

Evaluation of Health Status of Healthcare Providers in Hospitals and Primary Health and Family Healthcare Centers That Belong to Al-Karkh Health Directorate, Baghdad, Post-COVID-19 Vaccination

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Abstract: The coronavirus pandemic of 2019 has increasingly caused illness and economic losses to the world. In December 2019, there were a number of people with unclear causes of pneumonia in Wuhan City, Central China. This pneumonia has been named coronavirus disease 2019 by genome sequencing. To assess the health of hospital staff, primary health care providers, and specialized family health clinics after COVID-19 vaccination. Cross-sectional research was carried out from July 15, 2021, to January 11, 2021. The research area involved two hospitals (Al-Karkh Hospital and Alimamain Al-Kadhmain Teaching Hospital) and primary healthcare and family centers (Abdul-Sahib Dakheel & Al-Shaheed Al-Sadder Primary Healthcare & Family Centers). Fortunately, such centers were chosen. The number of observations is 200. However, just 160 people remain since 25 hadn't been vaccinated, 5 declined to take part, and 10 had utilized the questionnaire to improve it. The age range studied was 20-59 years of age, with pregnant women excluded and unvaccinated health-care professionals. Most people did not have chronic diseases (105, 65.6%) and had a higher level of education (110, 68.8%). Around 55.6% of people develop COVID-19 before being immunized, and 39.4% receive a PCR test diagnosis for the disease. Only 6.8% (11) were admitted into the hospital. The most common problems with the vaccines were: 26 (16.2%) fever, 24 (14.7%) exhaustion, and 23 (14.1%) discomfort at the place they were given. Thirty-one people (19.4%) were immunized and then tested for immunity. 29 (18.1%) had immunity. Of those who are immunized, about 17 people (10.6%) become infected with the virus. 132 people, or 82.5%, wear masks. 155 (96.9%) of them encourage their family members to take the vaccination. Due to their high risk of contracting the coronavirus as well as its sequelae, a large percentage of research participants recommend that healthcare personnel obtain the vaccination themselves and alongside their families.

Keywords: COVID-19, Pfizer, HCP, CDC, WHO, Wuhan.

INTRODUCTION

When genome sequencing of this pneumonia is performed, it is called coronavirus disease 2019 (COVID-19). (Gorbalenya, A. E. *et al.*, 2020)

The mean incubation period for CoV has been estimated to range from 2-14 days, with a mean of 3-7 days. (Lu, H. 2020)

Moreover, it has been documented that COVID-19 is capable of being spread by asymptomatic people during their incubation period. (Yuan, L. *et al.*, 2020; Wang, D. *et al.*, 2020)

In December 2020, Pfizer and Moderna's vaccines with mRNA biotechnology were granted Emergency Use Authorization by the FDA. (Backer, J. A. *et al.*, 2020; Lauer, S. A. *et al.*, 2020)

Furthermore, people infected with COVID-19 who are exhibiting no symptoms have been confirmed to effectively spread the virus during their

incubation phase. (Rothe, C. *et al.*, 2020; Quilty, B. J. *et al.*, 2020)

For both formulations, vaccine effectiveness surpassed 90% starting 14 days after a single dose, although it did not provide protection for more than three to four weeks following immunization. (Yuan, Y. *et al.*, 2017; Zerbini, C. *et al.*, 2020; Du, L. *et al.*, 2009; Baden, L. R. *et al.*, 2021)

Sinopharm has been shown to be highly effective in Bahrain. Moderna has shown the highest vaccination efficacy against infection in the U.S. (McMahon, D. E. *et al.*, 2021; WHO. 2021)

The data showed that the Pfizer COVID-19 vaccine was 95% effective in individuals 16 years and older and had a similar safety profile to existing viral vaccines, when taken as part of a two-dose schedule 21 days apart. (Polack, F. P. *et al.*, 2020; Voysey, M. *et al.*, 2021)

In another randomized controlled trial, those who got two doses of the (mRNA-based, Moderna) vaccine 28 days apart came out with 94.1 percent efficacy against COVID-19 illness, with no safety problems except for temporary local and systemic reactions. The randomized control trial (RCT) at AstraZeneca was comforting, with a safety profile and clinical effectiveness of 64% protection from COVID-19, and 70% protection from symptomatic COVID-19 after one standard dose and two doses. For this reason, it has been approved for emergency use to aid in the prevention of COVID-19 in a few countries around the world, but its use in the United States is still not approved by the FDA (CDC, 2021).

SUBJECTS AND METHODS

This is a cross-sectional study carried out from 15th July 2021 to 1st November 2021 in two hospitals (AlKarkh and AlImamain Al-Kadhmain) and two primary health centers (Abdal-Sahib Dagheel and Al-Shaheed Al-Sadder) in the city of Baghdad. This population consisted of adult (aged 20 – 59) healthcare providers who had been immunised and had agreed to take part in the study. Exclusions for children, pregnant women, non-HCPs, unvaccinated HCPs, and those who have refused to participate.

The cross-sectional study included two hospitals in Baghdad (AlKarkh and AlImamain Al-Kadhmain) and two main health clinics (Abdal-Sahib Dagheel and Al-Shaheed Al-Sadder) from July 15 to

November 1, 2021. Adult healthcare professionals (ages 20–59) who received vaccinations and gave their agreement to participate were included in the target group. Children, non-HCPs, pregnant women, unvaccinated HCPs, and those who refused vaccination were excluded.

The oral consent of all participants was obtained, and approval was granted by the relevant health authorities. The population and study areas were restricted due to security reasons. Data analysis was performed with the use of SPSS version 23, Mean percentage scores, and frequency tables.

RESULTS

Our sample size was 160 participants, and after exclusion, 40 participants from the study. In Table 1 summaries the socio-demographic features of all participants. The age group with the highest participation was at 49 (30.6%), and the lowest age group was between 50 and 59, at 30 (18.8%). Of all participants, 73 (45.6%) were males, and 87 (54.4%) were females. 30 (18.8%) were doctors, 6 (3.8%) were dentists, 26 (16.3%) were pharmacists, 29 (18%) were nurses, 25 (15.6%) were laboratory technicians, 8 (5%) were cleaners, and 36 (22.5%) were from other jobs. The study levels of the respondents were 68.8% from higher educational level, 13.8% secondary level, 4.3% primary school, 2.5% illiterate, and 10.6% from others. 105 (65.6%) were working in hospitals, while 55 (34.4%) worked in PHC centers.

Table 1: Shows Socio-demographic features

	Variables	Numbers	Percent %
Age Group	20-29	49	30.6%
	30-39	48	30%
	40-49	33	20.6%
	50-59	30	18.8%
Total		160	100%
Gender	Male	73	45.6%
	Female	87	54.4%
Total		160	100%
Job	Doctors	30	18.8%
	Dentists	6	3.8%
	Pharmacists	26	16.3%
	Nurses	29	18%
	Laboratories	25	15.6%
	Cleaners	8	5%
	Other jobs	36	22.5%
Total		160	100%
Study level	Higher education level	110	68.8%
	Secondary	22	13.8%
	Primary	7	4.3%

	Illiterate	4	2.5%
	Others	17	10.6%
Total		160	100%
Workplace	Hospital	105	65.6%
	PHC	55	34.4%
Total		160	100%

Table 2: Percentage of chronic diseases - The highest is 105 (65.6%) with no chronic diseases, and the lowest is 2 (1.3%) with heart disease. About 16 (10%) have hypertension, 8 (5%) have

diabetes, 4 (2.5%) have lung disease, other diseases 20 (12.5%) have other diseases. Only 2 (1.3%) of them have hypertension and diabetes, but 3 (1.8%) have hypertension and other diseases.

Table 2: shows chronic diseases.

Chronic diseases	No.	Percentage
Hypertension	16	10%
Diabetes	8	5%
Heart disease	2	1.3%
Lung disease	4	2.5%
Others	20	12.5%
No diseases	105	65.6%
Hypertension and diabetes	2	1.3%
Hypertension and others	3	1.8%
Total	160	100%

Table 3: Demonstrates the answers about coronavirus infection; about 89 (55.6%) get infected with coronavirus, while 71 (44.4%) didn't get the infection. The majority of those infected with the virus, 8 (5%), were diagnosed by the PCR test (63 cases, 39.4%), only 1 (0.6%) did all the tests, while 6 (3.8%) did the PCR test and 6 (3.8%)

did the PCR and the CT test. Only 5 (3%) did a CT scan. Conversely, 11 (6.8%) of them were admitted to the hospital, and 78 (48.8%) were stable and did not require hospitalization. About 76 (47.5%) have the symptoms for more than 3 months, while only 13 (8.1%) have the symptoms for less than 3 months.

Table 3: Shows answers about COVID-19 infection, investigation, period, and admission to the hospital.

	Variables	No.	Percentage%
COVID infection	Yes	89	55.6%
	No	71	44.4%
Total		160	100%
Investigations	Rapid test	8	5%
	PCR	63	39.4%
	CT scan	5	3%
	Rapid and PCR	6	3.8%
	PCR and CT	6	3.8%
	All the tests	1	0.6%
Total		89	55.6%
Hospital admission	Yes	11	6.8%
	No	78	48.8%
Total		89	55.6
Period of infection	More than 3 months	76	47.5%
	Less than 3 months	13	8.1%
Total		89	55.6%

Table 4 shows types of vaccines; the highest percentage was 84 (52.5%) take Pfizer vaccine, 32 (20%) take AstraZeneca, 42 (26.2%) take Sinopharm, and 2 (1.3%) didn't remember the type of vaccine. 12/161 (7.5%) received only one dose of vaccine, and 148/161 (92.5%) received two doses of vaccine.

Table 4: Demonstrates types of vaccines and doses.

	Variables	No.	Percent%
Type of vaccine	Pfizer	84	52.5%
	AstraZeneca	32	20%
	Sinopharm	42	26.2%
	Don't know	2	1.3%
Total		160	100%
Dose	One dose	12	7.5%
	Two doses	148	92.5%
Total		160	100%

Table 5: Shows the complications after vaccination and their duration, the most common complication was fever, fatigue and pain at the site of injection 26 (16.2%), fever fatigue and headache 22 (13.8%) and pain at the site of injection 20 (12.5%) and muscular pain joint pain and pain at site of injection 20 (12.5%), the least complication was diarrhea, dyspnea, muscular pain which was 1 (0.6%). 6 (3.8%) people do not have any symptoms after vaccination. Nearly 78.1% of individuals who were vaccinated are experiencing symptoms for 1-3 days, 13.1% for 4-7 days, and 5% for more than 7 days.

Table 5: shows the complications of vaccination and their duration.

Variables	No.	Percent%
Complications		
Fever	8	5%
Fatigue	9	5.6%
Headache	5	3.1
Diarrhea	1	0.6%
Dyspnea	1	0.6%
Joint pain	2	1.3%
Muscular pain	1	0.6%
Pain at the site of injection	20	12.5%
Fever, fatigue, pain at the site of injection	26	16.2%
Fatigue, pain at the site of injection	13	8.1%
Fever and pain at the site of injection	3	1.9%
Dyspnea, pharyngeal congestion, cough, pain at the site of injection	10	6.3%
Joint pain, muscular pain, pain at the site of injection	20	12.5%
Fever, muscular pain, joint pain	13	8.1%
Fever, fatigue, headache	22	13.8%
No symptoms	6	3.8%
Total	160	100%
Duration of symptoms		
1-3 days	125	78.1%
4-7 days	21	13.1%
More than 7 days	8	5%
Total	154	96.2%

Table 6: Shows those who are tested for immunity after vaccination. Only 31 (19.4%) tested their immunity, while 129 (80.6%) didn't do the test.

Among the people who tested their immunity, 29 (18.1%) were immune, and no one (1.3%) was not immune.

Table 6: shows the immunity results.

	Variables	No.	Percent%
Immunity test	Do the test	31	19.4%

	Didn't do the test	129	80.6%
Total		160	100%
Immunity results	Immunity present	29	18.1%
	No immunity	2	1.3%
Total		31	19.4%

Table 7: Demonstrates those who get infected with COVID-19 after vaccination. At about 17 (10.6%) get infected with the virus, while 143 (89.4%)

were not infected with the virus. 1 (0.6%) of those infected did the rapid test, and 16 (10%) did the PCR test.

Table 7: Shows those who get infected with COVID-19 after vaccination and the tests of diagnosis.

	Variables	No.	Percent%
Infected by COVID after vaccination	Yes	17	10.6%
	No	143	89.4%
Total		160	100%
Test of COVID	Rapid test	1	0.6%
	PCR	16	10%
Total		17	10.6%

Table 8: Demonstrates answers to general questions; the first question was about wearing a mask after taking the vaccine, about 132 (82.5%) wear a mask while 28 (17.5%) do not wearing the mask. The second question was regarding prevention of infection through vaccination. Half (50, 31.3%) believe it is adequate, and 110 (68.7%) don't believe it is sufficient to prevent infection. Question NO. three about advise family

to take vaccine 155 (96.9%) say yes, they advise their families to take the vaccine while 5 (3.1%) don't advise their families to take the vaccine because of different reasons about 2 (1.3%) were afraid of symptoms while 1 (0.6%) say it was not useful as they got the infection after vaccination and 1 (0.6%) said it was obligatory and 1 (0.6%) say it doesn't prevent the infection.

Table 8: Shows answers to general questions like wearing a mask or not, thinking about vaccination is enough to prevent infection, advise families to take the vaccine or not, and finally, if not advise why.

	General questions	No.	Percent%
Wear mask	Yes	132	82.5%
	No	28	17.5%
Total		160	100%
Do you think vaccination is enough to prevent infection	Yes	50	31.3%
	No	110	68.7%
Total		160	100%
Do you advise your family to take the vaccine	Yes	155	96.9%
	No	5	3.1%
Total		160	100%
If you don't advise your family to take the vaccine, then why	It isn't useful	1	0.6%
	Afraid of symptoms	2	1.3%
	It was obligatory	1	0.6%
	Doesn't prevent the infection	1	0.6%
Total		5	3.1%

DISCUSSION

Mortality and economic decline have resulted from the COVID-19 pandemic. While the world waits for effective vaccines to be administered to a large proportion of the population to prevent hospitalisation, severe disease and ideally, to reach the goal of herd immunity to stop the spread of virus, the possibility of outbreaks and disruption of

social and economic life will likely continue until this target is achieved, though virus transmission can be reduced through physical distancing, wearing face coverings, testing and possibly therapeutics. (Voysey, M. et al., 2021)

The study compared the clinical and demographic data gathered from a study in the Czech Republic

with data gathered from healthcare providers (HCPs) in Iraq. Most of the participants (60.6%) were young (20–39 years old), and less HCPs were senior. Samples were larger in the Czech study than this one; in the Czech study, there were 877 individuals, while in this study there were 190 individuals. A larger sample size, with more males (45.6%) and fewer females, was found in the gender distribution than there were in the Czech study, which consisted of 877 individuals. Iraq had more doctors, pharmacists, and laboratory workers compared to the Czech study, while the number of nurses were fewer in Iraq.

The rate of illiteracy was extremely low (2.5%), likely because this was a convenience sample and there were few illiterate people in hospitals and PHC facilities. Generally speaking, there were high levels of education. Most of the participants (65.5%) worked in hospitals, and 34.4% did in PHC facilities. This distribution is in line with the higher proportion of healthcare professionals in hospitals. Not quite so prevalent as diabetes, however, it could be associated with the use of steroids during the treatment of COVID, and should be investigated further. While not very common, the presence of chronic illnesses was similar to the younger age group.

We compared our study with the Czech study and found that 44.4% of the participants had not had an illness before vaccination versus 29.4% in the Czech study, which may be due to the more stringent precautions measures. A third of patients (39.4%) were only tested with a PCR test, 3.8% with PCR and a fast test, and 3.8% with a CT scan; 3% with only a CT scan, and 0.6% with all tests. Among the infected, 8.1% had symptoms for less than three months and 47.5% more than three months. (Riad, A. et al., 2021)

The highest vaccination uptake was among those who took the Pfizer vaccine (52.5%), followed by Sinopharm (26.2%) and AstraZeneca (20%). Almost all (92.5%) participants received two doses, as HCP were aware of the risks associated with the coronavirus. This is similar to the research done in the Czech Republic, which had 93.6% who had two doses. More or less, only 7.5% of citizens took the first dose in fear of side effects after the vaccination, as in the Czech Republic.

Side effects were reported by 96.2% of the subjects, which is significantly more than in the Czech data, though many of this may have been psychological.

Most HCPs wore a mask (82.5%) and strongly recommended family members receive vaccinations (96.9%), and indicated that vaccinations reduce, but don't completely prevent illness. But 3.1% have concerns about the side effects and don't encourage their family to use them. Before telling their family, they wish to take it cautiously and see any negative effects. Some people claimed it was necessary; others claimed that it was of no use (Zhou, W. et al., 2020).

REFERENCES

1. Gorbalenya, A. E., Baker, S. C., Baric, R. S., de Groot, R. J., Drosten, C., Gulyaeva, A. A., & Ziebuhr, J. "Severe acute respiratory syndrome-related coronavirus: The species and its viruses—a statement of the Coronavirus Study Group." *BioRxiv* (2020).
2. Lu, H. "Drug treatment options for the 2019-new coronavirus (2019-nCoV)." *Bioscience trends* 14.1 (2020): 69-71.
3. Xu, X., Chen, P., Wang, J., Feng, J., Zhou, H., Li, X., & Hao, P. "Evolution of the novel coronavirus from the ongoing Wuhan outbreak and modeling of its spike protein for risk of human transmission." *Science China Life Sciences* 63.3 (2020): 457-460.
4. Li, Q., Guan, X., Wu, P., Wang, X., Zhou, L., Tong, Y., & Feng, Z. "Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia." *New England journal of medicine* 382.13 (2020): 1199-1207.
5. Yuan, L., Zhi, N., Yu, C., Ming, G., Yingle, L., Kumar, G. N., & Ke, L. "Aerodynamic characteristics and RNA concentration of SARS-CoV-2 aerosol in Wuhan hospitals during COVID-19 outbreak." *BioRxiv* (2020).
6. Wang, D., Hu, B., Hu, C., Zhu, F., Liu, X., Zhang, J., & Peng, Z. "Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus-infected pneumonia in Wuhan, China." *jama* 323.11 (2020): 1061-1069.
7. Backer, J. A., Klinkenberg, D., & Wallinga, J. "Incubation period of 2019 novel coronavirus (2019-nCoV) infections among travellers from Wuhan, China, 20–28 January 2020." *Eurosurveillance* 25.5 (2020): 2000062.
8. Lauer, S. A., Grantz, K. H., Bi, Q., Jones, F. K., Zheng, Q., Meredith, H. R., & Lessler, J. "The incubation period of coronavirus disease 2019 (COVID-19) from publicly reported confirmed cases: estimation and

- application." *Annals of internal medicine* 172.9 (2020): 577-582.
9. Rothe, C., Schunk, M., Sothmann, P., Bretzel, G., Froeschl, G., Wallrauch, C., & Hoelscher, M. "Transmission of 2019-nCoV infection from an asymptomatic contact in Germany." *New England journal of medicine* 382.10 (2020): 970-971.
 10. Quilty, B. J., Clifford, S., Flasche, S., & Eggo, R. M. "Effectiveness of airport screening at detecting travellers infected with novel coronavirus (2019-nCoV)." *Eurosurveillance* 25.5 (2020): 2000080.
 11. Yuan, Y., Cao, D., Zhang, Y., Ma, J., Qi, J., Wang, Q., & Gao, G. F. "Cryo-EM structures of MERS-CoV and SARS-CoV spike glycoproteins reveal the dynamic receptor binding domains." *Nature communications* 8.1 (2017): 15092.
 12. Zerbini, C., Bailey, R., Swanson, K. A., Roychoudhury, S., Koury, K., Li, P., Kalina, W. V., Cooper, D., Frenck, R. W., Hammitt, L. L., Türeci, Ö., Nell, H., Schaefer, A., Ünal, S., Tresnan, D. B., Mather, S., Dormitzer, P. R., Şahin, U., Jansen, K. U., Gruber, W. C., "C4591001 Clinical Trial Group." *Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine. N Engl J Med.* 383 27 (2020): 2603-2615.
 13. Du, L., He, Y., Zhou, Y., Liu, S., Zheng, B. J., & Jiang, S. "The spike protein of SARS-CoV—a target for vaccine and therapeutic development." *Nature Reviews Microbiology* 7.3 (2009): 226-236
 14. Baden, L. R., El Sahly, H. M., Essink, B., Kotloff, K., Frey, S., Novak, R., & Zaks, T. "Efficacy and safety of the mRNA-1273 SARS-CoV-2 vaccine." *New England journal of medicine* 384.5 (2021): 403-416.
 15. McMahon, D. E., Amerson, E., Rosenbach, M., Lipoff, J. B., Moustafa, D., Tyagi, A., & Freeman, E. E. "Cutaneous reactions reported after Moderna and Pfizer COVID-19 vaccination: a registry-based study of 414 cases." *Journal of the American Academy of Dermatology* 85.1 (2021): 46-55.
 16. WHO "Background document on the inactivated COVID-19 vaccine BIBP developed by China National Biotech Group (CNBG)." (2021).
 17. Polack, F. P., Thomas, S. J., Kitchin, N., Absalon, J., Gurtman, A., Lockhart, S., & Gruber, W. C. "Safety and efficacy of the BNT162b2 mRNA Covid-19 vaccine." *New England journal of medicine* 383.27 (2020): 2603-2615.
 18. Voysey, M., Clemens, S. A. C., Madhi, S. A., Weckx, L. Y., Folegatti, P. M., Aley, P. K., & Bijker, E. "Safety and efficacy of the ChAdOx1 nCoV-19 vaccine (AZD1222) against SARS-CoV-2: an interim analysis of four randomised controlled trials in Brazil, South Africa, and the UK." *The Lancet* 397.10269 (2021): 99-111.
 19. "Centers for Disease Control (CDC) Advisory Committee on Immunization Practices (ACIP)." *Thrombosis with thrombocytopenia syndrome (TTS) following Janssen COVID-19 vaccine* (2021).
 20. Voysey, M., Clemens, S. A. C., Madhi, S. A., Weckx, L. Y., Folegatti, P. M., Aley, P. K., ... & Bijker, E. "Safety and efficacy of the ChAdOx1 nCoV-19 vaccine (AZD1222) against SARS-CoV-2: an interim analysis of four randomised controlled trials in Brazil, South Africa, and the UK." *The Lancet* 397.10269 (2021): 99-111.
 21. "International Monetary Fund: A crisis like no other, an uncertain recovery." (2020).
 22. Riad, A., Pokorná, A., Attia, S., Klugarová, J., Koščík, M., & Klugar, M. "Prevalence of COVID-19 vaccine side effects among healthcare workers in the Czech Republic." *Journal of clinical medicine* 10.7 (2021): 1428.
 23. Zhou, W., Liu, Y., Tian, D., Wang, C., Wang, S., Cheng, J., & Gao, Y. "Potential benefits of precise corticosteroids therapy for severe 2019-nCoV pneumonia." *Signal transduction and targeted therapy* 5.1 (2020): 18.

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