

Original Research Article

Perceptions and Attitudes towards COVID-19 Vaccine among Nurses

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Abstract: Vaccines are critical in the control and prevention of infectious diseases' transmission. The COVID-19 vaccine is a new innovation, for a relatively new virus. Therefore, in rolling it out, the government should bear in mind the Diffusion of Innovation theory, which places people on a spectrum, ranging from those who are open to innovation and those who are more conservative. Just as with the general public, nurses develop confidence at different rates and may be susceptible to misinformation about vaccines. This study aimed at appraising nurses' perceptions and attitudes towards COVID-19 vaccines. We conducted a cross-sectional study in September 2021 at a sub-county hospital in Nyamira County, Kenya. Eligible nurses completed structured self-administered questionnaires anonymously. The Statistical Package for Social Sciences (SPSS), version 22, was used to code, enter, analyse, organize, present and store data from the study. Logistic regression was performed to test if perceptions and attitudes had any association with uptake of Covid-19 vaccine. The results showed that all the perceptions and attitudes were positively associated with uptake of Covid-19 vaccine except vaccine safety and the importance of the vaccine to one's health. The study concluded that there was poor perceptions and negative attitudes towards COVID-19 vaccines which were significant factors for refusal to get vaccinated. It is therefore recommended that the management authorities and stakeholders should promote positive perceptions and attitudes through instituting targeted vaccination campaigns to improve the level of COVID-19 vaccine knowledge among the nurses in particular, and all health care workers in general, in order to achieve a better coverage among them, as well as to influence the patients, clients, their relatives, as well as the general public for ultimate positive vaccine acceptance and uptake.

Keywords: Nurses, COVID-19 vaccine uptake, perceptions and attitudes.

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INTRODUCTION

Vaccination is one of public health's most effective tools for protecting populations from many dangerous diseases, including COVID-19. Vaccines control and prevent the transmission of infectious diseases through working with the body's natural defences to build protection. When someone gets a vaccine, his/her immune system responds by forming antibodies. There are various vaccines to prevent more than 20 life-threatening diseases, helping people of all ages live longer, healthier lives (World Health Organization, 2021).

The COVID-19 vaccine is a new innovation which targets people around the world, and for a

relatively new virus. Thus, in rolling it out, the government should bear in mind the Diffusion of Innovation theory, which places people on a spectrum, ranging from those who are open to innovation and those who are more conservative, bound by tradition and skeptical of change. This means that different people will have different perceptions of the vaccine which will affect if and when they choose, or don't choose, to vaccinate. Therefore, different strategies are needed to appeal to these various groups. These should include: for early adopters of the vaccine, information sheets on the vaccine and where to get it; for late adopters, success stories from those vaccinated early and evidence of the vaccine's effectiveness; for the so-called laggards, fear appeals can be used. There should

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also be pressure on them from people in the early and late adopter groups (Kyobutungi, 2021).

There are four main types of COVID-19 vaccines: whole virus, protein subunit, viral vector and nucleic acid (RNA and DNA). Several COVID-19 vaccines have been validated for use by WHO (given Emergency Use Listing). The WHO Emergency Use Listing (EUL) process determines whether a product can be recommended for use based on all the available data on safety and efficacy and on its suitability. Vaccines are assessed to ensure they meet acceptable standards of quality, safety and efficacy using clinical trial data, manufacturing and quality control processes. As of 12 January 2022, the following vaccines had obtained EUL: *The Pfizer/BioNTech Comirnaty vaccine*, 31 December 2020; *The SII/COVISHIELD and AstraZeneca/AZD1222 vaccines*, 16 February 2021; *The Janssen/Ad26.COV 2.S vaccine developed by Johnson & Johnson*, 12 March 2021; *The Moderna COVID-19 vaccine (mRNA 1273)*, 30 April 2021; *The Sinopharm COVID-19 vaccine*, 7 May 2021; *The Sinovac-CoronaVac vaccine*, 1 June 2021; *The Bharat Biotech BBV152 COVAXIN vaccine*, 3 November 2021; *The Covovax (NVX-CoV2373) vaccine*, 17 December 2021; and *The Nuvaxovid (NVX-CoV2373) vaccine*, 20 December 2021 (World Health Organization, 2022).

Healthcare workers (HCWs), are the first priority population for vaccination against COVID-19 in the context of limited supply. The HCWs, especially nurses, play a critical role in building trust between the public and the immunization program and are generally cited as the most trusted source of information on vaccination. The HCWs must be confident in vaccination as a public health good and be able to transmit this confidence to those who trust them. The concerns, attitudes and intended practices of HCWs influence the social and behavioral drivers of vaccination among the general public (Puertas *et al.*, 2022).

However, just as with the general public, healthcare workers develop confidence at different rates and may be susceptible to misinformation about vaccines. Therefore, since the COVID-19 vaccines have renewed the hope to restore normal life, the perceptions and attitudes of the nurses towards vaccination and its impact on their life should be evaluated. This study, therefore, aims at appraising nurses' perceptions and attitudes towards COVID-19 vaccines.

METHODOLOGY

The study was conducted in a sub county hospital in Kenya. The study population was all the nurses in the study site. The study employed saturated sampling method whereby the entire population of 36 nurses working in the different departments of the hospital were targeted to participate. The inclusion criteria was all the nurses working in the study site during the data collection period and willingness to participate in the study. An institution-based cross-sectional study design was employed. Data collection was achieved using a structured self-administered questionnaire with questions on socio-demographic characteristics, questions related to COVID-19 vaccination, and questions related to perceptions and attitudes towards COVID-19 vaccines. In order to ensure validity and reliability of the questionnaire, it was pre-tested on nurses working in a different sub-county hospital. Following ethical approval by the Medical Superintendent of the Sub County Hospital, data was collected in September 2021. Respondents were informed of the nature and purpose of the study and were allowed to ask questions for clarification. They were informed of their right to withdraw from the study whenever they wished since participation was voluntary. They then signed an informed consent form. Measures to ensure confidentiality and anonymity were implemented by not writing names while filling in the questionnaires. Filled questionnaires were kept in a lockable drawer accessible to only the researchers. Codes were used for numbering. To mitigate infliction of psychological harm on subjects, questions were clearly stated. The Statistical Package for Social Sciences (SPSS), version 22, was used to code, enter, analyse, organize, present and store data from the study. Descriptive statistics such as frequencies, percentages, and means were used to summarize the findings from the study. Data was presented using tables. Research results were reported accurately and honestly and the study findings communicated to all the interested parties. The limitations to this study was that the study; was conducted in a single healthcare facility and thus it constitutes a local experience; was conducted amongst only one cadre of health care workers (nurses) thus cannot be generalized to all health care workers; and that a small population was used which limits generalization of the findings.

RESULTS

Demographic characteristics

Out of a total targeted population of 36 nurses, 31 nurses (86.1%) participated in the study. Majority (71%) were females while 29% were males. The demographic characteristics of the respondents are shown in Table 1 below.

Table 1: Demographic characteristics of the respondents (n=31)

Characteristics	Frequency	Percentage
Gender of the respondents		
Male	9	29
Female	22	71
Age of the respondents		
18-30 years	3	9.7
31-40 years	15	48.4
41-50 years	6	19.3
51-60 years	7	22.6
Level of nursing education		
Certificate	6	19.4
Diploma	17	54.8
Degree	7	22.6
Masters	1	3.2
PhD	0	0
Years of nursing experience		
0-10	5	16.1
11-20	15	48.4
21-30	9	29.0
Above 30	2	6.5

Uptake of COVID-19 vaccine

Out of the 31 respondents, 16 respondents (51.6%) had received the COVID-19 vaccine, while 15 (48.4%) had not. Out of those who received the vaccine, the majority were females (68.75%), while males accounted for 31.25%.

Perception and attitude towards COVID-19 vaccine

A total of ten items were listed in this section to gauge the respondents' perceptions and attitudes towards COVID-19 vaccine using the Likert Scale. The results are shown in Table 2 below.

Table 2: Perception and attitude towards COVID-19 vaccine (n=31)

	Strongly disagree	Disagree	Not sure	Agree	Strongly agree
The vaccine is effective	9.7	9.7	45.2	35.4	0
The vaccine is safe	0	9.7	51.6	25.8	12.9
The vaccine can be trusted	0	9.7	58.1	29.0	3.2
The vaccine is important for my health	6.4	12.9	32.3	29.0	19.4
The vaccine should be compulsory for all the nurses	22.6	32.3	19.4	19.4	6.3
I felt under pressure from my employer to get the vaccine	19.4	48.4	6.4	12.9	12.9
I am concerned about the side effects of the vaccine	0	6.4	0	45.2	48.4
Getting the vaccine is a good way to protect myself from the disease	6.4	6.4	22.6	45.2	19.4
Getting the vaccine is a good way to protect my family members from the disease	6.4	16.2	12.9	38.7	25.8
The roll-out of the vaccine by the government was well organized	29.0	25.9	3.2	35.5	6.4

Regression analysis

Logistic regression was performed to test if the perceptions and attitudes had any association with uptake of COVID-19 vaccine. The results showed that

all the perceptions and attitudes were positively associated with uptake of COVID-19 vaccine except vaccine safety and the importance of the vaccine to one's health. The results are shown in Table 3 below.

Table 3: Logistic regression of perception and attitude towards COVID-19 vaccine against uptake of COVID-19 vaccine

Independent variable	p-value @ 95% CI	Standard error of the Estimate (S.E.)
Vaccine effectiveness	.005	.088
Vaccine safety	.000	.085
Vaccine trustworthiness	.001	.114
Vaccine importance to one's health	.000	.063
Mandatory vaccination	.064	.002
Pressure from the employer	.054	.000
Concern about side effects	.113	.098
Self-protection from COVID-19	.077	.008
Protecting others from COVID-19	.064	.002
Vaccine roll-out	.056	.001

DISCUSSION

With the widespread availability of the COVID-19 vaccines, there is now real hope to end the pandemic. But until it is over, we must stay vigilant and continue to protect our loved ones by wearing masks, physically distancing and washing our hands.

HCWs, especially nurses, play a critical role in building trust between the public and the immunization program and are generally cited as the most trusted source of information on vaccination. Studies by Adejumo *et al.*, (2021) and Nasir *et al.*, (2021) showed that there was good perception and positive attitude towards COVID-19 vaccination by HCWs. Additionally, a systematic review carried out by Hajure *et al.*, (2021) revealed that the respondents in about two-thirds of the studies reviewed had a positive attitude ($\geq 50\%$) toward COVID-19 vaccination. However, many other studies have shown the contrary. Many studies have shown that HCWS are not fully convinced of the effectiveness and safety of these new vaccines, which can result in a delay or refusal to get vaccinated when offered (Adane *et al.*, 2022; Agyekum *et al.*, 2021; Ciardi *et al.*, 2021; Haddaden *et al.*, 2021; Khamis *et al.*, 2021; Manby *et al.*, 2022; Puertas *et al.*, 2022; Verger *et al.*, 2021).

According to a study done by Ciardi *et al.*, (2021), several factors were significantly associated with vaccine attitudes, including demographics such as gender ($p = 0.002$), age ($p = 0.005$), race ($p < 0.001$) and home location ($p < 0.001$), role within the hospital ($p < 0.001$), knowledge about the virus ($p < 0.001$) and confidence in and expectations about personal protective equipment and behaviors ($p < 0.001$).

In this current study, 51.6% of the respondents had received the COVID-19 vaccine, while 48.4% had not. Out of those who received the vaccine, the majority were females (68.75%), while males accounted for 31.25%. According to the results, there were varied perceptions and attitudes towards COVID-19 vaccine. Many other studies have shown similar results. For example, Khamis *et al.*, (2021) found that concerns about the COVID-19 vaccines including unknown health issues, efficacy and safety were stated by the participants. In a study carried out by Fares *et al.*, (2021), 51% of the participants were undecided, 28 % refused, and 21% accepted vaccination. Reasons for vaccine acceptance mainly were risks of COVID-19 (93%), safety (57.5%), and effectiveness (56.25%) of the vaccine. However, the reasons for vaccine hesitancy were the absence of enough clinical trials (92.4%) and fear of side effects of the vaccine (91.4%).

The current study revealed that 51.6% of the respondents were not sure whether the vaccine is safe or not. The regression analysis results showed that concern about side effects had the greatest association with uptake of the vaccine. This is not surprising because it

was reported that Kenyan health workers had doubts about the safety of the vaccines (Merab, 2021). Similar results have been reported in many other studies. For example, Manby *et al.* (2022) found that the respondents were uncertainty about the long-term safety of vaccines and efficacy against mutant strains. A study carried out by Agyekum *et al.* (2021) found that 65.5 % of the respondents were concerned about the safety of vaccines and was identified as the main reason why health care workers would decline uptake of COVID-19 vaccines in Ghana. In a study done by Puertas *et al.*, (2022), the primary construct identified as part of the qualitative analysis was related to doubts regarding vaccine safety (31%). Many respondents pointed to their concerns regarding potential long-term side effects caused by the vaccines as a reason for influencing their opinion and for refusing or delaying the COVID-19 vaccine. Verger *et al.*, (2021) found that hesitancy to receive the COVID-19 vaccine was mostly driven by vaccine safety concerns.

In the current study, vaccine trustworthiness had a p-value of .001. A study carried out by Nasir *et al.*, (2021) revealed very high vaccine trustworthiness as 87.40% of the participants showed trust in the efficacy and safety of the vaccine against COVID-19. Additionally, 20% of the respondents in a study carried out by Puertas *et al.*, (2022) lacked trust in the COVID-19 vaccines.

In the current study, the importance of the COVID-19 vaccine to one's health had no association whatsoever with its uptake, showing that the respondents did not consider the vaccine as important to their health. Other studies have revealed similar view points. For example, a study done by Adane *et al.*, (2022) showed that nearly half (46.9%) of the HCWs felt that vaccines could worsen any pre-existing medical conditions while 39.5% of them thought that vaccines could cause COVID-19 infections. Another study carried out by Puertas *et al.*, (2022) showed that the respondents had a low confidence in vaccine benefits (28%). They were uncertain on the length of the immunity provided by the vaccine, as well as the protection (or lack thereof) against variants of concern. Some respondents in a study carried out by Puertas *et al.*, (2022) argued that a low prevalence of the disease in their country at the time the survey was available rendered the COVID-19 vaccines unnecessary. Others suggested that if a different brand of the COVID-19 vaccines were made available, their intent of getting vaccinated would change toward vaccine acceptance.

In this study, 54.9% of the respondents disagreed that the vaccine should be compulsory for all the nurses. In fact, mandatory vaccination is against human rights and the employer should not pressurize HCWs to be vaccinated. However, a study done by Shaw *et al.*, (2021) recommends that the COVID-19

vaccine should be mandated to ensure that all HCWs are vaccinated.

93.6% of the respondents in the current study were concerned about the vaccine's side effects. According to a study done by Haddaden *et al.*, (2021), the most common reason for refusal was concerns for long-term adverse effects, cited by 59.5% of the respondents. All these results reflect what a study carried out by Agyekum *et al.*, (2021) revealed, that 14.8% of the respondents were concerned about adverse side effects of the vaccines.

Only 22.6% of the respondents strongly agreed that getting the COVID-19 vaccine was a good way to protect themselves as well as their families. In agreement, a study carried out by Puertas *et al.*, (2022) revealed that eighty-eight percent of respondents said they would recommend a COVID-19 vaccine to friends and family as a way of protecting themselves and others from the disease. Zaitoon *et al.* (2021) found that protecting themselves from the disease was a significant predictor of agreeing to receive the COVID-19 vaccine. Additionally, Motta and colleagues found that messages emphasizing the personal health risks and collective health consequences of not vaccinating significantly increased intentions to vaccinate (Motta *et al.*, 2021).

In the current study, there were mixed perceptions and attitudes concerning the roll-out of the vaccine by the government, which contributed to a positive association to uptake. Similar sentiments have been reported in other studies. For example, a study by Manby *et al.* (2022) showed that the HCWs felt that government decisions on vaccine rollout had not been supported by evidence-based science, and this impacted their level of trust and confidence in the programme. Ciardi *et al.* (2021) found that the most predictive factors for COVID-19 vaccination were prior vaccine attitudes and concern with the speed of testing and approval of the vaccines ($p < 0.001$). Multivariate analysis reinforced these, while also identifying perceived personal risk as significant ($p = 0.033$). Additionally, the respondents in a study carried out by Puertas *et al.*, (2022) voiced concerns on issues such as authorities handling of the pandemic and the messaging communicated to the public. This issue was exacerbated when combined with vaccine safety concerns.

With the negative perceptions and attitudes depicted in this study, it is vital that motivation and wide acceptance of COVID-19 vaccines among all healthcare workers, especially nurses, be instituted as they play a very vital role among the general population and contribute in comprehensive strategic planning to fight back against the pandemic in the world and more particularly among countries with restricted resources. Fakonti *et al.*, (2022) maintain that targeted vaccination campaigns are needed to improve nurses' and midwives' level of vaccination knowledge in order to

achieve a better coverage among them, as well as to influence their patients' ultimate positive vaccine decision. According to Fares *et al.*, (2021), the leading factor that could increase vaccination acceptance among the participants was to get sufficient and accurate information about the available vaccines.

CONCLUSION AND RECOMMENDATIONS

This study concluded that there was poor perceptions and negative attitudes towards COVID-19 vaccines which were significant factors for refusal to get vaccinated.

It is therefore recommended that the management authorities and stakeholders should promote positive perceptions and attitudes through instituting targeted vaccination campaigns to improve the level of COVID-19 vaccine knowledge among the nurses in particular, and all HCWs in general, in order to achieve a better coverage among them, as well as to influence the patients, clients, their relatives, as well as the general public for ultimate positive vaccine acceptance and uptake.

REFERENCES

- Adane, M., Ademas, A., & Kloos, H. (2022). Knowledge, attitudes, and perceptions of COVID-19 vaccine and refusal to receive COVID-19 vaccine among healthcare workers in northeastern Ethiopia. *BMC Public Health*, 22(128), 1-14. <https://doi.org/10.1186/s12889-021-12362-8>
- Adejumo, O. A., Ogundele, O. A., Madubuko, C. R., Oluwafemi, R. O., Okoye, O. C., Okonkwo, K. C., Owolade, S. S., Junaid, O. A., Lawal, O. M., Enikuomihin, A. C., Ntaji, M. I., Sokunbi, A., Timothy, A. O., Abolarin, O. S., Ali, E. O., & Ohaju-Obodo, J. O. (2021). Perceptions of the COVID-19 vaccine and willingness to receive vaccination among health workers in Nigeria. *Osong Public Health and Research Perspectives*, 12(4), 236-243. <https://doi.org/10.24171/j.phrp.2021.0023>
- Agyekum, M. W., Afrifa-Anane, G. F., Kyei-Arthur, F., & Addo, B. (2021). Acceptability of COVID-19 vaccination among health care workers in Ghana. *Advances in Public Health*, Article 9998176, 1-8. <https://doi.org/10.1155/2021/9998176>
- Ciardi, F., Menon, V., Jensen, J. L., Shariff, M. A., Pillai, A., Venugopal, U., Kasubhai, M., Dimitrov, V., Kanna, B., & Poole, B. D. (2021). Knowledge, attitudes and perceptions of COVID-19 vaccination among healthcare workers of an inner-city hospital in New York. *Vaccines*, 9(516), 1-16. <https://doi.org/10.3390/vaccines9050516>
- Fakonti, G., Kyprianidou, M., Iordanou, S., Toumbis, G., & Giannakou, K. (2022). General vaccination knowledge influences nurses' and midwives' COVID-19 vaccination intention in

- Cyprus: A nationwide cross-sectional study. *Human Vaccines & Immunotherapeutics*, 1-10. <https://doi.org/10.1080/21645515.2021.2016008>
- Fares, S., Elmnyer, M. M., Mohamed, S. S., & Elsayed, R. (2021). COVID-19 vaccination perception and attitude among healthcare workers in Egypt. *Journal of Primary Care & Community Health*, 12, 1-9. <https://doi.org/10.1177/21501327211013303>
 - Haddaden, M., Aldabain, L., Patel, N., Maharaj, A., Saif, A., Imam, Z., & Haas, C. J. (2021). Health care workers attitudes toward COVID-19 vaccination and the effect on personal and professional life. *Journal of Community Hospital Internal Medicine Perspectives*, 11(5), 585-589. <https://doi.org/10.1080/20009666.2021.1951943>
 - Hajure, M., Tariku, M., Bekele, F., Abdu, Z., Dule, A., Mohammedhussein, M., & Tsegaye, T. (2021). Attitude towards COVID-19 vaccination among healthcare workers: A systematic review. *Infection and Drug Resistance*, 14, 3883-3897. <https://doi.org/10.2147/IDR.S332792>
 - Khamis, F., Badahdah, A., Al Mahyijari, N., Al Lawati, F., Al Noamani, J., Al Salmi, I., & Al Bahrani, M. (2021). Attitudes towards COVID-19 vaccine: A survey of health care workers in Oman. *Journal of Epidemiology and Global Health*, 1-6. <https://doi.org/10.1007/s44197-021-00018-0>
 - Kyobutungi, C. (2021). *Kenya's COVID-19 vaccine rollout has got off to a slow start: The gaps, and how to fix them*. <https://aphrc.org/blogarticle/kenyas-covid-19-vaccine-rollout-has-got-off-to-a-slow-start-the-gaps-and-how-to-fix-them/>
 - Manby, L., Dowrick, A., Karia, A., Maio, L., Buck, C., Singleton, G., Lewis-Jackson, S., Uddin, I., Vanderslott, S., Martin, S., & Vindrola-Padros, C. (2022). Healthcare workers' perceptions and attitudes towards the UK's COVID-19 vaccination programme: A rapid qualitative appraisal. *BMJ Open*, 12, Article e051775, 1-8. <http://dx.doi.org/10.1136/bmjopen-2021-051775>
 - Merab, E. (2021, March 8). Why health workers in Kenya are hesitant to take Covid19 vaccine. *Nairobi News*. <https://nairobi.news.nation.co.ke/why-health-workers-in-kenya-are-hesitant-to-take-covid-19-vaccine/>
 - Motta, M., Sylvester, S., Callaghan, T., & Lunz-Trujillo, K. (2021). Encouraging COVID-19 vaccine uptake through effective health communication. *Frontiers in Political Science*, 3, 1-12. <https://doi.org/10.3389/fpos.2021.630133>
 - Nasir, M., Zaman, M. A., Majumder, T. K., Ahmed, F., Nazneen, R., Omar, E., Perveen, R. A., Farha, N., Zahan, T., Hossain, M. J., Parvin, S., Chowdhury, M. R., & Begum, H. (2021). Perception, preventive practice, and attitude towards vaccine against COVID-19 among health care professionals in Bangladesh. *Infection and Drug Resistance*, 14, 3531-3540. <https://doi.org/10.2147/IDR.S326531>
 - Puertas, E. B., Velandia-Gonzalez, M., Vulcanovic, L., Bayley, L., Broome, K., Ortiz, C., Rise, N., Antelo, M. V., & Rhoda, D. A. (2022). Concerns, attitudes, and intended practices of Caribbean healthcare workers concerning COVID-19 vaccination: A cross-sectional study. *The Lancet Regional Health - Americas*, 9, Article 100193, 1-13. <https://doi.org/10.1016/j.lana.2022.100193>
 - Shaw, J., Hanley, S., Stewart, T., Salmon, D. A., Ortiz, C., Trief, P. M., Reddy, E. A., Morley, C. A., Thomas, S. J., & Anderson, K. B. (2021). Healthcare personnel (HCP) attitudes about Coronavirus Disease 2019 (COVID-19) vaccination after emergency use authorization. *Clinical Infectious Diseases*, 1-8. <https://doi.org/10.1093/cid/ciab731>
 - Verger, P., Scronias, D., Dauby, N., Adedzi, K. A., Gobert, C., Bergeat, M., Gagneur, A., & Dubé, E. (2021). Attitudes of healthcare workers towards COVID-19 vaccination: A survey in France and French-speaking parts of Belgium and Canada. *Euro Surveill.*, 26(3), pii=2002047. <https://doi.org/10.2807/1560-7917.ES.2021.26.3.2002047>
 - World Health Organization. (2021, August 30). *Vaccines and immunization*. https://www.who.int/health-topics/vaccines-and-immunization#tab=tab_1
 - World Health Organization. (2022, January 24). *Coronavirus disease (COVID-19): Vaccines*. [https://www.who.int/news-room/questions-and-answers/item/coronavirus-disease-\(covid-19\)-vaccines?gclid=CjwKCAiAgbiQBhAHEiwAuQ6BkpQ8-ztovPcim961Zib09SV-uoIi2rQbr2cs2iUacNpXCI0Fj9KR0CtGUQAvD_BwE&topicsurvey=v8kj13](https://www.who.int/news-room/questions-and-answers/item/coronavirus-disease-(covid-19)-vaccines?gclid=CjwKCAiAgbiQBhAHEiwAuQ6BkpQ8-ztovPcim961Zib09SV-uoIi2rQbr2cs2iUacNpXCI0Fj9KR0CtGUQAvD_BwE&topicsurvey=v8kj13)
 - Zaitoon, H., Sharkansky, L., Ganaim, L., Chistyakov, I., Srugo, I., & Bamberger, E. (2021). Evaluation of Israeli healthcare workers knowledge and attitudes toward the COVID-19 vaccine. *Public Health Nursing*, 2021, 1-8. <https://doi.org/10.1111/phn.1298>

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