



## Evaluation of Healthcare Workers Attitudes Toward Handling and Treating COVID-19 Patients in Diyala Governorate, Iraq

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**Abstract Background:** In 2019, the World Health Organization (WHO) declared a global state of emergency due to the spread of the COVID-19 pandemic. **Objective:** This study aimed to determine the attitudes of healthcare workers in various Iraqi health institutions towards treating patients with COVID-19. Additionally, it aimed to identify the most important reasons behind preventing them from doing their job. **Methods:** Between Nov. 2021 to Dec. 2022, we conducted a self-administered cross-sectional survey of 207 healthcare worker participants. The data were collected using a questionnaire that included three parts. The first part included sociodemographic data, the second part aimed to assess the participants' information concerning how they dealt with this pandemic, and the third part was designed to identify the participants' attitudes. The statistic data were analysed by using (SPSS), 25.0/ IBM Corp., Armonk, NY. The scientific content of the questionnaire items was taken from the online literature as well as updated information on the WHO website. **Results:** The results study revealed that 135 (65.22%) of the participants were willing to receive and treat COVID-19 patients in hospitals and private clinics. While 72 (34.78%) of the study participants showed their unwillingness to treat infected patients. The most crucial reasons behind their reluctance were the fear of transmission of infection and the lack of protective equipment. **Conclusion:** The study concluded that the participants' willingness was good. This was indicated by their positive attitudes toward carrying out their medical duties and commitment to providing health care and treatment for COVID-19 patients. There is an urgent need to reduce psychological and physical stress as well as the pressures that health workers suffer from because they are facing large numbers of daily infections. This reduction is achieved via training, continuous education and equipping hospitals with the latest protective supplies to confront epidemics and pandemics.

**Key Words** COVID-19, healthcare worker, attitudes

### 1. Introduction

The World Health Organization (WHO) announced a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 and designated the outbreak as a pandemic on 11 March 2020 [1]. Emerging COVID-19 is a highly contagious viral disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The origin of SARS-CoV-2 infection was first reported among people attending seafood markets in Wuhan, China, in December 2019; subsequently, the disease spread throughout the world, and it has been a cause of severe acute respiratory illness. This led to a real case of emergency, which provoked great international weariness [2]. First, it was assumed that the source of infection was zoonotic in origin, possibly because SARS-CoV-2

originated in rats. Recent studies have shown that the virus is 96% identical at the level of the entire genome of the bat coronavirus, which means that bats (the largest potential host of SARS-CoV-2), as well as pangolins and snakes, can be potential transmitters of this virus infection [2]. SARS-CoV-2 is transmitted primarily through inhalation or direct exposure to respiratory droplets and aerosols from infected persons, which may fall on the nose or mouth, as well as the eyes, during coughing or sneezing [2], [3].

SARS-CoV-2 is primarily transmitted through inhalation or direct exposition to respiratory droplets and aerosols from infected persons during coughing or sneezing which may fall on the nose or mouth, as well as the eyes [4]–[6] The effect of COVID-19 differs from one person to another; it was noted

that there were four cases of COVID-19: mild, moderate, severe, and critical. The most prominent confronters of this pandemic and all epidemics are health workers in health institutions in all countries of the world and in their various types of specializations; according to reports of the early waves of the pandemic, they are more vulnerable to infection with the virus that causes the disease than others are [7]. The epidemiological crisis of the SARS-CoV-2 pandemic has shown that health care workers are the most important and valuable group in all countries; thus, ensuring their protection and safety through the provision of personal protective equipment and continuous psychological support is essential to limit further loss of health team members as a result of their suffering in facing enormous numbers of injured daily, psychological pressures, and working hours, in addition to the risks of injury and death resulting from such work [7], [8]. The current study was conducted during the COVID-19 pandemic crisis, and its aim was to determine the attitudes of health care workers (doctors and nurses) in various Iraqi health institutions towards treating patients with COVID-19 and to identify the most important factors that prevented them from wanting to treat them.

## 2. Methods:

### A. Study Design and Participants

This survey, a cross-sectional study, was performed from 1/11/2021 to 1/10/2023 and was based on a questionnaire that included some questions prepared by the researchers and others adopted from former online articles. Prior university approval was obtained to conduct the research project after it was scientifically reviewed by the Scientific Committee (Scientific Research Ethics Committee) in the College of Education for Pure Sciences, Department of Biology, where the researchers work (Ref. no. CEPC/006-11/2021). This study involved 207 participants (117 doctors and 90 nurses) who had direct contact with COVID-19 patients. The mean age of the study participants was (21-68) and the standard deviation was  $34.53 \pm 10.28563044$ , Patients who worked in medical institutions, teaching general hospitals (university hospitals), private clinics and primary healthcare centres were included. Personal consent was obtained from the study participants. The questionnaire was presented in Arabic to the participants and subsequently translated into English. The data included in the questionnaire were collected through direct interviews after each person was provided with obvious details of the questions asked and how to respond to them, as well as the purpose of conducting the research.

### B. Data collection

The data were collected using a questionnaire designed to include three parts. The first part included sociodemographic data (age, sex, job specialization, and place of work), while the second part included questions to assess the information of the study participants about dealing with the COVID-19 pandemic. This information was collected using 6 an item, and all the items were answered with "yes" or "no". The

Variables		Number	Percent
Age (Years)	≥ 25	31	14.98
	26 - 35	107	51.69
	36 - 45	37	17.87
	46 Up	32	15.46
Gender	Males	116	56.04
	Females	91	43.96
Specialist	Doctors	117	56.52
	Nurses	90	43.48
Job Place	Teaching general hospitals (university hospital)	147	71.01
	Private Hospital	11	5.31
	Private clinic	17	8.21
	clinic	32	15.46

Table 1: Statistical distribution of the studied sample according to demographic data

third part of the questionnaire was designed to include the attitudes of healthcare worker participants (including doctors and nurses) towards dealing with COVID-19 patients and treating them and the main reasons for their reluctance to provide health services. The questions of that part were measured using 3 items that were answered "yes" or "no". The attitudes of the study participants were evaluated as positive attitudes or negative attitudes, and the average scores of the questions related to the attitudes were extracted and used as a cut-off. The cut-off of attitude was 1.5 points; attitudes lower than 1.5 points were considered negative, while attitudes higher than 1.5 points were considered positive. Point 0 was assigned to the questions that the study participants answered "no", while point 1 was assigned to the questions that were answered "yes". The scientific content of the questionnaire items was taken from the online literature as well as updated information on the WHO website [9], [10].

### C. Statistical analysis

To manage and analyse the frequencies, percentages and specific graphs, the researchers used the (statistical software package SPSS 25.0/IBM Crop., Armonk, NY). To characterize the median with a specific interquartile range, the researchers used the normality test for ongoing variables. This was when the distribution of the data was not normal, and the Kruskal–Wallis test was used.

## 3. Results

This section deals with analysing the data after they are processed and tabulated; such a presentation is systematically oriented toward assessing the attitudes of doctors and nurses toward the treatment of COVID-19 patients in the Diyala Governorate. Table 1 shows the demographic characteristics of the doctors (n=117) and nurses (n=90) included in the present study. A total of 51.69% of the doctors and nurses were aged 26-35 years, 56.04% were males, and 71.01% were working at teaching general hospitals (university hospitals) (see Figures 1 - 4).

Of the 207 doctors and nurses, approximately two-thirds 173(66.18%) of the participants had dealt with previous epi-

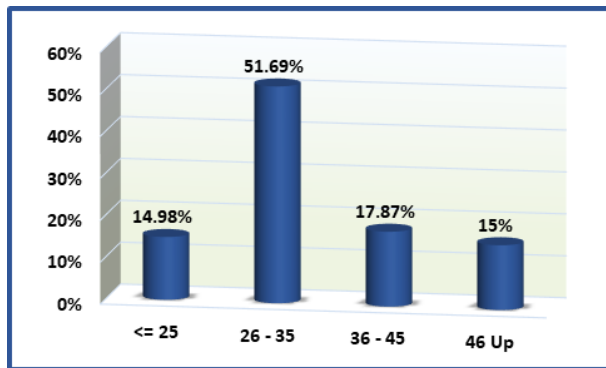


Figure 1: Bar chart of the studied sample according to age group

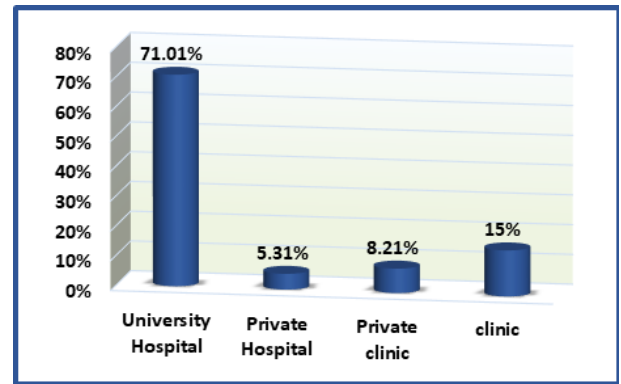


Figure 4: Bar chart of the studied sample according to Job place

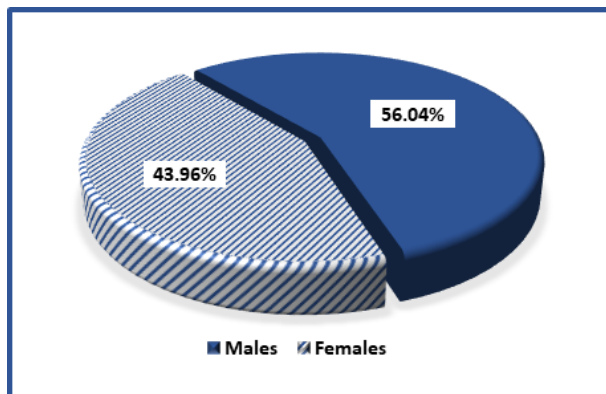


Figure 2: Pie chart of the studied sample according to sex

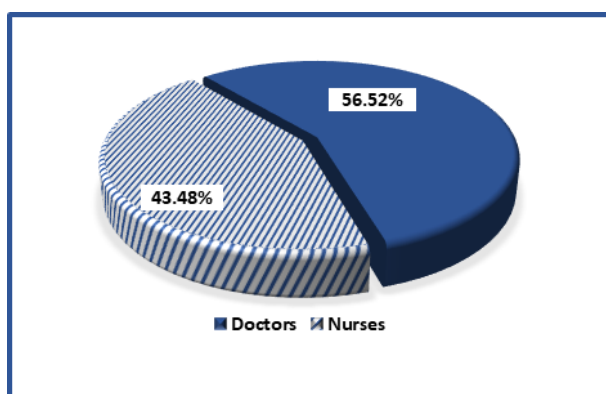


Figure 3: Pie chart of the studied sample according to specialists

demics, and 133 (64.25%) of them had received prior training to address the conditions of the pandemic and therefore had prior knowledge of the conditions of the pandemic. Concerning the provision of protective equipment by the Iraqi Ministry of Health, half 123 (59.42%) of the study participants answered that government hospitals are not equipped with such equipment to provide protection from infection transmission. A total of 122 (58.94%) of them indicated that they had contracted the infection during the treatment of COVID-19 patients and that the most common route of transmission was through contaminated respiratory droplets and surfaces contaminated with the virus 61 (29.47%) and 44 (21.26%), respectively. Real-time PCR confirmed COVID-19 infection in 98 (47.34%) participants, while another 24 (11.59%) confirmed their condition based on symptoms only (Table 2).

A total of 135 (65.22%) of the health workers (doctors and nurses) were positive in favour of COVID-19 patients in terms of their willingness to treat patients and advise them to go to specialized hospitals and stay there. Meanwhile, 72 (34.78%) of the study participants had negative attitudes towards treating COVID-19 patients, either by refusing to receive them in their private clinic or referring them directly to the hospital without treating them. However, the overall score on the Attitude Scale was positive (average score 1.77) for most study participants toward the treatment of COVID-19 patients (Table 3).

Table 4 shows the reasons why doctors and nurses refused to treat COVID-19 patients. Fifty-five (69.44%) of them confirmed that fear of infection transmission to family members, especially elderly people, was one of the reasons for refusal, and 38 (52.78%) of them attributed the lack of personal protective equipment as a second reason. Only 11 (15.27%) of the study participants stated that the lack of personal protective equipment was their only reason for their reluctance to treat patients with COVID-19.

According to the age variable shown in Table 5, most of the participants with a positive attitude were doctors or nurses in the 26-35 years age group, and the difference was

Items	Answers	No	%
1. Have you ever dealt with previous epidemics?	Yes	137	66.18
	No	70	33.82
2. Have you received training on dealing with COVID-19 patients?	Yes	133	64.25
	No	74	35.75
3. Do you suffer from a shortage of protective equipment such as face masks, gloves, and sterilization supplies in hospitals in general?	Yes	123	59.42
	No	84	40.58
4. Have you been infected with SARS-CoV-2 while dealing with COVID-19 patients?	Yes	122	58.94
	No	85	41.06
5. Have you been infected through respiratory droplets or direct contact contaminated surfaces or both?	Uninfected	85	41.06
	respiratory droplets or aerosol	61	29.47
	contaminated surfaces	44	21.26
	Both	17	8.21
6. Have you been confirmed infected with COVID-19 through a swab and diagnosed with Real-Time PCR?	uninfected	85	41.06
	confirm	98	47.34
	Unconfirmed	24	11.59

Table 2: Statistical distribution of the studied sample in terms of training, infection status, and whether they were equipped with protective tools during the COVID-19 period

Attitude Scale Items	Answers	No	%	Mean of Score	Assessment
1. Are you treating the patient and advising him/her to go and stay to the hospitals specialized in treating cases of COVID-19?	Yes	135	65.22	1.65	Positive
	No	72	34.78		
2. Are you referring the patient to designated hospitals for COVID-19 without treating them?	Yes	61	29.47	1.71	Positive
	No	146	70.53		
3. Do you refuse to see and treat the patient and ask him to leave the clinic?	Yes	11	5.31	1.95	Positive
	No	196	94.69		
Overall Attitude Items					
Overall Attitude	Negative	72	34.78	1.77	Positive
	Positive	135	65.22		

Table 3: Statistical distribution and assessment of doctors' and nurses' attitudes according to items on the attitude scale (if the patient had symptoms of coughing and sneezing or a confirmed infection with COVID-19 or who was receiving treatment) and overall items on the attitude scale

Terms	n	%
Q11	Yes	50 69.44
	No	22 30.56
Q12	Yes	49 68.05
	No	23 31.95
Q11\Q12	Yes\Yes	38 52.78
	No\No	11 15.27
	Yes\No	12 16.68
	No\Yes	11 15.27

Table 4: Statistical distribution of doctor and nurse rejection terms according to treatment

statistically significant (P=0.012). With regard to sex, the male participants in the study were distinguished by their positive attitudes toward treating patients with COVID-19. Notably, health care providers, including doctors and nurses, who work in teaching general hospitals (university hospitals), exhibited the most remarkable positive attitudes in terms of providing health and treatment services to people infected with the coronavirus, and these differences were highly significant (P=0.002).

The results presented in Table 6) show that the doctors and nurses included in the present study whose attitudes were positive toward providing care and treatment services to people infected with SARS-CoV-2 were significantly more likely to be infected with the virus (P=0.001). Respiratory droplets and aerosols were the main modes of transmission of the virus while they were examining patients, and it should not be forgotten that 73 confirmed their infection with

a molecular test using real-time PCR.

#### 4. Discussion

The global health impact of the COVID-19 pandemic has extended to the White Army, as described by the media, who are the frontline fighters in the battle against the 21st century virus. The pandemic has claimed the lives of a large number of doctors and nurses [11]. In addition, many of these individuals have experienced deterioration in mental health due to the rapid spread of the virus and facing large numbers of critical and moderate cases that put health care-takers of all kinds in difficult confrontations, trying to reduce the loss of life and the challenges of making decisions for those who are given priority in providing treatment services. According to the British newspaper, all workers in health institutions, including doctors and nurses, have been notified of the need to continue working in hospitals even if they

		Attitudes		Chi-square (df)	P value
		Negative (n=72)	Positive (n=135)		
Age (Years)	≥ 25	5	26	10.99 (3)	0.012*
	26 - 35	37	70		
	36 - 45	20	17		
	46 Up	10	22		
Gender	Males	45	71	1.87 (1)	0.171
	Females	27	64		
Specialist	Doctors	51	66	9.2 (1)	0.002**
	Nurses	21	69		
Job Place	Teaching general hospitals	40	107	14.73 (3)	0.002**
	Private Hospital	4	7		
	Private clinic	9	8		
	clinic	19	13		

Table 5: Relationships between demographic data and overall attitudes according to the chi-square test

		Attitudes		Chi-square (df)	P value
		Negative (n=72)	Positive (n=135)		
Q1	Yes	52	85	1.79 (1)	0.18
	No	20	50		
Q2	Yes	41	92	2.56 (1)	0.109
	No	31	43		
Q3	Yes	49	74	3.41 (1)	0.065
	No	23	61		
Q4	Yes	29	93	15.88 (1)	0.001**
	No	43	42		
Q5	Uninfected	43	42	17.35 (3)	0.001**
	Respiratory droplets or aerosol	12	49		
	Contaminated surfaces	11	33		
	Both	6	11		
Q6	Uninfected	43	42	16.54 (2)	0.001**
	Confirm	25	73		
	Unconfirmed	4	20		

Table 6: Relationships between term and overall attitudes according to the chi-square test

contract COVID-19, and this was confirmed by a Chinese doctor in Beijing to Reuters, who indicated that 80% of cases of infection occurred among health personnel. Many of them had to continue working and providing treatment services to patients, and this is another challenge that doctors and nurses faced during the pandemic. Such a situation exists in most countries worldwide [12].

Iraq is characterized by a modest health situation in terms of providing places to receive critical and medium cases, places for quarantine, and the provision of preventive supplies, in addition to the increasing number of hospital admissions for COVID-19, which puts health workers under great health and psychological pressure. According to the current study, 122 (58.94%) of the study participants (doctors and nurses) tested positive for SARS-CoV-2. Eighty (80.33%) of these patients were diagnosed via RT-PCR, and 24 (19.67%) relied on symptoms only when diagnosing the infection. Under the pressure of the pandemic crisis, most doctors and nurses did not hesitate to provide healthcare services for treating COVID-19 patients. The results of the current study showed this, as 135 (65.22%) of the doctors and nurses expressed positive attitudes toward their willingness to treat COVID-19 patients, which is greater than that shown in previous studies. A study conducted in Bangladesh by Patwary et al. [13], showed that only 92 (32.45%) of the healthcare workers were strongly willing to treat COVID-19 patients,

while 166 (57.63%) had poor attitudes and 33 (16.26%) unwillingness and refusal to treat patients. Another study in Pakistan indicated an astounding reluctance of 174 (83.7%) study participants (physicians) to treat patients infected with SARS-CoV-2 [14].

The spirit of altruism that characterized these doctors and nurses, who showed positive attitudes, emanating from moral, humanitarian, professional and religious aspects above all, broke the barriers of fear they had from the transmission of infection to them while they provided treatment services and health care to patients with COVID-19. The authors of the current article, along with McEachan et al. [15], believe that knowledge has a fundamental role in the formation of protective beliefs through which positive attitudes are reinforced and thus promote positive behaviors of people, especially health workers. While 72 of the participants in the current study were reluctant to treat COVID-19 patients (34.78%), the most important reasons for their reluctance, which could be considered important and somewhat logical, were their fear of transmitting the infection to their family members, especially elderly individuals, and their lack of protective supplies. This finding is in line with the results of another study in which the participants expressed fears similar to what was observed in the present study [14], [16], [17].

With regard to age, the current study revealed that most of



the participants whose attitudes were positive toward treating COVID-19 patients during the pandemic period were aged <20 and >26-35 years, and these two age groups were significantly different ( $P=0.012$ ). This may be because, according to the researchers' observations during the study period, the majority of health workers were young staff, and other studies have shown that most hospital staff are young [18]–[21]. The majority of participants included in the current study were workers in educational public hospitals; therefore, the most positive attitudes were for the health care providers of doctors and nurses ( $P=0.012$ ).

As a result of direct contact between most health workers whose attitudes were positive towards COVID-19 and patients, the current study showed that 93 of them became infected, with a highly significant difference ( $P=0.001$ ) compared to study participants who showed reluctance to provide health services, most of their infections confirmed by RT-PCR technique were acquired through respiratory aerosol or aerosol transmission, with a highly significant differences ( $P=0.001$ ) as well. This was documented by previous studies, which indicated that most infections occur in the workplaces of doctors, nurses, and other health personnel [22]–[26].

## 5. Conclusion

The current study revealed that the willingness of the study participants (doctors and nurses) to carry out their medical duties and commitment to providing health care and treatment for COVID-19 patients was good through their positive attitudes. The transmission of infection to their families and the lack of prevention supplies to avoid infection were the most important reasons for others to refrain from providing medical services to infected patients. There is an urgent need to reduce psychological and physical stress as well as the pressures of facing large numbers of daily infections on health workers through training and continuous education and equipping hospitals with the latest prevention supplies to confront epidemics and pandemics.

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## Abbreviations

WHO: World Health Organization SARS-CoV-2: Severe acute respiratory syndrome corona-virus 2

## Conflict of interest

The authors declare no conflict of interests. All authors read and approved final version of the paper.

## Authors Contribution

All authors contributed equally in this paper.

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