

## Awareness of Health Care Providers Toward COVID 19 Vaccine at Suez Canal University Hospitals

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### Abstract

**Background:** The novel coronavirus disease 2019 (COVID-19) pandemic, caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was declared a "public health emergency of international concern. **Aim:** Is to assess the awareness of health care provider towards COVID 19 vaccine at Suez Canal university hospital. **Research design:** A descriptive design was utilized in the study. **Setting:** The study was conducted in Suez Canal University Hospitals at Ismailia Governorate, **Sampling** A convenient sample composed of composed of (341) all available health care providers (nurses and physicians) **Tools:** two tools were used for data collection **First tool:** Self-administered questionnaire through Google forms were distributed by the researcher through social media and WhatsApp groups, included four parts: **Part I:** Sociodemographic characteristics. **Part II:** History of health care providers regarding COVID 19 vaccine. **Part III:** Knowledge of health care providers regarding COVID 19. **Part IV:** Reported practices of health care providers toward COVID 19 vaccine. **Second tool:** Likert scale adapted from **Zhong et al. (2020)** for assessing attitude of health care providers toward COVID 19 vaccine. **Results:** The main results of study revealed 94% of HCPs had satisfactory level of knowledge while 6% of them had unsatisfactory level of knowledge. 54% of HCPs had healthy reported practices while 46% of them had unhealthy reported practices. Additionally 98% of HCPs had positive attitude while 2% of them had negative attitude toward COVID 19 vaccine. **Conclusions** there was a highly statistically significance correlation between total level of reported practices and total level of knowledge of health care providers HCPs regarding COVID 19 vaccine in which  $p > 0.000$ . Moreover, it shows that there was a statistically significance correlation between total level of attitude and total level of knowledge of HCPs regarding COVID 19 vaccine. **Recommendation:** Further studies should be conducted to raising health care providers awareness through educational program about COVID-19 vaccination as a disease-control method, reducing hesitation toward vaccination

**Keywords:** Awareness, Health Care Providers, COVID 19, Vaccine

### Introduction:

The novel coronavirus disease 2019 (COVID-19) pandemic, caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was declared a "public health emergency of international concern" by WHO on January 30, 2020, and a "global pandemic" on March 11, 2020 (*WHO, 2021*).

Since March 2020, the world has faced a severe threat called COVID-19. According to the WHO, the COVID-19 pandemic is currently the most critical health crisis in the world and the most significant challenge and threat facing the world and humanity. This disease is a public health problem that has claimed the lives of

many men, women, and children worldwide (*Mohammad et al., 2022*).

Until August 6, 2021, over 201 million people worldwide had been diagnosed with the disease, and 4,284,467 had died, as confirmed by the WHO. The sudden increase in the demand for health care led to overload and the collapse of health systems. COVID-19 is an emerging disease with unknown clinical and therapeutic symptoms transmitted through close person-to-person contact (*WHO, 2021 & del Carpio-Toia et al., 2021*).

Healthcare providers are at the highest risk during this pandemic, as they are in direct contact with patients in COVID-19 designated care areas and are at risk of exposure to SARS-

CoV-2. Besides this, these health care providers can be the source of infection to their families, patients, and relatives. Healthcare providers, senior citizens, and people with co-morbidities and chronic illnesses are at greatest risk due to COVID-19 infections and priority group for getting a vaccination against COVID-19 too (Flaxman et al., 2020).

Vaccination is a very effective approach to reduce morbidity and mortality among the population. In public health, vaccination is one of the most important advances to control communicable diseases. Therefore, vaccination appears one of the most promising measures to control the spread of COVID-19 (Detoc et al., 2021).

The development of a new vaccine has been a long process that at least takes 10 to 15 years. Hence, it was clearly a challenge to develop a vaccine against COVID-19 in a very short span. The development of COVID-19 vaccines is a pivotal challenge for scientists (Dara et al., 2021).

Now many vaccines have been approved for their emergency use and many are in phase three trials and some of them were pre-clinical testing. After the clinical development of the COVID-19 vaccine, the next challenge is the distribution and acceptance of the COVID-19 vaccine in health care providers and the general population (Sharma et al., 2020).

The WHO recommends prevention of spread by protecting nurses and patient's close contacts. Primary preventive measures include regular hand washing, social distancing, and respiratory hygiene (covering mouth and nose while coughing or sneezing). Nurses are at the frontline of COVID-19 pandemic defense and are exposed to, not only infection with COVID-19 due to their frequent exposure to infected individuals, but also psychological distress, long working hours, fatigue, occupational stigma and physical violence (World Health Organization, (2), 2020)

The transmission of the disease among health care providers is exaggerated by overcrowding, absence of isolation facilities, contaminated environment and is likely enhanced by insufficient knowledge and awareness of infection control practices among nurses. That inadequate knowledge, practice

and the incorrect attitudes among nurses can directly influence practices and lead to delayed diagnosis, poor infection control practice, and spread of disease. Understanding nurses knowledge, practice and attitudes, and possible perception of risk of infection helps to predict the outcomes of COVID-19 in Egypt (Abdel Wahed et al., 2020).

Community health nurses play an important role in primary health care service operating on the basis of integrated and holistic services. Nurses play a role in giving care in the COVID-19 pandemic. Therefore, in the situation of the COVID-19 pandemic, community health nurses have played challenging roles in managing and providing health care services. Community health nurses are important people in the health system whose roles are responding to patient needs and acting as family caregivers, especially among vulnerable groups (Yodsuban et al., 2022).

#### **Significance of the study:**

Healthcare providers are a major and reliable source of information for vaccines that's why HCWs can act as role models for the general population for getting a vaccination against COVID-19. It is important to consider healthcare providers' acceptability, knowledge, awareness, and attitudes about COVID-19 vaccination. Health care professionals have a pivotal role in maintaining public trust in vaccination. That's why the current study aimed to assess the acceptability, awareness, and attitudes about COVID-19 vaccination and COVID-19-appropriate behavior adapted by health care providers (Shekhar et al., 2021).

COVID-19 considered a pandemic in Egypt as part of an ongoing worldwide COVID-19 pandemic. The Ministry of Health and Population Egypt confirmed that the first case of COVID-19 in Egypt was on February 14, 2020. As of the evening of June 15, there were 46289 confirmed cases of Covid-19 and 1672 deaths in Egypt (Mohamed et al., 2022).

Awareness is defined as the ability to directly know and perceive, to feel, or to be cognizant of events, and seems to be one of the crucial elements in changing behavior. More broadly, awareness is the state of being conscious of something. Another definition

describes it as a state wherein a subject is aware of some information when that information is directly available to bring to bear in the direction of a wide range of behavioral processes (*Shin et al., 2022*).

### **Aim of the study:**

This study aims to assess the awareness of health care providers toward COVID 19 vaccine at Suez Canal university hospital through:

1. Assessing knowledge of health Care Providers about COVID 19 Vaccine.
2. Assessing attitude of health care providers toward COVID 19 Vaccine.
3. Assessing reported practices of health care providers toward COVID 19 Vaccine.

### **Research Questions**

1. Is there a relation between knowledge and attitude of health care providers towards COVID 19 Vaccine?
2. Is there a relation between attitude and reported practice of health care providers towards COVID 19 Vaccine?
3. Is there a correlation between knowledge attitude and reported practice of health care providers towards COVID 19 Vaccine?

### **Subjects and Method**

The subjects and methods used to achieve the previous aim were discussed under the following designs:

#### **I. Technical design:**

The technical design used for the study includes three main categories: research design, setting, sampling of the study as well as tools of the data collection.

#### **Research design:**

A descriptive analytical design was used to conduct this study.

#### **Research setting:**

This study was conducted in Suez Canal University Hospitals at Ismailia Governorate; the university hospitals serve a large segment of the Ismailia, Canal Cities, Sinai and neighbouring governorates.

### **Sampling:**

- **Type:** A convenient sample was used in this study.

- **Size:** the sample composed of three hundred and forty two (342) included all available health care providers (nurses and physicians) dealing with COVID19 patients and participated in the study.

- All available health care workers working at the previously mentioned setting from both sexes

### **Where**

$$n = \left[ \frac{Z_{\alpha/2} * \sigma}{E} \right]^2$$

n= sample size  $Z_{\alpha/2} = 1.96$  (The critical value that divides the central 95% of the Z distribution from the 5% in the tail)  $\sigma = .9$  E = the margin of error (=width of confidence interval)=.1

The sample was 342

### **Tools of data collection:**

Two tools were used for data collection

#### **Tool I:**

Self-administered questionnaire include four parts:

#### **Part I:**

Demographic data for nurses and physicians as (age, gender, level of education, marital status, monthly income, current place of residence and job).

#### **Part II:**

History of nurses and physicians regarding COVID 19 vaccine such as,( previous contact with COVID-19 patients, previous infection with COVID-19, receiving or registering with the Ministry of Health website to receive the COVID-19 vaccine, having family member who has been infected with COVID-19.

#### **Part III:**

Knowledge of nurses and physicians regarding COVID 19 such as (definition of disease, cause of COVID-19, ways of disease transmission, symptoms, complication, preventive measures and treatment.

#### ❖ Scoring system:

Knowledge questions included (12) questions The correct answer was scored one degree and the incorrect answer was scored zero representing 12 degree These scores were summed up and converted into a percent score.

- Score more than or equal 60% referred to satisfactory knowledge.
- Score less than 60% that less than 8 degree referred to unsatisfactory knowledge.

#### Part IV:

Reported practices of health care providers toward COVID 19 vaccine such as (precautions before obtaining COVID 19 vaccine, selection proper type of vaccine, side effects experienced after obtaining vaccine, procedures during dealing with COVID-19 patient).

#### ❖ Scoring system:

Practices questions included (5) questions, each done item was scored one degree and not done was scored zero representing 5 degrees these scores were summed up and converted into a percent score.

- Score more than or equal 60% referred to healthy practices.
- Score less than 60% that less than (3) degrees referred to unhealthy practices.

#### Tool II:

**Likert scale was used for assessing** attitude of health care providers toward Covid 19 vaccine, adapted from *Zhong et al. (2020)* and was modified by the researcher.

#### ❖ Scoring system:

The attitude section was contained (13) items with (26) degree.it was scored by three point scale as agree=2 uncertain=1 and disagree=0. These scores was summed up and converted into a percent score.

- Score more than or equal 60% referred to positive attitude.
- Score less than 60% referred to negative attitude.

#### Content validity:

Was tested by three experts from Community Health Nursing Department, Faculty of Nursing, Ain Shams University to

review the tools for clarity, relevance, understanding and applicability.

#### Reliability:

- Reliability of knowledge: Cronbach's Alpha was .708
- Reliability of practice: Cronbach's Alpha was .650
- Reliability of attitude: Cronbach's Alpha was .657

#### II. Operational design:

It included reviewing current, past, local, and international related literature and theoretical knowledge of various aspects of study, using book articles, internet and magazines to develop tool for data collection and the theoretical part.

#### Pilot Study:

A pilot study was conducted on (5%) of the total sample (15 participants) in order to ensure the clarity, feasibility of the questions and the applicability of the tools and the time needed to complete them.

The results obtained from the pilot study helped in the modification of the study tools where items were corrected, omitted and added as necessary.

#### III. Administrative design:

An official letter was forwarded from the dean of faculty of nursing Ain Shams University to the director of intended study setting. Explanation about the aim of the study was explored, then a written consent was obtained from the study sample.

#### Ethical consideration:

An approval was obtained from scientific research ethical Committee Faculty of Nursing - Ain Shams University then written consent from participants. They were assured that confidentiality and the right to withdraw from the study at any time will be guaranteed.

Oral consent was obtained before inclusion in the study; a clear and simple explanation was given according to their level of understanding. They secured that all the gathered data was confidential and used for research purpose only. The patients were informed that they allowed to choose to participate or not in the study and have the right

to withdraw from the study at any time without any consequences.

The respondent was assured that the data will be treated as strictly confidential; furthermore, the respondent anonymity was maintained as they will not require mentioning their names.

To ensure scientific honesty, the investigator used bucketing and intuiting to avoid bias.

#### **Field Work:**

An oral approval was obtained from health care providers that included in the study. The respondent rights will be protected by ensuring voluntary participation, so the informed consent was obtained by explaining purpose, nature time of conducting the study, potential benefits of the study, how data will be collected, expected outcomes and the respondent rights to withdrawing from research study at any time in case of violation of his rights.

#### **IV. Statistical design:**

Data collected from the studied sample was revised, coded and entered using computer. Data entry and statistical analysis was achieved using the Statistical Package for Social Sciences (SPSS) software version 16. Data was presented using descriptive statistics in the form of frequencies, percentages. Chi-square test ( $\chi^2$ ) was used for comparisons between qualitative variables, and Spearman correlation analysis was used for assessment of the inter-relationships among quantitative variables.

**Level of significance was accepted at P value:**

- Significant difference  $P < 0.05^*$

- Non-significant difference  $p > 0.05$

#### **Study limitation:**

The sample was become 341 because one participant was withdrawn from the study.

#### **Result:**

**Table (1):** shows the demographic characteristics of the health care providers; regarding age it shows that 47.5% of them their age ranged from 25 to 34 years and the mean of age was  $(30.05 \pm 8.5)$ . (85%) of them female, 40.5% of them had bachelor's degree. Regarding marital status it shows that 59.2 % of them were married, (48.4 % and 42.8%) of them their income was 2000-4000 EGP and residence in rural area. In relation to job career, it was found that 55.4% of HCPs were nursing staff.

**Figure (1):** explains that 94% of HCPs had satisfactory knowledge while 6% of them had unsatisfactory knowledge.

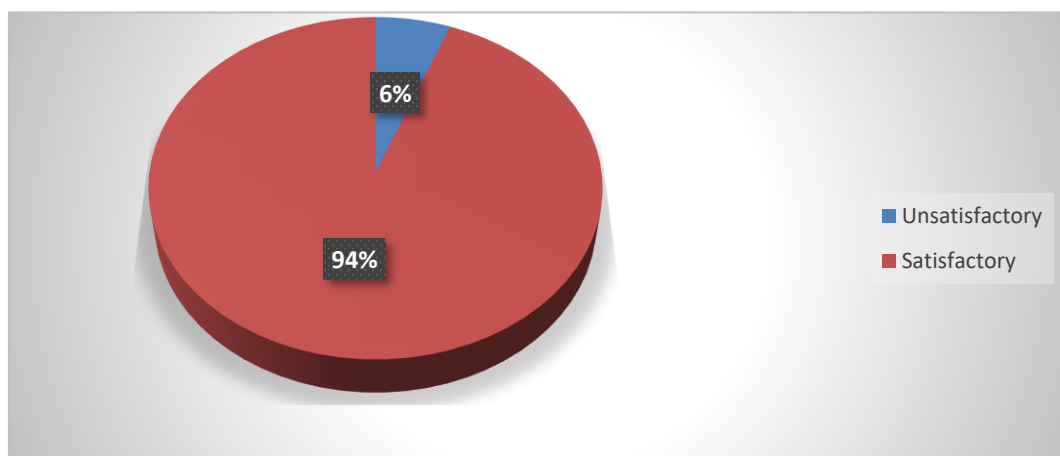
**Figure (2):** shows that 54% of HCPs had healthy practice while 46% of them had unhealthy practice.

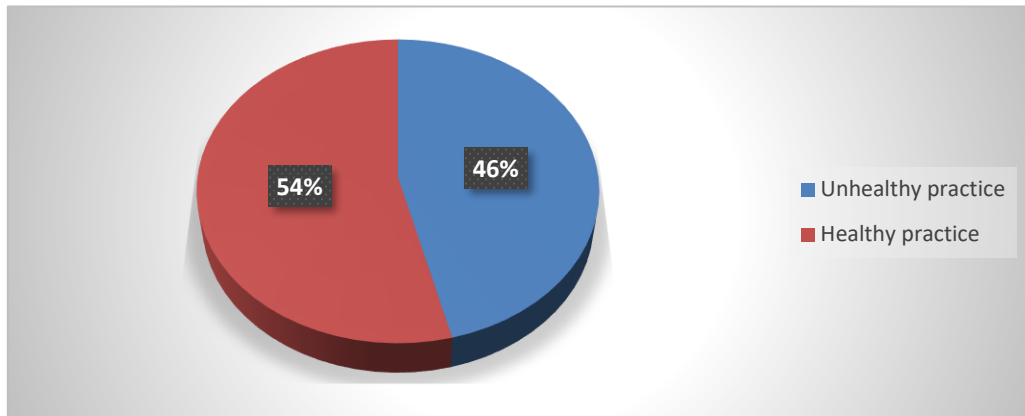
**Figure (3):** explains that 98% of HCPs had positive attitude while 2% of them had negative attitude.

**Table (2):** shows that there was a highly statistically positive significance correlation between total level of practice and total level of knowledge of HCPs regarding COVID 19 vaccine in which  $p > 0.000$ . Moreover, it shows that there was a statistically significance correlation between total level of attitude and total level of knowledge of HCPs regarding COVID 19 vaccine in which  $p > 0.05$

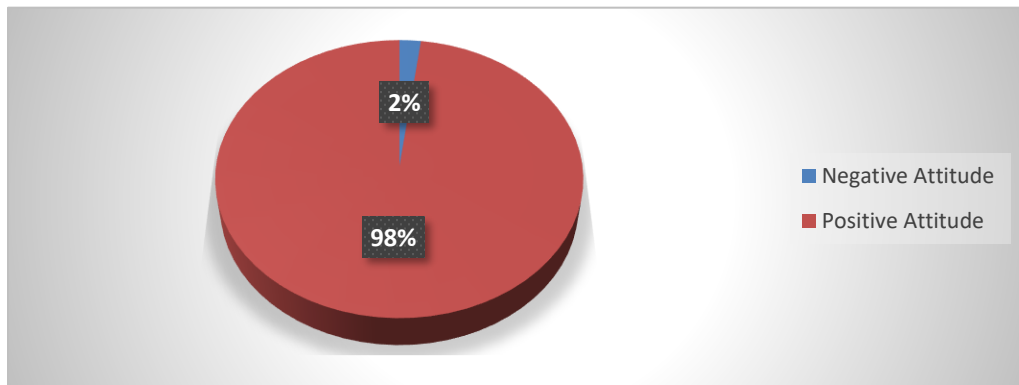
**Table (1):** Frequency Distribution of health care providers regarding Their Demographic Characteristics (N= 341).

Demographic Characteristics	N	%
<b>Age /years</b>		
<25	105	30.8
25-34	162	47.5
34-44	42	12.3
≥45	32	9.4
<b>Mean and SD of age</b>	<b>30.05±8.5</b>	
<b>Gender</b>		
Male	50	14.7
Female	291	85.3
<b>Education</b>		
Diploma	60	17.6
Institution	114	33.4
Bachelor's Degree	138	40.5
Postgraduate Studies	29	8.5
<b>Marital status</b>		
Single	139	40.8
Married	202	59.2
<b>Monthly Income according to WHO</b>		
2000-4000 EGP	165	48.4
4000-6000 EGP	102	29.9
6000- Above EGP	74	21.7
<b>Current Place of Residence</b>		
Urban Area	195	57.2
Village (Rural Area)	146	42.8
<b>Job (Career)</b>		
Nursing specialist	88	25.8
Nursing staff	189	55.4
Physician	50	14.7
Infection control	5	1.5
Technician	7	2.1
Nutritionist and Physiotherapist	2	.6

**Figure (1):** Percentage Distribution of healthcare providers regarding their total knowledge score level about COVID-19 infection. (N= 341).



**Figure (2):** Percentage Distribution of healthcare providers regarding their reported practices total score level before obtaining the Covid-19 vaccine (N= 341).



**Figure (3):** Percentage Distribution of healthcare providers regarding their total attitudes score level toward the COVID-19 vaccine (N= 341).

**Table (2):** Correlation between healthcare providers ‘knowledge, total practice, and total Attitude Related to COVID 19 Vaccine (n=341) related to research question (No3).

Items	Total practice		Total attitude	
	r	P value	r	P value
Total knowledge	.273	0.000	.115	.034

\*\*Correlation is positive significant at the 0.01 level (2-tailed).

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

**Discussion:**

Health care workers (HCWs) are the frontlines in combating COVID-19 infection, which makes them more vulnerable to infection than other parts of the society. Since the discovery of the novel coronavirus infection, thousands of health professionals have been infected and lost their lives because of the disease worldwide. Thus, it is crucial to implement preventive measures including vaccinations against the virus (*Pan-American*

*Health Organization (PAHO)/ World Health Organization (WHO) 2020).*

Regarding demographic characteristics of health care providers, the current study result showed the demographic characteristics of the health care providers; regarding age it shows that less than half of them their age ranged from 25 to 34 years and the mean of age was 30.05±8.5 (**Table 1**).

The present study result was contrasted with *Elhadi et al., (2021)* who applied a study in Libya among 15,087 respondents entitled

" Knowledge, attitude, and acceptance of healthcare workers and the public regarding the COVID-19 vaccine: a cross-sectional study" who found that the studied sample age ranging from 18 to 72 years with a mean (SD) age of  $30.6 \pm 9.8$  years. And found that 71% a highly percentage of the studied sample were married.

As regard to gender, the current study result showed that most of them were female and more than half of them were married (**Table 1**). This finding was contrasted with *Angelo et al., (2021)* who conducted a study in Ethiopia among 405 participants entitled "Health care workers intention to accept COVID-19 vaccine and associated factors in southwestern Ethiopia" and found that 49.6% less than half of the studied sample were female.

As regard to level of education, the current study result showed that less than half of them had bachelor's degree (**Table 1**). This result was in disagreement with *El-Elimat et al., (2021)* who applied a study in Jordan among 3100 participant entitled " Acceptance and attitudes toward COVID-19 vaccines: A cross-sectional study from Jordan" who found 69.9% more than two thirds of the studied subjects had undergraduate level of education. While in agreement with *Adane et al.,(2022)* who applied a study in Ethiopia among 404 study participants entitled "knowledge, attitudes, and perceptions of COVID-19 vaccine and refusal to receive COVID-19 vaccine among healthcare workers in northeastern Ethiopia" and found that 65.6% a highly percentage of the studied sample were had university level of education.

As regard to income, the current study result showed that less than half of them their income was 2000-4000 EGP and more than less than half of them were residence in rural area (**Table 1**). This result was contrasted with *Adane et al., (2022)* who mentioned that 38.5% a highly percentage of the studied participant were from rural area.

In relation to job career, the current study result found that more than half of HCPs were nursing staff (**Table 1**). This finding was in accordance with *Angelo et al., (2021)* who

reported 59.8% a highly percentage of HCPs were nursing staff.

Regarding total knowledge score level of health care providers about COVID-19 infection, the current study result explained that the majority of HCPs had satisfactory knowledge while minority of them had unsatisfactory knowledge (**Figure, 1**).

This result was supported with *Qadah, (2020)* who showed that 88% highly percentage of participants displayed positive knowledge towards COVID-19. Also this result was supported with *Mbachu et al., (2020)* who conducted a study in Nigeria among 402 health care workers entitled "COVID-19 infection: Knowledge, attitude, practices, and impact among healthcare workers in a South-Eastern Nigerian state" and mentioned that 88.5% most of the participants had good knowledge of COVID-19.

Additionally in the same line with *Reuben et al., (2020)* who applied a study in Nigeria among 136 healthcare workers entitled "Knowledge, attitudes and practices towards COVID-19: an epidemiological survey in North-Central Nigeria" and revealed that 99.5% highly percentage of health care workers had sufficient knowledge towards COVID-19.

From the investigator's point of view this result proves the effectiveness of social media and ministry of health to enhance health care providers' knowledge about COVID-19 infection

As regard reported practices total score level before obtaining the Covid-19 vaccine, the current study result showed that more than half of HCPs had healthy practice while less than half of them had unhealthy practice (**Figure, 2**).

This result was in accordance with *Olum et al.,(2020)* who applied a study in Uganda among 136 healthcare workers entitled "Coronavirus disease-2019: knowledge, attitude, and practices of health care workers at Makerere University Teaching Hospitals, Uganda" and showed that 74% highly percentage of the healthcare workers had a good practice towards COVID-19.

Also this result was in accordance with *Saqlain et al.,(2020)* who applied a study in Pakistan among 414 participants entitled "Knowledge, attitude, practice and perceived



barriers among healthcare workers regarding COVID-19: a cross-sectional survey from Pakistan" who found that 88.7% highly percentage of healthcare workers had a good practice regarding COVID-19.

Additionally this result was supported with *Zhang et al., (2020)* who conducted a study in China among 1357 healthcare workers entitled " Knowledge, attitude, and practice regarding COVID-19 among healthcare workers in Henan, China" who showed that 89.7% highly percentage of healthcare workers had a good practice regarding COVID-19.

From the investigator's point of view this result may be due to workload or inadequate supplies or decrease number of HCPs staff.

Regarding to total attitudes score level toward the COVID-19 vaccine, the current study result explained that the majority of HCPs had positive attitude while minority of them had negative attitude (**Figure, 3**).

This result was supported with *Li et al., (2021)* who conducted a study in China entitled "Healthcare workers' (HCWs) attitudes and related factors towards COVID-19 vaccination: A rapid systematic" who found that health care workers' had positive attitude towards future COVID-19 vaccines,

Also this result was matched with *Iguacel et al., (2021)* who conducted a study in Spain among 664 health professionals entitled "Attitudes of healthcare professionals and general population toward vaccines and the intention to be vaccinated against COVID-19 in Spain." found that less than 22.6% one quarters of the subjects showed high levels of negative attitudes toward vaccines. While this result was contrasted with *Adane et al., (2022)* who mentioned that 52.3% more than half of the studied health care had positive attitude toward the COVID-19 vaccine.

According to the investigator point of view this may be due to the studied subject had satisfactory level of knowledge which reflect on level of practice and level of attitude

Concerning correlation between healthcare providers 'knowledge, total practice, and total Attitude related to COVID 19 Vaccine, the current study result showed that

there was a highly statistically positive significance correlation between total level of practice and total level of knowledge of HCPs regarding COVID 19 vaccine in which  $p > 0.000$ . Moreover there was a statistically significance correlation between total level of attitude and total level of knowledge of HCPs regarding COVID 19 vaccine in which  $p > 0.05$  (**Table 2**)

This result was supported with *Saqlain et al., (2020)* who applied a study in Pakistan among 414 participants entitled "Knowledge, attitude, practice and perceived barriers among healthcare workers regarding COVID-19: a cross-sectional survey from Pakistan" and revealed that there was significant positive correlations between knowledge and attitude, knowledge and practice of health care workers regarding COVID 19.

This result was agreed with *Amro et al., (2022)* who studied to assess Knowledge, attitude, and practices concerning COVID-19 preventive measures among healthcare providers in Jordan and noted that there was a statistically significant difference between in attitude, and practice regarding COVID 19 Vaccine

This result was supported with *Ciardi et al., (2021)* who conducted a study in New York among 428 participants entitled "Knowledge, attitudes and perceptions of COVID-19 vaccination among healthcare workers of an inner-city hospital in New York" who revealed that there was A strong correlation was seen between participants' knowledge about COVID-19 and positive attitude towards receiving COVID-19 vaccination ( $r = 0.18, p < 0.001$ ).

### **Conclusion:**

**In the light of the current study findings and answering the research questions, it can be concluded that:**

There was a statistically insignificant relation between total level of attitude and total level of knowledge of HCPs regarding COVID 19 vaccine. While there was a statistically insignificant relation between total level of practice and total level of attitude of HCPs regarding COVID 19

vaccine. Additionally there was a highly statistically significance correlation between total level of practice and total level of knowledge of HCPs regarding COVID 19 vaccine. Moreover, there was a statistically significance correlation between total level of attitude and total level of knowledge of HCPs regarding COVID 19 vaccine.

### Recommendations:

**Based on the current study finding the following recommendations were proposed:**

- Raising health care providers awareness through educational program about COVID-19 vaccination as a disease-control method, reducing hesitation toward vaccination
- Continuous professional development programs for all HCWs in hospitals targeting heightened awareness
- Nurses should follow evidence-based practices and guidelines regarding COVID-19 toward causes, signs & symptoms, vaccination, control, prevention and management and these guidelines should be integrated into the patient's care
- Health care providers should design interventions in terms of awareness campaigns via all types of multimedia to spread more transparent information about the safety and efficacy of the vaccines.

### Further research

- This study results should be repeated with a larger probability sample size in a different geographic location to confirm the findings
- Recommend studies in urban and rural communities to investigate the religious conspiracy about COVID-19 vaccines that may ensure increasing the vaccination rate of COVID-19.

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