Original Article

KNOWLEDGE, ATTITUTE AND ACCEPTANCE TOWARDS COVID-19 VACCINES IN MALAYSIA

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ARTICLE INFO

ABSTRACT

Total number of COVID-19 cases reported in Malaysia is increasing day by day, and the number of severely sick patients necessitating ICU and ventilator treatment has risen. In order to combat this pandemic, vaccines are one of the most effective approaches to safeguard our civilization from COVID-19. Malaysia has launched National COVID-19 Immunisation Programs to stop the outbreak from becoming worse. Therefore, a study was conducted to assess the attitude and acceptance of COVID-19 vaccine in Malaysia. A cross-sectional study was conducted involving a total number of 700 respondents from 29th March 2021 to 28th July 2021. The distribution of questionnaires in dual languages by using Google form was through social media platforms. The questionnaires consisted of 35 questions with socio-demographic information and questions on knowledge, attitude and acceptance towards vaccines in Malaysia. SPSS version 26 was used to analysed the data. The result found that quarter of the respondents do not know about the mechanism of vaccine action, side effects of vaccine and safeness after taking vaccine jab. Attitudes of Malaysian towards the COVID-19 vaccine were not very convincing when this study found that only 58% had good attitudes while the other 42% had bad attitudes. Malaysian attitudes depend on gender, ethnicity, age, region, marital status, monthly income, and level of education. However, the acceptance rate was high, where 81% of Malaysian are willing to accept vaccines, and only 19% reject vaccines. The main reasons for rejecting COVID-19 vaccines were worries about the unforeseen effect and efficiency of COVID-19 vaccines. There is an urgent need to counter misinformation and provide accurate and reliable information. Strategies to increase good attitudes and acceptance rates towards vaccines should target community-specific concerns. This study will guide government and public health officials to develop an efficient campaign to deliver public health messages regarding vaccines in Malaysia.

INTRODUCTION

COVID-19, also known as coronavirus disease, is caused by SARS-CoV-2 originating from Wuhan, China, in December 2019. In a short period of time, its spreading has affected the populations of many countries; thus has been declared as a pandemic as of 11th March 2020 by the World Health Organization. Malaysia, as an addition to the total of 79 states world-wide, to be in a state of emergency in response to the pandemic [1]. There were thousands of daily cases reported in Malaysia and even up to hundreds of thousands that have been recorded by other countries. Hence, make up the total new cases of the world beyond control, highlighting the urgency of vaccination. Thus, the production of vaccines against COVID-19 mushroomed worldwide as an alternative to prepare the body's immune system against the coronavirus since prevention is better than cure. Various sources, including news, newspaper, and social media, are contributing a vital role by advertising the vaccination to the citizens as COVID-19 Vaccine jabs are being distributed everywhere in the world now.

All states and territories have showed an increase in new COVID-19 patients [2]. The vaccination programme in Malaysia or known as National COVID-19 Immunization Programme had been launched on 24 February of 2021. This programme had been launched by Prime Minister Muhyiddin Yassin. The purpose of this programme are to reduce the burden of disease for those in high-risks groups from the COVID-19 infections [3]. Besides, this programme also purposed to control this pandemic of covid-19 by the strategy of vaccination

distribution to those which had been prioritized based on the phases to receive the vaccination.

The groups that had been prioritized for the vaccination on the first phase that will be conducted from February until April of 2021 are the front liners that comprising for public and private health care personnel and for those front liners that consisting of essential services, defence and security personnel. The Ministry of Health has estimate that 500 thousands people will receive the vaccination from February until April of 2021 [4].

The second phase of vaccination programme that will be held from April until Augusts of 2021. The priority groups for this second phase are those remainder of health care workers as well as those in essential services, defence and security personnel. The senior citizens which are in range of aged 60 and over, the high-risk group with chronic diseases such as heart disease, obesity, diabetes and high blood pressure and people with disabilities (OKU) will also had been prioritized to receive vaccination in this second phase. The Ministry of health has estimate that 9.4 million people will be receive the vaccination on this second phase [4]. However, the information be reviewed periodically.

The third phase of vaccination programme that will be held from May of 2021 until February of 2022. The groups of this phase are among those adult population that are in range of aged 18 years old and above which are either citizens or non-citizens. However the priority will be given to those in the red zones followed by those in yellow zones and finally for those in green zones. The Ministry of Health has estimate that around 13.7 million people or more will be receive vaccination on this third phase [4].

There were four types of vaccines from different pharmaceutical companies that have been signed by Malaysia, which are Pfizer, Astra Zeneca, Sinovac and CanSinoBIO [3]. The mechanism of each type of the vaccines may differ or may also have similarities in between. For instance, Pfizer contains an mRNA sequence, whereas Sinovac utilizes virus that has been killed. Meanwhile, Astra Zeneca and CanSino-BIO perform a similar mechanism through a modified (vector) virus. On the other hand, the types of vaccine also influenced its advantages and weaknesses as it might be related to the mechanism factor. Pfizer is simple and quick to produce, but it must be stored in extremely cold conditions, and its type is used for the first time as a vaccine. Mean-while, Sinovac is suitable for those who have a weak immune system; even so, its manufacturing cost is high. On the other hand, Astra Zeneca and CanSino-BIO are proven technology, yet there is still a need to ensure that the virus is safe to use. As some of the vaccines vary from each other and all of them came from different manufacturers, so does the efficacy that it has on individuals. As to specify, Pfizer, Astra Zeneca, Sinovac and CanSinoBIO can work well up to 95%, 62%-90%, 50.4%-91.25%, and 65.7% respectively.

Herd immunity can be obtained if the vaccination takes place among the population [5]. Therefore, to achieve immunisation in Malaysia through vaccina-tion, this study should be conducted to assess how far the population in Malaysia has knowledge towards COVID-19 vaccine. The knowledge criteria in this study encompass the production and usage, effects, implementation, as well as religious views and beliefs towards the COVID-19 vaccine. Thus, the knowledge is essential for the authorities to take further action towards the government implementation associate with COVID-19.

METHODOLOGY

A total number of 700 responses were received from this cross-sectional study which was conducted from 29th March 2021 to 28 July 2021. Data was collected via online questionnaires by using Google Form. A questionnaire was developed comprises 35 questions with socio-demographic data, knowledge, attitude and acceptance towards COVID-19 vaccine in Malaysia. To identify these factors systematically, literature review and the pilot test were being use as a guide. A pilot study was conducted prior to the actual data collection. The Cronbach alpha value was 0.84. The dual language questionnaire was then distributed through social media platforms such as Facebook, Instagram, WhatsApp and email. The inclusion criteria for this study were Malaysian citizen, age 18 years old and above, and have not yet received the COVID-19 vaccine.

In this study, the sample size consists of 700 respondents with age of 18 to 65 years old. The sampling method was stratified convenience random sampling which involved 297 (42.4 %) male and 403 (57.6 %) females. Any information about the respondent's full name, IC number, or actual address were collected, so they will remain anonymous. Malaysian citizens, age 18 above, and not received the COVID-19 vaccine yet.

Statistical Analysis
The SPSS statistical package version 26 was used to examine all of the data. For categorical variables, the Likelihood Ratio (chi-square) and Games-Howell test were used to compare two groups. T-test and one-way ANOVA tests were conducted to assess differences between groups for continuous variables. A p-value of less than 0.05 was considered significant for all of these statistics.

Calculation of Score
Each answer from 15 questions regarding knowledge in the questionnaire was given a score with a "1" for the positive answer and a "0" for negative answer. Knowledge towards COVID-19 vaccines was categorized into three; poor, moderate and good knowledge. Respondents with score of 0 to 5 were considered as having poor knowledge. Those with score of 6 to 10 were considered as having moderate knowledge. While respondents with score of 11 to 15 were consid-ered as having good knowledge.

In calculation of score for attitude towards COVID-19 vaccines, each respondent will get score for 8 questions regarding attitude. Respondent with score 0-4 was categorised as having bad attitude, while the respondent with score 5-8 was considered as having good attitude towards COVID-19 vaccines. Calculation for acceptance was direct from the only one question either the respondent answer accepts or reject of taking COVID-19 vaccines.

RESULTS

The number of participants in this study was 700 respondents which constitute of 58% (403) females and 42% (297) males (Figure 1). The respondents were categorized into three age groups. The highest number of respondents were from young adults (18-39 years old) which is 519 (74.1%), followed by middle age adults (40-59 years old) which is 170 (24.3%), and old adults (more than 60 years old). The majority of ethnicity was Malay with 622 respondents (89%), followed by Indian with 49 respondents (7%), Chinese with 12 respondents (2%) and from other ethnicity with 17 respondents (2%). For religion, the highest percentage was Islam (91%), followed by Hindu (6%), Buddha (2%) and Christian only (1%).

The respondent whom single were 445 (63%), married 244 (35%) and divorced or separated or widowed were only 11 (1%). Most respondents had degree and above (65.5%), followed by respondents with diploma or vocational (23.2%), primary and secondary school (9%) and lastly the respondents with no formal education (0.3%) respondents. Lastly, the others was 14 (2%).
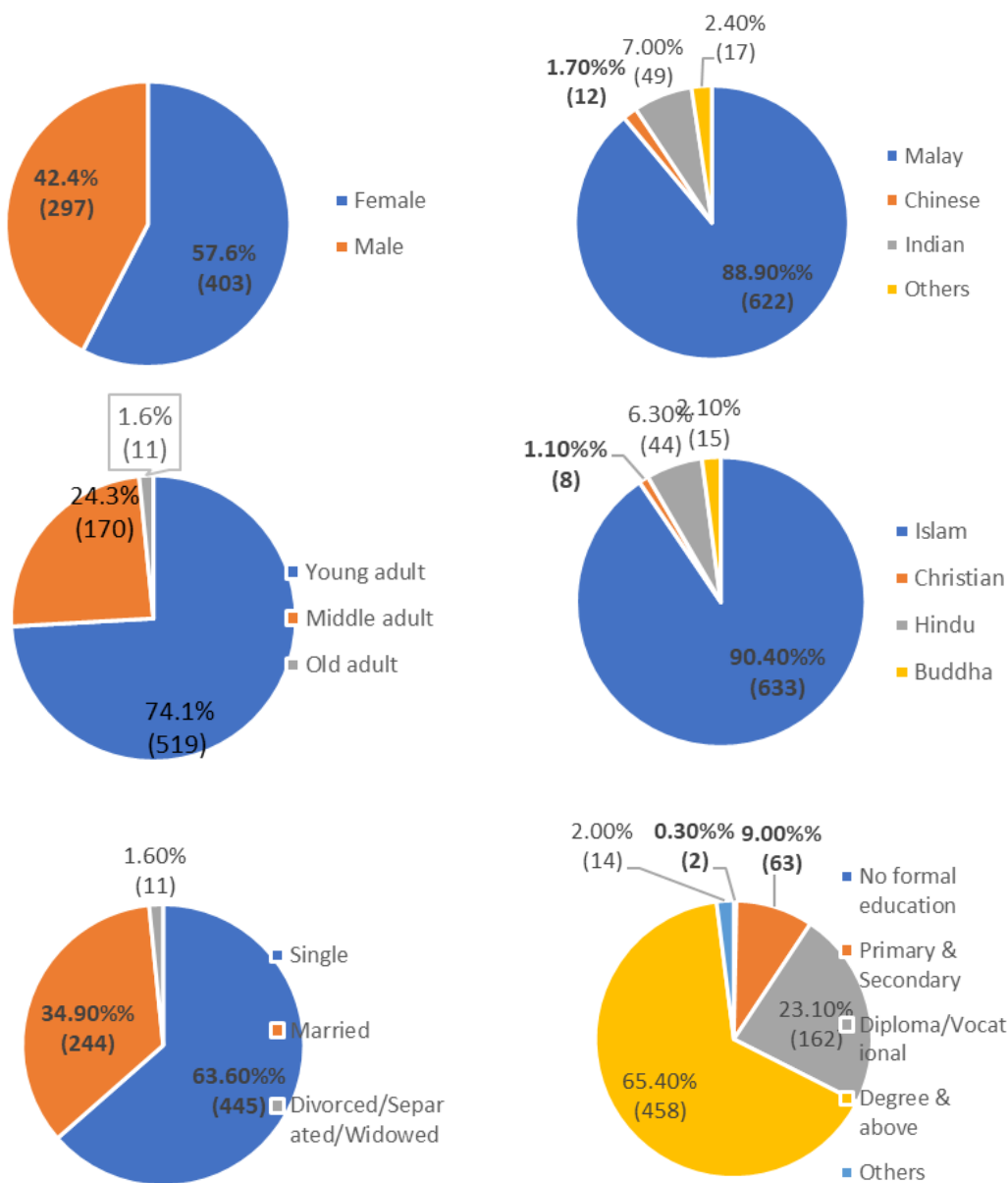

Figure 1: Demographic data

Most of the respondents were from northern peninsular of Malaysia with 41%, followed by respondents from middle peninsular (20%), east peninsular (22%), southern peninsular (12%) and lastly from East Malaysia with only 5%. Mostly respondent were not working which consist of 350 respondents (50%). Respondents in B40 group were 155 (22.1%) and those in the M40 group were 141 (20.1%). T20 group and others group had the lowest number of respondents as those in the T20 group were only 19 (2.7%) and the others group consist of only 35(5%).

Knowledge Towards COVID-19 Vaccines
The result in this study revealed that 609 respondents have good knowledge towards COVID-19 vaccines, followed by 83 respondents with moderate knowledge and 8 respondents with poor knowledge. Table 1 showed the percentages was 87%, 11.86% and 1.14% respectively.

Attitude Towards COVID-19 Vaccines
Figure 2 depicts respondents' answers for eight questions regarding attitudes towards COVID-19 vaccine. Overall, question 8 has the most positive

Table 1: Knowledge towards COVID-19 vaccines

LEVEL	SCORE RANGE	COUNT	PERCENTAGE
GOOD	11-15	609	87%
MODERATE	6-10	83	11.86%
POOR	0-5	8	1.14%
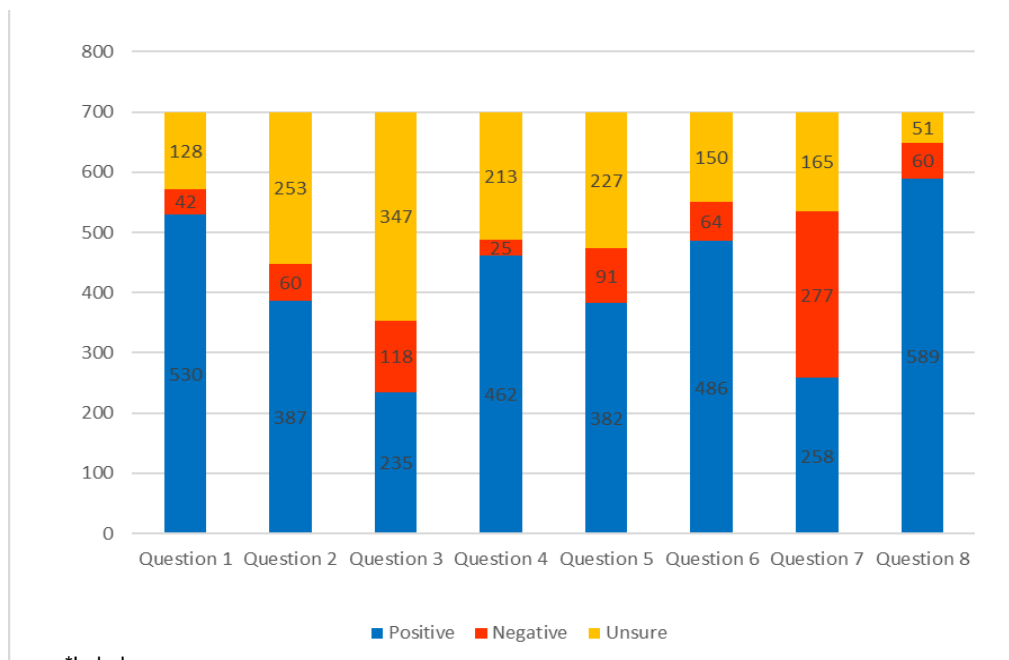
*Label

Q1: Do you think that vaccine COVID-19 is essential for us?

Q2: Do you think that vaccine COVID-19 is safe?

Q3: Do you think that vaccine will cause death?

Q4: Do you think COVID-19 vaccine is halal?

Q5: Do you think COVID-19 vaccine is a conspiracy agenda?

Q6: Will you encourage your family, friends and relative to get vaccinated?

Q7: Do you think that COVID-19 can be eradicated if you just follow SOP without vaccination?

Q8: Do you think that after getting vaccinated, you can disobey SOP?

Figure 2: Question on Attitudes toward COVID-19 vaccine.

answer which respondents think that they cannot disobey SOP even after getting vaccinated. Question 3 has the highest number of negative answer (including unsure), that think COVID-19 vaccine will cause death. The number was found to be quite alarming.

Respondents with good attitude were 58.1%, whom had score 5 and above in attitude score. Respondents that had score 4 and below were considered as having bad attitude towards COVID-19 vaccine, comprising of 293 respondents (41.9%). Figure 3 describing the attitude of Malaysian based on socio-demographic factors.
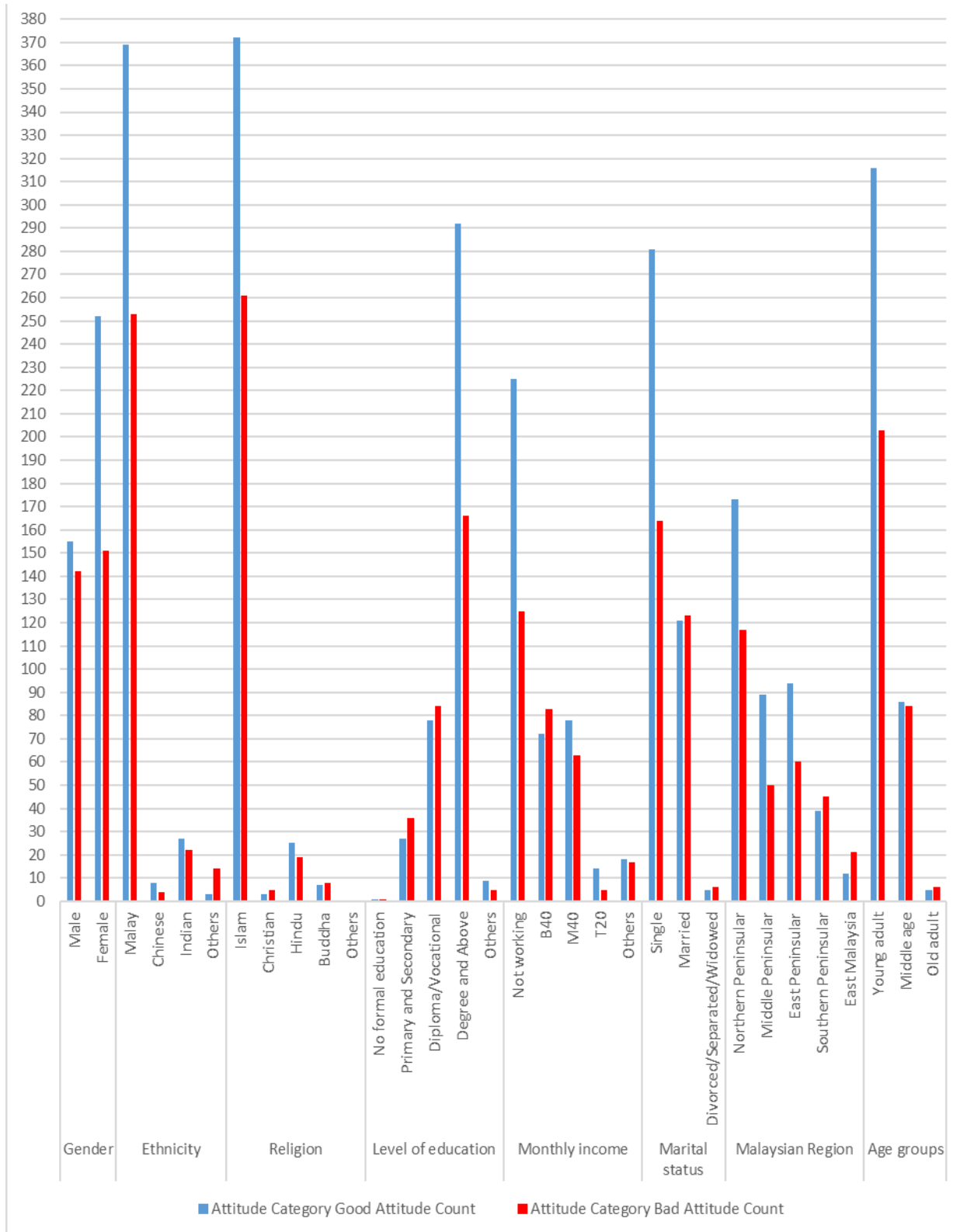

Figure 3: Attitudes category based on socio-demographic factors.

Acceptance Towards COVID-19 Vaccines

The results of acceptance towards COVID-19 vaccine found that 569 respondents (81.3%) accepted vaccine, while 131 respondents (18.7%) rejected vaccine. Figure 4 showed a clearer picture of how many Malaysians accepted and rejected COVID-19 vaccine based on socio-demographic factors. Most people whom rejected COVID-19 vaccine came from low education background and young people.
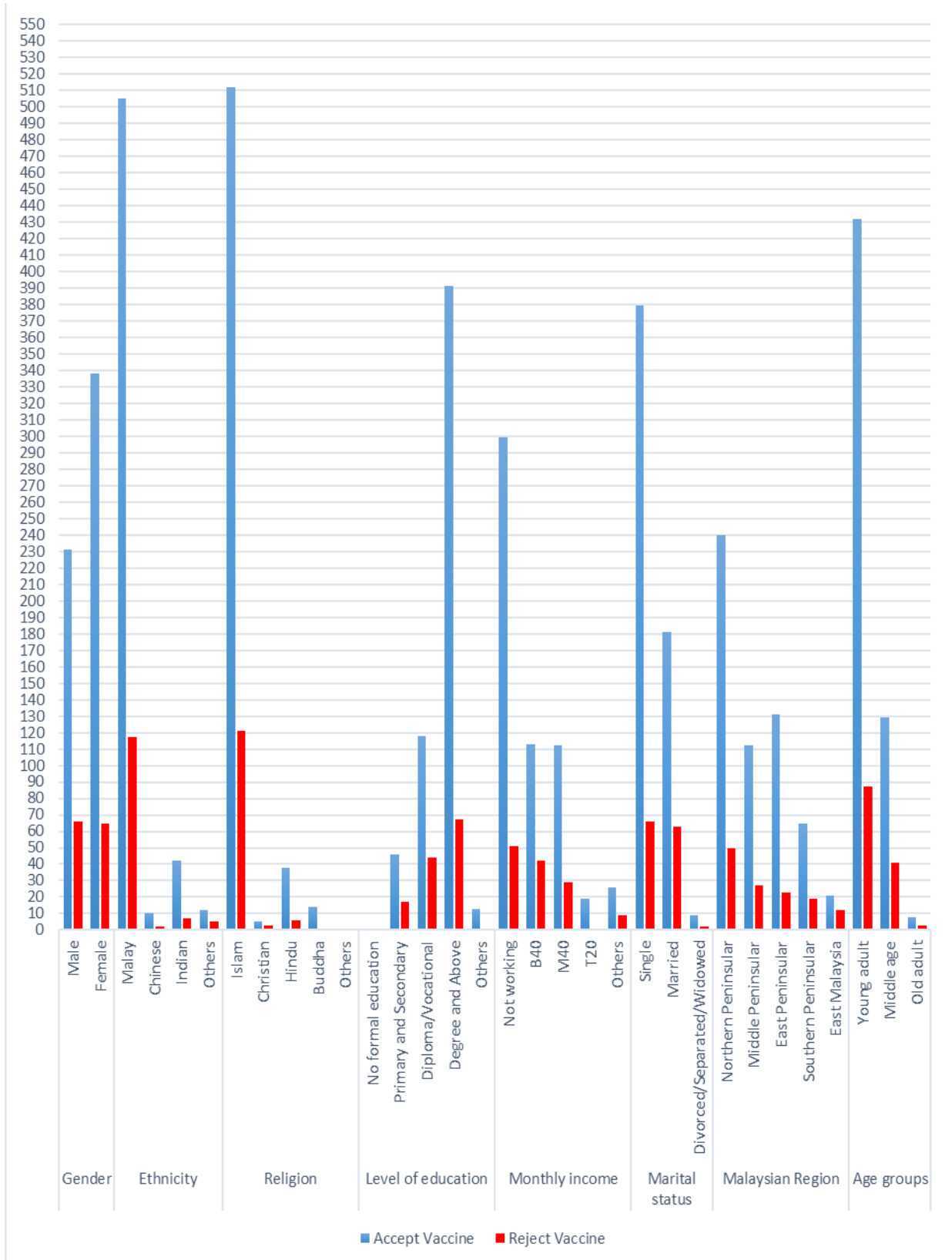

Figure 4: Acceptance Towards COVID-19 Vaccines based on socio-demographic factors.

Based on Chi-square test, it is found that category of attitude either the respondent had good or bad attitude was influenced by gender, age group, ethnicity, state, level of education, monthly income, marital status, did not influence by religion. There was a significant association ($p < 0.05$) between acceptance category and gender, Malaysian regions, level of education, monthly income and marital status. There was no significant association ($p > 0.05$) between acceptance category and ethnicity, religion and age group.

In the last part of the questionnaire, respondents were asked to list down the reason of rejecting vaccines. The reasons were showed in Figure 5. The main reason was that Malaysians are worried about unforeseen effect from COVID-19 vaccine and nd not really sure about the effectiveness of the vaccines.

DISCUSSIONS

This study showed that the percentage of respondents with good knowledge on COVID-19 vaccination is high (87%). This percentage shows that most of Malaysians have good knowledge on COVID-19 vaccination. To compare this result with previous studies, what can we say is that all results are consistent. Study by Negin Vaghefi et al. and Azlan

A et al. gave the results 94% and 80.5%. Knowledge towards COVID-19 were associated with educational level. This shows that educational level has important role in determining the level of knowledge. In this study we found that respondents with bachelor's degree or above have higher knowledge level compared to lower educational level. As educational level is related to cognitive ability, then it is not surprising to see such finding.

Malaysia has a high acceptance rate (81%) towards COVID-19 vaccine, and only 19% Malaysian adults reject vaccine. The result was similar to a study by Syed Alwi (2021) which was conducted in December 23–29, 2020, recorded 83.3% acceptance rate in Malaysia [6]. A study by Vaghefi (2021) which was conducted from 1 December 2020 to 25 January 2021, recorded 72% acceptance rate in Penang population [7].

However, this study found that only 58% Malaysians are having good attitude towards COVID-19 vaccine while the other 42% are having bad attitude. It does not in accordance with the high acceptance rate, probably the questions were not enough to reflect the real situation. But, if this is true, there is an urgent need to counter misinformation and provide accurate and reliable information.
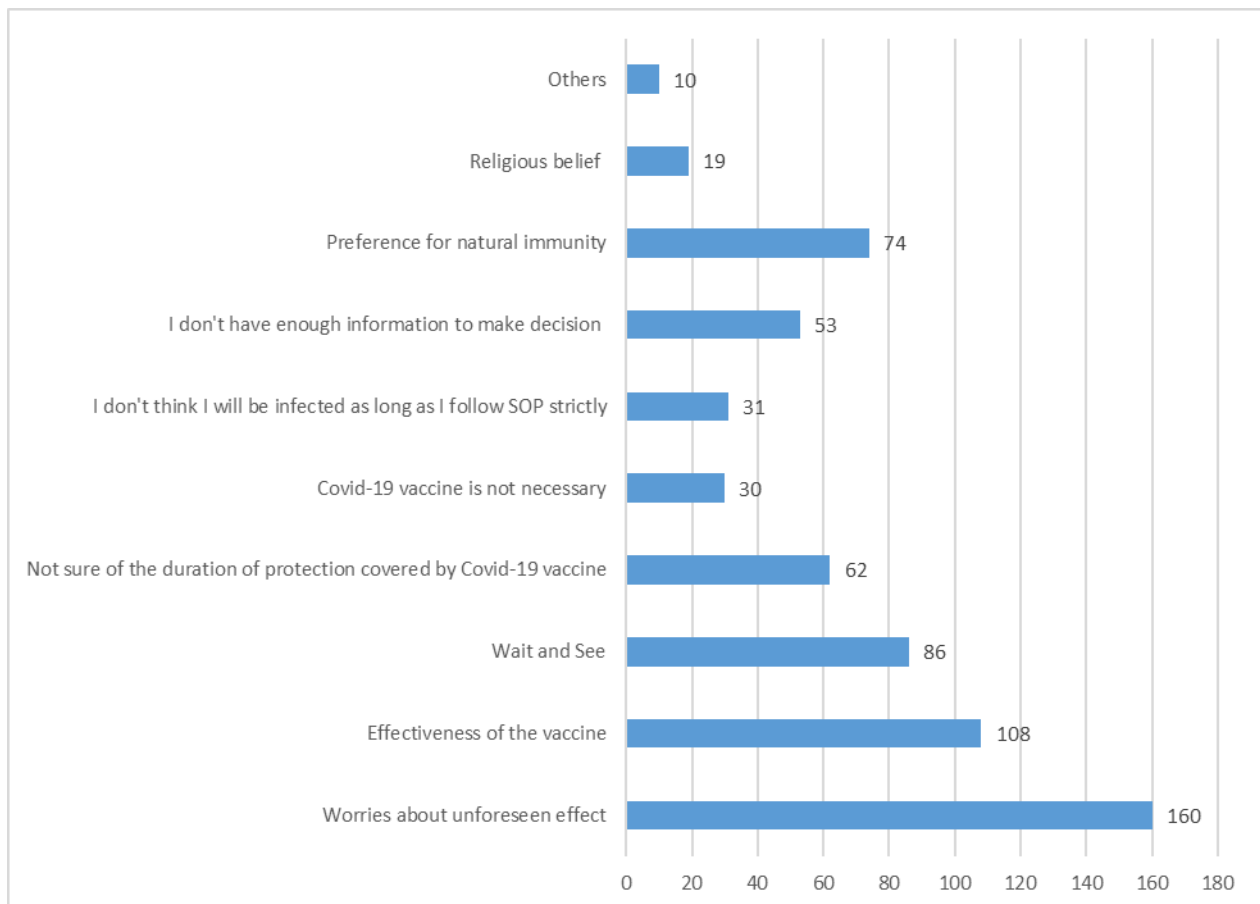

Figure 5: Reasons of rejecting COVID-19 Vaccines.

Other countries having high acceptance rate were Ecuador (97.0%), Indonesia (93.3%) and China (91.3%). Lower COVID-19 vaccine acceptance rate were reported in the Middle East Kuwait 53.1% [8], Russia, Africa and several European countries [9]. Several surveys about COVID-19 vaccine acceptance and hesitancy were also conducted in countries such as Canada [10]., Kuwait, America (79%) and Australia (85.8%) [11].

Malaysian has a low degree of COVID-19 vaccine hesitancy. Differences in COVID-19 vaccine acceptance, non-acceptance, or hesitancy may be attributed to differences in socio-demographic characteristics, health characteristics, human behaviour, vaccine availability, control of rumours and misinformation, confidence in the health system, type of vaccines available, side effect concerns, and level of trrust in vaccine advantages [12]. In this study we found that Malaysians reasons of rejecting were due to worry about the unforeseen effect and the effectiveness of the vaccines. Furthermore, the prevalence of worries about unintended consequences was associated to a greater likelihood of vaccination non-acceptance. This is in line with a recent American/Canadian study, which found that vaccination rejection was most closely linked to a scepticism of vaccine efficacy as well as a fear of unanticipated possible side effects. Herd immunity would be difficult, if not impossible, to achieve with these views. Moreover, the unacceptance of vaccine can be due to females' concerns about the vaccine's unforeseeable and long-term adverse effects on pregnancy and future generations, as well as the fact that a significant number of females are pregnant, breastfeeding, or expecting to become pregnant in the near future [12].

The subjects who have health-related risks were less likely have a will to take the vaccine. There is also respondent who reject vaccine as he need to under-go chemotherapy. The major issue about obtaining the vaccination is not whether it is safe for cancer patients, but rather how successful it will be, especially in those with compromised immune systems. Chemotherapy, radiation, stem cell or bone marrow transplants, and immunotherapy are all cancer therapies that might impact the immune system, making the vaccination less effective. People who have certain malignancies, such as leukaemia or lymphoma, may have weaker immune systems, making the vaccination less effective.

Respondent with lower education level is less likely to accept the vaccination in comparison to those with higher education level. This is due to the lesser amount of knowledge they can access or exposed to. Furthermore, many studies agreed with the findings that education is a factor in acceptance toward COVID-19 vaccine. A worldwide scale study had determined that respondents with higher knowledge about COVID-19 had higher chance of accepting COVID-19 vaccination, and university graduates had higher chance of accepting vaccination compared to respondents with primary or secondary school education. This disparity in the willingness to take COVID-19 vaccination was also

found in a U.S. study, where those who did not complete high school education reported lower acceptance prevalence as compared to those who did. Therefore, increasing knowledge about COVID-19, especially among those with fewer years of education, should be an effective way to increase willingness to take the

Vaccines are an extremely effective weapon in the battle against COVID-19. Some side effects will be experienced, which are common signs that the body is preparing to defend itself. These side effects may make it difficult to perform daily tasks, but they should subside within a few days. Some people experience no negative side effects [13] Pain at the injection site, tiredness, headache, muscle pain, chills, joint pain, and fever were the most commonly reported side effects, which typical-ly lasted several days. It is worth noting that these side effects were more common after the second dose than after the first, so vaccination providers and recipients should expect some side effects after either dose, especially after the second [7,13].

However, it is equally crucial to remember the dangers of COVID-19 infection. The chance of major side effects from vaccination is far lower than the chance of major disease or even death from COVID-19 infection. After the first injection, body starts making antibodies against the coronavirus. These antibodies aid the immune system in fighting the virus if the body are exposed, lowering the risk of contracting the illness. Antibodies, which are big proteins, are one of the ways the immune system fights infection. These antibodies serve as scouts, tracking down the infectious pathogen and designating it for immune system destruction. Each antibody is unique to the bacterium or virus it has identified, and it will elicit a distinct immune response. After the illness has passed, these particular antibodies will stay in the immune system. This implies that if someone contract the same illness again, immune system will have a 'memory' of it and will be ready to eliminate it before become ill and any symptoms appear [15]. Various types of vaccinations provide protection in different ways. However, all vaccinations leave the body with a supply of "memory" T-lymphocytes and B-lymphocytes that will remember how to fight the virus in the future. The body normally produces T-lymphocytes and B-lymphocytes a few weeks fol-lowing immunisation. As a result, a person might become infected with the virus that causes COVID-19 either before or shortly after immunisation and become ill as a result of the vaccine failing to give adequate protection [16].

However, someone can still be infected after getting vaccinated, but due to something called herd immunity, your odds of being sick are decreased even further. As a result, getting vaccinated not only lowers your risk of infection, but it also helps to safeguard the community by lowering the risk of viral transmission. This is a positive step since it allows us to return to regular life by establishing herd immunity [17].

All vaccines must go through a rigorous and detailed process before being approved for use [18].Clinical trials for vaccines were completed faster than for other vaccines. This was made feasible by a large amount of prior research that aided in their design, as well as vast financial rsources that allowed several development procdures to be completed simultaneously rather than sequentially, as would normally be the case. There has been expert and careful review of the science. The data from the vaccine trials were reviewed by both the FDA and independent scientists. The COVID-19 vaccines are not considered experimental. The data from the Pfizer-BioNtech, Moderna, and Janssen COVID-19 vaccines show they are highly effective in preventing severe COVID-19 and have revealed no safety concerns, including in people with chronic disease. Most people will tolerate the COVID-19 vaccine well.

In this study, 118 Malaysians think that vaccine causes death, 235 says no and the remaining 347 were unsure. Pfizer and AstraZeneca are two of the vaccines in use in Malaysia, together with other vaccines also approved and used by the National Pharmaceutical Regulatory Agency. Both the Pfizer and AstraZeneca vaccines are known to be effective in protecting individuals from severe disease and risk of death due to COVID-19 in adults of all ages. In the case of AstraZeneca, there have been reports of a serious, but very rare, side effect of blood clotting. To date, this condition has occurred in fewer than 10 people out of every million people that have received this vaccine. It is important for people and health workers to understand that this risk exists and to be alert to report and provide immediate medical care when these occurs. However, it is also important to remember that the benefits of vaccination far outweigh the risks of these serious adverse events. This is why WHO continues to recommend vaccination against COVID-19, especially for priority groups such as health workers, older persons and those with underlying health conditions. The number of cases of COVID-19 in Malaysia is currently rising. Vaccination, combined with other public health measures, is the best way to protect yourself and help control the infection rate. This is the reason of government authority recommends taking the vaccine when available.

Religiosity, when combined with enough understanding about the efficiency and effectiveness of COVID-19 vaccinations, tends to influence the decision to receive the vaccine. Religious views impact medical and scientifically solid evidence, leading to a variety of responses to vaccination, such as vaccination hesitancy [19]. The relationship between religious beliefs and vaccination is likewise complicated, with differences between and within religious groups. The US Catholic bishops have declared COVID-19 immunisation an "act of charity for the other members of our community," using spiritually grounded understandings of the common good. At the same time, certain Christian groups have expressed ethical concerns about the use of foetal cells in the production or testing of particular vaccinations. The halal status of different vaccinations is a source of worry for some Muslims [20]. On the international scale, major fatwa organisations, like the al-Azhar al-Sharif and the National Fatwa Council of the United Arab Emirates, have issued fatwas on the permissibility of vaccination usage [21].

There were some limitation in this study. Sample size was limited in terms of religion and ethnicity. In this study, the result is dominated mainly by Malays, Muslims, females and youths with age between 18-25. This inequality could cause biases in this study. Increasing the number of non-dominant respondents may give different and more accurate result. Secondly, data collection was conducted online, which means that may not have reached vulnerable groups such as the lower socioeconomic background and those who are illiterate. Lastly, a larger percentage of the respondents were from a single geographic area (Northern Peninsular Malaysia), which may impact the generalisation of the survey results.

CONCLUSION

This study showed that Malaysian adults having high percentage (87%) of good knowledge towards COVID-19 vaccinne. Malaysians have received adequate knowledge on production, usage, effect, implementation and religious view about COVID-19 vaccination. Level of education has a significant association with the results. Meanwhile, attitudes of Malaysian towards COVID-19 vaccine was not very convincing when this study found that only 58% had good attitude while the other 42% had bad attitude. There is an urgent need to counter misinformation and provide accurate and reliable information. This study also found that 81% Malaysian are willing to accept vaccine and only 19% reject vaccine. The reasons of rejecting was due to worry about the unforeseen effect and the effectiveness of the vaccines.

Strategies to build good attitudes towards vaccine and acceptance rate should directly address community-specific concerns or misconceptions. Therefore, this study will help government and public health officials develop a proper strategy and efficiently deliver public health messages. The high knowledge of Malaysians on COVID-19 proved the success of recent policies showing that it should be maintained but the attitude of Malaysian towards vaccine need to be improved with proper strategies targeting the specific sociodemographic groups.

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