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PERCEPTION, ACCEPTANCE & BARRIERS ASSOCIATED WITH COVID-19 VACCINATION AMONG NURSES IN SAUDI ARABIA

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Abstract

Background: The coronavirus (COVID-19) is a new infectious disease, which has become a pandemic that infected people around the world. The first Covid-19 vaccine has been used was in United Kingdom in the second week of December 2020. Nurses' perception and knowledge toward COVID-19 vaccine plays a major role in combating the pandemic. Nurses are among the frontline of health care delivery, and their perception about COVID-19 vaccination will better address barriers to widespread vaccination acceptance.

Aim: The aim of this study is to assess acceptance and perception and barriers toward COVID-19 vaccine among Nurses at MOH, in the Kingdom of Saudi Arabia.

Method: The study used a cross-sectional design, administered online survey to MOH's nurses. The web-based survey was distributed to a convenience sample of 5,000 nurses to assess nurses' perception and knowledge toward COVID-19 vaccine. The online self-administrative questioner includes demographic variables and 16 items of 5 Likert scale ranges from 1 "strongly disagree" to 5 "strongly agree" to measure the nurses' perception and knowledge.

Results: The average score for perception and barriers for Covid-19 vaccination was 2.19 ± 0.45 and 1.56 ± 0.44 respectively. It was found that Nurse's perception for covid-19 vaccination was negatively correlated with the barrier faced by nurses, $r\ (4841) = -0.40$, $P<0.01$. Multiple variable regression

demonstrated that nurse perception was statistically significant associated with gender (β: 0.153, [95%: 0.108, 0.197]), nationality (β: -0.092, [95%: -0.123, -0.061]), and qualification (β: 0.03, [95%: 0.001, 0.058]) of nurse.

Discussion: The present study's highlights the importance of diverse processes that include education and guidance in increasing immunization rates among nurses in Saudi. Efforts must be made to reduce hesitancy and barriers to take vaccine and increase vaccination confidence.

Conclusion: Health policy makers and officials should focus educational activities to address vaccination safety and efficacy concerns, while further study is needed to evaluate wide immunization coverage following the launch of the COVID-19 vaccine. The study has implication in wider international and local health settings who face vaccination acceptance issue among nurses.

Keywords: Nurses, Acceptance, Barriers, Covid-19 vaccination, Saudi Arabia, Pandemic, Healthcare

INTRODUCTION

Since December 2019, the COVID-19 flare-up has developed around the focal point of Huanan Seafood Market, a neighbourhood wet market, in Wuhan, Hubei Province, China (WHO 2020). The episode had spread quickly before very long, with the quantity of revealed and affirmed cases consistently expanding, bringing about a dispersion extent well surpassing that of extreme intense respiratory condition (SARS) in 2003. Coronavirus was identified by immediate or unusual contact with the discharges of contaminated a bats or beads from tainted individuals (NHC, CHINA 2020). As the infection is spreading to different areas by patients who moved to medical clinics in other locations In like manner, most nations all throughout the globe confronted tainted patients in travelling ports (WHO2020). Internationally, the outbreak of corona virus has been declared as emergency public health disaster that need urgent responses overall the world (WHO 2020). A sum of 307,280 confirmed cases had been recorded by March 22, 2020, 92,378 recovered cases and 13,049 died cases over the entire world (WHO 2020).

As the beginning of 2020 year, in excess of 500,000 Healthcare workers are engaged with the treatment of COVID-19 patients internationally. Coronavirus is recognized by its unambiguous capacity of individual-to-individual transmission (WHO 2020), which was not at first unmistakably perceived. Accordingly, safety for medical care staffs was insufficient, with normal clinical ward related openings and infections (Wang et al. 2020). Preventive measures were mostly concerned with fighting the Covid-19 pandemic around the world. As a result, the Covid-19 vaccination development has received significant attention and funding in order to be accessible as soon as feasible in 2020. In most countries, protecting medical staff and sustaining the health system was essential.

Nurses are the backbone of the healthcare system in order to maintain an effective health care delivery system while combating the epidemic. With being, frontline personnel who are constantly confronted with difficult Covid-19 situations. Understanding nursing staff concerns and attitudes regarding vaccines is critical to increasing knowledge and acceptability. Factors influencing acceptance and perception can be explored to promote understanding and favorable perception.

The coronavirus (COVID-19) is a new infectious disease, which has become a pandemic that infected people around the world (WHO 2020). The first Covid-19 vaccine has been used was in United Kingdom in the second week of December 2020 (WHO2020). Nurses' perception and knowledge toward COVID-19 vaccine plays a major role in combating the pandemic. Nurses are among the frontline of health care delivery, and their perception about COVID-19 vaccination will better address barriers to widespread vaccination acceptance. This paper examines factors affecting nurses' acceptance and perception and barriers toward Covid-19 vaccine in Saudi Arabia.

METHODOLOGY

Study Design: A quantitative descriptive cross-sectional correlational online survey research design was used to explore perception, acceptance and barriers associated with COVID-19 vaccination among Nurses working in MOH hospitals at the Kingdom of Saudi Arabia. Correlational studies were used to show the relationship between two variables.

Settings: The setting of this study was conducted at all Ministry of Health (MOH) hospitals. This setting across the 20 health regions in the Kingdom of Saudi Arabia, the MOH hospitals represent the largest nurses' workforce in the kingdom of Saudi Arabia. Geographically, this included a diverse population from which potential participants of various ages, gender, and socio-demographic and cultural backgrounds could be sampled. Moreover, the MOH hospitals mission states to raise awareness Acceptance COVID-19 vaccination among Nurses.

Population and Sample of the study: The target population for this research includes staff nurses affiliated to MOH Hospitals in the kingdom of Saudi Arabia. In this study, the accessible population comprised all male and female staff nurses. According to the Saudi ministry of health annual statistics, the number of nurses working in MOH was 97,000 nurses (MOH 2019). The total number of the study was 4845 out of 5000 staff nurses estimated by statistical calculation formula. All participants' nurses in the study were required to meet the following criteria: the inclusion was nurses who had worked for one year in MOH hospitals facilities and interested to participate in this research. Nurses who did not meet each of these criteria were excluded from the study.

Sampling Plan / Criteria: Non-probability purposive sampling was used in this study. Non-probability sampling emphasizes on sampling methods where the units are examined based on the researcher's judgment. This sampling meant that only available people could be surveyed (purposive sample). Total population sampling all staff nurses, The total number was 4845 out of 5000 staff nurses estimated by statistical calculation formula.

The sample size calculator is used to determine required sample. By setting the population size at 97,000, a confidence level at 95% and confidence interval with margin of error at 4%. A sample of 597 is required to get answer entire population would have pick that answer. (Survey system, 2021). Research team placed Three month on data collection stage for this study. All participants' nurses in the study were required to meet the following criteria: Inclusion Criteria for staff nurses were (1) male and female; (2) nurses who had worked for one year in MOH Hospitals at the kingdom of Saudi Arabia Exclusion Criteria Nurses who did not meet each of these criteria were excluded from the study the inclusion was nurses who had worked for one year in MOH hospitals facilities and interested to participate in this research.

Instruments: The researchers developed online self-administered survey in English language collecting data. The questionnaire was developed based on literature review and previous studies. To measure perception, acceptance and barriers associated with COVID-19 vaccination among Nurses working in MOH hospitals at the kingdom of Saudi Arabia. The survey questionnaire included three main parts, namely: Demographic data, perception and barriers of getting the vaccine among staff nurses. Attached with the questionnaire was a set of detailed instructions regarding the aim of the study, completion of the survey and informed consent.

Part one includes the Selected Demographic Characteristics of the staff nurses in terms of age, gender, marital status, nationality, qualification & regions.

Part two includes the staff nurses' perception and knowledge. This 16- item where each item is rated on a 5-Likert scale ranges from (1) strongly agree, (2) Agree, (3) Natural, (4) Disagree& (5) strongly agree.

Part three covers the barriers of getting the vaccine among staff nurses. This 8 item close questions.

Ethical considerations: The research was approved by central ethical committee, Institutional Review Board (IRB) (IRB)(Ref.(H-01-R-009) at MOH. The staff nurses who meet the eligibility criteria were invited to participate voluntarily in the study. Regarding ethical issues pertaining to participants' consent to participate, participants received sufficient information regarding the research and had the power to withdraw from the study at any stage, and a written in interface of online survey verifying the purpose of the study. The type of data that would be collected and insurance of anonymity and confidentiality of subject were attached in each questionnaire. Following these is an informed consent that confirms the participants` understanding of the information in interface of online survey; signing the consent was considered as accepting to participate. Participants were informed that participation was voluntary, and they have the right not to answer any question(s). There were no apparent risks or benefits for the participants in this study.

Data collection: IRB obtained from MOH (IRB) (Ref H-01-R-009) and the setting for data collection were determined. Staff nurses were approached through general directorate of nursing at MOH during Covid19. Data collection took three month starts from May 2021 to July 2021. A pilot study was carried out among 50 nurses from MOH hospitals at KSA to assess the applicability and test/retest reliability. Pilot study for the scales was conducted to confirm the clarity of the scales, detect any difficulties that could occur during data collection and the reliability test of the questionnaire was 0.86 cronbachs alpha.

Results: The survey questionnaire targeted 5000 nurses. The survey response rate from the nurse was 96.8%. Most nurses were in their 30s (49.4%), female (89.6%), married (65.8%), non-Saudi (57.1%) and held bachelor's degree (65.4%). Only 4,140 nurse (85.5%) had Covid-19 vaccination while remaining 14.5% nurse did not accept Covid-19 vaccination. The average score for perception and barriers for Covid-19 vaccination was 2.19 ± 0.45 and 1.56 ± 0.44 respectively. Despite of 703 nurses (14.5%) were not vaccinated, only 594 reported barriers as summarized in Table 1.

Table 1: Demographic characteristics of respondents

Demographic	Sub-category	(N :4843) (%)
Age	20-29 years	1513 (31.2)
	30-39 years	2391 (49.4)
	40-49 year	694 (14.3)
	>50 years	245 (5.1)
Gender	Male	505 (10.4)
	Female	4338 (89.6)
Marital status	Single	1471 (30.4)
	Married	3187 (65.8)
	Divorced	136 (2.8)
	widow	49 (1)
Nationality	Saudi	2078 (42.9)
	Non-Saudi	2765 (57.1)
Qualification	Diploma	1517 (31.3)
	Bachelor	3167 (65.4)
	Master	155 (3.2)
	PhD	4 (0.1)
Region	Riyadh	235 (4.9)
	Makkah	238 (4.9)
	Madinah	27 (0.6)
	Jeddah	324 (6.7)
	Aseer	298 (6.2)
	Baha	3 (0.1)
	Bisha	174 (3.6)
	Hafer Albatin	434 (9)

	Hail	344 (7.1)
	Hassa	506 (10.4)
	Eastern Region	500 (10.3)
	Jazan	89 (1.8)
	Jouf	219 (4.5)
	Najran	330 (6.8)
	Northern Border	13 (0.3)
	Qunfudah	59 (1.2)
	Qurayya	15 (0.3)
	Qassem	462 (9.5)
	Tabouk	392 (8.1)
	Taif	181 (3.7)
Accept Covid-19 vaccination	Yes	4140 (85.5%)
	No	703 (14.5%)
Nurse who did not vaccinated and explaining barrier		594 out of 703
Covid-19 perception and barrier	Perception	2.19 ± 0.45
	Barrier	1.56 ± 0.44

We also performed a reliability test that measure the internal consistence of the construct in the body. The reliability measured using Cronbach's alpha above 0.7 is considered good reliability. The perception for Covid-19 vaccination shows good level reliability, $\alpha = 0.86$. The barriers for Covid-19 vaccination shows acceptable level of reliability, $\alpha = 0.85$.

Most nurses strongly disagreed that the covid-19 vaccines are important for their health, inadequate information about the vaccine, unsafe and ineffective. The various nurse perception about covid-19 vaccination, as illustrated in figure 1.

The frequently observed barrier among nurse for covid-19 vaccines were unable to find appointment for covid-19 vaccines, unable to book the covid-19 vaccines due to technical problems, was covid-19 positive in recent 6 months, lack of nearby covid-19 vaccination center and pregnancy (Figure 2).

More than half of the participants (51%) who received the vaccinations advised others to do the same. There are statistically significant differences between obtaining the recommended vaccinations for health professionals and the intention to embrace COVID-19 vaccination. 6.19% nurse who were undecided for covid-19 vaccinations recommended other health professionals for COVID-19 vaccination. Since, we used non-parametric test since our data obtained from survey does not follows normal distribution.

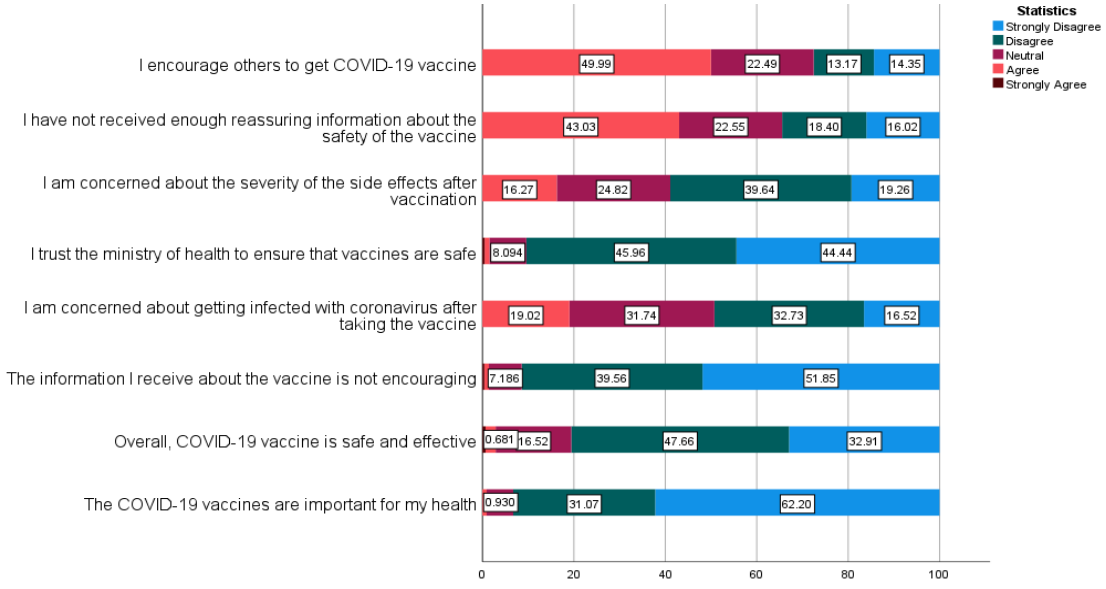

Figure 1: Nurse perception for covid-19 vaccination

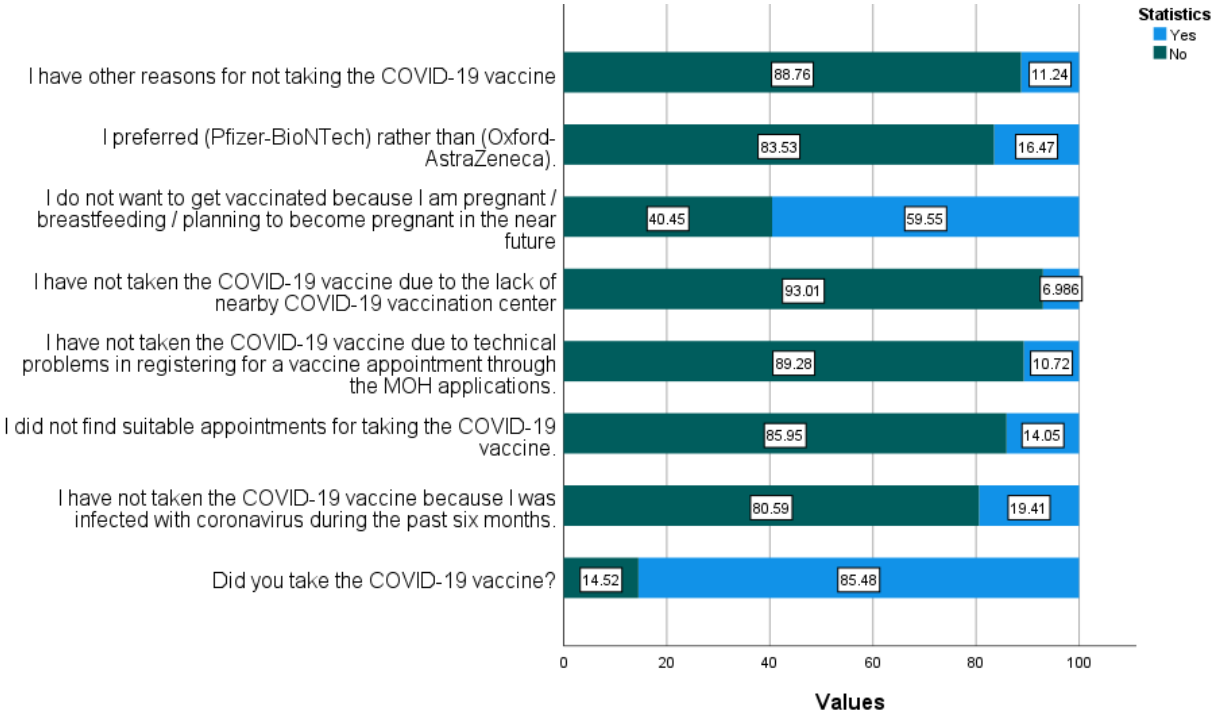

Figure 2: Nurse's acceptance and barrier of covid-19 vaccination

It was found that Nurse's perception for covid-19 vaccination was negatively corelated with the barrier faced by nurses, $r\ (4841) = -0.40$, $P<0.01$ (figure 3)

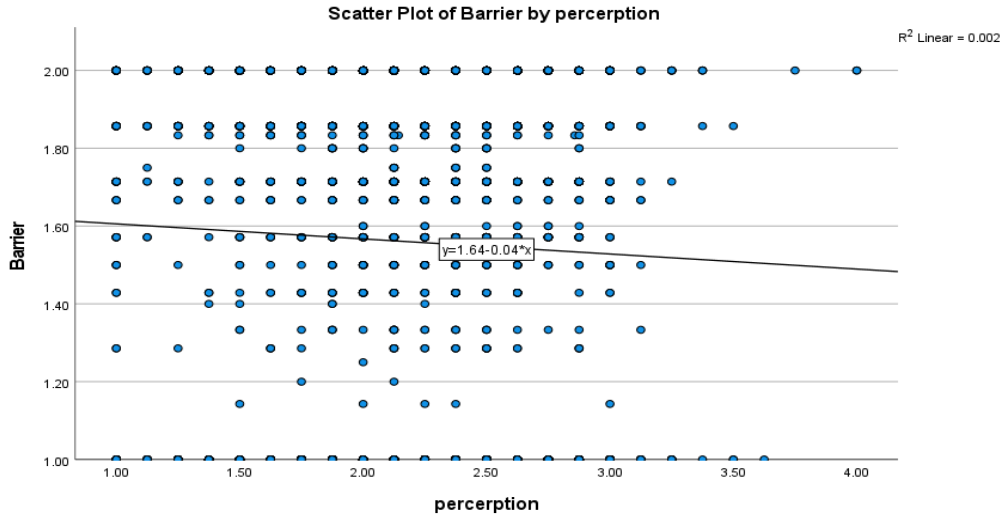

Figure 3: Pearson bivariate correlation between Nurse perception and barriers for Covid-19

Table 2: multiple regression model assessing effects of nurse perception for covid-19 vaccine

Coefficients

Model		B	t	Sig.	95.0% Confidence Interval for B	
					Lower Bound	Upper Bound
1	(Constant)	2.003	35.748	<.001	1.893	2.113
	Age in years	.001	.098	.922	-.017	.019
	Gender	.153	6.700	<.001	.108	.197
	Marital status	-.012	-.918	.359	-.037	.013
	Nationality	-.092	-5.898	<.001	-.123	-.061
	Qualification	.030	2.051	.040	.001	.058
	Region	.001	.976	.329	-.001	.003

a. Dependent Variable: perception

Multiple variable regression demonstrated that nurse perception were statistically significant associated with gender (β: 0.153, [95%: 0.108, 0.197]), nationality (β: -0.092, [95%: -0.123, -0.061]), and qualification (β: 0.03, [95%: 0.001, 0.058]) of nurse (Table 2).

Multiple variable regression demonstrated that nurse's barriers were statistically significant associated with age (β: 0.018, [95%: -0.00, -0.035]), gender (β: 0.086, [95%: -0.13, -0.043]), marital status (β: -0.033, [95%: -0.057, -0.008]), nationality (β: 0.107, [95%: 0.078, 0.137]), and qualification (β: 0.03, [95%: 0.001, 0.058]) of nurse (table 3).

Table 3: multiple regression model assessing effects of perception

Coefficients

Model		B	t	Sig.	95.0% Confidence Interval for B	
					Lower Bound	Upper Bound
1	(Constant)	1.641	30.289	<.001	1.535	1.747
	Age in years	.018	2.012	.044	.000	.035
	Gender	-.086	-3.928	<.001	-.130	-.043
	Marital status	-.033	-2.625	.009	-.057	-.008
	Nationality	.107	7.094	<.001	.078	.137
	Qualification	-.030	-2.150	.032	-.057	-.003
	Region	-.001	-.965	.335	-.003	.001

a. Dependent Variable: barriers

DISCUSSION

To the best of our knowledge, our study is the first to examine the acceptance of the COVID19 vaccine among nurses in Saudi Arabia. We observed that roughly more than half (64%) of respondents intend to accept a COVID19 vaccine; however, around 36% of them were did not want to accept this and can be classified as "hesitant". Independent factors associated with higher acceptance were gender and age. Despite the fact that our survey found that vaccination was widely accepted among nurses, not all of them agreed to get the vaccine. Nurses had a substantially greater acceptance rate than general population in a previous study conducted in Saudi Arabia (64 percent vs. 37%. percent) (Almetwali et al. 2021). Previous studies have found that nurses in Greece, Cyprus and France accept vaccinations between 60 and 90 percent, while nurses in Hong Kong, China accept vaccinations between 40 and 60 percent (Fakonti, et al.2021; Sallam et al. 2022).

However, vaccination hesitancy and resistance were lower (44 percent). Similarly, previous studies indicated healthcare worker hesitancy and reluctance to take vaccine for various reasons (Biswas et al. 2021). We believe they have an attitude toward the vaccination and whatever worries they may have had despite having been immunized. Their knowledge and expertise may give better recommendations for immunization program strategy.

The causes for non-vaccination are numerous and complicated. The primary causes for not obtaining the COVID-19 vaccination were found in this study. Participants in the research questioned whether the information provided for the vaccine was adequate, as well as their concern of adverse effects (31%), the availability of a nearby vaccination site, and their preferences for vaccine types (Pfizer versus AstraZeneca) (38 percent). The vaccine type has raised major concerns among the public due to overlapping information and manufacturing processes, as well as the scheduling of manufacture of numerous vaccine types at the same time. The rejection is often seen as a "pandemic public health conundrum" owing to the limited acceptance and adoption of a safe vaccination for such a high-risk disease (Wang et al.2020). However, the success of vaccination in disease prevention is contingent on the vaccine's high uptake or coverage rate. This may also have an impact on vaccination uptake and future vaccination compliance in persons who work professionally with vaccine-hesitant nurses (Newland et al. 2021). Previous research has found that social media fuels hesitancy, conspiracy theories, and fake news (Puri et al. 2020).

Concerns about the vaccine's protection or side effects have been cited as the primary reason for hesitancy, and previous research on the attractiveness of vaccination in opposition to rising severe infectious illnesses such as H1N1 had also emphasized that uncertainty about the brand-new vaccine, particularly its protection, can reduce self-assurance with the vaccine (Li et al. 2021). These findings were comparable to our study. The most prevalent reasons for vaccination hesitancy or resistance among nurses are concerns about adverse effects and a lack of adequate information.

In terms of socio-demographic determinants, this study found that , more females, individuals with higher age and married are likely to accept COVID-19 vaccination compared with those who had no intention to accept vaccination. Similar findings indicated in previous studies that confirm the age and social status as main determinants of covid- vaccine acceptability (Malik et al 2020).

Interestingly, nurses were more likely than those in other private health sectors to receive COVID-19 immunization. This might also be explained by the fact that there is increased pressure to follow standards in all government MOH public hospital and primary care settings, but other private health sectors are still making slow progress on mechanisms to enforce vaccination requirements Similarly, our findings coincided with earlier research on the determinants of vaccination acceptability in Saudi Arabia, which found that 68 percent of government employees were willing to receive the vaccine (Al-Mohaithef, & Padhi, 2020). However, further research is required to clarify these assumptions.

Clinicians have been identified as a key source of vaccination information in several studies. Vaccinated healthcare workers were more likely to suggest vaccinations to friends, family, and patients, and communication among physicians might increase adherence to vaccination recommendations (Malik et al 2020). As a result, it is important to assess healthcare professionals' vaccine acceptability and the variables that influence it, as well as to inspire non-healthcare employees to actively respond to vaccination via them.

The present study's findings point to the importance of diverse processes that include education and guidance in increasing immunization rates among nurses in Saudi. This study findings point to the importance of increased nurse compliance to obtain adequate COVID-19 immunization insurance and establish herd immunity. Efforts must be made to reduce hesitancy and barriers to take vaccine and increase vaccination confidence (Qattan et al. 2021). As a result, nurses must understand the benefits of vaccination as well as the fitness implications of illness for themselves, their patients, and their own family members.

According to research, several variables impact vaccination perception, which may include political, social, or contextual aspects, while its appraisal is done on the basis of multiple individual and societal factors. Furthermore, these are founded on an individual's views, ideas, judgments, experiences, and attitudes regarding the covid infectious illness. However, research has assisted in highlighting several characteristics that explain vaccine perception and the impact it has on controllability, voluntary exposure, or awareness level (Verger et al. 2021). As a result, vaccination perception is people's assessment of the features and danger of the covid -19 vaccine, while also raising severe concerns about how it will be prevented. Therefore, in future research, all of the elements that reduce anxiety and enhance vaccination positive perceptions must be studied and addressed in depth.

CONCLUSION

This is the first research study to look at the acceptability, perceptions, and obstacles of COVID-19 immunization among nurses in Saudi Arabia. The study found that about more than half (64%) of responding nurses intend to take a COVID19 vaccination, indicating a higher acceptance rate among nurses; nevertheless, around 36% of them did not want to accept this and may be categorized as "hesitant." Gender, marital status and age were independent variables linked with increased acceptability. Our results suggest that nurses did not intend to get vaccinated against COVID-19 owing to worries about rapid development and associated adverse effects.

Public health authorities and policymakers in Saudi Arabia must adopt vaccination promotion techniques to address the limits of COVID-19 vaccine hesitancy. Due to insufficient layers of vaccine reputation, quick efforts to increase vaccination insurance are required. The nurses' workplaces

increase the danger of contamination to them, their families, and the community. Saudi health officials should focus educational activities to address vaccination safety and efficacy concerns, while further study is needed to evaluate wide immunization coverage following the launch of the COVID-19 vaccine. The study has implication in wider international and local health settings who face vaccination acceptance issue among nurses.

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The authors have declared no conflict of interests.

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