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Knowledge Attitude & Perception towards COVID-19 Vaccination and Post Vaccination Status among Health Professional Educators and Staff of a Tertiary Institution of Malaysia

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Abstract: ***The study was done to analyse the knowledge, attitude and perception of health care professional educators and staff towards COVID-19 vaccine. A Cross-sectional study using online survey was conducted involving health professional educators and administrative staff of a tertiary care institution after their COVID vaccination. Pearson product-moment correlation was calculated to determine the correlation between knowledge, attitude and preparedness for COVID-19 vaccination. Multiple logistic regression analysis was performed to assess the factors associated with preparedness towards COVID-19 vaccines. Assessment on knowledge on COVID vaccines, among participants revealed that most of the respondents are aware about the type of COVID-19 vaccines, including its benefits, side effects, eligibility for getting COVID-19 vaccination and public health guidelines that should be followed vaccination. Among the participants, 66.7% of them were able to identify the type of COVID-19 vaccine (RNA & DNA vaccine) administered to them. Regarding the benefits of COVID vaccination, 82.4% of the respondents were aware that COVID vaccine provides protection against the disease, 92.2 % knows that it reduces risk of developing the illness, 58.8% were aware that it protects people and 17.6% indicated that it offers lifelong protection against SARS-Cov-2 virus. There was significant positive correlation between knowledge and attitude and between attitude and preparedness. But there was no significant correlation between knowledge and preparedness. There were no significant association between age, gender, job position, knowledge, and preparedness towards COVID-19 vaccines. There was significant association between attitude and preparedness as those who had higher attitude score were more likely to prepare for COVID-19 vaccination. Both academic and administrative staff of the tertiary institution Malaysia demonstrated high levels of knowledge regarding COVID-19 vaccines.***

Keywords: COVID-19, Vaccine, Knowledge, Attitude, Perception, educators

1. Introduction

Coronavirus disease 2019 (COVID-19) pandemic has been a health problem which is alarming the global population. Since its emergence in December 2019, it has taken a tremendous toll globally. Over 110 million cases and 2.5 million deaths worldwide have been reported by 2021. Most COVID-19 deaths have been reported among older adults and persons with chronic commorbid medical conditions (1). While COVID-19 continues raging worldwide, effective vaccines are highly anticipated, by the end of 2020, over 200 vaccine candidates on various platforms were in development, of which 14 are in late clinical stage development, and three has been approved or received emergency use authorization (EUA) and have started to be rolled out in several countries (UK, US, Russia, Bahrain, and Canada) after considering the safety profiles key by the general public (2).

Beyond the complex logistics of developing and testing, mass manufacturing, and distribution, the public's confidence and acceptance for the vaccines are unclear and changing (3, 4). Vaccine hesitancy for COVID 19 vaccines is widespread (5). Studies regarding intention to get vaccinated against COVID-19 have been published since early 2020 with great variations in question formats and results (6, 7). Many reported a pattern of increasing doubts about vaccine safety and declining receptivity (8, 9). However, differences in their findings and factors associated with vaccine hesitancy unique to COVID19 have not been systematically examined (10). We find perceptions of the risks and benefits of getting vaccinated vary by race, ethnicity, and political party affiliation (11).

General practitioners/Family doctors, academicians in health care set up play a vital role in public vaccination in most countries, and they also serve as role models in their own health behaviours (12). In many countries, they are also the most utilised and trusted sources of information on this topic (13). The most reported motives for GP's own vaccination are to protect themselves and their patients, while the commonest reasons for vaccine hesitancy include preference for actual exposure to disease thereby providing natural immunological protection, concerns regarding side effects, forgetfulness, and their own personal doubts about vaccine efficacy (12). A recent study reported that Academic nursing

leaders have been proactive in assuring widespread faculty and student vaccination uptake (14).

A comprehensive understanding of the current vaccination sentiments and potential determinants of public behavior is critical to encourage population immunization. To ensure the success of the COVID-19 vaccine, it is important to access the preparedness and perceptions towards vaccination against COVID-19 among community, health care professionals, and medical and health profession students. Vaccine readiness of Health care professionals (HSPs) and the public must be carefully determined before a vaccine becomes available (15). Frontline HCPs will play a central role in reassuring patients and the public that COVID-19 vaccines are safe and effective. Faculty will also play an important role in preparing students to be competent and comfortable in answering COVID-19 vaccine questions, and in preparing their school or college's COVID-19 vaccination program. On this direction, the present research was undertaken to understand the perspectives of the staff (Academic and administrative) of a tertiary institution in Malaysia on readiness and acceptance of COVID vaccination and to access the post vaccination status. The main objective of the study was to evaluate the knowledge, attitude and perception towards COVID-19 vaccination and post vaccination status among faculties in tertiary education University in Malaysia.

2. Methodology

A Cross-sectional study using online survey (Questionnaire based) was conducted involving health professional educators and administrative staff after their COVID vaccination. Study population included the academic staff, non-academic staff of a tertiary institution of Malaysia. A convenience sampling method was used for the study population selection. The participants who were willing to participate in this study were enrolled. The participants with medical illness (acute or chronic) during the vaccination period were excluded from the study. Online survey Questionnaire was used to assess the demographic details, readiness for COVID-19 vaccination and Physical and psychological indicators on post vaccination. A validated online survey Questionnaire using google forms via the Survey Monkey Platform, was used. Internet link for the questionnaire was distributed randomly to the MUCM cohort after informed consent (16). The Questionnaire is composed of 16 items, as follows: Section A demographic details, Section B: Preparedness for COVID vaccination, Section C. Post vaccination status – a. Side effects of vaccination, b. Readiness for second dose.

Knowledge component consisted of 5 multiple choice questions which included more than one correct answer in each question. The correct answer was scored 1 and the wrong answer was scored 0. Total score was computed, and higher score indicates higher knowledge. Attitude part consisted of 6 questions and preparedness for COVID-19 vaccination included three questions. Five-point Likert scale (strongly agree, agree, neutral, disagree and strongly disagree) was used. The mean score of each respondent was calculated for both attitude and preparedness. Furthermore, the mean score about preparedness for COVID-19 vaccination was categorized into "prepared" (score ≥4) or "not prepared" (score <4). Readiness for second dose was also asked using five-point Likert scale which ranged from strongly agrees to strongly disagree. Internal consistency was determined calculating KR-20 and Cronbach's alpha coefficient. Kuder-Richardson-20 (KR-20) of knowledge was 0.554 while Cronbach's alpha coefficient of attitude was 0.728 and preparedness was 0.522.

We used Microsoft excel for data entry and SPSS version 12 for data analysis. Descriptive statistics such as frequency and percentage were calculated for qualitative variables, while mean, standard deviation and range were calculated for quantitative variables. Pearson product-moment correlation was calculated to determine the correlation between knowledge, attitude, and preparedness for COVID-19 vaccination. Multiple logistic regression analysis was performed to assess the factors associated with preparedness towards COVID-19 vaccines. Odds ratio and its 95% confidence interval were calculated. All the tests were two-sided, and level of significance was set at 0.05.

Ethical clearance was obtained procedurally from the Institutional review board, research review board. Informed consent was obtained from all the study participants.

3. Results

A total of 51 respondents participating in the study. Among the respondents, 17.6% were administrative staff and 82.4% were lecturer.54.9% of the respondents were 30-49 years and 62.7% were female. Regarding race, 52.9% were Indian followed by Malay (31.4%). [Table 1]

Table 1: Demographic characteristics of the respondents (n = 51)

Variable	N (%)
Age	
18-29	5 (9.8)
30-49	28 (54.9)
50-64	12 (23.5)
≥65	6 (11.8)
Gender	

Male	19 (37.3)
Female	32 (62.7)
Race	
Malay	16 (31.4)
Chinese	6 (11.8)
Indian	27 (52.9)
Burmese	2 (3.9)
Job position	
Administrative staff	9 (17.6)
Lecturer (Faculty of Medicine)	24 (47.1)
Lecturer (Faculty of Dentistry)	8 (15.7)
Lecturer (Faculty of Foundation in Science programme)	10 (19.6)

Table 2 shows that most of the respondents had correctly answered the questions about COVID-19 vaccine including its benefits, side effects, who can take the vaccine, and public health guidelines that should be followed vaccination. Moreover, 66.7% of them were able to answer the correct type of COVID-19 vaccine (RNA & DNA vaccine) administered to them. [Table 2]

Table 2: Knowledge towards COVID-19 vaccines

Question	N (%)	
	Yes	No
The benefits of COVID-19 vaccine:		
Produces protection against the disease	42 (82.4)a	9 (17.6)
Reduces risk of developing the illness	47 (92.2)a	4 (7.8)
Protects people around you	30 (58.8)a	21 (41.2)
Lifelong protection against SARS-Cov-2 virus	9 (17.6)	42 (82.4)a
Who can take COVID-19 vaccine:		
Above the age of 18 years	50 (98.0)a	1 (2.0)
Pregnant women	15 (29.4)	36 (70.6)a
People with high blood pressure	32 (62.7)a	19 (37.3)
People with diabetes	32 (62.7)a	19 (37.3)
Public heath guidelines that was followed after vaccination:		
Stay 2 metres apart	38 (74.5)a	13 (25.5)
Clean your hands often	44 (86.3)a	7 (13.7)
Wear a face mask in crowded places only	30 (58.8)	21 (41.2)a

Drink plenty of water	23 (45.1)a	28 (54.9)
Common side effects of COVID-19 vaccine:		
Headache	39 (76.5)a	12 (23.5)
Swelling of face	5 (9.8)	46 (90.2)a
Fever	43 (84.3)a	8 (15.7)
Body pain	48 (94.1)a	3 (5.9)

Table 3 shows that most of the respondents had positive attitudes towards currently available COVID-19 vaccines as well as they were satisfied with COVID-19 vaccination program which was arranged by the university. [Table 3]

Table 3: Attitudes towards COVID-19 vaccines

Question	N (%)				
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
The currently available COVID-19 vaccines are safe.	8 (15.7)	29 (56.9)	14 (27.5)	0 (0)	0 (0)
All adults should take COVID-19 vaccine.	17 (33.3)	24 (47.1)	7 (13.7)	2 (3.9)	1 (2.0)
I am willing to take the second dose of COVID-19 vaccine.	22 (43.1)	27 (52.9)	2 (3.9)	0 (0)	0 (0)
I will also encourage my family/friends/relatives to get vaccinated.	21 (41.2)	24 (47.1)	5 (9.8)	1 (2.0)	0 (0)
The chances of getting COVID-19 will be low with vaccination.	9 (17.6)	24 (47.1)	11 (21.6)	7 (13.7)	0 (0)
I am satisfied with COVID-19 vaccine program at MUCM.	30 (58.8)	19 (37.3)	2 (3.9)	0 (0)	0 (0)

68.6% of the respondents did not think the COVID-19 vaccines may have serious side effects and all of them thought that strict SOPs should be followed even after 2nd dose. [Table 4]

Table 4: Perception towards COVID-19 vaccines

Question	N (%)	
	Yes	No
Do you think the COVID-19 vaccines may have serious side effects?	16 (31.4)	35 (68.6)
Do you think that strict SOPs should be followed even after 2nd dose of COVID-19 vaccination?	51 (100.0)	0 (0)
Do you think frontline workers should be vaccinated first?	51 (100.0)	0 (0)
Do you think COVID-19 vaccine should be available in local pharmacies?	21 (41.2)	30 (58.8)

Table 5 shows that most of them were prepared to take vaccination as well as they were mentally prepared for any side effects of it. [Table 5]

Table 5: Preparedness for COVID-19 vaccination

Question	N (%)				
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I was excited to take the COVID-19 vaccination.	19 (37.3)	21 (41.2)	11 (21.6)	0 (0)	0 (0)
I am/was mentally prepared for any side effects of CIVD-19 vaccination.	16 (314)	23 (45.1)	9 (17.6)	3 (5.9)	0 (0)

I will/did modify my daily routine/work schedule for COVID-19 vaccination.	14 (27.5)	23 (45.1)	6 (11.8)	6 (11.8)	2 (3.9)

Among the respondents, 76.5% had experienced side effects and 74.5% had these side effects within 1-5 days after vaccination. [Table 6]

Table 6: Post vaccination status

Question	N (%)
Did you experience any side effects after the COVID-19 vaccination?	
Yes	39 (76.5)
No	12 (23.5)
Approximately how many days did the adverse effects of vaccination last after your first vaccination dose?	
1-5 days	38 (74.5)
6-10 days	0 (0)
More than 10 days	1 (2.0)

Table 7 shows the descriptive statistics of the respondents' knowledge, attitudes, perception and preparedness towards COVID-19 vaccines. [Table 7]

Table 7: Descriptive statistics of knowledge, attitudes, perception, and preparedness towards COVID-19 vaccines

Variable	Mean (SD)	Minimum - Maximum
Knowledge (0-16)	12.9 (2.4)	8.0 – 17.0
Attitude (1-5)	4.1 (0.5)	3.2 – 5.0
Preparedness (1-5)	4.0 (0.6)	2.8 – 5.0

A Pearson's product-moment correlation was run to assess the relationship between knowledge, attitude and preparedness for COVID-19 vaccination. Preliminary analyses showed the relationship to be linear and all variables were normally distributed as assessed by Q-Q plot. Table 8 shows that there was significant positive correlation between knowledge and attitude ($r=0.398$, $P=0.004$) and between attitude and preparedness ($r=0.527$, $P<0.001$). But there was no significant correlation between knowledge and preparedness. [Table 8]

Table 8: Correlation between Knowledge, attitudes, perception, preparedness and readiness towards COVID-19 vaccines

Variable	Correlation coefficient (r)		
	Knowledge	Attitude	Preparedness
Knowledge	1		
Attitude	0.398**	1	
Preparedness	0.122	0.527**	1

Multiple logistic regression analysis was performed to determine the factors associated with preparedness towards COVID-19 vaccines. When we checked the assumption of multiple logistic regression analysis, linearity of the continuous independent variables with respect to logit of the dependent variable was assessed. It was found that all continuous independent variables were linearly related to the logit of the dependent variable. There was one studentized residual with a value of-3.813. The logistic regression model was statistically significant, $X2\ (7) = 20.705$, $P=0.004$. The model explained 45.9% (Nagelkerke R2) of variance in preparedness towards COVID-19 vaccination. There were no significant association between age, gender, job position, knowledge and preparedness towards COVID-19 vaccines. There was significant association between attitude and preparedness as those who had higher attitude score were more likely to prepare for COVID-19 vaccination (OR 62.14, 95% CI 4.40 to 878.33; P=0.002). [Table 9]

Table 9: Multiple logistic regression analysis of factors associated with preparedness towards COVID-19 vaccines

Variable	B	SE	Wald	df	P	OR	95% CI for OR
Age							
18-29							
30-49	0.62	1.29	0.23	1	0.630	1.86	0.15 – 23.27
50-64	0.30	1.62	0.04	1	0.851	1.36	0.06 – 32.46
≥65	0.37	1.82	0.04	1	0.838	1.45	0.04 – 51.11
Gender							
Male							
Female	-1.00	0.92	1.18	1	0.278	0.37	0.06 – 2.24
Job position							
Administrative staff							
Lecturer	0.36	0.13	0.13	1	0.716	1.43	0.21 – 9.79
Knowledge score	-0.23	0.22	1.12	1	0.290	0.79	0.52 – 1.22
Attitude score	4.13	1.35	9.34	1	0.002	62.14	4.40 – 878.33

4. Discussion

This study investigated the knowledge, attitude and perception towards COVID-19 vaccination and post vaccination status among faculties in tertiary education University in Malaysia. The respondents included academic staff (82.4%) and administrative staff (17.6%). Demographic profile found that 62.7% of respondents were female. This is in accordance with a recent Nigerian study where most of the respondents were females (17). The results found similarity towards a recent study survey conducted to assess the attitudes to COVID-19 Vaccination among Malaysians residing in Penang. A total of 411 residents from Penang aged 15 and above completed the survey. Women made up 64% of the study population (18). There are contrasting reports of gender effects in the literature, wherein some males were more likely to accept the vaccine (19). compared to others reporting higher acceptance among females (20, 21, 22). Distribution of the races among the study participants indicated that 52.9% were Indians and 31.4% were Malays. However, there is no correlation between the race and the factors studied.

Assessment on knowledge on COVID vaccines, among participants revealed that most of the respondents are aware about the type of COVID-19 vaccines, including its benefits, side effects, eligibility for getting COVID-19 vaccination and public health guidelines that should be followed vaccination. Among the participants, 66.7% of them were able to identify the type of COVID-19 vaccine (RNA & DNA vaccine) administered to them. Regarding the benefits of COVID vaccination, 82.4% of the respondents were aware that COVID vaccine provides protection against the disease, 92.2 % knows that it reduces risk of developing the illness, 58.8% were aware that it protects people and 17.6% indicated that it offers lifelong protection against SARS-Cov-2 virus. The results show similarity with the recent survey conducted among Malaysians which reported that 96% of the participants were aware of asymptomatic COVID-19 infections (18).

Regarding the questions on age and health status for getting COVID-19 vaccination, 98% of the respondents mentioned the age criteria as above 18 yrs. About 70.6% of the participants were aware that pregnant women were not eligible. Also 62.7 % of the respondents are aware that people with high blood pressure and diabetes are eligible for vaccination. Responses on knowledge on public health guidelines that should be followed vaccination, revealed that, 74.5% were aware that they should stay 2 metres apart, 86.3 % mentioned that we should Clean your hands often and 58.8% stated that we should wear face mask in crowded places only and finally, 45.1 % agreed that must drink plenty of water.

Hence in our study, most respondents reported high levels of knowledge regarding COVID-19 vaccines, including its benefits, side effects, eligibility for getting COVID-19 vaccination, public health guidelines however, the reported knowledge of the vaccine benefits was low, indicating the need for an educational intervention on vaccine benefits. Studies have reported a similar finding and identified the need for providing evidence-based education on the vaccine development process for nurses. A recent survey of HCPs conducted by Bhagavathula et al. (2020) reported that there is a gap in science-based understanding of COVID-1 (23). A recent study on the knowledge awareness of the Malaysian public on the coronavirus disease 2019 (COVID-19) reported that the Malaysian public demonstrated good knowledge towards COVID-19, adequate practice of

preventive measures and high acceptance towards the new norm (24).

Knowledge on awareness on the common side effects of COVID-19 vaccine among participants, indicated that 76.5% knew that headache is common and 84.3% were aware that fever is the one of the common side effects after vaccination and 9.8% stated swelling of the face as one of the side effects. A recent study revealed that half of the participants had safety concerns about the vaccine once it was available as indicated by their concerns about related side effects (25). A study conducted in the USA showed that most participants (~63%) were worried about the side effects of the COVID-19 vaccines (26). Our findings also showed that most of the participants felt that receiving the vaccine is important to protect against COVID-19.

Regarding attitude towards COVID vaccination, 72.6% of the respondents had positive attitudes towards currently available COVID-19 vaccines are safe.96% 0f the respondents are willing to take the second dose of COVID-19 vaccine.88.3% agreed that they will also encourage family/friends/relatives to get vaccinated. Among the respondents 96% were satisfied with COVID-19 vaccination program which was arranged by the university. Regarding perceptions towards COVID vaccination, 31.4% think that the COVID-19 vaccines may have serious side effects. Nearly 100% of the participants think that strict SOPs should be followed even after 2nd dose of COVID-19 vaccination. In addition, all the participants think that frontline workers should be vaccinated first. About 41% of the respondents think that COVID-19 vaccine should be available in local pharmacies. This is in accordance with a recent study, which reported that most respondents have high levels of knowledge regarding COVID-19 transmission and use of personal protective equipment (27).

When compared to a recent study (ANF survey, 2020) which reported 34% level of vaccine readiness, we found higher levels of readiness among the respondents investigated. Compared to the ANF study and the Pew Research Centre study (28). Our study reported higher readiness among the respondents. Achieving high vaccination coverage of HCPs early not only ensures an adequate workforce to treat infected patients, but also allows HCPs to share their positive vaccination experiences with patients (29). A recent study indicated that nursing students and adjunct clinical faculty are less willing to receive the COVID-19 vaccine compared with full-time faculty highlighting the key role of full-time faculty in providing education on the importance of the COVID-19 vaccine. The most frequently reported reasons for not being willing to receive the vaccine in our study were the belief that the vaccine will be developed too quickly to be safe and a concern about vaccine side effect (27).

Regarding the preparedness for vaccination, our findings indicated that most 78.5 % of the respondents were excited to take the COVID-19 vaccination and 76.5% of the respondents were mentally prepared for any side effects of it. This is in accordance with a recent report from a survey study which showed that the majority of respondents (72%) were likely to accept the COVID-19 vaccine (18). This result is also in accordance with a recent Malaysian survey which reported that most of the respondents were willing to get vaccinated (30).

Regarding post vaccination status, 76.5 % of the respondents experienced side effects after the COVID-19 vaccination. Among the participants 74.5 % mentioned that adverse effects of vaccination lasted for 1-5 days after the first vaccination dose and 2% mentioned that it lasted for more than 10 days.

The results indicated that there was significant positive correlation between knowledge and attitude and between attitude and preparedness among the participants. On the other hand, there was no significant correlation between knowledge and preparedness. Multiple logistic regression analysis of the factors associated with preparedness towards COVID-19 vaccines indicated that there was no significant association between age, gender, job position, knowledge, and preparedness towards COVID-19 vaccines. This is in contrast with results of a recent study which stated that vaccine acceptance rates differ by socio-demographic characteristics, ethnic groups and level of education. (18). There was significant association between attitude and preparedness as those who had higher attitude score were more likely to prepare for COVID-19 vaccination.

5. Conclusion

In summary, our findings suggest that both academic and administrative staff of the tertiary institution Malaysia demonstrated high levels of knowledge regarding COVID-19 vaccines, including its side effects, eligibility for getting COVID-19 vaccination, public health guidelines. However, the reported knowledge of the vaccine benefits was low, indicating the need for an educational intervention on vaccine benefits. The study also indicated that most of the staff were prepared for COVID vaccination and were mentally prepared for any side effects of it. As a tertiary health care providing institution it is essential for the HCPS to keep in track the results of the COVID-19 vaccine clinical trials and to gather timely information regarding the safety and efficacy of COVID-19 vaccines. Hence this information can be disseminated to students as faculty play a significant role in educating them.

6. Recommendations

This also recommends the development of health awareness campaign and trainings, educational interventions on COVID 19, coping strategies and benefits of vaccination for public/patients in our clinical attachment centres. The study also recommends the development of a policy statement supporting COVID-19 vaccination uptake and the vital role of academic and administrative staff in educating and encouraging the public and students regarding the safety and efficacy of the vaccine, would be extremely valuable. These measures would offer healthcare assistance to the community in pandemic.

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