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The Knowledge and Practice of Workers Toward Occupational Hazards: Case Study from United Arab Emirates

O Conhecimento e a Prática dos Trabalhadores em Relação aos Riscos Profissionais: Estudo de Caso dos Emirados Árabes

Fares M. Howari[1]; Yousef Nazzal[1] & Mustaffah Awad[2]

[1]College of Natural & Health Sciences, Zayed University, Khalifa City West Campus, Abu Dhabi City, Airport Road, Abu Dhabi Emirate, P.O Box 144534, United Arab Emirates
[2]Sajway/Posters Building, 167, Appt. No 13, Tourist Club Area, Abu Dhabi City, Abu Dhabi Emirate, United Arab Emirates
E-mails: fares.howari@zu.ac.ae; yousef.nazzal@zu.ac.ae; mustafa93awad@gmail.com
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Abstract

The focus of this investigation is to assess the level of knowledge, attitude and practice (KAP) of workers on occupational health and safety issues in the industrial town of Mussafah, United Arab Emirates. A combination of personnel interviews in conjunction with t-test and logistic regressions were used to assess the KAP of the workers. Around 98% of the survey results indicate that the computed p-value of the responses is greater than the significance level alpha = 0.05, hence the null hypothesis H0 of the test of normality cannot be rejected. The risk to reject the null hypothesis H0 while it is true ranges 77.86% to 99%. The study revealed that there is an overall low awareness of health and safety issues among the studied sample. This therefore makes the workers generally more susceptible to accidents. Results have also shown that 48% of the managers were aware of the hazards taking place at their facilities, and 42.6% of them knew the possible harmful effects from their industrial processes. In terms of the health considerations of the visited sites, 55% of the workers were unaware about it and 48% of them rarely used their given protective equipment. The present study indicates the education level and years of experience did not impact the practices. The results have shown the need for training programs to build the capacity of workers in the field of health and safety.
Keywords: Safety; educational level; training; awareness; industrial areas

Resumo

O foco do presente estudo é avaliar o nível de conhecimento, atitude e prática (CAP) dos trabalhadores sobre questões de segurança e saúde ocupacional na cidade industrial de Mussafah, Emirados Árabes Unidos. Uma combinação de entrevistas com o pessoal em conjunto com o teste-t e regressões logísticas foram utilizados para avaliar o CAP dos trabalhadores. Cerca de 98% do resultado da pesquisa indicam que o p-valor das respostas é maior que o nível de significância alfa = 0,05, daí a hipótese nula H0 do teste de normalidade não pode ser rejeitada. O risco para rejeitar a hipótese de nulidade H0 enquanto é verdade varia 77.86% a 99%. O estudo revelou que existe uma falta de conhecimento geral em relacao a questões de saúde e segurança entre a amostra estudada. Isso faz com que os trabalhadores sejam mais suscetíveis a acidentes. Os resultados também mostraram que 48% dos gestores estavam cientes dos perigos no local onde trabalham, t e 42,6% deles conhecia os possíveis efeitos nocivos dos processos industriais. Em termos de conhecimento dos services de saúde disponiveis nos sites visitados, 55% dos trabalhadores desconheciam sobre este dominio e 48% deles raramente usavam os equipamentos de proteção recebidos. O presente estudo indica que o nível de educação e anos de experiência não tem impacto na prática. Os resultados demonstraram a necessidade de programas de formação para preparar trabalhadores para o campo da segurança e da saúde.
Palavras-chave: Segurança; nível educacional; treinamento; conscientização; áreas industriais

1 Introduction

Since the discovery of oil in the UAE, there has been a great increase for demands in goods, services and overall development activities (Shihab, 1990). For example, in the past few years, the Emirate of Abu Dhabi has witnessed massive investment in the construction industry from both public and private enterprises due to the rising demand of new housing units and the high investment undertaken in the construction business. Despite the latest global economic slowdown, the construction sector in the Emirate remained strong and contributed about 10.1% to the Emirate AED150 billion GDP in 2009, (Statistics Center-Abu Dhabi, 2010). The sector is ranked the third in its contribution to the Emirate GDP after crude oil production (49.4%) and services (29.3%) sectors, (Statistics Center-Abu Dhabi, 2010). As the UAE government intends to diversify its economy from oil-based to other industries, infrastructure investments will further boost in future. This has allowed for an increase in the production and manufacturing of products by various industries, and unfortunately, leads to some more susceptible hazards at the work environments as it is the case in other countries. These situations lead to an increase in the recognition of hazard controlling measures.

On the other hand, the applications of well-known principles of health and safety have taken place in the majority of workplaces throughout the world but still complete hazard control is near impossible in many industries. This leads to implementing supplementary measures like using personal protective equipment, known as PPE among other measures. However, still human recourses is a key factor to prevent the occupational accidents that happen at work place. Each year, thousands of these hazards take place, worldwide, and the majority of these are caused by human related factors. Major percentages of those accidents are fatal. For example, Ahola *et al.,* (2013) stated that injures, and life losses was regarded as severe among forest finish industry due to health and safety conditions. Their study concluded that developing work conditions and optimizing workload may enhance safety and decrease health expenses related to all injuries. Whereas Parimalam *et al.,* (2007) conducted a study that emphasized on the employees that worked in a garment factory in India. The purpose of the investigation was to assess the awareness of health problems among the workers and their attitudes. The resulting data showed that in three sections, high levels of knowledge of the health problems were prevalent, but the knowledge of personal protective equipment varied in the sections. More than half of the workers in each section knew the benefits of personal protective equipment (PPE), but merely a few workers in the cutting section were making use of the equipment. There was a large gap between their knowledge and their utilization of the protective devices.

The present study – which is still a work on progress –focus on the industrial sector of Mussafah area. This area is a small industrial town to the southwest of Abu Dhabi, United Arab Emirates. Also known as Musaffah Sanaiya, it is one of the most important economic areas of the United Arab Emirates and has been designated a special economic zone, with numerous factories and port. The industrial operations principally comprised workshops, service and maintenance facilities. The main objectives of the present study is to test the knowledge and practice of employees and managers regarding the area of occupational health and safety. Based on the outcome, one could have an idea where to focus resources to solve associated problems.

2 Material and Methods

Primary data collection was through an interview of the workers, supervisors managers followed by other methods such as observation, hazard records, and report maintained in the visited sites. This approach was used successfully by Parimalam *et al.* (2007), and was adhered to in the present study. Ten industrial sites were selected for the study. Face to face questionnaire was used to obtain the primary information regarding the knowledge and practice of workers and managers in the industrial town of Mussafah. Workers and managers (n= 110) that were at the sites were interviewed. The interview included questions about personal information regarding the education and years of experience as well as other questions on workers' knowledge and practice on occupational health and safety issues. The responses were analyzed in terms of education level, hours worked at the site and years of experiences. JMP software was used

to enter and analyze data from the questionnaire. For the questions in the results of the survey where the response is "yes/no," the following descriptive statistics were included: 1) the number and percent of responses and non-responses; and 2) the number and percent of yes and no responses. Logestic regression was performed to further investigate the relationship between the knowledge, attitude and practice (KAP) variables and the contributors of each variables. The t- test analyses was also carried out to analyze the association between the variables related to education and years of experiences, and their health and safety knowledge and practices. The results were demonstrated in both graphical and tabular formats.

3 Results and Discussion

The test of normality for the responses indicate that the computed p-value of 95% of responses is greater than the significance level alpha=0.05, hence the null hypothesis HO of the test of normality cannot be rejected (Figure 1). The risk to reject the null hypothesis H0 while it is true range 77.86% to 99%. The results from this investigation revealed that 60% of the managers had finished secondary school, 30% had finished their bachelors or diploma, and 10% had completed their master degree. This data suggest that there is a concern about the educational level between the managers which could impact health and safety conditions of workplace and related decisions. Regarding the duration of service, 20% worked between 1 and 5 years, 20% worked 5 and 10 years, 30% worked between 10 and 15 years, 20% worked between 15 and 20 years, and 10% worked over 20 years in total. This indicate that workers' experience levels and probable capability of handling situations in the workplace can be considered satisfactory. Table 1 shows that only 44% of the workers had only finished their primary education, 49% finished their secondary education, and only 7% had finished their bachelors and/ or diplomas. This demonstrate that the workers' education levels prior to beginning work had been quite low, and this could affect the awareness about the impact that their jobs could have on their safety and health. They likely never studied about these possible situations. The duration of service also shows that 54% only finished between 1 and 5 years of work, 36% worked only from 5 to 10 years, and 7% worked from 10-15 years. The numbers continue to decrease as the year brackets increase. They have low levels of experience and education, so one would expect that they are more vulnerable to accidents in the workplace (Table 2).

As shown in Table 1 and 2, 40% of managers were actually aware of the hazards that were associated with their factories, meaning that 60% of them did not. With respect to the question that asked whether the managers knew about the possible harmful effects of their industry on the workers, the answers showed that 30% of the managers responded positively. Another question regarding whether there were rules or regulations relating to occupational health and safety in the workplace, the response showed that 70% of the managers responded positively.

The present study also showed that 70% of the visited sites had provided proper training for their employees, and the other 30% failed to provide any sort of training regarding health and safety. This puts the workers of those locations at disadvantage in the workplace. However, personal protective equipment was provided to the workers by all of the surveyed managers. This is most likely due to the strict enforcement of associated laws and rules from the local authorities. There is a significant lack of knowledge between the managers concerning health and safety in their respective factories, and they also lack the knowledge that these hazards may be fatal towards workers, (Table 3).

Forty one percent of surveyed workers were actually aware of the hazards associated with their jobs, and more than half did not know about it. When asked if they knew these hazards were harmful to their health, the results showed that fewer were unaware than those that were (Table 4). There is a lack in the education about these hazards in the workplace, and the impact that they could have on the workers. The results indicate that 76% of the workers did not know anything regarding regulations of health and safety, which is a large issue in any factory. Only 16% had actually received training regarding the health and safety processes in the study area. On the other hand, 81% of the interviewed workers were provided with the appropriate personal protective equipment. However, when they were asked how often they use them, 37% answered that they use them all the time and the other 63% stated that they

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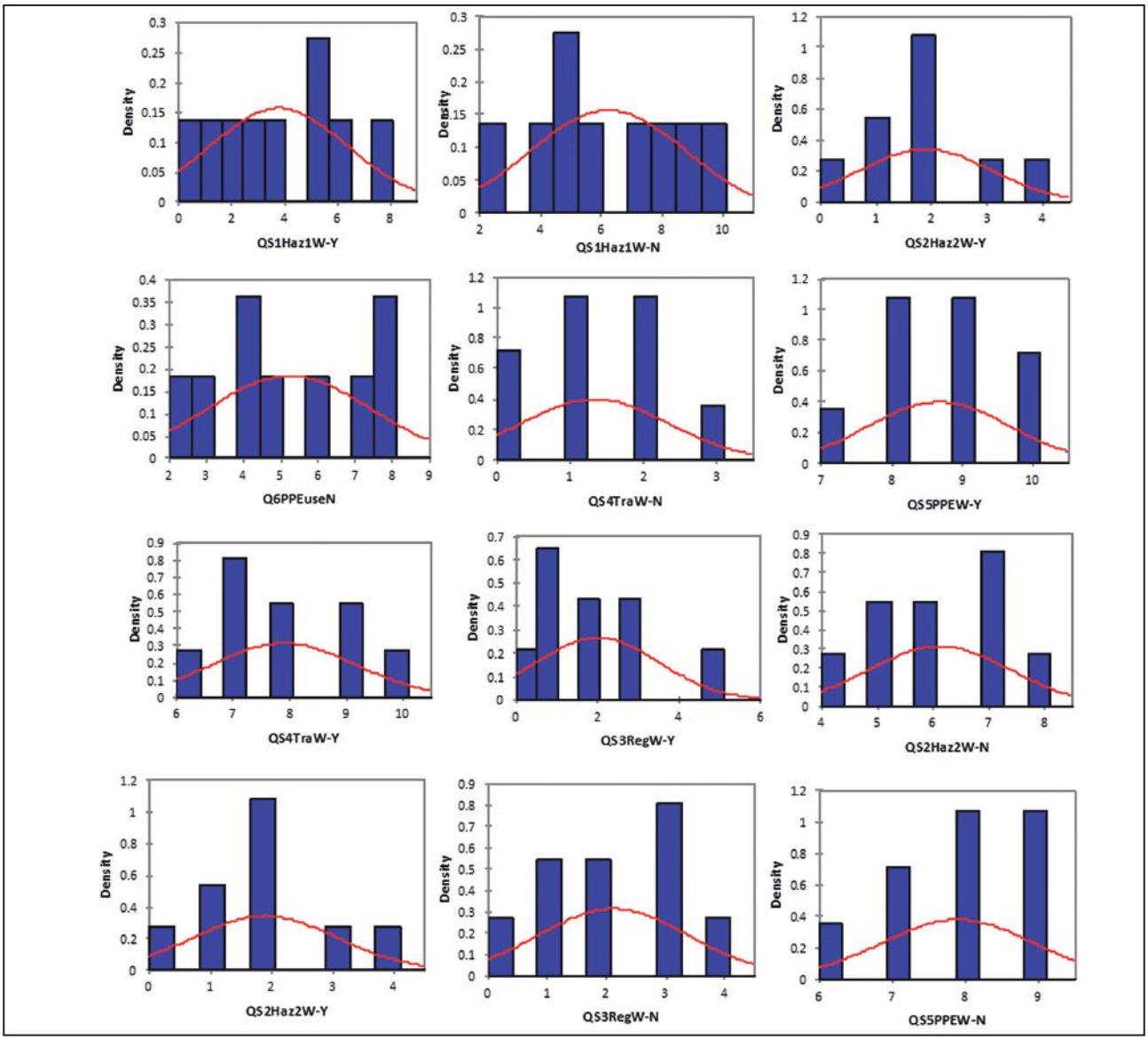

Figure 1 The normal distribution of the responses where the x -axis demonstrates the outcome from the different responders of the survey questions.

Education Level	Site#1	Site#2	Site#3	Site#4	Site#5	Site#6	Site#7	Site#8	Site#9	Site#10	
	N=1 (10%)	N=1 (10%)	N=1 (10%)	N=1 (10%)	N=1 (10%)	N=1 (10%)	N=1 (10%)	N=1 (10%)	N=1 (10%)	N=1 (10%)	100%
Primary/none	0	0	0	0	0	0	0	0	0	0	0
Secondary	1	1	1	1	0	0	1	0	1	0	60%
Bachelors/diploma	0	0	0	0	1	1	0	0	0	1	30%
Masters	0	0	0	0	0	0	0	1	0	0	10%
Duration of Service											
0-5 years	1	0	0	1	0	0	0	0	0	0	20%
5-10 years	0	1	1	0	0	0	0	0	0	0	20%
10-15years	0	0	0	0	0	1	1	0	0	1	30%
15-20 years	0	0	0	0	1	0	0	0	1	0	20%
20-25 years	0	0	0	0	0	0	0	1	0	0	10%
How many hours worked per day	8	8	9	8	10	8	8	9	8	8	
How many working days per week	6	6	6	6	6	6	6	6	6	6	

Table 1 Education level, years of experience, working hours and days of the responders for managers.

use them sometimes or never. A greater percentage of the workers do not take these precautions all the time. Some also stated that they fail to use the equipment because of the heat it brings upon them or because it possess in the way of their work. Either way this brings possibilities of hazards in every situation.

Education Level											
Primary/none	3	4	8	5	3	1	7	5	6	2	44%
Secondary	6	6	2	5	6	6	3	5	4	6	49%
Bachelors/diploma	1	0	0	0	1	3	0	0	0	2	7%
Masters	0	0	0	0	0	0	0	0	00	0	0%
Duration of Service											
0-5 years	4	5	9	7	5	2	6	5	5	6	54%
5-10 years	5	3	1	2	5	4	4	4	5	3	36%
10-15years	1	1	0	1	0	3	0	1	0	0	7%
15-20 years	0	1	0	0	0	1	0	0	0	1	3%
20-25 years	0	0	0	0	0	0	0	0	0	0	0%
How many hours worked per day	8	8	9	8	9	8	8	9	8	8	
How many working days per week	6	6	6	6	6	6	6	6	6	6	6

Table 2 Education level, years of experience, working hours and days of the responders for workers.

Sites	**Do you know the hazard associated with the factory? (QS1)**		**Do you think these hazards are harmful to the workers? (QS2)**		**Do you have any regulations regarding occ. health and safety? (QS3)**		**Have you provided training for workers about health and safety? (QS4)**		**Have you provided PPE for your workers? (QS5)**		**Do you know if they use them? (QS6)**	
	Yes	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
Site # 1	1		1		1		1		1		1	
Site # 2		1		1		1		1	1			1
Site # 3	1				1		1		1			1
Site # 4		1		1	1		1		1			1
Site # 5		1		1		1		1	1		1	
Site # 6	1		1		1		1		1		1	
Site # 7		1			1		1		1			1
Site # 8	1			1	1		1		1		1	
Site # 9		1	1			1		1	1			1
Site # 10		1		1	1		1		1			1

Table 3 The response of the responders from the different sites for the survey questions for the managers.

Sites	**Do you know the hazard associated with the factory? (QS1)**		**Do you think these hazards are harmful to the workers? (QS2)**		**Do you have any regulations regarding occ. health and safety? (QS3)**		**Have you provided training for workers about health and safety? (QS4)**		**Have you provided PPE for your workers? (QS5)**		**Do you know if they use them? (QS6)**	
	Yes	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
	8	2	4	6	3	7	1	9	8	2	8	2
Site # 1	1	9	2	5	1	9	0	10	8	2	7	3
Site # 2	5	5	2	7	0	10	2	8	7	3	8	2
Site # 3	3	7	3	6	3	7	2	8	9	1	4	6
Site # 4	0	10	2	5	4	6	0	10	6	4	2	8
Site # 5	7		6	4	5	5	4	6	10	0	7	3
Site # 6	4	6	2	7	2	8	1	9	7	3	3	7
Site # 8	6	4	0	8	3	7	1	9	8	1	4	6
Site # 9	2	8	1	7	1	9	2	8	9	1	5	5
Site # 10	5	5	1	4	2	8	3	7	9	1	6	4

Table 4 The response of the responders from the different sites for the survey questions for thw workers

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Overall, lack of knowledge and practice was shown in both the workers and managers. It is believed that the main issues with the workers are their lack of health and safety education, and experience. They were therefore not aware of several hazards that had occurred, or about those that could occur in the workshops. The managers showed a lack of knowledge as well, regarding the negative effects that machinery or their working environments could have on themselves as well as their employees.

The outcome from logistic regression analysis identified the major factors that influenced the knowledge, and practice of workers. The prevalence of good knowledge, and safe practice was relatively low (Table 5). Contrary to what was expected, the technical and general education levels did not impact the worker responses. Their responses were not significantly different. Similarly, the years of experience did not impact their answers. It is either the questions were too basic for them or the practical experience put them on the same level of awareness and attitude about the interview questions. Hence, their answers were not significantly different. However, the answerers of BSc holders for questions dealing with the training and the personnel protective equipment is significantly different, and the answers of those who have 5 to 10 years' experience were significantly different for questions dealing with the regulation and training issues (Figures 2, 3 and 4; Table 5). It noteworthy that there is poor link between the length of working hours per day and the positive responses for the survey questions (Figure 3). Similar results were reported by Yu *et al.,* (2005) during their study to male printing workers coming from 28 factories in Hong Kong, the prevalence of good knowledge, appropriate attitude, and safe practice was not at an expected level. The results were 20.4%, 38.4%, and 22.0% respectively towards these categories. Appropriate attitude was considered on having knowledge at a younger age. Safe practice did not regard merely knowledge and attitude, but had a positive correlation with being informed of safety precautions and having supplies with chemical information by workers' respective supervisors.

Based on the data collected in this study, it is recommended that the competent authorities take relevant and significant action towards conducting training programs for the employees and the workers, as an example. This would educate them greatly regarding health and safety. Also, the rules that are applied should be stricter regarding PPCs being used and safety precautions in the Workshops. Check-ups should be done more regularly to ensure that this is a consistent attempt to help the workplace and all of its employees.

		Education Degree			Years of Experience				
Survey Questions		**Sec**	**BSc**	**Msc**	**0-5**	**5-10**	**10-15**	**15-20**	**20 -25**
	Prob>| t |	**Prob>| t |**	**Prob>| t |**	**Prob>| t |**	**Prob> | t |**	**Prob>| t |**	**Prob> | t |**	**Prob> | t |**	**Prob>| t |**
Do you know the hazard associated with the factory?	Yes	0.48	0.63	0.65	0.42	0.53	0.36	0.51	0.47
	No	0.86	0.81	0.56	0.3	0.65	0.67	0.07	0.38
Do you think these hazards are harmful to the workers?	Yes	0.81	0.34	0.22	0.29	0.79	0.42	0.49	0.16
	No	0.15	0.0059	0.159	0.19	0.92	0.18	0.91	0.1
Do you have any regulations regarding occ. Health and safety?	Yes	0.39	0.41	0.86	0.2	0.85	0.8	0.5	0.9
	No	0.05	0.08	0.7	0.56	0.03	0.44	0.92	0.69
Have you provided training for workers about health and safety?	Yes	0.05	0.08	0.7	0.16	0.23	0.54	0.22	0.34
	No	0.121	0.03	0.62	0.9	0.48	0.07	0.48	0.64
Have you provided PPE for your workers?	Yes	0.12	0.03	0.6	0.6	0.32	0.02	0.77	0.62
	No	0.23	0.15	0.8	0.91	0.16	0.13	0.9	0.84
Do you know if they use them?	Yes	0.13	0.21	0.61	0.72	0.39	0.46	0.39	0.52
	No	0.46	0.71	0.51	0.68	0.12	0.95	0.16	0.51

Table 5 The association between the responses of the responders and their education level and years of experience.

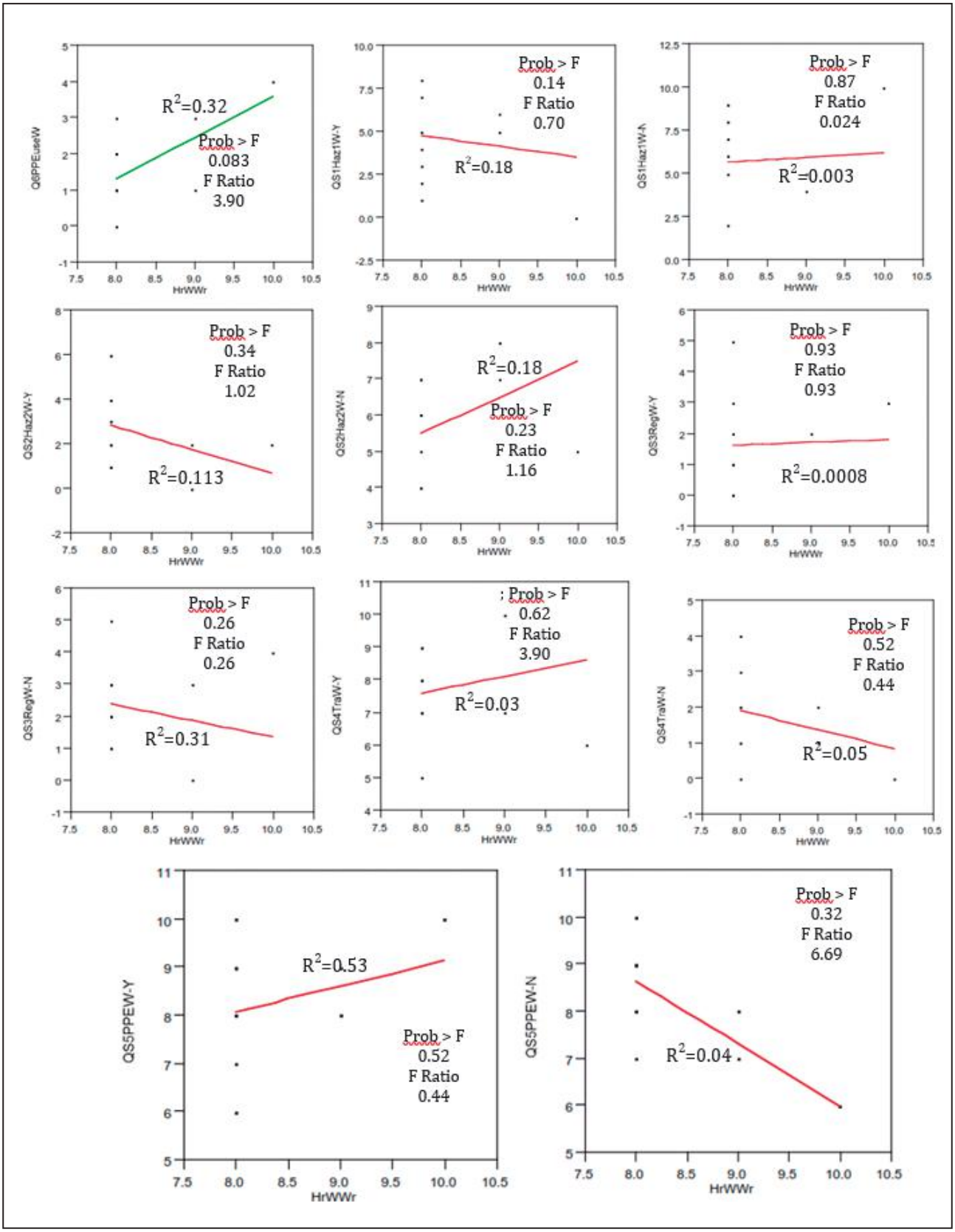

Figure 2 The trend between the working hours of the responders and their responses where x-axis represents the working hours of the surveyed samples and y-axis represents the survey questions

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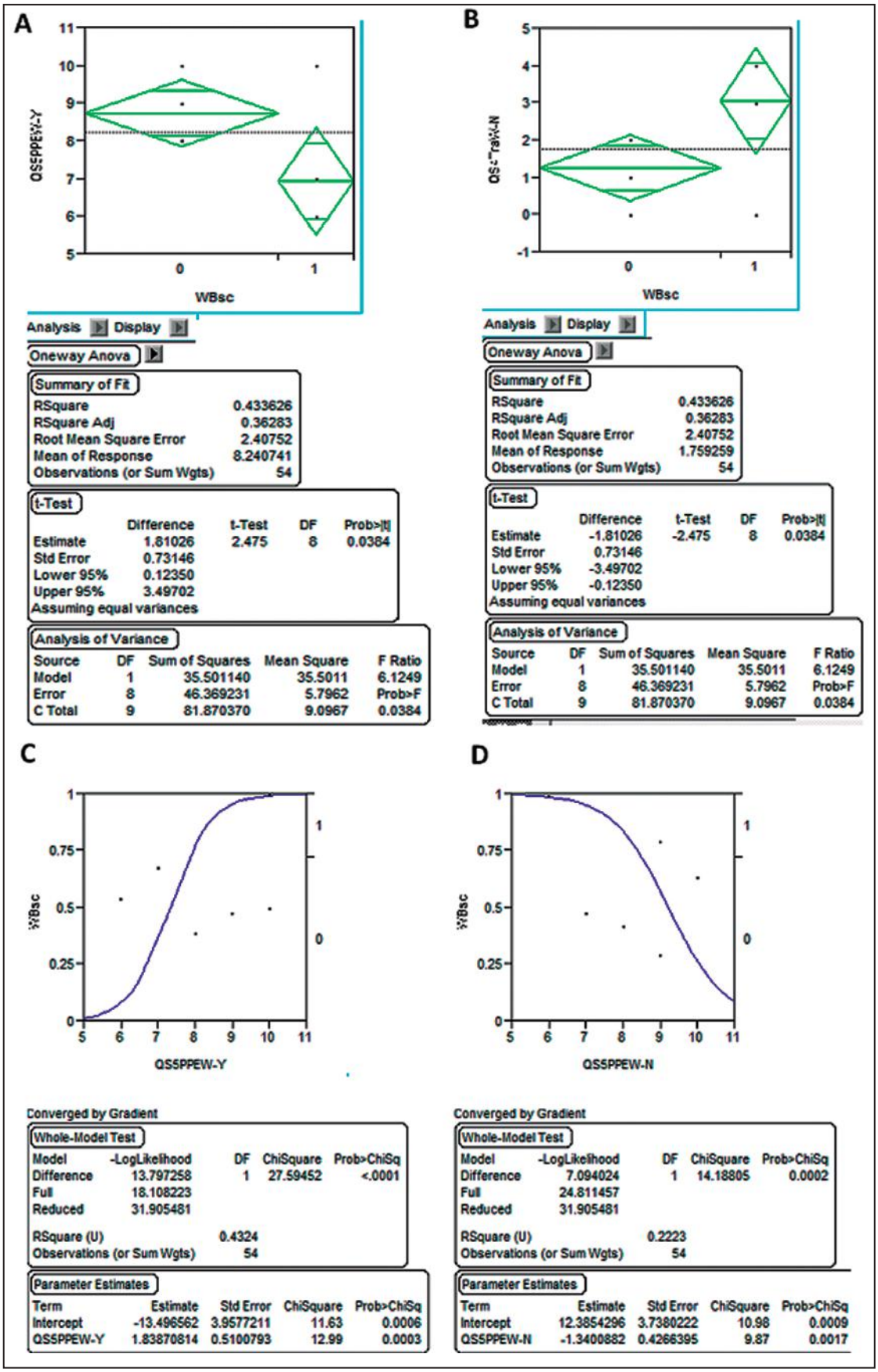

Figure 3 The answers of the bachelor holders to question number 5 which deals with PPE where in A and B the x-axis represent the education level and y-axis represent the survey questions and vice-versa in C and D.

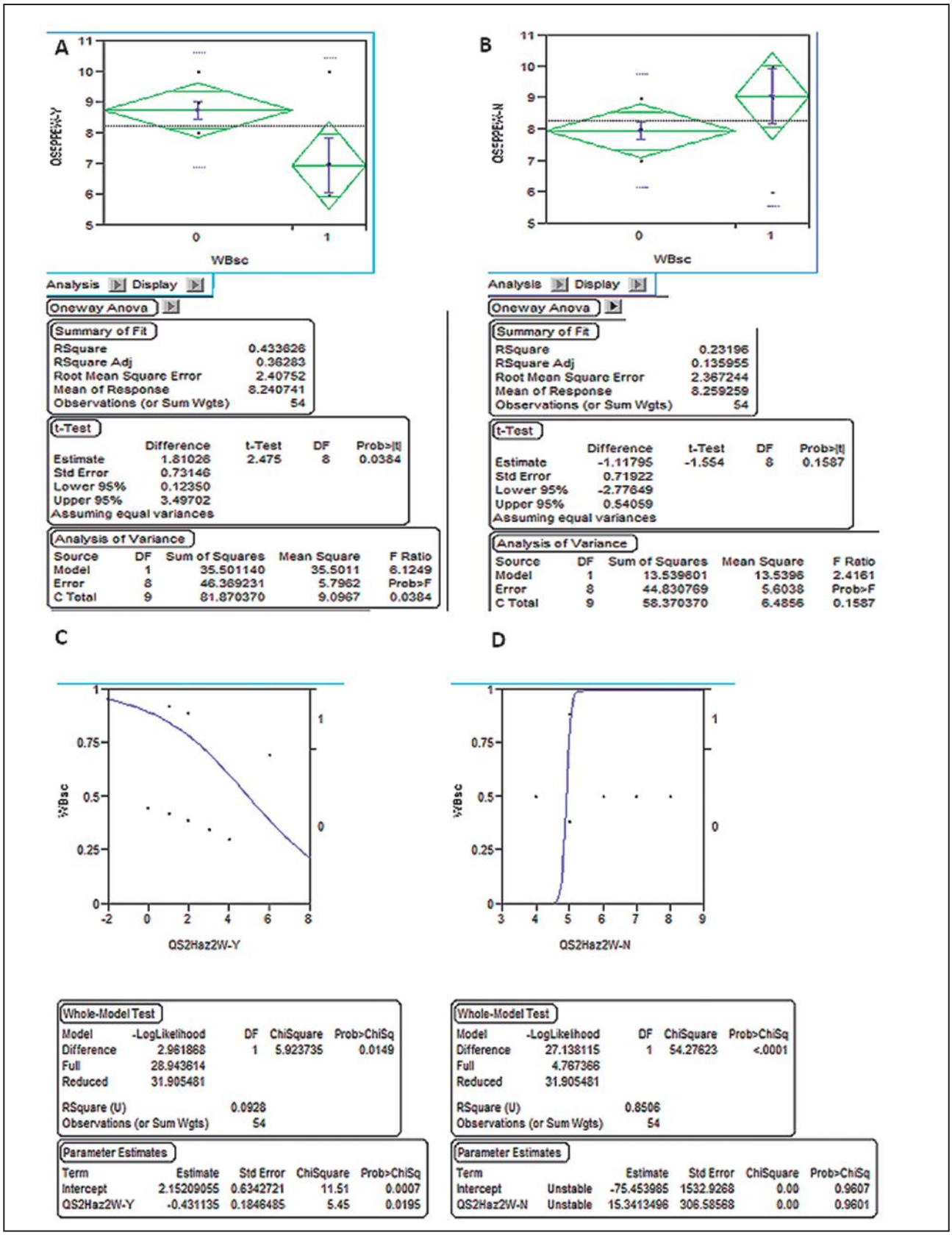

Figure 4 The answers of the bachelor holders to question number 5 which deals with PPE where in A and B the x-axis represent the education level and y-axis represent the survey questions and vise versa in C and D.

4 Conclusions

The study found that the responses of the responders were normally distributed. The study observed an inverse relation between the number of workers and their associated years of experiences in their fields of expertise. The study revealed that there is an overall low awareness of health and safety issues among the studied sample. The workers were therefore not aware of several hazards that had occurred, or about those that could occur in the workshops. The study reveal that, there is concern about the educational level among managers who is responsible about decisions related to workers health and safety. Workers capability of handling situation in the workplace is almost satisfactory in spite of the fact that, the workers level of education percentages is low. The study showed 70% of the visited sites provide proper training to their employees, while 30% failed to provide training to their employees. This lead to urgent need for more training programs to build the capacity of workers in the study area. The data indicated that more number of workers do not use the protective devices during the working time and this at the end effect their health & safety.

5 References

Ahola, K.; Salminen, S.; Toppinen-Tanner, S.; Koskinen, A. & Väänänen, A. 2013. Occupational burnout and severe injuries: an eight-year prospective cohort study among Finnish forest industry workers. *Journal of Occupational Health*, *55*(6): 450-457.

Haldiya, K.R.; Sachdev, R.; Mathur, M.L. & Saiyed, H.N. 2005. Knowledge, Attitude and Practices related to Occupational Health Problems among Salt Workers working in the Desert of Rajasthan, India. *Journal of Occupational Health*, *47*: 85-88.

Ignatius, T.S.; Nga, L.L. & Wong, T.W. 2005. Knowledge, attitude and Practice regarding organic solvents among printing workers in Hong Kong. *Occupational Health Journal*, *47*: 176-184.

Parimalam, P.; Kamalamma, N. & Ganguli, A.K. 2007. Knowledge, attitude and practices related to occupational health problems among garment workers in Tamil Nadu, India. *Journal of Occupational Health*, *49*(6): 528-534.

Reeder, A.I.; Gray, A. & McCool, J.P. 2013. Occupational sun protection: workplace culture, equipment provision and outdoor workers' characteristics. *Journal of Occupational Health*, *55*(2): 84-97.

Shihab, M. 1990. Industrial Development in the United Arab Emirates. *Cultural & Scientific Association Al-Owais Prize Annual Book*, *1*: 53-108.

Shihab, M. 1996. Human Development in the United Arab Emirates. *Economic Horizons*, *17*(66): 9-31.

Statistics Center-Abu Dhabi. 2010. Access: https://www.abudhabi.ae/pdfdirectview/en/308788/blaetterkatalog/blaetterkatalog/pdf/complete.pdf

Yu, I.T.; Lee, N.L. & Wong, T.W. 2005. Knowledge, attitude and practice regarding organic solvents among printing workers in Hong Kong. *Journal of Occupational Health*, *47*(4): 305-310.