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A Pilot Study of Covid-19 Vaccination Readiness

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Abstract

The COVID-19 vaccination program in Malaysia is an effort launched by the Malaysian government as a means of containing the spread of coronavirus disease 2019 (COVID-19) and ending the outbreak in Malaysia by developing herd immunity among its citizens and non-citizen. A major effort will be required from health agencies, non-governmental organizations, industries, national and also state governments. In some states, low vaccination rates have resulted in outbreaks of Covid-19, while also impeding the government's efforts to achieve its aim. The goal of this study is to establish the antecedents of Covid-19 vaccination acceptability in which to establish the data's reliability and validity, a two-stage pilot study was conducted. Several antecedents were identified and examined and analysed using SPSS software. Findings of study in first stage postulated the items were validated and the elimination of more than 20% items indicated that item validity had been violated. Meanwhile, the second pilot tests produced high internal consistency of above 0.7 of the minimal value for cronbach alpha after further improvement. In summary, this paper validated the measurement of research variables and not all items can be used in examining the vaccine readiness in Malaysia context of study. The actual data will use the item validation based on this pilot study.

Keywords: COVID-19 Vaccine Readiness, Knowledge, Due Diligence, Religiosity, Factor Analysis.

Introduction

In March 2020, WHO announced Covid-19 was a pandemic in which the world took unprecedented lockdown measures affecting nearly a billion people subsequently putting everyone's lives to a grinding halt. No one could have expected the unprecedented lockdown measures triggered public health crisis and economic upheaval, devastating the lives of people and crumbling businesses to the ground. The presence of Covid-19 led scientists around the world scrambling to study about the deadly virus that has to date claimed almost 2.05 million lives and 96.2 million positive cases worldwide¹ whereas in Malaysia, the disease

¹ WHO, 2020 <https://covid19.who.int/>

increased drastically from 642 lives in January to 3768 lives in June and a spike from 172,549 to 646,000 positive cases and is expected to increase until 2022 if not curbed². As a result, it has become a global race to produce Covid-19 vaccine with the hope to eradicate if not to decrease the spreading of this disease.

The Ministry of Science, Technology and Innovation in collaboration with the Ministry of Health are the ministries responsible for the purchase and supply a of covid-19 vaccines to Malaysians. The Government has successfully secured Covid-19 vaccines from Pfizer Inc with BioNTech SE and Moderna Inc, which the clinical trials showing that it is effective up to 95%.³ The Government is also considering AstraZeneca Plc vaccine which has reported to be 90% effective⁴. In order to cater nearly 70% of Malaysian population, further negotiations took place of other Covid-19 vaccine manufacturing companies by the Special Committee on Guaranteed Access to Supply of Covid-19 Vaccines, namely Sinovac and CanSinoBio from China and The Gamaleya National Center from Russia⁵ and then there are other Covid-19 vaccines on the market such as GlaxoSmithKline, Janssen (Johnson & Johnson), Merck, Novavax, Sanofi, Takeda, Abbott and CureVac⁶. As with other vaccines before, it is predicted that Covid-19 vaccine is able to suppress this epidemic after the Malaysian population has reached 'herd immunity'.

This paper captures the current standing of Covid-19 vaccine readiness in Malaysia. In terms of contribution, this research paper shares findings and insights on the assessment of individual knowledge about covid-19 vaccine, their attitude towards vaccine, social and family support, government due diligence and religiosity. In terms of theoretical contribution, this paper empirically establish the compounding model of knowledge, attitude and practice model (Harapan, et al., 2019; Sherman, et al., 2021; Zhang, et al., 2021; Leidy & Cerda, 2020) and health believe model theory (Wen, et al., 2020; Alqudeimat, et al., 2020; Lin, et al., 2020; Wong, et al., 2020; Chen, et al., 2021). While the religiosity construct may draw attention to examine people's behavior in vaccine readiness (Alqudeimat, et al., 2020; Sherman, et al., 2021). In Malaysia, almost 70 percent populations were muslims, thus this contributes to the literature of different view of vaccine readiness as muslims were particular in halal status of the vaccine. This research was based on Malaysian who reside in Terengganu, which offers a unique findings in terms of their acceptance where Terengganu is considered as one of rural state and the complacent attitude could pose a challenge in ramping up the herd immunity for the state.

² WHO, 2020 <https://covid19.who.int/>

³ Pfizer (2020), Pfizer and BioNTech Conclude Phase 3 Study of COVID-19 Vaccine Candidate, Meeting All Primary Efficacy Endpoints, <https://www.pfizer.com/news/press-release/press-release-detail/pfizer-and-biontech-conclude-phase-3-study-covid-19-vaccine>

⁴ Jenny S (2020) AstraZeneca-Oxford Covid-19 Vaccine Up to 90% Effective in Late-Stage Trials, Wall Street Journal, <https://www.wsj.com/articles/astrazeneca-oxford-covid-19-vaccine-up-to-90-effective-in-late-stage-trials-11606116047>

⁵ The Athira Yusof (2020), Khairy: RM2.05 billion for the purchase of Covid-19 vaccines for Malaysians, <https://www.nst.com.my/news/government-public-policy/2020/12/651769/khairy-rm205-billion-purchase-covid-19-vaccines>

⁶ Donato Paolo Mancini (2020), Covid-19 vaccine makers lobby EU for legal protection, Financial Times, <https://www.ft.com/content/12f7da5b-92c8-4050-bcea-e726b75eef4d>

Literature Review

The COVID-19 pandemic is expected to threaten the well-being of communities and economies around the world. Whenever a safe and effective COVID-19 vaccine becomes available, governments must be prepared to enable widespread, fair access and distribution (Lazarus, et al., 2021). This will necessitate enough health-care system capacity, as well as initiatives to improve vaccine trust and acceptability among those who administer it. The preparedness of Malaysians to receive the vaccine should be given attention to ensure the immunity status of the group among the community. A study done by Sheldenkar, et al. (2019) highlighted where the acceptance and uptake rate of influenza vaccinations across Asia, including Malaysia is low.

Readiness

Geiger, et al (2021) debated in their study vaccination readiness varies substantially among individuals even though vaccines has proven can fight to control the virus outbreak. Vaccination readiness is defined as a set of components that increase or decrease the individual's likelihood of getting vaccinated (Geiger, et al., 2021). In other studies, vaccine readiness were measure through community acceptance (Harapan, et al., 2020; Alqudeimat, et al., 2021) and intention to vaccine (Lackner & Wang, 2021; Kwok, et al., 2021; Wang, et al., 2020). In recent study, researcher found out one major obstacle facing the achievement of getting community to vaccinated is vaccine hesitancy and skepticism among the population worldwide (El- Elimat, et al., 2021). The WHO Strategic Advisory Group of Experts defined vaccine reluctance as "delay in acceptance or refusal of vaccination despite availability of vaccination services" (MacDonald, 2015). Al-Mohaithef and Padhi(2020) described vaccine acceptability is determined by three factors: confidence, convenience, and complacency. In other studies, perceived severity, threat to health, perceived susceptibility of getting infected, side effect, lack of information, doubted effectiveness, accessibility, religious/personal beliefs, attitudes and support are among the factors contribute to acceptance and hesitancy of vaccines (Harapan, et al., 2020; Alqudeimat, et al., 2021; Lackner & Wang, 2021; Kwok, et al., 2021; Wang, et al., 2020; El- Elimat, et al., 2021).

Knowledge

Knowledge is defined as a highly valued state in which a person is in cognitive contact with reality (Zagzebski, 2017). Meanwhile, Lehrer (2018) discuss in his book, Theory of knowledge emphasized that knowledge should be concern with the correct information where the application of knowledge to conclude a reasoning, confirm the hypotheses and refute others. In field of medical research, knowledge is looked as an awareness of community about one's information which regards as information of diseases, treatment, medicine, medical procedures and vaccines (Kassahun & Mekonen, 2017; Napolitano, Napolitano & Angelillo, 2017; Ricco, et al., 2017).

Attitude

Rheu (2020) defined an attitude as a person general evaluation toward an attitude object, which is generated from the past experience of learning that influences their thinking and acting about the object. Attitudes have been widely discussed and debated by previous scholars especially the attitude of subject group of exposing media content and relationship of individual's attitude towards different social group, economy, potical and health behavior (Rheu, 2020). In health study, attitude is defined as the way community thinks and behave

towards the sickness, treatment, medicine and vaccines (Kassahun & Mekonen, 2017; Rosso, et al., 2019; Ricco, et al., 2017) and were measure by looking at their positive and negative attitudes (Vergara et al., 2021; Hagemeister, et al., 2018; Gailbraith-Gyan, et al., 2019).

Social Support

In a health study, social support is defined as the perceived or actual receipt of social resources (e.g., tangible, emotional) and is one of the most reliable predictors of disease morbidity and mortality (Uchino, et al., 2018). In one study on the HPV vaccine acceptance, the social support is one of the important contributing factor in evaluating the degree of vaccine acceptance where the study also observe the mother-daughter relationship (Gailbraith-Gyan, et al., 2019). On the other side of story, some individuals may seek support from the people who already the experiences the sickness or vaccine uptakes. By looking at social media platform like google, facebook, twitter, some group may lead to vaccine hesitancy where a continuum of positive and negative stances toward vaccination exists on the internet (Elkin et al., 2020).

Due Diligence

Due diligence is commonly understood in the business world to refer to a process of investigation carried out by a company to identify and manage commercial risks. The main goal of due diligence is to confirm facts, data, and representations involved in a commercial transaction in order to determine the transaction's value, price, and risk, including the risk of future litigation (Bonnitcha & McCorquodale, 2017). They go on to say that legal risks are frequently included in due diligence processes, and that the risk of legal liability is merely another business concern to be identified and managed in the context of a specific transaction. Due diligence is a word used to describe a collection of practises used by a company to identify and manage risks. It is not limited to mergers and acquisitions. Nanni, et al (2017) point out that during the vaccine procurement process, a government must conduct due diligence on vaccine supply, production capability, and high vaccine prices and delivery costs.

Religion (Religiosity)

Religiosity is defined differently by many researchers. Previous scholar defined religion as intrinsic behavior which refers to belief and identity (Allport & Ross, 1967). Meanwhile, Koenig & Bussing (2010) defines religious values as an expression that can be demonstrated by attendance to religious services; attitudes toward religious behaviors and involvement in religious activities. Another study discussed on specific combinations of religious affiliation and fundamentalism when investigating science attitudes and knowledge, which lends to a rather limited interpretation of the relation between religion and science (McPhetres & Zuckerman, 2018).

Research Method

A pilot study is critical because it improves the instrument's precision (Zikmund 2003). It entails the collection of data from a smaller sample size than that used for primary data collection (Zikmund 1984). According to Abbott and Bordens (2011), a pilot study enables the evaluation of the performance of a research instrument. Pilot studies are advantageous in a variety of ways like it identifies flaws and errors in instruments (Cooper and Schindler 2011). This contributes to the better reliability and validity of the instrument (Ghauri and Grnhaug,

2010). Pilot studies also facilitate in resolving questionnaire wording issues (Lee and Lings, 2010), comprehension and clarity issues (Saunders and Tosey, 2012), adequacy of instructions or directions issues (Bryman, 2008), questionnaire layout and attractiveness issues, and questionnaire timing and length issues (Saunders and Tosey, 2012). In summary, pilot testing benefits the instrument by increasing its quality (Bryman, 2008) and reliability and validity (Ghuri and Grnhaug, 2010). As a result, pilot study is important to be conducted as it helped to prove the reliability and appropriate of the data collection, so as to proceed with the future research instruments effectively (Rosli & Sidek, 2013).

This pilot study employs a quantitative approach of research. The quantitative approach is appropriate for a deductive research, objective and outcome-oriented studies by using standards of validity and reliability of statistical procedures (Creswell, 2010). The nature of this study is a cross-sectional research whereby the data is collected, analyzed, and summarized statistically and conclusions are drawn at a single point in time. This study also used survey method in collecting the data as it is the best way to obtain information about belief, attitude, perception or opinion from people in their natural environment (Graziano & Raulin, 2004; Babbie, 2004) and involves collection of sizable responses using the most economical approaches (Musa, 2017).

The pilot study in this paper used a 10-point Likert scale. A Likert scale is an interval scale commonly used in survey research employing questionnaire for data collection (Voleti 2019). A 10 point Likert scale will offer more variance than a smaller Likert scale, provide a higher degree of measurement precision and provide a better opportunity to detect changes and more power to explain a point of view (Wittink & Bayer, 2003). The 10 scales used are: 1-Very Strongly Disagree, 2-Strongly Disagree, 3-Disagree, 4-Mostly Disagree, 5-Slightly Disagree, Slightly Agree, Mostly Agree, Agree, Strongly Agree and Very Strongly Agree. Moreover, questionnaires was designed in Bahasa to reach different level of respondent education and knowledge.

Factor analysis generally was performed with large sample sizes (Winter, et al., 2009). Guilford (1954) recommended a minimum sample size of 200 for consistent factor recovery. Meanwhile, in other study, a sample between 25 and 100 individuals is enough for pilot test (Cooper & Schindler, 2011). Therefore, 100 questionnaires were distributed to citizen of Terengganu through online survey for validity and reliability purposes. As the rise of positive cases of infected covid-19, this constraint lead to researcher choose online survey method.

Employees from different state government agencies and commercial companies in Terengganu who are 18 years old and have not had the Covid-19 immunization took part in the pilot trial in March 2021. Within 5 days, 88 replies were received from the 100 surveys given. The data was evaluated with SPSS version 22 software to determine the item's validity and reliability. A few changes to the study items were made in response to the findings, and a second round of pilot testing was conducted to assess the item's dependability before the actual data was collected. In the second step of the pilot test, 30 questionnaires were distributed.

Results and Discussion

First Stage of Pilot Test

The first part of the pilot test was conducted using an online survey utilizing Google Forms. A total of 100 surveys were distributed through WhatsApp groups confining to one particular university. The screening questions include: '(1) Are you a Terengganu resident aged 18 and above? (2) Have you had your vaccinations?' were created in order to obtain the appropriate target group. Within 5 days, 88 replies were collected. There were no missing values or outliers in the data.

Frequency Analysis

Demographic analysis has been described in terms of twelve different areas; age, gender, residing location, educational level, occupation, religion, income, current diseases respondent has, history of Covid-19 infection, MySejahtera registration, search of information, and vaccine preference. The results of the descriptive analysis are shown in Table 1.1. In term of age, the majority of those who took part in the study were between the ages of 18 and 40. More over half of the respondents or 67 percent were female and only had SPM qualification. 37.5 percent of respondents were B40, 51.1 percent were M40 and 11.4 percent were T20. High blood pressure and high cholesterol are two diseases that respondents have, and nearly all respondents are free of chronic diseases.

88 respondents are Terengganu citizens who have never been infected with the Covid-19 virus. However, 22.7 percent of respondents' families had infected with the virus. Almost a third of the respondents live with senior citizens. One of intriguing finding is that 97.7 percent of respondents agreed that they seek further information about the Covid-19 virus and vaccines. However, the highest percentage of information sources were those seeking information informally such as via whatsapp, telegram and social media applications such as facebook compared to the official WHO and MOH websites. The registration of Covid-19 vaccine through MySejahtera is still unsatisfactory where only 64.8 percent of the respondents are registered. Only two types of vaccines, Pfizer and Sinovac are preferred by respondents when it comes to vaccine choosing in which the majority chooses Pfizer because they believe in the credibility of the manufacturer. Another reason respondents chose these vaccines is that they believe these vaccines able to prevent and treat virus Covid-19.

Table 1.1

Respondent Profile for Pilot Test Stage 1

		Frequency	Percentage
A1.	Age:		
	18 years – 25 years	49	55.7
	26 years – 40 years	26	29.5
	41 years – 64 years	13	14.8
	65 years and above	0	0
	Total	88	100
A2.	Gender:		
	Male	29	33.0
	Female	59	67.0
	Total	88	100

A3.	Residing Location:		
	Northern Zone	3	3.4
	Central Zone	65	73.9
	Southern Zone	20	22.7
	Total	88	100
A4.	Educational Level:		
	No formal education	0	0
	Primary School	0	0
	Secondary School	20	22.7
	Diploma/ Matriculation	10	11.4
	Bachelor Degree	42	47.7
	Postgraduate (Master or PhD)	16	18.2
	Total	88	100
A5.	Occupation:		
	State government offices	13	14.8
	Local authorities	0	0
	State statutory bodies	20	22.7
	Religious schools	0	0
	Government-linked companies	0	0
	Private companies	7	8.0
	Federal Offices/ Federal Statutory Bodies	13	14.8
	Self-employed	1	1.1
	unemployed	34	38.6
	Total	88	100
A6.	Religion:		
	Muslim	88	100.0
	Hindu	0	0
	Budhha	0	0
	Christian	0	0
	Others	0	0
	Total	88	100
A7.	Income:		
	Less than RM4,850	33	37.5
	RM4,850-RM10,959	45	51.1
	More than RM10,959	10	11.4
	Total	88	100
A8.	Current illness:		
	Diabetes	1	1.1
	High Blood	7	8.0
	High Cholesterol (hypercholesterolemia)	5	5.7

	chronic obstructive airway disease (asthma)	0	0
	Chronic kidney disease	0	0
	Heart failure	0	0
	Cancer	0	0
	No chronic diseases	81	92.0
	Others:	5	5.7
A9.	Infected with COVID-19:		
	Yes	0	0
	No	88	100
	Total	88	100
A10.	Families infected with COVID-19:		
	Yes	20	22.7
	No	68	77.3
	Total	88	100
A11.	Looking after the elderly:		
	Yes	26	29.5
	No	62	70.5
	Total	88	100
A12.	MySejahtera Registration:		
	Yes	57	64.8
	No	31	35.2
	Total	88	100
A13.	Search for information		
	Yes	86	97.7
	No	2	2.3
	Total	88	100
A13a.	Official information		
	Official website of the World Health Organization (WHO)	46	52.3
	Ministry of health Malaysia Official website	58	66.0
	Instant messaging application (SMS)	26	29.5
	Print media(Journal)	2	2.3
	Official sites in social media (Facebook, Twitter, Instagram)	70	79.5
	Others :.....		
A13b.	Unofficial information		
	Instant messaging applications (WhatsApp, Telegram, SMS)	61	69.3
	Print media (magazines and newspapers)	25	28.4
	Social media (Facebook, Twitter, Instagram)	71	80.7

	Electronic media (TV, radio)	57	64.8
	Blog	3	3.4
	Others :.....		
A14.	Types of vaccines		
	Pfizer	84	95.5
	AstraZaneca UK	1	1.1
	AstraZaneca Global	0	0
	Sinovac	3	3.4
	CanSinoBio	0	0
	Sputnik V	0	0
	Total	88	100
A15.	Reasons for choosing		
	It's safe.	27	30.7
	It's expensive.	14	15.9
	It is free	17	19.3
	I trust manufacturers	46	52.3
	Able to prevent and treat Covid-19	35	40.0
	Total	88	100

Factor Analysis

Factor analysis, a class of processes for reducing and summarising data in which each variable is presented as a linear combination of the underlying factors, is one of the most frequent approaches to measure construct validity (Malhotra & Birks, 2020). It's also known as a multivariate methodology that confirms the operationally defined dimensions of a concept while also identifying which objects are most suited for each dimension (Sekaran & Bougie, 2016). As a result, in this study, factor analysis was used to examine the interrelationships among a large number of variables and to explain these variables in terms of their common underlying dimensions (Hair et al., 2010).

This study consisted of 80 items where 15 items for readiness, 17 items for knowledge, 20 items for attitude were measured through six dimensions. Due diligence also is a multidimensional variable where 11 items measured in three dimensions. Support consisted of 10 items and religion consisted of 7 items. A varimax rotated principal components factor analysis was then conducted on all items for 6 variables separately. Here, only loadings of at least or more than 0.50 were included and as a result, factor was extracted for these variables based on the eigen value.

Overall, all 6 variables reach a minimum value of 0.6 for the Kaiser-Meyer-Olkin (KMO) measure of sample adequacy, and all variables score more than 0.7 for the KMO, indicating that the items were associated and shared common characteristics. All tests of sphericity were found to be significant at $p < 0.001$, indicating that the correlations among the variables are suitable and thus provide a solid basis for factor analysis (Ho, 2006). Meanwhile, individual MSA values reached a minimum cut value of 0.5, indicating that the data matrix was eligible for factor analysis. Meanwhile, factor loading for items ranged from 0.592 to 0.963 as showed in Table 1.2.

The findings of factor analysis also indicated there are reduction of dimensions for variable attitude which is from 6 dimensions to 3 dimensions which are herd immunity, unforeseen future effect and pessimistic. Variable knowledge also formed 2 factors which are vaccine information and alternative treatment. Due diligence remain with 3 factors which are the financial assistance, credibility of the manufacturer, and ministry responsibility. Meanwhile social support, religion and readiness remain to have 1 factor respectively. Although the loadings achieve minimum value suggested by Nunally and Bernstein (1994), there were 28 items deleted due to the factor loadings.

Table 1.2 below demonstrate the factor loadings of each items and the value of cronbach alpha for each variable(s) and dimension(s). According to Hair et al. (2017), a researcher is allowed to drop items up to 20 percent of the total number of items in the measurement model without compromising content validity. The total number of items dropped in this study is 28 items representing thirty five percent (35%) of the total number of items in the measurement model. Thus, the percentage of items that have been dropped does violate the specified conditions. All items dropped indeed have a load of factors below 0.60 as prescribed by Nunally and Bernstein (1994).

Hair et al. (2010) have provided guidelines for the values of coefficient alpha, also referred to as Cronbach's alpha which range from 0 to 1. Table 3.8 shows the rule of thumb to interpret alpha values as suggested by George and Mallery (2002) and Hair et al. (2006) explained the interpretation of alpha values must be based on the rule of thumb where the values of alpha below than 0.6 consider poor and acceptable, 0.6 to 0.7 consider moderate, alpha value between 0.7 to 0.8 is good and above than 0.8 is excellent. However, as a pre-caution, Hair et al. (2006, 2010) added that if the value of coefficient alpha recorded more than 0.95, the items should be inspected to ensure that they are measuring the different aspects of the concept. Based on the findings (Table 1.2), alternative treatment, dimension under knowledge and financial assistance, dimension under due diligence have poor inter consistency value. While for manufacturer dimension under due diligence recorded alpha value more than 0.95 which is at 0.966. Hence, researchers agreed to revised the items in the first pilot test as the items have validity and reliability issue and conduct a second pilot test.

Table 1.2

Factor analysis of research variables

Variable(s), Dimension(s) and Items	Loadings
KNOWLEDGE	
Vaccine information	
Without massive vaccination programs, Covid-19 would still exist.	0.891
The efficacy of vaccines Covid-19 has been extensively proven.	0.885
I understand what I read about Covid-19 virus.	0.830
Vaccines Covid-19 are 100% effective.	0.791
There is other strain of Covid-19 that can infect humans, including those that cause the common cold.	0.756
Cronbach alpha	0.875
Alternative treatment	
Antibiotics are an effective treatment for Covid-19.	0.915
Flu vaccine will protect me from Covid-19.	0.896
There is no evidence that eating garlic will protect me against the Covid-19.	0.824
Taking vitamin C or other vitamins will protect me from Covid-19.	0.679

Cronbach alpha	0.567
ATTITUDE	
Mistrust of Benefit	
Although Covid-19 vaccines appear to be safe, there may be problems that we yet to discover.	0.860
I believe I can still be infected with Covid-19 after vaccination.	0.760
I am concerned about my financial implication if i suffer serious side effects of Covid-19 vaccine.	0.713
I'm concerned about the unknown side effects of Covid-19 vaccines in the future.	0.673
Natural exposure to viruses and germs gives the safest protection from Covid-19.	0.644
Covid-19 vaccines can cause unforeseen problems and side effects particularly for high-risk patients.	0.629
Cronbach alpha	0.859
Pessimistic	
I don't believe Covid-19 vaccines can stop the spreading of Covid-19.	0.821
I don't feel vaccination Covid-19 is safe for me.	0.810
Pharmaceutical companies only focused on profit gain from the production of the covid-19 vaccine, but do not care about the safety of vaccine recipients entirely.	0.717
Authorities promote vaccination for financial gain, rather than for the welfare of the public.	0.595
Cronbach alpha	0.821
Herd Immunity	
It is important to get vaccinated against Covid-19 in order to protect others.	0.934
It is important to get vaccinated to protect my family from Covid-19.	0.913
It is important to achieve herd immunity in order to eradicate the pandemic Covid-19.	0.878
Cronbach alpha	0.931
FAMILY/SOCIAL SUPPORT	
My family provides me with the emotional support and assistance I need.	0.935
There is a special person who is around to advise me to get vaccination COVID-19.	0.901
My family makes every effort to persuade me to get the COVID-19 vaccine.	0.836
There is a special person with whom I can share my decision to take part in the COVID-19 immunization program.	0.820
My friends really having been working hard to persuade me to get vaccinated of COVID-19.	0.816
I have friends with whom I can share my decision of participating COVID-19 immunization program.	0.693
My family is willing to help me in making choices.	0.626
I can talk about my health problems with my friends.	0.602
Cronbach alpha	0.906
DUE DILIGENCE	
Manufacturer Credibility	
Before purchasing the COVID-19 vaccine, the ministry involved had made due diligence on risk studies and legal problems of the purchase of COVID-19 vaccine.	0.963

The collaboration between governments and ministries has developed a comprehensive policy before purchasing the COVID-19 vaccine.	0.955
I am concerned about my financial implication if i suffer serious side effects of Covid-19 vaccine.	0.926
The Government initiated the immunization of the COVID-19 programme by providing assurance that it will provide financial assistance to those affected in the event of serious side effects.	0.878
The purchase of the COVID-19 vaccine was made after the National Pharmaceutical Regulatory Agency (NPRA) Malaysia Approved the Covid-19 Vaccine.	0.847
The government simply chose pharmaceuticals that had high transparency in vaccine attempts.	0.815
Cronbach alpha	0.966
Ministry Responsibility	
The Ministry responsible for having extensive experience handles the COVID-19 vaccine immunization program.	0.960
The Ministry responsible for the purchase of the COVID-19 vaccine carries out its duties properly.	0.794
The Ministry of Science, Technology and Innovation and the Ministry of Health efficiently implemented the COVID-19 vaccine immunization program.	0.767
Cronbach alpha	0.896
Financial Assistance	
The government provides free COVID-19 vaccine to the people.	0.809
The purchase of the COVID-19 vaccine is one of the government's efforts to revive the country's economy.	0.694
Cronbach alpha	0.296
RELIGIOUSITY	
I am very concerned about the halalness of COVID 19 vaccine.	0.935
Halal principle is concerned with hygiene and safety of vaccine Covid-19.	0.901
I must know how COVID- 19 vaccine being produced.	0.836
Cronbach alpha	0.801
READINESS	
I want to be vaccinated.	0.929
I advise friends and family to get vaccinated for Covid-19.	0.912
I understand about the importance of COVID-19 vaccines for my life.	0.907
I have no objection if my employer impose a policy for all employees to be vaccinated for Covid-19.	0.864
I received good source of information about COVID-19 vaccine from KKM.	0.762
I do not want COVID-19 vaccine because this virus is not easily treated.	0.693
I Worried about COVID-19 as much as other type of infectious disease.	0.670
I have transport accessibility to go to hospital/clinic for vaccination program.	0.592
Cronbach alpha	0.924

Second Stage of Pilot Test

The second pilot study was conducted with 30 different respondents from the first pilot research after modifications were made based on the findings of the first pilot research. The researchers revised 11 items out of 80 in the first phase pilot test since they were irrelevant and did not fit with the study's aims. According to the findings of the analysis, the item's reliability rate in the second phase pilot trial was higher than in the first. Table 1.3 shows the results of the second phase's reliability analysis.

In the second phase pilot study, only the reliability analysis of the items was conducted due to data collection constraints ($n=30$), whereby factor analysis required at least 80 respondents (Hair, et al., 2010). Sekaran and Bougie (2010) pointed out that pilot studies which are commonly being conducted on a small scale, by interviewing individuals or gathering information from a limited number of occurrences, are not uncommon in exploratory research. In this regard, as recommended by Robbins (1999) that sample size for pilot test should range from 25 to 75, a total of 30 questionnaires were collected through self-administered to the population in order to conduct the pilot test. Based on the analysis of construct reliability analysis (Table 1.3) proves the cronbach alpha value for all constructs increased after improving the order and structure of sentences on the questionnaire item.

VARIABLE	NO. OF ITEM	CRONBACH ALPHA	SCALE IF ITEM DELETED	
			NO. OF ITEM	CRONBACH ALPHA
1. KNOWLEDGE	13	0.657	12	0.735
2. ATTITUDE	19	0.819		
Mistrust Vaccine Benefit	3	0.613	2	0.886
Future Effect	3	0.868		
Commercial Profiteering	3	0.864		
Natural Immunity	3	0.814		
Herd Immunity	4	0.833		
Vaccine Origin	3	0.487	2	0.860
3. FAMILY/SOCIAL SUPPORT	9	0.919		
4. DUE DILIGENCE	11	0.895		
Company	5	0.951		
Valuation	3	0.679	2	0.828
Personnel	3	0.883		
5. RELIGIOUSITY	4	0.723		
6. READINESS	13	0.858		

Conclusion

The goal of the study is to identify and assess the factors that influence covid-19 vaccination preparedness in Terengganu. To check and validate the study items, a two-stage pilot test was conducted. In the first stage, 88 responses were collected, and factor analysis was performed. Because more than 20% of the items in the first stage of the pilot test were discarded, the researchers decided to evaluate and amend the items before conducting the second stage. In the second stage, 30 responses were collected, and the item's internal

consistency improved from the first stage. Both stages of the data were free of missing data and outliers. Because this is a pilot study with a limited sample size, it is still too early to make any definitive inferences. Future research with a bigger sample of respondents may yield more compelling conclusions.

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