OCCUPATIONAL HEALTH AND SAFETY FACILITIES AND PERFORMANCE OF WORKERS IN MANUFACTURING INDUSTRY: AN EMPIRICAL INVESTIGATION

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Abstract - The aim of this study to find out the relationship between Occupational health and safety facilities (OHSFs) and performance of workers (PW) in a textile manufacturing industry located in Karachi, Sindh, Pakistan. The data were collected through surveys and analyzed by using flexible package Statistical Package for the Social Sciences (SPSS 20) software. Cronbach's alpha was used to check the reliability of data. Further details were depicted using descriptive statistics including percentage, mean frequency, standard deviation and in the last inferential statistical tools (simple Regression and Pearson correlation). The result shows that occupational health and safety facilities have a positive relationship with the performance of workers. This illustrates that OHSFs were not properly provided to the workers. The study recommended that there is need to make the better infrastructure of health and safety facilities to improve the performance of workers for future development in Pakistan.

Keywords - Occupational Health and Safety, Facilities, Performance of Workers, Empirical study

I. INTRODUCTION

The main objectives of (OHSFs) is to prevent the workers from rising hazards in the workplace. Occupational health and safety programmes are involved in two major branches, they include; occupational medicine which deals with prevention and diagnosis of health hazards at the workplace; it is also concerned with stress or any ill health that happens in the workplace. In contrast to the occupational medicine, occupational hygiene is concerned with the accurate measurement of hazards using standard scientific methods (Armstrong, 2006). In this context, the Italian labor laws have been at the forefront in emphasizing safety training and education amongst the workers. According to this law, workers should acquire preventive techniques in addition to their professional skills. Studies have shown that lack of safety skills among workers has a direct consequence on the performance and productivity of such workers (Cascio, 1996). According to a survey by the British Safety Council (BSC), a significant number of senior managers believe that an organization with the high-quality staff possessing the requisite health and safety skills would have greater input from the working personnel and significantly improve the reputation of organizations Pike (2000). Furthermore, (Cagno et al., 2011) have suggested that occupational accidents have a great negative influenced by the performance of workers. (Health and Safety Commission, 2006) have reported that a recent statistics have shown that more than two million peoples are suffering from diseases; that is directly related to the poor workplace. (Marson, 2001) have stated that the negative impact of the poor workplace does not limit itself to the workers only; rather it dissects across a wide spectrum affecting the industry or the organization where the workers belong as well as their immediate family. (Vinodkumar and Bhasi, 2010) have illustrated that the proper consideration by occupational health and safety management can improve the working conditions at the workplace. The full concentration of organization management leads the OHS management. OHS management provides the better suggestion, safety policies and information for organization management for preventing the injuries and the workplace accidents. After implementation of these parameters, the floor accidents and injuries are reduced and the workplace becomes more secure from incidents and hazard. (Brenda, 2007) have explained that there is need to make strong safety policies in a healthy working environment. Progressive countries are focusing to solve the issues of occupational health and safety policies and now they are adopting the safety rules and regulation in their industry. (Oludele and Solaja, 2014) have stated that positive infrastructure-related safety provides the positive performance of workers. The poor occupational health and safety programs can never protect employees from hazards. These risks reduce the productivity of an organization and worker performance. (Mohsin et al., 2016) have focused that safety society is performing the positive role in enhancing the performance of workers. (Okumbe, 2001) have mentioned in their research that health and safety is not a responsibility or separate function, but as a generous start that goals in developing profitability performance, productivity and competitiveness of an organization. In addition, studies over the years have shown that a workplace which gives special regards to the health and safety of its staffs enjoys more profits, high input from the working personnel and records low or no loss in most cases. On the contrary, organizations or industries that pay less attention to the health and safety of its staffs

suffer most when it comes to natural or man-made disasters.

II. METHODS AND METHODOLOGY

A survey was conducted at one of the industrial sectors of Karachi, Pakistan is known as the (LIA) Landhi Industrial Area. The sampling technique and questionnaire were designed to collect the data, given in Appendix A. A questionnaire was based on a Likert scale, range started 1-5, whereas 1 = not at all, 2 = to a small extent, 3 = some extent, 4 = great extent and 5 = very great extent. Three levels were selected for analysis the data. In the 1st level, Cronbach's alpha was used to check the reliability, which illustrates the internal consistency of data (Allen et al., 2008). The coefficient ranges from Cronbach's alpha from 0 to 1. Coefficient value: 0.8 to 0.9 indicates the very good reliability, 0.70 to 0.80 indicates good reliability, 0.60 to 0.70 indicates the fair reliability and α <0.60 indicates the poor reliability (Zikmund, Babin Carr, Griffin, 2010). In addition, the descriptive statistics including percentage, mean, frequency and standard deviation were evaluated at the 2nd level. The flexible package SPSS (Statistical Package for the Social Sciences) 20 software was used to compute the data with inferential statistical tools (simple Regression and Pearson correlation) in the 3rd level. (Malik et al., 2010) have studied that correlation helps to find out the durability between an independent variable and dependent variables.

III. RESULTS AND DISCUSSION

The reliability of data was analyzed through Cronbach's Alpha which indicates 0.77 yielded. It means that coefficient value 0.70 to 0.80 indicates good reliability.

3.1 Rate of response

A total 150 questionnaires were provided to workers, out of which 17 (11.33%) workers denied to fill, while 13 (8.67%) were partially filled and 120 (80%) were properly filled and used for the data analysis as shown in Fig.1.

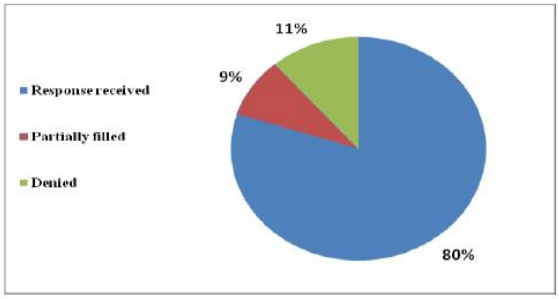


Fig.1. Rate of response

3.2 Socio-Economic Characteristics

Socio-economic characteristics give in associating and analyzing demographics of the impact of occupational health and safety facilities on the performance of workers. The present employee's age, level of education and department working are most valuable socio-economic variables, which helps to find out the opinion and judgment of the workers.

3.2.1. Departments of respondents

Majority of the respondents 31 (25.83%) were at Stenter department, 22 (18.33%) were printing, 16 (13.33%) were steaming, 15 (12.50%) were washing, 26 (21.67%) were in finishing, whereas; 10 (8.33%) were related to other departments as shown in Fig. 2.

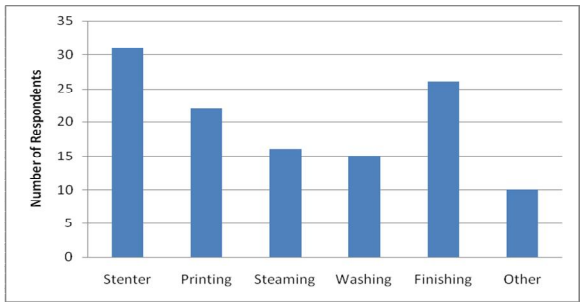


Fig. 2. Departments of Respondents

3.2.2. Age of respondents

It was observed that majority of the respondents 41 (34.2%) were in the age range of 30~39 years, 36 (30.0%) of the respondents were between the ages of 20 ~29 years, 28 (23.3%) were between the ages of 40~ 49, whereas; 15 (12.5%) of the respondents were between 50~59 years as shown in Figure 3.

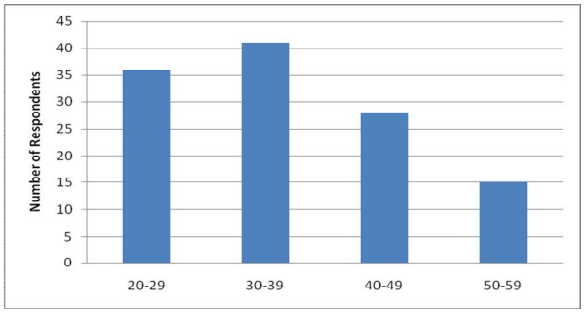


Fig. 3. Age of respondents

3.2.3. Level of education

According to the data, majority of the respondents 31(25.8%) have primary education, 26 (21.7%) have no formal education, 23 (19.2%) obtained high school certificates, 23 (19.2%) were graduates, while; 17 (14.2%) of the respondents obtained secondary school certificates as shown in Fig. 4.

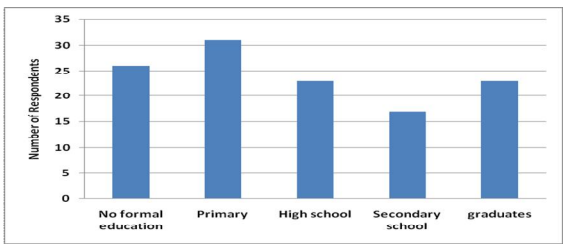


Fig. 4. Level of Education

3.3 Occupational Health And Safety Facilities (OHSFs)

The collected data for the occupational health and safety facilities were analyzed through a survey in industry. Respondents were provided with 5 points Likert scale ranging from 1 to 5, where 1= not at all, 2= to a small extent, 3= to some extent, 4= great extent and 5= very great extent. Data were statistically analyzed in term of mean and standard deviation as summarized in Table 1. The Statistical values of drainage system were ($\bar{x}$) = 3.97 and SD = 0.36 as shown in Table 1. The mean value of this factor is close to 4, which indicates that respondents were satisfied that proper drainage system was available in the workplace. Superior drainage system promotes the safer working environment in the workplace. (Sharmaa et al., 2014) have inveterate that drainage systems help to increase the performance of workers and enlarge the life cycle of the floor. The statistical value for Medical checkup were ($\bar{x}$) =3.93 and SD = 0.51 and Ambulance service ($\bar{x}$) = 3.83 and SD = 1.21, which indicates that is close to 4 in Table .1. The results show that respondents were agreed that there were better medical checkup and ambulance service facilities at the workplace. Similarly, the same results were obtained by (Mohsin et al., 2016) have studied that the majority of the respondents 67 (83.3%) replied that medical check-up was present in industry territory. That's why workers were satisfied with the organization and performing well in the workplace. (Loeppke et al., 2009) have described the relationship between health and performance; observed that sick workers always perturb the production at the workplace. Ambulance services have strong relationships with the worker's performance. According to (Norwegian Red Cross, 2013) have stated that the aim of the ambulance to stabilize the injured condition of workers and to provide better treatment in an emergency or short time. Statistical value for illumination ($\bar{x}$) =3.90 and SD =0.64 and proper ventilation were ($\bar{x}$) = 3.86 and SD = 0.85 as shown in Table 1. The mean value of these factors is close to 4, which illustrates that respondents were satisfied to have these two variables at the workplace. (Rudd and Bergey, 2014) have explained that proper ventilation system reduces the energy consumption cost and develops the comfortable environment and better air quality for the occupational place. Illumination is the very important factor to prevent the workers from accidents. (Seppanen et al., 2006) have emphasized that proper illumination reduced the indoor pollution and less ventilation creates an injurious effect on the performance of employees. The statistical mean value of the fire passage exits was ($\bar{x}$) = 3.85 with SD = 0.61. The mean value of this parameter is less than 4.5; it will be considered as 4, which shows that respondents were satisfied that there were adequate fire passage exits in the working area of the industry. Similarly, results were obtained by (Gopang et al., 2017) that the majority of workers were satisfied in the presence of fire passage exit at the workplace. (Malik et al., 2010) have suggested that fire accidents diminish the economy of business; also greatly influenced on their performance of workers. (Wadud et al., 2014) have done the same study that accidents of fire severely disrupt the reputation of an industry and performance of workers. As shown in Table 1. Statistical value of health and safety policies were ($\bar{x}$) = 2.31 with SD = 0.80. Here is close to 2, therefore it indicates that respondents were not satisfied with the health and safety policies in the workplace. (Aswathappa, 2007) have explained in their study that industrial accident is usually occurring due to inadequate health and safety policies in the workplace. The unsatisfactory framework of safety policies approaches to originating the hazards in the workplace. (Lehtinen, 2001) have stated that developing countries are exploring their products in all over the world. It can be possible when health and safety policies will be implemented in the working environment. (Fernandez-Muniz et al., 2009) have illustrated that through the better occupational health policies, practices, better attitude, and actions; an unexpected and undesirable accident can be reduced which is more helpful in organization and worker's performance. In order to view, the mean value of greasy floor was = ($\bar{x}$) 1.39 with S.D of 0.88. Since value is less than 1.5, is approximated as 1, signifying that the respondents believed that this factor was not present at the workplace. (United States Department of Labor) have illustrated that slippery and wet floors are a falling hazard; Which can increase the falling and lifting accident in finishing and dyeing department. One of the important factors to be considered in industries dealing with machines is the nature of the working floor; once it is greasy it could be slippery endangering the life of the workers. From the result obtained, it showed that the floor of this industry is relatively good. Statistical values for safety offices were ($\bar{x}$) = 1.29 with SD = 0.87 as shown in Table 1. The value of ($\bar{x}$) = 1.29, which is near to 1 and shows that safety offices were not available at the workplace. (Khan et al., 2013) have concluded that safety officers are the backbone of any organization. Safety offices provide the information, guidelines and notice to workers; how to prevent potential hazards in the workplace.

Table: Occupational health and safety facilities (OHSFs) measures

Variable	Mean	SD
Drainage system	3.97	0.36
Medical check up	3.93	0.51
Illumination	3.90	0.64
Proper ventilation	3.86	0.85
Fire passage exits	3.85	0.61
Ambulance services	3.83	1.21
Health and safety policy	2.31	0.80
Greasy floor	1.39	0.88
Safety offices	1.29	0.87

3.4 Accident Prevention measures

The statistical value for provision of PPE were ($\bar{x}$) = 4.42 with SD= 1.08, Provision of chimney ($\bar{x}$) =4.09 with SD = 0.77, Place of storage hazardous chemicals ($\bar{x}$) = 3.97 with SD = 0.34, Exhaustion fans mean ($\bar{x}$) = 3.91 with SD = 0.67, machine maintenance ($\bar{x}$) = 3.88 and SD = 0.86, provision of protective dress ($\bar{x}$) = 3.84 with SD 0.79 and Firefighting training for workers ($\bar{x}$) = 3.77 with SD = 1.04 are given in Table 2. Here is near to 4, which shows that respondents were satisfied that these facilities were provided by an industrial organization at the workplace. Personal protective equipment is playing an important role in a manufacturing industry. (Haslam et al., 2005) have defined that accident occurs due to inadequate PPE (Personal Protective Equipment) at the workplace. (Davis, 2003) have contributed to their study that better equipment and knowledge of PPE help the employees to complete the production on time. Chimney reduces the contamination and maintains the temperature of the environment. In the same study of (Curry and Purkis, 1986) has stated that chimney discharges the flu-gases, waste, smoke and hot gases also prevent the workers from the hot atmosphere.

A hazardous chemical is a very dangerous and negative impact on workers' performance. (Sivaprakash et al., 2014) have suggested that inappropriate place of hazardous chemicals has created numerous accidents in the life of the workers. The inappropriate storage method and improper handling must be ignored for maintaining and protecting the working environment in the industry. Ann Arbor (2000) have described that accidents destroy the economy of the organization. An accident due to hazardous chemicals can bring the injurious effect of the performance of workers at the workplace. Exhaust fans maintain the heat, temperature and also help to remove dust contamination from the workplace. (Krishnamurthy et al., 2017) have shown in their results that the lack of cooling devices and exhaustion fans reduced the work capacity and cause health problems in the workplace. Maintenance of every place gives the positive impact on health. (Ben-Daya and Duffuaa, 1995) has stated that the profit of organization based on sustainable product and quality. It can be improved when the organization will focus on the machine maintenance. (Martyn, 2010) stated that machine maintenance has become an important and enormous impact on work performance to enhance its manufacturing process in order to achieve its sustainability goals. Protective dress protects the workers from hazards like noise, temperature, and fire at the workplace. (Marroyo et al., 2017) have illustrated that protective dress preserves the workers from the thermal exposure. (Diugwa, 2011) have studied that PPE prevents the occupational accidents and absenteeism of the workers and also enhance the performance of workers. Firefighting programs increase the confidence level of workers and provide knowledge them; how to save from fire accidents at the workplace. A fire department is very necessary for every organization because tiny particles of fire can burn the whole factory. (Theuws et al., 2013) have mentioned about the great misfortune accidents in the Ali enterprises industry in Karachi. Which was fully burned and thousands of workers lost their lives due to insufficient fire equipment and workers were unaware of the training of firefighting equipment. The statistical value of first aid training programs was 1, which reflects that respondents were not getting first aid training at the workplace. First aid training increases the confidence and promotes the training education to the workers. Training workers can easily provide the urgent medical treatment to injured workers. According to the study of (Galmessa, 2006) have suggested that the first aid training raises the morale of workers and reduced the risk and protect the workers from accidents.

Table 2: Accident prevention measures

Variable	Mean	SD
Provision of PPE	4.42	1.08
Provision of chimney	4.09	0.77
Place of storage hazardous chemicals	3.97	0.34
Exhaustion fans	3.91	0.67
Machine maintenance	3.88	0.86
Provision of protective dress	3.84	0.79
Firefighting training for workers	3.77	1.04
First aid training programs	1.45	0.84

3.5 Workers Satisfaction measures

Workers satisfaction measures were analyzed through the mean ($\bar{x}$) and standard deviation (SD) in Table 3. The results show that for all these variables in near to 4. Which shows that respondents were agreed at a great extent that organization was providing them Bonus yearly, financial support, loans for workers, sick leave and stipend yearly facilities, which helps workers to increase the satisfaction level at the workplace? (Narayanan et al., 2013) have suggested that satisfied employee can provide better performance for an organization in the future. Ann Arbor (2000) has reported that workers feel satisfaction to get them some special gift from an organization like medical free, free pension and a monthly stipend. These all thing promotes the better structure in society.

Table 3: Workers satisfaction measures

Variable	Mean	Standard deviation
Bonus yearly	3.99	0.62
Financial support	3.93	0.70
Loans for workers	3.93	0.51
Sick leaves	3.88	0.79
Stipend yearly	3.85	0.63

3.6 The Performance of Workers measures

According to the Table 4, the results indicates that the mean ($\bar{x}$) value and SD of these parameters, production increase ($\bar{x}$) = 4.17 and SD 1.34, injuries decreases ($\bar{x}$) = 3.83 and SD = 0.85, profit achieving ration ($\bar{x}$) = 3.87 and 0.68 and enhancement of workers motivation ($\bar{x}$) = 3.89 with SD = 0.60, here of these variables near to 4. It means that workers were agreed that due to safety practices, production increase, profit achieving ration and enhancement of workers motivation were increased, while injury will also be decreased. It means occupational health and safety facilities have a positive impact on the performance of workers. Worker performance is very necessary for the organization and their families. It can be achieved by the superior safety practices by an organization at the workplace. The performance of workers is adversely disturbed when the organization becomes fail to provide more excellent health and safety facilities to their workers (Hassa et al., 2001). Injury creates the negative impact on the performance and production. Furthermore, (Ellen, 2003) have explained that provision of better health and safety policies of the workers creates the peaceful and healthy environment and save them from the accidents, infectious diseases, and injury at the workplace. According to (OSHA, 2012) have reported industries have known the importance of health and safety programs and they are going to implement on health and safety programs due to achieve better reputation and profit in the market. (Srivastava et al., 2011) have recommended that, healthy work environment, individual incentives, merit promotion, good salary and better attitude with workers can enhance the worker's motivation which can bring positive impact on the organization.

Table 5: Performance of workers measures (PWM)

Variable	Mean	Standard Deviation
Production increase	4.17	1.34
Injuries decrease	3.83	0.85
Profit achieving ration	3.87	0.68
Enhancement of workers motivation	3.89	0.60

3.7 Correlation between all (OHSFs) Measures with performance of workers measures (PWM)

In Table 6, the results show that an occupational health and safety facilities (OHSFs) have a positive and significant correlation with the performance of workers (PW), rs .234, and p (two-tailed) < 0.05. Furthermore, Accident prevention (AP) has also a positive and significant correlation with the performance of workers (PW), rs .380, and p (two-tailed) < 0.05. Workers satisfaction (WS) has a positive and significant correlation with the performance of workers (PW), rs .243, and p (two-tailed) < 0.05. From this summary, it can be observed that each independent variable have a positive and significant correlation with the performance of workers in this study.

Table 6: Model summary (Correlation between all occupational health and safety facilities (OHSFs) with the performance of workers measures (PWM)

Correlations

		OHSFs	APM	WSM	PWM
OHSFs	Pearson Correlation	1	.605**	.678**	.234*
	Sig. (2-tailed)		.000	.000	.010
	N	120	120	120	120
APM	Pearson Correlation	.605**	1	.839**	.380**
	Sig. (2-tailed)	.000		.000	.000
	N	120	120	120	120
WSM	Pearson Correlation	.678**	.839**	1	.243**
	Sig. (2-tailed)	.000	.000		.008
	N	120	120	120	120
PWM	Pearson Correlation	.234*	.380**	.243**	1
	Sig. (2-tailed)	.010	.000	.008	
	N	120	120	120	120

***. Correlation is significant at the 0.05 level (2-tailed).**

Table 7: Model summary (Regression and Correlation of OHSFs measures and performance of workers measures (PWM).

Variables	Regression coefficient, B	Standard error, B	Pearson coefficient, r
Independent variables: All OHSFs)	2.441	0.481	0.410[a], p < 0.000

P value is significant at 0.05.

Table 8: Regression of variables (regression and correlation of OHSFs measures and the performance of workers measures (PWM).

Variables	Values
Multiple R	0.410
R square	0.168
Adjusted R square	0.147
Standard error	0.476
Df	3
F value	7.819, p < 0.000

3.8 The impact of all occupational health and safety facilities (OHSFs) on the performance of workers

In Table 7, the regression and correlation of OHSFs, accident prevention measures and worker satisfaction

measures against an overall mean of the performance of workers. The results show that the value of r (0.410) is directly positively relation between all (OHSFs) and performance of workers. According to the table, results are showing that p-value 0.000, which is <0.410. It means that occupational health and safety policies positively contribute towards the performance of workers. The previous studies also justify this statement i.e. bottani et al. (2009), Fernandez-Muniz et al. (2009) and Makori (2012). In these studies, it has been discussed that those industries providing the OHS facilities to workers; they are getting the worker's performance positively.

CONCLUSION

The purpose of this research study to find out the relationship between the occupational health and safety facilities on the performance of workers in the textile Industry. This study will promote the better environment for all workers at the workplace. The result of Pearson correlation is ($r \leq 0.410$, $p < 0.000$ that is < 0.05) exposed that (OHSFs) and the performance of workers have a positive correlation amongst each other. The value of F must be greater than 5. In this study, the value of F is 7.819 that are greater than 5. The result of regression analysis (R-square = 0.168) shows that there is a variation of 16% in the performance of workers due to occupational health and safety programs. Particularly, this study also concludes that health and safety programs are very important for Pakistani industry to bring the better improvements in the workplace. Especially safety measures, i.e. personal protective equipment, first aid training programs and firefighting skills; because the top management organization is unconscious about these essential and competitive parameters. This study illustrates that health and safety facilities have a great positive impact on workers performance, so every organization should need to compulsory health and safety facilities for all the employees at working place.

RECOMMENDATION

Occupational Health and safety facilities develop the organization's profit and enhance the extensive health of all workers. Health and safety issues became severe problems for Pakistan. Pakistan industry will give more attention regarding health and safety facilities. It is recommended by the researcher that all the manufacturing industry, a textile company, firms, and organizations will have to ensure that they will provide the better infrastructure related health and safety facilities for workers performance. This recommendation will improve the lifestyle and performance of workers and also bring the achievement and positive results in future. The government safety officer should visit physically to check the condition of health and safety facilities at the workplace. The economy of any country can be boost-up by implementing the occupational health and safety programs for achieving sustainable development.

Appendix A. Questionnaire

University of science and technology of China, Anhui, Hefei, China
Occupational Health and Safety Facilities (OHSFs) Survey
Section A: Socio-demographic information
Rate of response
Working of department
Age
Level of education
Section B: Health and Safety Facilities (OHSFs)
Please tick the best answer which OHSFs is present in your industry.

S.no.	Statement	Very great extent	Great extent	Some extent	To a small extent	Strongly disagree
1	Section A: Occupational health and safety facilities The industr have proper drainage system.	5	4	3	2	1
2	There is a proper ventilation system at workplace.	5	4	3	2	1
3	There is a medical checkup facility in industry.	5	4	3	2	1
4	There is adequate illumination at working area.	5	4	3	2	1
5	There is adequate Health and safety policy in the industry.	5	4	3	2	1
6	The industry has greasy floor.	5	4	3	2	1
7	There are any Fire passage exits doors.	5	4	3	2	1
8	Ambulance services are available.	5	4	3	2	1
9	Safety offices are available.	5	4	3	2	1
10	Section B : Accident prevention measures There is adequate Provision of chimney in workplace.	5	4	3	2	1

11	Industry provides the protective dress to workers.	5	4	3	2	1
12	Provision of PPE for workers.	5	4	3	2	1
13	Place of storage hazardous chemicals	5	4	3	2	1
14	Machine maintenance	5	4	3	2	1
15	There is first aid training in the industry	5	4	3	2	1
16	There is adequate firefighting training for workers.	5	4	3	2	1
17	There are adequate exhaustion fans at the production area.	5	4	3	2	1
	Section C : Workers Satisfaction Measures					
18	Industry provides Loans for workers	5	4	3	2	1
19	Workers get Stipend yearly	5	4	3	2	1
20	Sick leaves	5	4	3	2	1
21	Bonus yearly	5	4	3	2	1
22	Industry gives Financial support to workers	5	4	3	2	1
	Section D: Performance of Workers					
23	Injuries has been decrease	5	4	3	2	1
24	Achieving high profit ratio	5	4	3	2	1
25	Production is increases	5	4	3	2	1
26	Enhancement of workers motivation	5	4	3	2	1

Thanks for your co-operation

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