

Covid- 19 Vaccine Side Effects and Its Associated Factors among Health Care Workers

Omnia Saleh A Abualnaja¹, Fatmah Salman Alharbi², Mohammed Abdullah Alnajjar³, Muna Fayez Mukhtar⁴, Abdulaziz Omar Sairafi⁵, Emtsal Mohammad Doom⁶, Yasser Shammash Saleh⁷, Tahani Abdullah Melebari⁸, Faisal Khalid Alghamdi⁹, Roba Salem Almeahmadi¹⁰, Moneerah Ibrahim Alqarni¹¹, Faisal Gamaan Alzahrani¹², Yousef Mansi Alqarni¹³, Khulood Abdulaziz O Hawsawi¹⁴, Najwa Ghali A Alsubhi¹⁵

¹Family medicine consultant, Alhesenia primary health care center, Saudi Arabia.

²Family medicine Consultant, Al Taneem PHCC, Saudi Arabia.

³Dentist, King Abdulaziz hospital, Saudi Arabia.

⁴Dentist, North PHC Aljouf, Saudi Arabia.

⁵Resident Dentist, King Abdulaziz Hospital, Saudi Arabia.

⁶Specialist, Alnoor specialist hospital, Diabetes Center, Saudi Arabia.

⁷Nursing Technician, King Abdullaziz Hospital, Saudi Arabia.

⁸Lab Specialist, Aldheifa Primary Health Care, Saudi Arabia.

⁹Pharmacist Technician, Aljumom health sector Ministry of Health, Makkah, Saudi Arabia

¹⁰Specialist nurse, King abdulaziz hospital, Saudi Arabia.

¹¹Family medicine consultant, Alhindawyah primary health care center, Saudi Arabia.

¹²Technician, King Abdulaziz Hospital, Dental center, Saudi Arabia.

¹³Dental hygiene specialist, King Abdulaziz Hospital, Dental center, Saudi Arabia.

¹⁴Health services management specialist, support management, Directorate of Health Affairs in Makkah Al-Mukarramah, Saudi Arabia.

¹⁵General physician in University Medical Center, Umm Al Qura University Makkah Al Mukarramah, Saudi Arabia.

Abstract:

The global vaccination drive against the deadly viral disease has provided a sliver of hope for a return to normalcy. Factors associated with vaccine side effects are needed to be considered among health care workers. Aim: assess the prevalence and associated factors of the first dose covid-19 vaccine in Saudi Arabia among health care workers at king Abdel Aziz hospital, health centers (Alhagla, Alawaly, Alazizia) Makka in 2021. Design: descriptive cross sectional. Population: 200 health care workers at the above mentioned setting. One tool was used for data collection. Results: highest percentage of participant HCW were aged from 30-50 years, married, nurses, with more than 10 years of experience, no previous covid infection, hesitated to receive the first dose of vaccine because of its side effects, reported a safe perception regarding the vaccine. The most of them reported side effects in a form of headache, fever, myalgia, injection site pain and nausea. In relation to the incidence if side effects, differences were found in relation to age, marital status, profession and exposure to covid 19 patients. Ongoing education to HCW is recommended to follow the vaccination program and encourage others to receive the vaccine.

Key words: Covid- 19, vaccine, side effects, associated factors, health care workers

Introduction:

Coronavirus is a pandemic started at Wuhan city in China and spread all over the world (Shi et al., 2020& Abuya et al., 2020). The first spotted case was suffering from pneumonia of unidentified cause. Since the pathogen identified was termed as novel corona virus (COVID-19) (Saqlain et al., 2020). Corona virus has a droplet mode of transmission from a person to another with 4-14 days incubation period. World Health Organization (WHO) reported that older adults and people with chronic diseases as; cardiovascular diseases and diabetes are more probable to attain infection and deteriorate more rapidly (Saqlain et al., 2020). Until now, there is no definite treatment or proved vaccination against COVID-19. Strong preventive and control measures are the primary intervention to minimize the spread of the disease in the community (Li, J. Y., et al., 2020).

The global vaccination drive against the deadly viral disease has provided a sliver of hope for a return to normalcy, and since early 2021, more than 7.5 billion vaccine doses have been administered worldwide. The World Health Organization (WHO) approved several vaccines for use, and many are under trial. Messenger RNA (mRNA) vaccines such as Pfizer-BioNTech (BNT162b2) and Moderna (mRNA-1273), inactivated vaccines such as Sinopharm and Sinovac, and Adenovirus vector-based vaccines such as Sputnik V (Gamaleya) and AstraZeneca (AZD1222 Vaxzevria) are among those that the WHO has finalized and readily available across the world via the COVAX vaccine-distribution program (Shrivastava & Shrivastava., 2022; Mazonakis et al., 2022).

Vaccinations are a powerful choice to stop disease outbreaks, including covid-19. The ideal vaccine should be effective and well-tolerated. In practice, vaccine side effects such as fever, muscle ache, and injection site pain are common but generally mild. However, sometimes adverse reactions including anaphylaxis, shock, seizure, active infection, and death will occur (Karlsson et al., 2021).

Health care workers are in a double stress as they are the most likely group to acquire the infection. In addition, they are obligated to receive the vaccine. Since covid-19 vaccines are as yet in progress, data on their safety is limited. As a result, people including health care workers hesitate to take the vaccine when there is a lack of knowledge and experience about the safety of a new vaccine. However, any attainable risks which will exist are significantly under those related to covid-19 infection and immensely outweighed by the advantages of protecting individuals and preventing the virus from spreading (Riad et al., 2021).

Different studies show various side effects reported from different individuals: lymphadenopathy, Injection site pain, fatigue, headache, muscle pain, chills, fever, joint pain, nausea. Covid-19 vaccine hesitancy is a growing public health challenge fueled by misinformation or lack of information. Although, identifying the possible side effects of covid-19 will help not only in the management of adverse outcomes and side effects, but it is also very important in the enhancement of covid-19 vaccination, minimizing hesitancy related to vaccine side effects and overall covid-19-related morbidity and mortality reduction, there is no relevant data on side effects of the covid-19 vaccine in Saudi Arabia. Investigating for other factors that may play a role in the incidence and severity of vaccine side effects is very important in order to target the high risk groups and preventing severe life threatening side effects (El-Shitany et al., 2021; Riad et al., 2021). So this study aimed to assess the

prevalence and associated factors of the first dose covid-19 vaccine in Saudi Arabia among comprehensive and specialized referral hospital vaccinated health care workers in 2021

Aim of the study:

to assess the prevalence and associated factors of the first dose covid-19 vaccine in Saudi Arabia among health care workers at king Abdel Aziz hospital, health centers (Alhagla, Alawaly, Alazizia) Makka in 2021.

Materials and Methods:

Design:

Descriptive, cross-sectional study was conducted.

Setting:

The study was carried out at king Abdel Aziz hospital and health centers (Alhagla, Alawaly, Alazizia), Makka in 2021

Population:

A convenience sample of all health care workers who received the first dose of covid 19 vaccination in the above mentioned setting were involved in the study (200 health care workers)

Tools:

The data were collected by a self-administered questionnaire using a structured questionnaire prepared to address all the important variables. The questionnaire was adopted from different literature developed for similar purposes (Kadali et al., 2021; Riad et al., 2021).

This tool was consisted of two parts: part I: biosociodemographic data: it included data about age, sex, marital status, religious, profession, work experience, previous exposure to covid 19 infection, exposure to covid 19 patients, presence of chronic disease, any medication used.

Part II concerning questions regarding side effects of covid 19 vaccine, causes of hesitancy and perception of vaccine safety.

Method:

Administrative approval to conduct the study was obtained. Tool was developed and translated into Arabic language to be suitable for all health care workers. Tool validity and reliability was tested. After explanation of the study aim, data was collected through self-administered questionnaire. Tool was take from 15-20 min to be answered.

Ethical Considerations:

Ethical approval was taken from the Ethical committee of King Abdel Aziz hospital. After explaining the purpose of the study, written informed consent was obtained from participants before the data collection. They were informed that participating in the study is voluntary and the right to withdraw from the study at any time during the interview was

assured. The privacy of the participants and the confidentiality of the information they provided were secured at all levels anonymously.

Statistical analysis:

Data were cross-checked, coded, and entered into SPSS version 20. Cronbach's alpha was used to assess the consistency or reliability of questionnaires to measure the side effects of the covid vaccine. Descriptive statistics such as frequency, percentage, and mean with standard deviation were computed. We used χ^2 and Student's t-tests to compare the study characteristics of individuals with the development of vaccine side-effect. Bivariable and multivariable binary logistic regression models were used to assess the significant association between independent variables and outcome variables. All independent variables having a p-value less than 0.2 were included in the multivariable binary logistic regression model. Finally, variables with a P-value less than 0.05 in multivariable binary logistic regression will be taken as statistically significant and the adjusted odds ratio with its 95% confidence interval will be considered to see the strength and direction of the association.

Results:

Table I: frequency distribution of the study sample sociodemographic characteristics:

This table shows that approximately half of participants (46%) were aged from 30-50 years followed by about one third (35%) was more than 50 years. The highest proportion of them were married (43%), divorced (22%) and single (21%). Regarding profession, about one third of participants were nurses (33%), followed by physicians (19%), laboratory (19%), and pharmacist (15%). Two thirds of them had more than 10 years of experience (62%), majority had no previous covid (82%), but exposed to covid patients (58%). More than two thirds of them (68%) were hesitated to take the first dose of vaccination due to its side effects (88%). In relation to perception of vaccine safety, (60%) of participants reported that is safe while (32%) don't know.

	N	%
Age		
<30	38	19
30-50	92	46
>50	70	35
Marital status		
Married	86	43
Single	42	21
Divorced	44	22
Widowed	28	14
Profession		
Physicians	38	19
Nurses	66	33
Midwives	20	10
Laboratory	38	19
Pharmacy	30	15

Others	8	4
Work experiences		
<10	76	38
>10	124	62
Ever Covid-19 infection		
No	164	82
Yes	36	18
Exposure for Covid-19 patients		
No	84	42
Yes	116	58
Hesitation to take the first dose		
No	64	32
Yes	136	68
Reasons for hesitation		
Side effect	176	88
Distrust effectiveness	12	6
Fear of getting Covid-19	6	3
Presence of chronic disease	6	3
Perception of vaccine safety		
Safe	120	60
Do not know	64	32
Unsafe	16	8

Table II: frequency distribution of the reported vaccine side effects:

This table represented the most reported vaccine side effects are headache (52%), fever (46%), nausea (38%), insomnia (34%), myalgia (33%), and feeling of un-wellness (22%).

Vaccine Side Effect	N	%
Fever	92	46
Headaches	104	52
Chills	52	26
Myalgia	66	33
Injected site pain	54	27
Sore throat	18	9
Abdominal pain	10	5
Leg swelling	22	11
Nausea	76	38
Vomiting	58	29
Fatigue	54	27
Insomnia	68	34
Lymphadenopathy	10	5
Shortness of breath	32	16

Feeling of un-wellness	42	21
Halitosis	4	2
Ulcer	10	5
Angular cheilitis	8	4
Skin rash	12	6
Overall At least one Side effect	126	63

Figure I: represents that 63% of participants experiences vaccine side effects.

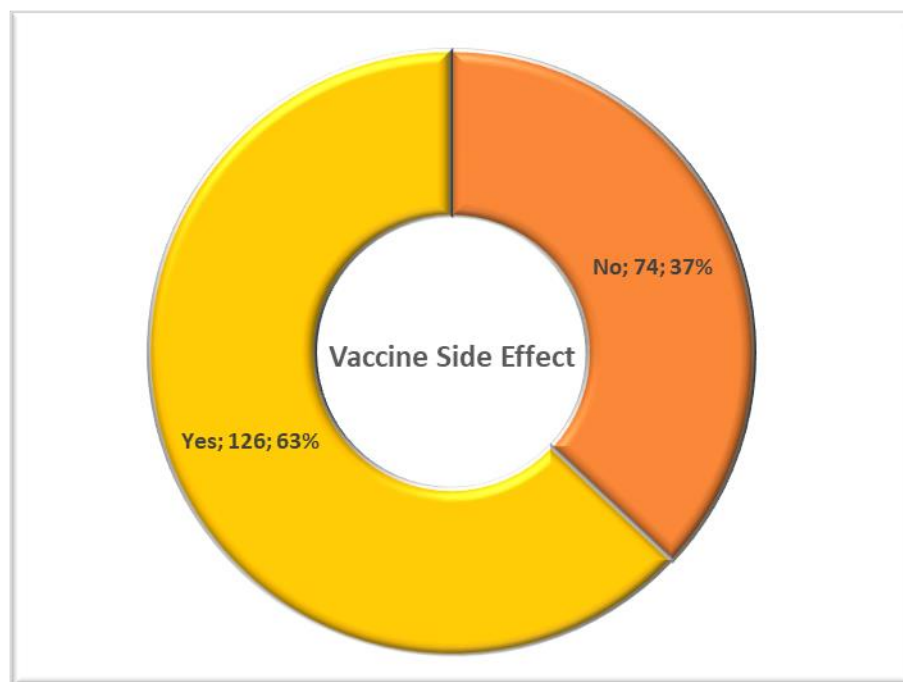


Table III: Frequency distribution of the participants' medical condition:

This table showed that minority of participants had chronic diseases as cardiac diseases (20%), DM (19%), cancer (17%) and kidney diseases (12%). Regarding medication used, most used medications were thyroid medications (16%) and analgesics (10%). One third of them have at least one medical condition and one fifth use at least one medication.

	N	%
Medical Condition		
Allergy	12	6
Asthma	10	5
Hypertension	16	8
Diabetes mellitus	38	19
Liver disease	22	11
Cardiac disease	40	20
Cancer	34	17
Pulmonary disease	6	3
Kidney disease	24	12

Neuro-psychiatric	30	15
Hematologic disease	12	6
At least one medical condition	58	29
Medication-Taking Status of the Participants		
Anti-asthmatic	12	6
Antibiotics	8	4
Antiepileptic	14	7
Cardiac medication	6	3
Anti-hypertension	12	6
Hypoglycemic agent	4	2
Steroid drug	6	3
Thyroid disease medication	32	16
Analgesics	20	10
At least one medication use	40	20

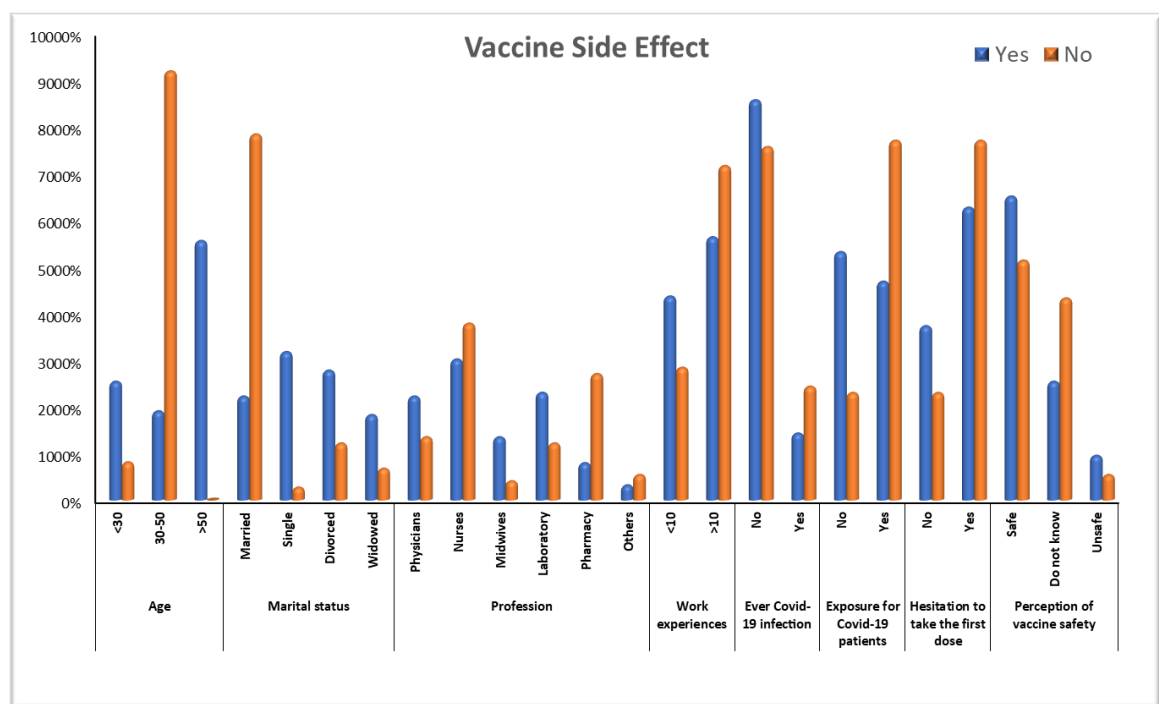
Table IV and figure II: vaccine side effects distribution by participant's bio sociodemographic characteristics:

The mean age of the study participants was significantly higher in individuals developing side effects (independent t-test, p-value=0.000). In addition, side effects are significantly lowered in married personnel. The prevalence of vaccine side effects was significantly altered between profession as nurses and physicians (0.001) and exposure to covid 19 patients (0.000)

		Total		Vaccine Side Effect				Chi-square	
				Yes (n=126)		No (n=74)		X ²	P-value
		N	%	N	%	N	%		
Age	<30	38	19	32	25.40	6	8.11	102.223	0.000
	30-50	92	46	24	19.05	68	91.89		
	>50	70	35	70	55.56	0	0.00		
Marital status	Married	86	43	28	22.22	58	78.38	62.485	0.000
	Single	42	21	40	31.75	2	2.70		
	Divorced	44	22	35	27.78	9	12.16		
	Widowed	28	14	23	18.25	5	6.76		
Profession	Physicians	38	19	28	22.22	10	13.51	21.644	0.001
	Nurses	66	33	38	30.16	28	37.84		
	Midwives	20	10	17	13.49	3	4.05		
	Laboratory	38	19	29	23.02	9	12.16		
	Pharmacy	30	15	10	7.94	2	27.03		

						0			
	Others	8	4	4	3.17	4	5.41		
Work experiences	<10	76	38	55	43.65	21	28.38	4.615	0.032
	>10	124	62	71	56.35	53	71.62		
Ever Covid-19 infection	No	164	82	108	85.71	56	75.68	3.183	0.074
	Yes	36	18	18	14.29	18	24.32		
Exposure for Covid-19 patients	No	84	42	67	53.17	17	22.97	17.456	0.000
	Yes	116	58	59	46.83	57	77.03		
Hesitation to take the first dose	No	64	32	47	37.30	17	22.97	4.399	0.036
	Yes	136	68	79	62.70	57	77.03		
Perception of vaccine safety	Safe	120	60	82	65.08	38	51.35	7.093	0.029
	Do not know	64	32	32	25.40	32	43.24		
	Unsafe	16	8	12	9.52	4	5.41		

Figure II:



Discussion:

COVID-19 is the unpredicted strike in which the whole world allied and armed with knowledge and discipline to battle. Over 104 million confirmed cases of COVID-19 and 2.29million deaths until now (February 6, 2021), as reported by World Health Organization (WHO) (Fares et al., 2021; WHO., 2020)

The results of the present study explained that the highest percentage of participant health care workers were aged from 30-50 years, married, nurses, with more than 10 years of experience, no previous covid infection, hesitated to receive the first dose of vaccine because of its side effects, reported a safe perception regarding the vaccine. The most of them reported side effects in a form of headache, fever, myalgia, injection site pain and nausea. In relation to the incidence if side effects, differences were found in relation to age, marital status, profession and exposure to covid 19 patients.

In relation to the perception of covid 19 vaccine, Fares et al., 2021 conduct as a study to assess the perception and attitude of healthcare workers in Egypt toward COVID-19 vaccines, acknowledge the determinants of their attitude, and the factors that could increase the acceptance of the vaccine. They found that Despite the COVID-19 pandemic, only approximately 21% of Egyptian healthcare workers in our study accepted the COVID-19 vaccination. Vaccine hesitancy represents a major barrier to implementing vaccination programs.

In Saudi Arabia, Qattan et al., 2021 conduct a study to o determine the acceptability of a COVID-19 vaccine among healthcare workers in Saudi Arabia and the factors affecting their intention to accept the vaccine. The results conclude that a reseanable proportion of health care workers delay receiving the vaccination until confirming iys safety and recommend that more health-related education among healthcare workers to alleviate any fears that might be associated with the COVID-19 vaccine.

The study results are congruent with Zare et al., 2021 and Riad et al., 2021 who found that the most common side effects of vaccine among healthcare workers were injection site pain, muscle pain, fatigue, fever, and headache. In addition, age was the most important variables in the prevalence of vaccine side effects.

Beatty et al., 2021 added that serious COVID-19 vaccine adverse effects were rare and comparisons across brands could be made, revealing that full vaccination dose, vaccine brand, younger age, female sex, and having had COVID-19 before vaccination were associated with greater odds of adverse effects.

Klugar et al., 2021 supported that the increasing number of COVID-19 vaccines available to the public may trigger hesitancy or selectivity towards vaccination. In our study, hesitancy was related to side effects. Klugar et al., 2021 was not in the same line with our study results as we found that side effects are most common in old age but they found younger age group were associated with an increased risk of side effects either after mRNA-based or viral vector-based vaccines.

Conclusion and recommendations:

The highest percentage of participant health care workers were aged from 30-50 years, married, nurses, with more than 10 years of experience, no previous covid infection, hesitated to receive the first dose of vaccine because of its side effects, reported a safe

perception regarding the vaccine. The most of them reported side effects in a form of headache, fever, myalgia, injection site pain and nausea. In relation to the incidence of side effects, differences were found in relation to age, marital status, profession and exposure to COVID-19 patients. So, providing vaccine-related information to the community and health care workers to be vaccinated is mandatory to increase vaccine uptake by reducing hesitancy and misconceived vaccine safety issues. Moreover, individuals with chronic diseases should take the first dose of the vaccine under the close supervision of health professionals.

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