COVID-19 Vaccination and Acceptance in Melaka Tengah, Malaysia

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Abstract
Clinical tests done in a short and limited time have raised questions regarding the validity of COVID-19 vaccination efforts. This study aims to determine the level of COVID-19 vaccine acceptance and the main indicator of COVID-19 vaccine acceptance among citizens of Melaka Tengah, a highly dense and most developed area in Melaka, Malaysia. A quantitative cross-sectional survey is employed using purposive non-probability sampling techniques. A four-point scale questionnaire was administered online. A total of 411 vaccinated adults aged 18 or older responded to the survey, with 68.4% being government servants and 60.1% having a household income of less than RM5,110. Data analysis was performed using Statistical Packages for Social Sciences (SPSS) version 26. The findings showed that the level of COVID-19 vaccine acceptance among citizens of Melaka Tengah was moderate (M=2.92). The main indicator (M = 3.01) and part of the population's behaviour was self-efficacy. Hence, more efforts are needed to increase self-efficacy to enhance the acceptance of the COVID-19 vaccination as compared to perceived benefits and cues to action that have low predictive power.
Keywords: COVID-19, Health Belief Model, Melaka Tengah, Self-Efficacy, Vaccine Acceptance.

Introduction
On March 11, 2020, World Health Organisation (WHO) declared the COVID-19 disease as a pandemic. A respiratory ailment known as COVID-19 which was brought by the coronavirus SARS-CoV-2 spread rapidly from Hubei, China to nations around the world (Mohamed et al.,

2021). In order to fight against the spread of COVID-19, many nations have imposed vaccination so as to build herd immunity (Hashim et al., 2021; Mannan & Farhana, 2021). Essentially, vaccination is regarded as one of the highest advancements in contemporary medicine for public health (Klimiuk et al., 2021; Ridzuan et al., 2022).

About 11 months after the disease first emerged in 2019, the Food and Drug Administration (FDA) has approved the use of Pfizer/BioNTech and Moderna vaccines under a mass vaccination programme (Mohamed et al., 2021). As the COVID-19 vaccination was imposed rather abruptly on citizens, many issues were raised. This is because the speedy development and licencing of the vaccine, which took less than a year, may have affected public acceptance of the COVID-19 vaccine. People were wary of its imposition (Mannan & Farhana, 2021).

Many recent studies have reviewed predictors related to COVID-19 vaccine acceptance. Among others are trust in science and healthcare systems, source credibility, halal issue related halal products, safety, side effects, effectiveness, and alternative medication (Al-Qerem & Jarab, 2021; Alqudeimat et al., 2021; Cordina et al., 2021; Jiahao et al., 2020; Mannan & Farhana, 2021; Syed Alwi et al., 2021; Wake, 2021; L. P. Wong et al., 2022). Furthermore, there are various studies done on the acceptance of COVID-19 vaccines in several countries, including Malaysia (Al-Qerem & Jarab, 2021; Alqudeimat et al., 2021; Cordina et al., 2021; Faturohman et al., 2021; Huynh et al., 2021; Kalam et al., 2021; Lau et al., 2021; Lazarus et al., 2021; Li et al., 2020; Mannan & Farhana, 2021; Mohamed et al., 2021; Alwi et al., 2021; Wong et al., 2022).

As yet, there are limited studies recorded in the Melaka Tengah district (Amzah et al., 2022). In fact, Melaka Tengah is the most developed and fastest developing area related to the tourism and industrial sectors as compared to two other districts in Melaka, Jasin and Alor Gajah. This area has the highest population density with 1,613 people per square kilometer (Department of Statistic Malaysia [DOSM], 2020). Melaka Tengah is one of the districts in Melaka that has recorded several incidences of high infection rates above the national average with the value of COVID-19 National R-Naught at 0.99 in 2021. On April 11, 2020, the Melaka Tengah area was declared among the 26 red zone areas identified with the highest number of positive COVID-19 cases in Malaysia. On February 13, 2021, Melaka recorded the highest COVID-19 daily infection rate (Rt), which is at 1.07. COVID-19 vaccine acceptance rate was low during the early days of the pandemic. Zakarya (2021) stated that nearly 70,000 registrars in Melaka failed to turn up at vaccination centers for their vaccinations as recorded in the MySejahtera apps.
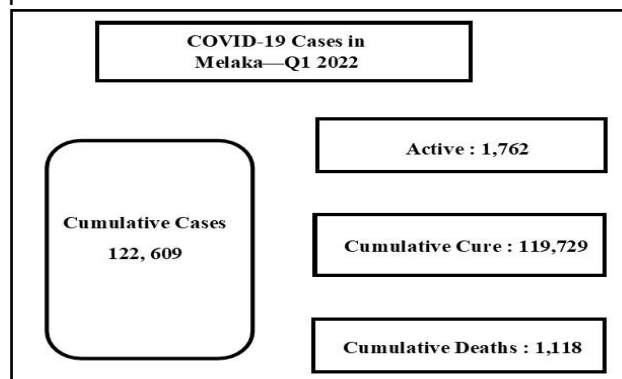

Figure 1: COVID-19 Cumulative Cases in Quartile1 2022

Figure 1 shows the COVID-19 cumulative cases in Melaka during the first quarter of 2022. The data showed that the cumulative cases recorded in August 3, 2022 were 122,609, with active cases at 1,762, cumulative cure with 119,729 cases, and cumulative deaths with 1,118 cases (Mahidin, 2022). This rising total number of cases in Melaka is a matter of concern to the state government. Essentially, the COVID-19 pandemic had a significant impact on Melaka, particularly the tourism sector. Tourist visits dropped more than 70% in 2020. In 2019, Melaka had clocked 18.7 million tourist arrivals with RM21.298 billion of its total revenue ("Over 70pc Drop in Tourist Arrivals," 2021). Significantly, the Melaka state government stated that at least 74% of its population needed to be vaccinated against COVID-19 in order to open its border and bring in tourists back to its region (Omar, 2021).

Unfortunately, some citizens refused to take the COVID-19 vaccine. It is essential that studies be done to understand the reasons behind vaccination resistance in view of the high rate of COVID-19 infections in Malaysia. Hence, this paper seeks to answer two major research questions which are (1) What is the level of COVID-19 vaccine acceptance? (2) What are the main indicators of COVID-19 vaccine acceptance among the population in Melaka Tengah? In addition, the study also seeks to investigate two main objectives: (1) to determine the level of COVID-19 vaccine acceptance, and (2) to determine the main indicators towards COVID-19 vaccine acceptance among the population in Melaka Tengah using the Health Belief Model (HBM) constructs. The findings will serve to add knowledge and information and assist the local government in promoting a higher rate of vaccination and booster uptake for long-term herd immunity to protect against COVID-19 infections.

Literature Review
Studies on Vaccines
Vaccines are derived from the Latin words Vacca (cow) and vaccinia (infectious disease) (cowpox). Antigenic chemicals are used in vaccines to generate active immunity to a disease, preventing or reducing the impact of infection by wild or natural species (Mohamad al-Bakri, 2015). Vaccine, according to Merriam-Webster (2021) is a non-harmful material containing a virus or bacteria that is given to a person or animal to prevent them from contracting the virus or bacterium's disease. Individual behaviour and beliefs that favour vaccination are referred to as vaccine acceptance. Vaccine acceptance encompasses a wide range of viewpoints and values (Feemster, 2013).

According to Mustafa Khan and Zulkipli (2018), vaccinations have been used since long ago. History demonstrated that it started in 1774, when a cattle breeder by the name of Benjamin Jesty contracted cowpox. He discovered that he was resistant to smallpox, a more dangerous illness. Then Benjamin Jesty purposefully gave his son and wife cowpox injections. His actions incited resentment among his neighbors. Even though he was only a regular cattle breeder, he knows the connection between cowpox immunity and smallpox before the initial smallpox infection. He stopped displaying his experiments to the public after that.

In Malaysia, vaccinations were first administered in 1868 under the British administration. The Malay headmaster started it during the smallpox virus infection in the Straits Settlements. Then, it spread to the rest of the nation in the 1950s. Those who refused to be vaccinated were imposed a compulsory fine of RM1,000. In 1980, this initiative was successful in containing the smallpox pandemic (Mohamad al-Bakri, 2015). In terms of COVID-19, clinical trials on a variety of COVID-19 vaccines began as early as January 2021. The outcomes demonstrated the effectiveness for general public use. Several COVID-19 vaccines have been authorised for use in emergency situations (Forni & Mantovani, 2021).

COVID-19 Vaccine

Beginning of March 2, 2021, Malaysia launched the National COVID-19 Vaccination Programme (PICK). During the initial stage, which lasted from February to April 2021, 500,000 front-line workers were vaccinated. Between April and August 2021, a total of 9.4 million vulnerable and disabled individuals received the vaccine as part of the second phase. From May 2021 till February 2022, participants must be at least 18 years old to participate in the third phase (Salim & Fong, 2021). At this early stage, 250,000 doses of vaccinations are administered to the general public on a daily basis at the national level. The daily totals then increased to 400,000. Jayatilaka (2021) stated that the COVID-19 national vaccination programme has used Astra Zeneca, Pfizer-BioNTech, Sinovac, Cansino Biologics, Johnson & Johnson, and Sputnik V as its primary vaccine types.

Unfortunately, certain communities have continually refused the COVID-19 vaccine ever since it was first made accessible. Thus, there is a need to understand why this is happening and why certain citizens have refused to be vaccinated. It is also important that we understand the reasons behind vaccination resistance in view of the high rate of COVID-19 infections in Malaysia. Germani and Biller-Andorno (2021) in their study discovered that anti-vaccine attitude is expressed often on Twitter. Anti-vaccine communities have never stopped in their promoting tactics to persuade individuals to refuse vaccination. Through the micro-blogging software, their fans frequently circulate incorrect information. Anti-vaccination proponents employ emotional speech and conspiracy theories in contrast to pro-vaccination supporters. Additionally, compared to other social media sites, Twitter was used more frequently by its campaigners. They use influential individuals to spread their anti-vaccine messages. Donald Trump was the main proponent of vaccine misinformation on Twitter before his account was suspended.

Essentially, the COVID-19 pandemic poses a serious risk to public health. The most desired remedy is an efficient vaccine. According to Al-Qerem and Jarab (2021) survey conducted on 1,144 Jordanians, the major reasons for vaccination refusal or hesitancy were due to worries about its usage and also the feelings of distrust. The findings showed a significant level of refusal or hesitation. A high risk of COVID-19 problems affected 30.4% individuals, whereas a medium risk affected 27.5%. In general, participants had a lot of knowledge with regards to COVID-19 symptoms, transmission routes, safety precautions, and treatment options.

In order to reduce the burden of COVID-19, it is essential to create a high rate of vaccine uptake. Certainly, there is a need to ease the anxiety level of public who are vaccine resistant to make the National COVID-19 Immunisation Programme a success. The results of an online poll conducted by Syed Alwi et al. (2021) among 1411 participants using a snowball sampling technique in Malaysia indicated that the overall acceptance rate was high (83.3%), with the lowest rate among pensioners and elderly people aged 60 and over (63.4%). Reluctance was brought on by worries about the COVID-19 vaccine side effects (95.8%), safety (84.7%), lack of knowledge (80.9%), effectiveness (63.6%), religious factors (20.8%) and cultural considerations (6.8%). This means that Malaysians generally agree with COVID-19 vaccination. Moreover, they suggested that the Malaysian government and other relevant organisations intensify campaigns and introduce COVID-19 mass vaccination programmes. Despite the high acceptance rate, it is still crucial to address the concerns of hesitant citizens by fostering trust and faith towards vaccination safety and efficacy through sufficient information dissemination.

Faturohman et al (2021) performed an online survey on 311 Indonesian respondents to determine their acceptance towards COVID-19 perceived usefulness, perceived ease of use, perceived religiosity toward, and amount of information. The study employed the Technology Acceptability Model (TAM) as its framework in determining the variables influencing vaccination acceptance. In order to determine the relationship between each explanatory factor and vaccination acceptance, a structural equation model was used. The Mann-Whitney test and Kruskal-Wallis rank were applied to evaluate demographic parameters linked to acceptance. According to the TAM model, acceptance of the COVID-19 vaccination was greatly improved by high perceived usefulness. Likewise, perceived usefulness was significantly raised by high perceived ease of use. Acceptance of vaccines was not significantly impacted by perceived religiosity.

Halal Vaccine Issue in Malaysia
Islam and religion are significant factors in Malaysia. Some Muslims disagreed to be vaccinated partly due to being suspicious of its halal status. In a survey on 1,745 Muslim consumers, researchers from Universiti Sains Islam Malaysia (USIM) discovered that 22% of respondents absolutely disapproved COVID-19 vaccine. About 300 to 400 respondents demonstrated disapproval towards the vaccination, mainly due to religious concerns. Some Muslims also prohibited their family members to be vaccinated (Albeny et al., 2018; Ramayah, 2021).

Sabri (2021) reported that 0.2% out of 13,800 teachers refused to be vaccinated in Melaka. Despite the government and the Mufti's explanations, Muslim community in Malaysia still has numerous questions regarding its status. A study from the Malaysian Ministry of Health highlighted that from January to March 2022, there were 119,000 cases of COVID-19 infection among children aged 5 to 11. A total of 12,000 young children, between the ages of 0 and 4, and 13,000 older children, have contracted the virus. Some children experienced major consequences that necessitate hospitalisation and critical care (ICU). Additionally, 2022 has seen a number of death incidents (Aida, 2022). This means that as adults were vaccinated, children also need to be vaccinated as well.

Theoretical Framework
Various concepts and theories are generally applied to explain society attitude and behaviour during COVID-19 pandemic. This study applied the Health Belief Model (HBM) by Rosenstock (1974) as the foundation to investigate the variables of health and direct behaviour modification on a person's attitude and belief (Jarim, 2018; Tajudin et al., 2021). In order to achieve the objectives of this study, HBM is used as an explanatory framework by looking at three potential variables: perceived benefit, self-efficacy, and cues to action.

Past health-related research highlighted perceived benefits among the highest indicator towards vaccine acceptance. Perceived benefit is referred to a person's perception on the available vaccine effectiveness to reduce the threat of COVID-19 disease. Meanwhile, self-efficacy and cues to action are among two of the variables which are rarely included in health studies. However, prior research has shown that self-efficacy accurately predicts interest-based behaviour, and cues have a significant impact on a person's ultimate decision to accept or reject vaccination (Burton-Jones & Hubona, 2005; Wake, 2021; Walker et al., 2021).

Methodology

The ongoing COVID-19 pandemic and public hesitancy regarding its related vaccines have increased public health concerns towards these issues. This study aims to investigate the level of COVID-19 vaccine acceptance among the population in Melaka Tengah and the main indicator towards COVID-19 vaccine acceptance.

- **Research Design**

This study employed the quantitative survey method. This cross-sectional survey research allowed for quick, low-cost data collection from a large sample of respondents and from a variety of demographics background (Mahmud, 2008; Ridzuan et al., 2022).

Table 1
Krejcie and Morgan (1970) for Sample Calculation

N	S	N	S	N	S	N	S	N	S	N	S
10	10	85	70	220	140	440	205	1200	291	4000	351
15	14	90	73	230	144	460	210	1300	297	4500	354
20	19	95	76	240	148	480	214	1400	302	5000	357
25	24	100	80	250	152	500	217	1500	306	6000	361
30	28	110	86	260	155	550	226	1600	310	7000	364
35	32	120	92	270	159	600	234	1700	313	8000	367
40	36	130	97	280	162	650	242	1800	317	9000	368
45	40	140	103	290	165	700	248	1900	320	10000	370
50	44	150	108	300	169	750	254	2000	322	15000	375
55	48	160	113	320	175	800	260	2200	327	20000	377
60	52	170	118	340	181	850	265	2400	331	30000	379
65	56	180	123	360	186	900	269	2600	335	40000	380
70	59	190	127	380	191	950	274	2800	338	50000	381
75	63	200	132	400	196	1000	278	3000	341	75,000	382
80	66	210	136	420	201	1100	285	3500	346	1000000	384

N = Population S = Sample

Table 1 illustrates the calculation sample size by Krejcie and Morgan (1970). The total population in Melaka Tengah as of May 2022 was 571,200 people. According to Krejcie and Morgan's (1970) table, 384 samples is sufficient to represent the entire population of this research. This is in line with the calculation by (*Raosoft Sample Size Calculator,* 2004).

- **Instrument**

The instruments in this study were adopted and developed based on the variables in the Health Belief Model and literature related to COVID-19, vaccination and acceptance during the pandemic.

Table 2
Source of variables from previous studies

Items	Construct Health Belief Model	Sources / Past Studies
COVID-19 Vaccine Acceptance	Perceived Benefit (6 questions)	(Benis et al., 2021; Jarim, 2018; Rosenstock, 1974; Shmueli, 2021)
	Self-Efficacy (6 questions)	(Bandura, 1997; Huynh et al., 2021; Kim et al., 2020; Maddux & Kleiman, 2016; Mohamed et al., 2021; Rosental & Shmueli, 2021; Shabrina & Zaki, 2019; Shmueli, 2021; Stout et al., 2020; Yoo et al., 2016)
	Cues to Action (5 questions)	(Burton-Jones & Hubona, 2005; Li et al., 2020; Wake, 2021; Walker et al., 2021)

Table 2 indicates the source of variables from past studies. Suitable questions were then adapted, developed and set up via Google Forms before being distributed online using various social media sites, such as Facebook, WhatsApp and Telegram groups. Furthermore, the validity of its content was finalised after going through the rigorous review and evaluation by relevant experts from the university faculties. Adjustments were made following their comments. The questionnaires were also piloted among 50 citizens of Melaka Tengah before the final questionnaire was sent out. According to Darusalam and Hussin (2016), if there were more than 30 samples, statistical counting would become reliable. The outcome demonstrated that the pilot test's strength of association determination was excellent.

Table 3
Reliability Analysis for COVID-19 Vaccine Acceptance Items

Variables	Cronbach's Alpha Coefficient Values			
	N of Items	N of Discarded Items	Pilot Study (50)	Survey (411)
Perceived Benefit	6	None	.886	.915
Self-Efficacy	6	None	.861	.927
Cues to Action	5	None	.859	.913

Table 3 shows the Cronbach's alpha for COVID-19 vaccine acceptance items. All items revealed high Cronbach's Alpha, both in the pilot test and survey. The questionnaires were then distributed to respondents in Melaka Tengah.

- **Sampling and Data Collection**

Purposive non-probability sampling method was used to sample 411 respondents across Melaka Tengah region. Melaka state is divided into three districts, Melaka Tengah, Jasin, and Alor Gajah. From a "sleepy hollow" district, Melaka is now considered as one of the world's 100 most resilient cities (Ismail & Koh, 2017). Despite being the second smallest state in Malaysia, Melaka is the fifth state with the highest population density with 1,613 people per kilometer square (Abdul Majid, 2021). In fact, Melaka has been identified several times as having a high infection rate above the national average. Data collection was done from 7 February to 12 March, 2022. The self-administered questionnaires with four-point scale were distributed online via various social networking sites.

- **Data Analysis**

Quantitative data was analysed descriptively using the Statistical Package for the Social Sciences (SPSS) software, where it was calculated, analysed, transformed, and produced in an understandable format. Descriptive statistics explained respondents' characteristics, and data was summarised using aspects of frequencies, percentages, means, and standard deviations.

Table 4
Level of Determination Based on the Mean Score

Mean Score	Level
3.02 – 4.02	High
2.01 – 3.01	Medium
1.00 – 2.00	Low

Source: (Pallant, 2020)

Additionally, Table 4 displays Pallant (2020) examination of the mean score data range of levels. The outcome is at a high level when the mean score falls between 3.02 and 4.02. In contrast, if the mean score is between 1.00 and 2.00, it is in the low level, and if it is between 2.01 and 3.01, it is in the medium level.

Result and Discussion

- **Demographic of Respondent**

The sample profile in this research is discussed in several aspects such as age, sex, race, marital status, religion, level of education, occupation, and household income.

Table 5
Respondents' Demographic Background

Characteristics		Frequency (N)	Percentage (%)
Sex	Female	212	51.6
	Male	199	48.4
Race	Malay	388	94.4
	Chinese	15	3.6
	Indian	7	1.7
	Others	1	0.2
Marital Status	Married	292	71.0
	Single	106	25.8
	Widow	9	2.2
	Divorced	4	1.0
Religion	Islam	392	95.4
	Christian	13	3.2
	Buddhism	4	1.0
	Others	2	0.5
Level of Education	MCE/HSC (National Examination)	177	43.1
	Certificate / Diploma	104	25.3
	Bachelor's Degree	101	24.6

Characteristics		Frequency (N)	Percentage (%)
	Master's / Doctorate Degree	29	7.1
Occupation	Government Sector	281	68.4
	Private Sector	71	17.3
	Unemployed	26	6.3
	Self-employed	19	4.6
	Housewife	10	2.4
	Retiree	4	1.0
Household Income	B40 (less than RM5,110)	247	60.1
	M40 (RM5,111 – RM10,729)	141	34.3
	T20 (more than RM10,730)	23	5.6
Total		**411**	**100.0**

Table 5 represents the demographic background of 411 respondents. The data illustrates that 94.4% of respondents were Malay and 95.4% were Muslim. Females made up 51.6% of the respondents. Meanwhile, 71% were married couples as compared to the single, divorced, or widowed or widower categories. Furthermore, in terms of education, 43.1% possessed formal higher education. In terms of occupation, 68.4% of respondents were public servants. Moreover, 6.1% were in the B40 income category or with a household income of less than RM5,110.

- **Level of COVID-19 Vaccine Acceptance**

Based on the health belief model variable, from six constructs (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy, and cues to action), only three constructs, (perceived benefit, self-efficacy, and cues to action) are included in this study as per the objective of this research.

1. **Perceived Benefit**

Perceived benefit is a person's opinion of the effectiveness of a given vaccination to decrease the threat of the COVID-19 disease (Huynh et al., 2021; Kalam et al., 2021; Li et al., 2020; Mohamed et al., 2021; Rosenstock, 1974; Shmueli, 2021). There are six items on perceived benefits. They are connected to the assumption that the COVID-19 product is effective in reducing the likelihood of contracting the diseases and other infections, as well as the major suffering and problems associated with them. In addition, respondents were asked whether they supported receiving the COVID-19 vaccine in order to avoid taking health precautions and attending religious events.

Table 6
Perceived Benefit Items

Variables	Code	Statement	Mean	Std. Deviation	Cronbach Alpha
Perceived Benefit	PB1	I support COVID-19 vaccination to attend religious events in the congregation.	3.11	.91	.91
	PB2	I am vaccinated (COVID-19) because I believe the risk of being infected with the disease will decrease	3.09	.82	.89
	PB3	I am vaccinated (COVID-19) because I believe the risk of infecting others will decrease.	3.05	.87	.89
	PB4	I believe the COVID-19 vaccine has high efficacy in preventing the significant complications of the disease	2.96	.84	.89
	PB5	I believe the COVID-19 vaccine has high efficacy in preventing the significant suffering of the disease.	2.95	.84	.89
	PB6	I support COVID-19 vaccination so that I do not need to follow the health preventive measure	2.58	.95	.93
Overall Mean			2.96	.87	.92

Table 6 illustrates the items of perceived benefit. The highest mean score is (M=3.11) on the item of supporting COVID-19 vaccination to attend religious events in the congregation. This indicated that citizens in the Melaka Tengah district voluntarily were vaccinated against COVID-19 because they wished to attend religious events in the congregation. During the Conditional Movement Control Order (CMCO), religious activities such as religious parades, Friday prayers, all worshipping or gathering in mosques, prayer houses, and houses of worship were prohibited. Once the government was satisfied and approved, all activities in mosques and suraus including in a Muslims' home of prayer were allowed (Parzi, 2020).

According to some, the gradual opening of mosques and suraus could enhance mental health. For example, the Federal Territory's Mufti, Datuk Luqman Abdullah stated that the community was really looking for a place to calm down after being affected by COVID-19 and the Movement Control Order (MCO). Luckily, it seemed that these decisions have indirectly made the suicide cases at that time to become manageable (Ismail, 2021).

The second item with highest mean score is (M =3.09) with the item on agreement to be vaccinated (COVID-19) because they believed that the risk of being infected with the disease would decrease. This indicated that citizens in Melaka Tengah agreed that the COVID-19 vaccination could decrease the rate of disease and infection. Ying-Ru and Abdul Halim Mu'adzam Shah (2021) stated that Malaysians' views towards the virus were improving. Malaysians in general showed a higher level of knowledge regarding vaccines and the severity of the disease as compared to during the initial spread of the pandemic. Moreover, their understanding and perceptions towards COVID-19 has significantly changed. Majority of Malaysians with 99%, regarded the virus as very harmful.

Li et al (2020) reported that many of their study respondents agreed to be vaccinated because they believed that COVID-19 vaccine would reduce the risk of getting sick. They also

agreed that vaccination would make them feel less afraid. The overall mean score for perceived benefit is (M = 2.96). These findings demonstrated that the majority of population in Melaka Tengah agreed to accept COVID-19 vaccine injections. However, their level of acceptance was considered as just moderate (Pallant, 2020). They believed that the vaccination was highly effective to reduce serious risk and suffering. It could be said that accepting the COVID-19 vaccine could therefore allow citizens to participate in openly in community gatherings and religious activities, attend congregations, shield them from infections, and promote them to take essential preventative measures.

Self-Efficacy

Self-efficacy is an individual impression or conviction in their own ability to tackle a particular difficult activity. The self-efficacy of a person, in the words of psychologist Albert Bandura, "is their belief in their skills to achieve desired consequences by their own activities" (Bandura, 1997; Maddux & Kleiman, 2016). By accepting the COVID-19 vaccination, respondents in this survey believed that they were able to defeat the COVID-19 infection. This component contains the following elements: the required safety measures and vaccinations, the government as the vaccine's supplier, the vaccination procedure, and vaccines as a source of profit.

Table 7
Self-efficacy Items

Variables	Code	Statement	Mean	Std. Deviation	Cronbach Alpha
Self-Efficacy	SE1	Even if I take all the necessary precautions, I still need to be vaccinated against COVID-19.	3.17	.85	.91
	SE2	I am vaccinated (COVID-19) because the government health centres provided the vaccine.	3.12	.82	.91
	SE3	I am vaccinated (COVID-19) because proper safety protocols are maintained while giving the vaccine.	3.12	.81	.91
	SE4	I believe that getting vaccinated (COVID-19) is not a tedious process that requires time.	2.94	.87	.91
	SE5	I believe that getting vaccinated (COVID-19) is not a tedious process that requires effort.	2.94	.85	.91
	SE6	I believe COVID-19 vaccine is not a money-making venture.	2.74	.91	.93
Overall Mean			3.01	.93	.93

Table 7 indicates the items of self-efficacy. The highest mean score is (M = 3.17) with a statement that even if individuals take all the necessary precautions, they still need to be vaccinated against COVID 19. This indicates that the citizens of Melaka Tengah self-efficacy are at a medium level. This outcome suggested that residents in Melaka Tengah are more

likely to support the government's advice to accept COVID-19 vaccine injections. To lessen the risks of this infectious virus, citizens must nevertheless follow instructions on preventive behaviour (Yoo et al., 2016).

According to a study by the Institute for Health Behavioural Research (IHBR) in Malaysia, 97.9% of the respondents agreed that taking preventive measures to break the COVID-19 infectious chain was a good idea. While 98.6% concurred that it was important to stop COVID-19 infection (Zakaria et al., 2020). This is in line with earlier findings made by the Chinese industry people (Pan et al., 2020). These respondents claimed that the majority of their respondents who worked in the factory had never removed their face masks in office or in other public places. However, research revealed that respondents do not adhered to preventative measures including using hand sanitizer, having social gatherings at restaurants, and avoiding crowded places.

Moreover, the second and third items have the same mean score. The items on agreement on being vaccinated (COVID-19) because the government health centers provided the vaccine (M = 3.12) and being vaccinated (COVID19) because proper safety protocols were maintained while giving the vaccine. This showed that the state government's efforts to provide various channels to spark the population's interest led to the Melaka Tengah residents' consent to be vaccinated. Based on the article on "Melaka Govt to Study Best Mechanism on Encouraging More to Register for Vaccination, Says MB" (2021) efforts included providing free vaccinations to 701,000 citizens.

However, in an effort to make the population more comfortable for vaccination sessions, Melaka has opened up 16 vaccination centers. These facilities were believed to be able to manage issues such as congestion and reduce waiting time in the vaccination centers. Mamat (2021) reported that the government has even designed a drive-through vaccination process for recipients to administer the second dosage. Additionally, the campaigns on National Booster COVID-19 Immunisation Programme, which debuted on October 13, 2021, is yet another important effort to deliver the booster dose to people who have already received the full dose of the vaccine. The overall mean score for self-efficacy is (M = 3.01), which showed that the residents in Melaka Tengah have a moderate self-efficacy level of acceptance towards COVID-19 immunisation injection.

Cues to Action

Cues to action are outside situations that motivate someone to make changes to their health. It is possible to describe cues to action as the act that is provided by the combined degrees of sensitivity and severity, as well as the perception of rewards (fewer obstacles), and which gives a preferred course of action (Huynh et al., 2021; Li et al., 2020; Mohamed et al., 2021; Rosenstock, 1974; Rosental & Shmueli, 2021; Shmueli, 2021).

The questions on cues to action include about whether respondents accepted the COVID-19 vaccination because the Ministry of Health (MOH) has released its official guidelines on the pandemic, whether the opinions of leaders on social media sites influenced respondents' choices, whether respondents had support from family and friends, and whether respondents had received physician's recommendation.

Table 8
Cues to Action Items

Variables	Code	Statement	Mean	Std. Deviation	Cronbach Alpha
Cues to Action	CA1	I am vaccinated (COVID-19) because the official guidelines from the Ministry of Health are published.	3.07	.82	.91
	CA2	I am vaccinated (COVID-19) because my family expressed their support.	2.84	.89	.88
	CA3	I am vaccinated (COVID-19) because my friends expressed their support.	2.72	.89	.88
	CA4	I am vaccinated (COVID-19) because recommended by my doctor.	2.64	1.0	.92
	CA5	I am vaccinated (COVID-19) because the opinion leaders on social networking sites expressed their support.	2.63	.89	.87
Overall Mean			2.78	.89	.91

Table 8 indicates the items of cues to action. The highest mean score is (M =3.07). The outcome suggested that because the Ministry of Health has established guidelines for COVID-19 pandemic, respondents agreed to receive the COVID-19 vaccine. Even though news and information concerning COVID-19 pandemic and vaccinations were made easily accessible on numerous social media sites, residents in Melaka Tengah continued to believe the news and information provided by the government. This notion agrees with past studies from many nations.

Lazarus et al (2021) discovered that respondents who had higher levels of trust in information from government sources were more likely to accept COVID-19 vaccine injection and follow their employers' advice to do so, as highlighted in global population survey on 19 nations. Singapore, stood out for having a high level of public confidence towards government administration. According to Wong and Jensen, 2020), compared to 5.8% in South Korea, 5.5% in Germany, or 3.7% in the US, 24% of Singaporeans said that they have high confidence towards Singapore government regarding this issue.

The Malaysian Ministry of Health (MOH) has worked hard to promote COVID-19 vaccine both through conventional and online media, particularly through the MOH official social media pages. Due to the daily news and information they received from both media, Malaysians believed that being immunised would allow them to lead a regular life (Mohamed et al., 2021).

Moreover, the item on citizens were vaccinated because of family support received the second-highest mean score (M = 2.84). The data indicated that residents in Melaka Tengah have a moderate level of acceptance for the COVID-19 vaccine. Family support is critical when deciding whether or not to be vaccinated, in any circumstances. According to Cordina et al (2021), those who are significant in a person's life could strengthen beneficial health behaviour by encouraging it. The overall mean score for cues to action is (M = 2.78). This demonstrated that the overall mean level on cues to action among the citizens of Melaka Tengah was at the medium level.

Overall Mean of COVID-19 Vaccine Acceptance

Based on the interpretation of the mean score by Pallant (2020), citizens in Melaka Tengah have medium level of acceptance and agreed on COVID-19 vaccination. In a prior study by Amzah et al (2022) on the urban community perceptions of the COVID-19 vaccine in Melaka Tengah, specifically in the Duyong area, it was discovered that nearly all relationships between sociodemographic factors and perception factors have a negative correlation. The results indicated that the Melaka Tengah citizens, especially in the Duyong area, have a positive attitude towards the acceptance of the COVID-19 vaccination.

Table 9
Overall Mean of COVID-19 Vaccine Acceptance

Variables	Mean	Level
Self-Efficacy	3.01	Medium
Perceived Benefit	2.96	Medium
Cues to Action	2.78	Medium
Overall Mean	2.92	Medium

Table 9 shows an overall mean score for COVID-19 vaccine acceptance (M = 2.92). Self-efficacy is found to be a powerful indicator of health behaviour protection. The critical component of COVID-19 vaccine acceptance showed that self-efficacy, has influenced how Melaka Tengah residents behave, particularly how they chose to respond to the COVID-19 pandemic. However, past studies revealed that cues to action, perceived benefits, and perceived barriers were consistently the stronger predictors of vaccine acceptance (Burton-Jones & Hubona, 2005; Wake, 2021; Walker et al., 2021).

Conclusion

As a conclusion, the health belief model posits that perceptions of benefit, self-efficacy and cues to action predict behaviour and are important indicators of COVID-19 vaccine acceptance. This study revealed that, as for the residents in Melaka Tengah, the overall level of acceptance rate is at the medium level of (M=2.92) with self-efficacy being the main indicator of COVID-19 vaccine acceptance. Hence, more efforts are needed to increase self-efficacy to enhance the acceptance of the COVID-19 vaccination as compared to perceived benefits and cues to action that have low predictive power.

Limitations of this study include aspects such as the results do not represent Melaka's whole population due to the reason that this study was carried out on the residents of Melaka Tengah. Moreover, the researchers have to spend a long time to gather responses from respondents online due to movement control travel restrictions and self-distancing capacity in organisations. Furthermore, the high response rate is dependent on respondents' sincerity. Subsequently, most of the respondents were government servants. Thus, this means that their belief and trust in the credible source disseminated by the government were at a high level. In the age of social media and online information resources, improving COVID-19 vaccination adherence must begin by fostering trust among Malaysian citizens.

It is recommended that health policymakers and the state government authorities work well with social influencers and respectable figures in the community in order to eliminate and reduce harmful false claims regarding vaccination. This is essential so as to effectively spread credible and truthful vaccination information. The results from this study provide useful information that will benefit future health intervention efforts focusing on enhanced

knowledge and self-efficacy to promote vaccine acceptance. Future research must consider the Jasin and Alor Gajah districts, as well as other states in Malaysia or regions worldwide. The outcomes provide the government with precise and trustworthy information, which will help determine the actual degree of COVID-19 vaccine acceptance. Such information ultimately helps in the planning of future initiatives to boost vaccination rates and confidence in national vaccine and immunisation programmes to combat severe infectious diseases.

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