PERCEPTION AND ACCEPTANCE OF COVID-19 VACCINE AMONG SELECTED WORKERS IN RIVERS STATE, SOUTH-SOUTH NIGERIA

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Abstract: **A safe and effective vaccine is a critical tool to control the COVID-19 pandemic. However, Vaccine hesitancy presents a barrier to immunization program success and, in fact, has been identified by the World Health Organization (WHO) as one of the top 10 global health threats in containment the virus. Hence, the present study aim to evaluate the perception and acceptance of covid-19 vaccine among selected workers in Rivers State. Using the cross-sectional survey design, a sample size of 500 were randomly selected from the population of 1,665,000 inhabitants of Port Harcourt as at the time of the study. A structured questionnaire was used to obtain information for the study from the respondent. Data obtained from the retrieved questionnaire were analyzed using IBM SPSS descriptive statistics and chi-square inferential statistics was used for the inferential statistics at 0.05 level of significance. The result revealed that participants who have heard about vaccination were most frequent with 454(98.7%), those who were willing to take the vaccine or have taken the vaccine before were 322(70%) and healthcare workers were the most frequent option to consult before taking the vaccine when in doubt 243(53.9%).Furthermore, the healthcare workers had the highest level of acceptance, showing a proportional statistical significant at p<0.001 when compared to Civil servants and UNIPORT staff members. though there was high level of awareness of vaccine, however, vaccines perceived safety concerns and trust were associated with hesitance. Hence, the health authorities via health care providers, who were identified by the people as the most trusted source of information regarding information about COVID-19 vaccines, should design interventions in terms of awareness campaigns via all types of multimedia to spread more transparent information about the safety and efficacy of the vaccines.**

Keywords: **Perception, Vaccine, Corona Virus and Workers.**

1. INTRODUCTION

The novel corona virus was first reported in Wuhan, China, and has since spread internationally causing a pandemic (World Health Organization, 2020). This viral strain was designated as severe acute respiratory syndrome corona virus 2 (SARS-CoV2), the causative agent of coronavirus disease 2019 (COVID-19), which carries a high infectious rate in humans (World Health Organization, 2020). The infectious nature of the disease, rising numbers of cases, daily mortalities and a lack of therapeutics have led to a healthcare crisis of epic proportions. As at June 6, 2021 the pandemic incidence stood at 172,639,637 cases and 3,718,683 deaths worldwide (World Health Organization, 2021). The virus has an incubation period of up to 14 days in infected individuals either with common symptoms, including fever, cough and shortness of breath, or without signs of the infection (asymptomatic) (Lauer *et al*., 2020). The ability of SARS-CoV2 to cause severe complications in a relatively short span of time in a cross-section of infected individuals, with devastating repercussions ranging from

ISSN 2349-7823

International Journal of Recent Research in Life Sciences (IJRRLS)
Vol. 11, Issue 1, pp: (11-22), Month: January - March 2024, Available at: **www.paperpublications.org**

acute pneumonia, respiratory distress syndrome, heart failure, cytokine storm and multi-organ dysfunction present a unique challenge and burden to health care facilities around the world (Sherwani and Khan, 2020). Vaccine hesitancy is defined as "the delay in acceptance or refusal of vaccination despite the availability of vaccination services," and it is a global concern and a crucial factor in under-vaccination (MacDonald, 2015). Various factors were found to underlie this behavior, which include low perceived benefits, low perceived risk of infection, fear of side effects and concerns surrounding safety and efficacy (Rubin *et al.,* 2013; Bonaccors*et al.,* 2013; Rabaan *et al.,* 2020). The aim of the research is to evaluate the perception and acceptance of covid-19 vaccine among selected workers in Rivers State. Study from Wuhan Institute of Virology showed that the similarity of gene sequence between SARS-CoV-2 and bat coronavirus is as high as 96.2% by sequencing technology (Zhou *et al.,* 2020) This also implied that bats are the possible source of SARS-CoV-2 (Xu, *et al,* 2020). Based on bioinformatics evidence indicated that digestive tract might be a potential route of SARS-CoV-2 infection (Wang *et al.,* 2020).). Meanwhile, a retrospective study based nine pregnant women with COVID-19 had for the first time indicated that the possibility of intrauterine vertical transmission between mothers and infants in the late pregnancy was temporarily excluded (Chen *et al.,* 2020). Moderately ill patients with underlying chronic illness, immunocompromised conditions and pregnancy require hospitalization (Xu *et al.,* 2020; Mitjà and Clotet, 2020). The anti-malarial drugs, hydroxychloroquine and chloroquine, showed promising results in early in vitro study (Yao *et al*., 2020).). However, the most robust and recent study in patients with COVID-19 have not shown unequivocal evidence of benefits for the treatment with hydroxychloroquine or chloroquine (Mehra *et al.,* 2020; Geleris *et al*., 2020; Mahévas et al., 2020). In fact, the largest analysis to date of the risks and benefits of treating COVID-19 patients with these anti-malarial drugs was unable to confirm a benefit of hydroxychloroquine or chloroquine, when used alone or with a macrolide, on in-hospital outcomes for COVID-19 (Mehra *et al.,* 2020). These vaccines have different working mechanisms to protect individuals against the disease (Wibawa, 2020). Sallam (2021) posited a large variability in COVID-19 vaccine acceptance rates was found. Qattan *et al* (2021) aimed to determine the acceptability of a COVID-19 vaccine among healthcare workers in Saudi Arabia and the factors affecting their intention to accept the vaccine. Fares *et al* (2021) assessed 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.

2. MATERIALS AND METHODS

Research Design

The study used a cross sectional survey design. The design was used to investigate events as it occurs in their natural conditions. Also, Research design connotes outlines, arrangements and approaches of investigation into new knowledge perceived in a bid to obtain responses to research questions and to control inconsistencies. Hence, the study was design to assess knowledge, attitude and practice towards hand washing in preventing of covid-19 spread among adolescent in government girls secondary school, Rumuokwuta, Rivers State.

Study Area

The research was carried out in Rivers State. Rivers State is located in the south-south geopolitical zone of Nigeria with a population estimated to be 5,198,716 as recorded from the 2006 census (Federal Republic of Nigeria, 2007). The state is made of 23 local government area consisting both upland and riverine settlements having rural and urban settings. In upland rural settings the predominant occupation is agrarian subsistence farming and in the riverine community practice mainly subsistence fishing with extremely bad family income. Though, oil exploration and exploitation remain common indices between the upland and riverine local government areas. Health services are offered in primary health facilities in all the Local Government Areas in addition to two tertiary health facilities in Port Harcourt, the capital of Rivers State. Nevertheless this study capture selected workers (amongst Civil servants, UNIPORT staff members and healthcare workers) within Port Harcourt metropolis.

Port Harcourt is the capital and largest city of Rivers State, Nigeria. It is the fifth-largest city in Nigeria after Lagos, Kano, Ibadan and Benin City. It lies along the Bonny River and is located in the Niger Delta. As 2021, the Port Harcourt urban area has an estimated population of 1,665,000inhabitants, up from 1,382,592 as of 2006 (Demographia, 2021).Due to the economic viability of port Harcourt owing to the presences of various industries and government institutions including public ministries, hospital, tertiary institutions etc. The population is constituted mostly by workers in the various industries and government institutions.

Population of the Study

Population represents the totality of the fundamentals consisting of individuals having characteristics which is of relevance to the researcher from which the sample size was drawn. The target population for this study comprised of the 1,665,000 inhabitants of Port Harcourt as at the time of the study.

Sample and Sample Techniques

Sample size can be defined as a small representative fraction of a population that is eventually studied and the result obtained is used in making generalization about the entire population.The sample size for the study was five hundred (500) respondent randomly selected from the different strata of the population as meeting the criteria for the study.

Nature/ Sources of Data

Data was gotten from primary and secondary sources. The former include information from administration of a well-structured questionnaire. While, the latter is information from textbooks, journals articles, periodicals and research dissertations.

Method of Data Collection/Instrumentation

The major instrument for data collection was the questionnaire. The questionnaire was divided into three (3) sections; section A and B. Section A is concerned with demographic data of the respondents, while section B Perception and acceptance of covid-19 vaccine among selected workers in Rivers State. On approaching a selected respondent, the researcher explained the purpose of the study, assuring them of confidentiality. As soon as consent was obtained, the respondents were requested to fill the questionnaire.

Validity/Reliability of the Instruments

The research questionnaire was developed by the researcher and a copy was sent to the research supervisor, to make input and correction were necessary, the questionnaire was finally rewritten by integrating the suggestions and corrections to ensure its validity.

Data Management and Organization

The data collected were assessed for completeness and response failing to meet the 75% cut-off (on all valid questions) was excluded. The data obtained from the survey were entered into Microsoft Excel (2016) and the scores checked for non-readable indentations.

3. RESULTS AND DISCUSSION

Table 1: Socio demographic Characteristics

Variable	Frequency	Per cent
Age category		
18 – 28 yrs	28	6.1
29 - 39 yrs	150	32.6
40 – 49 yrs	151	32.8
50 – 59 yrs	91	19.8
60 – 69 yrs	37	8.0
$\geq$70 yrs	3	0.7
Total	460	100.0
Occupation		
Civil servants	92	20.0
UNIPORT	213	46.3
Health Care Workers	155	33.7
Total	460	100.0

Sex		
Male	252	54.8
Female	200	43.5
Don't want to disclose	8	1.7
Total	460	100.0
Marital status		
Married	314	68.3
Single	130	28.3
Don't want to disclose	16	3.4
Total	460	100.0
Religion		
Islam	44	9.6
Christianity	404	87.8
Catholic	5	1.1
Others	7	1.5
Total	460	100.0
Level of Education		
No formal education	1	2.4
Completed primary	8	1.7
Completed junior secondary	7	1.5
Completed senior secondary	128	27.8
Completed tertiary	306	66.5
Total	460	100.0
Health insurance		
Government	320	69.6
Private	49	10.7
No insurance	91	19.8
Total	460	100.0

Table 2a: Descriptive statistics on the perception and acceptance of COVID 19 Vaccine

Variable	Frequency	Percent
Have you heard of vaccination?		
Yes	454	98.7
No	6	1.3
Total	460	100.0
Have you taken vaccine before ?		
Yes	444	96.5
No	16	3.5
Total	460	100.0
Have you administered vaccine before as a health care worker?		
Yes	103	22.4
No	357	77.6
Total	460	100.0
Have you, family or neigbour had COVID 19?		
Yes	28	6.1
No	419	91.1

Not sure	13	2.8
Total	460	100.0
Availability of COVID 19 vaccine		
Yes	436	94.8
No	24	5.2
Total	460	100.0
Are you willing to be vaccinated?		
Yes	116	25.2
No	117	25.4
Have been vaccinated	206	44.8
Not decided	21	4.6
Total	460	100.0
Are you willing to pay for the vaccine?		
Yes	55	12.0
No	319	69.3
Don't know	86	18.7
Total	460	100.0
Reasons for not taking the vaccine		
Not sure of safety	15	3.2
Not sure of effectiveness	29	6.3
Fear of side effects such as fever & pain	33	7.2
No trust in vaccine	35	7.6
Religious belief	5	1.1
Not applicable	343	74.6
Total	460	100.0

Table 2b: Descriptive statistics on the perception and acceptance of COVID 19 Vaccine cont'd

Variable	Frequency	Percent
Preferable vaccine		
Oxford Astrazeneca	135	29.3
Pfizer/biotech	146	31.7
Moderna	16	3.5
Any of the vaccines	25	5.4
Not applicable	138	30.1
Total	460	100
Who would you consult before taking the vaccine?		
Family members	93	20.2
Health worker	243	53.9
Religious leader	49	10.7
Community leader	4	0.9
Government officials	63	13.6
Others	3	0.7
Total	460	100.0
Preferable vaccine designated location for vaccination		
General hospital	261	56.7
Private hospital	106	23.0
Home delivery	50	10.9
Primary healthcare centres	43	9.4
Total	460	100.0

Would you like to get further information about COVID 19 vaccine?		
Yes	383	83.2
No	56	12.2
Don't know	21	4.6
Total	460	100.0
How would you like to get more information about COVID 19?		
Social media such as Whatsapp, Facebook, Instagram, Twitter	49	10.7
Telecommunication such as SMS and calls	18	3.9
Online platforms such as zoom, skype	99	21.5
Print and Electronic media, TV, Newspaper	140	30.4
Face to face communication	154	33.5
Total	460	100.0

Table 3a: Comparison of Perception COVID 19 vaccine amongst Civil servants, UNIPORT staff members and healthcare workers in Rivers State

Variables	Civil servants	UNIPORT staff members	Healthcare workers	Total	X^2	P-value
Have you taken vaccine before?						
Yes	92(20.0)	203(32.4)	295(44.1)	444(96.5)		
No	0(0)	10(2.2)	6(1.3)	16(3.5)	20.541	0.015
Total	92(20.0)	213(46.3)	301(33.7)	460(100.0)		
Availability of COVID 19 vaccine						
Yes	92(20.0)	193(32.8)	285(42.0)	436(94.8)		
No	0(0)	20(4.3)	4(0.9)	24(5.2)	22.640	0.007
Total	92(20.0)	213(46.3)	289(33.7)	460(100.0)		
Have you, family member, friends or neighbour had COVID 19 ?						
Yes	6(1.3)	10(2.2)	12(2.6)	28(6.1)		
No	83(18.0)	201(29.4)	284(43.7)	419(91.1)	131.201	0.001
Not sure	3(0.7)	2(0.4)	5(1.7)	13(2.8)		
Total	92(20.0)	213(46.3)	305(33.7)	460(100.0)		
Are you willing to pay for the vaccine ?						
Yes	9(2.0)	23(5.0)	32(5.0)	55(12.0)		
No	73(15.9)	137(29.8)	109(23.6)	319(69.3)	122.711	0.001
Don't know	10(2.2)	53(11.5)	23(5.0)	86(18.7)		
Total	92(20.1)	213(46.3)	164(33.6)	460(100.0)		
Reasons for not taking the vaccine						
Not sure of safety	0(0)	38(8.3)	24(5.2)	62(13.5)		
Not sure of effectiveness	6(1.3)	46(10.0)	64(13.9)	116(25.2)		
Fear of side effects such as fever & pain	24(5.2)	51(11.1)	55(12.0)	130(28.3)	308.029	0.001
No trust in vaccine	50(10.9)	78(17.0)	9(1.9)	137(29.8)		
Religious belief	12(2.6)	0(0)	3(0.7)	15(3.3)		
Total	92(20.0)	213(46.3)	155(33.7)	460(100.0)		

ISSN 2349-7823

International Journal of Recent Research in Life Sciences (IJRRLS)
Vol. 11, Issue 1, pp: (11-22), Month: January - March 2024, Available at: www.paperpublications.org

If you have not decided yet, who would you consult before taking the vaccine ?					X^2	P-value
Family members	16(3.5)	57(12.4)	20(4.3)	93(20.2)		
Health worker	56(12.2)	114(24.8)	78(16.9)	248(53.9)		
Religious leader	13(2.8)	19(4.1)	17(3.8)	49(10.7)	258.423	0.001
Community leader	4(0.9)	0(0)	0(0)	4(0.9)		
Government officials	3(0.7)	23(5.0)	37(8.0)	63(13.7)		
Others	0(0)	0(0)	3(0.7)	3(0.7)		
Total	92(20.0)	213(46.3)	155(33.7)	460(100.0)		
Preferable vaccine						
Oxford Astrazeneca	27(5.9)	114(24.8)	52(11.3)	193(42.0)		
Pfizer/biotech	53(11.5)	83(18.0)	72(15.7)	208(45.2)		
Moderna	3(0.7)	5(1.1)	16(3.4)	24(5.2)	201.591	0.001
Any of the vaccines	9(2.0)	11(2.4)	15(3.2)	35(7.6)		
Total	92(20.0)	213(46.3)	155(33.7)	460(100.0)		

Table 3b: Comparison of Perception COVID 19 vaccine Civil servants, UNIPORT staff members and healthcare workers in Rivers State cont'd

Variables	Civil servants	UNIPORT staff members	Healthcare workers	Total	X^2	P-value
Preferable vaccine designated location for vaccination						
General hospital	72(15.7)	89(19.3)	100(21.7)	261(56.7)		
Private hospital	14(3.0)	70(15.2)	22(4.8)	106(23.0)	211.181	0.001
Home delivery	0(0)	36(7.8)	14(3.1)	50(10.9)		
Primary healthcare centres	6(1.3)	18(3.9)	19(4.1)	43(9.3)		
Total	92(20.0)	213(46.3)	155(33.7)	460(100.0)		
Would you like to get further information about COVID 19 vaccine ?						
Yes	83(18.0)	165(35.9)	135(29.4)	383(83.3)		
No	6(1.3)	36(7.8)	14(3.1)	56(12.2)		
Don't know	3(0.7)	12(2.6)	6(1.3)	21(4.6)	113.694	0.001
Total	92(20.0)	213(46.3)	155(33.7)	460(100.0)		
How would you like to get more information about COVID 19 ?						
Social media such as Whatsapp, Facebook, Instagram, Twitter	9(2.0)	32(7.0)	8(1.7)	49(10.7)		
Telecommunication such as SMS and calls	3(0.7)	12(2.6)	3(0.6)	18(3.9)		
Online platforms such as zoom, skype	17(3.7)	63(13.7)	19(4.1)	99(21.5)	291.228	0.001
Print and Electronic media, TV, Newspaper	41(8.9)	68(14.8)	31(6.7)	140(30.4)		
Face to face communication	22(4.8)	38(8.3)	94(20.4)	154(33.5)		
Total	92(20.0)	213(46.3)	155(33.7)	460(100.0)		

ISSN 2349-7823

International Journal of Recent Research in Life Sciences (IJRRLS)
Vol. 11, Issue 1, pp: (11-22), Month: January - March 2024, Available at: **www.paperpublications.org**

Table 4: Comparison of Socio demographic characteristics with acceptance of COVID 19 Vaccine

Variable	Are you willing to take the COVID-19 Vaccine			Total	X^2	P-value
Age category	Yes	No	Not decided			
18 – 28 yrs	28(6.1)	0(0)	(0)	28(6.1)		
29 - 39 yrs	46(10.0)	36(7.8)	68(14.8)	150(32.6)		
40 – 49 yrs	29(6.3)	48(10.4)	74(16.1)	151(32.8)		
50 – 59 yrs	9(2.0)	29(6.3)	53(11.5)	91(19.8)	116.328	0.001
60 – 69 yrs	4(0.9)	18(3.9)	15(3.3)	37(8.0)		
$\geq$70 yrs	0(0.0)	3(0.7)	0(0)	3(0.7)		
Total	116(25.2)	134(29.1)	210(45.7)	460(100.0)		
Occupation						
Civil Servants	34(7.4)	5(1.1)	53(11.5)	92(20.0)		
UNIPORT staff	40(8.7)	93(20.2)	80(17.4)	213(46.3)		
Health workers	42(9.1)	36(7.8)	77(16.8)	155(33.7)	123.780	0.001
Total	116(25.2)	134(29.1)	210(45.7)	460(100.0)		
Sex						
Male	68(14.8)	52(11.3)	132(28.7)	252(54.8)		
Female	48(10.4)	82(17.8)	78(15.2)	208(43.5)	33.340	0.001
Total	116(25.2)	134(29.1)	210(45.7)	460(100.0)		
Marital Status						
Single	56(12.2)	34(7.2)	41(8.9)	131(28.3)		
Married	60(13.0)	100(21.7)	154(33.5)	314(68.3)	43.994	0.001
Total	116(25.2)	134(29.1)	210(45.7)	460(100.0)		
Educational level						
No formal education	4(0.9)	3(0.7)	4(0.9)	11(2.5)		
Completed primary	0(0)	5(1.1)	3(0.7)	8(1.8)		
Completed junior sec.	3(0.7)	0(0)	4(0.9)	7(1.6)		
Completed senior sec.	49(10.7)	23(5.0)	56(12.2)	128(27.8)	42.870	0.001
Completed tertiary	60(13.0)	103(22.4)	143(31.1)	306(66.5)		
Total	116(25.2)	134(29.1)	210(45.7)	460(100.0)		
Health insurance						
Government	68(14.8)	97(21.1)	155(33.7)	320(69.6)		
Private	39(8.5)	4(0.9)	6(1.3)	49(10.7)		
No insurance	9(2.0)	33(7.2)	49(10.5)	91(19.7)	90.923	0.001
Total	116(25.2)	134(29.1)	210(45.7)	460(100.0)		

Table 5: Comparison of level of acceptance COVID 19 Vaccineby Civil servants, UNIPORT staff members and healthcare workers in Rivers State

Variable	Are you willing to take the COVID-19 Vaccine			Total	X^2	P-value
	Yes	No	Not decided			
Occupation						
Civil Servants	34(7.4)	5(1.1)	53(11.5)	92(20.0)		
UNIPORTstaff members	40(8.7)	93(20.2)	80(17.4)	213(46.3)		
Healthcare workers	42(9.1)	36(7.8)	77(16.8)	155(33.7)	123.780	0.001
Total	116(25.2)	134(29.1)	210(45.7)	460(100.0)		

ISSN 2349-7823

International Journal of Recent Research in Life Sciences (IJRRLS)
Vol. 11, Issue 1, pp: (11-22), Month: January - March 2024, Available at: www.paperpublications.org

Table 6: Adverse effects of COVID 19 vaccinations seen among participants

Variable	Frequency	Per cent
Post vaccination adverse effects		
High blood pressure & fever	8	1.7
Body weakness & pains	32	7.0
High blood pressure & insomnia	3	0.7
Headache	10	2.2
Heaviness of arm, pains	15	3.3
High blood pressure only	7	1.5
No side effect	125	27.2
Not applicable	260	56.4
Total	460	100.0

The study is to assess the perception and acceptance of covid-19 vaccine among selected workers in Rivers State. The objectives and research questions analyzed using IBM SPSS version 22 and presented in simple percentage, and frequency counts, while chi-square inferential statistics at 0.05 level of significance was used for inferential statistics and inference was drawn and was compared with interactive reviewed. Quantitative data was presented in tables while explanations to the same as presented in text. The study revealed that participants who have heard about vaccination were most frequent with 454(98.7%), this is in agreement with Ekwebene *et al* (2021) *whose studies stated that* revealed good knowledge of covid-19 vaccine among participants. those who were willing to take the vaccine or have taken the vaccine before were 322(70%), this is supports Qattan *et al* (2021), Jaradat *et al* (2021) and Olomofe *et al* (2021) whose study stated that most of the participant were willing to accept the vaccine . The most prevalent reason for not taking the vaccine was lack of trust in vaccine 35(7.6%), this agrees with Lazarus *et al* (2020) who posited that that trust in government is associated with vaccine confidence. General hospital was the most prevalent preferable vaccine designated location for vaccination 261(56.7%). 383(83.2%) would like to get further information about COVID 19 vaccine, however they preferred face to face as the medium of communication for getting more information about COVID-19154(33.5%), and healthcare workers were the most frequent option to consult before taking the vaccine when in doubt 243(53.9%) this is in line with Arce *et al* (2021) and El-Elimat*et al* (2020) whose study stated that health workers are the most trusted sources of guidance about COVID-19 vaccines. This study found that healthcare workers had a positive statistically significant relationship with vaccine destination, information about vaccine and channel of information about covid-19 vaccine (P<0.001) compared to civil servants and UNIPORT staff members. This is in line with Akinyemi *et al* (2021) whose study found a significant association between positive perception and willingness to take COVID-19 vaccine and that being a healthcare worker, having good knowledge of the disease is a significant determinants of willingness to uptake COVID-19 vaccine.

This study further revealed that age category, occupation, sex, marital status, educational level and insurance were all statistically significant (p=0.001) with the acceptance COVID-19 vaccine by Civil servants, UNIPORT staff members and healthcare workers in Rivers State. This agrees with Jaradat *et al* (2021) who stated that willingness to accept vaccination were relatively higher among females and those with higher education. Also, Al-Mohaithef and Padhi (2020) posited that Willingness to accept the COVID-19 vaccine was relatively high among older age groups, being married participants with education level postgraduate degree or higher and employed in government sector. Furthermore, the healthcare workers had the highest level of acceptance, showing a proportional statistical significant at p<0.001 when compared to Civil servants and UNIPORT staff members. In addition , the adverse effects of COVID-19 vaccination seen among participants who have already taken the vaccine showed that the most frequent side effect reported was body weakness & pains with 32(7.0%), while the least reported was high blood pressure & insomnia with 3(0.7%).

4. CONCLUSION

From the findings of this study there was high level of awareness of vaccine, however, vaccines perceived safety concerns and trust were associated with refusal and fear of vaccine acceptance. Hence, the health authorities via health care providers, who were identified by the people as the most trusted source of information regarding information about COVID-19 vaccines, should design interventions in terms of awareness campaigns via all types of multimedia to spread more transparent information about the safety and efficacy of the vaccines. The awareness campaigns should also shed the light over the new technology that was utilized in the production of few of them in order to boost COVID-19 vaccines acceptance.

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