the Ninth Development Plan published by the Ministry of Economy and Planning (MEP), the annual growth rate of the construction sector is 7.2 percent, which can be compared with the growth rate of 4.7 percent reported in the previous plan, and it is expected to reach approximately 7.8 percent towards the end of 2014 (MEP, 2014).

Saudi Arabia is home to the holiest of Islamic cities and Jeddah, which is its second largest city, is the main entry point. Therefore, the infrastructure of Jeddah is currently being overhauled with the aim of both better accommodating pilgrims and stimulating business expansion. The city must also cope with a population that is growing at a rate of between 20 and 28 percent annually. Currently, there are several mega projects, which are either under construction or in the final planning stage, that are intended to bring Jeddah's infrastructure to a point of optimal balance and ensure that the city can cope with growing demands. The local government is following a 20-year plan of redevelopment and enhancement, including projects in the Khozama and Ruwais districts. These comprehensive plans are focused on the rehabilitation of

the city's central and historic districts as well as the provision of the additional infrastructure required to cope with growing demands. Many of the new developments are mega projects, for example, the SR99.75 billion King Abdullah Economic City and the SR42 billion Jeddah Hills (Telmesani, 2010).

Table 1.4 presents GOSI statistics showing the number of worker-related accidents broken down by nationality. It shows that non-Saudi nationals, namely those from Yemen, Syria, Egypt, India, Pakistan and the Philippines, suffered more work-related injuries than Saudi nationals. As reported in the table, the number of work-related accidents suffered by foreign nationals represents a consistently larger percentage of between 92.2 percent and 94.3 percent during the four-year period under consideration (i.e. 2008–2011) when compared to that of Saudi nationals, which decreased from 7.8 percent in 2008 to 5.7 percent and six percent in 2011 and 2012, respectively. These figures highlight the seriousness of occupational accidents among foreign workers employed in the construction industry in Saudi Arabia. The percentage of accidents itself is of course very alarming and a cause of great concern too.

Table 1.4
Number of Accidents Broken Down by Nationality

Nationality	2008		2009		2010		2011		2012	
	No of Injuries	**%**	**No of Injuries**	**%**	**No of Injuries**	**%**	**No of Injuries**	**%**	**No of Injuries**	**%**
Saudi	7.129	7.80%	6.548	7%	4,641	6.10%	4,357	5.70%	3659	6%
Non Saudi	84,693	92.20%	86.737	93%	70,846	93.90%	71,468	94.30%	61997	94%
Total	**91,822**	**100%**	**93,285**	**100%**	**75,487**	**100%**	**75,825**	**100%**	**65,656**	**100%**

Source: The General Organization for Social Insurance (GOSI), 2012.

The rate of work-related accidents seen for foreign workers is typically notably higher than that seen for domestic workers in the same country. For instance, Ambrosini and Barone (2007) reported that when looking at the situation of foreign workers in Italy, one out of every 16 foreign workers could expect to sustain a work-related injury.

Unsatisfactory occupational safety and ineffective workplace safety practices in the construction industry have become a critical issue because of the high incidence of accidents and fatalities among construction workers. Occupational safety management issues are vitally important to the progress of projects, since they affect the quality of work and timely completion of the project. As accidents and injuries have emerged as the most serious occupational safety concern, it is therefore vital for the Saudi Arabian construction industry to implement additional occupational safety measures that can improve the performance of the construction industry while also maintaining a safe working environment. Whether in construction or other industries, the consideration of safety requirements has become accepted over the years as the right way to proceed and the benefits of implementing occupational safety management systems have been positively received. As it represents an effective means of either eliminating or reducing hazards at their source, good access to appropriate occupational safety services is important for the welfare of workers (Abdullah, Spickett, Rumchev, & Dhaliwal, 2009).

1.2 Foreign Workers in Saudi Arabia

Foreign workers are vitally important to the Saudi Arabian economy due to the high volume of economic activities conducted within the country that are largely dependent on such workers (Al-Haadir & Panuwatwanich, 2011). In 2013, the Saudi Ministry of Labour and Social Development (MLSD) estimated that over eight million workers employed in the country were foreign born, with 3.6 million (45%) of them working in the construction sector (MLSD, 2013).

Numerous empirical studies have found that foreign workers face many occupational safety issues and social challenges when trying to adapt to their host countries. For example, Rautiainen (2012) noted that homesickness is a major source of stress for foreign workers, especially those who are married and living away from their families. As a result, this segment of workers requires a long time to adapt to a new environment. Rautiainen (2012) added that if these workers continue to feel homesick and do not have the opportunity to engage in social interactions/activities, they may experience tiredness and stress, which could influence their safety-related behaviour and thereby contribute to an increased incidence of workplace accidents and injuries. Similarly, Pernice and Brook (1996) postulated that the increased level of anxiety and depression experienced by foreign workers could be the result of a perception of discrimination, being far from their families and lacking close associates. Foreign workers certainly face difficulties when adjusting to their new society, including adopting safe and healthy lifestyles (Kuruvila, Dubey, & Gahalaut, 2006).

Foreign workers employed in Middle Eastern countries are also often faced with various occupational risks, including accidents at work, anxiety, depression, stress, mental health issues and lifestyle-related factors such as illegal drinking (Adhikary, Keen, & van Teijlingen, 2011). The authors further recognised that such workers generally only have access to poor working and living conditions; hence, they encouraged future researchers to focus more attention on the minority ethnic groups employed in Middle Eastern countries (Adhikary et al., 2011).

In sum, the main challenge facing both the Saudi Arabian government and Saudi construction companies is to ensure the safety of foreign workers employed in the construction industry, since they are exposed to a high number of safety-related risks despite being recognised as fundamental to Saudi Arabian physical and economic development. The above evidence indicates that foreign workers face a greater risk of experiencing occupation safety issues than domestic workers, which suggests that this particularly vulnerable group of workers needs increased protection against all work-related hazards. Importantly, feelings of being homesick, discriminated against, stressed and anxious can be managed with proper social support (Rautiainen, 2012). Thus, activities that facilitate social support for foreign workers represent a possible means of helping them to overcome challenges such as coping with stress and working in an unfamiliar environment with people from other cultures.

1.3 Problem Statement

As mentioned above, Saudi Arabia exhibits the highest level of growth of all the Gulf countries. However, occupational safety in the country still poses a significant

challenge, particularly in the construction sector (Al-Haadir & Panuwatwanich, 2011). This necessitates the realisation of workplace safety in this sector, particularly on account of the increasing number of accidents, injuries and fatalities. In this regard, previous researchers have revealed considerable interest in addressing the prevention of accidents, injuries and fatalities onsite (e.g. Choudhry, 2014; Neal & Griffin, 2006; Vinodkumar & Bhasi, 2010; Zin & Ismail, 2012).

Previous researchers have noted that accidents, injuries and fatalities can be triggered by three major factors, namely technology, systems, and human error (Vinodkumar & Bhasi, 2010). The technological perspective refers to onsite accidents that occur due to technological errors, for example, mechanical errors, complex systems, technical inadequacies related to design and an imbalance between skill and technical understanding (Reiman & Rollenhagen, 2014). On the other hand, errors attributed to systemic characteristics are referred to as system errors and they are committed by operatives. Such errors include a lack of workers, lack of management training and lack of information sharing (Chen & Chen, 2014; Meshkati, 1991; Wachter & Yorio, 2014). System errors arise when there are ineffective prevention and safety methods in place due to inefficient safety policies, a lack of employee accountability, ineffective inspection and rectification, and limited standards regarding the prevention of fatalities, accidents and injuries (Bellamy, 2010; Chen & Chen, 2014; Cooper & Phillips, 2004; Stricoff, 2000).

The third perspective attributes workplace accidents to human error (e.g. Bottani, Monica, & Vignali, 2009; Cigularov, Chen, & Rosecrance, 2010; Enshassi,

Choudhry, Mayer, & Shoman, 2008; Fahlbruch, 2010; Gordon, Flin, & Mearns, 2005; Jiang, Yu, Li, & Li, 2010; Mearns & Yule, 2009; Ryerson & Whitlock, 2005). For example, a previous investigation by Yorio and Wachter (2014) found that human error is often the result of time pressure, mental pressure, interruption and overconfidence. More specifically, Rasmussen (1983) contended that human errors may be due to low awareness levels and limited information sharing. Employees breach rules and take risks daily, and accidents may occur when employees intentionally take risks that breach a known or unknown policy (Zimolong & Elke, 2006). Common examples of human error include mishandling, inadequate communication, a lack of skills and insufficient supervision. It therefore stands to reason that if sufficient safety policies, rules and procedures as well as information concerning safety are provided to construction workers, human negligence and errors on construction sites could be minimised and the incidence of accidents and fatalities decreased (Atkinson, 1999; Dong, Wang, & Daw, 2012; Garrett & Teizer, 2009).

Evidently, human error plays a significant role in all nearly accidents. For instance, Fleming and Lardner (2002) noted that "human behaviour is a contributory factor in approximately 80% of accidents" (p. 38). Similarly, Goetsch (2002) reported that 88 percent of industrial accidents originate from human factors. Further, Kumar, Gupta, Agarwal and Singh (2016) argued that human error plays a crucial role in accidents and hence it needs to be addressed adequately by means of risk and safety management.

Based on the above discussion, human error is the most important factor contributing to onsite accidents, injuries and fatalities (Akyuz & Celik, 2014; Kumar et al., 2016). Therefore, the present study employs the safety climate perspective in an attempt to explain workers' safety-related behaviour in the Saudi Arabian construction industry. Specifically, in the context of this study, the issue of human error when conducting activities, for example, drilling, cutting and using sharp objects and electrical tools, will be further investigated. Previous studies (Chen, McCabe, & Hyatt, 2017; Cigularov, Lancaster, Chen, Gittleman, & Haile, 2013) have argued that the safety climate has the ability to address both the situations and threats that contribute to the occurrence of human errors by raising the level of safety onsite. Therefore, it can be stated that the safety climate can enhance working conditions as well as positively impact the attitudes and behaviours of workers regarding safety, which can in turn lower the incidence construction work-related accidents.

This study aims to investigate the relationship between safety climate and workers' safety-related behaviour in the Saudi construction industry. The identified dimensions of the safety climate are management commitment, the priority of safety, safety communication and feedback, safety rules and procedures, safety training, workers' involvement in safety, and work-related pressure. Previous studies have reported that these dimensions have the potential to control and minimise onsite accidents and injuries, in addition to playing an essential role in ensuring employees comply with safety rules (Bosak, Coetsee, & Cullinane, 2013; Michael, Evans, Jansen, & Haight, 2005; Törner & Pousette, 2009). Thus, if the different dimensions of the safety climate are aligned, then workers' safety-related behaviour can be

improved. For example, management commitment is one of the key drivers of employees' safety performance and injury rates in a variety of industries, since it is such an important cornerstone of safety programmes (Michael et al., 2005). In addition to management commitment, work-related pressure is an essential dimension of the safety climate that influences workers' safety behaviours (Amponsah-Tawaih & Appiah, 2016). Another important dimension of the safety climate is the priority assigned to safety, which has consistently been found to directly predict safety outcomes such as safety-related behaviour (Bosak et al., 2013). Additionally, safety training has been reported to be one of the fundamental methods of improving workers' safety onsite due to enhancing their risk awareness and knowledge of safe working methods, as well as facilitating an understanding of both accident occurrence and all safety requirements on a construction site (Han, Saba, Lee, Mohamed, & Peña-Mora 2014). Workers' involvement in safety-related matters is another vital dimension of the safety climate, which can serve to improve occupational safety and continuously address any safety issues that might arise. It may also help management to solve problems through broad participation (Törner & Pousette, 2009). Similarly, safety communication and feedback have also been found to significantly increase the level of safety on construction sites (Kines et al., 2010). Finally, safety rules and procedures represent another core dimension of the safety climate in the construction industry. Clear and well-documented safety rules and procedures, as well as adequate and efficient enforcement by supervisors and managers, can help to both improve the safety behaviour of workers and reduce

accident rates (Wu, Song, Wang, & Fang, 2015). Thus, the selection of the aforementioned dimensions is clearly justified.

Despite the vast amount of literature concerning the safety climate, previous researchers have found that its influence on safety behaviour remains unpredictable (Langford, Rowlinson, & Sawacha, 2000; Mashi, 2014; Vinodkumar & Bhasi, 2009), specifically in the context of the Saudi Arabia construction industry (Alasamri et al., 2012). In addition, Anderson (2005) argued that an effective safety climate has failed to explain the variation in safety behaviour. Subramaniam, Shamsudin, Zin and Lazim (2014) stated that further research is required in order to better understand the impact of workplace safety practices on safety behaviour.

In addition, as discussed above, foreign workers may feel homesick, discriminated against, stressed, anxious, etc., which might lead to onsite injuries. However, these feelings can be managed with proper social support (Rautiainen, 2012). As such, social support activities for foreign workers are seen as a possible means of helping them to overcome challenges such as coping with stress and working in an unfamiliar environment with people from different cultures. This suggests that a social factor, for example, social support, could be an important moderating variable that should be considered when examining the relationship between the safety climate and safety behaviour. Social support can be helpful to workers, since it has the ability to facilitate workers' behaviour through social interactions. On the other hand, it changes workers' safety-related psychology from unconcerned safety behaviour to concerned safety behaviour. As a consequence, it can serve to improve

their level of trust and encourage a safe working environment. Basically, it represents a useful form of safety assistance for workers, which can be helpful in their operational duties due to improving their safety performance, reducing accidents and injuries, and helping them behave appropriately within a safety context (Schaubroeck & Fink, 1998). However, to the best of the researcher's knowledge, no prior study has considered investigating social support as a moderating variable on the relationship between the safety climate and safety behaviour, particularly in terms of safety behaviour among foreign workers in the Saudi construction industry. This gap must be filled, especially given that workers have different perceptions of safety. When they are guided, tutored and assisted through social support, it is reflected in how they behave on construction sites. Tucker, Chmiel, Turner, Hershcovis and Stride (2008) noted that social support, such as co-workers' support, can enhance employee safety. This interaction and exchange within the organisation must be efficient and it can only be made possible via frequent and useful social exchanges between the employee and employer.

This study made use of both the accident/incident theory and the social exchange theory, which sheds light on social interactions. For instance, when a worker behaves in a manner that benefits another worker, the latter is obligated to reciprocate the behaviour towards the former, which in turn benefits other employees (Blau, 1964). As such, the present study investigated the influence of the safety climate on safety behaviour. In addition, the safety climate safety behaviour relationship would also incorporate and examined the moderating influence of social support on the relationship.

1.4 Research Questions

On the basis of the above discussion, this study aims to answer the following research questions:

a) What is the level of safety behaviour among the foreign workers working in the Jeddah construction industry?

b) Do safety climate influence the safety behaviour among the foreign workers working in the Jeddah construction industry?

c) Would social support moderate the relationship between safety climate and safety behaviour among the foreign workers working in the Jeddah construction industry?

1.5 Research Objectives

Based on the research questions stated above, the following research objectives are formulated for the present study:

1. To determine the level of safety behaviour among the foreign workers working in the Jeddah construction industry.
2. To investigate the influence of safety climate on safety behaviour among the foreign workers working in the Jeddah construction industry.
3. To examine the moderating effect of social support on the relationship between safety climate and safety behaviour among the foreign workers working in the Jeddah construction industry.

1.6 Scope of Study

This study is based on the Saudi Arabian construction industry. It particularly focuses on the theoretical framework that examines the influence of the safety

climate on the safety behaviour seen in the Jeddah construction industry. The study further focuses on foreign construction employees who are directly exposed to the chance of injuries (Cheng, Ryan, & Kelly, 2012b; Tam, Zeng, & Deng, 2004; Wachter & Yorio, 2014; Yu, Ding, Zhou, & Luo, 2014), including electricians, iron workers, drillers, plumbers, painters, equipment operators, dry wall finishers, concrete labourers and other relevant onsite workers in the Jeddah construction industry. The following points justify the selection of the construction industry as the subject of this study:

1. The Saudi Arabian construction industry had the highest rate of work-related injuries from 2008 to 2012. For example, in 2012 the Saudi construction industry recorded a total of 31,048 accidents, which accounted for 47.3 percent of the total number of accident (GOSI, 2012).
2. On the basis of the MEP's Ninth Development Plan report, the annual growth rate of the construction sector is 7.2 percent, which can be compared to the rate of 4.7 percent reported in the previous plan, and it is expected to reach around 7.8 percent towards the end of 2014 (MEP, 2014).
3. The construction industry is one of the main contributors to the Saudi economy. According to the Council of Saudi Chambers, the construction industry is the second largest economic sector after the oil industry. It has been reported that in 2012, the sector contributed 16.5 percent of the Saudi gross domestic product (GDP) (MLSD, 2013).

Additionally, the following points justify the selection of foreign workers as the subject of focus within the construction industry:

i. According to statistics from 2012, some 61,997 foreign workers suffered work-related injuries on construction sites, which accounts for about 94 percent of all injuries (GOSI, 2012).

ii. Statistics from 2013 revealed that out of eight million foreign workers, 3.6 million (45%) were employed in the Saudi construction industry (MLSD, 2013).

iii. The majority of employees (90 percent) in the construction sector are migrant workers (MLSD, 2013). In addition, construction activities in Saudi Arabia attract construction companies from around the world to participate in many development projects, which is likely to increase the rate of foreign labour within the construction sector (Al-Haadir & Panuwatwanich, 2011).

Another important element that needs to be emphasised in the present study is the geographical location where the study was conducted. The current investigation took place in the city of Jeddah. The following points justify the selection of foreign workers employed in the construction industry in Jeddah

i. As part of the recent development initiatives instituted by the Saudi Arabian government, Jeddah is undergoing a 20-year redevelopment programme. This programme includes a number of mega projects that will help to modernise and transform Jeddah's infrastructure. These mega projects include the SR99.8 billion (US$26.6 billion) King Abdullah Economic City and the SR 42 billion (US$11.2 billion) Jeddah Hills (Telmesani, 2010).

ii. Statistics provided by the GOSI have revealed that of the three main regions, namely Jeddah, Riyadh and Dammam, Jeddah recorded the highest number

of work-related accidents in 2010 (16.5 percent) and 2012 (22.7 percent) (GOSI, 2012).

iii. According to the Jeddah Development and Urban Regeneration Company (JDURC), Jeddah is the second largest city in Saudi Arabia and it is the principal gateway to the holiest Islamic sites. A complete infrastructural transformation is taking place in an effort to better accommodate pilgrims, increase business growth and manage a population density that is increasing at a rate of 20–28 percent every year (Telmesani, 2010).

1.7 Significance of Study

This study attempts to improve workers' behaviour with regards to safety by addressing the relationship between the safety climate and social support in the Jeddah construction industry. The study contributes practically as well as theoretically with regards to safety behaviour in the workplace. From a theoretical perspective, there is currently only very limited research on safety behaviour (Noweir, Alidrisi, Al-Darrab, & Zytoon, 2013), particularly in the context of the Saudi construction industry. This study therefore aims to empirically investigate the influence of the safety climate on safety behaviour in the construction industry in Jeddah. This study thus views safety behaviour through the lens of the safety climate.

Additionally, this study also aims to expand the existing knowledge by contributing to the social exchange theory in terms of understanding safety behaviour. The inclusion of social support in an effort to understand its moderating effect on the

relationship between the safety climate and safety behaviour is another significant aspect of the present study. In the Saudi construction industry, the foreign workers mainly come from Asia (Philippines, India, Pakistan, Syria, Egypt and Yemen). They experience difficulties in settling into their new environment and complying with their new job responsibilities. It takes time for them to adapt to a new construction environment. Therefore, social support facilitates foreign workers' interactions with each other on construction sites. While many prior studies have concentrated on the local workforce, this study contributes to the literature by providing insight into foreign labour, which constitutes the largest workforce in the Saudi Arabian construction sector.

From a practical standpoint, the present study contributes in the form of policy implications, especially in relation to employing foreign workers in Saudi Arabia, by providing construction companies with empirical evidence of how to improve safety behaviour. Further, organisational interventions could also be designed using the output of the present investigation. In addition, this research attempts to align safety-oriented research on the construction working environment with the focus of the present investigation so as to enable construction management to efficiently tackle work-related fatalities, accidents and injuries. In the construction industry in particular, workers play a significant role in the development of a safe working environment. Workers' safety behaviour-related problems can contribute to their awareness of dangerous working conditions, which can in turn lead to the implementation of relevant rules, regulations and procedures as well as, ultimately, better working conditions on construction sites. In addition, this study was conducted

among a previously unstudied population in the Saudi Arabian construction industry, with it being important to note that Saudi Arabia is a developing country. Practically speaking, this study aims to motivate foreign workers to change their attributes towards safety behaviour, which should influence their individual safety performance. Ultimately, in these manner workplace fatalities, accidents and injuries can be reduced.

1.8 Operational Definitions

1.8.1 Safety Behaviour

Safety behaviour is defined as the behaviour or working actions that individuals exhibit in their workplace (Zhang & Fang, 2013).

1.8.2 Safety Climate

The safety climate is defined as workers' perceptions of workplace safety policies, procedures, strategies and practices (Schwatka, Hecker, & Goldenhar, 2016).

1.8.3 Management Commitment to Safety

Management commitment to safety is defined as "the extent to which management is perceived to place a high priority on safety and communicate and act on safety issues effectively" (Neal & Griffin, 2004, p. 27).

1.8.4 Priority of Safety

The priority of safety is defined as the degree to which workers perceive safety to be a top priority on the part of the management (Bosak et al., 2013).

1.8.5 Safety Communication and Feedback

The notion of safety communication and feedback is defined as as effective and efficient communication and timely feedback intended to warn of any risk or

hazardous place on the construction site in order to avoid any uncertainty (Lu & Yang, 2011).

1.8.6 Safety Rules and Procedures

Safety rules and procedures are defined as the "degree to which safety is a priority, the extent to which people are consulted on safety matters, and the practicality of implementing safety policy and procedures" (Glendon & Stanton, 2000, p. 202).

1.8.7 Safety Training

Safety training is defined as the acquisition of knowledge and technical skills intended to enhance safety performance among workers in order to prevent accidents and injuries in the workplace (Vinodkumar & Bhasi, 2010).

1.8.8 Worker Involvement in Safety

The notion of worker involvement in safety is defined as the involvement of individuals or groups of employees in the conducting of safety programmes and in the decision-making process within the organisation (Vinodkumar & Bhasi, 2010).

1.8.9 Work Pressure

Work pressure is defined as the "degree to which employees feel under pressure to complete work, the amount of time there is to plan and carry out work, and the balance of workload" (Glendon & Stanton, 2000, p. 202).

1.8.10 Social Support

Social support is defined as social exchange or relationship that helps the workers with actual guidelines and assistance or with a feeling of affiliation or attachment to an individual or group that is perceived as loving or caring (Hobfoll & Stokes, 1988).

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The preceding chapter presented the research background and highlighted the main problems, issues and significance of this research study. The present chapter demonstrates the current state of research on the safety climate in relation to safety behaviour. It reviews the notion of the safety climate based on empirical studies conducted on safety behaviour. This chapter also facilitates a clear understanding of several variables investigated in relation to safety behaviour. The first part of the chapter explores empirical studies related to safety behaviour. This is followed by the second part, which addresses the relationship between the safety climate and safety behaviour, while the third part provides an overview of social support as a moderating variable as well as the underpinning theory. The final part discusses research framework; and finally, a summary of this chapter is discussed.

2.2 Safety Behaviour

Safety behaviour is defined as individuals' behaviours in relation to the promotion of their own health and safety as well as health and safety in the working environment (Leung, Liang, & Olomolaiye, 2015). Safety behaviour is intended to reduce all injuries and illnesses related to working methods by means of applying "behaviour security". Safety behaviour security is explained as the concern that workers' behaviour tends to emphasise the potential negative consequences of not acting in a secure way, which might ultimately lead to such negative consequences, for

example, accidents and injuries (Anderson & Agarwal, 2010). Basically, the use of proactive measures of workers' perception of safety is considered to be the most valuable indicator of their safety performance (Borman & Motowidlo, 1993), while safety performance itself is seen as the result of workers' safety behaviour.

Previous studies have identified different dimensions for the measurement of safety behaviour, for example, Pousette, Larsson and Törner (2008) used three dimensions in an effort to measure self-reported safety behaviour, namely personal safety behaviour, structural safety behaviour and interactional safety behaviour. In their view, personal safety behaviour is behaviour on the part of employees that promotes their personal protection, including the use of all prescribed protective equipment and following safety rules. Therefore, their conception of personal safety behaviour is similar to the outcome variable used by Neal, Griffin and Hart (2000) (i.e. safety compliance). Structural safety behaviour, on the other hand, concerns the workers' ability to participate in organised safety activities, for example, taking part in risk assessments. Finally, interactional safety behaviour refers to the employees' safety behaviour during their daily work in interaction with both co-workers and management, such as discussing a safety problem with a fellow worker or manager. Therefore, both structural safety behaviour and interactional safety behaviour are equivalent to the outcome variable termed safety participation by Neal et al. (2000).

Tucker and Turner (2011) developed and validated five dimensional safety-related behaviours of young workers, namely safety voice, safety neglect, safety patience, safety exit and safety compliance. The notion of the safety voice refers to speaking

out regarding safety concerns within the organisation. Hence, the safety voice may manifest in different ways and be directed toward different targets, including raising safety concerns with a manager, the ability of workers to speak before a safety committee and reporting dangerous working conditions to government officials. For instance, a study by Walters and Haines (1988) found that when workers raise safety concerns, they most often raise them with a supervisor (42%), followed by their co-workers (16%) and then with a safety representative (7%). The safety neglect dimension is related to taking shortcuts or using a workaround. It can also be understood as the opposite of safety compliance, which is broadly defined as "the core safety activities that need to be carried out by individuals to maintain workplace safety" (Griffin & Neal, 2000, p. 349). The domain of safety-related neglect includes worker behaviours such as non-compliance with safety rules and procedures, not reporting observed hazards or injuries, and any other behaviour that undermines the upkeep of occupational safety (Tucker & Turner, 2011). The safety patience dimension concerns the behaviour related to adapting to a dangerous job in the hope that safety conditions will improve in the future (Tucker & Turner, 2011). Safety patience can have both passive and active manifestations. It can be seemingly passive insofar as it can lead to self-protection and adaptation under hazardous conditions without resorting to use of either the safety voice or safety exit. In contrast, patience may engender actions that subtly and indirectly support change, such as agreeing with a co-worker that a hazard needs to be addressed. The safety exit dimension, on the other hand, refers to the workers' intentions to leave work because of decreasing workplace safety (Tucker & Turner, 2011).

In another study, Hogan and Foster (2013) identified and validated six dimensions of safety performance, namely compliant, cautious, confident, vigilant, emotionally stable and trainable. Within their dimensions, being safety compliant has to do with following normal operating procedures, which is similar to Griffin and Neal's (2000) definition of compliance as "core safety activities that need to be carried out by individuals to maintain workplace safety" (p. 349). The notion of being safety cautious is related to avoiding unnecessary risks, while being safety confident is linked to employees' tendency to handle stress or concerns by responding to emergencies with poise and self-assurance. Being safety vigilant is linked to focusing attention while performing work or, in other words, it concerns the ability to stay focused while performing monotonous tasks. The notion of being emotionally stable concerns the employees' tendency to maintain emotional control or control their emotions during stressful situations. Finally, the idea of being safety trainable refers to pursuing training and development opportunities or responding to and learning from training.

Al-Haadir, Panuwatwanich and Stewart (2010), Neal et al. (2000) and Vinodkumar and Bhasi (2010) have all noted that safety behaviour has two key components that describe the actual behaviour of workers. Further, Neal and Griffin (1997) and Griffin and Neal (2000) identified two types of safety behaviour, namely safety compliance and safety participation. This research is based on investigating the factors of safety behaviour which are safety compliance and safety participation as previous research (Baysari, McIntosh, & Wilson, 2008; Hofmann & Stetzer, 1996; Morrow et al., 2010; Neal & Griffin, 2006). Exploring safety behaviour and

accidents signifies a connection between unsafe behaviour and the incidence of accidents. For example, Al-Haadir, Panuwatwanich and Stewart (2013) found that most documented safety violations occur within Saudi construction companies and often such violations remain unnoticed or even tolerated by the administration at the construction sites. They further added that accidents and injuries are easy to control so long as workers are motivated to act safely. These perceptions will create a safe working climate on the construction site, which will ultimately influence their safety behaviour. It has been suggested that workers might behave in a specific manner that is not compliant with safety rules and regulations and, even when displaying such negative behaviours and attitudes, the workers are ignored by managers or co-workers, since compliance is considered to be less important than performing compulsory work (Morrow et al., 2010). It is pertinent that onsite managers and company management need to understand which factors that encourage unsafe behaviour can provide opportunities for intervention in order to enforce safety, reduce non-compliant behaviour and protect the working mechanism from susceptibilities. Moreover, there are two key components of safety behaviour, namely safety compliance and safety participation, which are both discussed in detail in the following sections.

2.2.1 Safety Compliance

Safety compliance is defined as adhering to safety procedures and carrying out work in a safe manner (Neal et al., 2000). Borman and Motowidlo (1993) stated that safety compliance is actually related to task performance. Al-Haadir et al. (2013) explained safety compliance (task performance) to be the core safety activities that need to be

carried out by individuals in order to maintain workplace safety, such as wearing personal protective equipment. Compliance with rules and regulations is one of the imperative features of safety performance. The term 'safety compliance' refers to the core behaviour workers need to perform to maintain workplace safety. Such behaviour includes maintaining the standard of work procedures and wearing personal protective equipment (Neal & Griffin, 2002). Moreover, safety compliance serve to make people at work more aware of rules and regulations concerning safety measures and their implementation (Neal & Griffin, 2006). Similarly, Leung et al. (2015) described safety compliance as behaviour aimed at meeting the minimum safety criteria, such as following safety procedures in the workplace. Neal et al. (2000) defined safety compliance as a situation in which workers comply with safety procedures and work in a safe manner. According to Inness, Turner, Barling and Stride (2010), safety compliance comprises task performance and core safety-related activities, since it is compulsory for workers to have at least minimum safety in their workplace.

Based on the above definitions, and in the context of the present study, safety compliance is here defined as the foreign workers' compliance with onsite safety activities, including taking precautionary measures, wearing protective equipment and following the stipulated safety instructions. Compliance with safety-related rules and regulations is important for foreign workers, since it is not just their safety at stake but also the safety of their co-workers', which is a priority for construction companies. Foreign workers need to adjust themselves and behave in a safe manner

in order to maintain safety standards by following safety procedures and taking all the required precautions.

2.2.2 Safety Participation

Safety participation is defined as employees' voluntary behaviours that contribute to safety (Neal et al., 2000). It includes behaviours that extend beyond an employee's formal role (Jiang et al., 2010). Safety participation requires co-workers to be helped to enhance and comply with safety programmes in the workplace as well as to take the initiative and expend effort to ensure safety in the workplace (Neal et al., 2000). Safety participation is a similar concept to organisational citizenship behaviours (OCBs), which include voluntary behaviours that are favourable to the organisation (Hofmann, Morgeson, & Gerras 2003).

Safety participation is important in terms of understanding safety behaviour. It comprises a variety of activities, including helping with safety-related issues, active involvement in voluntary safety activities and attending safety meetings (Broadbent, 2004; Lu & Yang, 2010; Neal & Griffin, 2006). In other words, safety participation implies that the behaviour of workers does not directly influence other workers' safety, but rather educates the public about the importance of creating an environment that is conducive to safety (Neal & Griffin, 2002; Neal et al., 2000). Al-Haadir et al. (2010) similarly stated that safety participation behaviours do not contribute to workplace safety directly, but instead help to promote an environment that supports safety (Griffin & Neal, 2000).

The present study explains safety participation as foreign workers' cooperation with their co-workers in order to encourage safety programmes on construction sites. Such safety participation will help the workers to adopt positive behaviour in relation to safety by facilitating their co-workers, initiating safety programmes and becoming involved in safety activities and safe behaviour that can help the management to improve onsite safety.

2.3 Antecedents to Safety Behaviour

A variety of antecedents of safety behaviour have been empirically tested in an effort to understand safety across various work settings, including level of education (Gyekye & Salminen, 2009), age and tenure (Blanch, Torrelles, Aluja, & Salinas, 2009), risk assessment (Vecchio-Sadus & Griffiths, 2004), workers' safety-related attitudes (Cox & Cox, 1991), management system (Vinodkumar & Bhasi, 2011), social capital (Watson, Scott, Bishop, & Turnbeaugh 2005), supervisors' behaviour in terms of prevention (Simard & Marchand, 1994), age differences (Siu, Phillips, & Leung 2003), safety leadership (Lu & Yang, 2010) and safety motivation (Pedersen & Kines, 2011). These issues will be discussed in more detail in the following sections.

2.3.1 Safety Climate

The safety climate is defined as "individual perceptions of policies, procedures and practices relating to safety in the workplace" (Neal & Griffin, 2006, pp. 946-947). In previous studies, the safety climate has generally been taken to reflect workers' perceptions of how safety is valued by the organisation (Schwatka et al., 2016).

Perceptions of the safety climate vary from individually moulded attitudes towards safety that imply a degree of disagreement to agreement. The safety climate therefore represents the attitudes of the worker toward safety and it is formed through the worker's interaction with his/her environment (Ismail & Nyarko, 2014).

Agnew, Flin and Mearns (2013) conducted a quantitative study on National Health Service (NHS) acute hospitals in Scotland by distributing questionnaires to 1866 NHS staff members. Their study aimed to investigate the hospitals' safety climate and test whether the scores are linked to workers' safety behaviour as well as patient and worker injuries. Their findings indicated that in a hospital setting, a safety climate that supports safer patient care would also help to ensure workers' safety.

In another research study, Bosak et al. (2013) conducted a study on 623 employees of a chemical manufacturing organisation in South Africa. Their study attempted to investigate the link between the safety climate (i.e. commitment of management to safety, safety priority and production pressure) and its influence on risk behaviour as indicated by the workers. Their findings showed that the risk behaviour of employees is negatively related to the commitment and priority of management regarding safety. Their findings further indicated that on a professional level and all managerial levels within an organisation, the superiors must visibly demonstrate their commitment to, as well as their support for, safety.

Similarly, Parboteeah and Kapp (2008) conducted a research study on 237 employees from five manufacturing plants in the Midwest of the USA by examining specific local ethical climate types and their link to injuries and safety-enhancing

behaviours, safety compliance and safety participation. They concluded that the climate types, while benevolent, do have the anticipated negative relationship with injuries. Egoism and benevolence are not related to safety-enhancing behaviours. Meanwhile, Cooper and Phillips (2004) conducted a study on the situation in a packaging and production plant in the UK by distributing 540 questionnaires. Their study aimed to investigate the link between the safety climate and safety behaviour. The study concluded that there is a significant relationship between the safety climate and safety behaviour. Smith and DeJoy (2014) conducted a study on 398 professional firefighters in the Southeastern USA. The objective of their study was to test an initial model of a safety climate for firefighting. The study categorised the safety climate into four sub-dimensions: management's commitment to safety, supervisor's support, safety communication, and safety policies and programs. The authors tested the relationship between the safety climate, safety behaviours and firefighter injuries. The study found that the behaviours attributed to safety, namely compliance and participation, are both positively and significantly influenced by the safety climate.

Wills, Watson and Biggs (2006) conducted a study on 329 workers from three organisations (local government council, a state government transport agency and a private industrial resource provider) in Queensland, Australia. The study found that the safety climate is a strong predictor of safety-related outcomes in the government, state and private industries. The study further indicated that out of the six identified dimensions (communication and procedures, work pressures, relationships, safety rules, driver's training and management commitment) of the safety climate, only

three (safety rules, communication and management commitment) are significantly related to particular aspects of work-related driving behaviour.

A study by Zohar (2008) identified group-level and organisation-level safety climates as distinct constructs with separate measurement scales. The study indicated that there is a relationship between the safety climate and behaviour, which is often missing in the existent literature. He added that on the basis of priorities among competing facets, which primarily focus on perceptions of the organisational climate, the side effect of different role behaviours (e.g. stressing speed over safety) that inform the behaviour outcome expectancies was found to provide a strong prediction of actual behaviour, which forms the rationale for a positive association between the safety climate and safety behaviour.

In summary, the safety climate is crucial in explaining a worker's safety-related behaviour. The notion of the safety climate is therefore continuously being debated among researchers. Some researchers view it from the psychological perspective of workers, while others approach it from the operations perspective. There are many factors, for example, the workers' commitment, workers prioritising safety and work load pressure that can reduce risky behaviour and, ultimately, reduce onsite accidents, injuries and fatalities. In short, the literature indicates that a safety climate is created when workers do not ignore or violate the rules and procedures onsite.

2.3.2 Leadership

Leadership can play a significant role in influencing subordinates to accept what is specifically proposed or said to be in the best interests of onsite safety in a manner

intended to foster agreeable compliance rather than simply commanding obedience. In order for work activities to be well performed, there must exist a trusting relationship between managers and workers. Managers should also seek to empower workers by involving them in the decision-making process, communicating with workers, listening to them and acting on their suggestions. Such a leadership style may consistently influence workers' behaviour (O'Dea & Flin, 2001). In addition, Alolah et al. (2014) found that leadership plays a significant role in controlling workers' safety-related behaviour. As stated by Mearns, Whitaker and Flin (2003), the concept of management relates to the actual management roles, practices and functions linked to safe workplace practices. Choudhry and Fang (2008) noted that management plays an important role in promoting a positive safety culture. Employees, when aware of their code of conduct and responsibilities regarding any uncertainty, will take a more active interest in maintaining healthy and safe workplace practices. In addition, Håvold and Nesset (2009) noted that management is more concerned with the degree to which workers perceive their company to provide effective and useful information related to safety matters.

Lu and Yang (2010) conducted a study on 336 respondents who work for five major container terminals in Taiwan. The study examined the influence of safety leadership on self-reported safety behaviour. The findings concluded that there are three basic dimensions of safety leadership, namely safety motivation, safety policy and safety concern. It was further found that safety motivation and safety concern have a significantly positive impact on self-reported safety behaviour, for example, safety compliance and safety participation. Added to this, the safety policy dimensions

were found to be positively related to safety participation. The authors also reported a significantly positive relationship between safety training and self-reported safety behaviour. Strong leadership plays a significant role in moulding workers' safety behaviour and, by influencing their safety behaviour, the rate of accidents, injuries and fatalities can be controlled.

2.3.3 Safety Systems

A safety system is basically an embedded system within a company that accommodates a multinational or cultural workforce through different types of initiatives, such as the use of interpreters and an increased use of visual methods to communicate health and safety messages (Bust, Gibb, & Pink, 2008). In order to further elaborate on safety systems, Wachter and Yorio (2014) conducted two studies in the USA on safety among managers, supervisors and employees. In the first study, which was conducted using the American Society of Safety Engineers' membership database, a 69-item survey was distributed to approximately 2400 safety managers from across the USA. Only 342 respondents fully completed the survey used in study one. The second study was conducted on 29 participants who were also included in study one. Of the 29, only 23 were involved in critical safety operations, for example, heavy manufacturing, nuclear power research and production, mining and construction. The aim of the study was to develop a system of safety management practices (SMPs) based on ten specific practices in order to identify their association with safety statistics (e.g. accident rates) and determine how they lead to positive safety outcomes (prevention of accidents) with the help of workers' involvement. The findings pointed to a significant negative link between the existence of the ten

SMPs and accident rates, thereby showing a significantly negative relationship between workers' emotional and cognitive involvement and accident rates. Both a safety management system (SMS) and workers' involvement can be utilised individually to forecast accident rates. An SMS can also be used to forecast workers' involvement level. The existence of an SMS is related to accident minimisation and it may represent the important first step in accident prevention. Thus, when an organisation invests in an SMS to minimise accidents and improve safety performance, it should also focus on winning over the hearts and minds of the workforce with the help of a performance-based SMS made to develop and integrate workers' involvement.

Chen and Chen (2014) conducted a study on 239 commercial pilots utilising the structural equation modelling (SEM) technique. Their findings indicated that both perceptions of SMS practices and self-efficacy have a direct, positive influence on pilots' safety behaviours.

2.3.4 Safety Motivation

Safety motivation is an important aspect when it comes to defining safety behaviour. Fey (2005, p. 6) defined the term motivation as "the set of psychological processes that cause the initiation, direction, intensity, and persistence of behaviour". In general, motivation refers to the worker's eagerness or intention to do something. It can be categorically divided into intrinsic and extrinsic motivation (Locke & Latham, 2004). On the one hand, the concept of intrinsic motivation can be explained as a motivational perspective that stresses the instincts or innate

propensities that manifest themselves in behaviour (e.g. imitation, emulation, anger, resentment, sympathy). However, different authors hold different views about the concept of instincts in relation to motivation. Intrinsic motivation is not a complete explanation for behaviour, although it provides a limited view based on experience built upon habits. On the other hand, Oudeyer and Kaplan (2007, p. 2) define extrinsic motivation as "a construct that pertains whenever an activity is done in order to attain some separable outcome. Extrinsic motivation thus contrasts with intrinsic motivation, which refers to doing an activity simply for the enjoyment of the activity itself, rather than its instrumental value".

Al-Haadir et al. (2010) conducted research on the Saudi Arabian construction industry and they found a significant relationship between safety motivations and safety behaviour. In addition, Pedersen and Kines (2011), who conducted a research study on safety motivation and safety performance, noted a significant positive relationship between safety motivation and safety performance. Kim and Park (2001) conducted a study in Korea in order to examine the influence of safety motivation on safety performance, with a focus on the two sub-dimensions of safety behaviour (compliance and participation) and occupational accidents. They found that safety motivation has a significantly positive influence on safety performance, while employees' individual characteristics influence both safety compliance and safety participation, which have a direct impact on accident reduction. In another research study conducted on five major container terminal companies in Taiwan, Lu and Yang (2010) investigated the relationship between safety motivation and safety

performance (safety compliance and safety participation). Their findings indicated that safety motivation has a significantly positive influence on safety performance.

In conclusion, there are many factors, for example, the safety climate, leadership, safety systems and motivation, which significantly (either positively or negatively) influence both safety compliance and participation. The following section discusses the seven dimensions of a safety climate as well as their influence on safety behaviour.

2.4 Safety Climate and Safety Behaviour

Safety climate is defined by Zohar (2008) as the procedures, policies, strategies and activity enforcements implemented through organisational practices in order to improve the safety of employees. In the present study, the elements of the safety climate are examined as antecedents of safety behaviours. It is important to consider the safety climate when trying to predict safety behaviour, since previous research (Vinodkumar & Bhasi, 2009; Al-Haadir et al., 2010) has recommended common and relevant procedures for controlling safety and appreciating safety behaviours in order to prevent injuries and accidents. Vinodkumar and Bhasi (2009) noted that the safety climate has the ability to control onsite accidents and injuries, thereby preventing the occurrence of human errors and controlling workers' safety behaviours, since human errors represent the largest contributing factor to unsafe working conditions, accidents and injuries (Akyuz & Celik, 2014; Fleming & Lardner, 2002; Kumar et al., 2016). In addition, it is management's role and responsibility to efficiently implement or enforce a code of conduct (rules, procedures, training, drills and

information) among the construction workers in order to maintain safety onsite (Gordon et al., 2005). Therefore, it can be stated that the safety climate can enhance working conditions and positively impact the attitudes and behaviours of workers with regards to safety, which can in turn minimise the number of construction accidents (Kirwan, 1998).

In the context of this study, the safety climate is considered to comprise workers' perceptions of workplace safety policies, procedures and practices (that is, management commitment, priority of safety, safety communication and feedback, safety rules and procedures, safety training, worker's involvement in safety and work pressure), which management implements in order to prevent workers from experiencing any possible accidents and injuries.

This study aims to investigate how the different dimensions of the safety climate listed above influence workers' safety behaviour in the Saudi construction industry. Previous studies have reported that these dimensions have the ability to control and minimise onsite accidents and injuries as well as play an essential role in ensuring employee comply with the organisation's safety rules (Bosak et al., 2013; Michael et al, 2005; Törner & Pousette, 2009; Vinodkumar & Bhasi, 2009). Thus, if these safety climate dimensions are aligned, workers' safety behaviour can be improved.

For instance, management commitment is one of the drivers of employees' safety performance and injuries in a variety of industries, since it is such an important cornerstone of safety programmes (Michael et al., 2005). In addition to management commitment, work pressure is an essential dimension of the safety climate, which

also influences safety behaviours (Amponsah-Tawaih & Appiah, 2016). Another important safety climate dimension is the priority of safety, which has consistently been found to directly predict safety outcomes such as safety behaviour (Bosak et al., 2013). Additionally, safety training is reported to be one of the fundamental methods of improving workers' onsite safety by training them about risk awareness and methods of safe behaviour as well as facilitating an understanding of both accident occurrence and all safety requirements on the construction site (Han et al., 2014). Workers' involvement in safety is another vital dimension that can improve occupational safety and continuously address safety issues, and it may help management to solve problems through broad participation (Törner & Pousette, 2009).

One further key dimension of the safety climate is safety communication and feedback, which significantly increases levels of safety on the construction sites (Kines et al., 2010). Finally, safety rules and procedures represent another important dimension in the construction industry. Well-documented safety rules and procedures as well as appropriate enforcement by supervisors and managers can improve the safety behaviour of workers and reduce the accident rate (Vinodkumar & Bhasi, 2009).

In summary, understanding the safety climate is particularly significant for the construction industry in Saudi Arabia due to the widespread desire to reduce foreign workers' onsite injuries and improve the safety behaviour of all construction

workers. The following section empirically examines the seven dimensions of the safety climate.

2.4.1 The Relationship between Management Commitment and Safety Behaviour

Management commitment is an important factor in safety climate; In particular, it serves to influence workers' safety behaviours (Vinodkumar & Bhasi, 2009). Cooper (2006) defined management commitment as workers' engagement and maintenance behaviours that support the achievement of other organisational goals. Neal and Griffin (2004, p. 27) defined management commitment as ''the extent to which management is perceived to place a high priority on safety and communicate and act on safety issues effectively". Previous research studies (e.g. Agnew et al., 2013; Cox & Cheyne, 2000; Huang et al., 2012; Mashi, 2014; Michael et al., 2005; Vinodkumar, 2005; Vinodkumar & Bhasi, 2010; Vredenburgh, 2002) have found that management commitment is the most important component of contemporary safety behaviours. For example, Vinodkumar and Bhasi (2009) and Mearns et al. (2003) noted that management commitment is the aspect of the safety climate that comprises safety committees, considerations of safety in job design, reviews of the work pace, accident and near-miss incident investigation and follow-up actions, priority assigned to safety, occupational health programmes, etc.

In the context of Hong Kong, Cheng et al. (2012a) conducted a study on the construction industry. They found that a lack of commitment to safety management might reduce safety awareness. The reduction might also be due to an uncooperative

relationship between management and workers, which might hamper safety communication, and hence workers may be unaware of safety concerns. Similar findings were reported by Häkkinen (1995), who, in a study of top management, found that insufficient commitment to safety management might lead to reduced safety awareness. Limited management commitment is not helpful for workers' onsite safety, since it leads to them being unaware of safety parameters and standards perceived by management onsite.

In another study, Miozza and Wyld (2002) investigated the behaviours and incentive-based protection programme attributes of American safety professionals. They showed that the success of behaviour-based safety in decreasing injuries requires the involvement and commitment of every level of management. The nature of the relationship between management commitment and safety behaviour can be further explained by considering the roles of managers and employees at different levels of management. For instance, Michael, Guo, Wiedenbeck and Ray (2006) investigated the influences of management commitment on subordinates' safety in wood product manufacturing facilities. Their findings suggested that a commitment to safety at every level of management is helpful in encouraging workers to respond to actions, since it demonstrates safe behaviours in the workplace. Relatedly, Michael et al. (2005) conducted a study of 641 employees at three wood product manufacturing factories, and they noted that management commitment influences employee behaviours. Geldart, Smith, Shannon and Lohfeld (2010) conducted a study of 312 Canadian manufacturing companies and examined the relationship between organisational practices and workplace health and safety. They identified the positive

influence of management commitment on the incidence of occupational injuries. The above studies indicate that the effects of management's commitment to safety on worker-level outcomes might highlight the value of managers exhibiting a strong commitment to safety.

In another research study, Kath, Marks and Ranney (2010) examined 548 railway workers in the USA and found that a commitment to safety is an extremely important factor in decreasing workplace accidents and injuries. Similarly, Hansez and Chmiel (2010) conducted research on Belgium's energy sector and found a positive relationship between management commitment and safety behaviour. Specifically, the authors found results related to goal-setting and facilitator performance to be widely determined by different levels of management commitment. Bailey (1997) suggested that management's commitment to safety could be demonstrated by the leadership openly and proactively showing consistent leadership on a daily basis in terms of safety-related issues. The findings indicated that workers' perceptions of management's commitment to safety behaviours are strongly significant. Cox, Jones and Rycraft (2004) conducted a project to examine behavioural approaches to safety management in UK reactor plants. Their findings indicated a significantly positive relationship between management commitment and behavioural safety across all organisational levels. In another study, Yule, Flin and Murdy (2007), who aimed to investigate the role of both management and the safety climate in preventing risk-taking at work, found a significant relationship between management commitment and the prevention of workers' risky behaviour.

Along similar lines, Mahmood, Isa, Mustafa, Abd Aziz and Salleh (2009) examined the role of safety commitment. Their findings indicated that safety commitment has a strongly significant relationship with workers' safety behaviour. Fernández-Muñiz, Montes-Peón and Vázquez-Ordás (2012) conducted an empirical study on 131 Occupational Health and Safety Assessment Series (OHSAS) 18001 certified Spanish organisations. Their study aimed to investigate the safety climate in these organisations by determining the antecedents of workers' safety behaviours. The findings indicated that management commitment has a positive influence on safety behaviours.

The above studies indicate that management commitment is a key predictor of safety outcomes. In the reviewed studies, management commitment was found to be positively associated with safety behaviour, while safety activities are hard to execute without management commitment.

Although the above-mentioned studies have indicated that management commitment is positively related to safety behaviours, some prior studies have found a non-significant relation between management commitment and safety behaviour. For example, Cui, Fan, Fu and Zhu (2013) investigated the safety behaviour of frontline employees in a mining corporation in China. The study did not find a direct relationship between management commitment to safety and workers' safety behaviour. Kao, Stewart and Lee (2009) also examined the relationship between management commitment to safety and flight attendants' safety performance, and

they found that management commitment has no direct relationship with safety rule compliance and injuries among Taiwanese airline attendants.

In conclusion, many researchers have found that management commitment has a positive association with safety behaviours. For example, Cox et al. (2004) and Hansez and Chmiel (2010) noted that there is a significantly positive relationship between management commitment and safety behaviours. Furthermore, the findings of Geldart et al. (2010) illustrated that management commitment has an important influence on reducing the occurrence of workplace injuries. Similarly, Marsh et al. (1998) noted that a high level of management commitment plays a fundamental role in ensuring the success of behavioural safety interventions in the construction industry. Consequently, in the context of this study, based on the above literature, it is posited that the strong attributes of management commitment will encourage workers' safety behaviours. Therefore, this study hypothesises that:

H1a: There is a significant positive relationship between management commitment and safety compliance.

H1b: There is a significant positive relationship between management commitmentand safety participation.

2.4.2 The Relationship between Priority of Safety and Safety Behaviour

Priority of safety is a vital factor that determines the success of the safety climate (Bosak et al., 2013). The priority of safety is defined as the degree to which workers perceive safety to be a top priority on the part of the management (Bosak et al., 2013). It has been recognised that the greater the priority assigned to safety within

the organisation, the more workers are motivated to take greater ownership and accountability for safety, which induces them to behave in a safe manner (Bosak et al., 2013; Naveh, Katz-Navon, & Stern, 2006). Conversely, safety as a low priority indicates that safety-related policies, standards and actions are seen by workers as mere rhetoric by management, since it is likely that safety rules and procedures can be ignored (Flin, Mearns, O'Connor, & Bryden, 2000).

Safe working implies that employees need to slow down and take extra care (Naveh, Katz-Navon, & Stern, 2005). A high safety priority within an organisation means that safety is considered to be an important issue that must be given precedence regardless of other competing demands, for example, work speed and productivity (Fleming & Lardner, 1999). The safety priority is an important dimension of the safety climate and it is linked to employee expectations concerning the balance maintained between work pressures, time, speed and workload for a production output and related to various safety outcomes (Morrow et al., 2010).

The priority of safety is an onsite precaution prior to the performance of tasks, since it makes employee behave safely (Rundmo, 2000) and helps the organisation to reduce both injuries and the accident rate (Van Dyck, Dimitrova, de Korne, & Hiddema, 2013). This factor has a superior level of control over safety outcomes, since when top management emphasises the priority of safety, workers can work more safely, which should result in clear benefits for both workers and organisational safety (Leroy et al., 2012). A number of empirical studies have linked the safety priority with employees' safety behaviour.

In an off-shore environment, Fleming and Lardner (1999) submitted that 19% of the variance in workers' safety behaviour was explained by the safety priority. Hassan et al. (2015) investigated the organisational safety climate of 226 employees working in two milk processing plants in Pakistan, and they found that the safety priority had a significantly positive influence on the safety performance of the two plants. The authors added that the safety priority is a very common issue within the operations, since supervisors push their employees to increase production and possibly engage in unsafe working practices, which could lead towards injuries, accidents and fatalities.

Along similar lines, Dedobbeleer and Beland (1991) reported that the employees' attitude towards safety, such as their risk propensity, was predicted by workers' perceptions of the priority assigned to safety by management. In addition, Katz-Navon, Naveh and Stern (2007) conducted a study on 161 nurses in two large Israeli general hospitals. The nurses were asked questions regarding the safety priority that related to the perceived level of standardisation and safety self-efficacy. The findings revealed that the priority of safety significantly contributes to safety self-efficacy. When the priority of safety is perceived to be high, nurses will recognise that the organisation supports safe working and hence their safety behaviours are appreciated.

In a study by Feng, Bobay, Krejci and McCormick (2012) that was conducted on 248 nurses from a Chinese university hospital, the priority of safety was found to be positively associated with the patient safety culture. The authors claimed that the organisational safety prioritisation factor measured nurses' perceptions of the

organisational safety goals, objectives, safety strategies and initiatives as well as safety resources. The presence of these safety resources could also communicate to nurses that the hospital management is ready to deliver the tangible support necessary for patient safety. Moreover, Rundmo and Hale (2003) conducted a study on 210 respondents from hydro management safety training workshops and found that high safety priority is a significant predictor of safe working practices. They added that the priority of safety also exerted an impact on intentions with respect to safety regulations and procedures.

Bosak et al. (2013) conducted a study on 623 employees from a chemical manufacturing organisation in South Africa and found that the priority of safety has a significantly negative influence on employees' risk behaviour. The authors suggested that the high priority assigned to safety provided workers with sufficient cues regarding the importance of safety within their unit that a managerial emphasis on safety had no additional influence. Similarly, Rundmo (2000) found that management priorities regarding safety had an indirect influence on risk behaviour. Furthermore, Vinodkumar and Bhasi (2009) conducted a study on 2536 employees in eight major hazardous chemical industrial units in Kerala, India. They found that the safety priority displayed a significantly negative correlation with the self-reported accident rate. They added that management should pay greater attention to the priority of safety and, accordingly, that employees also needed to change their unsafe practices.

A study by Hong (2015), who investigated 251 nurses working in the emergency departments at 18 hospitals in South Korea, found that there was a positive correlation between the safety priority and the progress of safe practices. Morrow et al. (2010) concluded that utilising a participatory approach to clarify the priority of safety within an organisation, encouraging bottom-up communication about safety, and empowering workers to suggest and make changes to their job design in order to carry out their duties without compromising safety might all be worthwhile interventions for reducing work-safety tension.

Although the above-mentioned studies indicate that the safety priority influences safety behaviours, other researchers have found a non-significant relationship between the safety priority and safety behaviour. For instance, Katz-Navon, Naveh and Stern (2005) examined four dimensions of safety climate (safety procedures, safety information flow, perceived managerial safety practices and priority of safety) and safety performance among 632 employees in 46 hospitals in Israel. Their findings showed no significant effect on the direct relation between priority of safety and safety performance.

In summary, the literature on the priority of safety generally indicates a positive association between the safety priority and workers' safety behaviours (Bosak et al., 2013; Hassan et al., 2015; Rundmo, 2000; Vinodkumar & Bhasi, 2009). Therefore, it is hypothesised that:

H2a: There is a significant positive relationship between the priority of safety and safety compliance.

H2b: There is a significant positive relationship between the priority of safety and safety participation.

2.4.3 The Relationship between Safety Communication and Feedback and Safety Behaviour

Safety communication is an essential element of safety climate that influences safety behaviour as well as reducing workers' injury rates (Conchie, Taylor, & Charlton, 2011; Vredenburgh, 2002). Communication and feedback are considered to be key factors in the provision of information and data regarding the safety level of organisations (Kletz, 1993). Safety communication is defined as the provision of information and data regarding the safety level of an organisation in order to identify the degree of risk that accidents will occur in the workplace (Bentley & Haslam, 2001). Additionally, communication and feedback influence employees' performance within organisations (Arboleda, Morrow, Crum, & Shelley, 2003; Bentley & Haslam, 2001). In other words, communication plays a dominant role in the success of both efficient workplace operations and workers' effectiveness, particularly in terms of workers' completion of their tasks and achievement of the desired objectives (Eshraghi & Salehi, 2010).

Moreover, feedback is critical for explaining work performance, since workers' behaviours depend on new occurrences, for example, accurate information about threats and hazards. As a result, well-organised communication and feedback enable management to track errors onsite, correct any deviations from standard practice and make decisions in a timely fashion (Pandey & Garnett, 2006). Ineffective

communication or a lack of communication and feedback prevents workers from noting possible hazards, which may lead to accidents and injuries. Indeed, the entire workplace will become risker if communication and feedback are lacking. There is hence a need for management to periodically ensure the easy and efficient flow of communication and feedback (Hofmann & Morgeson, 1999; Kath et al., 2010).

Safety communication and feedback have been widely studied by a variety of researchers, including Neal et al. (2000), Cohen (1977), Vinodkumar and Bhasi (2010), Vredenburgh (2002), Cox and Cheyne (2000) and Mearns et al. (2003). All these authors have noted that communication and feedback are vital, finding that safety behaviours are influenced by the maturity level of the communication within an organisation. Cigularov et al. (2010) conducted a study of the construction industry in the USA and found that there is a significantly positive relationship between safety communication and safety behaviours. Hardison, Behm, Hallowell and Fonooni (2014) conducted a study using the Delphi method on 14 panellists who were classified as construction safety experts and selected according to a relative point system. They suggested that a supervisor needs to establish effective communication practices, since routine and non-routine work communication is the responsibility of construction supervisors. Effective communication is helpful in all disciplines, including resolving safety issues. When a supervisor uses unprofessional and disrespectful methods to try and change workers' behaviours, it might negatively affect the construction workers and the workplace atmosphere. Conchie et al. (2011) recommended that in order to maintain efficient communication, it is very important for a supervisor to facilitate a positive relationship between leaders and workers.

Prior studies have shown that employees are negligent from time to time. Therefore, they need to be warned about risky behaviours through formal communication mechanisms, while co-workers need to ensure that information is being shared and that all necessary safety information is covered (Wachter & Yorio, 2014). Choudhry (2014) conducted a study in the context of the Hong Kong construction industry and found that management systems and safety communication can be synchronised with an awareness of safety behaviours. The author revealed that there was a general lack of safety communication between workers and management and, more specifically, a lack of subcontractors' involvement in implementing safety initiatives. Ng, Cheng and Skitmore (2005) studied the safety performance of 129 main contractors and sub-contractors in Australia. They noted that safety communication is a significant antecedent of safety performance in the construction industry.

Cheyne, Cox, Oliver and Tomas (1998) examined the role of communication and feedback in forecasting levels of safety activity. They showed a positive relationship between safety communication and safety performance, including safety compliance and safety participation. Griffin and Neal (2000), who investigated the safety climate and safety performance of seven manufacturing companies in Australia, indicated that safety communication positively and significantly affects safety behaviours. In another study, Parker, Axtell and Turner (2001), who examined safety in the workplace and the effectiveness of communication among supervisors, showed a significantly positive relationship between safety communication and safety performance. In addition, Bentley and Haslam (2001) explored the connections between the safety practices used by managers to regulate high and low accident

rates in postal delivery offices in the UK. They found that safety communication is positively correlated with a low accident rate.

The above-mentioned studies all indicate that safety communication and feedback play important roles in safety. Thus, communication and feedback represent a very useful means of controlling workers' safety behaviours. Further, most prior research has noted safety communication to be positively associated with workers' safety behaviours. Safety communication and feedback can trigger a timely intimation of trouble, thereby preventing workers suffering accidents and injuries. In addition, high accident and injury rates in workplaces are due to not every worker having the communication skills or tools that prove necessary when they face uncertainty.

Probst and Estrada (2010) studied the under-reporting of accidents among employees. Their study collected data from 425 employees working in five industries in the USA with a high risk of workers' experiencing accidents and injuries. The findings revealed that safety communication plays an important role in the reporting of accidents. In addition, Ali, Abdullah and Subramaniam (2009) found that feedback and communication are strong predictors of injuries in the industrial sector in Malaysia. Reporting accidents is helpful in making workers aware of future activities and hazards. In a related study, Vredenburgh (2002) conducted an investigation of 62 hospitals in the USA and found that safety communication plays a significant role in the implementation of management practices as well as in controlling accidents and injuries. He further found a positive association between communication and feedback and low rates of injury. Wu, Chen and Lu (2008)

examined four universities in Central Taiwan and noted the positive influence of safety communication on safety performance. Similarly, Cox and Cheyne (2000) conducted a study in the UK and concluded that communication and feedback can improve safety performance.

The above-mentioned studies have all found that appropriate and timely communication and feedback directly influence both safety and workers' psychology with regards to preventing accidents and injuries. Onsite safety can therefore be seen as related to how clear and simple the communication between managers and their subordinates is.

However, Kath et al. (2010) conducted a study of 548 railway workers in the USA and noted that previous research had demonstrated the effectiveness of communication between supervisors' and workers' leader-member exchange (LMX). Their study found that workers' perception of the attitude of management regarding safety is a critical factor in determining the effectiveness of safety communication. The other relevant factors are job demands getting in the way of safety, followed by the LMX. Fairhurst (1993), who conducted a study on the communication patterns of medium, high and low LMX dyads (with the LMX consisting of two elements or parts), found that a high-quality supervisor and worker connection involves open discourse regarding non-routine work-related issues. By applying these findings to safety communication in particular, the author suggested that employees who engage in strong communication with supervisors feel more relaxed and comfortable discussing their safety concerns.

In conclusion, effective communion should mean that workers are more comfortable and frank with their supervisors, which will enable them to discuss even the smallest of concerns that can be avoided or corrected in case of any potential safety incidents. If the supervisor-worker communication is poor in quality, then the workers might feel uneasy and uncomfortable or even afraid of bringing any safety concerns to the supervisor's attention. In such circumstances, safety issues might only surface after an incident has progressed to the point at which it becomes acute.

In the workplace literature, it has been shown that frequent communication and the provision of feedback regarding safety issues in the workplace (i.e. in terms of hazards) can ultimately inform co-workers, supervisors and management before accidents or injuries occur. Efficient communication and feedback can also help to control workers' behaviour and tackle any unexpected events. If there is a lack of communication, it might be impossible to inform workers about hazards that could cause accidents.

Although the above-mentioned studies indicate that safety communication influences safety behaviours, other researchers have found a non-significant relationship between safety communication and safety behaviour. For instance, Casey and Krauss (2013) found that the quality of upwards safety communication failed to significantly predict employees' safety behaviour in South Africa. Relatedly, Lu and Yang (2011) conducted a study among passenger ferry workers in Taiwan and found that safety communication non-significantly influenced safety behaviour. Additionally,

Vinodkumar and Bhasi (2010) found a non-significant relationship between safety communication and safety behaviour.

In summary, safety communication and feedback have a significant relationship with safety behaviour. For example, Cigularov et al. (2010), Conchie et al. (2011), Parker et al. (2001) and Vredenburgh (2002) have all found a significantly positive relationship between safety communication and feedback and the reduction of workers' injury rates. Vinodkumar and Bhasi (2010) argued that safety communication among management and the workforce can increase safety in the workplace. In the context of the construction industry, Cigularov et al. (2010), Hardison et al. (2014) and Ng et al. (2005) argued that feedback and communication are key to preventing hazards. Previous researchers have claimed that the most common dimension of safety behaviour is safety communication (Fernández-Muiz et al., 2012; Neal et al., 2000; Vredenburgh, 2002). Based on the literature review, this study proposes that safety communication and feedback lead to lower rates of injuries or accidents. Thus, they are important, not only in relation to hazards or any indication of uncertainty, but also for fostering a safe atmosphere in which workers can behave safely. Therefore, it is hypothesised that:

H3a: There is a significant positive relationship between safety communication and feedback and safety compliance.

H3b: There is a significant positive relationship between safety communication and feedback and safety participation.

2.4.4 The Relationship between Safety Rules and Procedures and Safety Behaviour

Safety rules and procedures represent another key dimension of safety climate (Vinodkumar & Bhasi, 2009). It is common practice in industry settings to prepare safety manuals, which explain the compulsory rules and procedures needed to establish a sufficiently safe, functional, supportive and effective environment for workers (Mashi, 2014). Safety rules and procedures are defined as the set and well-understood protocols of safety (Dahl, 2013). Safety rules and procedures enable workers to perform their duties according to both ethical and safety methods. During their hiring processes, companies must ensure that workers understand the rules and procedures and do not act in an unethical, over-confident or indifferent fashion (Vinodkumar, 2005).

In a study by Neal et al. (2000) concerning the Australian hospital industry, the authors examined a sample of 525 individuals and found that the motivation to safely follow workplace procedures is a significant antecedent of actual safety behaviours. Relatedly, Langford et al. (2000) conducted a study of 126 directly employed construction workers in ten companies in the UK, and they found that perceptions of risk management as well as rules and regulations governing safety influence the attitudes of construction workers. They added that safety rules and procedures help to reduce accidents and injuries. In addition, Mohamed, Ali and Tam (2009) noted that construction workers' behaviour with regards to safety is influenced by their psychological aspect or their perception of risk and safety rule and procedures. In their study of the Saudi Arabian construction industry, Al-Haadir and

Panuwatwanich (2011) noted that in order to control the incidence of injuries and fatalities, it is very important for workers to follow the rules and procedures established for construction sites.

On a similar note, Bomel (2001) indicated that safety levels in developing countries are worse than in other countries, specifically among unskilled workers, mostly due to a lack of strict safety regulations. The author added that workers take every opportunity to flout the established procedures and rules, since they believe that breaching such regulations is a minor matter that will not cause accidents. Bomel (2001) concluded that in developing countries, safety rules barely exist. This might be a possible reason for the increased accident and injury rates seen in the construction industry. Hinze (1997) confirmed that safety rules and procedures often fail to effectively or appropriately prevent accidents and injuries on construction sites due to the weak implementation of safety rules, procedures and programmes.

The above-mentioned research studies show that safety rules and procedures should always be followed. When workers behave safely and work according to established rules and procedures, they can avoid suffering fatalities, accidents and injuries. Further, the operational excellence of companies involves the implementation of strict safety rules and procedures as well as the adequate monitoring of such rules to prevent any uncertain events from occurring due to a breach of safety protocol.

Fernández-Muñiz et al. (2012) claimed that employees' safety behaviours are of fundamental importance if a firm's technical system is to work properly. It is important to understand that appropriate behaviours not only involve workers

complying with the firm's procedures or rules, but also clearly understanding the critical nature of rules and procedures. Vinodkumar and Bhasi (2010) argued that safety rules and procedures that are well documented and enforced by management can serve to enhance safety behaviours. This also suggests that violations of safety rules and procedures tend to result in serious consequences for organisations, both financially and non-financially. In another research study, Subramaniam et al. (2014) examined the healthcare sector in Malaysia. Their study aimed to investigate the extent to which perceptions of workplace safety practices influence behaviours. They found that nurses' perceived compliance with safety behaviours is significantly and positively influenced by the perceived practices of their co-workers in relation to safety (i.e. by following safety rules or encouraging others to follow safety procedures).

The literature discussed above shows that safety rules and procedures are of significant importance and that management cannot tolerate any negligence in relation to compliance with such safety rules and procedures, since negligence may jeopardise human life. Safety rules and procedures must be strictly followed, since any violation may cause the loss of life and/or financial and non-financial losses.

Dahl (2013) examined 24 contract workers employed in the Norwegian petroleum industry and noted that previous research has focused more on intentional than unintentional violations. These violations of rules and procedures are usually identified as significant causal factors behind workplace accidents. The author argued that previous research has focused on the attributes of work that influence

workers' safety attitudes and their motivations regarding compliant behaviour; however, studies on the factors that influence workers' knowledge of rules and procedures concerning safety remain few and far between. Therefore, petroleum companies need to be cautious in ensuring that workers' safety behaviours are in accordance with safety rules and regulations. Parboteeah and Kapp (2008) conducted a study of 237 employees from five manufacturing plants in the USA. They found that safety rules and procedures are significant predictors of workers' safety compliance and participation. In fact, safety rules and procedures motivate workers and enhance their safety behaviours.

Clarke (2013) reviewed the literature and identified relevant studies for inclusion in a meta-analysis by filtering a total of 103 studies (114 independent samples) for inclusion in the analysis. The author noted a significant relationship between workers' compliance with safety (i.e. their safety behaviours) and safety rules and regulations. In addition, Fernández-Muñiz et al. (2012) conducted an empirical study of 131 OHSAS 18001-certified Spanish organisations and concluded that all organisations that aim to effectively implement formal procedures to reduce the health and safety risks posed to employees should adopt the OHSAS 18001 standards.

Safety rules and procedures are just as important as safety implementation, which is in line with companies' policies and planning agenda. Management should always intend to oversee smooth, structured and accident-free operations and processes. However, it is not easy for management to align workers' behaviours according to

established rules and procedures regarding safety, since there are often complications related to rules, procedures, policy, reporting hurdles and other formalities. Workers often find it difficult to follow rules and procedures and, due to their behaviours, may find themselves at risk of accidents and injuries.

While the above-mentioned studies indicate that safety rules and procedures are positively related to safety behaviours, a number of other studies have found a non-significant relationship between safety rules and procedures and other safety behaviour. For instance, Lu and Yang (2011) reported that safety rules did not significantly influence safety compliance among passenger ferry workers in Taiwan. Similarly, Vinodkumar and Bhasi (2010) found a non-significant direct relation between safety rules and procedures and safety participation.

In summary, safety rules and procedures have been found to be significant variables that show a positive variation in workers' safety behaviours, since breaches of rules and procedures represent a major cause of accidents. Researchers such as Subramaniam et al. (2014) have found a significantly positive relationship between safety rules and procedures and safety behaviour. In the context of the construction industry, Al-Haadir and Panuwatwanich (2011) and Langford et al. (2000) claimed that safety rules and procedures must be implemented if workers are to behave safely, since safety rules and procedures align workers' safe behaviours and influence them to respect and obey company policies regarding safety. Vinodkumar and Bhasi (2010) argued that safety rules and procedures that are well documented and enforced by management can serve to improve the safety behaviours,

compliance and participation of workers. Hence, this study considers safety rules and procedures to be one of the most influential factors driving safety behaviour, since a successful and safe construction company requires strict discipline and onsite safety rules and regulations. Therefore, based on the above literature, it is hypothesised that:

H4a: There is a significant positive relationship between safety rules and procedures and safety compliance.

H4b: There is a significant positive relationship between safety rules and procedures and safety participation.

2.4.5 The Relationship between Safety Training and Safety Behaviour

Safety training is defined as safety-related information or knowledge provided to workers in order to allow them to conduct their work routines safely and with no risk to their well-being (Abdullah et al., 2009b). Essentially, safety training refers to the set of guidelines and instructions that workers need to follow so as to avoid accidents (Carlson & Eggerding, 2000).

There are two basic types of safety training (Carlson & Eggerding, 2000). First, general workplace safety training, which including concerns and procedures regarding safety in the workplace (e.g. rules, emergency procedures and where the first aid box is located). Second, there are training programmes on safety, which train workers in relation to their job performance as well as how to work technical machines properly and safely. For example, specific safety training may teach a worker how to perform a task, how to use protective guards or the procedures for the

safety lockout feature (Lingard, 2002). These two types of training enable management to address safety, particularly in terms of the priority assigned to safety and the appropriate adoption of methods, procedures and other technicalities.

Safety training's influence on workers' safety outcomes has been discussed in the previous literature, which shows that a significantly positive relationship exists between safety training and safety outcomes. It has also been noted that safety training can reduce the number of accidents and safety-related problems. For example, Farooqui, Arif and Rafeeqi (2008) aimed to investigate the safety behaviours on 27 construction sites in Pakistan. They noted that safety training has a significant influence on workers' safety behaviours. Similarly, Lehmann, Haight and Michael (2009) conducted a study on 53 mining industry workers in the USA and found that safety training is particularly essential for changing safety-related behaviours. Meanwhile, Chen and Jin (2011) conducted a study on the construction industry in the USA and revealed that safety training is significant in controlling and preventing workers' accidents, which suggests that safety training is a necessary exercise to reduce accident rates and injuries in the workplace.

Similarly, Wahab, Rajab, Shaari, Rahman and Saat (2014), who conducted a study of Malaysian auto-manufacturing and assembly plants, investigated the role of safety training practices in influencing safety performance. They concluded that safety training has a significantly positive influence on workers' safety performance. In this context, Geldart et al. (2010), who inspected the organisational practices and workplace health and safety of 312 manufacturing companies in Ontario, Canada,

found evidence that supports the relationship between safety training and lower injury rates. Another study that discovered a similar relationship was conducted by Vassie and Lucas (2001), who measured health and safety management within working clusters in the UK manufacturing sector. They found a significant and positive relationship between safety training and safety management as a medium for communicating and helping workers to understand the importance of safety. They further noted that effective safety training provides workers with a sense of belonging, thereby making them more accountable for safety in their workplace. Zacharatos, Barling and Iverson (2005), who conducted a study to examine the association between occupational safety and high-performance work systems, found that there is a significant association between safety training and high performance. The researchers noted that sufficient and appropriate safety training for workers can both improve their level of workplace safety and influence their workplace performance.

Based on the above studies, it can be argued that safety training is important in aligning the safety behaviours of workers, particularly as it is required to match the understanding of management and workers regarding safety and hazardous acts. Workers' safety can be improved if systematic and comprehensive safety training for both existing and new workers is offered. There should exist a formal safety training plan for workers that periodically addresses the importance and practical issues of onsite safety.

A study conducted by Laharnar, Glass, Perrin, Hanson and Anger (2013) on 793 county government supervisors in the state of Oregon, USA, found that training is an effective and valid strategy for determining workers' and supervisors' knowledge and awareness in order to support onsite safety policy implementation. In addition, Vinodkumar and Bhasi (2010) argued that safety training can significant improve workers safety behaviour in workplace, which highlighted the need for safety training in the workplace. Alolah et al. (2014) conducted research on Ministry of Education officers and school executives in Saudi Arabia. The authors indicated that previous studies (e.g. Garratt, 1999; Marquardt, 2000) had explored the concept of learning and training in order to measure its impact on workers' safety performance, finding that safety training comprises both efficient skills development and risk assessment related to the task as well as an understanding of suitable safety measures for the avoidance any disaster or uncertainty. They concluded that the effectiveness of safety training can improve numerous areas of workers' safety culture. It can build workers' confidence with regards to reporting safety issues, heighten their sense of responsibility and decrease their fatalistic vision of life. A study by O'Dea and Flin (2001) selected 200 offshore installation managers from 157 offshore oil and gas installations in the UK to evaluate the link between safety behaviours and managers' levels of experience. They revealed that well-trained employees usually have a significant insight into safety behaviours when compared to the employees who are comparatively less well trained. Additionally, Krause and Hidley (1989) conducted a study on the manufacturing and transportation sector in order to evaluate the impact

of safety training on safety behaviours, and they found that safety training tends to improve workers' safety behaviours.

The above-mentioned literature suggests that workers need to be more cautious regarding safety and that workers' safety training plays an important role in informing them about hazardous acts as well as what and how various tasks should be performed. However, the literature thus far has failed to explore the relationship between employees' experience and safety training's influence on safety behaviour, which is a significant oversight because expert and experienced advice provided during training is very useful in determining workers' awareness of techniques, procedures and performance timing.

Depasquale and Geller (1999) sought to investigate the critical success factors behind behaviour-based safety in the USA. Their study targeted a total of 701 employees from 20 different organisations that had applied behaviour-based safety, and they found that training is significantly related to employees' involvement in behaviour-based safety. Similarly, Sgourou, Katsakiori, Goutsos and Manatakis (2010) attempted to examine the connection between practical characteristics and safety performance. They noted that various activities, together with safety training, are related to the prevention of occupational injuries and ill health. In keeping with this finding, a study conducted by Tinmannsvik and Hovden (2003) noted that safety training has a positive influence on accident prediction. Furthermore, Vredenburgh and Cohen's (1995) research findings indicated that the level of perceived danger

increases compliance with warnings and instructions, which reveals a positive association between workers' training and the reduction of hazards

The literature discussed above has identified a primarily positive and significant relationship between safety training and safety behaviours. It is likely that workers are willing to understand the instructions and demonstrations providing during safety training, since they enable the workers to perform well, achieve more incentives, strengthen their understanding of tasks and remain protected and safe.

Although the above-mentioned studies all indicate that safety training positively influences safety behaviours, some prior studies have found a non-significant relationship between safety training and safety behaviours. For example, Ismail, Asumeng and Nyarko (2015) found that safety training had a non-significant influence on safety behaviours (safety compliance and safety participation) among the employees of a multinational gold-mining company in Ghana. Similarly, Vinodkumar and Bhasi (2010) found no significant direct relation between safety training and safety behaviours (safety compliance and safety participation).

In summary, the literature on safety training has generally found it to have a positive association with safety behaviours. Several studies (Depasquale & Geller, 1999; Krause & Hidley, 1989; Laharnar et al., 2013; O'Dea & Flin, 2001; Vinodkumar & Bhasi, 2010) have claimed that safety training helps to improve safety behaviours by educating workers on hazardous scenarios; thus, safety training can help workers to face challenging and unsafe situations onsite. In addition, Bahari (2013) argued that safety training in the workplace offers clear benefits for both individual and

organisational safety. Other studies have revealed that safety training results in a significant improvement in safety knowledge, attitudes and behaviours (Lingard, 2002). Employees who receive suitable safety training are thought to improve their safety behaviours and perform work activities in a safe fashion (Farooqui et al., 2008). Safety training is also very significant because it allows workers to recognise standard operating procedures and potential hazards and risks as well as teaches them the risk control methods (Bahari, 2013; Lingard, 2002). Therefore, based on the above literature, it is hypothesised that:

H5a: There is a significant positive relationship between safety training and safety compliance.

H5b: There is a significant positive relationship between safety training and safety participation.

2.4.6 The Relationship between Workers' Involvement in Safety and Safety Behaviour

Workers' involvement in Safety is one of the most important factors of safety climate and on the basis of previous research, it has been found to be a decisive factor behind organisational safety (Cheng, Leu, Cheng, Wu, & Lin, 2012a; Cox & Cheyne, 2000; Lee, 1998; Rundmo, 1994; Shannon et al., 1996; Vinodkumar, 2005; Vinodkumar & Bhasi, 2009; Vredenburgh, 2002; Wachter & Yorio, 2014). As stated by Vinodkumar (2005), workers' involvement is a behaviour-oriented approach that enables individuals (or a group of individuals) to engage in upward communication and make decisions within an organisation. The quality and quantity of workers'

involvement can vary from no involvement (the supervisor makes all decisions) to full involvement (all workers connected with or affected by a decision are involved) (Vredenburgh, 2002). Workers' involvement is a physiological factor and it depends on how individuals act. Essentially, it is a factor that enables workers to mix and communicate with others. From the perspective of work-related safety, workers' involvement can be defined as the willingness of employees to accept responsibility for creating an injury- and accident-free workplace environment (Geldart, Shannon, & Lohfeld, 2005). Workers' involvement is necessary to create a hazard-free working environment, and it involves workers in a process that requires practical and self-motivated behaviours. Workers' involvement enables them to solve their routine problems in relation to safety (Shearn, 2004).

Previous research studies (e.g. Cohen, 1977; Depasquale & Geller, 1999; Griffiths, 1985; Harper, Cordery, & De Klerk, 1997; Marwat, Qureshi, & Ramay, 2007; Shannon, Mayr, & Haines, 1997) have found that companies with lower accident rates are more likely to benefit from workers' involvement in safety. For example, Marwat et al. (2007) conducted a study on the telecommunications division in Islamabad in order to examine the relationship between workers' involvement and workers' safety performance. They found that workers' involvement has a positive association with workers' safety performance. Similarly, Vinodkumar and Bhasi (2010) showed that workers' involvement in safety has a direct and significant association with safety behaviours within industrial units in India, since the involvement of workers is a technique based on behaviour. This technique involves individuals or groups of workers in the processes of upward communication and

decision making within the organisation, which can range from full participation to no participation.

Johnstone, Quinlan and Walters (2005) provided evidence of the positive benefits for occupational safety at the workplace of workers' involvement. Workers' regular involvement in safety activities can also benefit other workers and supervisors in relation to safety. These studies demonstrate the important and positive link between lower accident rates and workers' involvement, and the literature continues to show that workers' involvement is closely associated with workers' safety behaviours. This knowledge could prove helpful in controlling and decreasing the number of onsite injuries and accidents. Further, Törner and Pousette (2009) conducted a research study on a large Swedish construction project, and they noted that suggestions and recommendations related to workers' behaviour are important for improving safety and that continuously addressing such issues may help management to solve problems through broad participation and the stimulation of new ideas.

The above-mentioned studies in the context of workers' involvement have found a significant association with safety behaviour. However, workers also face complications and hurdles in the workplace, for example, difficulties related to work design and the depreciation of their involvement in safety activities. Workers need to work closely with their managers and supervisors, since close interactions and communication will help them to participate safely.

Cheyne, Oliver, Tomás and Cox (2002) examined the connections among the organisational safety climate, perceived physical work environment and perceived

workplace hazards within a manufacturing firm in the UK. They found both a conducive operational environment and employee participation to positively influence safety activities. Shannon et al. (1996) aimed to study workplace organisational correlates in relation to six types of industries, including automobile manufacturing, metal articles, printing, grain products, plastic articles and textile manufacturing. They revealed that workers' involvement in safety matters lowers the rates of workplace injuries and accidents. Moreover, a safe workplace was found to lead workers to become more involved in safety activities. Furthermore, Miozza and Wyld's (2002) study of American safety professionals found that the success of behaviour-based safety in decreasing accidents and injuries requires the commitment and involvement of every level of management.

In another research project, Carder and Ragan (2003) conducted a study of 6000 workers from chemical plants in the USA. The aim of their study was to analyse the safety measurements used by the chemical companies, and they found that workers' involvement encourages improvements in the safety performance of those companies. Similarly, Clarke (1982) revealed that workers' involvement is able to prevent workers' from experiencing any possible accidents, which indicates a strong significant relationship between workers' involvement and the prevention of industrial accidents and injuries in Canada. Similarly, Walters (1998), who investigated involvement in health and safety activities among workers in the agricultural sector in the UK, found that the success of workers' involvement in safety depends on the commitment and experience of those workers in relation to their companies. The author further added that all the participants had worked in the

agricultural sector for many years, meaning that they were highly cognisant of the safety standards. Singleton (1983) conducted a study on occupational safety and health systems and found that workers' involvement in safety issues is an important factor in decreasing the rate of workplace accidents and injuries. Moreover, the author found that workers' expertise and the quantity of information available to them both contribute to their ability to improve working conditions and make suitable decisions.

In the same vein, Vinodkumar and Bhasi (2010) conducted a study involving 1566 employees in Kerala, India, and they found that workers' involvement in safety has an important and direct relationship with safety behaviours within industrial units in India. Essentially, the term 'behaviour-based safety involvement' denotes a condition in which the primary focus is on worker observations conducted while the workers perform their regular tasks (Cooper, Phillips, Sutherland, & Makin, 1994; Maiti & Paul, 2007). Empowering workers provides them with the responsibility, accountability and authority for making required decisions and ensures that both employees and management are involved in setting goals and objectives related to effective safety practices (Vinodkumar, 2005). Cooper (2000) also noted that workers' significant involvement in, and commitment to, safety within an organisation varies with corporate management's perceptions regarding the value of safety.

The studies discussed above all note that workers' involvement in safety is found to have a significantly positive influence on both onsite safety and influencing workers

to behave safely. Prior to becoming involved in safety-related activities, workers need to recognise any onsite hazards. This step depends on their participation, which can range from supervisor domination to workers' full participation, whereby everyone connected to or affected by a decision is involved in making it.

While the above-mentioned studies indicate that workers' involvement is positively associated with their safety behaviours, one prior study has found a negative relationship between workers' involvement in safety and safety behaviours. Subramaniam, Shamsudin, Zin, Subramaniam and Hassan (2016) found that workers' involvement was significant ($\beta = -0.357$, $p<0.05$) but negatively associated with safety participation. They also failed to identify any direct influence of workers' involvement on safety compliance. Britt and Bliese (2003) claimed that some workers may be unwilling to become involved or participate due to having weak norms in relation to safety. Accordingly, they may behave in an unsafe manner and in contrast to the management's established guidelines concerning safety. Regardless of workers' possible unwillingness to participate, it is crucial to involve workers in different issues, since managers do not have the solutions to all problems. In sum, the involvement of workers is very important in introducing safety behaviours into the workplace.

In conclusion, various researchers have found that workers' involvement in safety has a positive association with safety behaviours. Workers' involvement in safety can also help to reduce accidents and injuries in the workplace (Cohen, 1977; Depasquale & Geller, 1999; Griffiths, 1985; Harper et al., 1997; Shannon et al.,

1997). In addition, Cheyne et al. (2002) argued that workers' involvement enhances an organisation's safety activities. In the context of the construction industry, Törner and Pousette (2009) found that workers' involvement in safety is significant, since it tends to focus on greater personal influence at the operational level as well as on a greater role in decision making. Ultimately, the more workers participate, the safer they remain. Moreover, workers' involvement in safety has been reported to be a conclusive factor by Lee (1998), Rundmo (1994), Shannon et al. (1996), Vredenburgh (2002) and Vinodkumar (2005). Thus, workers need to work in close collaboration with their managers and supervisors as well as to engage in the kind of close interactions and communication that will allow them to participate. Likewise, workers can alter their actions in relation to hazards. Therefore, based on the reviewed literature, it is hypothesised that:

H6a: There is a significant positive relationship between workers' involvement in safety and safety compliance.

H6b: There is a significant positive relationship between workers' involvement in safety and safety participation.

2.4.7 The Relationship between Work Pressure and Safety Behaviour

Achieving a balance between workload, time and space is crucial if employees are to perform their work safely (Seo, 2005). Basically put, work pressure is an important dimension of the safety climate that has been reported to impact various employee safety outcomes, including unsafe behaviour (Bronkhorst, 2015). Work pressure has been defined as the "degree to which employees feel under pressure to complete

work, the amount of time to there is to plan and carry out work and the balance of workload" (Glendon & Stanton, 2000, p. 202). Workers who are subjected to a high level of work pressure are less likely to use personal protective equipment (Bronkhorst, 2015). Employees' psychological stress generally appreciates due to work pressure, which eventually increases the chances of employees becoming involved in workplace accidents and injuries. When employees are working a under condition of pressure or work overload, they may ignore safe precautions, rules and regulations in order to complete their work as quickly as possible (Pordanjani & Ebrahimi, 2015).

Previous studies have found work pressure to have a significant influence on safety behaviour as well as occupational accidents (e.g. Pordanjani & Ebrahimi, 2015; Sadullah & Kanten, 2009). For example, Bronkhorst (2015) conducted a study on 6230 health care employees of 52 organisations and found that work pressure has a significantly negative influence on physical safety behaviour.

Moreover, Sadullah and Kanten (2009) conducted a study on 125 employees from one large-sized Turkish shipyard and found that an absence of work pressure positively influences safety behaviours. Similar findings were reported by Amponsah-Tawaih and Appiah (2016), who found work pressure to be negatively associated with safety behaviour. Likewise, Choudhry, Fang, Lew and Jenkins (2007) conducted a survey of 1120 employees selected from 22 construction projects in Hong Kong and revealed that work pressure is inversely correlated indicating poor safety performance. They added that time appears to be crucial and employees

needed to meet deadlines, which is again a management priority. Likewise, employees who are facing work pressure are likely to take risks in order to complete the job.

In addition, Mullen (2004) investigated the factors that influence individual's safety behaviour at work and found that performance pressure, as one element of work pressure, influences safety behaviour because workers lack sufficient time, resources and training to perform their jobs. In another research project, Pordanjani and Ebrahimi (2015) conducted a study on 1160 employee from the Khorasan petrochemical company in Iran. The authors noted that work pressure has a significant positive correlation with the occupational accident rate. They further explained that work pressure increases the likelihood that employee will possibly become involved in unsafe behaviours due to looking for short-cuts and time-saving working methods.

However, some prior studies have identified the non-significant influence of work pressure on safety behaviour. For instance, Mohamed (2002) investigated the association between the ten dimensions of the safety climate and safety behaviour at 19 construction sites in South Queensland, Australia. He found that work pressure is not directly significantly related to the safety climate. He further claimed that the non-significant relationship could be due to the psychological aspects of working under pressure and perceiving the conflicting safety and production requirements. Similarly, Ghasemi, Kalatpour, Moghimbeigi and Mohhamadfam (2017) examined

how work pressure affects safety behaviour and found that work pressure has a non-significant influence on safety behaviour.

In conclusion, the majority of researchers have found that work pressure has a negative association with safety behaviours. Work pressure has been found to be a fundamental element of both accident rates and unsafe behaviour in the workplace. This is because work pressure can increase the likelihood that workers will become involved in unsafe behaviours due to adopting short-cut work approaches, which in turn increase the possibility of becoming involved in occupational accidents (Amponsah-Tawaih & Appiah 2016; Bronkhorst, 2015; Pordanjani & Ebrahimi, 2015). In essence, workers' safety behaviours will be decreased when they feel the need to act quickly due to work pressure. Based on the literature review, this study proposes that work pressure can lead to workers' unsafe behaviours as well as increase the rates of occupational accidents. Therefore, it is hypothesised that:

H7a: There is a significant negative relationship between work pressure and safety compliance.

H7b: There is significant negative relationship between work pressure and safety participation.

2.5 Possible Moderator (Social Support)

A moderator variable is a variable that modifies the relationship between a predictive variable or independent variable and a dependent variable, either positively or negatively (Walsh, Wunderlich, & Evanschitzky, 2008). Previous studies that have examined the relationships of the safety climate have investigated management

commitment (Hansez & Chmiel, 2010; Huang et al., 2012; Michael et al., 2005), safety training (Chen & Jin, 2011), workers' involvement in safety (Alasamri et al., 2012; Britt & Bliese, 2003; Lambert, 2008), safety communication and feedback (Hardison et al., 2014; Ismail et al., 2014), safety rules and procedures (Fleming & Lardner, 2002; Mashi, 2014; Yean, Ling, Ai, & Teo 2004), safety priority (Bosak et al., 2013; Morrow et al., 2010), work pressure (Bronkhorst, 2015) and safety behaviour or other related safety outcomes. Such studies have provided a number of inconsistent results. These inconsistent findings could be further examined with the inclusion of a moderator variable. Baron and Kenny (1986) stated that moderating variables are specifically assigned when there is an inconsistent, non-significant or weak relationship between the independent and dependent variables.

In safety-related studies, several moderating variables have previously been examined, including perceived job characteristics (Kisamore, Liguori, Muldoon, Jawahar, & Cheung, 2013), organisational commitment to civic virtue (Ueda, 2011), safety-specific trust (Conchie & Donald, 2009), subordinates' competency level in terms of leadership (Lee & Salleh, 2009) and the safety climate (Hofmann et al., 2003). However, the present study considers social support to be a moderator in the relationship between the safety climate and safety behaviour. As mentioned in Chapter One, foreign workers often feel homesick, discriminated against, stressed, anxious, etc. (Rautiainen, 2012). Such feelings can influence their safety behaviour and increase the injury rate at the worksite.

Social support is seen as a potential moderator because it could represent a possible solution for helping foreign workers to overcome challenges such as coping with stress and unfamiliar working environment (Rautiainen, 2012). Foreign workers who have a high perception of the safety climate (management commitment to safety, priority of safety, safety communication and feedback, safety rules and procedures, safety training, workers' involvement in safety and work pressure) are expected to exhibit better safety-related behaviour. However, if workers receive social support, then it is likely that their safety behaviour could be further improved. This argument is based on the fact that social support can control and influence workers' safety behaviour, since it has the ability to facilitate the workers' social interactions. This moderator variable might change the workers' safety behaviour psychology from unconcerned safety behaviour to concerned safety behaviour, which could in turn improve their trust and encourage a safe working environment. Schaubroeck and Fink (1998) concluded that social support also controls workers' extra-role performance behaviour, even when the workers lack experience, skills and information. Their performance could hence be improved with assistance from others (social support).

In addition, Schaubroeck and Fink (1998) further stated that social support represents an opportunity for management to influence huge number of workers comparatively inexpensively, and it is thus the best, most easy, convenient and economical way to approach workers. In the context of the Saudi Arabian construction industry, each construction company has a large number of foreign workers as well as many projects being built in different locations. Thus, social support helps management to

not only observe foreign workers, but also to stop the occurrence of accidents. It also helps foreign workers to align their safe working behaviour. In the context of this study, social support is particularly suitable for the foreign construction workers due to the fact that they have different demographic attributes, such as country of origin, education, experience, age, skills, culture, etc. As a result, they exhibit different kinds of safety behaviour. In these circumstances, social support could encourage the workers to match their responsibilities to the job design and safety concerns as well as make them comply with and participate in safety initiatives that are in line with the onsite safety climate.

The term 'social support' has been defined as "affective support (e.g., love, liking, and respect), confirmation (i.e., confirming the moral and factual 'rightness' of actions and statements); and direct help (e.g., aid in work, giving information or money)" (Frese, 1999; Kahn & Antonucci, 1981). In other words, social support refers to allocating resources, for example, communication, information, empathy, emotional support and other forms of tangible assistance that may be of varying quality (Kossek, Pichler, Bodner, & Hammer, 2011; Viswesvaran, Sanchez, & Fisher, 1999). Based on the above definitions, this study defines social support (as a positive moderator) as resources provided by either co-workers, supervisors or family that enable foreign workers to behave safely and remain protected against accidents and injuries.

Previous empirical investigations have considered social support to be a moderator between independent and dependent variables; they have noted that it is a positive

moderator. For example, Beeble, Bybee, Sullivan and Adams (2009) investigated the role of social support in buffering negative psychological consequences. Their findings indicated that social support positively moderates quality of life (QOL), although it negatively moderates workers' depression. This might be because the psychological exploitation of both QOL and depression are associated with, and could be partially explained by, variations in social support. Martz, Bodner and Livneh (2010) found that emotional social support significantly decreases the impact of disability in terms of Post-Traumatic Stress Disorder (PTSD) levels. This might be because the influence of disability on PTSD levels suggests that therapeutic interventions that include interpersonal components, such as social support (family and group) counselling, can help to facilitate the disabled individual's adaptation and functioning following the onset of a chronic medical condition, which has been seen to occur in warzones.

Wickramasinghe (2012) conducted a study on 232 software developers in Sri Lanka and noted that social support (supervisor support) significantly moderates the relationship between work schedule flexibility and job stress, since the immediate social support provided by the supervisor enhances the effectiveness of formal work schedule flexibility policies in reducing job stress. Jamal (2013) found that social support significantly moderates the relationships between challenge stress, hindrance stress and burnout, job satisfaction and health problems. The author argued that workers who experience high hindrance stress, but who are fortunate enough to have high social support, do not suffer from high burnout and health problems to the same degree as employees who have high hindrance stress and low social support.

Willemse, de Jonge, Smit, Depla and Pot (2012) conducted a study involving 15 healthcare nursing homes in the Netherlands. They found that social support (supervisor support) has an adverse effect on job demands and emotional exhaustion in circumstances with lower decisional authority. Social support (co-worker support) was also identified as having a negative impact on personal accomplishment in high strain situations. They further reported that this negative influence of co-worker support most noticeably emerges in high strain jobs (i.e. high demands and low decision authority). In such circumstances, supportive co-workers might help individuals to see that their working conditions are as bad as or even worse than they really are, thereby accentuating moods of powerlessness and helplessness and deteriorating the staff's self-perceptions (i.e. personal accomplishment). A study by Deelstra et al. (2003) reported that social support has a negative moderating influence on workers' self-esteem and work-related stress. They further found that social support can serve as a potential threat to a worker's self-esteem, that is, if someone feels that he or she must consistently rely upon others to deal with work-related stressors.

Additionally, Kaufman and Beehr (1986) studied the moderating and main influence of social support among police supervisors and non-supervisors, and they found a negative moderating effect in which the stressor-strain relationship is stronger when level of the social support is high. This is because it depends on the timing and manner in which supervisors and others staff are interfering, which might increase levels of stress and depression and thus cause workers to behave negatively. Glaser, Tatum, Nebeker, Sorenson and Aiello (1999) conducted a study to test the effects of

the workload on stress and performance, where social support was used as a moderating variable. Their study found a significant three-way interaction between workload, social support and time. Their findings also revealed that high social support leads to higher stress. It was evidenced that social support, rather than lowering stress, actually increases stress. The authors added that there is a possibility that stress leads workers towards more social support seeking behaviour. Social support has been found to increase stress, and it might not therefore have a desirable or beneficial early impact on workers.

Social support has previously been used as a moderator in several contexts. However, to the best of the researcher's knowledge, to date no study has considered investigating social support as moderating the relationship between the safety climate and safety behaviour. Thus, the present study filled a gap in the literature by introducing social support as a moderator variable in the relationship between the safety climate and safety behaviour.

In conclusion, previous studies that used social support as moderator found a positive association (e.g. Beeble et al., 2009; Jamal, 2013; Martz et al., 2010; Wickramasinghe, 2012), which suggests that workers who receive social support can improve their safety behaviour (in the context of this study, this refers to foreign workers), while it can also reduce the rates of accidents and injuries on construction sites. Social support is important on construction sites, especially where workers' safety is concerned. Social support could be helpful not only in terms of controlling accidents and injuries, but also in helping foreign workers to comply with and

participate in safety activities. Lower work-related stress, depression and pressure can all improve safety awareness. Schaubroeck and Fink (1998) argued that social support represents an important means for the management to facilitate the workers by encouraging them to behave safely and building their trust in order to foster safe working conditions. In the context of this study, it is significant to use social support as a moderating variable because the workers' psychology could be efficiently changed from a negative perception to a positive perception regarding safety concerns. In this regard, the present study argues that social support has a theoretical moderating influence and could thus enhance safety behaviour when the safety climate is taken into account. Therefore, based on the above literature, it is hypothesised that:

H8a : Social support moderates the relationship between management commitment and safety compliance.

H8b : Social support moderates the relationship between management commitment and safety participation.

H9a : Social support moderates the relationship between the priority of safety and safety compliance.

H9b : Social support moderates the relationship between the priority of safety and safety participation.

H10a: Social support moderates the relationship between safety communication and feedback and safety compliance.

H10b: Social support moderates the relationship between safety communication and feedback and safety participation.

H11a: Social support moderates the relationship between safety rules and procedures and safety compliance.

H11b: Social support moderates the relationship between safety rules and procedures and safety participation.

H12a: Social support moderates the relationship between safety training and safety compliance.

H12b: Social support moderates the relationship between safety training and safety participation.

H13a: Social support moderates the relationship between workers' involvement in safety and safety compliance.

H13b: Social support moderates the relationship between workers' involvement in safety and safety participation.

H14a: Social support moderates the relationship between work pressure and safety compliance

H14b: Social support moderates the relationship between work pressure and safety participation.

2.6 Underpinning Theory

This study aims to investigate the influence of the safety climate on safety behaviour. In addition, the study also includes the moderating effect of social support on this relationship between the seven dimensions of the safety climate and safety behaviour, as explained by the social exchange theory and accident/incident theory. The following sections discuss these theories and their application to the present study's setting.

2.6.1 Social Exchange Theory (SET)

Social exchange theory "is among the most influential conceptual paradigms for understanding workplace behaviour" (Cropanzano & Mitchell, 2005, p. 874). Social exchange theory (SET) highlights "interdependent and contingent exchanges by individuals as the bedrock for all societal transactions and relationships" (Cropanzano & Mitchell, 2005, p.874). The main assumption of this theory is that diverse types of social exchanges are put up upon mutual exchanges and which also accelerates reciprocity (Molm, Peterson, & Takahashi, 1999). The theory therefore provides a framework for interpreting the rules and norms that form organisational transactions, exchanges of resources and the quality of the exchange obligations that are reflected in the developing relationship behaviours within organisations (Lioukas & Reuer, 2015; Tekleab & Chiaburu, 2011).

SET has been commonly used in various disciplines, including anthropology (Neale, 1976), knowledge exchange (Chen & Choi, 2005), co-worker behaviours (Deckop, Cirka, & Andersson, 2003), social partnerships (Kolk, van Dolen, & Vock, 2010) and safety management (Dejoy, Della, Vandenberg, & Wilson, 2010). This theory has two distinct branches, namely economic exchange and social exchange (Blau, 1964). The economic exchange is related to a clear contract providing negotiated gains of economic exchange between the worker and the company (Deckop et al., 2003), while the social exchange is a generalised interchange fulfilling personal self-interest (Blau, 1964).

The understanding of the effect of the safety climate on workers' safety behaviour provided by empirical studies has increased in recent years (e.g. Ismail et al., 2015; Liu et al., 2015); however, there remains a lack of research regarding how the safety climate may affect construction workers' safety behaviour in Saudi Arabia. The current study employs social exchange theory (Blau, 1964) as an underpinning theory to explain how construction workers' perceptions of the safety climate may lead to their safety compliance and participation. Blau's (1964) interpretation of social exchange theory assumes that in social relationships, the relations between parties create a standard of exchange (Uhl-Bien & Maslyn, 2003). This exchange postulates that a positive action received by one party obliges that party to offer a positive action in return (Gouldner, 1960). The opposite would also be true, since when a negative action is given away, a negative action or bad behaviour would be given in exchange.

Studies included within the safety literature have drawn on SET in an effort to understand employees' safety behaviour (e.g. Zhang & Li, 2015). The applicability of this theory within the construction industry has been reported in prior studies (Zhang & Li, 2015). For instance, one study found that workers create an obligation favourable to the organisation if the management provides an environment that supports and invests in workers (Mearns, Hope, Ford, & Tetrick 2010). Hadjimanolis and Boustras (2013) stated that "the commitment of management to safety and their actions to improve the work environment lead employees to reciprocate by compliance to safety rules, willingness to participate in safety meetings and cooperation with co-workers on safety issues" (p. 51). The present study follows the

same line of reasoning based on this theory, such that construction workers who work on a construction site with a positive safety climate are more likely to demonstrate safe working behaviours, thereby decreasing the likelihood of injuries if they perceive management support for, and commitment to, their safety and well-being or consider safety to be a priority.

2.6.2 Accident /Incident Theory (Petersen's theory)

The accident/incident theory is essentially an extension of the human factors theory (Pillay, 2014). The systems failure component is an important contribution made by Petersen's theory (Beaubien & Baker, 2002; Reinach & Viale, 2006). First, it shows the potential for a causal relationship between management decisions or management behaviour and safety. Second, it establishes management's role in accident prevention as well as the broader concepts of safety and health in the workplace (Reinach & Viale, 2006). The following are some of the different ways that, according to this theory, systems can fail: management does not establish a comprehensive safety policy; responsibility and authority with regards to safety are not clearly defined; safety procedures such as measurement, inspection, correction, and investigation are ignored or given insufficient attention; workers do not receive a proper orientation; workers are not given sufficient safety training; and workers are not given sufficient time to complete their tasks. In cases such as these, the workers' safety behaviour might ultimately be reduced and the rates of accidents, injuries and fatalities in the workplace could be increased. This theory is applied in the present study as a supporting theory in order to test the theoretical framework of the study.

In summary, this study uses both social exchange theory and accident/incident theory, since construction workers who work in an organisation with a positive safety climate are more likely to have a positive perception of management commitment, the priority of safety, safety training, workers' involvement, safety communication and feedback, and safety rules and procedures as well as a negative perception of work pressure as being beneficial to their personal safety. They are also more likely to exchange by working safely and hence reducing the rates of injuries and incidences onsite (Hofmann et al., 2003). Additionally, in the case of construction workers who work for an organisation with social support, they are more likely to have a positive perception of the safety climate and thus help to reduce the incidence of injuries.

2.7 Research Framework

The above-mentioned empirical literature and the underpinning theories combine to form the theoretical framework depicted in Figure 2.1. In the context of this study, social interaction can significantly contribute towards the realisation of safety behaviour and the formation of an appropriate safety climate, thereby leading to the achievement of organisational aims. The obligation of social exchange is helpful for workers in maintaining their safety behaviour as well as reducing the rates of accidents and injuries in the workplace (Zhang & Li, 2015). For example, when workers work in a positive safety climate, they are more likely to demonstrate safe working behaviours, thereby decreasing the likelihood of injuries. Additionally, if workers receive social support, their safety behaviour could be further enhanced. In practical terms, this kind of social interaction should motivate foreign workers to

change their attributes towards safety behaviour, which should in turn influence individual safety performance onsite. As mentioned above, the independent variable is the safety climate, which has seven dimensions (management commitment, priority of safety, safety communication and feedback, safety rules and procedures, safety training, workers' involvement in safety and work pressure). Further, safety behaviour is the dependent variable in this study, which is measured using two dimensions, namely safety compliance and safety participation. Moreover, social support is used as a moderating variable. The theoretical framework of the study is presented in Figure 2.1.

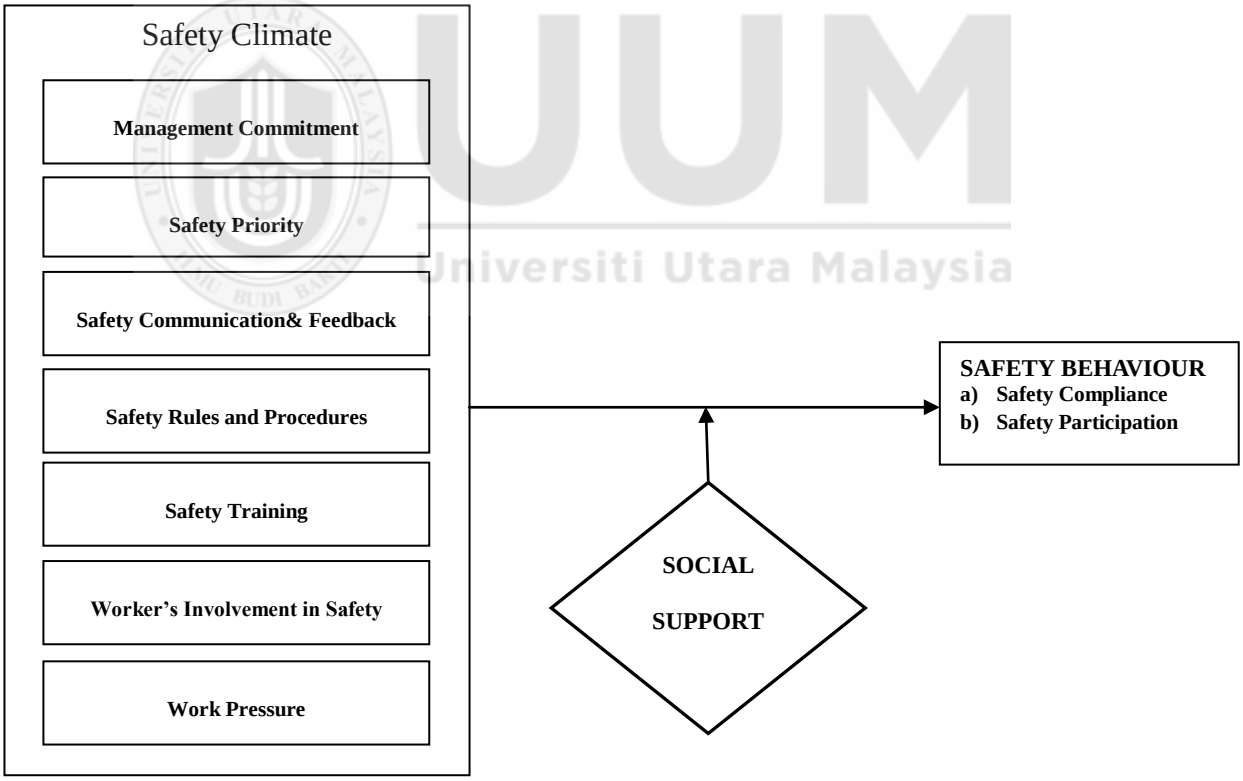

Figure 2.1
Research Framework

2.8 Summary

In summary, safety behaviour is anticipated to play a significant role in the prevention of fatalities, accidents and injuries. Previous studies concerning the safety climate and safety behaviour have indicated that if all these variables are used in conjunction, they can help to improve safety behaviour. Moreover, the safety climate can significantly improve the behavioural aspects of onsite workers in terms of encouraging them to behave and act safely in order to avoid any accidents or injuries. However, researchers to date have failed to address the moderating effect of social support on safety behaviour, since different forms of social support, from time to time, can remind workers about hazardous workplace environments, which can ultimately improve their workplace safety behaviours. This study suggests that these differences can play a role in explaining workers' safety behaviour in the workplace. Thus, in the present study, social support is examined as a moderator of the relationship between the safety climate and safety behaviour in the Saudi Arabian construction industry in order to fill the significant gaps in our current knowledge of safety. The following chapter explains in detail the methodological aspect of this research in terms of how the study was conducted so as to meet the research objectives set out in Chapter One.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

In every empirical research study, the methods and procedures adopted are crucial to achieving the research objectives. Therefore, this chapter discusses the methodological aspect and process employed in the present study. The chapter hence considers the following issues: research design, population and sampling, measurement, questionnaire design, translation, pilot study, data collection procedures and data analysis. Finally, a summary of the chapter is presented.

3.2 Research Design

The chosen research design depends on a strategic agenda that comprises specific methods and procedures for gathering data in order to further analyse the study population and obtain solutions to the problem statement (Sekaran, 2003; Zikmund, Babin, Carr, & Griffin, 2010). In order to satisfy the research objectives of the present study, a quantitative research approach was utilised. Quantitative research is a formal, objective and systematic process that defines and examines the predictable association and calculates the interaction effects among variables (Burns & Grove, 2005).

In addition, the quantitative research method of data analysis is particularly valuable for a study that aims to obtain important findings from the collected data. Furthermore, this type of research provides a summary of the analysis in terms of

both empirical and statistical values that provide a high degree of confidence (Alexei, 2002; Zikmund et al., 2010). The current research study adopted a quantitative method, since it attempted to investigate the connection between safety climate, social support and safety behaviour. The findings of this study are intended to serve as a solution to the problems faced by foreign construction workers. In this regard, the following sections explain the purpose of the research as well as the unit of analysis.

3.2.1 Purpose of a Research

The main purpose of research is to define what is to be acquired through the study as well as an efficient way of using its results (Yin, 2003). Several studies have highlighted the existence of three research purposes, namely exploratory, descriptive and hypothesis testing (Sekaran, 2003). The term 'exploratory research' refers to a research study wherein the problem inspected has not been clearly and sufficiently defined. This type of research method describes the situation, seeks novel insights, asks important questions and deals with a variety of phenomena from a novel or unique perspective. This approach is always used for a qualitative research analysis. On the other hand, descriptive research is conducted to define a given phenomenon using narrative descriptions, classifications or measured relationships. This type of research depicts an accurate profile of a situation or event (Sekaran, 2003). Finally, hypothesis testing allows researchers to expose and infer fundamental associations between variables (Sekaran, 2003).

On the basis of the above explanation, this study was founded on hypothesis testing, whereby hypotheses are developed on the basis of research objectives and research questions. As defined in Chapter One, the present study aims to investigate the influence of the seven dimensions of the safety climate on workers' safety behaviour as well as the role of social support as a moderator.

3.2.2 Unit of Analysis

According to Sekaran (2003) and Zikmund et al. (2010), the term 'unit of analysis' is defined as the extent of aggregation of the data collected during the subsequent data analysis stage. In the context of the present study, foreign construction workers were chosen as the unit of analysis, since the main aim of the study was to explore the extent to which individual foreign workers can be prevented from experiencing accidents and injuries through compliance and participative behaviour.

Table 3.1
Summary of the Reseach Design

Purpose	Hypothesis Testing
Type of Study and Approach	Quantitative Methodology Approach
Type of Data	Primary Data
Type of Investigation	Survey Research
Unit of Analysis	Individual (Foreign Workers)

3.3 Population, Sampling and Sampling Technique

Workers who share a mutual set of characteristics are classified as one population, while the elements of a population are referred to as individual member of that population. A sample is a subset or small part of the population (Zikmund et al.,

2010). In this regard, the following sections explain this study's target population, sample size and sampling technique.

3.3.1 Population

A population refers to people, events or records that possess the desired information and that can answer measurable questions (Cooper & Schinder, 2008). The population in this study comprises foreign construction workers (individual workers who are at risk of workplace injuries and accidents, including electricians, iron workers, drillers, plumbers, painters, equipment operators and other relevant onsite workers). Currently, there are five major companies involved in the Jeddah constructions sector, namely the Al Muhaidib Construction Company, the Saudi Binladin Group, Freyssinet Saudi Arabia, the Arabian Bemco Construction Company and the Almabani Construction Company (MLSD, 2013). The researcher contacted these five construction companies and asked them to cooperate in this research; however, only one company agreed to participate, the Al Muhaidib Construction Company. Thus, the population of the present study comprises the foreign workers employed by the Al Muhaidib Construction Company, which included 8738 individuals as of October 2015.

3.3.2 Sample Size

The sample size is a subset of the population required to ascertain consequential results and precise findings (Fink, 2002; Sekaran, 2003). As mentioned previously, there are 8738 foreign construction workers employed by the Al Muhaidib Contracting Company in Jeddah. For a study population of 9000, Krejcie and

Morgan (1970) suggested that a sample size of 368 workers would be adequate. In order to comprehend the sample size determination as suggested by Krejcie and Morgan (1970), a state-of-the-art technique was incorporated into this study to estimate the minimum sample size required. The G*Power analysis was used to compute the statistical power analyses for various different statistical tests. It can also be used to compute effect sizes and display the graphical results of power analyses (Faul, Erdfelder, Lang, & Buchner, 2007). This study uses an alpha level ($\alpha = 0.05$), an effect size ($f^2 = 0.15$), a desired statistical power ($1-\beta = 0.95$), a total of 22 predictors (i.e. seven independent variables, namely management commitment, the priority of safety, work pressure, safety training, workers' involvement in safety, safety communication and feedback, and safety rule and procedures), one moderating variable (social support) and 14 interactions. Therefore, in the context of the present study, the minimum sample size according to the G*Power analysis should be 230, as shown in Figure 3.1. Hence, the present study distributed 368 questionnaires with the aim of securing a minimum of 230 usable questionnaires.

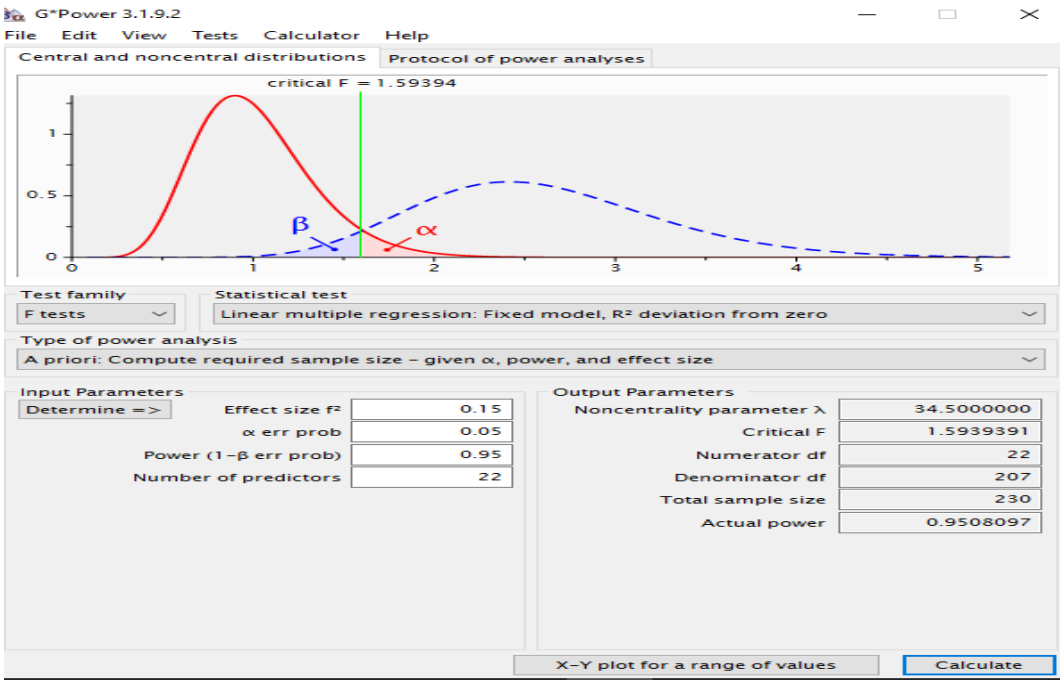

Figure 3.1
The G-Power Result

3.3.3 Sampling Technique

The term 'sampling technique' refers to precisely how the sampling is performed. This study used the stratified sampling technique because it highlights specific subgroups within the population. In addition, it is an efficient research sampling design, that is, it provides more information for a given sample size (Sekaran, 2003). Dividing the population into a series of relevant strata means that the sample is more likely to be representative. This method ensures that each of the strata is represented proportionally within the sample. The sample elements are then selected, independently, from each stratum randomly in a manner consistent with the measurement objectives of the survey (Saunders, Lewis, & Thornhill, 2009). This technique is useful in the present study for ensuring that all nationalities of foreign workers participate in the survey. Therefore, the total population of this study was

divided into six strata based on the nationalities of the foreign workers. Table 3.2 presents the population size for each stratum of foreign workers, who were divided based on nationality, and the sample size for each stratum.

Table 3.2
Population by Nationality

Nationality	Population	Sample	%
Pakistani	3,601	151	41
Indian	3,399	143	39
Egyptian	756	32	9
Yemeni	562	24	6
Filipino	259	11	3
Syrian	161	7	2
Total	**8,738**	**368**	**100.00**

After dividing the total population into six strata based on the nationalities of the foreign workers, the next step was to guarantee the appropriate representation of the different nationalities; thus, the researcher identified the sample size for each strata using the proportionate stratified random sampling method (Gay & Diehl, 1992). For example, to identify the sample size for the Pakistani strata, the population of 3601 was divided by the total population of 8738 and then multiplied by the total sample size of 368, which yields 151 employers. This was followed by a random sampling approach for selecting the sample for each strata (Gay & Diehl, 1992). Random sampling can deliver a sample that is highly representative of the population to be studied. The sample of respondents was selected randomly from the list of names of foreign workers in each stratum who are at risk of workplace injuries and accidents, including electricians, iron workers, drillers, plumbers, painters, equipment operators and other relevant onsite workers. As shown in Table 3.2, some 368 respondents were randomly selected from the total population of 8738 of the Al Muhaidib Construction Company.

3.4 Measurement of Variables Instrumentation

The measurement of the chosen variables is important for the success of any research project (Sekaran, 2003). Basically, such measurement is a mechanism for describing particular attributes of the variables by allocating numbers in a valid and reliable way (Sekaran, 2003). This section details the measurement of the variables in this study as well as the scale used to measure them.

3.4.1 Safety Climate

Safety climate is operationally defined as workers' perceptions of workplace safety policies, procedures, strategies and practices (Schwatka et al., 2016). In this study, seven dimensions of the safety climate were examined, namely management commitment, the priority of safety, safety communication and feedback, safety rules and procedures, safety training, workers' involvement in safety and work pressure. A total of 34 items were used to measure the safety climate. Specifically, seven items used to measure management commitment, four items used to measure the priority of safety and five items used to measure safety communication and feedback were adapted from Cox and Cheyne (2000). Five items used to measure safety training and four items used to measure workers' involvement in safety were adapted from Vinodkumar and Bhasi (2010). Additionally, six items were adapted from Glendon and Litherland (2001) in order to measure work pressure, while three items used to measure safety rules and procedures were adapted from Glendon and Litherland (2001). A five-point Likert scale that ranged from '1' or 'strongly disagree' to '5' or 'strongly agree' was utilised to measure the safety climate items.

The respondents were asked to respond to the items by indicating their level of agreement. This type of scale was chosen because Revilla, Saris and Krosnick (2014, p. 89) argued that "In terms of quality of measurement, five-point scales yield better quality data" and therefore recommended to "use 5- and not 7-point scales". In addition, such scales are widely used in social science research and they have been extensively tested in the social science literature (e.g. Cooper & Phillips, 2004; Kath et al., 2010; Lingard, Cooke, & Blismas, 2009; Vinodkumar & Bhasi, 2010).

3.4.1.1 Management Commitment

Management commitment is operationally defined as "the extent to which management is perceived to place a high priority on safety and communicate and act on safety issues effectively" (Neal & Griffin, 2004, p. 27). Safety-related management commitment is more efficient in reducing illness and injuries in a workplace (Abudayyeh, Fredericks, Butt, & Shaar, 2006). This study used seven items to measure management commitment, which were adapted from Cox and Cheyne (2000). Some examples include: "In my workplace management acts quickly to correct safety problems" and "Management acts decisively when a safety concern is raised". The internal consistency value of the items was 0.845, which is within the range suggested by Hair, Hult, Ringle and Sarstedt (2014). In this study, two items, namely "In my workplace management turn a blind eye to safety issues" and "Management acts only after accidents have occurred", were reverse coded because they were negative statements.

3.4.1.2 Priority of Safety

Priority of safety is defined as the degree to which workers perceive safety to be a top priority on the part of management (Bosak et al., 2013). This study used four items to measure the priority of safety, which were again adapted from Cox and Cheyne (2000). Some examples include: "Management clearly considers the safety of foreign workers of great importance" and "I believe that safety issues are not assigned a high priority". The internal consistency value of these items was 0.722, which is within the range suggested by Hair et al. (2014). In this study, one item, namely "I believe that safety issues are not assigned a high priority", was reverse coded because it was a negative statement.

3.4.1.3 Safety Communication and Feedback

In this study, safety communication and feedback is operationally defined as effective and efficient communication and timely feedback intended to warn of any risk or hazardous place on the construction site in order to avoid any uncertainty (Lu & Yang, 2011). This study used five items to measure safety communication and feedback, which were adapted from Cox and Cheyne (2000). Some examples include: "Safety information is always brought to my attention by the management" and "There is good communication here about safety issues which affect me". The internal consistency value of the items was 0.734, which is within the range suggested by Hair et al. (2014). Additionally, in this study, two items, namely "My management does not always inform me of current concerns and issues" and "I do not receive praise for working safely", were reverse coded because they were negative statements.

3.4.1.4 Safety Rules and Procedures

In this study, safety rules and procedures are operationally defined as the "degree to which safety is a priority, the extent to which people are consulted on safety matters and the practicality of implementing safety policy and procedures" (Glendon & Stanton, 2000, p. 202). These rules and procedures must be followed by workers in order to maintain safety and help them to behave in accordance with onsite safety rules and procedures (Dahl, 2013). This study used three items to measure safety rules and procedures, which were adapted from Glendon and Litherland (2001). Some examples include: "Safety rules and procedures are always practical" and "Safety rules and procedures are followed even when a job is rushed". The internal consistency value of the items was 0.72, which is within the range suggested by Hair et al. (2014).

3.4.1.5 Safety Training

Safety training is operationally defined as the acquisition of knowledge and technical skills intended to enhance safety performance among workers in order to prevent accidents and injuries in the workplace (Vinodkumar & Bhasi, 2010). This study used five items to measure safety training, which were adapted from Vinodkumar and Bhasi (2010). Some examples include: "Safety issues are given high priority in training programs" and "Safety training given to me is adequate to enable me to assess hazards in the workplace". The internal consistency value of these items was 0.82, which is within the range suggested by Hair et al. (2014).

3.4.1.6 Worker's Involvement in Safety

In this study, workers' involvement in safety is operationally defined as "a behaviour-oriented technique that involves individuals or groups in the upward communication flow and decision-making process of the organization" (Vinodkumar & Bhasi, 2010, p. 2084). This study used four items to measure workers' involvement in safety, which were adapted from Vinodkumar and Bhasi (2010). Some examples of the items include: "In my workplace opinions are always welcomed from foreign employees before making final decisions on safety-related matters" and "Management promotes employees' involvement in safety-related matters". The internal consistency value of the items was 0.69, which is within the range suggested by Hair et al. (2014).

3.4.1.7 Work Pressure

Work pressure is operationalised as the "degree to which employees feel under pressure to complete work, the amount of time there is to plan and carry out work and the balance of workload" (Glendon & Stanton, 2000, p. 202). This study used six items to measure work pressure, which were adapted from Glendon and Litherland (2001). Some examples include: "There are enough workers to carry out the required work" and "Time schedules for completing work projects are realistic". The internal consistency value of the items was 0.89, which is within the range suggested by Hair et al. (2014).

3.4.2 Social Support

In this study, social support is operationally defined as a social exchange or relationship that helps workers with actual guidelines and assistance or with a feeling

of affiliation or attachment to an individual or group that is perceived as loving or caring (Hobfoll & Stokes, 1988). The current study used social support scaled by measuring the supervisor, co-worker and family support, as recommended by Lee and Hong (2005). A five-point Likert scale ranging from '1' or 'not at all' to '5' or 'very much' was used to measure this construct.

In the context of this study, social support as a moderating variable consists of supervisor support, co-worker support and family support. This study used fifteen items to measure social support, which were adapted from Fujiwara, Sukishima, Sutsumi, Awakami and Kishi (2003). Some examples of the items used to measure supervisor support include: "How much does your supervisor recognise and value your job?" and "How much support do you receive from your supervisor?". In the study by Fujiwara et al. (2003), the internal consistency of the Cronbach's alpha value was found to be 0.87, which is within the range suggested by Hair et al. (2014). Some examples of the co-worker support items include: "How much can you rely on your co-workers when there are difficulties?" and "How much do your co-workers cooperate with you to solve when there are difficulties?". The internal consistency value of the items was 0.80, which is within the range suggested by Hair et al. (2014). Finally, some examples of the family support items include: "How much support do you receive from your family" and "How much does your family recognise and value your job?". The internal consistency value of these items was 0.83, which is within the range suggested by Hair et al. (2014).

3.4.3 Safety Behaviour

Safety behaviour is operationally defined as the behaviour or working actions that individuals display in their workplace (Zhang & Fang, 2013). Safety behaviour is usually explained as the protective measures taken against injuries and illnesses in the workplace (Agnew et al., 2013; Jiang et al., 2010; Vinodkumar & Bhasi, 2010). Safety behaviour aims to reduce the incidence of all injuries and illnesses connected to working methods (Anderson & Agarwal, 2010). Vinodkumar and Bhasi (2010) measured safety behaviour in terms of both safety compliance and safety participation. This study measured safety behaviour using a total of eight items (four items for safety compliances and four items for safety participation), which were adapted from Vinodkumar and Bhasi (2010). A five-point Likert scale ranging from '1' or 'strongly disagree' to '5' or 'strongly agree' was utilised to measure the safety behaviour items.

3.4.3.1 Safety Compliance

Operationally, the term 'compliance' is explained as the devotion to safety procedures and the performance of work in a safe manner (Neal et al., 2000). In the context of the present study, a total of four items were used to measure workers' compliance. Some examples of the items include: "I use necessary safety equipment to do my job" and "I follow correct safety rules and procedures while carrying out my job". These items were adapted from Vinodkumar and Bhasi (2010) and their internal consistency value was 0.66.

3.4.3.2 Safety Participation

Safety participation is operationally defined as employees' voluntary behaviours that contribute to safety (Neal et al., 2000). Lu and Yang (2010) explained that operationally, safety participation refers to workers' involvement in safety meetings, activities and exercises. In the context of the present study, a total of four items were used to measure safety participation. Some examples of the items include: "I voluntarily carry out tasks or activities that help to improve workplace safety" and "I always point out to the management if any safety-related matters are noticed in my company". These items were adapted from Vinodkumar and Bhasi (2010) and their internal consistency value was 0.66.

Table 3.3
Original Sources of the Items, Number of Items Used/Dropped and their Reliability

SN	Constructs	Number of Items	Cronbach's Alpha from Source Article	Source
	Safety Climate	**34**		
1	Management Commitment	7	0.845	(Cox & Cheyne , 2000)
2	Priority of Safety	4	0.722	(Cox & Cheyne, 2000)
3	Work Pressure	6	0.890	(Glendon & Litherland, 2001)
4	Safety Training	5	0.820	(Vinodkumar & Bhasi, 2010)
5	Safety Communication	5	0.734	(Cox & Cheyne , 2000)
6	Safety Rules and Procedures	3	0.720	(Glendon & Litherland, 2001)
7	Worker's Involvement in Safety	4	0.690	(Vinodkumar & Bhasi, 2010)
	Safety Behaviour	**8**		
1	Safety Compliance	4	0.760	(Vinodkumar & Bhasi, 2010)
2	Safety Participation	4	0.660	(Vinodkumar & Bhasi, 2010)

	Social Support	**15**		
1	Supervisor Support	5	0.870	(Fujiwara, Sukishima, Sutumi, Awakami & Ishi,2003)
2	Co-worker Support	5	0.80 0	(Fujiwara et al. 2003).
3	Family Support	5	0.830	Fujiwara et al. 2003)

3.5 Questionnaire Design

The questionnaire was prepared in a booklet format. Sudman and Bradburn (1982) recommended that a booklet style questionnaire prevents pages from being misplaced or lost. Furthermore, the respondents can simply turn the pages. The respondents were directed to circle the response that most appropriately reflected their understanding of the questions. For the multiple choice questions, the respondents were instructed to circle all the appropriate responses. A cover letter was attached to each questionnaire to introduce the research before the questionnaire was actually filled in (Sudman & Bradburnm, 1982). A cover letter helps to ensure that the respondent writes and marks the appropriate answers. The survey instrument for this research study consisted of 70 items, which were presented in four main sections, namely section A collected demographic information with 13 items, section B investigated the safety climate with 34 items, section C investigated social support with 15 items and section D investigated safety behaviour with eight items.

3.5.1 Translation of the Questionnaire

The original version of the questionnaire was prepared in English. As previously stated, the population of the present study is foreign workers. Accordingly, the

questionnaire was translated into three main languages, namely Arabic, Urdu (Pakistan) and Hindi (Indian), since not all respondents were able to understand the questions in English. Sekaran (2003) suggested that a questionnaire must be in the language preferred by each respondent in order to avoid any bias or data collection error. However, the management informed the researcher that the Filipino workers preferred to use the English language questionnaires.

The questionnaire was translated using the back-translation method to ensure that an equivalence of measures was achieved in all the languages spoken by the foreign workers (Brislin, 1970). The translation of the questionnaire was performed by the Huna Khidma Translations Agency. This agency's translation service is approved and accepted by the Saudi Arabian Government. Basically, the translation of the questionnaire involved two steps. First, a comparison between the original version of the English questionnaire and the back-translated English version of the questionnaire was performed, which suggested that no major rewording was needed for any items. Second, to ensure that the original meanings were maintained after the translation was performed, the researcher held detailed discussions with the Huna Khidma Translations Agency.

3.6 Pilot Study

Previous studies have recommended conducting a pilot study because it serves to improve both the format and the content of the questionnaire (Trochim & Donnelly, 2006). In addition, a pilot study is important for testing the reliability of the included measures. Indeed, researchers need to be sure that the measures feature no omissions, mistakes or unsuitable language (Thabane et al., 2010). A pilot study

should also help to validate the psychometric properties of the measures before they are adapted/adopted (Johanson & Brooks, 2010).

In the present study, prior to distributing the questionnaire in the pilot study phase, it was given to experts in safety who work in the safety department of the Al Muhaidib Contraction Company to check for any necessary corrections and observations. These experts verified the wording as well as the content of the questionnaire.

Questionnaires were distributed to 31 foreign construction workers employed by the Al Muhaidib Contraction Company who were not part of the main study. The researcher had to ensure that they were not included in the main study, since a self-administered approach was deployed. The 31 questionnaires were divided into six stratums where each stratum had 5 respondents; however one stratum (Pakistani) had six respondents. A total of 31 responses were received, which indicates a 100% response rate. The responses to the pilot study were not included in the main study. Cooper and Schindler (2008) indicated that the appropriate sample size for a pilot study is approximately 25 to 100 respondents, which suggests that 31 responses was sufficient. The reliability of the instrument was checked in order to determine the internal consistency. Basically, reliability refers to the stability and consistency of the measurement items. The most frequently used statistical test of reliability is Cronbach's alpha (Hair et al., 2014; Sekaran, 2003; Zikmund et al., 2010). Table 3.4 presents the results of the reliability test. Importantly, Cronbach's alpha does not assume equivalence (i.e. equal factor loadings of individual indicators), which can prevent an underestimation of internal consistency reliability (Henseler, Ringle, &

Sinkovics, 2009). Several scholars therefore recommend using composite reliability (CR) to evaluate individual constructs (e.g. Hair et al., 2014). Hence, this study used CR to test the reliability of the variables.

Table 3.4
Results of the Pilot Study

Construct	Items	Dropped Items	Loading	CR[a]
Management Commitment	MC1		0.850	0.849
	MC2		0.719	
	MC4		0.850	
		MC3	0.203	
		MC5	0.477	
		MC6	0.540	
		MC7	0.429	
Priority of Safety	PS1		0.862	0.845
	PS3		0.848	
		PS2	-0.085	
		PS4	0.129	
Safety Communication	SC1		0.920	0.893
	SC2		0.876	
		SC3	0.364	
		SC4	0.159	
		SC5	-0.293	
Safety Compliance	SCO1		0.918	0.964
	SCO2		0.924	
	SCO3		0.940	
	SCO4		0.949	
Safety Participation	SPA1		0.906	0.911
	SPA2		0.878	
	SPA3		0.896	
	SPA4		0.700	
Safety Rules and Procedures	SR1		0.783	0.850
	SR2		0.862	
	SR3		0.779	
Social Support	SS1		0.780	0.920
	SS10		0.730	
	SS11		0.728	
	SS12		0.719	
	SS13		0.744	
	SS14		0.698	
	SS15		0.756	
	SS2		0.600	
	SS5		0.623	
	SS6		0.789	
	SS9		0.690	
		SS3	0.478	
		SS4	0.470	
		SS7	0.441	

		SS8	0.436	
Safety Training	ST1		0.843	0.793
	ST3		0.836	
	ST4		0.541	
	ST5		0.546	
Worker's Involvement in Safety		ST2	0.387	0.707
	WI2		0.588	
	WI3		0.876	
		WI1	0.346	
		WI4	0.438	
Work Pressure	WP1		0.865	0.823
	WP2		0.906	
	WP3		0.535	
		WP4	0.254	
		WP5	0.483	
		WP6	0.266	

As shown in Table 3.4, the results indicated that the CR of all the constructs exceeded the minimum threshold of 0.7, as recommended by Hair et al. (2014). In fact, the CR values ranged from 0.707 to 0.964. It should be noted that in order to achieve an above minimum CR of 0.7, some items with very low loadings were deleted (Hair et al., 2014). Moreover, the questionnaires were resent to the experts for further verification. The experts re-verified the wording as well as the content of the questionnaire. Consequently, the constructs/items possess good internal consistency reliability and hence are appropriate for use in the main study.

3.7 Data Collection Procedures

This study used a questionnaire survey as the primary data collection tool. It is an essential component of quantitative research, since it permits respondents to provide the required and specific data within a limited time period and keeps bias to a minimum level (Sekaran, 2003; Zikmund et al., 2010).

The data were obtained from foreign workers employed by the Al Muhaidib Contraction Company who are at risk of experiencing workplace injuries and

accidents, including electricians, iron workers, drillers, plumbers, painters, equipment operators and other relevant onsite workers in the Saudi construction industry. The questionnaires was distributed and administered personally by the researcher. The core motivation for distributing the questionnaires in this manner was to enable the researcher to explain the purpose and the benefits of the study as well as to encourage the participants to provide honest answers (Sekaran, 2003). Furthermore, a self-administered survey is more reliable and valid than low-cost interviews, since the former incurs less error than the latter (Creswell, 2012). Therefore, a self-administered survey was found to be particularly useful for the present study, and its use resulted in a high response rate that exceeded the consensual sample size required.

Prior to the distribution of the questionnaires, a letter was obtained from the Saudi Arabian Cultural Mission (SACM) in Malaysia that validated the research study was authentic and explained the objectives and intention of the researcher. After all the formalities and procedures had been clarified, the researcher visited the construction company (Al Muhaidib Construction Company) and met with the director and manager of the safety department, from whom further official permission was obtained to distribute the questionnaires among the foreign workers employed onsite. The distribution of the survey was planned according to the timing of their duties so that they would both have adequate time to fill in the questionnaire and feel relaxed and comfortable participating in the study. However, the researcher still faced many challenges when collecting data from the foreign construction workers, including:

1. Communication problems: As most of the workers have a relatively low level of education, while some cannot even read and write but instead work only on their supervisors' and coordinators' instructions, some communication problems were encountered. The questionnaire was difficult for the laymen construction workers to understand because, first, academic language is different from the workers' everyday language. Second, even if they were from Pakistan or India and were provided with a questionnaire that had been translated into their official language, they could not understand it due to the numerous local languages used in their countries. Therefore, the researcher asked for help from other workers who could clearly explain the questionnaire.
2. Timing problems: Conducting the research proved difficult in terms of catching the workers during their free time, since they worked in shifts and when their shift finished they were very hungry and tired after having worked long hours. Therefore, the researcher provided food and drinks as an incentive and a token of appreciation in order to encourage them to participate in the study.
3. Resource assistant delay: For the duration of distributing the survey, the Al Muhaidib Company's safety department allocated a resource assistant to facilitate the researcher in conducting the study at different locations. The researcher could not access those locations without the resource assistant. However, the assistant also had his own work to complete. On many occasions he was delayed and cancelled appointments, which meant that the

researcher wasted a lot of time and frequently could not even track the workers before their shift started. Consequently, the researcher arranged other appointments with the resource assistant.

The data collection process took place in multiple shifts in order to target the workers who are working on the morning (A), afternoon (B) and evening (C) shifts. In addition, the research strategy was to identify a suitable time during the lunch hour or break time so that the workers were in a pleasant mood and felt comfortable answering the questionnaire.

3.8 Data Analysis Technique

Data analysis is an important aspect of any research study. When the data have been collected, a preliminary test should be conducted to determine the rate of response, frequencies of the demographic profile and reliability and validity of the study constructs. The reliability analysis is conducted to assess the validity and reliability of the independent variable (safety climate) and the moderator variable (social support) in influencing safety behaviour (safety compliance and safety participation). Descriptive statistics, mean, standard deviation, frequency and percentage were all used to define the main characteristics of the sample.

According to Huck, Cormier and Bound (1974), a descriptive statistics analysis is used to convert data into a more meaningful form. Further, this study used Smart-PLS 2.0 to test the goodness of fit of the outer model by running the algorithm technique. This study also tested the hypothesised relationships among the variables by running the bootstrapping technique. The justification for using Smart-PLS 2.0 is

that according to Barnes (2011), Smart-PLS 2.0 is better equipped to deal with formative measures and moderating relationships. Moreover, Tamjidyamcholo, Gholipour, Baba and Yamchello (2013) posited that Smart-PLS is not only able to formulate a formative model for latent constructs, but also requires fewer requirements to verify a model.

3.8.1 Data Screening

Data screening in multivariate analysis is necessary because it assists the researcher in identifying any possible violations of assumptions concerning the data analysis techniques (Hair et al., 2014). In the present study, the collected data will be inputted into the SPSS software version 23. The researcher will then conduct the data screening. The following preliminary data analyses will be conducted: (1) missing value analysis, (2) assessment of outliers (3), normality test and (4) multicollinearity test (Hair et al., 2014; Tabachnick & Fidell, 2013).

3.8.2 Data Coding

All the items from the questionnaire concerning the latent variables will be coded by using two or three letters for easy identification in SPSS. For example, the safety compliance items will be coded as SCO, while the safety participation items will be coded as SPA. Similarly, management commitment to safety will be coded as MC, safety training as ST, workers' involvement in safety as WI, safety communication and feedback as SC, safety rules and procedures as SR, the priority of safety as SP, work pressure as WP and social support as SS.

3.8.3 Missing Values

A missing value of 5% or less is considered to be insignificant in terms of affecting the results of the analysis (Tabachnick & Fidell, 2007). It has been suggested that if the missing values are less than 5% per item, then they can be replaced by using mean replacement (Hair et al., 2014). In the current study, descriptive statistics will be used to find the missing values. Then, the missing values will be replaced using the mean replacement technique.

3.8.4 Assessment of Outliers

When using a multivariate analysis, it is essential to recognise and treat outliers (Hair et al., 2014). Hair et al. (2014) suggested that assessing outliers within a data set can aid the researcher in checking the extreme case scores that could considerably affect the results of the study. Based on the recommendation of Tabachnick and Fidell (2013), the Mahalanobis (D2) measure (Mahalanobis, 1948) will be used in this study to identify and treat multivariate outliers.

3.8.5 Normality Test

The PLS-SEM method is lenient with regards to the normality assumption of the data (Hair et al., 2014). Although the PLS-SEM method is non-parametric and does not require normal data, it is important to assess the data in terms of how far it is from normality (Hair et al., 2014). Extremely non-normal data can be problematic when evaluating the parameters and it may inflate the standard errors derived from the bootstrapping (Hair et al., 2014). Therefore, in the present study, the statistical methods of skewness and kurtosis and the graphical methods of histogram and

normal Q-Q plot (Hair et al., 2014; Kline, 2011; Tabachnick & Fidell, 2013) will be used to test the normality of the data.

3.8.6 Multicollinearity Test

Multicollinearity can be a serious issue that effects structural equation modelling when the inter-correlations among the variables are very high (Hair et al., 2014). This means that when two or more constructs are highly correlated, multicollinearity will occur among the exogenous constructs. Hair et al. (2014) suggested that multicollinearity will become an issue when the value of the variance inflation factors (VIF) is more than 5 and the value of tolerance is less than 0.20. Therefore, the present study will use that approach to assess multicollinearity (Chatterjee & Yilmaz, 1992; Peng & Lai, 2012).

3.8.7 Goodness of the Measurement Model

The assessment of measurement models includes the use of composite reliability to evaluate internal consistency, individual indicator reliability and average variance extracted (AVE) so as to evaluate the convergent validity. In addition, the Fornell-Larcker criterion and cross loadings will be used to assess the discriminant validity (Hair et al., 2014).

3.8.8 Assessment of the Structural Model

Once the goodness of fit of the outer model is confirmed, the next step will be to test the hypothesised relationships among the variables by using the bootstrapping technique.

3.9 Summary

This chapter discusses the research methodology applied in the present study, which includes consideration of the research design, unit of analysis, measurement of the variables, questionnaire development, item selection, translation of the questionnaire, study population, sample framing and data collection procedures. In addition, it explains the process of testing the reliability of the construct instruments based on the pilot study, which was conducted prior to the actual study, as well as the technique used for data analysis.

CHAPTER FOUR

DATA ANALYSIS AND FINDING

4.1 Introduction

This chapter analyses the goodness of the measures through the utilised validity and reliability analyses. It also analyses the relation between the safety climate and safety behaviour based on the data gathered using the questionnaire. First, using SPSS, the chapter begins with a description of the response rate, demographic distribution of the respondents, validity, non-response bias and descriptive statistics of the study variables. Second, the chapter describes the partial least squares structural equation modelling (PLS-SEM) used in order to explain the goodness of fit of the measurement model, which included content validity, convergence validity and discriminant validity. Third, the chapter presents the structural model used to test the study hypotheses. Finally, the predictive relevance and the quality of the model are detailed.

4.2 Response Rate

As mentioned in Chapter Three, the sample size for the present study was 368, which was comprised of foreign workers employed by the Al Muhaidib Contracting Company in Jeddah. The data were gathered via self-administered questionnaires that were distributed to the 368 foreign workers. Some 311 questionnaires were returned, although 29 were excluded due to several missing responses from the cases. The cases with missing data were excluded when they comprised less than

5% of the total cases (Meyers, Gamst, & Guarino, 2006). Therefore, 282 valid responses were used for further analysis, which resulted in an effective response rate of 76.6% that covered multiple contracting locations of the Al Muhaidib Company. This response rate was considered to be more than adequate, since the data were collected in a self-administered fashion, with no prior contact or personal connection having been made with the foreign workers. In addition, a review of the published social research literature suggested that a response rate of at least 50% can be considered adequate for analysis and reporting (Babbie, 2007). Table 4.1 presents a summary of the response rate to the questionnaires, while Table 4.2 shows the number of actual responses collected by nationality.

Table 4.1
Summary of the Response Rate of the Questionnaires

Description	**Frequency/Rate**
Number of distributed questionnaires	368
Returned questionnaires	311
Questionnaires not returned	57
Returned and excluded questionnaires	29
Returned and usable questionnaires	282
Usable response rate	**76.6%**

Table 4.2
Number of Responses by Nationalities

Nationality	**Sampling**	**Actual Data Collected**	**Rate %**
Indian	151	96	34.0
Pakistani	143	111	39.4
Egyptian	32	36	12.8
Yemeni	24	24	8.5
Filipino	11	4	1.4
Syrian	7	11	3.9
Total	**368**	**282**	**100**

4.3 Data Screening

Data screening as part of a multivariate analysis is necessary because it assists the researcher in identifying any possible violations of assumptions concerning the data analysis techniques (Hair et al., 2014). In the current study, after the collected data were inputted into the SPSS version 23 software. The researcher conducted the data screening. The following preliminary data analyses were performed: (1) normality test, (2) missing value analysis, (3) assessment of outliers and (4) multicollinearity test (Hair et al., 2014; Tabachnick & Fidell, 2013).

4.3.1 Data Coding

In this study, all the items of latent variables from the questionnaire were coded by using 2 or 3 letters for easy identification in both PLS and SPSS. For example, the items of safety compliance were coded SCO1 to SCO4, the items of safety participation were coded SPA1 to SPA4, Similarly, management commitment to safety were coded as MC1 to MC7, safety training were coded as ST1 to ST5, worker involvement in safety were coded as WI1 to WI4, safety communication and feedback were coded as SC1 to SC5, safety rules and procedures were coded as SR1 to SR3, priority of safety were coded as SP1 to SP4, work pressure were coded as WP1 to WP6 and social support were coded as SS1 to SS15. In this study, there were five items with negative worded which have been reverse coded: MC3, MC6, PS2, SC3 and SC5.

4.3.2 Missing Values

The descriptive statistics were computed to determine the number of missing values. Of the 16,074 data points, 584 were randomly missed, which accounted for 3.6% of the total (see Table 4.3). Specifically, safety compliance had 36 missing values, safety participation had 38, management commitment had 73, the priority of safety had 50, work pressure had 66, safety training had 55, safety communication had 53, safety rules and procedures had 30, workers' involvement had 37 and social support had 146 missing values. It has been suggested that if the missing values are less than 5% per item, then they can be replaced by using mean replacement (Hair et al., 2014). In the present study, it was found that all the indicators had less than 5% missing values. The missing values were therefore replaced via SPSS version 23 using the mean replacement technique.

Table 4.3
Total Number of Missing Values

Latent Variables	**Number of Missing Values**
Management Commitment	73
Priority of Safety	50
Work Pressure	66
Safety Training	55
Safety Communication	53
Safety Rules and Procedures	30
Work Involvement	37
Social Support	146
Safety Compliance	36
Safety Participation	38
Total	584

Note: percentage of missing values is arrived at by dividing the total number of missing vales for the entire data set by total number of data points multiplied by 100

4.3.3 Assessment of Outliers

Fallowing the recommendation of Tabachnick and Fidell (2013), the Mahalanobis (D2) measure (Mahalanobis, 1948) was used in this study to identify and treat multivariate outliers. Thus, the D2 was computed using linear regression approaches in SPSS version 23, followed by the computation of the Chi-square value. In the current study, 57 items were adapted, of which 56 represent the degree of freedom in the Chi-square table with $p<0.05$; hence, the standard is 74.47 (Tabachnick & Fidell, 2013). This indicates that any value with a D2 of ≥ 74.47 is an outlier and should therefore be removed from the data set. Following this criterion, none of the cases were recognised as multivariate outliers, since the maximum value was 46.93.

4.3.4 Normality Test

According to Curran, West and Finch (1996), the absolute values of skewness and kurtosis should be < 2 and < 7, respectively. Furthermore, Kline (2011) recommended that the absolute value of skewness should be < 3, while the absolute value of kurtosis should be < 10. Based on the recommendation of Curran et al. (1996), Table 4.4 shows that the absolute values of the skewness and kurtosis of all the constructs in this study are within the acceptable range of < 2 and < 7, respectively. In addition, Figure 4.1 shows that the data in the present study follow a normal pattern, since all the bars on the histogram are closed to a normal curve. Therefore, the normality assumptions were not violated in the present study.

Table 4.4
Values of Skewness and Kurtosis of Measured Variables

Constructs	Skewness	Kurtosis
Management Commitment	-1.042	0.945
Priority of Safety	-1.166	1.154
Work Pressure	-1.057	1.205
Safety Training	-1.236	1.400
Safety Communication	-1.211	1.872
Safety Rules and Procedures	-0.739	-0.012
Work Involvement	-1.297	1.905
Social Support	-1.280	1.281
Safety Compliance	-1.376	1.564
Safety Participation	-1.078	0.898

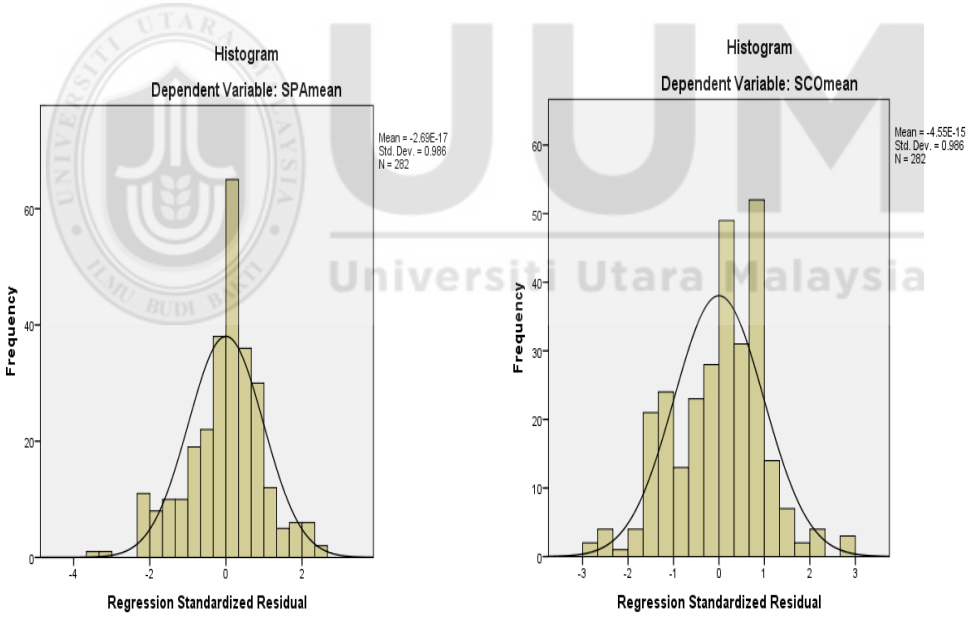

Figure 4.1
Histogram for test of normality

4.3.5 Multicollinearity Test

Hair et al. (2014) suggested that multicollinearity will become an issue when the VIF value is more than 5 and the value of tolerance is less than 0.20. Table 4.5 shows that the values of tolerance range from 0.32 to 0.60, which are all more than 0.20. Likewise, the VIF values range from 1.66 to 3.08, which are all lower than 5 (Hair et al., 2014). This result indicates that in the present study, there was no multicollinearity concern among the exogenous constructs due to all the tolerance values exceeding 0.20 and all the VIF values being lower than 5 (Hair et al., 2014).

Table 4.5
Tolerance and Variance Inflation Factors (VIF)

Constructs	**Tolerance**	**VIF**	**Condition Index**
Management Commitment	.437	2.290	20.925
Priority of Safety	.523	1.913	21.952
Work Pressure	.371	2.693	24.690
Safety Training	.324	3.083	27.310
Safety Communication	.601	1.663	27.841
Safety Rules and Procedures	.459	2.180	29.646
Workers' Involvement	.408	2.450	33.752
Social Support	.504	1.983	38.095

A correlation coefficient of 0.90 or more indicates multicollinearity between the exogenous constructs (Hair et al., 2014). Table 4.6 shows the correlation matrix of all the exogenous constructs, which indicates that the correlations between the exogenous constructs were under the recommended threshold value of 0.90. Indeed, the correlation between the exogenous constructs in the current study ranged between -.365 and .008, which clearly indicates that the exogenous constructs were independent and not highly correlated.

Table 4.6
Correlation Matrix of the Exogenous Latent Constructs

NO	Constructs	1	2	3	4	5	6	7	8
1	Management Commitment	1							
2	Priority of Safety	.007	1						
3	Work Pressure	-.033	-.006	1					
4	Safety Training	-.081	-.207	.008	1				
5	Safety Communication	-.146	.001	-.187	-.331	1			
6	Safety Rules and Procedures	-.129	-.043	-.119	-.081	-.152	1		
7	Work Involvement	-.211	-.134	-.286	-.113	.000	-.109	1	
8	Social Support	-.154	-.225	-.174	.003	-.121	-.365	-.157	1

4.4 Demographic Profile of the Respondents

The demographic profile of the respondents indicates that 53.5% (n=151) of them have a certificate or lower in terms of their education level. However, 48% of respondents have educational qualifications that differ from those listed, including specific technical qualifications for use on a construction site, for example, the Technical Programme for Construction Equipment Operators (crane operator, forklift driver, etc.). Meanwhile, 55.7% (n=157) of respondents are aged between 21 and 30 years, which indicates that construction companies are hiring young workers despite the majority of them being only lowly qualified. This might be due to the heavy nature of the work involved in the construction. With regards to gender, all the respondents are male 100% (n=282), which is likely due to the fact that only men are employed on constructions site in Saudi Arabia.

The results also show that the majority of respondents were from Pakistan (39.4%, n=111), since the Pakistani workers represented the majority of foreign workers employed on the construction site. Meanwhile, only 1.4% (n=4) of workers were from the Philippines and they thus represented the minority of foreign workers. The demographic results also show that despite the majority of respondents (67.7%,

n=191) having worked abroad for between one and five years and the majority of them (88.7%, n=250) having also attended occupational safety training, the majority of respondents (56%, n=158) still reported having has an occupational accident. The demographic details concerning the respondents are shown in Table 4.7.

Table 4.7
Demographic Profile of the Respondents

Demographic Attributes	**Frequency**	**%**
Nature of Work		
Electrician	66	23.4
Iron Worker	29	10.3
Driller	9	3.2
Plumber	32	11.3
Drywall Finisher	20	7.1
Carpenter	31	11.0
Crane Operator	5	1.8
Concrete Laborer	28	9.9
Equipment Operator	11	3.9
Painter	9	3.2
Others	42	14.9
Total	**282**	**100.0**
Education level		
Certificate or Lower	151	53.5
Diploma	57	20.2
Bachelor Degree	26	9.2
Others	48	17.0
Total	282	100
Gender		
Male	282	100
Female	0	0
Total	**282**	**100**
Country of origin		**100**
India	96	34.0
Pakistan	111	39.4
Egypt	36	12.8
Yemen	24	8.5
Philippines	4	1.4
Syria	11	3.9
Total	**282**	**100**
Age		

Demographic Attributes	Frequency	%
21-30	157	55.7
31-40	98	34.8
41- 50	25	8.9
More than 50	2	0.7
Total	**282**	**100**
Experience (in years)		
1-5	126	44.7
6-10	122	43.3
11-15	25	8.9
16-20	9	3.2
Total	**282**	**100**
Experience Working Abroad (in years)		
1-5	191	67.7
6-10	83	29.4
11-15	7	2.5
16-20	1	0.4
Total	**282**	**100**
Experience in the Present Organisation (in years)		
1-5	223	79.1
6-10	57	20.2
11-15	2	0.7
Total	**282**	**100**
Occupational Accident		
Yes	158	56.0
No	124	44.0
Total	**282**	**100**
Frequent Accident in Present Organisation		
Never	124	44.0
Sometimes	146	51.8
Fairly Often	3	1.1
Very Often	6	2.1
Always	3	1.1
Total	**282**	**100**
Attended Any Occupational Safety Training		
Yes	249	88.7
No	33	11.3
Total	**282**	**100**
Frequent of Attend Occupational Safety Training		
Never	33	11.7
Sometimes	42	14.9
Fairly Often	45	16.0
Very Often	89	31.6
Always	73	25.9

Demographic Attributes	Frequency	%
Total	**282**	**100**

4.5 Non-Response Bias

To determine the non-response bias in this study, the respondents were divided into two groups (Armstrong & Overton, 1977). Some respondents provided their responses early (n=175), while others only responded after many visits (n=107). The data collection period ran from 5 October 2015 to 20 February 2016. For the purpose of assessing the non-response bias, a t-test was conducted to compare the waves of responses from among the early and late responses for the study variables. The independent t-test was carried out using SPSS software between the 175 early respondents and the 107 late respondents (Armstrong & Overton, 1977). In addition, all the study constructs study were taken into consideration. Prior to examining the equality of the means across the early and late responses, Levene's test for the equality of variances was performed. The results shown in Table 4.8 confirmed that the variances were homogeneous across the two groups at the 0.1 level of significance. Table 4.9 presents the means of the early and late respondents. The mean values showed no significant differences between the early and late respondents. Therefore, non-response bias was not a major issue in the present study (Armstrong & Overton, 1977).

Table 4.8
Independent Samples Test

Construct		F	Sig.	T	df	Sig. (2-tailed)
MC	Equal variances assumed	4.429	0.566	1.706	280	0.326
	Equal variances not assumed			1.613	185.758	0.326
PS	Equal variances assumed	.292	0.589	.246	280	0.806

Construct		F	Sig.	T	df	Sig. (2-tailed)
	Equal variances not assumed			.250	235.497	0.803
WP	Equal variances assumed	4.377	0.580	3.575	280	0.254
	Equal variances not assumed			3.441	197.354	0.254
ST	Equal variances assumed	9.179	0.880	2.815	280	0.378
	Equal variances not assumed			2.692	193.173	0.378
SC	Equal variances assumed	2.791	0.891	.111	280	0.912
	Equal variances not assumed			.107	200.097	0.915
SR	Equal variances assumed	.707	0.401	2.349	280	0.877
	Equal variances not assumed			2.403	240.175	0.877
WI	Equal variances assumed	1.365	0.244	2.220	280	0.934
	Equal variances not assumed			2.163	205.537	0.934
SS	Equal variances assumed	13.097	0.894	3.062	280	0.250
	Equal variances not assumed			2.790	164.343	0.250
Safety Compliance	Equal variances assumed	10.249	0.805	3.224	280	0.873
	Equal variances not assumed			2.971	170.386	0.873
Safety Participation	Equal variances assumed	4.154	0.243	1.101	280	0.272
	Equal variances not assumed			1.129	242.504	0.260

Table 4.9

Group Descriptive Statistics for the Early and Late Respondents

Construct	Response time	N	Mean	Std. Deviation	Std. Error Mean
MC	Early Respondents	175	4.1400	.74402	.05624
	Late Respondents	107	3.9673	.94238	.09110
PS	Early Respondents	175	4.2114	.83107	.06282
	Late Respondents	107	4.1869	.77862	.07527
WP	Early Respondents	175	4.2714	.69834	.05279
	Late Respondents	107	3.9439	.81936	.07921
ST	Early Respondents	175	4.4400	.63932	.04833
	Late Respondents	107	4.2009	.77051	.07449
SC	Early Respondents	175	4.2257	.74407	.05625

	Late Respondents	107	4.2150	.85812	.08296
SR	Early Respondents	175	4.3200	.79539	.06013
	Late Respondents	107	4.0981	.72502	.07009
WI	Early Respondents	175	4.4000	.69893	.05283
	Late Respondents	107	4.2009	.77963	.07537
SS	Early Respondents	175	4.3229	.71923	.05437
	Late Respondents	107	3.9953	1.07610	.10403
Safety Compliance	Early Respondents	175	4.5057	.68437	.05173
	Late Respondents	107	4.1869	.97256	.09402
Safety Participation	Early Respondents	175	4.4486	.68244	.05159
	Late Respondents	107	4.3598	.61351	.05931

4.6 Descriptive Statistics for Main Study Variable

A descriptive analysis of the data was conducted in order to assess the management commitment to safety, the priority of safety, work pressure, safety training, safety communication and feedback, safety rules and procedures, workers' involvement in safety, social support, safety compliance and safety participation from the foreign workers' perspective. Table 4.10 presents descriptive statistics that show all the variables to have mean values of more than 4, which indicates that the foreign workers emphasise the importance of all the variables because these practices are well implemented within the organisation.

Table 4.10
Descriptive Statistics

Construct	N	Mean	Std. Deviation
Management Commitment	282	4.07	.828
Priority of Safety	282	4.20	.810
Work Pressure	282	4.15	.762
Safety Training	282	4.35	.700
Safety Communication	282	4.22	.788
Safety Rules and Procedures	282	4.24	.776
Worker's Involvement in Safety	282	4.32	.736
Social Support	282	4.20	.885

Construct	N	Mean	Std. Deviation
Safety Compliance	282	4.38	.819
Safety Participation	282	4.41	.657

4.7 Goodness of the Measurement Model

In order to test the study's hypotheses, the measurement model, that is, the outer model was assessed using the PLS-SEM technique. In the following sections, the researcher addresses each criterion for the assessment of measurement models.

4.7.1 Construct Validity

According to Hair et al. (2014), construct validity can be examined through content validity, convergence validity and discriminant validity, which are discussed in more detail below.

4.7.2 Content Validity

According to Hair et al. (2014), construct validity can be examined through content validity, convergence validity and discriminant validity. Based on a factor analysis, all the items were correctly assigned to their constructs. Table 4.11 shows the content validity of the measures. It can be seen that there are high loadings for the items on their respective constructs when compared to the other constructs.

Table 4.11
Factor Analysis and Loadings of the Items

Construct	Items	MC	PS	SC	SCO	SPA	SR	SS	ST	WI	WP
Management Commitment	**MC1**	**0.952**	0.514	0.345	0.397	0.372	0.501	0.413	0.450	0.454	0.400
	MC5	**0.972**	0.496	0.311	0.394	0.376	0.453	0.396	0.420	0.435	0.401
	MC6	**0.878**	0.469	0.232	0.355	0.323	0.467	0.402	0.407	0.408	0.499
Priority of Safety	**PS1**	0.422	**0.858**	0.509	0.387	0.263	0.347	0.442	0.585	0.406	0.433
	PS2	0.442	**0.914**	0.350	0.214	0.244	0.368	0.271	0.382	0.326	0.308
	PS3	0.467	**0.753**	0.203	0.229	0.333	0.372	0.261	0.269	0.393	0.317

Construct	Items	MC	PS	SC	SCO	SPA	SR	SS	ST	WI	WP
Safety Communication	SC1	0.344	0.415	**0.775**	0.324	0.288	0.395	0.351	0.663	0.449	0.531
	SC2	0.218	0.317	**0.860**	0.245	0.301	0.192	0.197	0.316	0.263	0.310
	SC3	0.271	0.306	**0.841**	0.233	0.269	0.301	0.238	0.421	0.318	0.405
	SC5	0.235	0.401	**0.887**	0.297	0.322	0.225	0.291	0.451	0.348	0.432
Safety Compliance	SCO1	0.354	0.318	0.307	**0.822**	0.496	0.431	0.616	0.581	0.391	0.457
	SCO2	0.276	0.189	0.204	**0.797**	0.621	0.312	0.449	0.227	0.296	0.219
	SCO3	0.267	0.261	0.296	**0.791**	0.647	0.349	0.417	0.272	0.368	0.257
	SCO4	0.406	0.316	0.259	**0.858**	0.676	0.378	0.637	0.484	0.447	0.431
Safety Participation	SPA1	0.373	0.302	0.237	0.602	**0.814**	0.284	0.433	0.169	0.299	0.266
	SPA2	0.243	0.281	0.332	0.480	**0.803**	0.267	0.353	0.107	0.296	0.234
	SPA3	0.262	0.171	0.281	0.596	**0.778**	0.413	0.458	0.336	0.313	0.314
	SPA4	0.336	0.319	0.277	0.651	**0.791**	0.309	0.429	0.316	0.321	0.233
Safety Rules and Procedures	SR1	0.368	0.307	0.279	0.301	0.312	**0.758**	0.258	0.364	0.384	0.429
	SR2	0.446	0.385	0.264	0.427	0.341	**0.856**	0.441	0.488	0.487	0.462
Social Support	SS12	0.349	0.356	0.282	0.493	0.425	0.351	**0.855**	0.394	0.363	0.466
	SS13	0.293	0.295	0.251	0.496	0.351	0.358	**0.808**	0.437	0.442	0.423
	SS15	0.349	0.380	0.253	0.546	0.497	0.316	**0.772**	0.381	0.419	0.332
	SS3	0.380	0.374	0.249	0.525	0.364	0.394	**0.862**	0.503	0.437	0.467
	SS6	0.354	0.271	0.291	0.547	0.454	0.351	**0.843**	0.442	0.305	0.512
	SS7	0.324	0.318	0.273	0.574	0.439	0.378	**0.722**	0.476	0.440	0.471
	SS9	0.385	0.261	0.234	0.577	0.437	0.359	**0.801**	0.473	0.353	0.491
Safety Training	ST2	0.406	0.419	0.445	0.477	0.238	0.399	0.473	**0.874**	0.524	0.634
	ST3	0.293	0.380	0.513	0.371	0.259	0.445	0.431	**0.814**	0.471	0.595
	ST5	0.435	0.463	0.446	0.422	0.256	0.495	0.469	**0.815**	0.461	0.540
Worker's Involvement in Safety	WI2	0.463	0.432	0.351	0.453	0.337	0.570	0.496	0.581	**0.856**	0.589
	WI3	0.340	0.388	0.381	0.286	0.265	0.366	0.338	0.506	**0.759**	0.387
	WI4	0.317	0.291	0.295	0.382	0.336	0.369	0.339	0.341	**0.827**	0.348
Work Pressure	WP3	0.346	0.299	0.366	0.316	0.324	0.433	0.431	0.489	0.431	**0.749**
	WP4	0.452	0.422	0.468	0.379	0.255	0.512	0.496	0.598	0.483	**0.839**
	WP5	0.270	0.380	0.343	0.243	0.143	0.294	0.339	0.519	0.338	**0.734**
	WP6	0.367	0.292	0.410	0.420	0.288	0.465	0.478	0.629	0.468	**0.848**

4.7.3 Convergence Validity Analysis

The loadings of all the items were examined and found to be more than 0.708, which is an acceptable level according to the multivariate analysis literature (Hair et al., 2014). In Table 4.12, the values of CR are presented. The CR values ranged from 0.790 to 0.954, which exceeds the recommendation for values between 0.70 and

0.90, although it can be regarded as satisfactory (Hair et al., 2014). Therefore, these results confirm the convergence validity of the outer model.

Furthermore, the AVE values were examined in order to confirm the convergence validity of the outer model. If the AVE value is at least 0.5, then the set of items has an adequate convergence in measuring the concerned construct (Barclay, Higgins, & Thompson, 1995). In the present study, the AVE values range between 0.630 and 0.874, that indicates a good level of construct validity for the measures used.

Table 4.12
Convergence Validity Analysis

Construct	Items	Loading	CR[a]	AVE
Management Commitment	MC1	0.952	0.954	0.874
	MC5	0.972		
	MC6	0.878		
Priority of Safety	PS1	0.858	0.881	0.714
	PS2	0.914		
	PS3	0.753		
Safety Communication	SC1	0.775	0.907	0.709
	SC2	0.860		
	SC3	0.841		
	SC5	0.887		
Safety Compliance	SCO1	0.822	0.889	0.668
	SCO2	0.797		
	SCO3	0.791		
	SCO4	0.858		
Safety Participation	SPA1	0.814	0.874	0.635
	SPA2	0.803		
	SPA3	0.778		
	SPA4	0.791		
Safety Rules and Procedures	SR1	0.758	0.790	0.654
	SR2	0.856		
Social Support	SS12	0.855	0.930	0.657
	SS13	0.808		
	SS15	0.772		
	SS3	0.862		
	SS6	0.843		

Construct	Items	Loading	CR[a]	AVE
Safety Training	SS7	0.722	0.873	0.697
	SS9	0.801		
	ST2	0.874		
	ST3	0.814		
	ST5	0.815		
Worker's Involvement in Safety	WI2	0.856	0.856	0.664
	WI3	0.759		
	WI4	0.827		
Work Pressure	WP3	0.749	0.872	0.630
	WP4	0.839		
	WP5	0.734		
	WP6	0.848		

*[a] CR = (Σ factor loading) ^{2} / {(Σ factor loading) ^{2}) + Σ (variance of error)}
*[b] AVE = Σ (factor loading) ^{2} / {Σ (factor loading) ^{2} + Σ (variance of error)}

4.7.4 Discriminant Validity Analysis

For the purpose of this study, the discriminant validity of the measures was confirmed by employing the method of Fornell and Larcker (1981). As explained in Table 4.13, the square root of the AVE for all the constructs was replaced at the diagonal elements of the correlation matrix. The discriminant validity of the outer model for this study is confirmed, since the diagonal elements in the table are higher than the other elements of the column and row in which they are located. As a result of the above testing of the construct validity of the outer model, it is assumed that the obtained results pertaining to the hypotheses testing are reliable and valid.

Table 4.13
Discriminant Validity Matrix

Construct	MC	PS	SC	SCO	SPA	SR	SS	ST	WI	WP
Management Commitment (MC)	**0.935**									
Priority of Safety (PS)	0.528	**0.845**								
Safety Communication (SC)	0.319	0.432	**0.842**							
Safety Compliance (SCO)	0.409	0.342	0.330	**0.817**						

Safety Participation (SPA)	0.383	0.336	0.352	0.737	**0.797**					
Safety Rules and Procedures (SR)	0.506	0.431	0.333	0.457	0.404	**0.809**				
Social Support (SS)	0.431	0.399	0.325	0.667	0.529	0.443	**0.810**			
Safety Training (ST)	0.456	0.505	0.557	0.510	0.299	0.533	0.549	**0.835**		
Worker's Involvement in Safety (WI)	0.463	0.453	0.414	0.468	0.387	0.543	0.487	0.582	**0.815**	
Work Pressure (WP)	0.460	0.429	0.503	0.440	0.331	0.551	0.559	0.706	0.550	**0.794**

4.8 Assessment of the Structural Model

Once the goodness of fit of the outer model had been confirmed, the next stage was to test the hypothesised relationships among the variables. Using Smart-PLS 2.0, the hypothesised model was tested using the bootstrapping technique.

4.8.1 Testing the Direct Relationships between Safety Climate and Safety Behaviour

To further understand the relationship between the safety climate and safety behaviour, the bootstrapping technique was performed. Hence, the beta coefficients were generated using PLS Algorithm as illustrated in Figure 4.2.

In addition, Figure 4.3 was created in order to confirm whether or not the beta coefficients were significant by using the bootstrapping technique in Smart-PLS 2.0 as well as to conclude where the t-values were statistically significant. The results of testing the direct relationships provide interesting insight into the construction industry in terms of safety compliance and safety participation in Saudi Arabia (see Table 4.14).

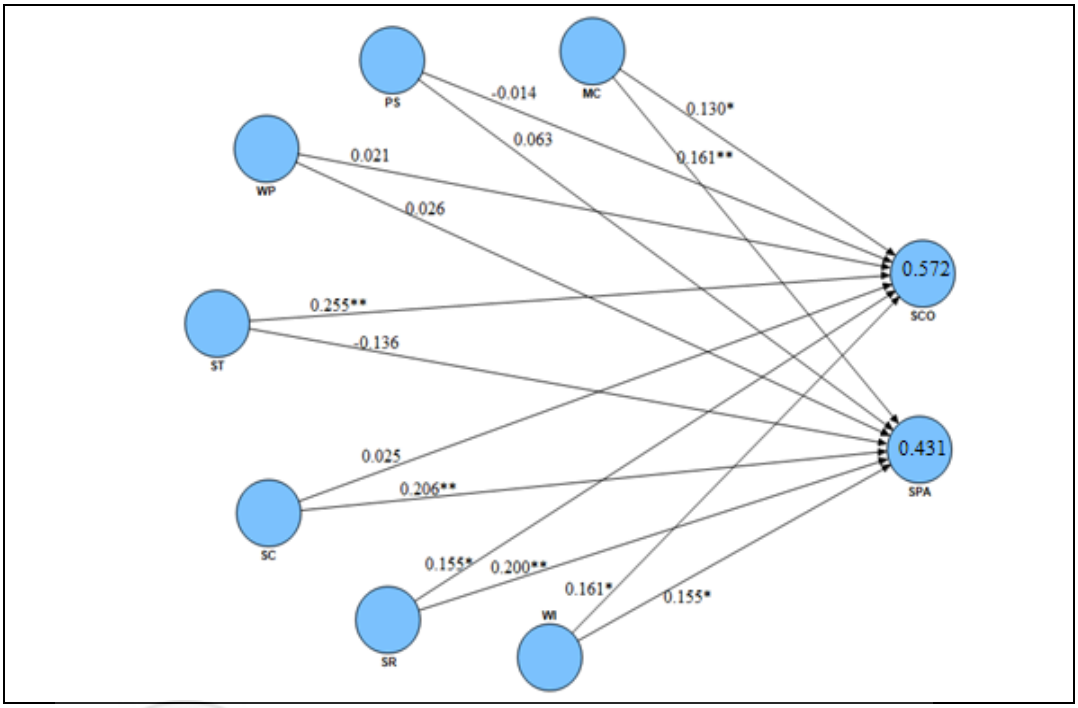

Figure 4.2
Beta Model Results
*t value >1.645; **t value >2.33

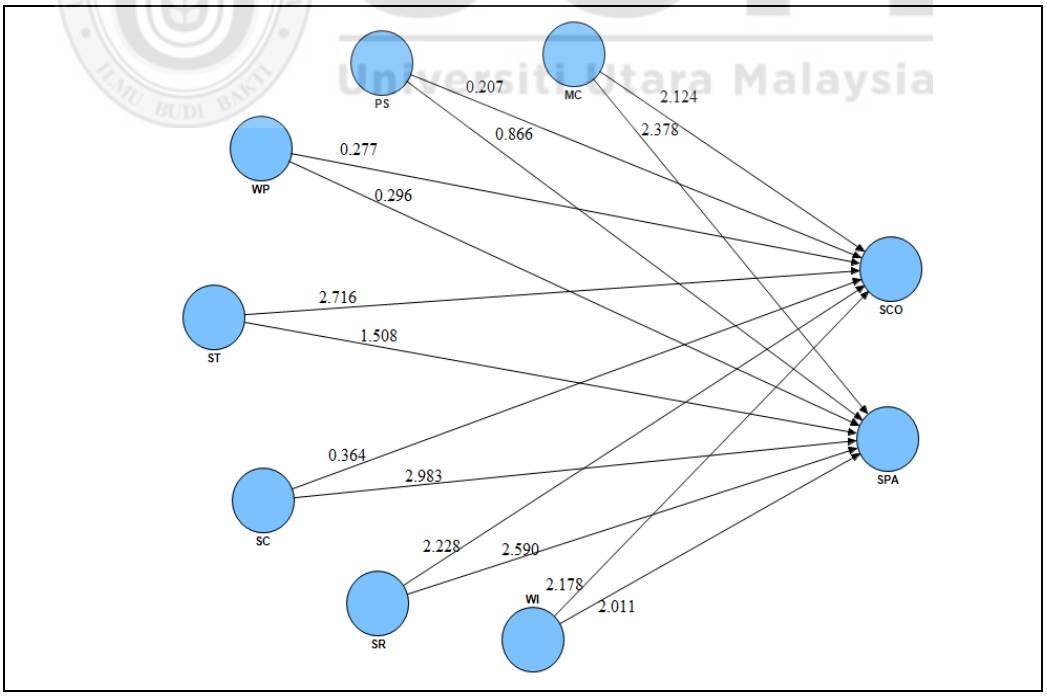

Figure 4.3
Model of Significance Results

Table 4.14
Results of the Inner Structural Model (Direct Hypothesis Testing)

No	Hypothesis	Beta	Standard Error	T Value	Decision
H1a	Management Commitment (MC) --> Safety Compliance (SCO)	0.130*	0.061	2.124	Supported
H1b	Management Commitment (MC) --> Safety Participation (SPA)	0.161**	0.068	2.378	Supported
H2a	Priority of Safety (PS) --> Safety Compliance (SCO)	-0.014	0.066	0.207	Not supported
H2b	Priority of Safety (PS) --> Safety Participation (SPA)	0.063	0.073	0.866	Not supported
H3a	Safety Communication (SC) --> Safety Compliance (SCO)	0.025	0.069	0.364	Not supported
H3b	Safety Communication (SC) --> Safety Participation (SPA)	0.206**	0.069	2.983	Supported
H4a	Safety Rules and Procedures (SR) --> Safety Compliance (SCO)	0.155*	0.070	2.228	Supported
H4b	Safety Rules and Procedures (SR) -> Safety Participation (SPA)	0.200**	0.077	2.590	Supported
H5a	Safety Training (ST) --> Safety Compliance (SCO)	0.255**	0.094	2.716	Supported
H5b	Safety Training (ST) --> Safety Participation (SPA)	-0.136	0.090	1.508	Not Supported
H6a	Worker's Involvement in Safety (WI) --> Safety Compliance (SCO)	0.161*	0.074	2.178	Supported
H6b	Worker's Involvement in Safety (WI) --> Safety Participation (SPA)	0.155*	0.077	2.011	Supported
H7a	Work Pressure (WP) --> Safety Compliance (SCO)	0.021	0.076	0.277	Not supported
H7b	Work Pressure (WP) --> Safety Participation (SPA)	0.026	0.087	0.296	Not supported

*t value >1.645=p <0.05; **t value >2.33 =p<0.01

For the purpose of determining whether or not the beta coefficients were statistically significant, the bootstrapping technique was employed in this study using Smart-PLS 2.0. As reported in Table 4.14, the t-values for each beta coefficient were also generated using the bootstrapping technique. The results show that safety training had the highest and most significant effect on safety compliance (β= 0.255, t=2.716, p<0.01), which indicates that safety training was the most important dimension in relation to achieving safety compliance. In descending order, the other important predictors were workers' involvement in safety (β= 0.161, t=2.178, p<0.05), safety rules and procedures (β= 0.155, t=2.228, p<0.05) and management commitment (β= 0.130, t=2.124, p<0.05). Four predictor dimensions influenced the dependent variable (safety compliance) in the hypothesised direction. Hypotheses H1a, H4a,

H5a and H6a were therefore supported. However, the other dimensions (safety communication, work pressure and the priority of safety) had no significant effect on safety compliance, as shown in Table 4.14.

The results also show that safety communication had the highest and most significant effect on safety participation (β= 0.206, t=2.983, p<0.01), which indicates that safety communication was the most important dimension in terms of achieving safety participation. In descending order, the other important predictors were safety rules and procedures (β= 0.20, t=2.590, p<0.01), management commitment to safety (β= 0.161, t=2.378, p<0.01) and workers' involvement in safety (β= 0.155, t=2.011, p<0.05). Four predictor dimensions influenced safety participation as a dependent variable in the hypothesised direction. Hypotheses H1b, H3b, H4b and H6b were therefore supported. Yet, the other dimensions (the priority of safety, work pressure, and safety training) had no significant effect on safety compliance, as shown in the Table 4.14.

4.8.2 Testing the Moderation Effect of Social Support between Safety Climate and Safety Behaviour

This section presents the results concerning the moderating effect of social support between the safety climate (management commitment to safety, priority of safety, work pressure, safety training, safety communication, safety rules and procedures and workers' involvement in safety) and safety behaviour (safety compliance and safety participation). To generate these results, Smart-PLS 2.0 was employed to examine the interaction effect between the safety climate and safety behaviour, as illustrated in Figure 4.4 and Figure 4.5.

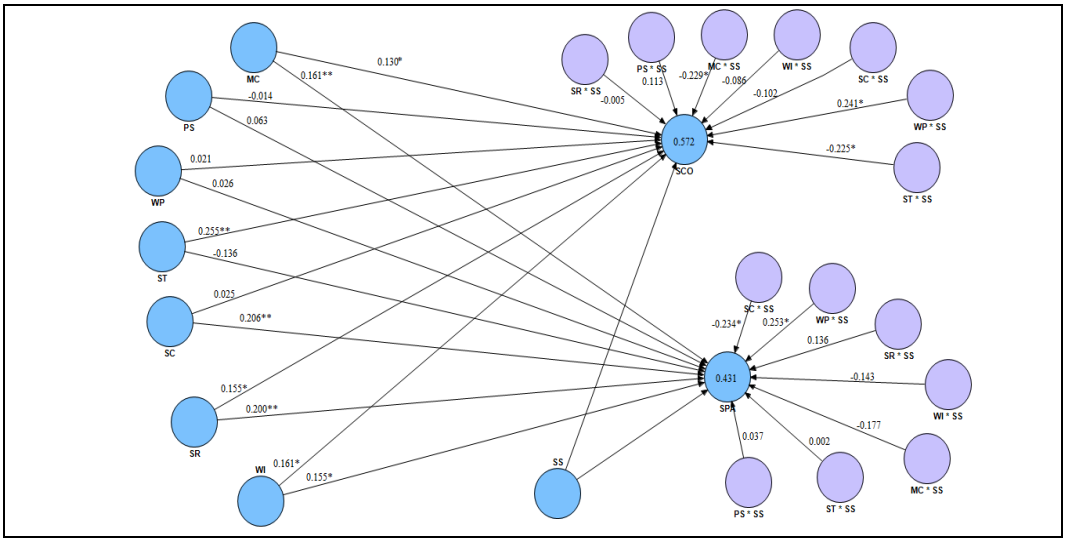

Figure 4.4

Beta Model Results for Moderating Role of Social Support

*t value >1.645; **t value >2.33

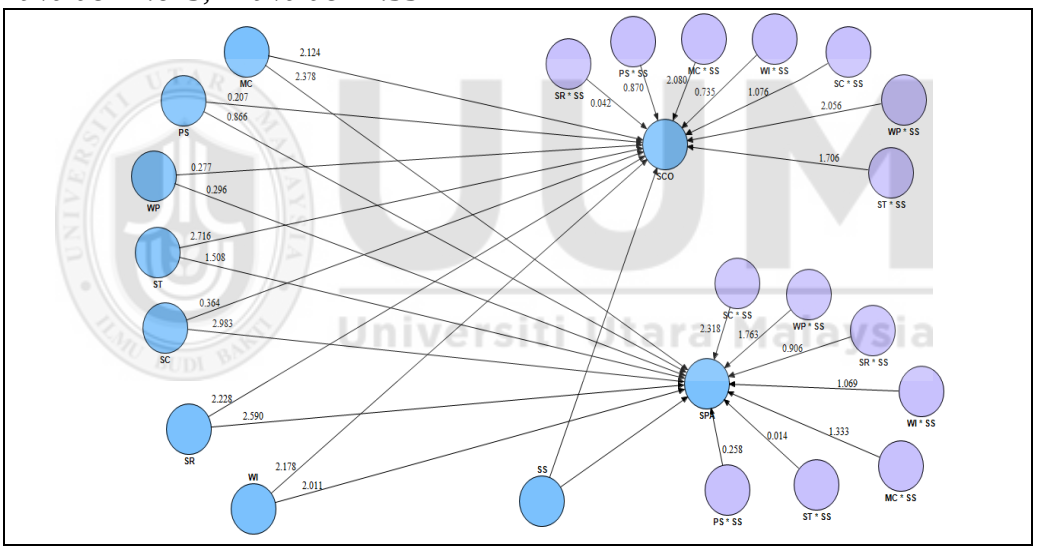

Figure 4.5

Model of Significance Results for Moderating Role of Social Support

Table 4.15 shows the result of creating a moderating effect using social support as the moderator variable in the relationship between the independent variables (management commitment, priority of safety, work pressure, safety training, safety communication, safety rules and procedures, and workers' involvement) and the dependent variables (safety compliance and safety participation). The results reveal

that social support significantly moderated the relationship between work pressure and safety compliance (β=0.241, t=2.056, p<0.05). Similarly, social support significantly moderated the relationship between safety training and safety compliance (β=-0.225, t=1.706, p<0.05). Additionally, social support significantly moderated the relationship between management commitment to safety and safety compliance (β=-0.229, t=2.080, p<0.05). Therefore, social support moderated the relationship between three predictor dimensions and safety compliance. Hence, hypotheses H8a, H12a and H14a were supported.

The results also reveal that social support significantly moderated the relationship between work pressure and safety participation (β=0.253, t=1.763, p<0.05). In addition, social support significantly moderated the relationship between safety communication and safety participation (β=-0.234, t=2.318, p<0.05). Social support therefore moderated the relationship between two predictor dimensions and safety participation as a dependent variable in the hypothesised direction. Hence, hypotheses H14b and H10b were supported.

Table 4.15
Results of the Inner Structural Model for Moderating Role of Social Support (Hypothesis Testing)

No	Hypothesis	Beta	Standard Error	T Value	Decision
H8a	Management Commitment (MC) * Social Support (SS) --> Safety Compliance (SCO)	-0.229*	0.110	2.080	Supported
H8b	Management Commitment (MC) * Social Support (SS) --> Safety Participation (SPA)	-0.177	0.133	1.333	Not Supported
H9a	Priority of Safety (PS) * Social Support (SS) --> Safety Compliance (SCO)	0.113	0.130	0.870	Not Supported
H9b	Priority of Safety (PS) * SS -> Safety Participation (SPA)	0.037	0.144	0.258	Not supported
H10a	Safety Communication (SC) * Social Support (SS) --> Safety Compliance (SCO)	-0.102	0.095	1.076	Not Supported
H10b	Safety Communication (SC) * SS -> Safety Participation (SPA)	-0.234*	0.101	2.318	Supported

No	Hypothesis	Beta	Standard Error	T Value	Decision
H11a	Safety Rules and Procedures (SR) * Social Support (SS) --> Safety Compliance (SCO)	-0.005	0.118	0.042	Not Supported
H11b	Safety Rules and Procedures (SR) * Social Support (SS) --> Safety Participation (SPA)	0.136	0.150	0.906	Not supported
H12a	Safety Training (ST) * Social Support (SS) --> Safety Compliance (SCO)	-0.225*	0.132	1.706	Supported
H12b	Safety Training (ST) * Social Support (SS) --> Safety Participation (SPA)	0.002	0.145	0.014	Not supported
H13a	Worker's Involvement in Safety (WI) * Social Support (SS) --> Safety Compliance (SCO)	-0.086	0.116	0.735	Not supported
H13b	Worker's Involvement in Safety (WI) * Social Support (SS) --> Safety Participation (SPA)	-0.143	0.133	1.069	Not supported
H14a	Work Pressure (WP) * Social Support (SS) --> Safety Compliance (SCO)	0.241*	0.117	2.056	Supported
H14b	Work Pressure (WP) * Social Support (SS) --> Safety Participation (SPA)	0.253*	0.144	1.763	Supported

*t value >1.645=p <0.05; **t value >2.33 =p<0.01

Figure 4.6 provides a plot of the interaction between management commitment to safety and social support on safety compliance at both high and low social support based on the recommendation of Dawson (2014). As shown in Figure 4.6, the relationship between management commitment to safety and safety compliance is strongest in the case of high social support, while it is weakest in the case of low social support. Individuals with different levels of social support did not differ much in terms of safety compliance under conditions of low management commitment, although large differences were noted under conditions of high management commitment. In other words, under conditions of high management commitment to safety, individuals reporting high levels of social support reported significantly better safety compliance than individuals reporting low social support.

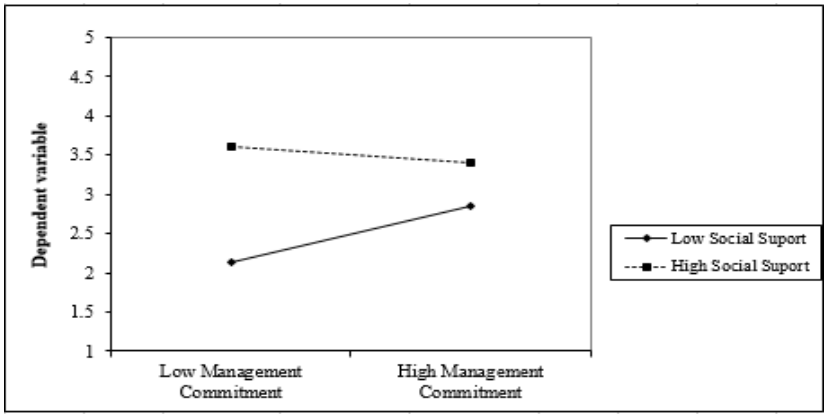

Figure 4.6

Plot of the Interaction between Management Commitment and Social Support on Safety Compliance

Figure 4.7 provides a plot of the interaction between work pressure and social support on safety compliance at both high and low social support based on the recommendation of Dawson (2014). As shown in Figure 4.7, the relationship between work pressure and safety compliance is weakest in the case of high social support, while it is strongest in the case of low social support. Individuals with different levels of social support did not differ much in terms of safety compliance under conditions of high work pressure, although large differences were noted under conditions of low work pressure. In other words, under conditions of low work pressure, individuals reporting high levels of social support reported significantly better safety compliance than individuals reporting low social support.

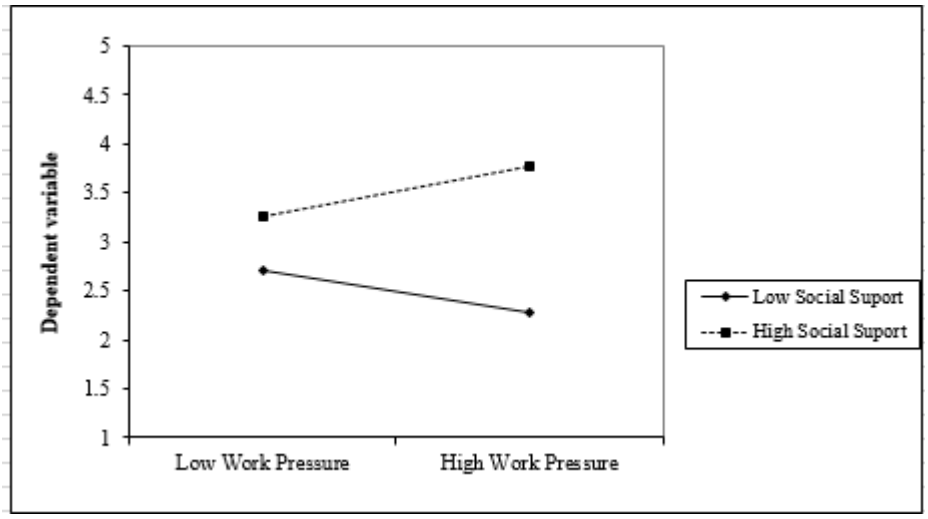

Figure 4.7
Plot of Plot of the Interaction between Work Pressure and Social Support on Safety Compliance

Figure 4.8 provides a plot of the interaction between safety training and social support on safety compliance at both high and low social support based on the recommendation of Dawson (2014). As shown in Figure 4.8, the relationship between safety training and safety compliance is strongest in the case of high social support, while it is weakest in the case of low social support. Individuals with different levels of social support did not differ much in terms of safety compliance under conditions of low safety training, although large differences were noted under conditions of high safety training. In other words, under conditions of high safety training, individuals reporting high levels of social support reported significantly better safety compliance than individuals reporting low levels of social support.

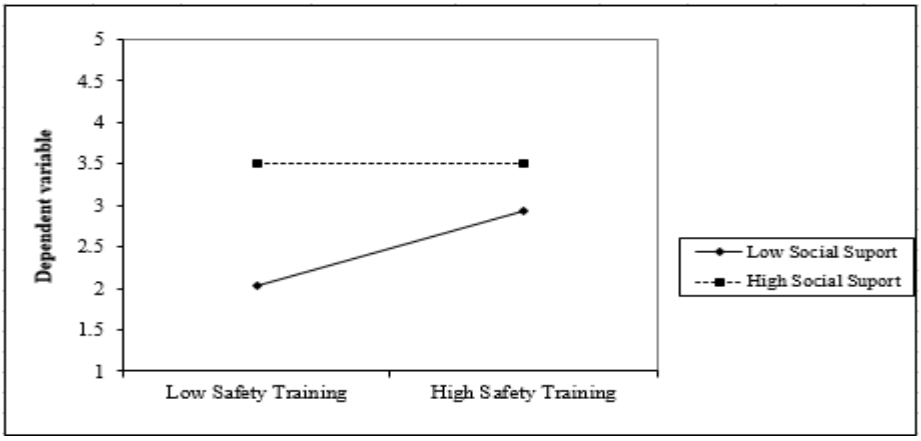

Figure 4.8
Plot of the Interaction between Safety Training and Social Support on Safety Compliance

The results also revealed that social support significantly moderated the relationship between work pressure and safety participation (β=0.253, t=1.763, p<0.05). Additionally, social support significantly moderated the relationship between safety communication and safety participation (β=-0.234, t=2.318, p<0.05). Social support was thus found to only moderate the relationship between those two dimensions and safety participation as a dependent variable in the hypothesised direction. Therefore, hypotheses H10b and H14b were supported.

Figure 4.9 provides a plot of the interaction between work pressure and social support on safety participation at both high and low levels of social support based on the recommendation of Dawson (2014). As shown in Figure 4.9, the relationship between work pressure and safety participation is weakest in the case of high social support, while it is strongest in the case of low social support. Individuals with different levels of social support did not differ much in terms of safety participation under conditions of high work pressure, although large differences were noted under conditions of low work pressure. In other words, under conditions of low work

pressure, individuals reporting high levels of social support reported significantly better safety participation than individuals reporting low social support.

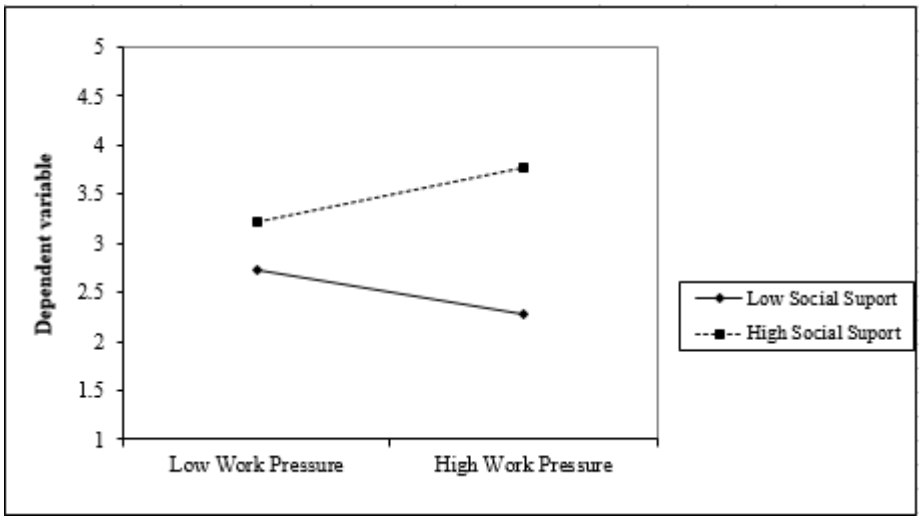

Figure 4.9
Plot of the Interaction between Work Pressure and Social Support on Safety Participation

Figure 4.10 provides a plot of the interaction between safety communication and social support on safety participation at both high and low levels of social support based on the recommendation of Dawson (2014). As shown in Figure 4.10, the relationship between safety communication and safety participation is strongest in the case of high social support, while it is weakest in the case of low social support. Individuals with different levels of social support did not differ much in terms of safety participation under conditions of low safety communication, although large differences were noted under conditions of high safety communication. In other words, under conditions of high safety communication, individuals reporting high levels of social support reported significantly better safety participation than individuals reporting low social support.

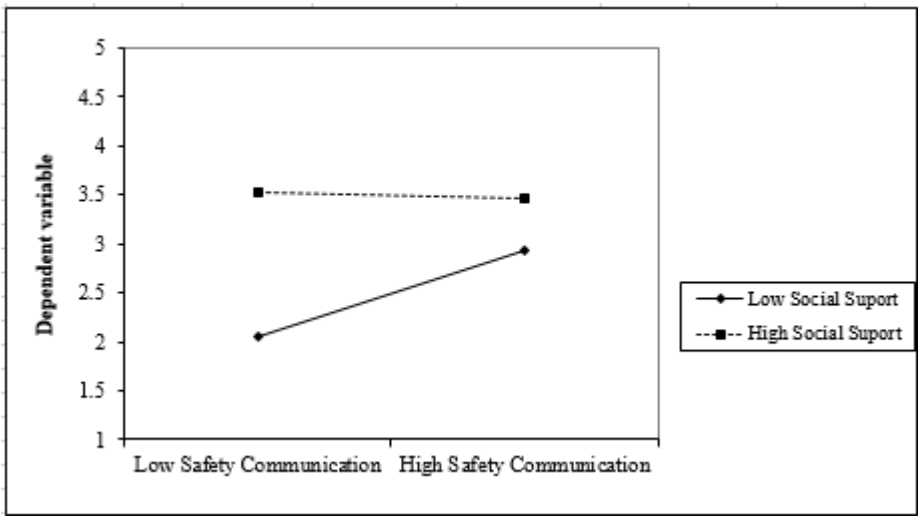

Figure 4.10
Plot of the Interaction between Safety Communication and Social Support on Safety Participation

4.9 Predictive Relevance and the Quality of the Model

According to the literature concerning multivariate data analysis, the quality of a model can be assessed using the R-squared, cross-validated redundancy, effect size and goodness of fit, which are discussed in the following sections.

4.9.1 R-Square

There are many criteria that can be used as guidelines for assessing the level of the R-squared. For instance, Cohen's (1988) criterion states that an R-squared value equal to or more than 0.26 is considered to be substantial, while 0.13 is considered moderate and 0.02 is considered weak. Moreover, Chin's (1998) criterion states that an R-squared value equal to or more than 0.67 is substantial, while 0.33 is considered moderate and 0.19 is considered weak. According to the aforementioned criteria, the R-squared values of the endogenous variables, namely safety compliance and safety participation, are 0.572 and 0.431, respectively, as depicted in Table 4.16. They are considered to be high, which reflects the adequacy of the developed model.

Table 4.16
R-Squared Values of the Model

Variable	Variable Type	R square
Safety Compliance	Endogenous	0.572
Safety Participation	Endogenous	0.431

4.9.2 Cross-Validated Redundancy

According to Fornell and Cha (1994), the redundant communality is found to be larger than 0 for all endogenous variables; therefore, the model is considered to have predictive validity, but if not, the predictive relevance of the model cannot be concluded. As illustrated in Table 4.17, the cross-validated redundancies for safety compliance and safety participation were 0.301 and 0.244, respectively, while the cross-validated commonality for safety compliance and safety participation were 0.439 and 0.640, respectively. Thus, based on the criteria suggested by Fornell and Cha (1994), all the values are more than zero, which indicates the adequate predictive validity of the model.

Table 4.17
Predictive Quality Indicators of the Model

Variable	Variable Type	Cross-Validated Communiality	Cross-Validated Redundancy
Safety Compliance	Endogenous	0.439	0.301
Safety Participation	Endogenous	0.640	0.244

4.9.3 Effect Size

According to Cohen's (1988) criterion, when the effect size is less than 0.15, it is considered to be a small effect. In Table 4.18, the effective size of safety compliance and the interaction terms for all the variables (management commitment, priority of

safety, work pressure, safety training, safety communication, safety rules and procedures and workers' involvement in safety) can be seen to be less than 0.15. Therefore, it can be stated that the effect is small for all the variables. Similarly, in Table 4.19, the effect size of safety participation and all the interaction variables (management commitment, priority of safety, work pressure, safety training, safety communication, safety rules and procedures and workers' involvement in safety) can also be seen to all be less than 0.15, which indicates that all the effect sizes are small. The following formula shows how the effect size was calculated:

$$Effect\ size(f) = \frac{R^2_{incl} - R^2_{excl}}{1 - R^2_{incl}}$$

Table 4.18
Effect Size of Safety Compliance and the Interaction Terms

Construct	R2incl	R2excl	R2incl-R2excl	1-R2incl	Effect Size	%	Size
Management Commitment	0.572	0.558	0.014	0.428	0.033	3.27	Small
Priority of Safety	0.572	0.568	0.004	0.428	0.009	0.93	Small
Work Pressure	0.572	0.558	0.014	0.428	0.033	3.27	Small
Safety Training	0.572	0.564	0.008	0.428	0.019	1.87	Small
Safety Communication	0.572	0.566	0.006	0.428	0.014	1.40	Small
Safety Rules and Procedures	0.572	0.564	0.008	0.428	0.019	1.87	Small
Worker's Involvement in Safety	0.572	0.568	0.004	0.428	0.009	0.93	Small

Table 4.19
The Effect Size of Safety Participation and the Interaction Terms

Construct	R2incl	R2excl	R2incl-R2excl	1-R2incl	Effect Size	%	Size
Management Commitment	0.431	0.419	0.012	0.569	0.021	2.11	Small
Priority of Safety	0.431	0.431	0.000	0.569	0.000	0.00	Small
Work Pressure	0.431	0.419	0.012	0.569	0.021	2.11	Small
Safety Training	0.431	0.411	0.020	0.569	0.035	3.51	Small
Safety Communication	0.431	0.378	0.053	0.569	0.093	9.31	Small
Safety Rules and Procedures	0.431	0.412	0.019	0.569	0.033	3.34	Small

Worker's Involvement in Safety	0.431	0.423	0.008	0.569	0.014	1.41	Small

4.9.4 The Goodness of Fit of the Whole Model

In contrast to the CBSEM approach, PLS-SEM has only one measure for goodness of fit. Tenenhaus, Chatelin and Lauro (2005) defined the global fit measure (GOF) for PLS to be the geometric mean of the average communality and average R-squared value for the endogenous constructs. For this purpose, the GOF measure accounts for the variance extracted by both the inner and outer models. According to the guidelines established by Wetzels, Odekeren-Schroder and Oppen (2009), the following formula is used:

$$Gof = \sqrt{(\overline{R^2} \times \overline{AVE})}$$

In this study, the obtained GoF value was calculated using the following formula:

$$Gof = \sqrt{(0.502 \times 0.586}$$
$$= 0.537$$

The comparison was made based on the baseline values of the GOF derived by Wetzels et al. (2009) (small=0.1, medium=0.25, large=0.36). Therefore, the results indicate that the GOF of the model is large, which in turn indicates an adequate PLS model validity.

4.10 Summary of Findings

This study employs PLS-SEM as the technique of analysis for testing the model of this research; rigorous steps were followed to establish the reliability and validity of the outer model as a standard reporting in SEM data analysis. After proving the validity and reliability of the measurement model, the hypothesised relationships

were tested. However, prior to examining the hypothesised relationships between the constructs, the predictive power of the model was examined and reported. This was followed by testing the goodness of fit of the overall model, which was confirmed. The final procedure was an examination of the structural model and the results are reported in detail. Table 4.20 presents a summary of the results of the tested hypothesis.

Table 4.20
Summary of the Results

No	Hypothesis Path	Decision
H1a	Management Commitment (MC) --> Safety Compliance (SCO)	Supported
H1b	Management Commitment (MC) --> Safety Participation (SPA)	Supported
H2a	Priority of Safety (PS) --> Safety Compliance (SCO)	Not supported
H2b	Priority of Safety (PS) --> Safety Participation (SPA)	Not supported
H3a	Safety Communication (SC) --> Safety Compliance (SCO)	Not supported
H3b	Safety Communication (SC) --> Safety Participation (SPA)	Supported
H4a	Safety Rules and Procedures (SR) --> Safety Compliance (SCO)	Supported
H4b	Safety Rules and Procedures (SR) -> Safety Participation (SPA)	Supported
H5a	Safety Training (ST) --> Safety Compliance (SCO)	Supported
H5b	Safety Training (ST) --> Safety Participation (SPA)	Not Supported
H6a	Worker's Involvement in Safety (WI) --> Safety Compliance (SCO)	Supported
H6b	Worker's Involvement in Safety (WI) --> Safety Participation (SPA)	Supported
H7a	Work Pressure (WP) --> Safety Compliance (SCO)	Not supported
H7b	Work Pressure (WP) --> Safety Participation (SPA)	Not supported
H8a	Management Commitment (MC) * Social Support (SS) --> Safety Compliance (SCO)	Supported
H8b	Management Commitment (MC) * Social Support (SS) --> Safety Participation (SPA)	Not Supported
H9a	Priority of Safety (PS) * Social Support (SS) --> Safety Compliance (SCO)	Not Supported
H9b	Priority of Safety (PS) * SS -> Safety Participation (SPA)	Not supported

No	Hypothesis Path	Decision
H10a	Safety Communication (SC) * Social Support (SS) --> Safety Compliance (SCO)	Not Supported
H10b	Safety Communication (SC) * SS -> Safety Participation (SPA)	Supported
H11a	Safety Rules and Procedures (SR) * Social Support (SS) --> Safety Compliance (SCO)	Not Supported
H11b	Safety Rules and Procedures (SR) * Social Support (SS) --> Safety Participation (SPA)	Not supported
H12a	Safety Training (ST) * Social Support (SS) --> Safety Compliance (SCO)	Supported
H12b	Safety Training (ST) * Social Support (SS) --> Safety Participation (SPA)	Not supported
H13a	Worker's Involvement in Safety (WI) * Social Support (SS) --> Safety Compliance (SCO)	Not supported
H13b	Worker's Involvement in Safety (WI) * Social Support (SS) --> Safety Participation (SPA)	Not supported
H14a	Work Pressure (WP) * Social Support (SS) --> Safety Compliance (SCO)	Supported
H14b	Work Pressure (WP) * Social Support (SS) --> Safety Participation (SPA)	Supported

Further discussion and analysis of these findings are provided in the following chapter in light of the literature review, the context of the study and the underpinning theories.

4.11 Chapter Summary

This chapter presents the response rate and provides a description of how the respondents are distributed with regards to certain demographic variables, including age, gender, qualifications and experience. In addition, this chapter reports the results of the non-response bias test. It is also reports the results of the data analysis. All the tests were conducted in order to examine the goodness of fit of the measurement model (content validity, convergence validity and discriminant validity). Further, tests were conducted to examine the structural model assessment as well as the predictive relevance and the quality of the model. Finally, a summary of the findings was provided.

CHAPTER FIVE

DISCUSSION AND CONCLUSION

5.1 Introduction

The present chapter discusses the findings presented in the preceding chapter to answer the research questions and objectives. The chapter is organized as follows: section one provides the recapitulation of the study findings while section two provides the discussion of the findings based on the research objectives and questions. In the section three, the implication of the study both theoretical and practical implications were provided while section four highlights the study limitations and based on the study limitations, in the section five suggestions for future studies were presented. Finally, in the section six conclusion is drawn.

5.2 Recapitulation of the Research Findings

The main objective of this study is to investigate safety behaviour of the foreign workers working in the Jeddah construction industry. Specifically, the present study investigate the relationships between safety climate i.e management commitment, priority of safety, safety communication, safety rules and procedures, safety training, workers involvement in safety, and work pressure on foreign workers safety behaviour (safety compliance and safety participation). In addition, the study also examines the interaction effect of social support on the relationship between the safety climate and safety behaviour.

With regards to the direct relationships between the safety climate and safety behaviour, of the 14 hypotheses proposed, eight hypotheses were supported. The

results show that management commitment, safety rules and procedures, safety training and worker's involvement in safety significantly predicts safety compliance. In contrast, priority of safety, safety communication and work pressure failed to predict safety compliance. With respect to safety participation, the results showed that management commitment, safety communication, safety rules and procedures and worker's involvement significantly predicts safety participation. While other dimensions priority of safety, safety training and work pressure had no significant effect on safety participation.

With regards to social support as moderator, the results reveal that social support significantly moderated the relationship between management commitment and safety compliance, safety training and safety compliance and work pressure and safety compliance. In contrast, social support failed to moderate the relationship between priority of safety, safety communication, safety rules and procedures, and workers involvement in safety on safety compliance.

The results also revealed that social support significantly moderated the relationship between safety communication and safety participation and the relationship between work pressure and safety participation. In contrast, social support failed to moderate the relationships between management commitment, priority of safety, safety rules and procedures, safety training and workers involvement in safety on safety participation.

5.3 Discussion

In this section, the headings of the discussion are organized according to the research questions and objectives. Precisely, the first part discusses the safety behaviour level among the foreign workers working in the Jeddah construction industry. Secondly, the discussions on the direct relationships of the safety climate on safety behaviour are discussed. Lastly, the moderating role of social support on the relationships between safety climate and safety behaviour are discussed.

5.3.1 Discussion on Safety Behaviour Level among the Foreign Workers Working in the Jeddah Construction Industry

The first research objective in this study is to assess the level of safety behaviour among the foreign workers working in the Jeddah construction industry. Safety behaviour is defined as the individuals' behaviours to promote health and safety of their own and the working environment (Leung et al., 2015). Based on the data collected from the field using five-point Likert scale, a test was conducted (see Table 4.10). From Table 4.10, the results showed the mean value of safety compliance was 4.38 and the mean value of safety participation was 4.41 which indicated strong agreement from the respondents. These findings imply that the level of safety behaviour among the foreign workers working in the Jeddah construction industry was high compared to other similar studies in safety (e,g., Guo Yiu, & González 2016; Hoffmeister et al. 2014; Lu & Yang, 2010; Neal & Griffin, 2006; Schwatka, & Rosecrance, 2016). For example, Vinodkumar and Bhasi (2010) found that the mean safety participation of 3.80 and the mean safety compliance of 3.88 in a study conducted in chemical industry in Kerala, India. In addition, Hon, Chan and Yam

(2014) reported mean safety participation of 3.44 and mean safety compliance of 4.55 in a study conducted in construction companies in Hong Kong.

There are numerous plausible reasons for this result. One possible reason could be attributed to the size of construction companies. In the context of this study, given that Al Muhaidib Company is among largest construction companies in Saudi; the company has enough resources to provide enough safety programs to foreign construction workers such as safety training program (MLSD, 2013). Earlier studies by Jannadi and AlSudairi (1995) which conducted among the twenty-five large construction companies in Saudi Arabia reported that, as the size of the company increases, the safety programs become more and more formal and tends to have better safety behaviour because the companies can properly design, develop and implement safety training.

Another possible reason for high safety behaviour in this study may be attributed to Saudi government requirement for high standard safety operating procedure. Saudi Arabian government make strong safety standard required for contractors because of the recent crane accident in the country (Hoseinpourfard, Ghanei, Tofighi, Ayoubian, & Izadi (2016).The provision of personal protective equipment in the work site and disaster planning and preparation are among the government requirements for assessing contractors (Hoseinpourfard et al. 2016). This possible reason of high level of safety behaviour among foreign workers in Al Muhaidib Company is attributed to Saudi Arabian government required standard safety operating procedure.

5.3.2 Management commitment to Safety and Safety Behaviour

Management commitment is defined as ‘‘the extent to which management is perceived to place a high priority on safety and communicate and act on safety issues effectively’’ (Neal & Griffin, 2004, p. 27). This study hypothesized that there is positive relationship between management commitment and construction workers safety behaviour (safety compliance and safety participation). As expected, the findings showed a significant positive relationship between management commitment and construction workers’ safety behaviour (safety compliance and safety participation) (see Table 4.14). This finding suggests that if the management are actively involved in safety issues, workers would reciprocate with positive safety behaviour. The finding from this study is consistent with the previous studies (e.g., Geldart et al., 2010; Miozza & Wyld, 2002; Michael et al., 2006). For example, Hansez and Chmiel (2010) conducted a research study on Belgium’s energy sector, and found a positive relationship between management commitment and workers safety behaviour. This finding is consistent with social exchange theory (Blau, 1964). This theory postulated that if management is committed to the construction workers safety in the organization, the workers would reciprocate in terms of safety compliance and participation.

The finding of the present study clearly demonstrates that organizations that heavily invest on worker’s safety would help induce positive safety behaviours (McGonagle, Childress, Walsh, & Bauerle, 2016). In the present context the organization is seen to heavily invest on employee’s safety; for example 250 out of the 282 respondents who respondent have stated that they have attended occupational safety training (see

Table 4.7). This action of investing in employees' safety by management will influence employee's safety behaviour (Michael et al., 2005). It is a clear example that management is investing into safety by sending its employee even though they are foreign labours for safety training. This act of the management is then reciprocated with these foreign labours behaviour that displays high level of compliance and participation.

Furthermore, effective safety behaviour is attributed to good safety practices by the management in the workplace (Panuwatwanich, Al-Haadir, & Stewart, 2016). Workers whose managers are dedicated to their own safety have expectations that such safe behaviour is valued and will be supported by their managers and, further, that unsafe behaviours are discouraged and will be penalised (Geldart et al., 2010). During the data collection, it was notable that the managers and supervisors were extremely circumspect about complying with safety practices onsite and followed strict safety protocols. As an illustration, while on a construction project, managers wore PPE at all times. This kind of safety compliance will positively influence and encourage construction workers to comply with safety practices onsite.

Additionally, safety behaviour is attributable to the quick action of management to correct any safety problems that arise in the organisation. Michael et al., (2006) argued that a commitment to safety at every level of management is helpful in encouraging workers to respond to actions because; doing so demonstrates safe behaviours in the workplace. Moreover, Panuwatwanich, et al., (2016), in a study conducted among construction workers in Saudi Arabia, reported that if management

consistently takes quick action when safety issues are raised, workers are more likely to comply with the requisite safety issues onsite. The management of Al Muhaidib creates the necessary conditions for positive safety behaviour onsite by making sure that safety department managers lead from the front line, continuously monitoring and evaluating safety procedures and protocols close to the foreign construction workers. Thus, if there are any hazards or workers raise alarms about safety issues, the management will be in a good position to take quick action to eliminate the risk.

5.3.3 Priority of safety and Safety Behaviour

Priority of safety is defined as the degree to which workers perceived safety as a top priority by the management (Bosak et al., 2013). This study hypothesized that there is positive relationship between priority of safety and construction workers safety behaviour (safety compliance and safety participation). The findings of this study demonstrated a non-significant relationship between the priority given to safety and construction workers' safety-related behaviour (safety compliance and safety participation) (see Table 4.14). In other words, variance in priority of safety failed to predict explain the variance in workers safety behaviour in this study. The finding from this study is consistent with the previous studies (e.g., Hong, 2015; Rundmo & Moen, 2007). For example, Katz-Navon, et al., (2005) found no significant effect on direct relation between safety priority and safety performance.

One possible reason for the non-significant relationship found in this study may be related to the management of the Al Muhaidib construction company, since the company was found to repeatedly make safety procedures contingent on production

pressures (Zohar & Erev, 2006). In this regard, foreign workers were found to infer that safety was only a low priority for the company, although the company's overt policy is that the safety of foreign workers is a top priority. Zohar and Erev (2006) stated that an organisation that makes safety procedures contingent on production pressures will affect workers' perception of the actual priority assigned to safety, which will consequently affect their safety-related behaviour. This potential explanation is also supported by the demographic characteristics of the respondents whereby the respondents reported high frequencies of accidents (see Table 4.7). This demonstrates that safety procedures within the Al Muhaidib construction company could be very much contingent on production pressures. Therefore, this would have made the construction workers to perceive that safety to have only a low priority, leading them to believe that production is more likely to be rewarded and supported than safe behaviour.

Another possible reason for the non-significant relationship identified in this study that may also be attributed to the management of the construction company is the fact that the company's typical practice is inconsistent with their stated safety priorities, especially when circumstances change. This notion can be supported by the research of Zohar (2010), who claimed that when a company's management team acts in a manner that is inconsistent with their stated safety priorities when circumstances change, it can signify the low priority of safety. As an illustration of this point, a recent Saudi government regulation intended to ensure the safety of all construction workers required construction companies to stop their foreign workers from working between the hours of 12pm and 3pm because of the high temperature

during that period (MLSD, 2016). This regulation could cause construction companies to attempt to increase the speed of work during the day in order to make up for the reduced working hours, which would necessitate lacks of a focus on safety. This could occur because of the commonly held belief that safety goals often conflict with other goals such as speed, which are also important organisational goals (Zohar, 2000). Since the construction companies are operating with the intention of maximising profit, it is likely that they will devise various procedures that workers perceive as a means of increasing speed (Panuwatwanich et al., 2016).

Another possible reason for the non-significant relationship between the priority given to safety and construction workers' safety-related behaviour may be attributed to the company's policy in terms of meeting client deadlines. It appears that the working practices of the Al Muhaidib construction company do stress the importance of safety before work commences, but as the work progresses the company's concern regarding deadlines takes priority and hence less attention is paid to safety. Presence of such condition is supported where a study conducted by Kartam, Flood and Koushki (2000) reported such an issue in Kuwait. They found that construction companies that consider meeting client deadlines typically report low employee safety behaviour. Therefore it is not surprising that the similar situation could take place in the Saudi context where meeting datelines are always a priority in construction sector to avoid delay penalties.

5.3.4 Safety Communication and Feedback and Safety Behaviour

Safety communication is defined as the provision of information and data on the safety level of an organization to identify the degrees of risk that result in accidents in the workplace (Bentley & Haslam, 2001). This study hypothesized that there is positive relationship between safety communication and construction foreign workers safety participation. The findings of this study demonstrated a significant positive relationship between safety-related communication and construction foreign workers safety participation (see Table 4.14). In other words, if management communicate safety to the foreign workers, the workers will exchange in participation in to safety activities. The finding from this study is consistent with the previous studies (e.g., Arboleda et al., 2003; Bentley & Haslam, 2001; Conchie, et al., 2011; & Vredenburgh, 2002). For example, Cigularov et al. (2010) conducted a study of the construction industry in the US, and found that there is a significant positive relationship between safety communication and safety participation.

Such a significant relationship between safety communication and safety participation could be attributed to a high level of communication between management and workers (Hardison et al., 2014). Fleming and Lardner (2002) argued that the quality and frequency of safety-related communication between managers and employees is likely to influence the safety behaviour of construction workers. In the context of this study, the management of the Al Muhaidib construction company assign a specialist safety team to each construction project in order to closely communicate with foreign workers and encourage them to participate in the company's safety programme. Such an approach should result in

the foreign workers participating more fully in all safety measures, as well as committing extra effort to improving the safety record of the company as a whole. This potential explanation is supported by the study of Hardison et al (2014), who noted that employees' safety participation can be increased by the management team communicating directly with the worker.

Additionally, the significant relationship identified between safety communication and safety participation might be attributable to the channel of communication used by management to deliver safety information (Vecchio-Sadus, 2007). It is clear that the management team of the Al Muhaidib construction company has identified an appropriate method of communication with both managers and foreign workers, since the company relies on the use of clear channels of communication such as face-to-face meetings with workers in the workplace. This type of communication is particularly appropriate for use with foreign construction workers because it allows for direct interactions between managers and workers that can serve to clarify safety issues on site (Fleming & Lardner, 2002). In addition, it causes the workers to report any safety-related matters that they observe during the construction project to those management representatives who are on site for safety purposes. This possible explanation is supported by the study of Vecchio-Sadus (2007), who reported that the proper use of appropriate communication channels for safety can improve workers' level of participation in the company's safety activities.

This study also hypothesised that there exists a positive relationship between safety communication and construction foreign workers' safety compliance. However, the

findings of the study showed a non-significant relationship between safety communication and construction foreign workers' safety compliance (see Table 4.14). In other words, safety communication failed to predict construction foreign workers' level of safety compliance in this study. Yet, this finding is consistent with the results of previous study (Casey & Krauss, 2013; Lu & Yang, 2011). For example, Vinodkumar and Bhasi (2010) found non-significant relationships between safety communication and safety safety compliance.

One possible reason for the non-significant relationship found in this study could be the coexistence of workers of different nationalities, which could result in communication barriers, not only among workers, but also between management and the workers (Sousa et al., 2014). In the context of this study, the profile of the respondents indicated that the foreign workers were of six different nationalities, namely Pakistani, Indian, Egyptian, Yemeni, Filipino and Syrian (see Table 4.7). The use of different first languages among workers makes communication difficult, especially between management and the workers, and it could certainly result in the workers not following the correct safety rules and procedures while carrying out their jobs. Cheng and Wu (2013) agreed that foreign workers might experience safety compliance problems due to differences in language, culture and living habits.

Another possible reason for the non-significant relationship identified in this study could be the low level of education found among the construction workers (Hallowell & Gambatese, 2008). In this study, the demographic results demonstrated that the majority of respondents had a low level of educational attainment (see Table

4.7). This low level of education is likely to cause the foreign workers to find it difficult to read safety notices and operating procedures, which will in turn reduce their level of on-site safety compliance. This potential explanation is supported by the findings of Davis (2011), who argued that the low compliance rate in certain industries is due to the fact that relatively complex safety procedures require a high level of education on the part of workers to ensure that they are capable of complying with the necessary procedures.

5.3.5 Safety Rule and Procedure and Safety Behaviour

Safety rules and procedures enable workers to perform their duties according to ethical and safe methods (Vinodkumar, 2005). This study hypothesized that there is positive relationship between safety rule and procedure and construction foreign workers safety behaviour. The findings of this study showed a significant positive relationship between safety rules and procedures and construction foreign workers' safety behaviour (safety compliance and safety participation). (see Table 4.14). The finding from this study is consistent with the previous studies (e.g., Al-haadir & Panuwatwanich, 2011; Langford et al., 2000). For example, Langford et al., (2000) conducted a study of 126 directly employed construction workers in 10 companies in the UK and found that perceptions of risk management as well as rules and regulations on safety influence the safety behaviour of construction workers. This finding is consistent with social exchange theory (Blau, 1964), this theory postulated that if management provides clear safety rules and procedures to the construction foreign workers, the workers would reciprocate in terms of safety positive safety behaviour (safety compliance and safety participation).

The significant relationship identified between safety rules and procedures and safety behaviour could be attributed to the strict new Saudi government regulations intended to guarantee safety on construction sites following the recent fatal crane accident in the country (Hoseinpourfard et al. 2016). Tam et al., (2004) agreed that if a government provides strict safety regulations, as well as focusing on safety-related policies and procedures, then companies must adhere to the stated rules. In the context of this study, it appears that the Al Muhaidib management is adhering to the safety rules established by the Saudi government. This results in the construction foreign workers following the correct safety rules and procedures while carrying out their tasks, as well as encouraging their co-workers to work safely when on site.

Furthermore, the significant relationship between safety rules and procedures and safety behaviour could also be due to the fact that management strives to make all rules and procedures practical for foreign workers (Cheng & Wu, 2013). When workers perceive that their employers are highly supportive due to safety procedures being made more practical for them, they are more likely to interpret the safety-related rules and procedures designed and implemented by the organisation as intended to maintain and improve safety, as well as being more confident in their capacity to achieve the desired safety outcomes (Hu, Griffin, & Bertuleit, 2016). For instance, in the context of this study, the management of the Al Muhaidib construction company have introduced practical standard safety rules and procedures for foreign workers, including ensuring the maintenance of safe equipment operating conditions. As a result, the foreign workers are likely to comply with the relevant

safety rules and procedures in order to reduce the accident risk associated with unsafe working practices.

Additionally, the significant relationship identified between safety rules and procedures and safety behaviour might be attributed to the ability of the construction company's management team to support workers' knowledge of all relevant rules and procedures. Workers who have more knowledge of safety rules and procedures are more likely to behave safely in the workplace (Dahl, 2013). In the context of this study, the management of the Al Muhaidib construction company is working to update foreign workers' knowledge of the company's safety rules and procedures. This notion is supported by the demographic characteristics of the respondents, which clearly showed that the majority of foreign workers (88.7%) have attended safety-related training (see Table 4.7). In addition, demographic characteristics of the respondents also showed high frequency of foreign workers safety training in Al Muhaidib Construction Company (see Table 4.7). This can be an avenue to share and educate the foreign workers on the safety rules and procedures. Therefore, knowledge enhancement certainly appears to be an appropriate means of improving workers' safety behaviour (safety compliance and safety participation).

5.3.6 Safety Training and Safety Behaviour

Safety training is defined as safety-related information or knowledge given to workers to allow them to operate their work routines safely and with no hazard to their well-being (Abdullah et al., 2009). This study hypothesised that there exists a positive relationship between safety training and construction foreign workers'

safety compliance. The finding from this study showed significant and positive relationship between safety training and construction foreign workers safety compliance (see Table 4.14). This finding implies that construction companies that constantly trained their workers would benefit in term of workers safety compliance. The finding in this study is consistent with prior studies (e.g., Lehmann et al. 2009; Chen & Jin, 2011). For example, Chen and Jin, (2011) reported that safety training has a positive influence on workers safety compliance.

The significant relationship between safety training and safety compliance could be attributed to the comprehensive programme of safety training provided to construction foreign workers by their employers. Such training would render the workers more likely to comply with safety precautions in order to avoid accidents on site (Carlson & Eggerding, 2000). Zacharatos et al. (2005) agreed that workers who are provided with sufficient and appropriate safety training by their managers will demonstrate an increased level of workplace safety. In the context of this study, the management of the Al Muhaidib construction company run frequent and comprehensive safety training sessions for foreign workers, which is supported by the demographic finding of this study that 73.5% of the workers have received sufficient and frequent safety training (see Table 4.7). Therefore, the foreign workers should have sufficient knowledge to comply with the company's on-site operating procedures. This notion is supported by the study of Lai, Liu, and Ling (2011), who argued that providing safety training regarding operating procedures and equipment usage can lead to better safety compliance on the part of workers.

Another reason for the significant relationship between safety training and safety compliance found in this study could be the fact that the Al Muhaidib management team work to ensure their foreign construction workers are kept well informed via sufficient and appropriate safety training (Lai et al., 2011). It is worth noting that Al Muhaidib assigns a specialist safety team to each construction project so that it is clear who has responsibility for updating the safety training of foreign workers in order to maintain the necessary safety standards on construction sites. This approach should render the foreign workers better able to understand any new instructions and safety-related demonstrations, as well as strengthening their understanding of necessary tasks and the need to remain protected and safe (Lai et al., 2011). This possible explanation is supported by the study of Chan, Chan and Choi (2010), who argued that updating workers regarding safety procedures should improve their level of safety compliance.

This study also hypothesised the existence of a positive relationship between safety training and construction foreign workers' safety participation. However, the results of this study actually showed a non-significant relationship between safety training and construction foreign workers' safety participation (see Table 4.14). In other words, safety training failed to predict the level of safety participation in the context of this study. Yet, this finding is consistent with the conclusions of prior studies that reported a non-significant relationship between safety training and workers' safety participation (e.g., Ismail, et al., 2015; Vinodkumar & Bhasi, 2010).

One possible explanation for the non-significant relationship identified in this study could be attributed to the safety training modules / contents probably are not relevant to address the basic knowledge, skills, and abilities that need to be equipped among foreign workers particularly those with low level of experience (Gyekye & Salminen, 2009). In the context of this study, the demographic characteristics of the construction foreign workers demonstrated that majority of them (79.1%) had only between 1-5 years in the present construction company which showed a low level of experience working in the construction industry (see Table 4.7). This indicates that they have limited experience and knowledge of participating in construction activities, which will of course impact their likelihood of informing the management team about any hazards they notice in the workplace. Therefore, the workers' low level of experience suggests that they would not have the ability to adequately participate in all activities relevant to safety in the construction industry. This possible explanation is in agreement with the previous findings of Gyekye and Salminen (2009), who reported that the lower workers' organisational tenure with a company is, the lower their safety participation in that company will be.

Another possible reason for the non-significant relationship found in this study could be the fact that the management team is not incorporating safety participation in the design of their safety training programme. In the context of this study, the profile of the respondents indicated that the foreign workers were of six different nationalities (see Table 4.7) which make it difficult for the management of the company to incorporate safety participation in their training design. Although the Al Muhaidib Company provides its foreign workers with safety training, which is of course

designed to help them to comply with safety rules, the language barrier might mean that the workers cannot participate in certain safety-related activities such as encouraging their co-workers to work safely. This suggestion is supported by the findings of Cheng and Wu (2013), who argued that language, culture and living habits are all strong barriers to foreign workers' participation in safety activities on construction sites.

5.3.7 Workers Involvement in Safety and Safety Behaviour

Workers' involvement is a behaviour-oriented approach that enables individuals (or a set of individuals) to communicate in the upward flow and to make decisions within an organization (Vinodkumar & Bhasi, 2010). This study hypothesized that there is positive relationship between workers involvement in safety and construction foreign workers safety behaviour (safety compliance and safety participation). The finding from this study showed significant positive relationship between workers involvement and construction foreign workers safety behaviour (safety compliance and safety participation) (see Table 4.14). This finding indicated that if management is involving workers in to safety decision, foreign workers safety behaviour can be improve. The finding is consistent with social exchange theory (Blau, 1964) which postulated that if management is involving the construction foreign workers into the organization's safety activities, the foreign workers would reciprocate in terms of safety compliance and participation. The finding from this study is consistent with the previous studies (e.g., Shannon et al., 1996; Vinodkumar & Bhasi, 2010; Vinodkumar, 2005; Vredenburgh, 2002; Wachter & Yorio, 2014). For example, Marwat et al., (2007) conducted a study on the telecommunications division in

Islamabad to examine the relationship between workers' involvement and workers' safety performance; it is shown that workers' involvement has a positive association with workers' safety performance.

The significant relationship identified in the present study could be attributable to the management of Al Muhaidib involving foreign workers in the setting of safety goals and objectives (Cheng et al., 2012b). This involvement is usually achieved through the workers' appointed representative. Törner and Pousette (2009) argued that the involvement of workers in safety-related decision making can enhance the workers' safety behaviour, since the more workers are involved in safety matters, the more they tend to remain safe. In the context of this study, during the data collection process, it was noted by the researcher that the Al Muhaidib management team appointed representatives from among the foreign workers to discuss safety issues and provide relevant opinions prior to final decisions being made regarding safety-related issues. This should certainly encourage workers to put in extra effort in order to improve safety on site, as well as informing managers via their appointed representatives of any safety-related matters that are noticed during construction projects.

Additionally, the significant relationship identified between workers' involvement and their safety behaviour might be attributable to the management involving workers in the design of safety measures targeted at the construction industry (Behm, 2005). Bluff (2003) argued that managers who involve workers in a project's safety design and solicit relevant suggestions actually help to ensure that the safety aims of

the project are achieved. In the context of this study, it appears that the Al Muhaidib management team do involve foreign workers with relevant experience in the design of safety procedures for individual projects. This should help the company to ensure that the prepared safety measures avoid predictable hazards for construction foreign workers. As a result, it should cause the foreign workers to be subject to the highest levels of safety when carrying out their tasks. This potential explanation is supported by the work of Behm (2005), who claimed that if the design of a construction safety concept is impacted by both management and workers, then the workers would be subject to improved safety and decreased risk onsite.

5.3.8 Work pressure and Safety Behaviour

Glendon and Stanton, (2000) defined work pressure as "a degree to which employees feel under pressure to complete work, amount of time to plan and carry out work, balance of workload" (p. 202). This study hypothesised that there exists a significant negative relationship between work pressure and construction foreign workers' safety behaviour (safety compliance and safety participation). Such a hypothesis was not in fact supported by the findings of this study, which instead demonstrated a non-significant relationship between work-related pressure and construction foreign workers' safety behaviour (see Table 4.14). The finding from this study is consistent with the previous studies (e.g., Ghasemi et al., 2017; Mohamed, 2002). For example, Mohamed (2002) investigated the association between ten dimensions of safety climate and safety performance and that between safety climate and safety behaviour in 19 construction sites in the South Queensland, Australia and found that work pressure is not directly significant with the safety behaviour. The author claimed that

the non-significant relationship could be due to the psychological aspects of working under pressure and perceiving the conflicting safety and production requirements.

The possible reason for the non-significant relationship between work pressure and safety behaviour identified in this study may be attributed to the fact that "working under pressure is the norm in the construction industry" (Mohamed, 2002, p. 381). This notion can be supported by the research of Choudhry et al., (2007) that noticed high work pressure among the construction workers. As illustrated this point in this study, during the data collection, the researcher noticed the foreign construction workers are working under pressure to finish their work on time. Because work pressure is usual in construction work as there always deadline in the contract, therefore, it seems that the construction foreign workers are accustomed to work in under time pressure. In this situation, the foreign workers might think that it is normal to work under such condition on construction site which could explain why work pressure does not influence foreign workers safety behaviour.

5.3.9 Moderating Effect of Social Support

Social support has been defined as "verbal and nonverbal communication between recipients and providers that reduces uncertainty about the situation, the self, the other, or the relationship, and functions to enhance a perception of personal control in one's life experience" (Albrecht & Adelman, 1987). As hypothesised in this study, with regards to the potential moderating effect of social support, the results reveal that social support significantly moderated the relationships between (i) management commitment and safety compliance, (ii) safety training and safety compliance, (iii)

work pressure and safety compliance, (iv) safety communication and safety participation, and (v) work pressure and safety participation. The findings of this study are therefore consistent with the conclusions of previous studies that found social support to serve as a moderator (e.g., Jamal, 2013; Martz et al., 2010; Wickramasinghe, 2012). For example, Abualrub, Omari, Al Rub and Fawzi (2009) investigated the role of social support from co-workers and supervisors on the stress satisfaction relationship. Their findings indicated that there were moderating influences of social support role from both co-workers and supervisors on the stress–satisfaction relationship. Workers with high level of social support interaction were more satisfied with their works than workers with less support.

The finding that social support moderates the relationship between work pressure and safety behaviour (safety compliance and safety participation), as well as the relationship between safety communication and safety participation, could be attributed to the fact that these factors are highly likely to be influenced by a worker's daily interactions with supervisors, co-workers and family, thereby reducing work-related pressure and increasing communication (Hsu, Lee, Wu, & Takano, 2010; Lingard, Cooke, & Blismas, 2012). Consequently, social support facilitates safety communication and reduces work-related pressure, which is of key importance to predicting construction workers' safety behaviour (Wedgeworth, LaRocca, Chaplin, & Scogin, 2016).

Further, the finding that social support moderates the relationship between management commitment and safety compliance could be attributed to the fact that

the management of the Al Muhaidib Company aims to foster an enabling environment that supports social interaction in the workplace (i.e. the construction site). Therefore, social support and management commitment interact to predict foreign workers' level of safety compliance. This possible explanation is supported by the findings of Amponsah-Tawaih and Appiah (2016), who claim that organisations that create an enabling environment in which their workers can interact actually serve to improve the workers' level of safety compliance.

Additionally, the finding that social support moderates the relationship between safety training and safety compliance could be attributed to the fact that the Al Muhaidib company provides frequent safety training for foreign construction workers (see Table 4.7), which also causes the workers to interact during the training programmes. Demirkesen and Arditi (2015) argued that the provision of regular safety training within an organisation can encourage and motivate workers to engage in more interactions during the training programmes. In this context, an increase in safety training serves to increase the foreign construction workers' safety compliance. The availability of social support hence strengthen/improves the workers' safety compliance level. In addition, as the workers develop their skills and knowledge during the training programmes, they learn how to better comply with the company's safety procedures.

In contrast, this study found that social support failed to moderate the relationships between (i) the priority of safety and safety compliance, (ii) safety communication and safety compliance, (iii) safety-related rules and procedures and safety

compliance, (iv) workers' involvement in safety-related matters and safety compliance, (v) management commitment and safety participation, (vii) the priority of safety and safety participation, (vii) safety-related training and safety participation, (viii) safety-related rules and procedures and safety participation, and (ix) workers' involvement in safety-related matters and safety participation.

The finding that social support failed to moderate the relationship between safety-related rules and procedures and safety behaviour (safety compliance and safety participation) could be attributed to the fact that the Al Muhaidib company provides a set of clear safety rules to all its foreign construction workers. Thus, the workers do not need to engage in social interactions in order to comply or participate in safety-related measures on the construction site. This possible explanation is supported by the work of Hale and Borys (2013), who reported that organisations with clear safety rules and procedures in place for workers facilitate those workers' participation and compliance with safety-related matters.

In terms of social support failing to moderate the relationship between the priority of safety and safety behaviour, this finding could be due to an employee requiring social support when he/she openly demonstrates a need for help (Frese, 1999). In this context, the employees of the Al Muhaidib company might have felt that the level of priority awarded to safety by the company's management actually provides them with support in the workplace (mean = 4.2) (see Table 4.10). As such, they would not require support in terms of their work practices, although they may need it in relation to the socialisation process. This would in turn have resulted in the influence

of social support as a moderator not manifesting in the relationship between the priority of safety and safety behaviour.

According to Frese (1999), another possible reason why the moderating role of social support might not be found in this context is the fact that an employee is more prone to receiving support when he/she makes it publicly known how badly he/she suffers due to the stressors present in the workplace. It is possible that foreign employees' concerns about being sent back to their country of origin mean that they do not make their suffering or problems publicly known. They could have borrowed money to travel to Saudi Arabia in search of work or they might have other commitments such as providing for their children's education or a parent's medical expenses (Frese, 1999), which are likely to prevent them from publicly discussing their suffering. Another potential explanation could be the fact that the company's management team has given priority to safety rather than production (mean = 4.2) (see Table 4.10). Therefore, the feelings of helpless that create the need for social support (Buunk, & Peeters 1994) do not arise in this context.

With regards to the relationship between management commitment and safety participation, the finding that the moderating influence of social support did not manifest could be explained by the fact that the foreign employees did not feel helpless. The mean value of management commitment (mean = 4.07) (see Table 4.10) demonstrates that the foreign workers employed by the Al Muhaidib company do not feel helpless and, as Buunk and Peeters (1994) stressed, it is feelings of helpless that cause depression and create the need for social support. In the present

context, the company's management has provided the foreign workers with feelings of being cared for; thus, social support would not have needed to manifest its influence in this relationship. However, it must be acknowledged that this is a highly speculative account. Another potential explanation could be the notion that demonstrating management commitment to safety-related matters could be perceived as a method of showing support for employees, which could in itself be perceived as a source of social support. It could also be a reason why social support did not manifest its moderating role in this context (Vinodkumar & Bhasi, 2010).

In terms of social support failing to moderate the relationship between workers' involvement in safety-related matters and safety behaviour, this finding could be attributed to the fact that the workers' involvement in safety issues at the Al Muhaidib company is sufficient to ensure foreign workers safe behaviour. Indeed, in this study, the mean value of workers' involvement in safety is high (mean = 4.32) (see Table 4.10). Therefore, the foreign workers do not demonstrate a need for social support because their level of involvement enables them to work and communicate closely with their managers and supervisors with regard to safety in the workplace (Geldart et al., 2005). In such a situation, the foreign workers would feel a sense of ownership of safety-related suggestions, as well as feeling valued due to their contributions, since the management teams helps to solve any problems that arise through broad participation (Biggs, Banks, Davey, & Freeman, 2013). This would in turn have resulted in the moderating influence of social support not being manifested in the relationship between workers' involvement in safety-related matters and safety behaviour.

The finding that social support failed to moderate the relationship between safety communication and safety compliance could be attributed to the fact that the foreign workers know how to follow the appropriate rules and procedures due to the safety communication provided by the Al Muhaidib management team they do not need to have social support interaction as they need it with safety participation which is supported in this study. Indeed, Kreijns, Kirschner and Jochems (2003) noted that participative behaviour requires more social interaction within an organisation.

Additionally, the finding that social support failed to moderate the relationship between safety training and safety participation could be attributed to the fact that the content of safety training programmes is probably not as relevant as the basic knowledge, skills and abilities that foreign workers need in order to participate safely in the workplace. Further, in the context of this study, the majority of foreign workers employed by the Al Muhaidib company had only a low level of experience working in the construction industry (see Table 4.7). This clearly indicates that they are likely to have only limited skills, knowledge and experience, which might impact their likelihood of engaging in social interactions on the construction site. This would in turn have resulted in the moderating influence of social support failing to manifest in the relationship between safety training and safety participation.

5.4 Research Implications

The findings of this study have significant implications for both theory and practice. Theoretically, the study contributes to the research literature concerning safety, while it contributes practically to the construction practitioners. The theoretical

contributions will be highlighted first, followed by the practical contributions for construction companies.

5.4.1 Theoretical Implications

This study specifically investigated construction workers' safety-related behaviour by using organisational safety practices as the antecedents and social support as a moderator in the Saudi construction industry. The study contributes theoretically to the existing safety literature by addressing an important research gap that has not previously been investigated by studies concerning safety.

First, this study has contributed significantly to the literature by introducing the role of social support as a moderating variable in the relationship between organisational safety practices and foreign construction workers' safety behaviour in Saudi Arabia. This model provides additional areas of study to safety researchers regarding the importance of social support in enhancing safety-related behaviour. The research findings have provided new avenues for the safety literature by offering new information on the role of social support in this context. In this regard, social support is proved to be helpful to foreign workers because it has the ability to facilitate the foreign workers' safety behaviour through social interactions.

Secondly, this study expanded the use of social exchange theory in understanding foreign construction workers' safety behaviour in the context of Saudi Arabia. Social exchange theory posits that the favourable treatment received by one party obligates him/her to provide favourable treatment in return (Blau, 1964). That is, when one party provides a benefit, the receiving party is obligated to respond in kind. The

reverse would also be true; hence, when negative treatment is provided, negative treatment or poor behaviour would be reciprocated. In the context of this study, the provision of sufficient and appropriate organisational safety practices by the Al Muhaidib Company would render the foreign construction workers likely to reciprocate in terms of safety compliance and participation on the construction site. The study thus offers an empirical validation of the theoretical justification for social exchange theory in the Saudi construction industry.

Thirdly, there has previously been only very limited research on organisational safety practices and safety behaviour, particularly in the context of the Saudi construction industry. This study contributed theoretically by investigating how organisational safety practices influence foreign construction workers' safety-related behaviour in the construction industry in Saudi Arabia. The study therefore provides additional areas of study to safety researchers regarding of the role of organisational safety practices in enhancing foreign construction workers' safety behaviour.

Finaly, this study added to the scant research on the safety of foreign construction workers employed in the Saudi construction industry. This is important because relatively few studies have previously been conducted on foreign construction workers' safety (Debrah & Ofori, 2001). Therefore, this study provided additional empirical evidence on the role of organisational safety practices in improving foreign construction workers' safety in the context of the Saudi construction industry. This should contribute to a better understanding of the relationship between the

antecedents of safety behaviour and accidents at a level where the actual causes of an accident can be determined.

5.4.2 Practical Implications

This study has important practical implications for construction companies in Saudi Arabia because the results have significant implications for the field of construction safety, particularly in terms of enhancing foreign construction workers' safety-related behaviours. First, since this study found management commitment to be among the most important predictors of foreign construction workers' safety behaviour, the Al Muhaidib management can increase the frequency of their safety commitment by tabling safety issues during meetings and investing in the resources necessary for guaranteeing safety, as well as facilitating the provision of adequate PPE to foreign construction workers. In addition, the company can enhance the foreign construction workers' safety behaviour by taking corrective action whenever unsafe working practices are reported to the management, as well as expressing concern if safety procedures are not adhered to on the construction site.

Secondly, the study empirically demonstrated that safety rules and procedures represent a significant predictor of foreign construction workers' safety behaviour. Al Muhaidib Construction Company could enhance the foreign construction workers' safety-related behaviour (i.e. compliance and participation) by maintaining and improving the necessary safety rules and procedures. This could be achieved by ensuring those safety rules and procedures are always practical for foreign construction workers employed on construction sites, as well as ensuring that the

safety rules and procedures can be followed by the workers without causing conflict with their working practices.

Thirdly, this study empirically proved that the workers' level of involvement in safety-related matters is a significant predictor of foreign construction workers' safety behaviour. Therefore, in order to ensure that the foreign construction workers' safety behaviour is enhanced on the construction site, the management of the Al Muhaidib Company could increase the frequency of involving foreign construction workers in the company's safety-related decision making. The company's management team should also regularly consult with the foreign workers regarding workplace safety issues, as well as listening to foreign construction workers' opinions before making the final decision on safety-related matters.

Fourthly, the empirical findings of this study demonstrated that safety training is significantly related to safety compliance. Therefore, in order to ensure that the foreign construction workers' level of safety compliance is increased, the management of the Al Muhaidib Company could increase the frequency of the safety training provided to foreign construction workers. For example, established workers should be provided with frequent comprehensive training, while newly recruited workers should be adequately trained in the safety rules and procedures relevant to the construction site.

Fifthly, since safety communication was empirically shown to predict workers' level of safety participation in this study, the management of the Al Muhaidib Company could improve foreign construction workers' level of safety participation through

properly communicating safety practices to the workers. For example, always informing the workers about current safety concerns and issues on the construction site, as well as operating an open door policy regarding safety issues relevant to the company.

Sixthly, the findings of this study provide additional empirical evidence for the Saudi government concerning how to enhance the safety policies and regulations of construction companies by determining which organisational safety practices are appropriate and important to the construction sector.

Finally, since social support was found to be an important moderator of the relationships between different facets of organisational safety practices, as well as being a critical element in the promotion of foreign construction workers' safety behaviour, it is recommended that the Al Muhaidib Company encourages supervisor support for foreign construction workers. For instance, the supervisors could assist the foreign construction workers when they are facing difficulties. Further, the supervisors could be encouraged to cooperate with the foreign construction workers in solving any such difficulties. Additionally, the Al Muhaidib management could enhance the level of co-worker support available within the company by encouraging cooperation among the foreign construction workers to solve any difficulties that might arise.

5.5 Research Limitations

The present study has succeeded in providing various insights into the importance of organisational safety practices, social support and safety behaviour. Nevertheless, the

study was subject to several notable limitations. Firstly, the study only focused on one company which is Al Muhaidib Construction Company it may therefore be difficult to generalise the findings to other construction companies in Saudi Arabia because the sampled workers came from a single construction company.

Secondly, in this study, the construction workers' safety-related behaviour was measured using self-report measures that may be affected by social desirability bias (Grimm, 2010). There exists a possibility that the workers may have over-reported their behaviour. However, in order to reduce the possibility of social desirability bias in this study, the researcher informed the respondents that their answers would be kept confidential and used solely for academic purposes. Therefore, the results should be used with caution.

Thirdly, the findings may not be generalizable to other contexts and cultures because the data collected from this study were limited to the Saudi Arabian construction industry. Different countries have different safety laws and business environments, which may affect how workers perceive organisational safety practices, social support and safety behaviour.

Finally, this study did not address the influence of the educational attinments into the hypothesized relationship. Given the variation in the educational attainments there is a possibility that these variation could have resulted in perception on safety climate to be dissimlar. Given these variation did not yield any difference on the study variables future studies are suggested to consider the influence of educational attainment in understanding perceptions on safety climate.

5.6 Suggestion for Future Research

Based on the limitations of this study, the following areas for future research are suggested. First, future studies should expand on research model to other sectors in Saudi Arabia such as the trade sector, which is the sector with the second highest number of accidents and injuries in the country. Such additional research studies would provide the opportunity for comparisons across sectors as the industries differ in terms of their management style and company culture. In addition, this research model could be expanded by examining new constructs /variables that are not included in the research model. For instance, job demands interfering with safety and pressure from coworkers to behave safely (Kath et al., 2010).

Secondly, future researchers may apply other methods for evaluating safety behaviour in order to control for social desirability bias. Specifically, supervisor ratings of worker's safety behaviour or peer reporting could be used to control for social desirability bias. Finally, future studies are recommended to replicate this study in other cultures or countries, especially other Middle Eastern countries, in order to widen the generalisability of the findings given that such countries experience similar safety problems (Awwad, El Souki, & Jabbour, 2016).

5.7 Conclusion

Numerous literature gaps can be seen in the safety literature in terms of the relationships between organisational safety practices and safety behaviour due to inconsistencies in prior findings (Christian, Bradley, Wallace, & Burke, 2009; Zohar, 2010). Therefore, social support was introduced in this study because it had not been

considered by earlier researchers. The present study contributed to the safety literature by responding to all the identified research objectives. The study successfully examined the relationship between organisational safety practices, safety behaviour and social support in the Saudi Arabian construction industry. The present study has provided empirical evidence of the role of social support as a moderator in the safety arena. The results also provide support for several theoretical contributions. First, this study filled an important theoretical research gap by including social support as a moderating variable in safety. Secondly, the study provided support for the utility of social exchange theory. In addition, the findings of this study offered significant practical implications to the construction industry regarding how to improve employees' safety-related behaviour. Finally, numerous future lines of research were identified based on the limitations of this study.

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Appendix A
English Language Research Questionnaire

Dear Sir/Madam,

I am Bassem Alfayez, a PhD student at the School of Business Management of Universiti Utara Malaysia. You are cordially invited to participate in a study that aims to investigate safety climate and safety behaviour. Findings of this study will offer practical recommendations on how organizations in Saudi Arabia can enhance their foreign employee's safety behavior in the construction sector. Your participation is voluntary. Kindly complete the attached survey. This should not take more than 15 minutes of your valuable time. The survey collects no identifying information. All of the responses in the survey will be recorded anonymously and will be treated in a confidential manner.

If you have any questions regarding the survey or this research project in general, please contact me at balfayez@hotmail.com or my supervisor, Assoc. Prof. Dr. Chandrakantan Subramaniam (chandra@uum.edu.my) or Dr. Md. Lazim Mohd Zin (lazim@uum.edu.my) otherwise you can call me at 0565555528.

I will appreciate it if you can complete the survey within a week, after which I will personally collect it from you. By completing this survey, you are indicating your consent to participate in the study.

Your participation is appreciated.

Thank you and have a good day.

Yours sincerely,

Bassem Alfayez
PhD Student
School of Business Management
Universiti Utara Malaysia

SECTION A: Demographic Information

Please fill in blank and tick (√) in the appropriate boxes that corresponds to your answer to each of the following questions below.

1. Nature of work:

☐ Electrician	☐ Iron Worker	☐ Driller	☐ Plumber
☐ Drywall Finisher	☐ Carpenter	☐ Crane Operator	☐ Concrete Laborer
☐ Equipment Operator	☐ Painter	☐ Others, please specify_____	

2. Gender: ☐ Male ☐ Female

3. Age: _____ years

4. Highest education level:

☐ Certificate or lower ☐ Diploma ☐ Bachelor degree
☐ Others, please specify _____

5. Country of origin _____
6. Your mother tough (Language which you speak)_____
7. Years of experience _____ years
8. Years of experience in the present organization _____ years
9. Years of experience working abroad _____ years
10. Have you ever had any occupational accident ever since you started working in this present organization?

☐ Yes ☐ No

11. How frequent do you encounter with workplace accident in this present organization?

☐ Never ☐ Sometimes ☐ Fairly Often ☐ Very Often ☐ Always

12. Have you attended any occupational safety training?

☐ Yes ☐ No

13. How frequent do you attend occupational safety training in this present organization?

☐ Never ☐ Sometimes ☐ Fairly Often ☐ Very Often ☐ Always

SECTION B: Safety Climate

Considering only your perception, please circle the most appropriate answer to you based on the scale below:

1	2	3	4	5
Strongly Disagree	Disagree	Undecided/Neutral	Agree	Strongly Agree

1	In my workplace management acts quickly to correct safety problems.	1	2	3	4	5
2	Management acts decisively when a safety concern is raised.	1	2	3	4	5
3	In my workplace management turn a blind eye to safety issues.	1	2	3	4	5
4	Corrective action is always taken when management is told about unsafe practices.	1	2	3	4	5
5	In my workplace management show interest in my safety.	1	2	3	4	5
6	Management acts only after accidents have occurred.	1	2	3	4	5
7	Management express concern if safety procedures are not adhered to.	1	2	3	4	5
8	Management clearly considers the safety of foreign workers of great importance.	1	2	3	4	5
9	I believe that safety issues are not assigned a high priority.	1	2	3	4	5
10	Safety procedures are carefully followed.	1	2	3	4	5
11	Management considers safety to be equally as important as work project progress.	1	2	3	4	5
12	Workers have enough time to carry out their tasks.	1	2	3	4	5
13	There are enough workers to carry out the required work.	1	2	3	4	5
14	There is sufficient "thinking time" to enable workers to plan and carry out their work to an adequate standard.	1	2	3	4	5
15	Problems arising from factors outside worker's control can be accommodated without negatively affecting safety.	1	2	3	4	5
16	Time schedules for completing work projects are realistic.	1	2	3	4	5
17	Workload is reasonably balanced.	1	2	3	4	5
18	My management gives comprehensive training to the foreign workers in workplace safety issues.	1	2	3	4	5
19	Newly foreign recruits are trained adequately to learn safety rules and procedures.	1	2	3	4	5
20	Safety issues are given high priority in training programmes.	1	2	3	4	5

	1 Strongly Disagree	2 Disagree	3 Undecided/Neutral	4 Agree	5 Strongly Agree				
21	Management encourages the foreign workers to attend safety training programmes.				1	2	3	4	5
22	Safety training given to me is adequate to enable to me to assess hazards in workplace.				1	2	3	4	5
23	There is good communication here about safety issues which affect me.				1	2	3	4	5
24	Safety information is always brought to my attention by the management.				1	2	3	4	5
25	My management does not always inform me of current concerns and issues.				1	2	3	4	5
26	Management operates an open door policy on safety issues.				1	2	3	4	5
27	I do not receive praise for working safely.				1	2	3	4	5
28	Safety rules and procedures are always practical.				1	2	3	4	5
29	Safety rules and procedures can be followed without conflicting with work practices.				1	2	3	4	5
30	Safety rules and procedures are followed even when a job is rushed.				1	2	3	4	5
31	In my workplace opinions are always welcomed from foreign employees before making final decisions on safety related matters.				1	2	3	4	5
32	My workplace has safety committee consisting of representative of management and foreign employees.				1	2	3	4	5
33	Management promotes foreign employees involvement in safety related matters.				1	2	3	4	5
34	Management consults with foreign workers regularly about workplace safety issues.				1	2	3	4	5

SECTION C: Social Support

Considering only your perception, please circle the most appropriate answer to you based on the scale below:

1	2	3	4	5
Not at all	**A little bit**	**Somewhat**	**Quite a bit**	**Very much**

1	How easily can you talk to your supervisor?	1	2	3	4	5
2	How much can you rely on your supervisor when there are difficulties?	1	2	3	4	5
3	How much does your supervisor recognize and value your job?	1	2	3	4	5
4	How much does your supervisor cooperate with you to solve when there are difficulties?	1	2	3	4	5
5	How much support do you receive from your supervisor?	1	2	3	4	5
6	How easily can you talk to your coworker?	1	2	3	4	5
7	How much can you rely on your coworker when there are difficulties?	1	2	3	4	5
8	How much does your coworker recognize and value your job?	1	2	3	4	5
9	How much does your coworker cooperate with you to solve when there are difficulties?	1	2	3	4	5
10	How much support do you receive from your coworker?	1	2	3	4	5
11	How easily can you talk to your family?	1	2	3	4	5
12	How much can you rely on your family when there are difficulties?	1	2	3	4	5
13	How much does your family recognize and value your job?	1	2	3	4	5
14	How much does your family cooperate with you to solve when there are difficulties?	1	2	3	4	5
15	How much support do you receive from your family?	1	2	3	4	5

SECTION D: Safety Behaviour

Considering only your perception, please circle the most appropriate answer to you based on the scale below:

1 Strongly Disagree	2 Disagree	3 Undecided/Neutral	4 Agree	5 Strongly Agree

1	I use necessary safety equipment to do my job.	1	2	3	4	5
2	I carry out my work in a safe manner.	1	2	3	4	5
3	I follow correct safety rules and procedures while carrying out my job.	1	2	3	4	5
4	I ensure the highest levels of safety when I carry out my job.	1	2	3	4	5
5	I always point out to the management if any safety related matters are noticed in my workplace.	1	2	3	4	5
6	I put extra effort to improve the safety of the workplace.	1	2	3	4	5
7	I voluntarily carryout tasks or activities that help to improve workplace safety.	1	2	3	4	5
8	I encourage my co-workers to work safely.	1	2	3	4	5

Thanks so much for taking the time to answer the questionnaires

Your cooperation highly appreciated

Appendix B
Arabic Language Research Questionnaire

Pusat Pengajian Pengurusan Perniagaan
SCHOOL OF BUSINESS MANAGEMENT
Universiti Utara Malaysia

السادة الأعزاء،

تحية طيبة وبعد،،،

أنا السيد/ باسم الفايز، باحث دكتوراه في إدارة الأعمال، جامعة اوتارا ماليزيا، أدعوكم للمشاركة في هذه الدراسة التي تهدف إلى فحص ممارسات السلامة التنظيمية وسلوك السلامة، حيث تطرح نتائج هذه الدراسة توصيات عملية عن كيفية تعزيز المنظمات في المملكة العربية السعودية لسلوك سلامة موظفيهم الأجانب في قطاع الإنشاء.

المشاركة تطوعية، لذا يرجى ملء استطلاع الرأي المرفق، ولن يستغرق هذا الأمر أكثر من 15 دقيقة من وقتك القيم.

ولا يوجد في هذا الاستطلاع أية معلومات شخصية، وسوف تُسجل جميع أجوبة وردود الأفعال على هذا الاستطلاع كل على حدة وسيتم التعامل مع ذلك بطريقة سرية.

في حالة وجود أي استفسار حول استطلاع الرأي هذا أو مشروع البحث بشكل عام، يرجى مراسلتي على balfayez@hotmail.com أو من خلال المشرف الخاص بي الأستاذ الدكتور/ تشاندراكانتان سوبرامانيام chandra@uum.edu.my أو الدكتور/ محمد لزيم محمد زين lazim@uum.edu.my أو الاتصال بي مباشرةً على الرقم (0565555528)

سوف اكون ممتنا في حال اكمالك لاستطلاع الرأي هذا خلال أسبوع واحد حتى أتمكن بعد ذلك من جمعه، وبإكمالك لاستطلاع الرأي هذا، تعد هذه موافقة منك على المشاركة في هذه الدراسة.

اقدر مشاركتك.

اشكرك على ذلك ونتمنى لك يوم جيد.

وتفضلوا بقبول فائق الاحترام والتقدير،،،

السيد/ باسم الفايز

باحث دكتوراه في إدارة الأعمال، جامعة اوتارا ماليزيا

القسم (أ): معلومات ديموغرافية:

يرجى ملئ المربع الفارغ بعلامة (✓) في المربعات المناسبة التي تتفق مع إجابتك على الأسئلة الموضحة أدناه:

1- طبيعة العمل:

☐ أعمال كهربائية ☐ عامل حديد ☐ حفار ☐ سباك

☐ عامل تشطيب ☐ نجار ☐ مشغل الرافعة ☐ عامل خرسانة

☐ مشغل المعدات ☐ دهان ☐ أخرى، يرجى تحديد ذلك_____

2- الجنس: ☐ ذكر ☐ أنثى

3- العمر: ____ سنة

4- مستوى التعليم:

☐ شهادة دراسية أو أقل ☐ دبلومه ☐ درجة البكالوريوس

☐ أخرى، يرجى تحديد ذلك___

5- بلد المنشأ:_____

6- اللغة الأم (اللغة التي تتحدث بها):_____

7- سنوات الخبرة _____ سنة

8- سنوات الخبرة أثناء عملك في المنظمة الحالية _____ سنة

9- سنوات الخبرة أثناء عملك في الخارج _____ سنة

10- هل تعرضت إلى أي حادثة مهنية من قبل منذ بدء عملك في هذه المنظمة؟

☐ نعم ☐ لا

11- كم عدد المرات التي تعرضت فيها لحادثة عمل في هذه المنظمة؟

☐ أبدًا ☐ أحيانًا ☐ غالبًا ☐ كثيرًا ☐ دائمًا

12- هل حضرت أي تدريب للسلامة المهنية من قبل؟

☐ نعم ☐ لا

13- كم عدد المرات التي حضرت فيها تدريب للسلامة المهنية في هذه المنظمة؟

☐ أبدًا ☐ أحيانًا ☐ غالبًا ☐ كثيرًا ☐ دائمًا

القسم (ب): ممارسات السلامة التنظيمية:

بناءاً على ادراكك فقط، يرجى وضع دائرة حول أكثر اجابة تناسبك استنادًا على الهيكل الموضح أدناه:

1	2	3	4	5
لا أوافق بشدة	لا أوافق	لم أقرر أو محايد	أوافق	أوافق بشدة

1- أتصرف بسرعة في أماكن العمل الخاصة بي لحل المشاكل المتعلقة بالسلامة	1	2	3	4	5
2- الادارة تتصرف بشكل سليم عند وجود مشاكل تتعلق بالسلامة	1	2	3	4	5
3-الادارة تتغاضى عن الأمور المتعلقة بالسلامة في أماكن العمل الخاصة بي	1	2	3	4	5
4- تتخذ الأعمال التصحيحية دائمًا عند اخبار الإدارة بممارسات غير آمنة	1	2	3	4	5
5- تبدى الادارة الاهتمام بسلامتك الخاصة في اماكن العمل	1	2	3	4	5
6- تتخذ الأفعال الإدارية فقط عند وقوع أي حادثة	1	2	3	4	5
7- تعبر الإدارة عن مخاوفها في حالة عدم الالتزام بإجراءات السلامة	1	2	3	4	5
8- تعتبر الإدارة أن سلامة العمال الأجانب من الأمور الهامة جدًا	1	2	3	4	5
9- أعتقد أن الأمور المتعلقة بالسلامة ليست من الأولويات القصوى	1	2	3	4	5
10- اجراءات السلامة متبعه بحرص	1	2	3	4	5
11- تعتبر الإدارة أن السلامة لا تقل أهمية عن انجاز العمل	1	2	3	4	5
12- يمتلك العمال الوقت الكافي لتنفيذ مهامهم	1	2	3	4	5
13- هناك ما يكفى من العمال لتنفيذ العمل المطلوب	1	2	3	4	5
14- هناك وقت كاف للتفكير لتمكين العمال من التخطيط وتنفيذ أعمالهم بالمعايير المناسبة	1	2	3	4	5
15- يمكن أن تناقش المشاكل التي تنشأ من المصانع خارج سيطرة العمال دون التأثير بشكل سلبي على السلامة	1	2	3	4	5
16- الجداول الزمنية لاستكمال مشاريع الأعمال واقعية	1	2	3	4	5
17- ضغط العمل متوازن بشكل مناسب	1	2	3	4	5
18- تقدم الإدارة الخاصة بي تدريب متكامل للعمال الأجانب في الأمور المتعلقة بسلامة مكان العمل	1	2	3	4	5
19- يتم تدريب المعينين الأجانب الجدد بشكل مناسب لتعليمهم قواعد وإجراءات السلامة	1	2	3	4	5
20- تعتبر الأمور المتعلقة بالسلامة من الأولويات القصوى في البرامج التدريبية	1	2	3	4	5
21- تشجع الإدارة العمال الأجانب على حضور البرامج التدريبية المتعلقة بالسلامة	1	2	3	4	5

1 لا أوافق بشدة	2 لا أوافق	3 لم أقرر أو محايد	4 أوافق	5 أوافق بشدة

22- التدريب المتعلق بالسلامة المقدم لي مناسب حتى أتمكن من تقييم المخاطر في مكان العمل	1	2	3	4	5
23- هناك اتصال جيد حول الأمور المتعلقة بالسلامة التي تؤثر عليك	1	2	3	4	5
24- دائما يتم اعطائي معلومات متعلقة بالسلامة من قبل الادارة	1	2	3	4	5
25- لا تبلغني الإدارة دائمًا بالمخاوف والأمور الحالية	1	2	3	4	5
26- تقوم الإدارة بتشغيل سياسة الباب المفتوح في الأمور المتعلقة بالسلامة	1	2	3	4	5
27- لا اتلقى أي إطراء عن العمل الآمن	1	2	3	4	5
28- تعتبر قواعد وإجراءات السلامة عملية دائما	1	2	3	4	5
29- يمكن اتباع قواعد وإجراءات السلامة دون تضارب مع ممارسات العمل	1	2	3	4	5
30- تتبع قواعد وإجراءات السلامة حتى عند ضغط العمل	1	2	3	4	5
31- ترحب الادارة دائمًا بآراء بالموظفين الأجانب المتعلقة بمكان العمل قبل اتخاذ القرارات النهائية الخاصة بمواضيع السلامة	1	2	3	4	5
32- يحتوي مكان العمل الخاص بك على لجنة آمنة تتكون من ممثل لموظفي الإدارة والموظفين الأجانب	1	2	3	4	5
33- تعزز الإدارة من مشاركة الموظفين الأجانب في الأمور المتعلقة بالسلامة	1	2	3	4	5
34- تستشير الإدارة العمال الأجانب بشكل منتظم عن الأمور المتعلقة بسلامة مكان العمل	1	2	3	4	5

القسم (ج): الدعم الاجتماعي:

بناءًا على ادراكك فقط، يرجى وضع دائرة حول أكثر اجابة تناسبك استنادًا على الهيكل الموضح أدناه:

1	2	3	4	5
ليس دائماً	ربما	الى حد ما	غالبا	دائما

1- ما مدى سهولة التحدث الى المشرف الخص بك؟	1	2	3	4	5	
2- إلى أي مدى يمكن الاعتماد على المشرف الخاص بك عند مواجهة الصعوبات؟	1	2	3	4	5	
3- إلى أي مدى يمكن للمشرف الخاص بك تحديد وتقييم عملك؟	1	2	3	4	5	
4- إلى أي مدى يمكن للمشرف الخاص بك التعاون معك لحل الصعوبات؟	1	2	3	4	5	
5- ما مدى الدعم الذى تتلقاه من المشرف الخاص بك؟	1	2	3	4	5	
6- ما مدى سهولة التحدث الى زميلك في العمل؟	1	2	3	4	5	
7- إلى أي مدى يمكن الاعتماد على زميلك في العمل عند مواجهة الصعوبات؟	1	2	3	4	5	
8- إلى أي مدى يمكن لزميلك في العمل تحديد وتقييم عملك؟	1	2	3	4	5	
9- إلى أي مدى يمكن لزميلك في العمل التعاون معك لحل الصعوبات؟	1	2	3	4	5	
10- ما مدى الدعم الذى تتلقاه من زميلك في العمل؟	1	2	3	4	5	
11- ما مدى سهولة التحدث مع افراد عائلتك؟	1	2	3	4	5	
12- إلى أي مدى يمكن الاعتماد على عائلتك عند مواجهة الصعوبات؟	1	2	3	4	5	
13- إلى أي مدى يمكن لعائلتك تحديد وتقييم عملك؟	1	2	3	4	5	
14- إلى أي مدى يمكن لعائلتك التعاون معك لحل الصعوبات؟	1	2	3	4	5	
15- ما مدى الدعم الذى تتلقاه من افراد عائلتك؟	1	2	3	4	5	

القسم (د): سلوك السلامة:

بناءًا على ادراكك فقط، يرجى وضع دائرة حول أكثر اجابة تناسبك استنادًا على الهيكل الموضح أدناه:

1	2	3	4	5
لا أوافق بشـدة	لا أوافق	لم أقرر أو محايد	أوافق	أوافق بشـدة

1- استخدم معدات السلامة الضرورية للقيام بعملي	1	2	3	4	5	
2- أقوم بعملي بطريقة آمنة	1	2	3	4	5	
3- اتبع قواعد وإجراءات السلامة الصحيحة عند القيام بعملي	1	2	3	4	5	
4- أضمن أعلى درجات السلامة عند القيام بعملي	1	2	3	4	5	
5- دائمًا ابلغ الإدارة في حالة وجود مشاكل تتعلق بالسلامة في مكان عملي	1	2	3	4	5	
6- أبذل جهدا اضافيا لتحسين سلامة مكان العمل	1	2	3	4	5	
7- أقوم بشكل تطوعي بتنفيذ المهام والأنشطة التي تساعد في تطور سلامة العمل	1	2	3	4	5	
8- أشجع زميلي في العمل على قيامة بالعمل بشكل آمن	1	2	3	4	5	

أشكرك جزيلاً على وقتك في الإجابة على الأسئلة

وأقدر تمامًا تعاونك الكامل معنا

Appendix C
Indian Language Research Questionnaire

Pusat Pengajian Pengurusan Perniagaan
SCHOOL OF BUSINESS MANAGEMENT
Universiti Utara Malaysia

आदरणीय देवियों और सज्जनों

मेरा नाम बासिम अल्फ़ाइज़ है। मैं औतारा यूनिवर्सिटी मलेशिया में स्कूल ऑफ़ बिज़नेस मैनेजमेंट का पी एच डी स्कॉलर हूं। मैं आप सभी सज्जनों को एक चर्चा में भाग लेने के लिए आमंत्रित कर रहा हूँ। यह चर्चा संगठनात्मक सुरक्षा प्रथाओं और सुरक्षा व्यवहार पर आधारित होगा। इस चर्चा के निष्कर्षों को व्यावहारिक सिफारिशों के तौर पर पेश किया जाएगा की सऊदी अरब में मौजूद ढेर सारी कंपनियां निर्माण क्षेत्र में विदेशी मजदूरों की जानी और माली हिफ़ाज़त में किस तरह का रोल अदा कर सकती हैं।

आप की हाज़री पूरी तरह आप पर निर्भर होगी, किर्पया अटैच्ड प्रश्नावली को भरें , इस के लिए आप के क़ीमती समय में से सिर्फ १५ मिनट से अधिक का समय नहीं जाएगा।

प्रश्नावली में किसी भी प्रकार के पहचान की जानकारी की ज़रूरत नहीं है। तमाम जवाबात गुप्त रखे जाएंगे।

प्रश्नावली या चर्चा पर आधारित किसी भी जानकारी के लिए किर्पया balfayez@hotmail.com पर मेल करें या फिर मेरे सुपरवाइजर प्रोफेसर डॉ. चंद्रकांतन सुब्रमनियम (chandra@uum.edu.my) या डॉ. लाज़िम मोहमद ज़ीन (lazim@uum.edu.my) या मेरे टेलीफोन नंबर 0565555528 पर संपर्क करें।

मेरी सराहना होगी अगर आप एक सप्ताह के भीतर सर्वेक्षण पूरा कर के मुझ को दे दें इस के लिए में खुद आप से भेंट करूँगा। प्रश्नावली को जब आप भर देंगे तो साथ ही चर्चा सभा में आप की हाज़री के लिए स्वीकारित समझी जाएगी।

आप के आने से मुझ को ख़ुशी मिलेगी

आप का
बासिम अल्फ़ाइज़
स्कूल ऑफ़ बिज़नेस मैनेजमेंट
यूनिवर्सिटी ऑफ़ मलेशिया

सेक्शन ए: जनसांख्यिकीय जानकारी

किर्प्या खाली जगह को भरें और नीचे दिए गए प्रश्नों के उत्तर उस की जगह में (√) का चिन्ह लगाएं।

1 - कार्य की प्रकृति

☐ इलेक्ट्रीशियन ☐ आयरन वर्कर ☐ ड्रिलर ☐ प्लम्बर

☐ ड्राई वाल फिनिशर ☐ बढ़ई ☐ क्रेन ऑपरेटर ☐ कंक्रीट मज़दूर

☐ सामान ऑपरेटर ☐ पेंटर ☐ अन्य: कृपिया अस्पष्ट करें

2 - लिंग ☐ पुरुष ☐ महिला

3 - आयु.....साल

4 - शिक्षा का उच्चतम स्तर

☐ सर्टिफिकेट या इस से कम ☐ बेचलर डिग्री

☐ डिप्लोमा ☐ अन्य: कृपिया अस्पष्ट करें

5 - मूल के देश _____

6 - अपनी मातृभाषा (वह भाषा जो आप बोलते हैं)_____

7 - अनुभव की अवधि _____ साल

8 - मौजूदा फर्म में अनुभव की अवधि _____ साल

9 - विदेश में काम करने की अवधि _____ साल

10 - मौजूदा फर्म में काम के दौरान कभी कोई हादसा पेश आया ?

☐ हाँ ☐ नहीं

11 - मौजूदा फर्म में आम तौर पर कितने हादसे होते हैं ?

☐ कभी नहीं ☐ कभी कभी ☐ काफी दफा ☐ अक्सर ☐ हमेशा

12 - क्या आप ने कभी व्यावसायिक प्रशिक्षण कार्यक्रम में भाग लिया ?

☐ हाँ ☐ नहीं

13 - मौजूदा फर्म में आप कितनी दफा व्यावसायिक प्रशिक्षण कार्यक्रम में भाग लेते हैं। ?

☐ कभी नहीं ☐ कभी कभी ☐ काफी दफा ☐ अक्सर ☐ हमेशा

सेक्शन बी: संगठनात्मक सुरक्षा अभ्यासें

सिर्फ आप अपने हिसाब से नीचे दिए गए पैमाना के तहत अपने मनासिब जवाब को घेर दें:

1	**2**	**3**	**4**	**5**
भर पूर असहमत	**असहमत**	**अनिर्णीत / निष्पक्ष**	**सहमत**	**भर पूर सहमत**

1	मेरे फर्म में सेफ्टी इशू को हल करने के लिए मैनेजमेंट तुरंत हरकत में आ जाती है।	1	2	3	4	5
2	सेफ्टी प्रॉब्लम होते ही मैनेजमेंट कोई निर्णायक रवैया अपनाती है।	1	2	3	4	5
3	मेरे फर्म में किसी भी सेफ्टी प्रॉब्लम होने के बावजूद मैनेजमेंट अपनी आँखें मूँद लेती है।	1	2	3	4	5
4	किसी भी तरह के असुरक्षित प्रथाओं की जानकारी मिलते ही मैनेजमेंट सही फैसला लेती है।	1	2	3	4	5
5	मेरे फर्म में मैनेजमेंट हमारी सलामती व सुरक्षा को पहले नंबर पर रखती है।	1	2	3	4	5
6	जब कोई हादसा पेश आता है तब मैनेजमेंट हरकत में आती है।	1	2	3	4	5
7	जब सलामती व सुरक्षा से मिलते जुलते प्रथाओं में डिस्टर्बे होने लगे तो मैनेजमेंट अस तरफ ध्यान देती है।	1	2	3	4	5
8	मैनेजमेंट विदेशी कामगारों के सुरक्षा को पहले नंबर पर रखती है।	1	2	3	4	5
9	मैं मानता हूँ की सेफ्टी से मिलते जुलते इशू को सुरक्षा को पहले नंबर पर नहीं रखते हैं।	1	2	3	4	5
10	सलामती व सुरक्षा से मिलते जुलते प्रथाओं पर अच्छी तरह अमल किया जाता है।	1	2	3	4	5
11	वर्क प्रॉजेक्ट को आगे बढ़ाने के लिए मैनेजमेंट सलामती व सुरक्षा से मिलते जुलते पॉलिसी को भी पहले नंबर पर रखते हैं।	1	2	3	4	5
12	वर्कर्स को अपना काम पूरा करने के लिए पूरा मौक़ा मिलता है।	1	2	3	4	5
13	दिए गए काम के लिए वर्कर्स की तादाद काफी है।	1	2	3	4	5
14	काम के मुनासिब स्तर को बाक़ी रखने की ग़र्ज़ से प्लानिंग और सोच विचार करने के लिए वर्कर्स को पूरी गुंजाईश मिल जाती है।	1	2	3	4	5
15	ऐसे इशू जिन को हल करना नामुमकिन हो ऐसे टाइम पर वर्कर्स को सलामती व सुरक्षा के साथ बेहतर सहूलियत दी जाती है।	1	2	3	4	5
16	प्रोजेक्ट को पूरा करने के लिए शेड्यूल काफी होता है।	1	2	3	4	5

1 भर पूर असहमत	2 असहमत	3 अनिर्णीत / निष्पक्ष	4 सहमत	5 भर पूर सहमत

17	काम का बोझ हद तक संतुलित रहता है।	1	2	3	4	5
18	हमारी मैनेजमेंट फर्म के अंदर विदेशी कामगारों के लिए सेफ्टी इशू से मिलते जुलती बेहतर ट्रेनिंग का परबंध करती है।	1	2	3	4	5
19	नए विदेशी कामगारों को सेफ्टी क़ानून बताने के लिए बेहतर ट्रेनिंग का परबंध करती है।	1	2	3	4	5
20	ट्रेनिंग प्रोग्रामों में सेफ्टी इशू को बहुत महत्व दिया जाता है।	1	2	3	4	5

1 भर पूर असहमत	2 असहमत	3 अनिर्णीत / निष्पक्ष	4 सहमत	5 भर पूर सहमत

21	सेफ्टी ट्रेनिंग प्रोग्रामों में भाग लेने के लिए मैनेजमेंट विदेशी कामगारों की काफी सराहना करती है।	1	2	3	4	5
22	सेफ्टी ट्रेनिंग मुझ को दी गई इस से अपने फर्म में किसी भी खतरे को जांचने में मुझ को कोई दिक्क़त ना आए।	1	2	3	4	5
23	सेफ्टी इशू को दूर करने के लिए यहां पर बेहतर सुविधा मौजूद है।	1	2	3	4	5
24	मुझ को मैनेजमेंट के माध्यम से सेफ्टी से मिलते जुलते अनुदेश मिलते रहते हैं।	1	2	3	4	5
25	हमारी मैनेजमेंट मौजूदा सेफ्टी प्रब्लेम्स से मिलते जुलते अनुदेश नहीं देती है।	1	2	3	4	5
26	मैनेजमेंट सेफ्टी इशू के लिए एक ओपन डोर पॉलिसी चलाती है।	1	2	3	4	5
27	बाहिफ़ाज़त काम ख़त्म करने पर मेरे काम को सराहा नहीं जाता है।	1	2	3	4	5
28	सेफ्टी अनुदेश और तरीका हमेशा व्यावहारिक रूप से अंजाम दिया जाता है।	1	2	3	4	5
29	काम के दौरान भी सेफ्टी अनुदेश का पालण किया जासकता है।	1	2	3	4	5
30	सेफ्टी अनुदेश पर काम के ख़त्म होने के बाद भी अमल किया जासकता है।	1	2	3	4	5
31	सेफ्टी से मिलते जुलते मामलों में हमारे फर्म के अंदर विदेशी कामगारों के राय को महत्व दिया जाता है।	1	2	3	4	5
32	हमारे फर्म में मैनेजमेंट और विदेशी कामगारों के प्रतिनिधियों पर सम्मिलित एक सेफ्टी समिति मौजूद है।	1	2	3	4	5
33	सेफ्टी से मिलते जुलते मामलों में हमारे फर्म के अंदर विदेशी कामगारों की भागीदारी के लिए मैनेजमेंट हमेशा उभारती रहती है।	1	2	3	4	5
34	मैनेजमेंट हमेशा फर्म के अंदर सेफ्टी से मिलते जुलते मामलों पर विदेशी कामगारों के साथ पारस्परिक विचार-विमर्श करती रहती है।	1	2	3	4	5

सेक्शन सीः सामाजिक समर्थन

सिर्फ आप अपने हिसाब से नीचे दिए गए पैमाना के तहत अपने मनासिब जवाब को घेर दें:

1 बिलकुल नहीं	2 थोड़ा	3 बहुत थोड़ा	4 बहुत	5 बहुत ज़्यादा

1	आप कितनी आसानी के साथ अपने सुपरवाइजर से बात कर लेते हैं?	1	2	3	4	5
2	कोई इशू आ जाने पर आप अपने सुपरवाइजर पर कितना निर्भर होते हैं?	1	2	3	4	5
3	आप का सुपरवाइजर आप के काम को कितना नोटिस करता है और वैल्यू देता है?	1	2	3	4	5
4	किसी भी क़िस्म के प्रोब्लेम्स जाने पर आप का सुपरवाइजर इन को सुलझाने के लिए कितना मददगार साबित होता है ?	1	2	3	4	5
5	आप अपने सुपरवाइजर से कितनी मदद लेते हैं?	1	2	3	4	5
6	आप कितनी आसानी के साथ अपने साथी से बात कर लेते हैं?	1	2	3	4	5
7	कोई इशू आ जाने पर आप अपने साथी पर कितना निर्भर होते हैं?	1	2	3	4	5
8	आप का साथी आप के काम को कितना नोटिस करता है और वैल्यू देता है?	1	2	3	4	5
9	किसी भी क़िस्म के प्रोब्लेम्स जाने पर आप का साथी इन को सुलझाने के लिए कितना मददगार साबित होता है ?	1	2	3	4	5
10	आप अपने साथी से कितनी मदद लेते हैं?	1	2	3	4	5
11	आप कितनी आसानी के साथ अपनी फैमिली से बात कर लेते हैं?	1	2	3	4	5
12	कोई इशू आ जाने पर आप अपनी फैमिली पर कितना निर्भर होते हैं?	1	2	3	4	5
13	आप की फैमिली आप के काम को कितना नोटिस करता है और वैल्यू देता है?	1	2	3	4	5
14	किसी भी क़िस्म के प्रोब्लेम्स जाने पर आप अपनी फैमिली इन को सुलझाने के लिए कितना मददगार साबित होता है?	1	2	3	4	5

15	आप अपनी फैमिली से कितनी मदद लेते हैं?	1	2	3	4	5

सेक्शन डी: सुरक्षा व्यवहार

सिर्फ आप अपने हिसाब से नीचे दिए गए पैमाना के तहत अपने मनासिब जवाब को घेर दें:

1	2	3	4	5
भर पूर असहमत	**असहमत**	**अनिर्णीत / निष्पक्ष**	**सहमत**	**भर पूर सहमत**

1	मैं अपना काम करते समय सुरक्षा उपकरण का उपयोग करता हूं।	1	2	3	4	5
2	मैं सही ढंग से अपने काम को अंजाम देता हूँ।	1	2	3	4	5
3	मैं अपने काम को पूरा करते समय सही सुरक्षा उपकरण का उपयोग करता हूं।	1	2	3	4	5
4	मैं अपने काम को ख़त्म करते समय सुरक्षा का भरपूर ख्याल रखता हूँ।	1	2	3	4	5
5	फर्म के अंदर कभी भी सुरक्षा से संबंध किसी भी तरह की गड़बड़ी का पता मिलने पर तुरंत मैनेजमेंट को इस की खबर देता हूँ।	1	2	3	4	5
6	मैं फर्म के अंदर सुरक्षा को बढ़ावा देने की हर दम चेष्टा में रहता हूँ।	1	2	3	4	5
7	मैं फर्म के अंदर कुछ इस तरह की एक्टिविटी करता रहता हूँ जिस से की सुरक्षा क़ायम रहे।	1	2	3	4	5
8	मैं अपने साथियों को सुरक्षा बरतने की प्रोत्साहित करता रहता हूँ।	1	2	3	4	5

प्रश्नावली के उत्तर देने और अपना क़ीमती समय देने का धन्यवाद

आपका सहयोग अत्यधिक सराहना है

Appendix D
Urdu Language Research Questionnaire

معزز خواتین وحضرات

میرا نام باسم الفائز ہے، میں اوتارا یونیورسیٹی میلیشیا میں اسکول آف بزنس منیجمنٹ کا پی ایچ ڈی اسکالر ہوں، میں آپ حضرات کو بصد احترام ایک مناقشہ میں شرکت کی دعوت دے رہا ہوں، یہ مناقشہ تنظیمی تحفظ کے طریقہء کار اور سیفٹی رویوں پر مبنی بحث وتحقیق کی غرض سے منعقد کیا جا رہا ہے، اس مناقشہ کے ماحصل کو بطور عملی توصیہ بایں معنی پیش کیا جائیگا کہ سعودی عرب میں واقع متعدد کمپنیاں تعمیراتی میدان میں غیر ملکی ملازمین کی جانی ومالی حفاظت میں کس طرح کا رول ادا کرسکتی ہیں۔

آپ کی شرکت قطعا راضی برضا ہوگی، براہ کرم منسلک سوالنامہ کو پر کردیں، اس کے لئے آپ کے قیمتی وقت میں سے صرف 15 منٹ سے زیادہ کا وقت صرف نہیں ہوگا۔

سوالنامہ میں کسی بھی قسم کی شناختی معلومات درکار نہیں ہیں، جملہ جوابات بالکل حساس شکل میں بطور پروفائل محفوظ رکھے جائینگے۔

سوالنامہ یا مناقشہ سے وابستہ کسی بھی قسم کے استفسار کے لئے براہ کرم balfayez@hotmail.com پر میل کریں یا پھر میرے سوپروائزر پروفیسر ڈاکٹر چندراکانتن سوبرامنیم (chandra@uum.edu.my) یا ڈاکٹر لازم محمد زین (lazim@uum.edu.my) یا میرے ٹیلیفون نمبر 0565555528 پر رابطہ کریں۔

ذرہ نوازی ہوگی اگر زیر نظر سوالنامہ کو ایک ہفتہ کے دوران ہی پر کردیں، اس کو واپس لینے کے لئے میں ازخود آپ سے ملاقات کرونگا، سوالنامہ کے تکملہ کے ساتھ ہی مناقشہ میں شرکت کے لئے آپ کی رضامندی شمار کی جائیگی۔

آپ کی شرکت باعث سرور ہوگی
شکریہ
آپ کا ممنون
باسم الفائز

پی ایچ ڈی اسکالر
اسکول آف بزنس منیجمنٹ
یونیورسیٹی آف اوتارا میلیشیا

سیکشن اے: شعبہ جاتی معلومات

براہ کرم خالی خانہ کو پر کریں اور مندرجہ ذیل سوالات کے جوابات متعلقہ خانہ میں(√)کا نشان لگائیں۔

1- **کام کی نوعیت:**

□ الیکٹریشین □ آئیرن ورکر □ ڈریلر □ پلمبر
□ ڈرائی وال فینیشر □ بڑھئی □ کرین آپریٹر □ کنکریٹ مزدور
□ ساز وسامان آپریٹر □ پینٹر □ دوسرے: براہ کرم وضاحت کریں - - - - - - - - - -

2- **جنس:** □ مرد □ عورت

3- **عمر:** - سال

4- **تعلیم کا اعلی ترین معیار:**

□ سرٹیفیکیٹ یا اس سے کم □ ڈپلومہ □ بیچلر ڈگری
□ دوسرے: براہ کرم وضاحت کریں - - - - - - - - - - - - - -

5- **وطن اصلی**: -

6- **مادری زبان** (وہ زبان جو آپ بولتے ہیں) - - - - - - - - - - - - - - - - - -

7- **تجربہ کی مدت**: -

8- **حالیہ فرم میں تجربہ کی مدت**: -

9- **اجنبی ملک میں ملازمت کی مدت**: - سال

10- **حالیہ فرم میں کام کے دوران کبھی کوئی حادثہ پیش آیا ؟**

□ ہاں □ نہیں

11- **حالیہ فرم میں عام طور پر کتنے حوادث وواقعات کا سامنا کرنا پڑتا ہے ؟**

□ کبھی نہیں □ کبھی کبھی □ کافی اکثر □ کثرت سے □ ہمیشہ

12- **کیا آپ کبھی مشغلہ جاتی ٹریننگ پروگرام میں شریک ہوئے ؟**

□ ہاں □ نہیں

13- **حالیہ فرم میں آپ کتنی دفعہ مشغلہ جاتی ٹریننگ میں شریک ہوتے ہیں ؟**

□ کبھی نہیں □ کبھی کبھی □ کافی اکثر □ کثرت سے □ ہمیشہ

سیکشن بی: انتظامی تحفظ سے متعلق طریقہء عمل

فقط آپ اپنے تئیں مندرجہ ذیل پیمانہ کے تحت اپنے مناسب جواب کو گھیر دیں:

	1 بھر پور غیر موافق	2 غیر موافق	3 غیرجانبدار / متذبذب	4 موافق	5 بھرپور موافق	
1	میرے جائے عمل میں سلامتی مسائل کو حل کرنے کے لئے منیجمنٹ فورا حرکت میں آجاتی ہے۔	1	2	3	4	5
2	سیفٹی پرابلم رونما ہوتے ہی منیجمنٹ کوئی ٹھوس اور فیصلہ کن رویہ اختیار کرتی ہے۔	1	2	3	4	5
3	میرے فرم میں کوئی بھی سیفٹی پرابلم رونما ہونے کے باوجود منیجمنٹ اپنی آنکھیں موند لیتی ہے۔	1	2	3	4	5
4	کسی بھی طرح کے غلط طرز عمل کی اطلاع ملتے ہی مینیجمنٹ ہمیشہ درست ایکشن لیتی ہے۔	1	2	3	4	5
5	میرے جائے عمل میں مینیجمنٹ ہماری سلامتی کو اولین ترجیح دیتی ہے ۔	1	2	3	4	5
6	جب کوئی حادثہ رونما ہوجاتا ہے تب مینیجمنٹ حرکت میں آتی ہے۔	1	2	3	4	5
7	جب تحفظ وسلامتی سے وابستہ طرز عمل میں رخنہ اندازی ہونے لگے تو مینیجمنٹ اس جانب متوجہ ہوتی ہے۔	1	2	3	4	5
8	مینیجمنٹ غیر ملکی ملازمین کے تحفظ کو اولین ترجیح دیتی ہے۔	1	2	3	4	5
9	میں مانتا ہوں کہ سلامتی سے متعلقہ مسائل کو اعلی ترین ترجیح نہیں دی گئی ہے۔	1	2	3	4	5
10	تحفظ وسلامتی سے وابستہ طریقہء کار پر بحسن وخوبی عمل کیا جاتا ہے۔	1	2	3	4	5
11	ورک پروجکٹ کو آگے بڑھانے کے لئے مینیجمنٹ تحفظ وسلامتی سے متعلقہ پالیسی کو بھی اولین ترجیح دیتی ہے۔	1	2	3	4	5

1	2	3	4	5
بھر پور غیر موافق	غیر موافق	غیرجانبدار / متذبذب	موافق	بھرپور موافق

12	ملازمین کو اپنے کام پورا کرنے کے لئے وافر مواقع ملتے ہیں۔	1	2	3	4	5		
13	مطلوبہ کام کے لئے ملازمین کی تعداد کافی ہے۔	1	2	3	4	5		
14	کام کے مناسب معیار کو بحال رکھنے کی غرض سے پلاننگ اور لائحہ عمل تیار کرنے کے لئے ملازمین کو پوری گنجائش مل جاتی ہے۔	1	2	3	4	5		
15	ایسے مسائل جن کے حلول ملازمین کی دسترس سے باہر ہو ایسے لمحات میں ملازمین کو ان کے تحفظ وسلامتی پر آنچ آئے بغیر ان کو متوفر وسائل فراہم کئے جاتے ہیں۔	1	2	3	4	5		
16	پروجکٹ کے تکملہ کے لئے درکار وقت کافی ہوتا ہے۔	1	2	3	4	5		
17	کام کا بوجھ معقول حد تک متوازن رہتا ہے۔	1	2	3	4	5		
18	ہماری مینیجمنٹ جائے عمل میں غیر ملکی ملازمین کے لئے سیفٹی مسائل سے وابستہ جامع تربیت کا انتظام کرتی ہے۔	1	2	3	4	5		
19	جدید غیر ملکی ملازمین کے لئے سیفٹی قوانین سے بہرہ ور کرانے اور طریقہء کار کے لئے ٹریننگ کا انتظام ہوتا ہے۔	1	2	3	4	5		
20	ٹریننگ پروگراموں میں سیفٹی موضوعات کو اہمیت دی جاتی ہے۔	1	2	3	4	5		
21	سیفٹی ٹریننگ پروگرام میں شرکت کرنے کے لئے مینیجمنٹ غیر ملکی ملازمین کی ہمت افزائی کرتی ہے۔	1	2	3	4	5		
22	سیفٹی ٹریننگ مجھ کو دی گئی تاکہ اپنے جائے عمل میں کسی بھی خدشات کو پرکھنے میں مجھ کو دقت نہ پیش آئے۔	1	2	3	4	5		
23	ایسے سیفٹی ایشوز جو مجھ پر اثرانداز ہوں ان کے حل کے لئے یہاں پر بہتر انتظام موجود ہے۔	1	2	3	4	5		

1 بھر پور غیر موافق	2 غیر موافق	3 غیرجانبدار / متذبذب	4 موافق	5 بھرپور موافق

24	مجھ کو مینیجمنٹ کے توسط سے تحفظ وسلامتی سے وابستہ تعلیمات ہمیشہ فراہم کی جاتی ہیں۔	1	2	3	4	5
25	ہماری مینیجمنٹ موجودہ خدشات ومسائل سے متعلق معلومات فراہم نہیں کراتی ہے۔	1	2	3	4	5
26	مینیجمنٹ سیفٹی ایشو کے لئے ایک اوپن ڈور پالیسی چلاتی ہے۔	1	2	3	4	5
27	باحفاظت کام انجام دینے پر میرے کام کو سراہا نہیں جاتا ہے۔	1	2	3	4	5
28	سیفٹی قوانین اور طریقہء کار ہمیشہ عملی طور پر انجام دیا جاتا ہے۔	1	2	3	4	5
29	کام کے دوران بھی سیفٹی قوانین کے طریقہ کار پر عمل کیا جاسکتا ہے۔	1	2	3	4	5
30	سیفٹی قوانین پر کام کے تکملہ کے بعد بھی عمل کیا جاسکتا ہے۔	1	2	3	4	5
31	سیفٹی سے وابستہ معاملات میں ہمارے فرم کے اندر غیر ملکی ملازمین کے رائے کی قدر ہمیشہ کی جاتی ہے۔	1	2	3	4	5
32	ہمارے فرم میں مینیجمنٹ اور غیر ملکی ملازمین کے نمائندوں پر مشتمل ایک سیفٹی کمیٹی فراہم ہے۔	1	2	3	4	5
33	سیفٹی سے وابستہ معاملات میں غیر ملکی ملازمین کی شمولیت کے لئے مینیجمنٹ ہمیشہ کوشاں رہتی ہے۔	1	2	3	4	5
34	مینیجمنٹ ہمیشہ فرم کے اندر سیفٹی سے متعلقہ مسائل پر غیرملکی ملازمین کے ساتھ تبادلہء خیال کرتی رہتی ہے۔	1	2	3	4	5

سیکشن سی: اجتماعی اور سماجی معاونت

فقط آپ اپنے تئیں مندرجہ ذیل پیمانہ کے تحت اپنے مناسب جواب کو گھیر دیں:

1 بالکل نہیں	2 تھوڑا	3 بہت تھوڑا	4 بہت	5 بہت زیادہ

1	آپ کتنی آسانی کے ساتھ اپنے سوپر وائیزر سے بات کر لیتے ہیں؟	1	2	3	4	5
2	مشکلات رونما ہوجانے پر آپ اپنے سوپر وائیزر پر کتنا منحصر ہوتے ہیں؟	1	2	3	4	5
3	آپ کا سوپر وائیزر آپ کے کام کو کتنا پرکھتا اور اہمیت دیتا ہے؟	1	2	3	4	5
4	کسی بھی قسم کے مشکلات پیش آجانے پر آپ کا سوپر وائیزر ان کو سلجھانے کے لئے کتنا مددگار ثابت ہوتا ہے؟	1	2	3	4	5
5	آپ اپنے سوپر وائیزر سے کس قدر مدد حاصل کرلیتے ہیں؟	1	2	3	4	5
6	آپ کتنی آسانی کے ساتھ اپنے کسی ساتھی سے بات کر لیتے ہیں؟	1	2	3	4	5
7	مشکلات رونما ہوجانے پر آپ اپنے ساتھی پر کتنا منحصر ہوتے ہیں؟	1	2	3	4	5
8	آپ کا ساتھی آپ کے کام کو کتنا پرکھتا اور اہمیت دیتا ہے؟	1	2	3	4	5
9	کسی بھی قسم کے مشکلات پیش آجانے پر آپ کا ساتھی ان کو سلجھانے کے لئے کتنا مددگار ثابت ہوتا ہے؟	1	2	3	4	5
10	آپ اپنے ساتھی سے کس قدر مدد حاصل کرلیتے ہیں؟	1	2	3	4	5
11	آپ کتنی آسانی کے ساتھ اپنی فیملی سے بات کر لیتے ہیں؟	1	2	3	4	5
12	مشکلات رونما ہوجانے پر آپ اپنی فیملی پر کتنا منحصر ہوتے ہیں؟	1	2	3	4	5
13	آپ کی فیملی آپ کے کام کو کتنا پرکھتی اور اہمیت دیتی ہے؟	1	2	3	4	5
14	کسی بھی قسم کے مشکلات پیش آجانے پر آپ کی فیملی ان کو سلجھانے کے لئے کتنا مددگار ثابت ہوتی ہے؟	1	2	3	4	5
15	آپ اپنی فیملی سے کس قدر مدد حاصل کرلیتے ہیں؟	1	2	3	4	5

سیکشن ڈی: سیفٹی طرز عمل

فقط آپ اپنے تئیں مندرجہ ذیل پیمانہ کے تحت اپنے مناسب جواب کو گھیر دیں:

1	2	3	4	5
بھر پور غیر موافق	**غیر موافق**	**غیرجانبدار / متذبذب**	**موافق**	**بھرپور موافق**

1	میں اپنے کام کو پورا کرنے کے لئے حفاظتی ساز وسامان کا ستعمال کرتا ہوں۔	1	2	3	4	5
2	میں صحیح ڈھنگ سے اپنے کام کو انجام دیتا ہوں۔	1	2	3	4	5
3	میں اپنے کام کو انجام دیتے وقت درست سیفٹی قوانین اور طریقہء کار پر عمل کرتا ہوں۔	1	2	3	4	5
4	میں اپنے کام کو انجام دیتے وقت سیفٹی کا بھر پور خیال رکھتا ہوں۔	1	2	3	4	5
5	فرم کے اندر کبھی بھی سیفٹی سے متعلق کسی بھی قسم کے خدشات کی خبر ملنے پر فورا مینیجمنٹ کو اس کی خبر دیتا ہوں۔	1	2	3	4	5
6	میں فرم کے اندر سیفٹی کو فروغ دینے کی زیادہ سے زیادہ کوشاں رہتا ہوں۔	1	2	3	4	5
7	میں رضاکارانہ طور پر فرم کے اندر کچھ اس طرح کی اکٹیویٹی کرتا رہتا ہوں جس سے کہ سیفٹی بحال رہے اور فروغ پاتا رہے۔	1	2	3	4	5
8	میں اپنے ساتھیوں کو سیفٹی برتنے کی ترغیب دیتا رہتا ہوں۔	1	2	3	4	5

سوالنامہ کے جوابات دینے کیلئے اپنا قیمتی دینے کا بہت بہت شکریہ
آپ کی اعانت کا میں بصد ممنون ہوں

Appendix E
Letter for Data Collection and Research Work

OTHMAN YEOP ABDULLAH
GRADUATE SCHOOL OF BUSINESS
Universiti Utara Malaysia
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KEDAH DARUL AMAN
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KEDAH AMAN MAKMUR • BERSAMA MEMACU TRANSFORMASI

UUM/OYAGSB/K-14
17 September 2015

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

LETTER FOR DATA COLLECTION AND RESEARCH WORK

This is to certify that **Alfayez, Bassem Abdullah D (Matric No: 95059)** is a bonafied student of Doctor of Philosophy (PhD), Othman Yeop Abdullah Graduate School of Business, Universiti Utara Malaysia. He is conducting a research entitled ***"The Moderating Effect Of Social Support On The Relationship Between Safety Management Practices And Safety Behavior Among Foreign Workers In Construction Industry In Saudi Arabia"*** under the supervision of Assoc. Prof. Dr. Chandrakantan Subramaniam.

In this regard, I hope that you could kindly provide assistance and cooperation for him to successfully complete the research. All the information gathered will be strictly used for academic purposes only.

Your cooperation and assistance is very much appreciated.

Thank you.

"SCHOLARSHIP, VIRTUE, SERVICE"

Yours faithfully

KARTINI BINTI DATO' TAJUL URUS
Senior Assistant Registrar
for Dean
Othman Yeop Abdullah Graduate School of Business

c.c - Supervisor
- Student's File (95059)

Othman Yeop Abdullah
Graduate School of Business
Universiti Utara Malaysia
06010 UUM Sintok
Kedah Darul Aman

Appendix F
Agreement Letter from Al-Muhaidib Construction Company

Al Muhaidib المهيدب
Contracting للمقاولات

التاريخ :١٤٣٦/١٢/٢٢هـ
الموافق :٢٠١٥/١٠/٠٥م
الموضوع : استبيان رسالة الدكتوراه.

سعادة الملحق الثقافي في ماليزيا وفقه الله

السلام عليكم ورحمة الله وبركاته ..

بناءً على رغبة الطالب بمرحلة الدكتوراه/ باسم بن عبدالله الفايز سجل مدني رقم: ١٠١٥٧٢٩١١٢ بالتعاون معه في تطبيق استبانته وجمع بعض المعلومات والبيانات المتعلقة برسالة الدكتوراه.

عليه نفيد سعادتكم بموافقتنا على طلبه و سيتم التعاون مع الطالب و تسهيل مهمته.

وتقبلوا خالص تحياتينا و تقديرنا ..

شركة المهيدب للمقاولات

محمد المهيدب

شركة المهيدب للمقاولات ذ.م.م.
ص.ب. ٩٢٩١ جدة ٢١٤١٣ المملكة العربية السعودية تلفون ٩٢٠٠٠٢٦٢٢ +٩٦٦ فاكس ٦٦١٤٩١٠٦ +٩٦٦
بريد إلكتروني info@muhaidibco.com www.muhaidibco.com
س.ت. ٤٠٣٠١٣٨٢٨٠ إشتراك الغرفة ٨٤٥٥٥ رأس المال ٢٠مليون ر.س.

Appendix G
Letter for Completed Data Collection

Al Muhaidib المهيدب
Contracting للمقاولات

25th February 2016

التاريخ: ١٦ جمادى الاولى ١٤٣٧هـ

HE cultural attaché of the Embassy of the Custodian of the Two Holy Mosques (May Allah protect him) Malaysia May God's peace, mercy and blessings be upon you Al-Muhaidib Contracting Company, certify that Mr. 'Bassem Abdullah Al-Fayez (National ID number 1015729112), the post-graduation student on doctorate stage ,has made several visits to the sites of our company , which has already taken him to distribute questionnaires and collect relevant data doctoral research , which is working on the preparation of his studies. This visit was commenced during the period from 05.10.2015 till date 02/20/2016. This letter is issued upon the request of Mr.Basim & to be submitted to the relevant authorities and build on student's responsibilities. We pray to Allah (SWTA) to bless him and enable him to achieve his goals with all the success. Yours Sincerely	سعادة الملحق الثقافي سفارة خادم الحرمين الشريفين حفظه الله دولة ماليزيا السلام عليكم ورحمة الله وبركاته،، بهذا تشهد شركة المهيدب للمقاولات بأن الاستاذ / باسم بن عبد الله الفايز (سجل مدني رقم ١٠١٥٧٢٩١١٢) والطالب بمرحلة الدكتوراه قد قام بعدة زيارات لمواقع الخاصة بشركتنا والتي قام خلالها بتوزيع الاستبيانات وجمع البيانات ذات العلاقة برسالة الدكتوراة التي هو يعمل على إعدادها وقد كانت تلك الزيارة على مدار الفترة من ٢٠١٥/١٠/٠٥م وحتى تاريخ ٢٠١٦/٠٢/٢٠م. حرر له هذا الخطاب لتقديمة للجهات ذات العلاقة وبناء على طلبة وعلى مسئوليته. داعين الله أن يسدد خطاه وأن يوفقه في رسالتة بكل التوفيق والنجاح بإذن الله. وتفضلوا بقبول وافر التحية والتقدير،،

عماد بن عبدالقادر المهيدب
Emad A.K.Al-Muhaidib
رئيس مجلس الإدارة
Chairman

Al Muhaidib المهيدب
Contracting للمقاولات
C.R. 4030138280 س.ت

شركة المهيدب للمقاولات ذ.م.م.
ص.ب. ٩٢٩١ جدة ٢١٤١٣ المملكة العربية السعودية تلفون ٩٢٠٠٢٦٢٢٠ +٩٦٦ فاكس ٦٦٤٩١٠٦ ٢ +٩٦٦
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Appendix H
Certification of Translation


هناخدمة
Huna Khidma

Certified Translation

ترجمة معتمدة

Affidavit

Hereby, Huna Khidma translation agency certifies that the attached documents and articles are correct ones of the original source text without taking any responsibility for any modification or addition without referring to us.

إفادة

تفيد مؤسسة هنا خدمة للترجمة أن المستند والمواد المترجمة المرفقة هي عبارة عن ترجمة صحيحة للنص الأصلي دون أدنى مسؤولية عن المحتوى والمؤسسة غير مسؤولة عن اي تعديل أو إضافة دون الرجوع لها.

ختم و توقيع مؤسسة هنا خدمة
Huna Khidma Seal and Authorized Signature

تصديق الغرفة التجارية
Chamber of Commerce

HK-5283-071015

Pages nr عدد الصفحات

18 OCT 2015
Date التاريخ

هناخدمة
Huna Khidma

Let Us translate your ideas ودعنا نترجم لكم أفكارك

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Stockholm: + 46 364 498 690
Beirut: + 961 3 281 363

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Appendix I
Univariate Statistics

Univariate Statistics

	N	Mean	Std. Deviation	Missing		No. of Extremes[a]	
				Count	Percent	Low	High
MC1	273	4.14	1.021	9	3.2	31	0
MC2	272	4.10	.793	10	3.5	11	0
MC3	271	4.10	.967	11	3.9	21	0
MC4	272	4.02	1.141	10	3.5	27	0
MC5	271	4.13	1.048	11	3.9	32	0
MC6	269	4.09	1.067	13	4.6	33	0
MC7	273	4.01	1.029	9	3.2	26	0
PS1	270	4.19	1.052	12	4.3	28	0
PS2	270	4.16	1.018	12	4.3	21	0
PS3	267	4.17	1.055	15	5.3	25	0
PS4	271	4.26	1.015	11	3.9	17	0
WP1	270	4.19	.900	12	4.3	11	0
WP2	272	4.14	.902	10	3.5	20	0
WP3	270	4.09	.975	12	4.3	20	0
WP4	272	4.12	1.004	10	3.5	22	0
WP5	273	4.11	.962	9	3.2	19	0
WP6	269	4.10	1.063	13	4.6	22	0
ST1	271	4.39	.844	11	3.9	12	0
ST2	271	4.34	.945	11	3.9	17	0
ST3	273	4.31	.900	9	3.2	16	0
ST4	269	4.17	.956	13	4.6	21	0
ST5	272	4.32	.826	10	3.5	13	0
SC1	273	4.28	.806	9	3.2	9	0
SC2	270	4.15	.896	12	4.3	15	0
SC3	272	4.24	.895	10	3.5	13	0
SC4	270	4.16	.969	12	4.3	21	0
SC5	272	4.16	.915	10	3.5	16	0
SR1	271	4.30	.887	11	3.9	14	0
SR2	274	4.30	.860	8	2.8	15	0
SR3	271	4.22	1.027	11	3.9	20	0
WI1	273	4.30	.923	9	3.2	16	0
WI2	272	4.25	.916	10	3.5	16	0
WI3	273	4.36	.829	9	3.2	11	0
WI4	273	4.35	.858	9	3.2	11	0
SS1	273	4.17	1.142	9	3.2	28	0
SS2	273	4.18	.764	9	3.2	9	0

SS3	272	4.37	.967	10	3.5	21	0
SS4	273	4.24	.861	9	3.2	14	0
SS5	272	4.22	.912	10	3.5	14	0
SS6	272	4.20	1.004	10	3.5	19	0
SS7	272	4.14	1.026	10	3.5	23	0
SS8	271	4.27	.832	11	3.9	11	0
SS9	272	4.21	.975	10	3.5	17	0
SS10	272	4.31	.888	10	3.5	12	0
SS11	271	4.35	.842	11	3.9	13	0
SS12	271	4.26	.974	11	3.9	20	0
SS13	272	4.36	.966	10	3.5	20	0
SS14	274	4.26	.938	8	2.8	21	0
SS15	274	4.23	1.009	8	2.8	18	0
SCO1	271	4.34	1.023	11	3.9	20	0
SCO2	272	4.42	.792	10	3.5	6	0
SCO3	275	4.45	.797	7	2.5	8	0
SCO4	274	4.43	.801	8	2.8	14	0
SPA1	273	4.33	.818	9	3.2	6	0
SPA2	272	4.35	.933	10	3.5	21	0
SPA3	274	4.45	.779	8	2.8	5	0
SPA4	271	4.52	.693	11	3.9	7	0

a. Number of cases outside the range (Q1 - 1.5*IQR, Q3 + 1.5*IQR).