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Factors Affecting the Intention to Receive Future COVID-19 Booster Vaccines in East Coast States in Malaysia

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Abstract: This conceptual paper is presented to study the factors affecting the intention to receive future COVID-19 booster vaccines in three East Coast states in Malaysia, which has become a concern to the government and health system in the country. It begins by reviewing the literature on associated factors and intentions against the booster vaccination. The Theory of Planned Behavior is used as the basis of the study. This study is driven by the low vaccination rates in Kelantan, Terengganu, and Pahang. Past studies have discussed the acceptance of COVID-19 vaccination in the country, but very few focus on these states. Due to the limited findings on the issues, this study, therefore, attempts to explore the factors influencing vaccination intention using a quantitative method. The survey distribution and data collection focus on the three states' residents. The findings are believed to be able to provide new insight and knowledge, especially to the healthcare providers and government to increase the vaccination rates in these states and prevent the severity of COVID-19 comeback.

Keywords: *COVID-19, Booster, Intention, east-coast states, Malaysia*

1. Introduction and Background

A severe respiratory disease called COVID-19 or Coronavirus disease has marked the world with an unforgotten memory where more than 300 million infected people and exceeded 6 million deaths have been recorded all over the world due to the rapid spreading and fatal infections (WHO, 2022). The disease pandemic not only affected psychological and physical health but also forced and drastically changed people's lives financially and socially including education and occupation (Yahaghi, et al., 2021). During the pandemic, vaccination against the virus was believed as the most effective approach to combating COVID-19 (Fan, et al., 2021). The development of the COVID-19 vaccine in a relatively short period and the administration for the masses around the world was proven to effectively help stop the spreading of the virus, slow down the transmission, and ultimately end the spreading through herd immunity (Duong & Antriyandarti, 2022).

The arrival of a new COVID-19 variant, a sub-variant of Omicron from China in late 2021 has led to the need for the third COVID-19 vaccine dose to previously vaccinated individuals. According to Thye et al. (2021), the administration of the booster dose was believed due to the wane of immunity and the weakening of protection provided by previous vaccines where the third dose is needed to boost immunity, restore the levels of antibodies and increase protection to the people for longer-term protection against the COVID-19. As per Wong et al. (2022), the COVID-19 vaccine booster was demonstrated to boost immunity and to have tolerable side-effect profiles. In mid-October 2021, Malaysia administered their booster vaccination to all vaccinated citizens, and by April 2024 more than 16 million people received at least their first booster dose.

World Health Organization (WHO) refers COVID-19 vaccine as a vaccine that can stimulate the immune system in the body in the instance of exposure to the virus and enables the body to react against COVID-19 infections. It is reported, that until December 2023, 13.64 billion doses of vaccines have been administered and 67% of the global population has been fully vaccinated (WHO, 2022). Malaysia, the National Vaccination program since the early 1950s and over the years has administered vaccines to protect people from vaccine-preventable diseases such as DTP (anti-diphtheria, tetanus, and pertussis vaccine) and BCG vaccine against tuberculosis (Khoo et al., 2020). The Malaysian National COVID-19 Immunisation Programme (NIP) was launched to curb the pandemic and aims to make sure that at least 80% of the adult population has been vaccinated by February 2022 by giving free vaccination to the people. Until August 2024, more than 27 million people (84.4%) had received the two doses of the primary series, and 16 million received their first booster dose. The success of the COVID-19 vaccine administration led the country to shift to the endemic phase from April 1, 2022, however, in recent years, the vaccination rate has shown a downward trend after the first dose, especially for first and

second booster doses (KKM, 2024). The World Health Organization declared that COVID-19 is not over, but it is circulating and, in some countries, the cases are on the rise again (WHO, 2022). Therefore, individuals need to be protected with at least two doses, and the booster dose is important to fight against the new variants.

There has been a great concern lingering on the people's attention especially around Kota Bharu to control and to create herd immunity in the population. Studies conducted from 2019 to 2022 in Malaysia reported a high intention to receive the primary COVID-19 vaccines between 83.3% to 94.3% (Alam et al., 2021; Wong, et al., 2022). Until March 2024, more than 27 million citizens received the primary vaccine. However, the COVID-19 vaccination rate among the people began to drop after the primary doses. Wong, et al., (2022) revealed that only 48.2% have the intent to receive the booster dose in the country. According to KKMNow, an official portal of the Ministry of Health reported that even after three years since the administration of the third dose, only 16 million people received the first booster and less than 1 million received the second boose dose. In addition, among 14 states in Malaysia, the east-coast states which are Kelantan, Terengganu, and Pahang are among the lowest vaccination rates in the country. As of 26 August 2023, Kelantan, Terengganu, and Pahang recorded only 17.8%, 28.3%, and 37.7% respectively for the first booster dose, whereby this percentage value is still comparatively low and far below the rate of global acceptance, which ranges from 54.8% to 88.6% (Jafar, et al., 2022).

The main focus of this study is to enlarge a literature review of factors affecting the intention to receive future COVID-19 booster vaccines in East Coast states in Malaysia. Through carrying out this study, the gap from the existing research can be filled by providing an extension of knowledge for the scanty number of studies on the intention to receive the future COVID-19 booster vaccine in east-coast states in the country. Most previous studies have explored the primary vaccine intention; however, it is essential to provide insight into this future booster dose according to the recent situation. In addition, it should be noted from the existing literature review, however, to the best of the author's knowledge, the local studies have not given great attention to utilizing the Theory of Planned Behaviour to understand these factors (attitude, vaccine knowledge, vaccine hesitancy, subjective norms, and perceived behavioral control) affecting the vaccination intention and this has motivated the present study.

2. Literature Review

Vaccine knowledge: Vaccine knowledge is defined as "detailed information regarding vaccine and immunization" (Voo, et al., 2021). People with adequate knowledge about in particular vaccine can better understand the vaccine's potential, advantages and importance, and this will lead to creating a positive belief about the vaccine at the same time increase trust in vaccination (Zheng et al., 2022). Zheng et al. (2022) also suggested that individual health knowledge and information serve as a significant foundation for the intention to perform health-related behavior such as vaccination. This is because, an individual with adequate knowledge of a certain vaccine can help to understand the vaccine's potential, benefits, and importance to create positive beliefs as well as to strengthen vaccination trust. Mohamed et al. (2021) in his study discovered that low educational background, source of information from peer members, and poor socioeconomic status are the factors contributing to poor understanding of the COVID-19 vaccine among Malaysians. Consistent findings from the research have shown that vaccine knowledge plays an essential role in the intention to get vaccinated for the COVID-19 vaccine (Asmare, et al., 2021; Fan, et al., 2021).
H1: There is a relationship between vaccine knowledge and intention to receive future COVID-19 booster vaccines in East-Coast states in Malaysia

Vaccine Hesitancy: Vaccine hesitancy is a common global phenomenon and is listed as one of the top ten threats to world health by WHO (WHO, 2022). In this paper, the term vaccine hesitancy is referred to as "delay in acceptance or refusal of vaccine regardless of the accessibility of vaccination services" (WHO, 2022). Farhart et al. (2022) further extended the term by suggesting that vaccine hesitancy includes those who receive a few vaccines, however, are still doubt their safety, importance, and effectiveness following the vaccination. Several studies have investigated vaccine hesitancy among Malaysians and have shown inconsistent and contradictory research findings. For example, research by Jian Ng et al. (2022) and Chan, et al. (2022) who explored the COVID-19 vaccine hesitancy found that Malaysian younger age groups are less inclined and hesitant to get vaccinated. In contrast, the study by Wong, et al. (2022) indicated that younger participants demonstrated a

higher acceptance of COVID-19 vaccine booster. Several studies have also consistently associated side effects, attitude, and knowledge can affect the intention to get vaccinated for the COVID-19 vaccine (Geers, et al., 2022; Voo, et al., 2021; Wong, et al., 2022). Vaccine hesitancy is revealed as the factor to reduce the intentions and shape negative attitudes toward COVID-19 vaccination (Lee et al., 2022).
H2: There is a relationship between vaccine hesitancy and intention to receive future COVID-19 booster vaccines in East-Coast states in Malaysia

Attitude: Attitude is defined as the person's attitude towards behavior and represents whether opinions about the behavior are favorable or unfavorable (Servidio, et al., 2022). In this paper, an attitude refers to an individual judgment whether getting COVID-19 vaccinated is positive or negative (Yahaghi, et al., 2021). Positive associations between attitude and intention to get vaccinated have been highlighted in several past studies. For instance, Asmare et al. (2021) in current studied the behavioral intention and its predictors toward COVID-19 vaccination in Ethiopia and concluded that attitude was significantly associated with intention to receive a vaccine, as people cultivate a positive attitude toward the vaccine, they may have great intent to accept it. Similarly, a systematic review and meta-analysis study in predicting vaccination intention against COVID-19 discovered that 92.68% of studies reported people's attitude toward COVID-19 vaccination was the most frequent TPB construct influencing vaccination intention (Limbu, Gautam, & Zhou, 2022).
H3: There is a relationship between attitude and intention to receive future COVID-19 booster vaccine in East-Coast states in Malaysia

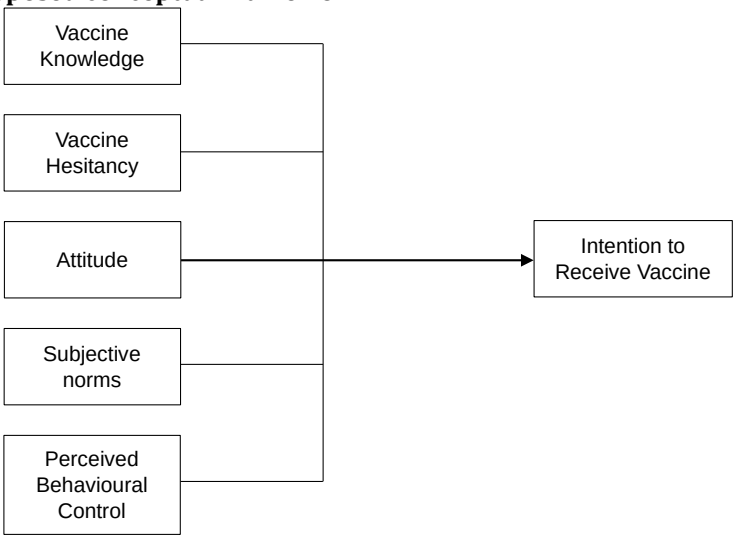
Subjective norms: Subjective norm is the second most salient determinant of intention and drives to perform the behavior of interest (Khayyam, et al., 2022). In general, subjective norms are people's belief of what significant social others think about his/her engaging in a particular behavior, and whether or not they consider it acceptable (Husain et al., 2021). In this present paper, subjective norm (SN) refers to the extent to which people's willingness to receive the COVID-19 vaccine is influenced by whether their significant social others (i.e., friends, family, doctors) agree of them receiving the vaccine or not (Barattucci, et al., 2022). Regarding immunization in recent years, Jian Ng et al. (2022) suggested that social influence, where an individual's perception that those closest to them (friends, family, and members) think they should get vaccinated, can help to increase the intention to vaccinate. According to Mohamad Ismail et al. (2023), some of the most influential societal forces supporting vaccination are members of the short and long-term social networks as well as medical professionals. Alshurman et al. (2021) stated that, from the studies done, the findings consistently agreed that personal recommendations from close ones are the most efficient in convincing people to get vaccinated against COVID-19.
H4: There is a relationship between subjective norms and intention to receive future COVID-19 booster vaccine in East-Coast states in Malaysia

Perceived Behavioural Control: Perceived behavioral control means "the perceived easiness or ability to execute the desired behavior', where when a person has a high level of perceived behavioral control, hence the person will put a great effort into performing the intended behavior (Khayyam, et al., 2022). In the present study, perceived behavioral control would refer to "whether an individual perception of the difficulty or ease to get the vaccine" (Bowyer et al., 2014). Therefore, in other words, it could be understood that the probability of a person performing a particular behavior is higher when he or she has more control over the resources and opportunities (Ajzen, 1991). In real practice, however not all behaviors can be controlled by a person's will, instead, the person will be affected by their external objective environment or other resource constraints. In this study, for instance, the residents in east-coast peninsular may not be vaccinated due to the fear of the side effects from the vaccination. As per Yang et al. (2022) time, cost, and side effects from vaccinations can be reflected in an individual's perceived behavioral control towards receiving the vaccination.
H5: There is a relationship between perceived behavioral control and intention to receive future COVID-19 booster vaccine in East-Coast states in Malaysia

3. Research Methodology

Conceptual Framework
The conceptual framework of the study is constructed as below:

Figure 1: Proposed conceptual framework



Sample

This study focuses on residents of East-Coast states in Malaysia including Kelantan, Terengganu, and Pahang. The target participants are those residents who are currently in the three states, aged 18 years and above and have completed two primary COVID-19 vaccinations. This study will employ a snowball sampling technique to identify and reach the targeted respondents for this study.

Measurement

The present study uses a set of validated self-administered questionnaires that were constructed based on related previous studies for data collection and to measure all variables to be tested in this study. The development of the items is by adopting and modifying existing questions to fit with the purpose of the current study identified from selected literature. The questionnaire consists of six sections, each section for each of the variables to be measured, and one section for socio-demographic profile. All questions for the independent variables will be measured by using a Five-point Likert scale where, 1= strongly disagree, 2= disagree, 3= neutral, 4= agree, and 5= strongly agree. Before boosting the survey, the researcher will conduct a pilot test to check the reliability of the instruments. The questionnaire will be distributed by using convenience sampling and prior data will be collected for analysis. The data collection is important to ensure the reliability of the instruments and method used before the actual research can be conducted.

4. Discussion

This study aims to explore the intention to receive future COVID-19 vaccine booster doses of three East Coast state residents in Malaysia who had completed two primary vaccinations required by the government and to identify the factors that potentially influence the intention. Studies from 2019 until 2022 among the Malaysian general and adult populations reported a high intention for former COVID-19 vaccinations between 83.3% to 94.3% (Wong, et al., 2022). For the booster vaccination, studies by Rajakumar et al. (2023), Khoo, et al. (2024), and Hwang et al. (2024) reported the acceptance rate for the booster vaccination from 55% to 87.6% among people. However, the number of COVID-19 vaccinations among the public began to drop after the second dose of vaccines. As of August 2024, the Ministry of Health of Malaysia, MOH reported the country has reached an 86.2% vaccination rate for the first dose, and 84.4% for the second dose as of August 2024. However, the booster dose uptakes remain relatively lower at 50.1% for the first booster dose and 2.5% for the second booster dose even after almost 3 years since the administration. Data from the official Ministry of Health portal report that three east-coast states recorded the lowest booster vaccination rates with below 40% and 2% for first and second booster doses (KKM, 2024). Shien Teh, et al. (2022) in his study also showed that the east peninsular states (Kelantan, Terengganu, and Pahang) had lower vaccination progress than the rest below 80%. Several factors were associated with influencing the COVID-19 vaccination intention in the country including knowledge, vaccine hesitancy, attitude, influential societal forces, and self-control.

5. Managerial Implications and Recommendations

Years passed by since the unforgotten hit from the COVID-19 pandemic, and the effects of the disease on the individual, society, and economy gradually treated to new norms. Although without the announcements and news regarding the current cases, infections, updates and urges to take vaccination against COVID-19 from the government, the virus is still there, living in the epidemic. According to the official COVID-19 portal of the Ministry of Health (MOH), KKMNow, there is an increase in local cases, with more than 50 confirmed daily cases recorded around the country. However, states on the east peninsular (Pahang, Terengganu and Pahang) had lower vaccination progress compared to other states. Even though full vaccination and boosters have successfully stopped the infections, prevented death and reduced the severity, the country has yet to achieve a full population vaccinated and protected to face the comeback of this virus. Therefore, it is vital for the government specifically to keep reminding and administering this vaccination from time to time. The findings from this study can help the government and healthcare providers to identify factors that contribute to the low vaccination intention among the eastern peninsular states residents to tackle the barriers and create better policies and regulations for COVID-19 vaccination. The implication of this study of the theory of planned behavior, this theory can provide a clear insight into the analysis of the attitude, influences of others, and self-control of the residents toward the vaccination. Other than that, the data findings from this study can also contribute academically to the scholars for future research.

Conclusion

The objective of this paper was to assess the intention to receive future COVID-19 vaccine booster doses from three East Coast state residents in Malaysia who had completed the primary vaccination required by the government and to identify the factors that potentially influence the intention. This study chooses to explore the booster vaccine intention due to the low performance of vaccination rates in Malaysia, especially in the three east-coast states (Pahang, Terengganu, and Kelantan). According to previous research, the acceptance rate of the COVID-19 vaccine among Malaysians was high, however, the study may be in general and yet focus on the concerned states with low vaccination rates. This study, therefore, attempts to investigate the behavior, intention, and related factors that contribute to this situation, and to assist the government and related agencies to plan better vaccination campaigns to overcome this issue.

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