Occupational Fire Safety and Organizational Management measures: An Empirical Investigation from the Coal Mining Industry

Mohsin Ali Shaikh[a*], Song Weiguo[b]

[a]University of Science and technology of china, Hefei, China, mohsin38@mail.ustc.edu.cn

[b]University University of Science and technology of china, Hefei, wgsong@ustc.edu.cn

* Corresponding author: Mohsin Ali

Abstract:

The study purpose to investigate the relationship between occupational fire safety (OFS) and organizational management (OM) measures in the Lakhra coal mining industry, Dadu, Sindh Pakistan. Under the fact, mining industry workers are facing more challenges relating to fire safety in Pakistan. The cross-sectional method was adopted and 200 questionnaires were distributed amongst workers, 162 questionnaires were properly filled (male 96.3% and female 3.7%) used for the study. Initially, the Cronbach's alpha was used to check the reliability of data. Which was 0.81; shows consistent and good. Moreover, mean, standard deviation, Pearson correlation, and regression were also used to analyses the date with the help of SPSS (statistical packages for social sciences) software. The results exposed a significant and positive relationship between occupational fire safety and organizational management. Furthermore, also indicated the substantial impact of fire safety on the worker's performance. This study will contribute more knowledge about practical implications and future research for the mining industry workers.

Keywords: Occupational Fire Safety Measures; Organization Management; Coal Mining Industry

1. Introduction

The mining sector is performing a vital role in maintaining the international economy (Azapagic, 2004). Now, this sector considered the most hazardous zone in the world (ILO, 2014)**.** By all means, mining workers' have pessimist from a fire hazardous working environment (Gyekye, 2006)**.** In such competitive situations, mining industry workers unprotected due to vulnerable fire hazards including; live flames, chemical, sparks, hot objects, flammable chemical, psychological, electric wires, higher loads, loose connections, and old electrical equipment, mechanical and electrical, (Amponsah-Tawiah and Mensah, 2016). The Mines and Mineral Development Act 1948 to promote necessary infrastructure for handling the mining workers' rights in Pakistan (Maluka, 2019). There are many places in Pakistan commercial or residential areas. they don't worry about linking actual consumption burdens. Similarly, safe evacuation cannot be guaranteed when the fire is set up and deployed at the workplace. Lack of such a way to track people or create a siege due to lack of ventilation. The World Bank (WB) reported that Pakistan produces significant growth in the mining sector. The mining sector with satisfactory investment and sufficient capital

has the ability to endorse foreign exchange and annual budgets approximately USD 1.5-2.0 billion or 3.04 % of GDP (Wikipedia, 2018) (Emerging Pkaistan, 2019)**.** With reference to (Zamir Ahmed Awan, 2018), Pakistan is Located in the continent of Asia that has developed a preferable objective for mineral assets. In 2018, GDP has increased to 344832 (PKR) million from 339747 million (PKR) in the mining sector of Pakistan (Wikipedia, 2018) (Batool, 2015) (Amponsah-Tawiah and Mensah, 2016)**.** In recent years, occupational fire accidents rate increase significantly in the Pakistan mining sectors. The massive accidents have a substantial human cost for Pakistani society. "No safety for coal miners workers in Pakistan" (Usama Khawar Ghumman, 2018). The working environment is progressively enhancing being acknowledge as a general conception affecting the quality and life features at the particular level to considerable influences in the field of public health at the social relation level (Helliwell and Putnam, 2004)**.**

Globally, (OFS) is an interdisciplinary perception that focuses on the advancement of health, safety, and interest of people committed in employment or work (Bhagawati, 2015). The (OFS) covers the psychological, physical health and passionate of the employees in connection with the control of his work function and, accordingly, indicates a fundamental topic of concern influencing absolutely positively on the success of organizational targets (Gyekye, 2006) (National Safety Council, 2004). The ILO reported, 2.3 million peoples have killed each year as a consequence of occupational injuries or accidents, moreover, 350, 000 of these deaths are perceptible to workplace disasters. Furthermore, every year 264 million misfortunate causalities occur in occupational illnesses (ILO, 2014). The progressive nation's industries are facing tremendous financial and economic cost as a consequence of diseases and injuries related to occupational work (Seo et al., 2004)]. In presently scientific research mentioned in their publication, the ILO exposed that every year maximum 860,000 work-related disasters happened indirect or direct cost for occupational accidents and illnesses is valued at $ 2.8 trillion globally (ILO, 2014).

The (OFS) have a valuable campaign for the mining processing industry. By all means, decreases the possibilities of unexpected accidents. Moreover, the organizational management needs more attention toward occupational fire safety issues to prevent the risks and injuries after implementation of the better precaution and safety rules (Kamrin, 2014). In addition, organization achievement increases the worker's intentions and positive attitudes toward their work performance (Sajid et al., 2014).

Fire accidents are a complicated common problem for society and management. Moreover, organizational management plays a vital role must be the aware first priority in every sphere of fire safety intervention. The organizational management ability to get extraordinary achievement from ordinary workers (Hoffman et al., 2006). The study suggested in the Canadian manufacturing industry, that administrative practices, policies, and attitudes have a positive influence on occupational fire safety in the working environment (Geldart et al., 2010). First and foremost, workers feeling for the sake of organizational management performance to workplace developed unexpected fire disaster reduction (Yule et al., 2006). In addition, workplace fire injuries could be reduced after the effective performance of management organizational practices in the workplace (Mearns et al., 2003).

In spite of global statistics on (OFS), limited research case studies on (OFS) have been arranged in sub-continent Asia-significantly, Pakistan peoples are involved in works classified risk, hazardous and disasters such as lumbering, fishing, mining and quarrying (Khan, 2012). Questionably, some researchers have conducted the relationship between occupational fire safety and organizational management, especially in the mining industry. Taking into account the

challenges problems on the coal mining extraction from the earth ground in the recent past years, this study tries to find (OFS) from the worker's perception and its implementation on industrial workers by organizational management (Amponsah-Tawiah and Mensah, 2016).

The Pakistan Central Mines Labor Federation (PCMLF) as per the figures accumulated the results as per figure 1. That most massive 46 accidents have observed in coal mining sectors during the last years in the country. Approximately 327 workers killed and thousands of injuries also recorded. The real calculation may be higher. The reason of death; explosions burnings, roofs falling, load-carrying vehicles and suffocation inside the coal mines (Shahzada Irfan Ahmed, 2018) as shown in Fig 1.

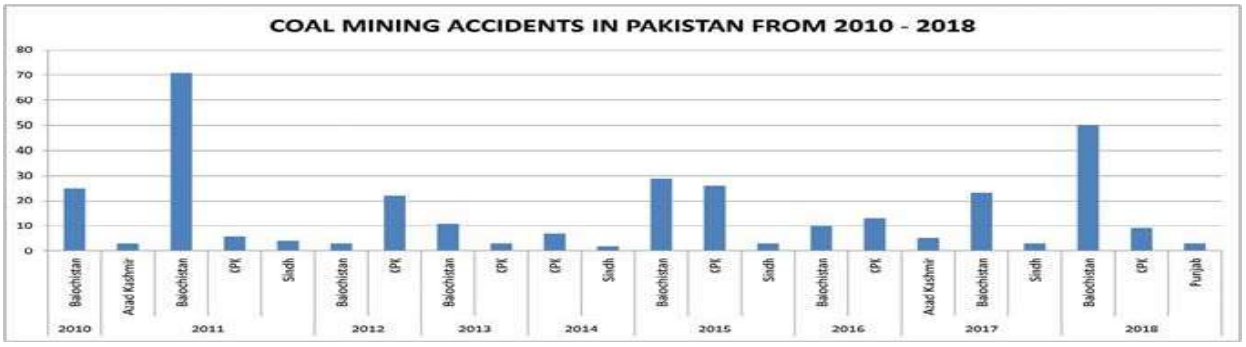


Fig. 1 Source: News Reports (Shahzada Irfan Ahmed, 2018)

2. Research objective

- Relationship between occupational fire safety & organizational management.
- Impact of occupational fire safety on workers performance.
- Workers perceptions after promoting occupational fire safety at the workplace.

3. Definition of key concepts

Occupational: "The place related to the industry, business, and activity in which many workers involved in manufacturing anything. (The free dictionary, https://www.thefreedictionary.com/occupational.

Fire safety: "Fire safety is the set of practices strategic to decrease the devastation produced by the fire. (The free dictionary, https://encyclopedia.thefreedictionary.com/fire+safety.

Safety: "A place which is free from accidents, risk, and injuries". (The Free Dictionary, https://www.thefreedictionary.com/safety.

Organizational: "A group of different people for a specific desire or objective: a business or association". (The Free Dictionary, https://www.thefreedictionary.com/organization.

Management: "The manner, act or managing practice, control, handling or supervision: like factory workers management. (The Free Dictionary, https://www.thefreedictionary.com/management.

3. Methodology and Methods

3.1. Research sample and design

In order to achieve this objective, the cross-sectional survey was adopted in this study. Hence, the date was collected from the respondents of Lakhra coal mining industry Dadu, Sindh, Pakistan during a time of hesitancy. It is expected that this hesitancy would have distressed the responses of workers. Therefore confining the influence of the outcome of this study. The mining industry has fully participated in the study. Before the data collection, permission was taken from the industrial-organizational management to collect data from their workers, especially, high skills workers (workers with expertise and powerful skills in mining sectors). The total 200 questionnaires were distributed among workers in which 13 (6.5%) questionnaire papers were rejected, while 25 (12.5%) were not completely filled and others 162 (81.0%) questionnaire papers were reliable to compute the data. The total time duration during data collection within two months. The Cronbach's Alpha was used to check the data reliability which indicates 0.80 yielded which indicates good reliability. According to (Kirk Allen Teri Reed-Rhoads Robert A. Terry Teri J. Murphy Andrea D. Stone, 2018) studied that 0.8 indicates good consistency. The data were analyzed through SPSS software while descriptive statistics were used to compute the data like mean, frequency and standard deviation and correlation. Likert scale Likert (1932), were provided to workers as 1= strongly disagree; 2 = Disagree; 3 = Not sure; 4 = Agree; 5 = strongly agree.

4. Results

The facts of demographic respondents are mentioned in Table 1.

Table 1

Demographic respondent's characteristics

Variable	Features (n=162)	Number	%
Gender	Male	156	96.3
	Female	06	3.7
Age (years)	below 19	2	1.2
	20-29	67	41.4
	30-39	43	26.5
	40-49	28	17.3
	50-59	18	11.1
	Above 60	4	2.5
Relationship status	Single	54	33.3
	Married	103	63.6
	Divorced	5	3.1
Working Department tenure (years)	lower than 1	31	19.1
	1-4	49	30.2
	5-10	34	21.0
	11-15	21	13.0
	16-20	19	11.8
	Above 20	08	4.9
Education	No education	41	25.3

Primary	56	34.6
Matric	31	19.1
Secondary	19	11.7
Bachelor	12	7.4
Master	3	1.9

4.1. Occupational Fire Safety measures (OFS)

The statistical value for provided first aid medical services ($\bar{x}$) = 4.82 and SD =0.47, Fire safety equipments and tools ($\bar{x}$) = 4.55 and SD = 1.16 and Fire safety awareness was ($\bar{x}$) = 4.51 and SD = 1.07 as mentioned in Table 1, indicates that respondents strongly agreed about the getting this parameter from an organizational management. The purpose of First aid medical services to provide initial medical treatment to victims before reaching the hospital. This facility increases the worker's morale and easily recover by getting medical service at a time. Several organizational management never considered this factor. After the accident, the workers lose their courage and their families face difficulties in life (Galmessa, 2006). The Fire safety equipments and tools are crucial to all workers and a significant aspect of effective safety and health management. It protects workers from hazards and helps to enhance the performance of workers (Utembe et al., 2015)**.** In many countries, fire safety awareness becomes a legal requirement. Across the globe, fire safety awareness has become an important factor in both the public and the private sectors (Stanton et al., 2001).

The statistical value for fire safety department ($\bar{x}$) = 4.43 and SD =1.15, fire safety supervisor ($\bar{x}$) = 4.43 and SD =0.68, fire and smoke detection alarm system ($\bar{x}$) = 4.19 and SD =1.10, fire evacuation plan ($\bar{x}$) = 4.13 and SD =0.38, water storage tanker ($\bar{x}$) = 4.06 and SD =1.21 and fully Charged Fire Extinguishers ($\bar{x}$) = 3.74 and SD = 1.34 as mentioned in Table 1 which statistical value is near about 4, indicates that respondents agreed about the getting this parameter from an organizational management.

The fire safety departments provides the courage's and prevents unhealthy consequence and threats. These departments can boost up the industry reliability and reduced the injuries, illnesses and accident Workplace (Occupational Safety and Health Adminstration and Labor, 2015)**.** The fire safety supervisor have a strong relationship with consultation in order to discuss exchange comments and fascinating in communication (Andrea Broughton, 2008).

The fire alarm system is an active and modern fire protection system that handles all the fire modules alarm in an industrial building. The heat sensor detector and smoke detector set out automatically. When a certain amount of smoke or heat observed; it starts alarm for the indication (Bin Bahrudin et al., 2013)**.**

The fire drill ($\bar{x}$) = 2.24 and SD =1.27, Hazard control training ($\bar{x}$) = 2.10 and SD =1.54, fire accident prevention training ($\bar{x}$) = 2.05 and SD =1.27, worker skills training ($\bar{x}$) = 2.01 and SD =1.06, fire fighters ($\bar{x}$) = 1.81 and SD =1.23, Emergency Numbers and Proper Signage ($\bar{x}$) = 1.57 and SD =0.65, as mentioned in Table 1 which statistical value is near about 2, indicates that respondents disagreed about the getting this parameter from an organizational management.

The executed and well-designed system safety and health programs contribute to developing an accident prevention plan and control of hazards. The accurate investigation of the workplace accident is the key to success. These investigations are most important to find out the measures that may be taken to save homogenous accident in the future. The incidents occur at any time, which may or may not have important results. The injury is not caused by these incidents; but more

serious incidents, obtain by minor incidents, where an employee may be damaged or wounded (Vinodkumar and Bhasi, 2010)**.** Workers skill training purpose to provide knowledge and training to workers related their working by an industrial organization or concerned department. The marketplace is rapidly changing with technology. Nowadays American workers are more participating in technological change and competition in the marketplace. A lack of education and basic workers skill training has highly reduced job potentials for the workers (Hopp et al., 2004).

The Statistical value for risk management were ($\bar{x}$) = 1.48 and SD=0.89, rapid evacuation system ($\bar{x}$) =1.27 and SD= 0.59 as shown in Table 2. This indicates that respondents strongly disagreed that these parameters were not available in the industry.

Risk management is the states of safety in which damages and accident increased, decreased maintained and below. The progressive process of risk management can reduce the hazards from the workplace and make a safe working environment (Bajaj, 2007).

The rapid evacuation system is the first primary tools devices in which evacuation became easily in the industry building or any building during the serious fire disaster or accident (Blair White, 2018).

Table 2
Occupational Fire Safety measures

Variables parameters	Mean	SD
First aid medical services	4.82	0.47
Fire safety equipment and tools	4.55	1.16
Fire safety awareness	4.51	1.07
Fire safety department	4.43	1.15
Fire safety supervisor	4.43	0.68
Fire and smoke detection alarm system	4.19	1.10
Fire evacuation plan at workplace	4.13	0.38
Water storage tanker	4.06	1.21
Fully charged fire extinguisher	3.74	1.34
Fire drill	2.24	1.27
Hazard control training	2.10	1.54
Accident prevention training	2.05	1.27
Workers skills training	2.01	1.06
Fire fighters	1.81	1.23
Emergency Numbers and Proper Signage	1.57	0.65
Fire Risk management	1.48	0.89
Rapid evacuation devices	1.27	0.59

4.2. Organizational Management (OM)

The organizational management efforts related (OFS) bring changes in the production and workers feel satisfaction from accidents and injuries. Data collected through the survey and workers perception related to organizational management as shown in Table 3. Respondents were given 5 point scale as shown before in the section of methodology.

Furthermore, statistical value for these variables Overtime with salary were ($\bar{x}$) = 4.83 and SD = 0.60), Management attitude with workers ($\bar{x}$) = 4.74 and SD = 0.80), Investigation of workers complain ($\bar{x}$) = 4.67 and SD = 0.58 and provided promotion after performance ($\bar{x}$) = 4.59 and SD = 0.77 in Table 3. It shows that for all these judgments is near to 5, which indicates that respondents strongly agreed that these parameters were available in the industry.

Industry gets work on a holiday and does not provide the overtime with salary. This situation measures a negative impact on workers performance (Beckers et al., 2004).

The study of (McCarthy et al., 2010) revealed that manager behavior and attitudes with workers have a significant relationship with motivation and personal job satisfaction.
Organization success depends on the actual supervision of managers, without its management, supervision their direct reports and performance of all employees. If there is a wide issue with the behavior of managers or workers, you have felt the effect in the organization such as turnover and rate of absenteeism (Aladwani, 2001)**.**
The investigation of workers complains the most key factor; organizational management consultation should be higher in this matter. For example, organizational management never gives preference, feedback or hearing related to workers complain. The European Foundation has published the report that the investigation of workers complain by organizational management represented a positive impact on the performance of workers (Wachter and Yorio, 2014)**.**

It is discussed that the organization should understand the physiology of workers and provides some basic rewards in the shape of promotion and salaries. The worker's performance can affect an entire industry in a positive way of developing significance financial growth for the industrial organization (Campbell, 2008)**.**

In the last, statistical analysis for increment after one year ($\bar{x}$) = 4.30 and SD = 1.29 are also given in Table 3. Here ($\bar{x}$) of these variables is close to 4, which shows that study respondents agreed that the industry was providing them salary increment after one year work. Salary increment is regularly communicated as a level of a worker's general base pay. An addition typically speaks to a part of what the worker gains every year. Businesses utilize augmentations to increment or reduction base pay rates or to grant rewards. Workers utilize them as a benchmark to either arrange a boost in compensation or a beginning pay with another business. Open representatives ordinarily get yearly raises in light of pay increases (Fore et al., 2015)**.**

Table 3

Organizational Management

Variables	Mean	SD
Overtime with salary	4.83	0.60
Organizational Management attitude with workers	4.74	0.80
Investigation of workers complain	4.67	0.58
Provided promotion after performance	4.59	0.77
Increment after one year	4.30	1.29

4.3. The impact of (OFS) on Organizational Management (OM)

The results of **Table 4(A)** indicates that occupational fire safety have a positive significant relationship with Organizational Management (OM). The value of r 0.166 for the OHS also showing the positive relationship between them, the p-value is significant 0.000 which is less than 0.05. The regression value shows in Table **4(B)** which indicates R-square is 0.28, which indicates that 28% variance achieves after the implementation of safety measures. It means that there is a positive relationship between (OFS) and (OM). Furthermore, the value of F (5.530) which indicates that it is greater than 5. All results are showing justification in this study.

Table 4(A)

Model summary (correlation and regression of mean OFS against the overall mean of Organizational Management (OM)

Variables	Regression coefficient, B	Standard error, B	Pearson coefficient, r
Independent variable: OFS	.304	.143	.166[a,] P<0.000

[a] p-value is significant at 0.05

Table 4 (B)

Regression of variables (correlation and regression of mean OFS against the overall mean of Organizational Management (OM)

Variables	Values
Multiple R	0.16
R square	0.28
Adjusted R square	0.21
Standard error	0.50
Df	1
F value	5.530, p <0.000

5. Conclusion

The aim of this study to find out the relationship between occupational fire safety (OFS) and organizational management (OM). All the results indicate that all independent variables have a strong relationship with the dependent variable. The organization needs to focus on fire drill, hazards control training, accident prevention training, workers skill training, fire fighters, Emergency Numbers and Proper Signage, fire risk management and rapid evacuation devices. These variables are very important for enhancing the performance of workers. Several industrial organization is not taking serious in this issue and they are not adopting occupational fire safety parameters for enhancing the performance of workers at the workplace. The organizational management must identify the reality that workers who believe safe and sound health in the production of their responsibilities, emotional commitment and have a significant sense of commitment to their management and probable behavior to the workers do not just make sincere to the industrial organization management ; instead, they believe strongly on organization management to foremost regarding their health and safety requirements by putting initial goods and safety policy parameters. Therefore, organizational management should contribute more investment in the shelter of workers health and safety in the mining sectors of Pakistan. This study will contribute more knowledge about practical implications and future research for the mining industry.

6. Future Recommendation

The data exposed that occupational fire safety is a positive relationship with organizational management. It is recommended that the organization management should create more focus on

occupational fire safety policies. The workers need a secure environment for enhancing the performance at the workplace. After (OFS) implementations are guaranteed to improve the mining workers' health and safety in Pakistan. This study will support all mining industries to make a positive environment in the workplace. In in the public sector, national and provincial disaster management officials should be asked to help build dangerous buildings. Equipment such as surveillance cameras and control centers are being civilized by the competent authorities, with repetitive functions. But basic stocks should also be prepared. Protective investigations can be conducted where fire complaints and risks increase. Fire causes and capacity hazards, planning risks and reservoir emergence. Fire departments must fill it with additional free hardware, rescue equipment and hydraulic devices.

References

[1] Aladwani, A.M., 2001. Change management strategies for successful ERP implementation. Bus. Process Manag. J. **https://doi.org/10.1108/14637150110392764.**

[2] Amponsah-Tawiah, K., Mensah, J., 2016. Occupational Health and Safety and Organizational Commitment: Evidence from the Ghanaian Mining Industry. Saf. Health Work. https://doi.org/10.1016/j.shaw.2016.01.002.

[3] Andrea Broughton, 2008. Working conditions and social dialogue. Eur. Fond. Improv. living Work. Cond.

[4] Azapagic, A., 2004. Developing a framework for sustainable development indicators for the mining and minerals industry, in Journal of Cleaner Production. https://doi.org/10.1016/S0959-6526(03)00075-1

[5] Bajaj, D., 2007. Risk management, in Workplace Strategies and Facilities Management. https://doi.org/10.4324/9780080521299

[6] Batool, K.A., 2015. Occupational Health Hazards in Mining in Pakistan : An Overview III, 5306–5319.

[7] Beckers, D.G.J., Van Der Linden, D., Smulders, P.G.W., Kompier, M.A.J., Van Veldhoven, M.J.P.M., Van Yperen, N.W., 2004. Working overtime hours: Relations with fatigue, work motivation, and the quality of work. J. Occup. Environ. Med. https://doi.org/10.1097/01.jom.0000147210.95602.50

[8] Bhagawati, B., 2015. Basics of Occupational Safety and Health. IOSR J. Environ. Sci. https://doi.org/10.9790/2402-09819194

[9] Bin Bahrudin, M.S., Kassim, R.A., Buniyamin, N., 2013. Development of Fire alarm system using Raspberry Pi and Arduino Uno, in 2013 International Conference on Electrical, Electronics and System Engineering, ICEESE 2013. https://doi.org/10.1109/ICEESE.2013.6895040

[10] Blair White, n.d. Slide to Safety – Rapid Evacuation System.

[11]Campbell, D., 2008. Nonfinancial performance measures and promotion-based incentives. J. Account. Res. https://doi.org/10.1111/j.1475-679X.2008.00275.x

[12]Chandola, T., Ferrie, J.E., Perski, A., Akbaraly, T., Marmot, M.G., 2010. The effect of short sleep duration on coronary heart disease risk is greatest among those with sleep disturbance: A prospective study from the Whitehall II cohort. Sleep. https://doi.org/10.1093/sleep/33.6.739

[13]Council, N.S., 2004. Injury Facts, Itasca (IL): NSC;2004.
[14] Du, N.J., 2014. A Management System about Prevention and Maintenance for Construction Equipment. Adv. Mater. Res. https://doi.org/10.4028/www.scientific.net/amr.1065-1069.1651
[15] Emerging Pkaistan, 2019. MINES & MINERALS.
[16] Fernández-Muñiz, B., Montes-Peón, J.M., Vázquez-Ordás, C.J., 2009. The relation between occupational safety management and firm performance. Saf. Sci. https://doi.org/10.1016/j.ssci.2008.10.022
[17] Fore, L., Perez, Y., Neblett, R., Asih, S., Mayer, T.G., Gatchel, R.J., 2015. Improved Functional Capacity Evaluation Performance Predicts Successful Return to Work One Year After Completing a Functional Restoration Rehabilitation Program. PM R. https://doi.org/10.1016/j.pmrj.2014.09.013
[18] Galmessa, A., 2006. First Aid and Accident Prevention.
[19] Geldart, S., Smith, C.A., Shannon, H.S., Lohfeld, L., 2010. Organizational practices and workplace health and safety: A cross-sectional study in manufacturing companies. Saf. Sci. https://doi.org/10.1016/j.ssci.2010.01.004
[20] Gyekye, S.A., 2006. Workers' perceptions of workplace safety: an African perspective. Int. J. Occup. Saf. Ergon. https://doi.org/10.1080/10803548.2006.11076667
[21] Hayes, B.E., Perander, J., Smecko, T., Trask, J., 1998. Measuring Perceptions of Workplace Safety: Development and Validation of the Work Safety Scale. J. Safety Res. https://doi.org/10.1016/S0022-4375(98)00011-5
[22] Helliwell, J.F., Putnam, R.D., 2004. The social context of well-being, in Philosophical Transactions of the Royal Society B: Biological Sciences. https://doi.org/10.1098/rstb.2004.1522
[23] Hoffman, L.R., Hersey, P., Blanchard, K.H., 2006. Management of Organizational Behavior. Adm. Sci. Q. https://doi.org/10.2307/2391509
[24] Hopp, W.J., Tekin, E., Van Oyen, M.P., 2004. Benefits of Skill Chaining in Serial Production Lines with Cross-Trained Workers. Manage. Sci. https://doi.org/10.1287/mnsc.1030.0166
[25] ILO, 2014, 2014. Safety and health at work: A vision for sustainable prevention [Internet]. 2014 [cited 2015 Mar 3]., International Labour Organization.
[26] International Labour Organization. Mining : A hazardous work [Internat]. 2015 [cited 2015 Feb 2]., n.d.
[27] Kamrin, M.A., 2014. Occupational Safety and Health Act, US, in Encyclopedia of Toxicology: Third Edition. https://doi.org/10.1016/B978-0-12-386454-3.00414-0
[28] Khan, K., 2012. Identification of high-risk landslide slopes and disaster management of Hattian Bala and adjacent landslide areas, Azad Kashmir (Pakistan): Applying the AHP (Analytic Hierarchical Process) method. J. Himal. Earth Sci.
[29] Kirk Allen Teri Reed-Rhoads Robert A. Terry Teri J. Murphy Andrea D. Stone, n.d. Coficient Alpha: An Engineer's Interpretation of Test Reliability 97, 87–94.
[30] Maluka, A.Z., 2019. Business-focused legal analysis and insight in the most significant jurisdictions worldwide 1–13.
[31] McCarthy, A., Darcy, C., Grady, G., 2010. Work-life balance policy and practice: Understanding line manager attitudes and behaviors. Hum. Resour. Manag. Rev. https://doi.org/10.1016/j.hrmr.2009.12.001
[32] Mearns, K., Whitaker, S.M., Flin, R., 2003. Safety climate, safety management practice and safety performance in offshore environments. Saf. Sci. https://doi.org/10.1016/S0925-

7535(02)00011-5
[33] Occupational Safety and Health Administration, Labor, U.S.D. of, 2015. Training Requirements in OSHA Standards and Training Guidelines. Saf. Heal.
[34] Porter, A., 1990. Management of fire safety. Prop. Manag. https://doi.org/10.1108/EUM0000000003362
[35] Safety, H. and, 2007. Workplace health, safety, in A Short Guide for Managers.
[36] Sajid, M., Qureshi, W.H., Rizwan, M., Wajid, M., Sheraz, A., 2014. Antecedents of Job Stress and its impact on employee's Job Satisfaction and Turnover Intentions. Int. J. Learn. Dev. https://doi.org/10.5296/ijld.v4i2.6098
[37] Seo, D.C., Torabi, M.R., Blair, E.H., Ellis, N.T., 2004. Cross-Validation of safety climate scale using confirmatory factor analytic approach. J. Safety Res. https://doi.org/10.1016/j.jsr.2004.04.006
[38] Shahzada Irfan Ahmed, n.d. A life, not ' mine .'
[39] Stanton, N.A., Chambers, P.R.G., Piggott, J., 2001. Situational awareness and safety. Saf. Sci. https://doi.org/10.1016/S0925-7535(01)00010-8
[40] Usama Khawar Ghumman, n.d. What is behind the deaths of coal miners in Balochistan ?
[41] Utembe, W., Faustman, E.M., Matatiele, P., Gulumian, M., 2015. Hazards identified and the need for health risk assessment in the South African mining industry. Hum. Exp. Toxicol. https://doi.org/10.1177/0960327115600370
[42] Vinodkumar, M.N., Bhasi, M., 2010. Safety management practices and safety behavior: Assessing the mediating role of safety knowledge and motivation. Accid. Anal. Prev. https://doi.org/10.1016/j.aap.2010.06.021
[43] Wachter, J.K., Yorio, P.L., 2014. A system of safety management practices and worker engagement for reducing and preventing accidents: An empirical and theoretical investigation. Accid. Anal. Prev. https://doi.org/10.1016/j.aap.2013.07.029
[44] Wikipedia, 2018. The economy of Pakistan.
[45] Yule, S., Flin, R., Murdy, A., 2006. The role of management and safety climate in preventing risk-taking at work. Int. J. Risk Assess. Manag. https://doi.org/10.1504/ijram.2007.011727
[46] Zamir Ahmed Awan, n.d. CPEC : Opportunities for Chinese entrepreneurs in the mining industry of.