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KNOWLEDGE ON VACCINE COVID-19: OVERCOMING HESITANCY THROUGH EFFECTIVE COMMUNICATION IN TERENGGANU, MALAYSIA

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Abstract: The success of Malaysia's large-scale National COVID-19 Immunisation Programme campaigns is dependent on people's willingness to be vaccinated. However, the classic situation of vaccine hesitancy persists, with numerous reasons contributing to it, particularly knowledge of the vaccine itself. Considering that Terengganu is among the lowest vaccination rates, this article explores whether knowledge correlates with vaccine hesitancy. Six key informant interviews were tape-recorded in Terengganu, transcribed verbatim, and analysed thematically to uncover the factors contributing to the lack of COVID-19 immunisation knowledge. We observed two main themes about the Terengganu people's lack of knowledge: (1) the digital divide and (2) the literacy gap. Another factor contributing to the lack of knowledge and rise of positive COVID-19 cases was the dissemination of post-vaccine information. We suggest that effective vaccine communication efforts should target vaccine sceptics (women, young adults, low-income people, and people living in rural areas), highlighting immunisation's immediate health, social, and economic benefits.

Keywords: COVID-19, vaccine hesitancy, knowledge, digital division, literacy.

Introduction

The Coronavirus Disease 2019 (COVID-19) pandemic is a serious global public health threat that affects people of all ages and socioeconomic backgrounds. COVID-19 vaccine efforts are the safest bet for controlling the pandemic, as vaccination could effectively reduce the prevalence of the present coronavirus disease pandemic. As the World Health Organisation and the worldwide community of countries ramp up plans for mass vaccination programmes, it may have reached a tipping point as it is already in place, raising hopes and aspirations for containing the spread of the COVID-19 pandemic that has halted economic and social activities (Kadoya *et al*., 2021). However, for these vaccination programmes to succeed, it is critical to understand people's knowledge as it affects the attitudes toward COVID-19 vaccination to achieve herd immunity (Mir *et al*., 2021).

It has been established that the fast production of COVID-19 vaccines has caused concern among the general public regarding their safety and efficacy. Their acceptance is only partial, with vaccine hesitancy and refusal posing a significant health risk. Vaccine hesitancy, scepticism, refusal, and anti-vaccine movements are major barriers to receiving a COVID-19 vaccine (Al-Jayyousi *et al*., 2021). A considerable amount of literature has found that one of the main factors of hesitancy is the level of knowledge on vaccine COVID-19, as it plays a pivotal role in developing an efficient vaccination campaign. This could pose a serious problem for COVID-19 prevention due to the spread of misinformation surrounding the ongoing pandemic. Public health communication about the vaccine and misinformation on the vaccine occur through various information channels. Some information channels are more commonly

found to spread myths and misinformation (Kumari *et al*., 2021).

With the general population inundated with misinformation, it is vital to develop the public's grasp of science and how it is generated, presented, and used. Figure 1 shows a model built on earlier vaccination research that accounts for how people go from becoming vaccinated to using it (Evans & French, 2021). In this model, the vaccination uptake is influenced by COVID-19 promotional campaign exposures, which transmit vaccine knowledge (e.g., consumption of advertisements and other content on media). According to Evan *et al.* (2021), the demand-creating process happens within the framework of government and civil society social support, product and service availability, healthcare system structures, and economic influences that hinder vaccination uptakes.

In January 2021, Malaysia launched its National COVID-19 Immunisation Programme, following other countries announcing huge immunisation initiatives. Groups who are most vulnerable to vaccine-preventable diseases, including the elderly, middle-aged individuals, healthcare workers, senior home residents, carers, people with chronic conditions, teachers, and soldiers, have been given priority in immunisation. Malaysia also faces the same challenges regarding vaccine hesitancy due to an alarming influx of misinformation circulating on social media, thus continuously reinforcing anxiety-inducing myths that ultimately affect vaccination uptakes. Bono *et al.* (2021) reported that Malaysia had the highest percentage of participants who feared vaccine side effects (74.1%).

According to The Special Committee on COVID-19 Vaccine Supply (JKJAV), a total of 21,591,116 individuals or 66.1% were fully vaccinated, while 2,976,852 or 9.1% have received at least one dose of COVID-19 vaccine. However, the number of people vaccinated in Terengganu remains low, with a total of 857,778 individuals as of 13th October 2021. Terengganu recorded 724,803 or 57.6% of individuals were fully vaccinated while 132,975 or 10.6% of individuals have received at least one dose (Ministry of Health Malaysia, 2021). The rise of these numbers negatively impacts the financial market, which correlates to countries' health and economic growth (Razali & Nur Firyal, 2021). According to studies, the efficacy of COVID-19 vaccination programmes in lowering disease transmission, morbidity, and death is strongly contingent on the population's willingness to accept the vaccine. The program's success depends on people's understanding and attitudes toward the COVID-19 vaccination programme. This study aims to identify and explore the factors of lack of knowledge of the people in Terengganu to be vaccinated. The crux of this study reveals that knowledge of vaccination COVID-19 is connected with hesitancy, which could be addressed through effective communication.

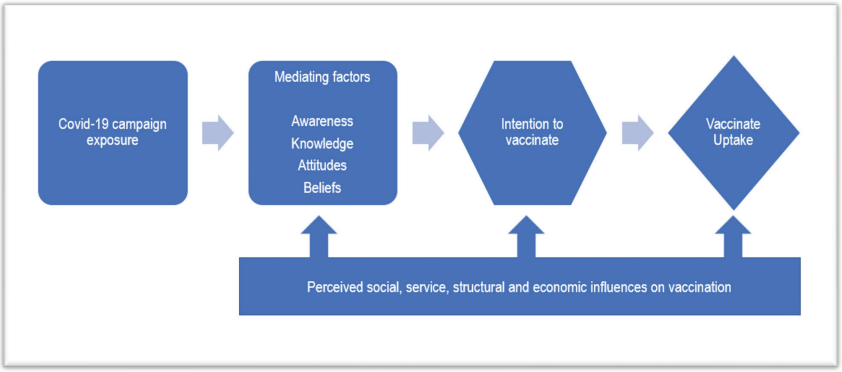

Figure 1: Social, service, structural, and economic influences on vaccination (Evans & French, 2021)

Literature Review

The COVID-19 pandemic has killed millions of people and put the world's medical and public health institutions to the test. As more approved vaccinations become accessible and supply matches or surpasses demand over the next two years, medical and public health experts will increasingly tackle the challenge of vaccine hesitance. However, there is an urgent need to generate demand in either misinformed populations or lacking knowledge.

The World Health Organisation's Director-General, Tedros Adhanom Ghebreyesus, stated that the world is now fighting not only the pandemic but also the infodemic, which has been defined as *"... an overabundance of information, either true or false, most of which is fake news, rumours, and conspiracy theories, making it difficult for people to find trustworthy sources and reliable guidance when they need it"*. These pieces of knowledge can spread quickly, especially during a pandemic and can cause severe consequences for people, which is exceedingly alarming.

Several studies are conducted around the world where lack of knowledge or misinformation contributes to vaccine hesitancy. For instance, Sallam *et al.* (2021) conducted a study to explore the relationship between vaccine acceptance and conspiracy theories. It was discovered that COVID-19 vaccines include microchips and are designed to inject them into recipients, respectively, in 27.7% and 23.4% of respondents. Women, individuals with a lower educational background, and those who use social media as their primary information source were all shown to have higher Vaccine Conspiracy Belief Scale scores. In addition to the higher-than-average hesitation in Jordan and Kuwait, other Arab countries have become alarmed about vaccination resistance as finding COVID-19 vaccinations via social media was connected to vaccine hesitance (Sallam, 2021).

Similarly, a study conducted by Razai *et al.* (2021) focused on the COVID-19 vaccine in Pakistan, primarily on the issue of acceptability and what is considered the cause of hesitance. The COVID-19 vaccine information was acquired by most participants through print and live news media (52.3%), followed by social media (23.7%). A portion of the reason for the poor vaccine acceptance rate in the Pakistani populace is a lack of knowledge, comprehension, and awareness of the risk (Razai *et al*., 2021).

Kricorian *et al.* (2021) conducted a study to understand the influence of various communication channels on vaccination uptake. Initially, the author expected social media to influence people's opinions. However, traditional outlets, especially national television, newspapers, and local papers, were more influential. The most accepting of the vaccine were those who learned about it from conventional media rather than social media or via both social and traditional media. The study's findings imply that social media could assist in getting hesitant parents to accept vaccines, while conventional media should help in spreading data-driven and informed vaccine information (Kricorian *et al*., 2021).

However, studies have shown that widespread online misinformation could jeopardise vaccination updates in countries where accurate evidence-based information is inadequate or scientific knowledge on vaccine effectiveness and safety is politicised (Bono *et al*., 2021). Vaccination is fast becoming a key intervention against the ongoing COVID-19 pandemic. We conducted cross-sectional online surveys to investigate COVID-19 vaccine acceptance across nine Low-and Middle-Income Countries (LMICs; N = 10,183. A study correlates lack of knowledge to one's educational degree. Participants with more understanding of COVID-19 and university graduates were more likely to adopt vaccination than those with only a primary or secondary school education. This gap in willingness to take COVID-19 immunisation was also discovered in a study conducted in the United States, where individuals who did not graduate high school reported a lower acceptance prevalence than those who did (Malik *et al*., 2020).

In line with previous research, we found that low-income participants were less likely to accept vaccines (Pogue *et al*., 2020; Lazarus *et al*., 2021). The lower income group in our study sample had lower acceptance probabilities, which could be attributable to a lack of access to high-quality information and health literacy (Dash *et al*., 2021). According to one study, people who self-identified as low-income were more likely to assume that the vaccine was ineffective. This could explain why they have a lower acceptance rate at 90% effectiveness. This is concerning because low-income people have been proven to be at a higher risk of developing COVID-19 as a result of overcrowding, public transit use, and a higher likelihood of working outside the home, all of which limit their ability to socially distance themselves (Jay *et al*., 2020; Mein, 2020).

Methodology

This study used an exploratory approach to understand COVID-19 vaccine hesitancy in Terengganu, Malaysia. Focus Group Discussions (FGD) rather than interviews were chosen as they allow obtaining information on the factors of acceptance or rejection of this COVID-19 vaccine among the people of Terengganu. This interview method is suitable to be conducted as a qualitative study design does not specifically specify 'what' and 'how' the study will be conducted in the early stages (Trochim & Donnelly, 2006). For data collection purposes, a semi-structured interview protocol was followed. In selecting the respondents, an email was sent to potential participants to invite them to participate in the study. A brief study overview was also provided and an online session was scheduled. The selection of participants was made by ensuring that there were variations between the sampled cases regarding job functions, size of organisations and types of operations in which these participants were involved. This approach was used to increase the richness and depth of each case to meet the research objectives. The details of the respondents, capturing the variations in the sample cases, are presented in Table 1.

Six respondents were carefully selected from the authoritative figure that employs state-born employees. To maximise the variability of our sample's experiences, we invited public civil services officers and top management of private companies wholly owned by the State of Terengganu. We conducted virtual FGD, which lasted approximately 2 hours. We used unstructured and open questions to have a flexible grid of structural and open questions, allowing each participant to express their opinion and experience and introduce a new theme spontaneously. The vast majority of the interviews were conducted by the author, who has a law and social sciences background.

Table 1: Lists of respondents

Respondents	Job Position
P1	Head of Legal Department
P2	Assistant Secretary Terengganu Local Authority Division (Policy and Development)
P3	Deputy Commissioner (Islamic Affairs) Terengganu Religious Affairs Department
P4	Director of Environmental Health Kuala Terengganu City Council
P5	Vice President Government Link Company
P6	Dean Faculty of Fisheries and Food Science, Universiti Malaysia Terengganu

Data collection and analysis were carried out simultaneously over one month beginning in May 2021.

The session was video recorded and transcribed verbatim by the main researcher and the research assistant (Malaysian speakers) within a week from the FGD. The main researcher read the transcript several times to become familiar with the content and later entered Atlas.ti for the coding. Both transcription and analysis of the FGD were conducted in the original language (Malaysian) to avoid missing significant elements during the translation process. As a result, the FGD provides a comprehensive perspective on a phenomenon (Patton, 2002; Creswell, 2012) and explores in depth to answer the question of 'what are' the vaccine hesitancy factors and how to address this issue.

Findings

The findings were designed based on using verbatim description and reporting (word for word) without any statistical observations (Ghazali Darusalam & Sufean Hussin, 2018) or, in other words, empirical research whose data is not in the form of numbers (Punch, 2003; Ahmad Puad Mat Som, 2005).

Digital Gap

The aim of FGD was focused on the need to understand the lack of knowledge about the COVID-19 vaccine, which led to the respondent's unwillingness to register as vaccine recipients. One of the respondents from the Terengganu Local Authority Division, a member of the pandemic control committee and the Terengganu state COVID-19 Immunisation Task Force (CITF) committee in which the responses were sought in the context of what contributed to the lack of knowledge of the people of Terengganu said:

> *"Among the factors that we can identify at this time is, apart from the awareness of the people themselves, digital gap is a factor for most of the people of Terengganu. If we want to register My Sejahtera, we need to have a smartphone, internet access and so on, this technology is not available to all" (Assistant Secretary Terengganu Local Authority Division)*

The group agreed that the lack of information mainly attributed to the digital divide or digital gap. The term digital gap refers to the gap between people using Information and Communication Technology (ICT). This can be explained by the fact that the degree of understanding of the people of Terengganu about vaccine information is still poor, owing to the majority of the information being disseminated via social media. The digital divide also impacts the National Immunisation Program registration statistics on the MySejahtera application. Rural people, disabled people and persons categorised with low-income households (B40) who do not have a smartphone and internet network are lagging in this regard. One of the respondents commented:

> *"I agree with Dr. regarding the issue of knowledge. The issue of knowledge, sometimes we, wise people say we are antagonist to something we do not know…" (Legal Adviser)*

The respondents identified two groups, i.e. the first group are those with less or no exposure or information about the COVID-19 vaccine, such as in rural areas consisting of the elderly. Usually, this group depends on the information presented to them by others. The Director of Environmental Health commented:

> *"The issue of knowledge and attitude, we have two groups that I see, the first is from rural area. This group, the people have problems with technology. But for the second group i.e. urban group, there are other problems even though the technology part is ok. That is the issues related to anti-vaccine group."*

Then there is the second group, those living in urban areas where people have smartphones and access to information. Too much information

raises doubts about the COVID-19 vaccine as they fail to differentiate between authentic and unauthentic information.

Literacy Gap

Further discussion by the respondents yielded that the digital divide is not the only factor of vaccine hesitancy due to lack of knowledge but also the literacy gap. They believe that even if someone has the tools or smartphones to read and obtain information on the vaccine, what do they do with it? Do they understand what they are reading? How do they verify which information is true or false with a plethora of information? The group understood that information literacy is a set of abilities to recognise what and when information is needed, locate and select critically, and use it ethically and effectively communicate it (UNESCO, 2004). The Vice President of a GLC stated:

> *"From the point of view of GLC companies, the majority are ok with the vaccine, there are only a minority who did too much research, so the conclusion that people can get, this vaccine is not good for them…"*

He further commented:

> *"Yes, I agree with the issue of knowledge. But for me it is temporary, the people is taking 'wait and see' approach. I presume after the first batch has been vaccinated and no one suffers any injury of death, when the second wave is over, people will register (for vaccination). So at this moment this percentage will probably continue to increase"*

Dissemination of Information on vaccine COVID-19

This led to the next finding, which is the dissemination of information about the vaccine COVID-19. The group discussed in detail the dissemination of information to the people of Terengganu and found that much emphasis was given towards getting the people to register for vaccination and get vaccinated. One of the FGD members, the Dean of the Faculty of Fisheries and Food Science of a university expert in vaccine veterinary, explained in detail the importance of quarantine after being vaccinated, especially after the first dose. Knowledge of the COVID-19 vaccine needs to be imparted to the people, not only limited to the importance of a person being vaccinated but also knowledge of self-care after vaccination. The COVID-19 vaccine cycle can be broken down into three stages, namely, before receiving the injection, during receiving the injection and after receiving the injection. This lack of exposure can indirectly fail the vaccination program. The respondent commented:

> *"Based on what can be seen now, knowledge of post-vaccine information is not clearly disclosed to the public. While the matter is the utmost important"*

Director of Environmental Health stated feedback on the dissemination of information in simple language:

> *"In my opinion, the information to be conveyed to the people should be in simple language, not in a scientific form…" (Director of Environmental Health)*

Continuous dissemination of information is also one of the workable methods. This was stated by informant Terengganu State Legal Adviser:

> *"…suggestions that can be made, for example the Dutch lady milk ad, as far back as I can remember from the age of my fifth grade in the 70s until now the ad is still running. So what I want to convey is in terms of this knowledge needs to be made continuously…"*

Discussion

The findings above could be summarised in three themes, i.e. digital division, literacy gap and dissemination of COVID-19 vaccine. These

outcomes are supported by several studies that have been previously conducted during this pandemic. For instance, John Lai (2021) stated that the digital divide limits opportunities for those without ready access to the Internet. He found a negative correlation between rurality and Internet speed at the county level, highlighting the struggle for rural areas. The rural area struggles to maintain sufficient speed, which halts access to information on the COVID-19 vaccine (Lai & Widmar, 2021). Rosella Simeoni stated that in the era of digitalisation, the vaccination processes are particularly based on digital technologies and identified electronic and information divide, which causes of lack of effective vaccination processes shown in Figure 2.

According to a study by Daniele Giansanti (2021), four impediments are caused by the digital divide, which is reflected in Figure 3. Social factors could be attributed to economic reasons, which enable them to access these technologies; cultural factors due to uneven access to technologies. For instance, mobile-born have a better ability to use technology compared elderly since mobile-born online schooling breaks down the digital divide barrier; disabilities factors such as communication disabilities, which generally represent an obstacle in a non-pandemic period to access to technologies, continue to represent an obstacle even during the Covid-19 pandemic (Giansanti, 2021).

The finding of poor vaccine literacy among the people of Terengganu is the same problem in any developing country. It is based on 'health literacy', defined as the degree to which people can obtain, process, and understand basic health information and services to make appropriate health decisions (Ratzan & Parker, 2020). Vaccine literacy leads to vaccine misconception, which WHO declared one of the top 10 health issues in 2019. A study conducted by Knights *et al.* (2021) reported that migrants concurred that digitalisation and virtual consultations have amplified existing inequalities in access to health care for many migrants due to a lack of digital literacy and access to technology,

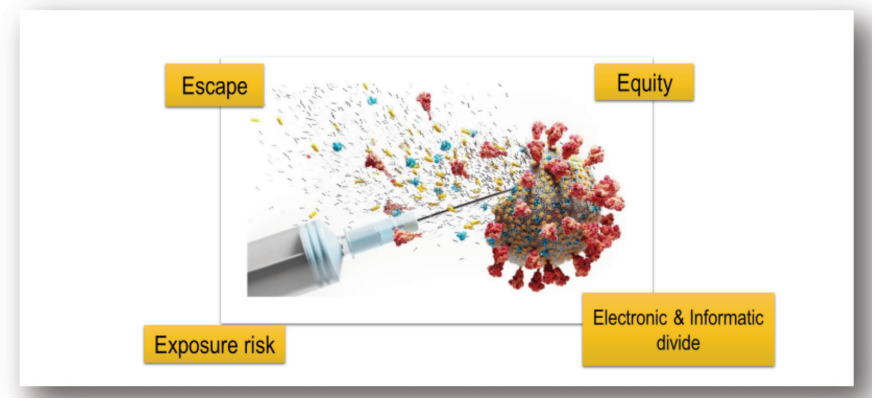

Figure 2: The causes of the lack of effective vaccination process (Lai & Widmar, 2021)

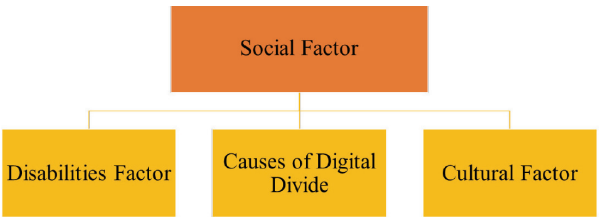

Figure 3: Four impediments caused by the digital divide (Giansanti, 2021)

compounded by language barriers (Knights *et al*., 2021). The migrants highlighted challenges around registering and accessing health care due to physical closure of surgeries, as well as indirect discrimination, language and communication barriers, and a lack of access to target and tailored COVID-19 information or interventions. Migrants reported a range of specific beliefs, from acceptance to mistrust, around COVID-19 and potential COVID-19 vaccines, often influenced by misinformation. Vaccine hesitancy due to vaccine literacy is also attributed to "infodemic", in which an overabundance of information, both factual and misinformation, contributes to hesitancy (Turner *et al*., 2021).

In a study conducted by Riad *et al.* (2021), various public figures, media outlets, and other media platforms impact vaccine coverage. These sources created hurdles such as a lack of understanding of vaccines, mistrust of governments and the pharmaceutical business, and poor media coverage. A large-scale, global survey employing an online questionnaire was conducted in February 2021, where vaccine reluctance was substantially higher among students in low- and lower-middle-income (LLMI) economies compared to their counterparts in upper-middle- and high-income (UMHI) economies (30.4% vs. 19.8%; $p < 0.01$). Kricorian *et al.* (2021) contended that the people who were worried about the safety of the COVID-19 vaccine were less likely to obtain it, knew less about the virus, and were more likely to accept falsehoods about the vaccine. They were less educated, earned less money, and lived in more remote areas than those who trusted the vaccine (Kricorian *et al*., 2021).

However, Ahmad Rauyani Ab Hamid *et al.* (2020) conducted a study pertaining readability of COVID-19 information by the Malaysian Ministry of Health (MMoH), which disseminates information about COVID-19 through its official websites. A textual analysis was conducted to assess the readability level of COVID-19 information by the MMoH. Since they are intended for the general public, this crucial information must be easily comprehended. Out of 661 materials related to COVID-19 from four MMoH websites, 14 texts were purposively selected for the analysis. The *Formula Kebolehbacaan Khadijah Rohani* (FKKR) and *Sistem Kebolehbacaan Bahasa Melayu* (SPIKE) were then employed to check their reading difficulty. It was found that most of the texts were written above the recommended level, 6th grade or year 6.

The findings suggest that this information is readable to three-quarters (78.7%) of Malaysian adults aged 15 and above. However, the remaining 21.3% of the same population, which equals 5.3 million Malaysian adults, may be unable to comprehend this information due to their illiteracy or minimal education. SPIKE Dyslexia scores revealed that nine texts are categorised as difficult. This could impede those with reading difficulties from understanding the COVID-19 information provided by this ministry (Ab Hamid *et al*., 2020).

Conclusion

The analysis of the transcripts yielded two main themes related to the lack of knowledge of the people in Terengganu, i.e. (a) the digital gap and (b) the literacy gap. This theme was a response discussion of the most prevalent factor concerning knowledge of vaccine COVID-19 hesitancy. An additional theme was issued in the method of disseminating knowledge, especially knowledge of post-vaccine information. It is pertinent to ensure that information literacy is made continuously and effectively. The findings stress the necessity of creating accessible health information for people of all socioeconomic and educational backgrounds. Vaccination communication initiatives should target hesitant individuals (women, younger adults, people with lower incomes and those living in rural areas) and highlight the immediate health, social and economic benefits of vaccination across these settings.

Country-level analyses are warranted to understand the complex psychological, socio-environmental, and cultural factors associated

with vaccine hesitancy. Future considerations include perceived benefits offered to people with vaccination and the role of health/digital literacy in preparedness policies. Therefore, efforts to vaccinate higher-risk older adults must aim to educate and provide vaccine access and engender trust in the vaccine development process and vaccination strategies at the federal and local levels. Such a campaign should promote the individual and population-level benefits of vaccination and pre-emptive efforts to address vaccine misinformation.

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