

Assessment the workers awareness with occupational health and safety at northern petrochemical company in Iraq

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ABSTRACT

Background: Occupational health and safety is the protective shield for workers against hazards and accidents at the workplace. Therefore, they must be fully awareness of the concepts and principles of occupational health and safety in order to avoid accidents within the petrochemical industries containing these hazards.

Aim: The study aimed to assess the workers awareness' with occupational health and safety at Northern Petrochemical Company in Salah Alden Governorate of Iraq and to find out relationship between this awareness with workers' demographical characteristics such as (age, period of services, marital status, and education level).

Materials and methods: A descriptive design was applied throughout the present study in order to achieve study goals. The study sample was (330) worker, working in basic factory departments, in the Northern Petrochemical Company. A special questionnaire was prepared by the investigator, through

an extensive literatures review, opinion of experts and conducting a preliminary study. Data were gathered through the worker' interviewed in workplace. Content validity of the questionnaire was done through eliciting the opinions of a panel of (9) expert, while the reliability of questionnaire was done through a pilot study and by using internal consistency and calculation of Pearson Correlation Coefficient on data gathered from (10) workers.

Results: The results of the study showed that all workforces were males and most of them were married have low educational level with period of services more than ten years; The results of the study showed that workers have an awareness "of the occupational health and safety they need in the workplace and there a significant relationship differences between this awareness and the worker ages, services period and their educational level at $P < 0.05$.

Conclusion: The awareness of workers' with occupational health and safety in the Northern Petrochemical Company comes from a comprehensive understanding of the hazards arising from the processes of production and use of chemicals materials and use of personal protection equipment. Awareness is also increasing among adult workers with a high level of education and long years of service period.

Key Words: Awareness; Occupational; Petrochemical; Safety

INTRODUCTION

The health and safety of people at work has been of concern since the growth of waged labor work, and particularly since those engaged in waged labor developed representative trade unions [1]. Occupational health and safety (OHS) is a cross-disciplinary area concerned with protecting the safety, health and welfare of people engaged in work or employment. "The goals of occupational safety and health programs include promotion a safe and healthy work environment". OHS may also protect co-workers, family members, employers, customers, and many others who might be affected by the workplace environment [2].

Studies in industrial countries disclose that the causing agent of 90% of workplace accidents is human error and only 10% of those go to unsuitable workplace and equipment [3]. "The overview hazardous technology has resulted in insecure and unhealthy working environments". Mostly workers are not too much educated to know what protective measures should be adopted. Occupational health aims at: the encouragement and preservation of the highest degree physical, mental and social wellbeing of workers in occupations [4].

Chemicals industries are one of the most significant sectors of the process industry. It plays a vital developing role by providing chemicals and intermediates as inputs to other sectors of the industry like paints, adhesives, pharmaceuticals, dye stuffs and intermediates, leather chemicals, pesticides etc. "Each year many workers are injured, become ill or are killed because of exposure to harmful chemical materials". These incidents cause human suffering, loss of production and high medical cost. Industrial hazards associated with these industries include large scale high pressure and temperature reactors and separations equipment containing highly flammable chemicals [5]. The exposure to pesticides and other agrochemicals

in workplace can cause poisoning and in certain cases, "lead to work-related cancer and death" [6].

MATERIALS AND METHOD

A non-experimental design (descriptive approach) was achieved in the present study in order to assess the workers awareness' with occupational health and safety at Northern Petrochemical Company and to find out relationship between this awareness with workers' demographical characteristics such as (age, period of services, marital status, and education level).

A purposive (non-probability) sample was used in selecting (330) subjects to answer study question. For the purpose of data collection, the researcher constructed a semi-structure questionnaire that consists of two parts: - Part I: this part was concerned with the description of the demographic characteristics of study subjects such as (age, period of services, marital status and educational level). Part II: includes workers awareness' with occupational health and safety. Nineteenth statements reflected the workers information of occupational health and safety domains that encompass the company responsibilities toward provide and maintenances the occupational health and safety measures as well as how workers understand and compliances with it. These questions were measured on a three-point scale agree, uncertain, and disagree and rated as agree=3, uncertain=2 and disagree=1. Reliability and validity of this tool is determined through application of a pilot study and panel of experts. Data were gathered through the worker' interviewed in workplace, each interview takes approximately (15-20) minute for each worker. The researcher was fed the computer by all the data that were collected in the study. SPSS was used for data analysis. The following statistical approaches were applied; Descriptive statistic (Frequency, Percentage and Mean Score) and Inferential Statistic (Chi-square).

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RESULTS

Table 1 demonstrates the demographic characteristics of the study sample. All the workers were males; the majority (62.12%) was 30-39 years old. High proportion was married (95.15%) and has (42.12%) period long of service 10-14 years of worker services. With regard to the educational level of workers, the highest percentage was (48.18%) who were graduated from secondary schools.

Table 2 shows that the awareness level was good on items 2, 6, 9, 15 and

moderate on the other one. Table 3 illustrates that there is a significant relationship between workers awareness' with occupational health and safety and their ages at $P \leq 0.05$. Table 4 demonstrates that there is a significant relationship between workers awareness' with occupational health and safety and their services period at $P \leq 0.05$. Table 5 shows that there is no significant relationship between workers awareness' with occupational health and safety and their marital status at $P \leq 0.05$. Table 6 shows that there is a significant relationship between workers awareness' with occupational health and safety and their educational level.

Table 1
Frequencies and Percentages of Socio-Demographical Characteristics

Items Characteristics	Groups	F	%
Age	20-29 Year	58	17.57
	30-39 Year	205	62.12
	40-49 Year	51	15.45
	More than 50 Year	16	4.84
Period of services	Less than 5 y	27	8.18
	5 – 9 y	89	26.96
	10 – 14 y	139	42.12
Marital Status	More 15 y	75	22.72
	Single	16	4.84
	Married	314	95.15
Education Level	Read & write	4	1.21
	Primary	38	11.51
	Intermediate	27	8.18
	Secondary	159	48.18
	Institution	46	13.93
	College	56	16.96

Table 2
Mean of Score for level of workers awareness's with occupational health and safety

List	Items	Agree		Uncertain		Disagree		M.S	
		F	%	F	%	F	%		
1	The Company is responsible for providing occupational safety measures at workplace.	200	60.6	118	35.7	12	3.6	2.5	M
2	The Company is responsible for sending safety warning to the necessary place.	210	63.6	109	33	11	3.33	2.6	G
3	The worker may only be employed after passing pre- employment medical and physical examinations.	157	47.5	104	31.5	69	20.9	2.2	M
4	The Company has to retire the worker who has a chronic occupational injury and diseases after giving him reward.	99	30	116	35.1	115	34.8	1.9	M
5	The Company should provide full care and rehabilitation for the injured worker as a result of work accidents.	207	62.7	93	28.1	30	9.09	2.5	M
6	Workers must rescue their peer who unconscious as a result of toxic gases or other injuries in the workplace.	264	80	49	14.8	17	5.15	2.7	G
7	I have to be sure of safety requirements before going to rescue the unconscious worker because the toxic gases or any other injury.	204	61.8	108	32.7	18	5.45	2.5	M
8	The rescue matter is the task of the specialized rescuers after telling them to help any unconscious worker.	147	44.5	146	44.2	37	11.2	2.3	M
9	I should know the name and toxicity of any chemical material used in the work.	221	66.9	85	25.7	24	7.27	2.6	G
10	It is the responsibility of the Company to monitor the dangerous occupational workplace.	186	56.3	92	27.8	52	15.7	2.4	M
11	The Company has to prevent any non-responsible to reach the places where the dangerous materials are saved.	212	64.2	98	29.6	20	6.06	2.6	M
12	The Company has to inform workers of the raw materials necessary in production of fertilizer in the factory.	163	49.3	111	33.6	56	16.9	2.3	M
13	The Company has an education programs about the daily amount and enough time of exposure to chemical materials that cause any diseases.	77	23.3	111	33.6	142	43	1.8	M
14	Safety personnel protective equipment must be used before work.	204	61.8	106	32.1	20	6.06	2.5	M
15	The body must be washed before and after the work shift and the use of organic solvents.	252	76.3	62	18.7	16	4.85	2.7	G
16	The company has to maintenance and repair factory machine with routine examination of high pressure machines and thermal boilers.	101	30.6	127	38.4	102	30.9	1.9	M
17	Air exhaust should be used to reduce dust that present from chemical materials and machines work.	160	48.4	136	41.2	34	10.3	2.4	M
18	The need to provide healthy food and a suitable place to eat at the workplace.	86	26	128	38.7	116	35.1	1.9	M
19	The company has to provide medical health care for injury, accident and other emergency cases.	147	44.5	149	45.1	34	10.3	2.3	M

Level of awareness (L): MS: Mean Score F: Frequency; (G) Good (<2.5) MS; (M) Moderate (1.5 – 2.5) MS; (P) Poor (> 1.5) MS

Table 3
Association between workers awareness's with occupational health and safety and their ages

Age group	Agree		Uncertain		Disagree		Total	
	F	%	F	%	F	%	F	%
20-29 y	1036	23.5	827	18.76	341	7.74	2204	50
30-39 y	3648	23.41	2832	18.18	1310	8.41	7790	50
40-49 y	868	22.39	648	16.72	422	10.89	1938	50
More 50 y	304	25	211	17.35	93	7.65	608	50
Obs. $X^2=37.708$	DF = 9	P ≤ 0.05						

Table 4
Association between workers awareness's with occupational health and safety and their services period

Services Period	Agree		Uncertain		Disagree		Total	
	F	%	F	%	F	%	F	%
Less 5 y	471	22.95	368	17.93	187	9.11	1026	50
5 – 9 y	1627	24.05	1255	18.55	500	7.39	3382	50
10 –14 y	2463	23.32	1873	17.73	946	8.95	5282	50
More 15y	1296	22.74	1020	17.89	534	9.37	2850	50
Obs. $X^2=21.552$								

Table 5
Association between workers awareness's with occupational health and safety and the marital status

Social status	Agree		Uncertain		Disagree		Total	
	F	%	F	%	F	%	F	%
Married	263	21.63	236	19.41	109	8.96	608	50
Single	5594	23.44	4281	17.94	2057	8.62	11932	50
Obs. $X^2=3.173$	DF = 3	P ≤ 0.05						

Table 6
Association between workers awareness's with occupational health and safety and their educational level

Educational level	Agree		Uncertain		Disagree		Total	
	F	%	F	%	F	%	F	%
Read & write	69	22.69	52	17.11	31	10.2	152	50
primary	626	21.66	496	17.16	323	11.18	1445	50
Intermediate	428	20.86	396	19.3	202	9.84	1026	50
Secondary	2892	23.93	2142	17.73	1008	8.34	6042	50
Institution	875	25.03	592	16.93	281	8.09	1748	50
College	967	22.72	840	19.74	321	7.54	2128	50
Obs. $X^2=63.350$					DF = 15	P ≤ 0.05		

DISCUSSION

Table 1 throughout the data analysis, the sample demographic characteristics had indicated that the majority of workers were (30-39) years old (62.12%). This finding provided supportive evidence to the fact that most of the working class was adults. The entire samples in the present study were males. With regard to their marital status, the married workers were accounted for the majority of the sample (95.15%).

Relative to the educational level, most of them were secondary school graduates (48.18%). This result documented that these subjects did not seek the opportunity to continue their education, so, they end up with this type of employment.

Concerning the service period, the majority of them were (10-14) years of service (42.12%).

For instance, Langkulsen et al. study about Safety and Health in the Petrochemical Industry in Map Ta Phut, Thailand showed that most sample were male (92.6%) with high school diploma or less (60.5%) and they mostly have more than 10 years period of services (54%) [7].

Discussion workers awareness' with occupational health and safety

Finding from Table 2 illustrated that the mean of score for worker awareness was a good level mean of score on item (2, 6, 9 and 15) that encompasses the workers awareness on the company responsibilities to warning in workplaces. Items 6 and 9 reverse the awareness of worker on how he can rescue injured peer and what he know about chemical materials on factory. Item 9 reflect awareness with use of solvent during washing, as well as how often time doing that. Other items on awareness domain indicated moderated level mean of score for workers awareness towered occupational health and safety,

the domains included workers knowledge on the company responsibilities that supported and maintenance the occupational health safety measures as well as how workers know and applied it as a general. This reflects the company strategy of employing those who have at least basic information occupational health and safety that necessary at the workplace.

For instance a study of Hu et al. showed that the employers were more aware of their responsibilities in the regulation of posting safety warnings, personal protection and providing safety and health equipment [8].

Discussion of the association between the workers awareness' with occupational health and safety and such hem demographical characteristics

Results illustrated that there was as significant relationship between workers awareness with occupational health safety and their (age, services period and educational) at P ≤ 0.05, Tables 4-6. Weather finding show no significant relationship with workers awareness with occupational health safety and their marital status at P ≤ 0.05, Table 5. This gives an impression that the level of worker awareness of occupational health and safety is affected by their educational level, service period and their ages.

A study of Sanaei Nasab et al. to evaluate the Knowledge, Attitude and behavior of workers towards occupational health and safety indicated that there was a significant relationship between awareness level and their education (P< 0.001), also significant relationship between the mean safety score of workers attitude and their age and workers job duration [9].

CONCLUSION

The workers' awareness and understanding for occupational health and safety in the Northern Petrochemical Company comes from a comprehensive understanding of the hazards arising from the processes of production

and use of chemicals materials, and thus the necessity of knowledge and adherence to occupational safety procedures. Also, the awareness level is increased with adult workers who they have high scientific level and long years of service period.

RECOMMENDATIONS

A health educational programs and training should provide for all employees with frequently and periodically. Also co-operation must be done between all related Ministries in order to minimize and prevent the workplace hazard's that affected workers and work environment.

DECLARATION OF INTEREST

The authors do not mention any conflict of interest. Only the authors are responsible for the content of the paper.

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