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The Effect of Safety Rules and Safety Training on Construction Workers Safety Behavior in Saudi Arabia: The Moderating Role of Social Support

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Abstract: Organizational injuries and accident has become a major issue in many countries, especially, among the construction workers. Investigating safety performance of construction employees has therefore become priority. This research objective is to investigate the moderating effect of social support on the relationship between safety training, safety rules and construction employee's safety behavior in Saudi Arabia. Partial Least Square techniques (PLS) approach was used test the hypotheses with a data collected among 282 foreign workers from construction companies. The finding shows that safety rules and procedures are significantly related to safety behavior (both compliance and participation. In contrast, we did not find any significant relationship between safety training and construction employee's safety behavior. Additionally, social support moderates the relationships between safety training and safety compliance. The finding in this study offers additional 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 enhance employee's safety behavior.

Key words: Safety training, safety rules, safety compliance, safety participation, construction workers, social support

INTRODUCTION

There has been a growing research about occupational safety and health performance by the several researchers in the construction industry (e.g., Abudayyeh *et al*., 2006; Dedobbeleer and Beland, 1991; Fang *et al*., 2006; Glendon and Litherland, 2001; Mohamed, 2002). However, notwithstanding the considerable improvements achieved, the rate of accidents in this industry is still significantly greater than in most of the other industries. Example, HSE report that in the year 2013/2014, 133 employees were fatally injured and the construction industry accounted for 42% of these fatalities. In Australia 30 fatalities were recorded in 2012. This number of fatalities associated to three deaths per 100,000 employees which was the fourth highest fatality rate among all industries (SWA., 2013). Within Korea the construction industry occupied the highest proportion of fatalities among all industries (Yi *et al*., 2012). The accidents and fatalities have caused huge financial costs to the companies in addition to personal and social implications to the workers (Ibrahim *et al*., 2010). This sterling statistics require further research in this area to identify the antecedents of safety performance in this industry. This called the attention of safety researchers to study managerial practices to improve the organizations safety (Zhu *et al*., 2016).

In the Saudi Arabian context where this study is conducted, due to the rapid arrival of several construction companies during the past two decades, safety of the large number of foreign construction workers became a major issue (Al Haadir and Panuwatwanich, 2011). An overview of the figures presented by the General Organization for Social Insurance (GOSI) demonstrated that between the periods of 2004-2010, serious injuries totaled 261,076, equivalent to 3413.9/100,000 employees on average, annually. The total number of injuries that resulted in death amounted to 2176 (given average rate of 28.3/100,000 workers per annum). Therefore, understanding the antecedents of construction workers safety behavior in Saudi Arabia becomes an importance.

Hitherto, there are many calls in safety literature to expand safety models by incorporating moderator that could strengthen the relationship between safety management practices with workers safety behavior (Khdair *et al*., 2011; Mashi, 2014). In this study, we

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address this important gap by examining a theoretically important workplace social construct that may have an impact on the relationship between safety training, safety rules and procedures on workers safety behavior-social support which is defined as social exchange or relationship that helps the workers with actual guidelines and assistance or with a feeling of affiliation or attachment's to an individual or group that is perceived as loving or caring (Hobfoll and Stokes, 1988). Precisely, in this study we investigate the moderating role of social support on relationships between safety training, safety rules and construction employee's safety behaviors in a sample of foreign construction employees in Saudi Arabia. In doing, so, we add in the safety literature by empirically investigating a modifiable variable of safety training, safety rules that contributes to safety theory development and we provide further evidence on the functioning of social support as a potential moderator for construction managers to use to improve employee safety. Hence, the main aims of the present study is to examine the direct relationship between safety training, safety rules and foreign construction workers safety behaviors and investigate the moderating effect of social support on the relationships.

Literature review

Safety behavior: In this study, employee safety behavior was conceptualized as bi-dimensional based on Griffin and Neal model of component of safety behavior which differentiated two categories of safety behaviors: safety participation and compliance. Safety participation and compliance are similar two categories of general work performance (Motowidlo, 2003): task and contextual performance. Safety compliance according to Griffin and Neal are employee's behaviors that focused on attaining the minimum required safety standards in the workplace, such as adhering to safety procedures and wearing the required Personal Protective Equipment (PPE). On the other hand safety participation related to employee behaviors that support organization safety such as assisting coworkers with safety-related matters or attending safety meetings voluntarily.

Safety rules and procedures: Compliance with safety rules in any occupation is a fundamental safety practices to reduce injuries and accidents (Hu *et al*., 2016; Vinodkumar and Bhasi, 2010). Leplat (1998) defines safety rules as a set of actions employee should do or not do to achieve occupational safety. Hence, the main aims of safety rules is ensure positive safety behavior. This can be achieve with proper organizational safety policy (Lu and Yang, 2010). Many empirical investigation submitted that absent of safety rules and procedures is related with injuries and accidents (Hale and Borys, 2013; Laurence, 2005). While present of safety rules and procedures is associated with positive safety behavior (Vinodkumar and Bhasi, 2010). Since, many empirical studies reported that companies with safety rules and procedures can promoted employee's positive safe behaviors (compliance and participation) (Lu and Yang, 2010; Vredenburgh, 1999). Based on the above submission, empirical studies submits that safety rule is related to workers safety compliance and participation. Therefore, the following hypotheses are formulated:

- H_{1a}: safety rules and procedures is positively related to safety compliance
- H_{1b}: safety rules and procedures is positively related to safety participation

Safety training: Training is "Refers to instruction and practice for acquiring skills and knowledge of rules, concepts or attitudes necessary to function effectively in specified task situations" (Cohen *et al*., 1998). Safety training is defined as "Instruction in hazard recognition and control measures, learning safe work practices and proper use of personal protective equipment and acquiring knowledge of emergency procedures and preventive actions" (Cohen *et al*., 1998). Safety training is an important risk prevention and control strategies to guarantee every employee is safe in a good workplace conditions (Cohen *et al*., 1998).

Occupational safety literature reported that safety training is an important factor in maintaining and changing employee's attitude toward positive safety (Ali *et al*., 2009; Keffane, 2014). Organizations can keep workers safe through seminars, workshops, training on the job among others (Mearnsa *et al*., 2010). Meta-analytic findings show that perceptions of safety training positively related to safety compliance and participation (Christian *et al*., 2009). Taken together, there are clear evidence in the literature that workers perception of safety training is significantly related to workers safety behaviors. Based on the above submission, empirical studies submits that safety training is related to workers safety compliance and participation. Therefore, the following hypotheses are formulated:

- H_{2a}: safety training is positively related to safety compliance
- H_{2b}: safety training is positively related to safety participation

Social support: Social support is a social exchange or affiliation that aids the employees with actual procedures and support or with a feeling of relationship or attachment

to an individual or group that is perceived as loving or caring (Hobfoll and Stokes, 1988). This social support depends on workers perception (Hobfoll and Stokes, 1988). Kim defined social support as evidence from others articulating concern, respect, love or value. For the support to be obliging, it desires to be apparent by the receiver as being supportive if a worker is specified money when they need a hug or some inspiration, the by action of giving money might not be understood as helpful (Hobfoll and Stokes, 1988). Shumaker and Brownell (1984) state that "Social support is an exchange of resources between at least two individuals perceived by the provider or the recipient to be intended to enhance the well-being of the recipient".

Literature reports social support has moderating effects that might get rid of the pressure felt by worker (Eaton, 1978). Construction employees that received greater levels of social support summited greater levels of safety and well-being (Shakespeare-Finch and Obst, 2011), signifying that social support can have an effect in or promote psychological outcomes positively. We argued that social support will moderate the relationship between safety training and safety rules and procedures on construction workers safety behavior. Therefore, we hypothesized that:

- H_{3a}: social support moderates the relationship between safety rules and safety compliance
- H_{3b}: social support moderates the relationship bet ween safety rules and safety participation
- H_{3c}: social support moderates the relationship between safety training and safety compliance
- H_{3d}: social support moderates the relationship between safety training and safety participation

Underlining theory and research framework: Social Exchange Theory (SET) (Blau, 1964) suggests that worker behavior has reciprocal relationship in the organization and on depend on the perceived rewards. Employees behavior is always act to maximize benefits and minimize the costs. If employees do not get some reward when providing favor to others, employee may not do that favor in the future. Furthermore, if the worker reciprocate with a coming back, more circles of exchanges will become possible. This act is mostly motivated by the one who obtain benefits from management later sense that there is a requirement to pay off through effort or loyalty. In the context of this study, if companies are giving their workers training and provide them with the necessary rules and procedure, workers will reciprocate in term of safety compliance and participation. Figure 1 depicted the research framework which is underpinned by this theory.

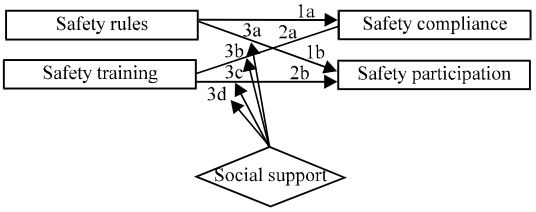

Fig. 1: Research framework

MATERIALS AND METHODS

Sample, data collection and data analysis technique: This study used cross-sectional study design using the quantitative method and the unit of analysis was construction workers in Saudi Arabia. The population of the study were 8738 and required samples sizes is 368 using table of sample determination. Additionally, the study used stratified sampling technique to select the required sample. Of the 368 distributed, 282 were returned. The data was collected by the researcher and the data collected was examined using SPSS 18 and SEM-PLS.

Measures: Three items were used to measure rules and procedures adopted from Glendon and Litherland (2001). Sample items 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. Five items were used to measure safety training adopted from Vinodkumar and Bhasi (2010). Sample items 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 the items was 0.82. Fifteen items were used to measure social support adopted from Ujiwara *et al.* (2003). Sample items include: "How much does your supervisor recognize and value your job?" and "How much support do you receive from your supervisor?". The internal consistency value was 0.87.

Four items were used to measure worker's safety compliance adopted from Vinodkumar and Bhasi (2010). Sampled items include: "I use necessary safety equipment to do my job" and "I follow correct safety rules and procedures while carrying out my job". The internal consistency value of the items was 0.66. Four items were used to measure safety participation adopted from Vinodkumar and Bhasi (2010). Sampled items include: "I voluntarily carryout 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". The internal consistency value of the items was 0.66.

RESULTS AND DISCUSSION

Respondent's profile: The profile of respondents demonstrates that 53.5% (n = 151) have high certificate and 55.7% (157) have lower certificate. Respondent's age showed more than half of respondents are between 21-30 years which indicated that construction companies are hiring young workers. With regards to the respondents gender, all respondents are men 100% (n = 282), this due to the fact that all workers in constructions site in Saudi are men. The demographic also showed that the majority of respondents are from Pakistan 39.4% (n = 111) since, the Pakistani workers represent the majority of foreign workers in construction site; meanwhile those form philippines were 1.4% (n = 4) because they represent the minority of foreign workers. The demographic results also shows that despite the majority of respondents 67.7% (n = 191) have experience working abroad between 1-5 years and the most of them 88.7% (n = 250) have attended occupational safety training, even though, the majority of them 56% (n = 158) had occupational accident.

Descriptive statistics: Table 1 displays the descriptive statistics in this study which include the constructs means and standard deviations. As presented in Table 1 the mean value of all the constructs ranged between 4.20 and 4.41.

Common method variance: Common Method Variance (CMV) must be tested when data are collected through self-reported questionnaires or when both the endogenous and exogenous variables are took from the same sources (Podsakoff *et al*., 2003). To decrease the effect of CMV in this study, first, the researcher guaranteed workers of their anonymity and privacy, so that, workers would response to the questions as honestly as possible. Second, Harman's single factor statistical test was used, CMV happens when only one factor appears from the factor analysis or one overall factor accounts for more than 50% of the variance (Podsakoff *et al*., 2003). First, we ran a factor analysis, the analysis returned a 5 factor solution explaining 61.87% of the variance. The first factor explained only 38.85% of variance, indicating method bias is not a serious issue in this study.

Measurement model evaluation: To analyze the data in this study SmartPLS 2.0 technique was used to analyze both the measurement and structural model in this study. Specifically, in the analysis, we first evaluate the measurement model which consist both the validity and reliability of the constructs.

As presented from Table 2 and 3 are factor loadings, Average Variance Extracted (AVE) and Composite Reliability. Table 3 reported all items loadings surpassed

Table 1: Mean standard deviation of the study variables

Construct	N	Mean	SD
Safety rules	282	4.24	0.776
Safety training	282	4.35	0.700
Social support	282	4.20	0.885
Safety compliance	282	4.38	0.819
Safety participation	282	4.41	0.657

Table 2: Loadings and cross loading

Constructs items	COM	PAR	SR	SS	TR
Safety compliance					
SCO1	**0.8216**	0.4947	0.4313	0.6163	-0.5842
SCO2	**0.8034**	0.6188	0.3121	0.4486	-0.2263
SCO3	**0.7878**	0.6447	0.3488	0.4168	-0.2899
SCO4	**0.8562**	0.6759	0.3780	0.6368	-0.4619
Safety participation					
SPA1	0.6021	**0.8205**	0.2840	0.4332	-0.1512
SPA2	0.4805	**0.8029**	0.2675	0.3527	-0.1429
SPA3	0.5949	**0.7853**	0.4130	0.4576	-0.3458
SPA4	0.6509	**0.7766**	0.3089	0.4289	-0.3366
Safety rules					
SR1	0.3010	0.313	**0.7584**	0.2580	-0.4256
SR2	0.4261	0.3422	**0.8560**	0.4406	-0.5492
Social support					
SS12	0.4931	0.4267	0.3513	0.8554	-0.4217
SS13	0.4942	0.3496	0.3575	0.8073	-0.4851
SS15	0.5468	0.4948	0.3158	0.7722	-0.4174
SS3	0.5246	0.3632	0.3938	0.8617	-0.5338
SS6	0.5465	0.4571	0.3511	0.8436	-0.4509
SS7	0.5734	0.4401	0.3781	0.7226	-0.4712
SS9	0.5772	0.4384	0.3586	0.8013	-0.4875
Safety Training					
ST1	-0.3424	-0.1918	-0.4838	-0.4671	**0.6687**
ST2	-0.4757	-0.2352	-0.3990	-0.4732	**0.8145**
ST3	-0.3683	-0.26	-0.4455	-0.4307	**0.7875**
ST4	-0.2111	-0.2197	-0.4830	-0.2641	**0.6025**
ST5	-0.4215	-0.2545	-0.4952	-0.4694	**0.8084**

Bold values are loadings for items which are above the recommended value of 0.5

Table 3: Convergent validity

Constructs	Loadings	(AVE)	CR
(Safety compliance)			
SCO1	0.822	0.669	0.890
SCO2	0.803		
SCO3	0.788		
SCO4	0.856		
(Safety participation)			
SPA1	0.821	0.666	0.874
SPA2	0.803		
SPA3	0.785		
SPA4	0.777		
(Safety rules)			
SR1	0.758	0.654	0.790
SR2	0.856		
(Social support)			
SS12	0.855	0.657	0.930
SS13	0.807		
SS15	0.772		
SS3	0.862		
SS6	0.844		
SS7	0.723		
SS9	0.801		
(Safety training)			
ST1	0.669	0.549	0.858
ST2	0.815		
ST3	0.788		
ST4	0.603		
ST5	0.808		

AVE: Averae Variance Extracted; CR = Composite Reliability

Table 4: Discriminant validity

Constructs	COM	PAR	SR	SS	TR
COM	0.818				
PAR	0.735	0.816			
SR	0.456	0.405	0.809		
SS	0.667	0.529	0.443	0.810	
TR	-0.506	-0.312	-0.608	-0.577	0.741

Diagonals (in bolded) represent the square root of the Average Variance Extracted (AVE) while the off-diagonals are correlations among constructs. Diagonal elements should be larger than off-diagonal elements in order to establish discriminant validity

Structural model evaluation: Based on the Hair *et al.* (2013)' suggestion, we evaluate the structural model by the suggested value of 0.7 (Chin *et al*., 2008). Composite reliability which show the extent to which the variable indicators specify the latent variable, surpassed the suggested value of 0.7 while the AVE which reveals the total sum of variance in the indicators accounted for by the variable, surpassed the suggested value of 0.5 (Hair *et al*., 2013). Therefore, convergent validity is achieved in this study.

Additionally, we evaluated the discriminant validity which is the extent to which the measures are not a replication of some other construct; This is indicated by low correlations between the measure of interest and the measures of other constructs. Table 4 present that diagonal values which is the square root of the AVE of each variable is greater than its matching correlation values demonstrating acceptable discriminant validity based on Fornell and Larcker (1981).

Table 5: Results of the structural model analysis (Direct Relationships)

Hypothesis	Relationships	SD.β	SE	t-values	Decision
1a	SR->COM	0.229	0.069	3.330*	Supported
1b	SR->PAR	0.339	0.076	4.477**	Supported
2a	TR->COM	-0.382	0.083	4.612	Not Supported
2b	TR->PAR	-0.125	0.081	1.532	Not Supported

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

Table 6: Results of the structural model analysis (moderating effects)

Hypothesis	Relationships	SD.β	SE	t-values	Decision
3a	SR*SS->COM	-0.0899	0.0991	0.9070	Not supported
3b	SR*SS->PAR	-0.0680	0.1362	0.4993	Not supported
3c	TR*SS->COM	0.1663	0.0936	1.7774*	Supported
3d	TR*SS->PAR	-0.0348	0.1260	0.2765	Not supported

*t- value>1.645 = p<0.05

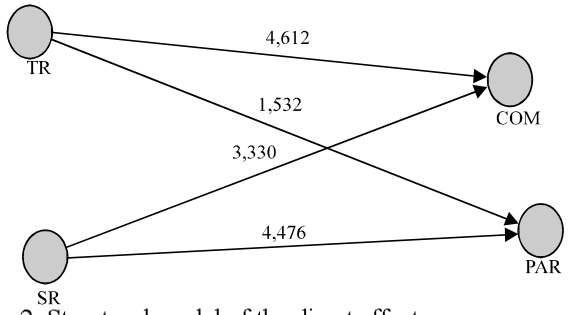

Fig. 2: Structural model of the direct effect

Structural model evaluation: Based on the Hair *et al.* (2013)' suggestion, we evaluate the structural model by considering the R^2 value, beta values and corresponding t-values using 5000 bootstrapping resample. We also reported the effect sizes (f^2) and predictive relevance (Q^2).

Result of the direct effect: Firstly, we look at the direct relationships between safety rules and safety training on construction workers safety behavior. Safety rules positively and significantly related to safety compliance (β = 0.229 t = 3.330 p<0.01) and safety participation (β = 0.339 t = 4.477 p<0.01). In contrast, safety training fail to predict safety participation (β = -0.125 t = 1.523 p>0.05) and the relationship between safety training and safety compliance is significant but unexpectedly with negative beta value (β = -0.382 t = 4.612 p<0.01). Therefore not supported in this study (Table 5 and Fig. 2).

Result of the interaction effect: The moderating result from Table 6 and Fig. 3 showed that social support moderates the relationships between safety training and safety compliance (β = 0.1663 t = 1.7774 p<0.05). Thus, H_{3c} was supported in this study. In contrast, this study did not find social support as moderator between safety training and safety participation (β = -0.0348 t = 0.2765 p>0.05), the relationship between safety rules and safety participation (β = -0.068 t = 0.4993 p>0.05) and the

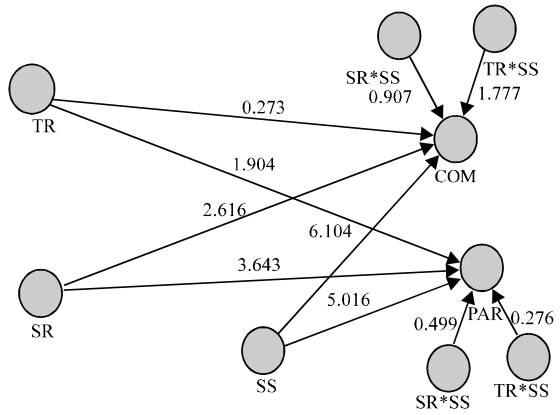

Fig. 3: Structural model with moderator

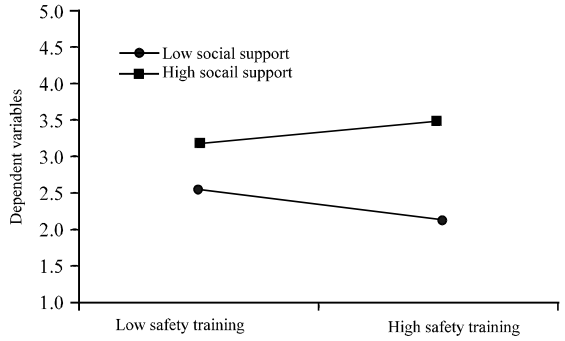

Fig. 4: Interaction effects of safety training*social support->safety compliance

relationship, between safety rules and safety compliance (β = -0.0899 t = 0.907 p>0.05). Thus $H_{3a, b}$ and H_{3d} 3b were not supported in this study.

Figure 4 provides a plot of the interaction between safety training and social support on safety compliance at high and low social support based on the recommendation of Dawson (2014). As shown in Fig. 4, the relationship between safety training and safety compliance is strongest in the case of high social support and weakest in the case of low social support. Individuals of different level of social support did not differ much in safety compliance under conditions of low safety training but 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 social support.

Additional, criteria for assessing the structural model is coefficient of determination (R^2). The R^2 of the safety compliance in this study was 0.48 which implied that safety training and safety rules on safety collectively explained 48% of the variations in safety compliance. Also, R^2 of safety participation is 0.33 which implied that safety training and safety rules on safety collectively explained 33% of the variations in safety participation. Chin classified R^2 of 0.19, 0.33 and 0.67 as weak, moderate and substantial, respectively. Therefore, the R^2 values in the present study can be considered as moderate R^2.

Additional, vital criterion for assessing a structural model is effect-size (f^2). Cohen considered f^2 of 0.02, 0.15 and 0.35 as small, medium, large respectively. The f^2 of the safety training and safety rules on safety compliance were 0.14 and 0.03 which are small, small, respectively. The f^2 of safety training and safety rules on safety participation were 0.015, 0.26 which are none and medium, respectively. The f^2 of the moderators were 0.44 on safety compliance and 0.22 on safety participation which are large and medium, respectively. The concluding valuation criterion is predictive relevance (Q^2). The Q^2 greater than zero indicates predictive relevance of a model (Geisser, 1974). Q^2 of safety compliance is 0.44 and for safety participation is 0.63 which are all greater than zero which indicates the model of this study has predictive relevance.

The results of the present study offer additional support for the significant positive relationships between safety rules on safety participation and compliance of construction workers in Saudi Arabia. Significantly, the study also found the significant empirical support for the hypotheses that workers with high levels of social support are connected with stronger positive relationships between safety training and safety compliance behaviors. These results offer further evidence for the view that social support plays a substantial part in eliciting the relationships between safety training and safety compliance.

The result from Table 5 shown that a significant relationship exists between safety rules and procedures and construction workers safety behavior in Saudi Arabia (both safety compliance and participation), hence, H_{1a} and H_{1b} is supported. This result is consistent with earlier research (Hu *et al*., 2016; Vinodkumar and Bhasi, 2010). The probable explanations for this finding is that if construction company concentrates on employees safety and provide the necessary safety policies and guidelines on how the workers should operate. Companies are utmost certain to gain high paybacks in terms of employee safety performance.

The result from Table 5 shown that safety training fail to predict construction workers safety behavior in Saudi Arabia (both safety compliance and participation), hence, H_{2a} and H_{2b} is not supported. This result is consistent with earlier research by Keffane and Delhomme (2013). The probable explanations for this finding is that if Construction Company may not understand the importance of training or the type of training given to the

workers is not in line with the company requirements. Another possible explanation may be the items did not capture what intended to measure. With regards to social support as moderator, the study found empirical support H_{3c}. Figure 4 demonstrated that safety training and social support on safety compliance at high and low social support. In other words, the relationship between safety training and safety compliance was high among constructions workers with high social support but low among constructions workers with low social support. Thus, social support buffered the effect of safety training on safety compliance. Therefore, company with high safety training and workers with high social support, safety compliance can be improved.

In contrast, we did not find the moderating role of social support on the relationships between safety rules and safety training on safety participation and the relationships between safety rules and safety compliance. Therefore were rejecting hypotheses $H_{3a, b}$, and H_{3d} The possible reasons for these findings may be attributable to the measure of social support used in this study.

CONCLUSION

This study offers additional evidence from the result of PLS modeling which demonstrated that safety rules and procedures was significantly and positively related to construction workers safety behavior in Saudi Arabia. In contrast, the relationship between safety training and safety behavior was not supported in this study. This study also has established the moderating role of social support that play a theoretically significant role in construction workers safety. Generally, these results highlighted the importance of social support when attempting to increase construction workers safety behavior in Saudi Arabia.

IMPLICATIONS

Theoretical and practical implications: The results of this paper are important to both theory and practice. From theoretical standpoint, the finding offered the boundary conditions under which the effect of safety training and employees safety compliance can be increase in Saudi Arabian context. The study also confirmed the usefulness of Social Exchange Theory (SET) (Blau, 1964) in understanding safety in the context of Saudi Arabia. From practical standpoints, since, this finding suggest that safety rules has significant influence in workers safety behavior. Therefore, one can believe that training construction workers is likely to provide useful changes in workers safety positively. This perhaps will extant a benefit for companies by maintaining a healthier status on site and improving their morale and reduce compensation cost to the management.

The key implication of the study is that even though safety training is critical in keeping employees safe, companies also need to consider social support that may provide further information. As in all empirical studies, this findings is not without limitations. So, while interpreting the findings, the subsequent limitations can be taking into account. The study is cross-sectional, hence, no causal inferences could be made to the population. So, future research are recommended to use longitudinal research design. Moreover, in this study construction workers safety behavior was measured using self-report measures which may be related with social desirability bias (Grimm, 2010). There is possibility that the workers may have over-reported their behavior. Hence, future investigators may apply other method to evaluate safety behavior. More precisely, supervisor ratings of workers safety or peers reporting to control for the social desirability bias.

REFERENCES

Abudayyeh, O., T.K. Fredericks, S.E. Butt and A. Shaar, 2006. An investigation of management's commitment to construction safety. Intl. J. Project Manage., 24: 167-174.

Al-Haadir, S. and K. Panuwatwanich, 2011. Critical success factors for safety program implementation among construction companies in Saudi Arabia. Procedia Eng., 14: 148-155.

Ali, H., N.A.C. Abdullah and C. Subramaniam, 2009. Management practice in safety culture and its influence on workplace injury: An industrial study in Malaysia. Disaster Prev. Manage. Intl. J., 18: 470-477.

Blau, P.M., 1964. Exchange and Power in Social Life. Transaction Publisher, Piscataway, New Jersey, USA., ISBN:978-0-88738-628-8, Pages: 352.

Chin, W.W., R.A. Peterson and S.P. Brown, 2008. Structural equation modeling in Marketing: Some practical reminders. J. Marketing Theory Pract., 16: 287-298.

Christian, M.S., J.C. Bradley, J.C. Wallace and M.J. Burke, 2009. Workplace safety: A meta-analysis of the roles of person and situation factors. J. Appl. Psychol., 94: 1103-1127.

Cohen, A., M.J. Colligan, R. Sinclair, J. Newman and R. Schuler, 1998. Assessing Occupational Safety and Health Training. National Institute for Occupational Safety and Health, Cincinnati, Ohio, Pages: 145.

Dawson, J.F., 2014. Moderation in management research: What, why, when and how. J. Bus. Psychol., 29: 1-19.

Dedobbeleer, N. and F. Beland, 1991. A safety climate measure for construction sites. J. Saf. Res., 22: 97-103.

Eaton, W.W., 1978. Life events, social supports and psychiatric symptoms: A re-analysis of the new haven data. J. Health Social Behav., 19: 230-234.

Fang, D., Y. Chen and L. Wong, 2006. Safety climate in construction industry: A case study in Hong Kong. J. Constr. Eng. Manage., 132: 573-584.

Fornell, C. and D.F. Larcker, 1981. Evaluating structural equation models with unobservable variables and measurement error. J. Market. Res., 18: 39-50.

Geisser, S., 1974. A predictive approach to the random effect model. Biometrika, 61: 101-107.

Glendon, A.I. and D.K. Litherland, 2001. Safety climate factors, group differences and safety behaviour in road construction. Saf. Sci., 39: 157-188.

Hair, J.F., G.T.M. Hult, C.M. Ringle and M. Sarstedt, 2013. A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). SAGE Publication, Thousand Oaks, CA., USA., ISBN-13: 978-1452217444, Pages: 328.

Hale, A. and D. Borys, 2013. Working to rule, or working safely? Part 1: A state of the art review. Saf. Sci., 55: 207-221.

Hobfoll, S.E. and J.P. Stokes, 1988. The Process and Mechanics of Social Support. In: Handbook of Personal Relationships: Theory, Research and Interventions, Duck, S., D.F. Hay, S.E. Hobfoll, W. Ickes and B.M. Montgomery (Eds.). John Wiley, Oxford, England, UK., pp: 497-517.

Hu, X., M.A. Griffin and M. Bertuleit, 2016. Modelling antecedents of safety compliance: Incorporating theory from the technological acceptance model. Saf. Sci., 87: 292-298.

Ibrahim, A.R., M.H. Roy, Z. Ahmed and G. Imtiaz, 2010. An investigation of the status of the Malaysian construction industry. Benchmarking: Int. J., 17: 294-308.

Keffane, S., 2014. Communication's role in safety management and performance for the road safety practices. Intl. J. Transp. Sci. Technol., 3: 79-94.

Khdair, W.A., F.M. Shamsudin and C. Subramaniam, 2011. A proposed relationship between management practices and safety performance in the oil and gas industry in Iraq. Rev. Bus. Res., 1: 27-45.

Laurence, D., 2005. Safety rules and regulations on mine sites-the problem and a solution. J. Saf. Res., 36: 39-50.

Leplat, J., 1998. About implementation of safety rules. Saf. Sci., 29: 189-204.

Lu, C.S. and C.S. Yang, 2010. Safety leadership and safety behavior in container terminal operations. Saf. Sci., 48: 123-134.

Mashi, M.S., 2014. Moderating effect of consideration of future safety consequences on the relationship between safety management practices and safety performance among health care workers: A conceptual analysis. Intl. J. Acad. Res. Bus. Social Sci., 4: 402-411.

Mearnsa, K., L. Hopeb, M.T. Fordc and L.E. Tetrick, 2010. Investment in workforce health: Exploring the implications for workforce safety climate and commitment. Accident Analysis Prevention, 42: 1445-1454.

Mohamed, S., 2002. Safety climate in construction site environments. J. Constr. Eng. Manage., 128: 375-384.

Motowidlo, S.J., 2003. Job Performance. In: Hand¬book of Psychology: Industrial and Organizational Psychology, Borman, W.C., D.R. Ilgen and R.J. Klimoski (Eds.). Wiley, Hoboken, New Jersey, USA., pp: 39-53.

Podsakoff, P.M., S.B. MacKenzie, J.Y. Lee and N.P. Podsakoff, 2003. Common method biases in behavioral research: A critical review of the literature and recommended remedies. J. Applied Psychol., 88: 879-903.

SWA., 2013. Work-related traumatic injury fatalities Australia 2012. Safe Work Australia, Australia.

Shakespeare-Finch, J. and P.L. Obst, 2011. The development of the 2-way social support scale: A measure of giving and receiving emotional and instrumental support. J. Personality Assess., 93: 483-490.

Shumaker, S.A. and A. Brownell, 1984. Toward a theory of social support: Closing conceptual gaps. J. Social Issues, 40: 11-36.

Ujiwara, K.F., E.T. Sukishima, A.T. Sutsumi, N.K. Awakami and R.K. Ishi, 2003. Interpersonal conflict, social support and burnout among home care workers in Japan. J. Occup. Health, 45: 313-320.

Vinodkumara, M.N. and M. Bhasi, 2010. Safety management practices and safety behaviour: Assessing the mediating role of safety knowledge and motivation. Accident Anal. Prevention, 42: 2082-2093.

Vredenburgh, A.G., 1999. Risk management: Which management practices are best predictors of employee injury rates?. Proceedings of the Conference on Human Factors and Ergonomics Society Vol. 43, September 27-October 1, 1999, SAGE Publication, Los Angeles, California, pp: 902-906.

Yi, J.S., Y.W. Kim, K.A. Kim and B. Koo, 2012. A suggested color scheme for reducing perception-related accidents on construction work sites. Accid. Anal. Prev., 48: 185-192.

Zhu, Z., M.W. Park, C. Koch, M. Soltani and A. Hammad *et al*., 2016. Predicting movements of onsite workers and mobile equipment for enhancing construction site safety. Autom. Constr., 68: 95-101.