Original article

Knowledge, Vaccine Preference and Fear of COVID-19 among Malaysians during the Heightened Phase of COVID-19 Pandemic

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Abstract

Objective: The objective of this study was to investigate the knowledge, vaccine preference and fear of COVID-19 among Malaysians. ***Materials and Methods:*** This online questionnaire survey was carried out from 6th September 2021 to 12th November 2021 through Google form on adult Malaysians. To collect the data, a pilot-tested validated questionnaire was administered to 387 samples. The questionnaire comprised of participants' socio-demographic characteristics, knowledge on COVID-19 vaccine with source of information, participants' specific vaccine preferences with reasons, vaccination status and fear on COVID-19. ***Results and Discussions:*** Participants has good knowledge on COVID-19 vaccina. Total 275(71%) participants showed preference for specific vaccine; Pfizer-BioNTech was the most preferred (61.5%) vaccine. The major reason for preference was effectiveness (56.4%). Participants with vaccine-preferred group obtained higher knowledge-score(7.38/8) than non-preferred (7.28/8) with insignificant difference. A total of 376(97%) respondents were vaccinated, among them 250 (66.5%) received preferred vaccine and 22(5.85%) received non-preferred, while rest had no preference. Among 11 non-vaccinated participants, three denied vaccinations as they were offered non-preferred vaccines. Fear of COVID-19 score was found higher (21.34/35) in the vaccinated group compared to non-vaccinated group (19.09/35), although no significant difference was observed. ***Conclusion:*** Most of the Malaysians are knowledgeable about COVID-19 vaccination, have vaccine-preference and vaccinated. Vaccine-preferred participants are more knowledgeable than non-preferred with insignificant difference. Among the non-vaccinated participants, 27% (3/11) denied vaccination as offered non-preferred vaccine. Vaccinated group showed more fear of COVID-19 than non-vaccinated, with an insignificant difference. Increased awareness is necessary for the people, unwilling or hesitant to vaccinate.

Keywords: knowledge; vaccine-preference; vaccination status; fear of COVID-19.

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Introduction

Coronavirus disease 2019 or COVID-19 caused by SARS-CoV2 was originated from Wuhan City, China in December 2019 [1]and was declared a pandemic by WHO in March 2020.[2] In Malaysia, cases started to be found on 25th January 2020 that starts the first wave of the COVID-19 pandemic which lasts till the end of February 2020.[3,4] The 2nd wave of pandemic started in early March 2020 after

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one large religious gathering attended by around 16,000 people in Kuala Lumpur. Strict movement control order (MCO) was implemented from 18th March with overseas travel ban for all individuals as well as inter and intra district travel restriction except for critical services. All these measures eventually flattened the epidemic curve and the recovery MCO (RMCO) phase started on 10th Jun 2020.[4] However, from the end of July 2020, COVID-19 cases steadily increased and in September 2020, a higher number of cases were recorded at different states[4] which marked the beginning of 3rd wave on September 8, 2020.[5] As an effective prophylactic measure, the vaccine is the only way to control the outbreak of this pandemic through achieving the herd immunity by the community via mass vaccination program.[6] Malaysian Government has launched the COVID-19 vaccination program on 24th February 2021.[7] Malaysia's vaccine portfolio includes a number of vaccines namely Pfizer-BioNTech, Astra Zeneca-Oxford, Sinovac, CanSino, Sinopharm, Johnson & Johnson, Sputnik V, and Moderna. So far, the government has rolled out the Pfizer, Astra Zeneca, and Sinovac vaccine.[8] The success of a vaccination program is dependent on the vaccine uptake by the population.[9] Therefore, the willingness of the people to receive the vaccine is an important issue in the control of this pandemic. It is found a number of various psychological and social factors influence people to make decisions on vaccine uptake.[10] Trust in the vaccines efficacy, safety as well as trust in the health services offered them, and the policy makers deciding on their rollout are an important factors in this decision making on vaccination.[10] Also, personal belief about the severity of the disease poses a high risk to their health together with the misinformation circulated in social media and other sources can influence them in their decision. Convenience to access the vaccine and the willingness to protect others from infection through self-vaccination has a great role here.[10] Thus, the proper knowledge of the population on the COVID-19 vaccination receiving through reliable source is very important.

Malaysian population have shown a good acceptance towards vaccination, however, it was found that there were groups of people who refuse or hesitate to accept COVID-19.[11] The main reasons of hesitance were found as concerns about side effects (95.8%), safety (84.7%), lack of information (80.9%), and effectiveness (63.6%) of the vaccine.[12] People also show specific vaccine type preferences due to different reasons. The fear of severe side effects from the Pfizer-BioNTech vaccine due to its synthetic components was noted to prohibit some older group of people from taking this vaccine compared to Astra Zeneca and Sinovac.[13] On the contrary, side effects of blood clots from Astra Zeneca, also prohibit some people from taking the Astra Zeneca vaccine.[14] In the case of the Sinovac vaccine, some people view it as inferior to Pfizer-BioNTech due to large variations of trial results. In addition, there is also concerns of halal issues and travel restriction to perform Hajj or umrah with Sinovac vaccination status adds to the unwillingness to accept this vaccine.[14] However, the choice of Sinovac is also noted as some people view it as safe, as it uses the standard method of inactivated viruses, compared to mRNA vaccines and viral vector vaccines which are of relatively new technology.[14] A proper knowledge on the vaccine is necessary for a successful intervention. Much false news transmitted through social media can influence the population in their vaccination acceptance.[15]

Fear of COVID-19 pandemic is considered as one of the most frequent emotional conditions,[16,17] that ultimately leads to worry and anxiety among individuals worldwide.[18] Conditions of physical distancing and controlled movement with uncertainty to return to normal life have an impact on their physical and mental wellbeing leading to fear, stress and anxiety.[19] It is reported that COVID-19 vaccination offers protection against COVID-19 infection, and thus reduces anxiety and depression.[20] However, uncertainty and ongoing pandemic make people impossible to turn off the anxiety that could lead to significant mental distress among the population.[21] Despite the negative effects, it also showed that negative emotions prohibit people from engaging the risky behaviour and thus motivate people to avoid it.[21] Study during the initial stage of pandemic showed risk perception among people engaged them in protective behaviour such as hand washing and maintaining social distancing to avoid the COVID-19 disease.[22] However, another report suggests unvaccinated people showed less fear towards coronavirus and took fewer precautions against it.[23]

During the 3rd wave of the pandemic, the daily positive cases in Malaysia were reported to be around 17000 by 6th Sept, 2021[24] and at that time fully vaccinated adult population received two doses reached 51%.[25] It is important to understand the individuals' knowledge, vaccine type preference and fear of

COVID-19 during the ongoing 3rd wave of pandemic and continued vaccination program aimed to identify any influence on the decision-making on vaccination. The objective of this study was to investigate the knowledge on COVID-19 vaccination,vaccine type preference and fear of COVID-19 pandemic among Malaysians.

Materials and Methods

This was a cross-sectional study conducted by a group of year-4 medical (MBBS) students of Widad University College (WUC), Kuantan, Pahang Malaysia, supervised by a faculty member of WUC. The study was carried out as a part of the requirement of fulfillment of their Community Medicine posting from 6th September 2021 to 12th November 2021. The study population were adult Malaysian citizens and the sample size of the study was 384 calculated based on the Cochran formula for the infinite population.[26]

To collect the data, a questionnaire was developed by adopting and modifying from recent literatures[12,27-31] which was finalized after pretesting it. The questionnaire was structured into four sections, comprising of participants' socio-demographic characteristics, knowledge and source of information on COVID-19 vaccination, vaccine type preference and fear of COVID-19 pandemic.

Sociodemographic characteristics included age, gender, race, religion, marital status, employment status and academic level, residence, information on COVID-19 infection on self or on family members and having any history of chronic illness. Knowledge about the COVID-19 pandemic among the participants was studied utilizing the 8-items questionnaire by Al-Marshoudi et al., (2021),[28] where the respondents were asked to respond by "Yes," "No, or "Don't know" options against each of the 8 items of knowledge. The scores were calculated by giving one point to each correct answer, and '0' point to no/ don't know response. Total scores were calculated with a range 0–8. The higher scores indicate more knowledge about COVID-19 vaccine. Source of information were added in this section of the questionnaire. Regarding the vaccine type preference against COVID-19 vaccination, participants were asked about whether they had any specific vaccine preference or not, the name of preferred vaccine if any by putting a tick in the list of vaccines named Pfizer-BioNTech, Sinovac, and Oxford-Astra Zeneca. Reasons for preference of specific vaccine type was investigated by adopting attributes[27] that includes effectiveness, vaccine-related side-effects, duration of vaccine protection, acquaintances vaccinated, number of doses, and subsidy. Participants were also asked about their vaccination status, and those who were vaccinated whether got the preferred specific vaccine or not. Participants who had not been vaccinated till then were also required to specify their reasons such as being unable to get the preferred vaccine, waiting for vaccine appointments, and other reasons from the list. Fear of COVID-19 pandemic was investigated utilizing valid and reliable seven items Fear of COVID-19 scale by Pang et al., (2021)[29] and Ahorsu et al., (2020),[30] rated using five-point Likert scale ranging from 1(strongly disagree) to 5 (strongly agree). The possible scores ranged from 7 to 35; the more the score, the higher the level of fear of COVID-19.[30] The Malay version by Pang et al., (2021)[29] and English version by Ahorsu et al., (2020)[30] and Winter et al., (2020)[31] showed very good internal consistency.

Data were collected by administering both Malay and English versions of the questionnaire online to the participants using Google Forms through WhatsApp and Facebook. Inclusion criteria include Malaysian citizens eligible for vaccination, aged 18 and above, living in Malaysia during the study period, having reliable Internet access and could read and understand Bahasa Malaysia or English. Malaysians who took part in pilot-testing and foreigners living in Malaysia were excluded from this study. Participants were assured of the confidentiality and the privacy of their responses.

The data was analyzed using Statistical Package for Social Sciences (SPSS) version 26. All descriptive data were presented as number and percent (%) distribution. Association of participants' knowledge with vaccine preference, as well as participants' fear of COVID-19 were compared between the vaccinated and non-vaccinated groups and any significant difference was determined by independent t-test. A p-value of <0.05 was considered statistically significant with aconfidence interval of 95%.

Results

Total of 387 respondents participated in this questionnaire survey. Table-1 showed the demographic data of the respondents and information regarding comorbidities, history of COVID-19 infection.

Table-1: Socio-demographic characteristics of participants, n= 387.

Sociodemographic variables		Frequency	%
Age	18-30 years	218	56.3
	31-50 years	128	33.1
	>50 years	41	10.6
Gender	Male	138	35.7
	Female	249	64.3
Ethnicity	Malay	342	88.4
	Chinese	30	7.8
	Indians	10	2.6
	Others	5	1.3
Religions	Muslims	349	90.2
	Hindu	6	1.6
	Buddhist	26	6.7
	Christians	6	1.6
	Others	0	0
Education	High School or Less	66	17.1
	Diploma	82	21.2
	Bachelor	216	55.8
	Master and above	23	5.9
History of chronic diseases	Hypertension	33	8.5
	Hypercholesterolemia	21	5.4
	Diabetes	19	4.9
	Respiratory disease	10	2.6
	Heart disease	9	2.3
	Other	11	2.8
	None	323	83.5
Residence	Metropolitan city	169	43.7
	Semi urban area	171	44.2
	Rural area	47	12.1
Suffered from COVID-19	Yes	19	4.9
	No	368	95.1
Family members have suffered from COVID-19	Yes	106	27.4
	No	281	72.6

Table-2 showed the distribution of participants' knowledge on COVID-19 vaccine and source of information. The majority of the respondents were knowledgeable about the COVID-19 vaccine in all the eight items of knowledge variables. In regards to the source of information, participants gathered the highest information about COVID-19 vaccine through social media (85.3%).

Table-2: Participants' knowledge of the COVID-19 vaccine and source of information, n= 387.

Knowledge variables	Yes n (%)	No/Don't know n (%)
1.Heard about the COVID-19 vaccine.	384 (99.7)	3 (0.3)
2.Vaccines can reduce the COVID-19 infection rate.	358 (93.0)	29 (7.0)
3.The vaccine protects from getting COVID-19.	363 (94.3)	24 (5.7)
4.It is possible to get COVID-19 even after taking the vaccine.	374 (97.1)	13 (2.9)
5.COVID-19 vaccine can be given to a person witha past COVID-19 infection.	357 (92.7)	30 (7.3)
6.COVID-19 vaccine cannot be given to a person currently suffering from COVID-19 infection.	270 (70.1)	117 (29.9)
7.Some general side effects are fever, swelling and redness at the injection site.	359 (93.2)	28 (6.8)
8.Most of the COVID-19 vaccine is given in 2 doses.	380 (98.7)	7 (1.3)
Source of information		
Social media (WhatsApp, Facebook, etc.).	330 (85.3)	-
Internet search.	263 (68.0)	-
Acquaintances.	177 (45.7)	-
Medical personnel.	165 (42.6)	-

Table-3 revealed the distribution of participants' preference of vaccine type, reasons for preferences, vaccination status and reasons for not getting vaccinated. Out of 387 participants, 275 (71%) showed preference on the specific vaccine type, among which the highest preferred vaccine type was the Pfizer-BioNTech (61.5%) and the lowest one was Astra Zeneca (17.5%). Vaccine effectiveness (56.4%) was the most cited reason for vaccine preference. Total 376 (97.2%) respondents were vaccinated, of which 250 (66.5%) had received their preferred vaccine type. Among the 11 non-vaccinated participants, 4 (36.4%) participants were still waiting for the appointment, 3(27.3%) refused vaccination as offered non-preferred type of vaccine while 4 (36.3%) participants were concerned about the safety and undisclosed side effects of the vaccine.

Table-3: Participants' preference of any vaccine type, reasons of preferences, vaccination status and reasons for not getting vaccinated .

Vaccine preference variables		Yes n (%)	No n (%)
Have a preference for specificvaccine type, n=387		275 (71)	112 (29)
Most preferred vaccine type,n=275.	Pfizer-BioNTech	169(61.5)	-
	Sinovac	58 (21.1)	-
	Oxford-AstraZeneca	48(17.5)	-
Reasons for preference ofspecific vaccine type,n=275.	Effectiveness	155 (56.4)	-
	Vaccine related side-effects	92 (33.5)	-
	Duration of vaccine protection	74 (26.9)	-
	Acquaintances vaccinated	43.37(15.8)	-
	Number of doses	35 (12.7)	-
	Subsidy for vaccine	32 (11.6)	-
Vaccination status (vaccinated or not), n=387.		376 (97.2)	11(2.8)
Received preferred vaccine, n=376.		250(66.5)	22(5.85)
Have no preference, n=376.		104 (27.7)	-
Reasons for not vaccinatedagainst COVID-19, n=11	Could not get an appointment or wait for appointment	4 (36.4)	-
	Got non-preferred vaccine type in appointment	3 (27.3)	-
	Not sure about safety	3 (27.3)	-
	Afraid of undisclosed side effects	1 (9.1)	

Table-4 showed respondents' degree of agreement with the mean score on seven items fear scale of COVID-19. The table revealed that 144 (38%) respondents rated 4-5 as agreed to strongly-agreed and 153 (39%) rated 1-2 as strongly-disagreed to disagreed while 90 (38%) were unsure.

Table-4: Distribution of respondents' mean rating and score on a seven items fear scale of COVID-19 as: Strongly Disagree (SD)=1; Disagree (D) =2; Unsure (U) =3; Agree (A) =4; Strongly Agree (SA) =5; n=387.

Fear Scale Statements	SD=1 n (%)	D=2 n (%)	U=3 n (%)	A=4 n (%)	SA=5 n (%)
1. I am most afraid of COVID 19	23 (5.9)	23(5.9)	66 (17.1)	108(27.9)	167(43.2)
2. It makes me uncomfortable to think about COVID-19	34(8.8)	35(9.0)	87(22.5)	106(27.4)	125(32.3)
3. My hands become clammy when I think about COVID-19	142(36.7)	80(20.7)	98(25.3)	36(9.3)	31(8.0)
4. I am afraid of losing my life because of COVID-19	38(9.8)	39(10.1)	71(18.3)	70(18.1)	169(43.7)
5. When watching news and stories about COVID-19 on social media, I become nervous or anxious	49(12.7)	84(21.7)	119(30.7)	77 (19.9)	58(15.0)
6. I cannot sleep because I am worrying about getting COVID-19	147(38.0)	99(25.6)	90(23.3)	28(7.2)	23(5.9)
7. My heart races or palpitates when I think about getting COVID-19	123(31.8)	94(24.3)	97(25.1)	43 (11.1)	30(7.8)

Table-5 showed the distribution comparison score of knowledge between groups having vaccine-preference and no-preference and comparison score of fear of COVID-19 in vaccinated and non-vaccinated group. It is revealed that, total mean score of knowledge was 7.33. In the comparison of knowledge between the two groups of having vaccine preference (score: 7.38) and no-preference (7.28); participants with vaccine preference obtained higher score. However, there was no significant difference (p=0.39). The total mean score for fear of COVID-19 was 20. 23 while mean score in vaccinated group was

21.34 and in the non-vaccinated group was 19.09. Vaccinated group participants obtained more score and as such have more fear of COVID-19, also there was no significant difference was observed (p=0.27).

Table-5: Comparison of knowledge between groups having vaccine-preference and no-preference and comparison of fear score in vaccinated and non-vaccinated group.

Comparison of knowledge score between groups having vaccine preference and no-preference.	**Vaccine preference**	**Mean score of knowledge (maximum score 8)**	***p*-value**	**Total mean knowledge score**
	Have preference (n=275)	7.38	0.39	7.33
	No-preference (n=112)	7.28		
Comparison of fear score in vaccinated and non-vaccinated group.	**Vaccination status**	**Mean score of fear of COVID-19 (maximum score35)**	***p*-value**	**Total mean fear score**
	Vaccinated (n=376)	21.34	0.27	20.23
	Non-vaccinated (n=11)	19.09		

Discussion

This present study was conducted to find out the participants' knowledge on ongoing COVID-19 vaccination and also to find out any specific vaccine preference as well as fear of COVID-19 among the participants. Study findings showed that 89% of participants were in the 18-50 years of age group, 64% females and 88 % Malays (Table-1). Participants had a good knowledge of COVID-19 vaccination (Table-2) which were reflected by the 97.2% vaccination rate of the participants (Table-3). This was in tally to good acceptance towards the vaccine. Moreover, despite having specific vaccine preference, 5.85% of participants had received the non-preferred vaccine, confirming the good acceptance towards vaccination (Table-3). It was found that social media (WhatsApp, Facebook, etc.) and internet search were the main sources of information (Table-2). Since the pandemic era started, many reliable websites were providing updates regarding this disease including information about the vaccine, namely by the World Health Organization (WHO), Center for Disease Control and Prevention (CDC) and Ministry of Health (MOH). However, the information provided in social media were generated by the users and it could be misinformation, inaccurate or fake. Although, accurate and reliable information transmitted from reliable sources through social media can play a central role in tackling misinformation.[32] In our study, a large number of respondents used social media (88.2%) as a source of information which may mislead them if the validity was not ensured. Malaysian Government is strongly monitoring the misinformation regarding the negative effects of vaccines from an unreliable source or any fake news related to COVID-19.[11]

Regarding the vaccine preference, this study demonstrated that 71% of the Malaysian population had a preference towards the specific vaccine type. This study showed Pfizer-BioNTech was the most preferred vaccine (61.5%). This study also proved that there were some factors that influenced the publics' decision on having a preference on vaccines with the effectiveness of the vaccine (56.4%) being the highest reason. A sub-group of 33.5% was concerned about vaccine-related side effects meanwhile 26.9% chose the duration of vaccine protection as their main reason for having a preference towards a specific vaccine (Table-3). The knowledge score in the participants having vaccine preference was higher than participants having no preference, although there was no significant difference (Table-5).

In this present study, the safety issue was also found as an important cause of not taking vaccines among the non-vaccinated group of participants. Here, among the 11 non-vaccinated participants, 36.4% were waiting for the vaccine appointment, 27.3% were offered non-preferred vaccine who denied to take vaccine while another 27.3% did not take the vaccine as they were unsure about the safety of the vaccine. To make a successful vaccination program, it is necessary to know the factors that make people willing or unwilling to participate in the program. Here, in this present study, the important finding was that there were some participants who were unwilling to take the non-preferred vaccine and some were concerned about the safety issues, effectiveness, and side effects. Uncertainty on the safety issue and effectiveness of the vaccine can

have a negative impact and reduce vaccine uptake.[33] This unwillingness to take vaccine is termed as vaccine hesitancy defined according to WHO as "delay in acceptance or refusal of vaccine despite the availability of vaccination services".[34,35] In this present study, although the number of participants unwilling to take the non-preferred vaccine was not many, health care provider needs to pay attention to this aspect to make the vaccination successful. More awareness about the safety and effectiveness of vaccines will make the population accept the vaccines. In this present study, participants did not mention other reasons such as having currently infected with COVID-19, confident that they will not get infected with the virus, far way vaccination site, considering COVID-19 as not a serious disease, unaware of COVID-19 vaccines, fear of injection, no time to get a vaccination, and religious reason.

People are in the continuous fight against COVID-19 as the virus undergoes continuous mutation causing mortality and morbidity. Fear of COVID-19, therefore still existed even though people were vaccinated very fast. In this study, a greater number of participants (71%) were agreed to strongly agreed that they were afraid of COVID-19, it made them uncomfortable (60%) to think about COVID-19, and 62% were afraid of losing their life because of COVID-19. This study reflected that this pandemic has created great fear among the participants during the ongoing 3rd wave of the pandemic although strict MCO and other protective measures were carried out with a continued vaccination program (Table-4). This present study showed that participants were having a mean fear score of 20.23 on the seven-item fear-scale out of a maximum score of 35. Previous study in Bangladesh showed a fear score of 19.4 among the older people[16], and 18.53 among the general population aged 13 to 90-years-old.[36] In Malaysia, a mean fear score of 17.5 was reportedwhere a low score of 7-21 was reported by 72.9% of participants and a high score of 22-35 was reported by 27.1% of participants[19]. This present study showed a higher score than the previous studies in Malaysia which could be due to the different study periods. This present study is more recent during the 3rd wave of pandemic and the higher score could be due to ongoing pandemic and uncertainty aggravated by isolation, physical distancing causing more loneliness and financial insecurities. A previous study suggests that COVID-19 has an association with health-related anxiety, intolerance of uncertainty, Gender-based violence, and mental health issues.[37] People perceived increased stress, and anxiety that increases morbidity and mortality worldwide.[38-41]

In this present study, comparing the fear score between the non-vaccinated and vaccinated groups, we found the vaccinated group having more fear compared to the non-vaccinated group although no significant difference was observed between the two (Table-5). The higher score in the vaccinated group correlates well with established behavioural theorisations of fear. Fear and anxiety are the natural response of the body activated on the perception of danger or threat and it acts as a signal to trigger the adaptive responses.[42,43] Previous study showed that less fear of COVID-19 is significantly associated with vaccine hesitancy.[44] This present study largely mirrors the psychological construct of a phobia which proves that the vaccinated group of respondents completed vaccination as a response to the fear. A good communication governs a greater adherence to the remedial through right decision making.[45] It is essential to ensure good communication among the people regarding any issue, through widespread trusted media coverage.

This study has some limitations. The distribution of the questionnaire is online as we were not able to conduct the study in person which causes restriction of participants only to those having internet access and digital literacy. Also, the Malaysian population by the demographic distribution of the states may not be represented here. Moreover, the participation of the respondents is voluntary, therefore, the results may be biased as the individuals concerned about the COVID-19 pandemic and vaccine may have responded. The cross-sectional nature of the study is another limitation that reflects the responses for only that time.

Conclusion

It is concluded that most of the participants are knowledgeable and received vaccines despite

some did not get the preferred vaccine. More than 70% of participants have some preference towards the specific vaccine type, and Pfizer-BioNTech is the most preferred vaccine. The vaccinated group showed more fear of COVID-19 compared to the non-vaccinated group although no significant difference was observed. It is vital to increase the awareness among the people who are unwilling or hesitant to vaccinate through the trusted widespread media coverage.

Conflict of interest

The authors declare that there are no conflicts of interest.

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Authors' contribution

All authors have participated sufficiently in the conception, design, data analysis as well as writing of this manuscript and approved its final version to submit to the Journal for publication.

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