

Occupational Risk Assessment in Light of the Corona Pandemic in Some Health Institutions of Wasit Governorate-Iraq

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Abstract:

Background: Healthcare employees work in one of the most dangerous occupational environments. In addition to the normal workplace-related risks, healthcare workers face a variety of hazards as a result of their work last activities .These hazards arise from many sources and include biological agents, chemical agents physical and psychosocial factors in health facilities**Methodology:** This study is a descriptive; cross sectional study conducted at four hospitals in Wasit governorate. The data collection started from December 2020 till the March 2021.The Data were collected by direct interview with the health worker by the researcher, by using a self-reporting questionnaire form the occupation hazard dimension ,which include five domains :physical hazard chemical hazard, biological hazard ,psychological hazard and privation and control. The statistical method used include Mean , Stander Deviation and Chi-square. Statistical significance considered whenever the P value was equal or less than 0.05.**Results:** The current study found that the highest percentage 254 (57.6%) were in the age group <30 years, there was a distinct females preponderance of 242(54.9%). The highest percentage of occupational hazards were Biological hazards 335(76.0%) followed by psychological hazards 324(73.0%). **Conclusions:** The study reveals that most health care workers were infected with corona virus during providing health care services.The aim of study to asses occupational risk in some health institution during covid 19 in the study area .

Key words: Assessment, Occupational Risk, Public Health Institutions, Health care workers

Introduction:

Occupational hazards may result in a variety of injuries, as well as a lack of manpower, which may contribute to lower production and, in the worst-case scenario, the unavoidable death of employees, resulting in the loss of qualified staff. Furthermore, the occupational weakness of health-care providers, especially physicians, nurses, and nurses' aides, could jeopardize the quality of health-care delivery in developing countries ¹.

The rate of occupational hazards in hospitals remains more than those in constructions and manufacturing which are generally thought to be relatively hazardous ².Which may threaten healthcare workers' health and safety ³.

The healthcare workforce, which includes hospitals, is one of the largest in the world, accounting for over 12% of the global workforce⁴. Healthcare employees work in one of the most dangerous occupational environments. In addition to the normal workplace-related risks, healthcare workers face a variety of hazards as a result of their work last activities⁵. These hazards arise from many sources and include biological agents, chemical agents physical and psychosocial factors in health facilities⁶.

methodology:

This study is a descriptive cross sectional study conducted at four hospitals in Wasit governorate which are AL-zahraa teaching hospital, AL-suwaira hospitals, AL-naemania hospitals, and AL-shaheedfairouz hospital. Data were collected during the period starting from the December 2020 till the March 2021. The workers participation in study were 441 workers in these hospitals.

Data was collected using direct interview of health workers using questionnaire. The questionnaire consists of four parts: First part socio-demographic characteristics of the studied health worker regarding age, gender, etc. The second part is occupational characteristics of the studied health worker regarding professional, years of experience and place of work. Third part the occupational hazard dimensions which include four domains: Physical hazard (14 items), Chemical hazard (11 items), Biological hazard (16 items) and Psychological hazard (16). Fourth part assesses preventive measures in hospital (24 items) was assessed by using five Likert scale.

Analysis of data was carried out using the available statistical package of SPSS-25 (Statistical Packages for Social Sciences- version 25). Data were presented in simple measures of frequency, percentage, mean, standard deviation, and range (minimum-maximum values). The significance of difference for different percentages (qualitative data) were tested using Pearson Chi-square test (χ^2 -test). Statistical significance was considered whenever the P value was equal or less than 0.05.

Results:

1.1. Distribution of health care workers according to socio- Demographic characteristics.

The Socio-demographic characteristics of the study population. found that The mean \pm SD of their ages was 30.8 ± 8.12 years, the age range of the health worker in the study were between 20-56 years, The highest percentage 254 (57.6%) were in the age group <30 years. There were a distinct females preponderance 242 (54.9%), while the association between the four groups was highly significant ($P=0.000$). As for residence and educational level, the study revealed that the majority of participants in studied hospitals from urban regions 394 (89.3%), while the highest percentage 354 (80.3%) of health workers have an educational level (institute and College) followed by 74 (16.8%) had secondary educational level. The result of this study indicated that 265 (60.1%) of the study population were married and 161 (36.5%) of participation were single in study hospital. as appear in Table 1.

Table (1): Socio-demographic characteristics of the study population.

Socio-demographic characteristics			Hospitals				Total	P. value
			Al-Zahraa	Al-Shaheed Fairooz	Al-swiara	Al-Nuamania		
age groups	<30	No	51	63	77	63	254	0.588
		%	53.7%	54.8%	59.7%	61.8%	57.6 %	
	≥30	No	44	52	52	39	187	
		%	46.3%	45.2%	40.3%	38.2%	42.4 %	
Mean ±SD(Range)			30.8±8.12 (20-56)					
Gender	Male	No	52	37	56	54	199	0.003*
		%	54.7%	32.2%	43.4%	52.9%	45.1 %	
	Female	No	43	78	73	48	242	
		%	45.3%	67.8%	56.6%	47.1%	54.9 %	
Residence	Urban	No	87	104	117	86	394	0.308
		%	91.6%	90.4%	90.7%	84.3%	89.3 %	
	Rural	No	8	11	12	16	47	
		%	8.4%	9.6%	9.3%	15.7%	10.7 %	
Educational level	Primary	No	1	2	0	1	4	0.606
		%	1.1%	1.7%	0.0%	1.0%	0.9%	
	Intermediate	No	3	1	1	4	9	
		%	3.2%	0.9%	0.8%	3.9%	2.0%	
	Secondary	No	13	19	23	19	74	
		%	13.7%	16.5%	17.8%	18.6%	16.8 %	
	institute and College	No	78	93	105	78	354	
		%	82.1%	80.9%	81.4%	76.5%	80.3 %	
Social status	Married	No	49	67	78	71	265	0.142
		%	51.6%	58.3%	60.5%	69.6%	60.1 %	
	Single	No	41	42	48	30	161	
		%	43.2%	36.5%	37.2%	29.4%	36.5 %	
	Others	No	5	6	3	1	15	
		%	5.3%	5.2%	2.3%	1.0%	3.4%	

1.2.Distribution of healthworkers according to professional, experience years, and place ofwork.

The study demonstrated that the first rank of health care workers were nurses 125 (28.3%) followed by 107(24.3%) of medical assistants, laboratory assistants, and radiology assistants in all studied hospitals. While the overall frequency of Technicians was 86(19.5%) in all hospitals. which found that most participation had the years' experience ≥ 5 is 244(55.3%). The result of this study indicated that the highest proportion of participants were 117(26.5%) working in medical Laboratories followed by 82 (18.6%) working in admission unit for

patients in all studied hospitals. The association between the four groups was highly significant ($P=0.000$).as appear Table 2

Table (2): Distribution of health worker According to Professional, Experience years, and Place of working.

								p. value
Socio-demographic characteristics			Hospitals				Total	
			Al-Zahraa	Al-Shaheed Fairouz	Al-swiara	Al-Nuamania		
Professional	Physicians	No	10	6	3	10	29	0.135
		%	10.5%	5.2%	2.3%	9.8%	6.6%	
	Pharmacists	No	6	7	11	10	34	
		%	6.3%	6.1%	8.5%	9.8%	7.7%	
	Technicians	No	23	21	27	15	86	
		%	24.2%	18.3%	20.9%	14.7%	19.5%	
	Nurse	No	20	38	40	27	125	
		%	21.1%	33.0%	31.0%	26.5%	28.3%	
	Biologist and Chemist	No	9	4	12	8	33	
		%	9.5%	3.5%	9.3%	7.8%	7.5%	
	Medical assistant and laboratory assistant and Radiology	No	18	33	32	24	107	
		%	18.9%	28.7%	24.8%	23.5%	24.3%	
	Administrative employees	No	9	6	4	8	27	
		%	9.5%	5.2%	3.1%	7.8%	6.1%	
experience years	<5	No	48	51	56	42	197	0.591
		%	50.5%	44.3%	43.4%	41.2%	44.7%	
	≥5	No	47	64	73	60	244	
		%	49.5%	55.7%	56.6%	58.8%	55.3%	
Mean ±SD(Range)			7.83±7.2 (1-35)					
Place of working	Administrative units	No	4	5	9	4	22	0.000*
		%	4.2%	4.3%	7.0%	3.9%	5.0%	
	consulting unit	No	0	5	0	5	10	
		%	0.0%	4.3%	0.0%	4.9%	2.3%	
	Radiology department	No	6	3	7	0	16	
		%	6.3%	2.6%	5.4%	0.0%	3.6%	
	Admission unit for patients	No	24	17	19	22	82	
		%	25.3%	14.8%	14.7%	21.6%	18.6%	
	Health units	No	19	9	4	13	45	
		%	20.0%	7.8%	3.1%	12.7%	10.2%	
	Pharmacy unit	No	9	7	14	14	44	
		%	9.5%	6.1%	10.9%	13.7%	10.0%	
	Emergency	No	12	8	8	8	36	
		%	12.6%	7.0%	6.2%	7.8%	8.2%	
	Operation department	No	2	22	12	9	45	
		%	2.1%	19.1%	9.3%	8.8%	10.2%	
	Blood bank	No	0	1	5	3		
		%	0.0%	0.9%	3.9%	2.9%	2.0%	
Medical	No	17	34	42	24	117		

	Laboratories	%	17.9%	29.6%	32.6%	23.5%	26.5%
	Maternity hall	No	2	4	9	0	15
		%	2.1%	3.5%	7.0%	0.0%	3.4%

1.3. Distribution of health care workers according to psychological hazards.

The results distribution of health care worker according to psychological hazards showed that the mean for the question (1st, 4th, 5th, 11th, 12th, 13th, and 14th) was (2.48, 1.46, 2.51, 1.94, 2.28, 1.95, and 2.47) respectively, were resting on agree responds level. While Stander deviation for questions (1st, 4th, 5th, 11th, 12th, 13th and 14th,) was (1.424, 0.974, 1.424, 1.1061, 1.1307, 1.156, 1.386) respectively as appear in Table 3.

Table (3) Distribution of health care workers according to psychological hazards .

Psychological hazard	Strongly agree		Agree		Neutral		Disagree		Strongly Disagree		Mean	SD	Answer level
	No	%	No	%	No	%	No	%	No	%			
1-suffering from fear of catching disease	168	38.1	70	15.9	72	16.3	85	19.3	46	10.4	2.48	1.424	Agree
2-Do suffer from fear of transmitting infection to you family	85	19.3	146	33.1	75	17.0	90	20.4	45	10.2	2.69	1.274	Neutral
3.Do use drugs and alcohol	25	5.7	33	7.5	34	7.7	114	25.9	235	53.3	4.14	1.185	Disagree
4-suffer from fatigue and lack of focusing at workplace	333	75.5	58	13.2	22	5.0	12	2.7	16	3.6	1.46	0.974	Agree
5.feeling unable to protect yourself and those close to you	163	37.0	69	15.6	75	17.0	87	19.7	47	10.7	2.51	1.424	Agree
6.feeling tired and don't have energy	118	26.8	96	21.8	92	20.9	84	19.0	51	11.6	2.67	1.355	Neutral
7.suffer from a loss of interest and pleasure in doing things	109	24.7	80	18.1	87	19.7	106	24.0	59	13.4	2.83	1.386	Neutral
8.exposure to offending and violence from patients	51	11.6	102	23.1	106	24.0	116	26.3	66	15.0	3.10	1.245	Neutral
9.difficulty of sleeping or sleeping for long periods of time	60	13.6	85	19.3	100	22.7	126	28.6	70	15.9	3.14	1.281	Neutral
10.feeling bad about yourself or a filing person	106	24.0	94	21.3	94	21.3	94	21.3	53	12.0	2.76	1.347	Neutral
11.feeling a frustration and depression	209	47.4	126	28.6	51	11.6	32	7.3	23	5.2	1.94	1.161	Agree
12.thinking that you would be better if you dead or harming yourself in some way	172	39.0	100	22.7	72	16.3	66	15.0	31	7.0	2.28	1.307	Agree
13.feeling with anxious and tense	208	47.2	123	27.9	58	13.2	29	6.6	23	5.2	1.95	1.156	Agree
14-inability to overcome or control anxiety	160	36.3	80	18.1	79	17.9	79	17.9	43	9.8	2.47	1.386	Agree
15.suffering from Poor peptide	87	19.7	138	31.3	110	24.9	70	15.9	36	8.2	2.61	1.201	Neutral
16.Job insecurity	115	26.1	77	17.5	93	21.1	88	20.0	68	15.4	2.81	1.415	Neutral

1.4.Overall of the psychological hazards.

The highest percentage of the psychological hazards level was found high-risk level 86 (84.3%) in the al-nuamania hospital. while the lowest percentage of the studied in al-shaheedfairooz hospitals was 70 (60.9%) and high risk level 324 (73.5%) in four hospital while 127 (26.5%) have a good score of the psychological hazards level among HCWs. The difference between the four hospitals with respect to score level was statistically significant ($P=0.001$), as appear in the table 4.

Table (4):Overall of the Psychological hazards .

Psychological Score			Score		P. Value
			Poor (High Risk<48)	Good/Acceptable (Low Risk ≥48)	
Hospital s	Al-Zahraa hospital	No	71	24	0.001*
		%	74.7%	25.3%	
	Al-Shaheed Fairooz	No	70	45	
		%	60.9%	39.1%	
	Al-swiara	No	97	32	
		%	75.2%	24.8%	
	al-Nuamania	No	86	16	
		%	84.3%	15.7%	
Total		No	324	117	
		%	73.5%	26.5%	
*Significant difference between proportions using Pearson Chi-square test at 0.05 level.					

*Significant difference between proportions using Pearson Chi-square test at 0.05 level.

1.5.Distribution health care worker of according to biological hazards.

. The mean of (1st, 2nd, 12th, 13th, 14th, and 15th) questions were (2.24, 2.40, 2.20, 2.17, 2.32, and 2.44) respectively, were resting on agree responses level. While Stander deviation for question (1st, 2nd, 12th, 13th, 14th, 15th) was (1.380, 1.489, 1.414, 1.379, 1.406, 1.453), as appear in table 4.

Table (5) Distribution health care worker according to biological hazard.

Biological hazard	Strongly agree		Agree		Neutral		Disagree		Strongly Disagree		Mean	SD	Answer level
	No	%	No	%	No	%	No	%	No	%			
1.during your periods work with patients you have been stabbed and injured by a sharp object contaminated h from infected person	194	44.0	100	22.7	28	6.3	86	19.5	33	7.5	2.24	1.380	Agree
2.During your periods work you were exposed to direct contact with the body fluids infected person	185	42.0	90	20.4	22	5.0	91	20.6	53	12.0	2.40	1.489	Agree
3.vaccine for infectious disease is available	61	13.8	88	20.0	27	6.1	83	18.8	18	41.3	2.46	1.519	Disagree
4.serum for Infectious diseases are available	56	12.7	91	20.6	28	6.3	86	19.5	18	40.8	2.45	1.498	Disagree

5.I wore personal protective equipment during the spray generation process for a person infected with the corona virus	85	19.3	98	22.2	9	2.0	70	15.9	17 9	40.6	2.64	1.628	Neutr al
6.danger boxes are available for scalpels and cutting tools	50	11.3	94	21.3	33	7.5	84	19.0	18 0	40.8	2.43	1.474	Disagr ee
7.you provide health care directly to people infected with coronavirus	193	43.8	85	19.3	9	2.0	96	21.8	58	13.2	2.41	1.532	disagr ee
8.you wears personal protective equipment when you are dealing with corona virus patient	67	15.2	85	19.3	12	2.7	85	19.3	19 2	43.5	2.43	1.555	Disagr ee
9.During the provision of health care to corona patients you wear and removes personal protective equipment in a safe manner according to a protocol	65	14.7	94	21.3	17	3.9	77	17.5	18 8	42.6	2.48	1.555	Disagr ee
10.hands washing is done before and after using medical gloves	57	12.9	83	18.8	12	2.7	83	18.8	20 6	46.7	2.32	1.520	Disagr ee
11.During the provision of health services hands washing maintains after handing medical devices and patient tools	52	11.8	110	24.9	39	8.8	72	16.3	16 8	38.1	2.56	1.490	Neutr al
12.While providing health care services I'm infected with the corona virus	206	46.7	97	22.0	27	6.1	67	15.2	44	10.0	2.20	1.414	Agree
13.Touching your eyes ,nose or mouth while you are working	205	46.5	98	22.2	34	7.7	65	14.7	39	8.8	2.17	1.379	Agree
14.As result of contact with your colleagues you were exposed to the corona virus	180	40.8	104	23.6	36	8.2	78	17.7	43	9.8	2.32	1.406	Agree
15.You have direct contact with the environment of the corona virus patient (bed ,bathroom ,medical equipment , etc)	171	38.8	91	20.6	48	10.9	77	17.5	54	12.2	2.44	1.453	Agree
16.Leave a distance of 2 meters 1.5 when dealing with people infected with corona virus	104	23.6	128	29.0	93	21.1	59	13.4	57	12.9	3.37	1.324	Neutr al

1.6.Distribution overall of the biological hazards .

The highest percentage of the biological hazards level was found high-risk level 74 (77.9%) in al zahraa hospital and low risk 96(74.4%) in al suwaira hospital. while high –risk level 335 (76.0%) in the four hospitals and the lowest percentage of the studied hospitals was 106(24.0%) have a good score of the biological hazards level among HCWs. The difference

between the four hospitals with respect to score level was statistically not significant ($P=0.941$).as appear in Table 6.

Table (6):Overall of the Biological hazards .

			Score		
			Poor (High Risk<48)	Good/Acceptable (Low Risk ≥ 48)	P. Value
Hospital s	Al-Zahraa hospital	No	74	21	0.941
		%	77.9%	22.1%	
	Al-Shaheed Fairouz	No	88	27	
		%	76.5%	23.5%	
	Al-suwiara	No	96	33	
		%	74.4%	25.6%	
	al-Nuamania	No	77	25	
		%	75.5%	24.5%	
Total		No	335	106	
		%	76.0%	24.0%	
*Significant difference between proportions using Pearson Chi-square test at 0.05 level.					

Discussion:

The present study found that 254(57.6%) were in the age group of health care worker<30 years. These results are consistent with the previous study done in Palestine hospitals by Al-Khatib et al., (2015)⁷, who found that 60% of the study participants fall included the age group (20-30 years) This may be due to the increasing number of graduates from medical institutes and colleges in Iraq and Their enrollment in the directly job more than before.in this study, there was a distinct females preponderance 242(54.9%), while the association between thefour groups washeight significant ($P=0.000$). These results agreed with the study findings done in Nigeria ⁸, which found that most of the participants were females, and another similar study in India byChelladurai et al., (2020)⁹ revealed that the highest percentage (80%) of the study samples were females. Furthermore, these results consistent with the study findings done in Riyadh, Saudi Arabia ¹⁰, which found the participants proportion in the study for females higher than males. But, these results differ from the findings study in Palestine byAlqam, (2013)¹¹ who found that most participants were males.

The results of this study indicated that 265(60.1%) of the study population were married, and 161(36.5%) of Participants were single in studied hospitals. These results consistent with the study done bySeidat, (2020)⁸, who revealed that highest percentage (63.0%) of the study samples were married.

The current findings that the first rank of health care workers were nurses 125 (28.3%) followed which reached to 107(24.3%) of medical assistants, laboratory assistants, and radiology assistants in all studied hospitals. While the overall frequency of Technicians was 86(19.5%) in all hospitals. This may be due to the increasing number of private and

government colleges that graduate large number of nurses .These results agreed with the study byAlmurr, (2013)¹², which found that the first rank of health care workers were practical nurses (46.4%).

In this study, the percentage (13.6% , and 19.3%) of participants respond with "strongly agree and agree" respectively regarding difficulty sleeping or sleeping for long periods of time. These results disagreed with the study done bySabra and Morsy, (2016)¹³, which found that most participants nurses suffer from disturbances in the sleeping.

Regarding " feeling tired and don't have the energy " the study found that (26.8%, and 21.8%) the HCWs responded with " strongly agree and agree" respectively. These results are consistent with the findings done byShinde et al., (2016)¹⁴, who revealed that 67.6% of the study samples responded "Strongly agree", and 31.4% responded with "agree" about nurses have stress due to lack of rest. according to my opinion due to the lack of health personal due to the pandemic, which increase workload .

Concerning "exposure to offending and violence from patients" the study found that the mean of about it was (3.10), resting on a neutral answer level. This result differs from the study byShinde et al., (2016)¹⁴, who found that 50.5% of the study samples responded " agree", and 42.9% of participants responded with "Strongly agree" regarding "nurses are exposed to violence primarily from patients, relatives and visitors".

In this study, approximately half of the participant's inability to overcome or control anxiety, where rests within the agreed answer level. This result is in agreement with the previous study findings done in Saudi Arabia byAlharthyet al., (2017) ¹⁵, who found that 52% of the health workers had anxiety.

The highest percentage of the psychological hazards level was found high-risk level (73.5%) in the four hospitals. while the lowest percentage of the studied hospitals was 26.5% have a good score of the psychological hazards level among HCWs. These results nearly correspond with a study done byEliwaet al., (2018) ¹⁶, which found same the findings.

The results of this study indicated that the highest percentage of the biological hazards level was found high-risk level (76.0%) in the four hospitals. while the lowest percentage of the studied hospitals was 24.0% have a good score of the biological hazards level among HCWs. The difference between the four hospitals with respect to score level was statistically not significant (P=0.941). That is due a weak of health education on communicable disease and lack training courses on diseases . In Iraq, a study conducted byAL-Sarraji et al., (2017) ¹⁹, who revealed that the maximal effect presented by the biological hazards among AL-Amarah City Hospitals. This result is in agreement with the study our findings.

These findings correspond with the previous study results done bySeidat, (2020)⁸, who found that the biological hazards level was high (95.5%) among the study participants. But these findings inconsistent with the study results conducted in Egypt byElewa and El Banan, (2016) ¹⁷, and a study by Nabil et al., (2018)¹⁸, which found that the biological hazards level was low (10.48%) and (45.73%) according to respondents answer respectively.

Conclusions:

- 1- The study reveals that most health care workers were suffering psychological hazards in consulting unit and Radiology department in hospital.
- 2- The results found that the highest occupational hazards are biological hazards followed by psychological hazards among health care workers.

Acknowledgements: thank all participation in this study, especially in light of the current global crisis (covid 19) and the hospitals administration division at Al nuamania hospital ,Al swiara hospital ,Al fairouz hospital and Al zahraa hospital.

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