Relationship of The Media Literacy Influence on Vaccination Knowledge among Parents in Malaysia

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Abstract
Parents place a high value on vaccination education as a means of protecting their children's health. Nonetheless, when it comes to vaccination myths spread by the media, it's hard for parents to notify between fact and mitos. The need for diverse information on health problems should be given comprehensive exposure and awareness of all types of diseases as the information needs on individuals are different. In addition, the purpose of this study is to investigate how parents' vaccination beliefs and practices are related in Malaysia. This study uses questionnaires to acquire quantitative data. 396 parents with children ages 1 years old to 15 years old in five Malaysian zones participated in the research. This study was analyzed using SmartPLS 3.0 software, Partial Least Squares Structural Equation Modeling (PLS-SEM) which is a process of evaluating hypothesis models, testing and linking all media literacy constructs, knowledge and behavior change among parents in Malaysia. All relationships were found to be statistically significant, suggesting that just two media literacy dimensions (access and sharing) are really influential in bringing about change among Malaysian parents. In the future, researchers may choose to conduct their research using either qualitative research techniques or a mix method in order to provide findings more in-depth.
Keywords: Media Literacy, Vaccination, Health Communication, Attitude, Knowledge, Behavioral Change

Introduction
Health is a critical component in ensuring everyone's well-being. A good health will ensure a high quality of life at all times. According to the World Health Organization (2018), health is a condition of complete physical, mental, and social well-being. Nevertheless, vaccination started to become a significant concern and problem, and as a result, it became an issue for parents, which is now being highly disputed. Literacy in the media is reported to be a factor that influences the decrease and addition of data of infectious illnesses in Malaysia, particularly infectious diseases that may be prevented by vaccines.

In this regard, knowledge of adequate vaccination and high levels of media literacy play an important role in triggering changes in vaccination behaviour for parents, regardless of whether the behaviour is one of completely accepting, partially accepting, was hesitant and suspicious, refused causality, or completely rejecting this vaccination. In other words, parents are classified as either pro-vaccine or anti-vaccine depending on their stance on the subject.

In any circumstance, the first thing that should be worked on is strengthening one's faith in the information being presented. On the other hand, Roberts (2019) from BBC News highlighted that a lack of confidence is a worldwide problem when it comes to kid immunizations. This leads to the difficulty in the total intake of the vaccine in parents since, as a result of the unwillingness to vaccinate their children, this problem has become a contemporary one that is often discussed by (Petrelli et al., 2018).

According to Nordin (2019), the topic of vaccination is currently being discussed and it will not stop being reviewed. One of the primary reasons for this is the widespread misunderstanding of vaccination among the community, particularly among parents who find it difficult to differentiate between facts and myths regarding vaccination. It is the result of a viral competition in the media between facts and rumours. If this supposition is allowed to spread unchecked, it opens the door to threats that might affect the health of all people.

It has been reported that accessing the internet for information is one of the activities that people do the most often on the internet (Cole, 2006). The pursuit of false information contributes to a high rate of refusal of vaccinations among parents. This is because parents who lack information, do not have access to relevant facts, or have an incomplete understanding are more likely to behave in a manner that is antagonistic toward vaccinations (Hobson-West, 2003). This is as a result of the fact that there are also responders whose thinking has been impacted by the occurrence of disinformation, anti-science, sentiment, or anti-vaccine campaigners.

According to a statement made by the deputy health minister, Datuk Seri Dr. Hilmi Yahaya, there were roughly 1,600 newborns who were found to have not had an immunisation shot in 2016, compared to as many as 1,500 babies in our nation who were not immunised in 2015.

The health communication that is supposed to be transmitted as ineffectual as a consequence of inadequate information, which in turn leads there to be a broad variety of opinions and attitudes on the immunisation programme. This predicament is not just the consequence of the representation by the media that transmits the danger of a sickness, but it has also resulted in their engaging in illogical activity once they have been aware of this information (May, 2005). Human conduct is shaped by the emotions we experience as a result of the things we see about ourselves and the world.

The way a person acts depends on how they already feel about things. Both positive and negative attitudes have an effect on how people act. Several things inside and outside of a person can help shape and change their behaviour. Behavior is also based on what you know, and it will be better if you are aware, pay attention, use good judgement, and even have a good attitude. According to Miller (1996), education and knowledge make a person think

productively on an issue. This can be attributed to parents who do not have knowledge in media literacy.

The success or failure of the vaccination programme may be attributed, in part, to factors such as the level of knowledge, attitude, and practicality among the parent population. These days, the vast majority of professionals working in the health industry communicate with patients and other stakeholders through social media (Kind, 2013). The idea of media literacy has to be widened so that it is not simply restricted to young people, who make up a big portion of the consumer population, and so as to further lessen the possible negative impacts that media influence may have on lifestyle and behaviour. When it comes to comprehending information and knowledge, particularly on a more general level about one's health, one's age is not a factor in the need for media literacy.

The objectives of the present study are:
1)   To examine the relationship between media literacy and vaccination knowledge among parents in Malaysia
2)   To examine the relationship between vaccination knowledge and behavior among parents in Malaysia

Literature Review
This section discusses the research constructs: media literacy, knowledge and behaviour.

Media Literacy
Media literacy fosters the growth of many factions in the quest for information. Media literacy, as defined by Martens (2010), is a person's knowledge, skills, and ability to access, analyse, evaluate, and re-communicate messages or information in multiple forms. In another study, Strasburger et al (2014) define media literacy as the ability to understand and use mass media effectively and efficiently. According to the viewpoint expressed by Livingstone (2003), media literacy is defined as the capability to access, analyse, and evaluate the content of the media, as well as to re-communicate such information to the general public.

Knowledge
The definition of knowledge is that which is already present in a person's head. It may be gained via one's own experience, from the experiences of others, or through tradition (Prasetyo, 2007). The process whereby a person acquires information and abilities via the use of their senses in relation to a certain item is known as knowledge (Hidayat, 2007).

Knowledge is gained via one's eyes and hearing, which are the primary contributors to one's knowledge (Notoatmodjo, 2003). Knowledge may be received from a variety of sources, including a person, traditional media, electronic media, books, and so on, and it has the ability to instill confidence in an individual to the point where they create their conduct in accordance with their own particular preferences.

Behavior
A person's actions, whether they are carried out directly or indirectly, consciously or semi-consciously, are considered to constitute their behaviours. It is also dependent on attitudes that a person has, along with certain values (Beaker, 2001). Martin dan Pear (2019) define

behaviour as "everything spoken or done that involves the activity, response, action, and reaction of a person," which includes the use of one's muscles, glands, and the electrical activity of each organ.

Figure 1 consist seven constructs, namely access, analyses, evaluate, communicate, knowledge, pro-vaccine and anti-vaccine.
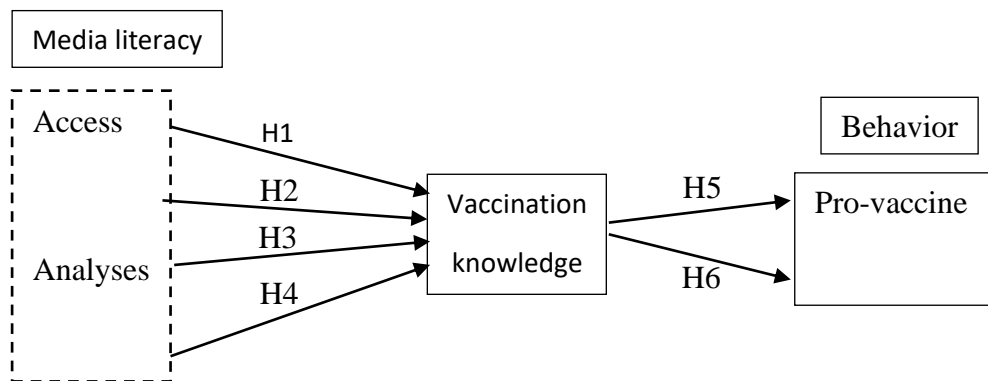

Figure 1 : Conceptual Model

Research Methodology and Location
This study used a quantitative approach, with 396 respondents completing a questionnaire that involved five zones in Malaysia, namely the East zone (Kelantan, Terengganu, Pahang), West zone (Wilayah Persekutuan, Selangor, Perak), North zone (Perlis, Kedah, Pulau Pinang), South zone (Johor, Melaka, Negeri Sembilan), and Borneo zone (Sabah, Sarawak).

This study focuses on Malaysian parents who solely use the internet to find vaccination information and have children ages 1 day to 15 years old, whether male or female. The data collection stage covered four months, from November 1, 2018, to February 28, 2019. There are three types of sampling involved: multistage cluster sampling, random sampling, and purposive sampling.

A total of 60 items for the study were divided into three constructs: media literacy, knowledge and behavior. The present study measured all the constructs on a 5-points Likert-type scale (1 = *strongly disagree,* 2 = *disagree,* 3 = *neither disagree nor agree,* 4 = *agree,* 5 = *strongly agree*). Therefore, the three measurement constructs included in the questionnaire were as follows:

• Media literacy (ML) includes 32 items and four dimensions, namely access (AC), analysis (AN), evaluate (EV) and communication (CO).
• Knowledge (KN) includes 10 items with three dimensions: low, medium, and high.
• Behaviour includes 18 items and two dimensions, namely pro-vaccine (PV) and anti-vaccine (AV).

Hypothesis Development
Once the conceptual framework was finalized, the next step was the hypotheses development.

The first hypothesis was developed to explore the relationship between access and vaccination knowledge.

H1: Access significantly influences vaccination knowledge.

The second hypothesis was developed to explore the relationship between analyses and vaccination knowledge.

H2: Analyses significantly influences vaccination knowledge.

The third hypothesis was developed to explore the relationship between evaluate and vaccination knowledge.

H3: Evaluate significantly influences vaccination knowledge.

The fourth hypothesis was developed to explore the relationship between communication and vaccination knowledge.

H4: Communication significantly influences vaccination knowledge.

The fifth hypothesis was developed to explore the relationship between vaccination knowledge and pro-vaccine.

H5: Vaccination knowledge significantly influences pro-vaccine.

The sixth hypothesis was developed to explore the relationship between vaccination knowledge and anti-vaccine.

H6: Vaccination knowledge significantly influences anti-vaccine.

Composite Reliability (CR)
Composite reliability, or CR, was described by Hair et al (2019) as "a measure of internal consistency reliability that, in contrast to Cronbach's alpha, does not imply equally weighted indicator loadings." This was stated in the study. When doing an exploratory study, the composite reliability need to be more than 0.60 and, generally speaking, greater than 0.70, but it must not be greater than 0.95.

Indicator Reliability/ Outer Loadings
Indicators with outer loadings ranging from 0.40 to 0.70 should be eliminated if doing so enhances composite reliability and AVE over the specified threshold value. As a result, the indicator's outside loading should be more than 0.70 (Hair et al., 2017).

Average Variance Extracted (AVE)

Hair et al. (2019) defined average variance extracted (AVE) as "the average (mean) of the squared loadings of all indicators associated with a certain construct." AVEs of 0.50 or more are good enough. As a measure of convergent validity, the AVE is used (Hair et al., 2017).

Discriminant Validity

The Fornell-Larcker criteria, cross-loadings, and the heterotrait-monotrait (HTMT) ratio of correlations are three methods that may be used to evaluate the discriminant validity of a test. Issues with discriminant validity manifest themselves if HTMT values are high (Hair et al., 2019).

Research Findings

The study utilized the partial least square (PLS) method for data analysis using Statistical Package for Social Sciences (SPSS) version 22 and Smart PLS version 3.3 software. A reliability test must be performed initially to decide if the components in the instrument should be retained or eliminated. The Cronbach Alpha coefficient was utilized to compute the reliability test. The reliability test was divided into parts that covered media literacy, knowledge, and parents' behavioral changes in Malaysia.

Table 1
Test of Reliability

Constructs	Total items	Cronbach's Alpha
Media literacy	32	0.977
Vaccination knowledge	10	0.907
Parents behavioral changes	18	0.972

Respondents Information

Table 2 shows the distribution of respondents information. A total of 396 parents from 14 states were involved in this study as respondents. There were 218 female respondents (55.1%) among the 396 participants surveyed. This indicates that mothers prioritize their children's welfare over fathers. The majority of respondents (235 people, or 59.3%) are between the ages of 21 and 30. More than half of the respondents — 219 in total (55.3%) — are of the Malay race, followed by the Chinese with 60 respondents (15.2%), the Indians with 47 respondents (11.9%), the Bumiputera with 45 respondents (11.4%), and other races with 25 respondents (6.3%). This study includes 212 respondents (53.5%) from urban areas and 184 (46.5%) from rural areas. Married couples living in the same house with a partner reported the highest value of 174 people (43.9%). The majority of respondents (109 people, or 27.5%) had three children, whereas just 60 people (15.2%) had one child.

Table 2
Distribution of Respondents Information

Demography factor	Frequency	Percentage (%)
Gender		
Male	178	44.9
Female	218	55.1
Age		
21-30 years	235	59.3
31-40 years	110	27.8
41-50 years	49	12.4
51-60 years	2	0.5
Race		
Malay	219	55.3
Chinese	60	15.2
Indian	47	11.8
Bumiputera	45	11.4
Others	25	6.3
Origin		
Urban	212	53.5
Rural	184	46.5
Marital status		
Single (Never married)	5	1.3
Married (Stay in the same house)	174	43.9
Married (Stay in a different house)	96	24.2
Divorce (Single father)	68	17.2
Widower (Single mother)	53	13.4
Number of children		
1 child	60	15.2
2 children	81	20.5
3 children	109	27.5
4 children	74	18.6
More than 4 children	72	18.2

Source: Authors

Measurement Model
According to Hair et al (2019), the measurement model depicts the relationship between indicators (items) and each construct. The measurement model is evaluated using two metrics: convergent validity and discriminant validity. The measurement model is being evaluated to see if the indicators used have enough validity and reliability to examine the relationship between exogenous and endogenous variables in the model (Hair et al., 2019). Table 3 displays the measurement model's results.

Convergent Validity
This study evaluates each construct in the measurement model to fulfill the convergent validity criteria. The extracted average variance (AVE) is used to assess a construct's

convergent validity, with an acceptable AVE of 0.50 or greater (Hair et al., 2019). Table 3 indicates that all AVE values are more than 0.50 and range from 0.581 to 0.908.

However, the factor loading for each indicator is between 0.674 and 0.993, which is greater than the default value of 0.5 (Hair et al., 2017). Then, the composite reliability (CR) is between 0.929 until 0.982, which is exceeds the minimum value of 0.7 (Hair et al., 2019). Fourteen indicators with loading values of less than 0.5 were omitted from the convergent validity criteria because they did not fulfill the minimum loading value condition. Table 3 shows that convergent validity is fulfilled because the factor loadings, AVE, and CR exceed specified values.

Table 3
Measurement model results

Construct	Items	Factor loadings	CR	AVE
AC	AC1	0.829	0.952	0.738
	AC2	0.889		
	AC3	0.871		
	AC4	0.838		
	AC5	0.860		
	AC6	0.821		
	AC7	0.902		
AN	AN1	0.753	0.982	0.902
	AN2	0.969		
	AN4	0.990		
	AN5	0.988		
	AN6	0.983		
	AN7	0.993		
EV	EV1	0.969	0.967	0.908
	EV2	0.917		
	EV6	0.972		
CO	CO2	0.921	0.929	0.766
	CO3	0.763		
	CO7	0.921		
	CO8	0.887		
KN	KN1	0.674	0.933	0.581
	KN2	0.681		
	KN3	0.681		
	KN4	0.823		
	KN5	0.822		
	KN6	0.772		
	KN7	0.785		
	KN8	0.772		
	KN9	0.808		
	KN10	0.786		
PV	PV4	0.950	0.972	0.898
	PV5	0.946		

	PV9	0.949		
	PV10	0.946		
AV	AV1	0.904	0.963	0.868
	AV2	0.925		
	AV3	0.950		
	AV8	0.947		

Discriminant Validity

Once convergent validity is met, the last step is evaluating discriminant validity. The discriminant validity is fulfilled when the value of heterotrait-monotrait (HTMT) is less than 0.90 (Franke dan Sarstedt, 2019). Table 4 shows that all HTMT values are less than 0.90, ranging from 0.223 to 0.894. As a result, it is reasonable to conclude that the study's respondents understand the distinctions between the seven constructs based on each variable.

Table 4
Discriminant validity by HTMT criterion

	AC	AN	EV	CO	KN	PV	AV
AC							
AN	0.671						
EV	0.662	0.881					
CO	0.644	0.879	0.894				
KN	0.486	0.691	0.619	0.653			
PV	0.223	0.253	0.244	0.282	0.608		
AV	0.225	0.231	0.226	0.269	0.613	0.898	

Structural Model

Before assessing the structural model, a multicollinearity test is conducted to ensure there is no collinearity in the research model. Table 5 displays six constructs with Variance Inflation Factor (VIF) values ranging from 1.000 to 4.476, all of which are less than 5 (Hair et al., 2017). The multicollinearity test revealed that there was no collinearity between the variables. This result demonstrates that each variable in the research has a different interpretation. The research hypothesis in this study is tested using the bootstrapping procedure. The bootstrapping procedure is used to test and assess the significance of a relationship between variables. This study generated 5000 bootstrapping from 396 samples.

Table 5 displays the hypothesis test findings. The bootstrapping analysis findings reveal that AC (β = 0.037, t = 0.703, p = 0.482) and EV (β = -0.009, t = 0.122, p = 0.903) had not significant relationship on KN. Thus, hypothesis H1 and H3 are not supported. Besides, AN (β = 0.528, t = 6.223, p = 0.000) and CO (β = 0.172, t = 2.610, p = 0.009) had significant relationship on KN. Therefore, H2 and H4 are supported. This result also reported KN had significant relationship on PV (β = 0.565, t = 13.384, p = 0.000) and AV (β = 0.566, t = 13.338, p = 0.000).

Table 5
Hypothesis testing

Hypothesis	Relationship	Coef. (β)	Std. error	*t*-value	*p*-value	VIF	Decision
H1	AC → KN	0.037	0.052	0.703	0.482	1.840	Not supported
H2	AN → KN	0.528	0.085	6.223	0.000	4.332	Supported
H3	EV → KN	-0.009	0.076	0.122	0.903	4.476	Not supported
H4	CO → KN	0.172	0.066	2.610	0.009	3.821	Supported
H5	KN → PV	0.565	0.042	13.384	0.000	1.000	Supported
H6	KN → AV	0.566	0.042	13.338	0.000	1.000	Supported

The coefficient of determination (R^2) value refers to the total variance of the endogenous variable explained by the exogenous variable. The larger the value of R^2, the greater the ability to predict exogenous variables against endogenous variables in a structural model. Based on the results in Table 6, the value of R^2 (0.480) indicates that AN and COM contribute 48% to KN. While KN contributes 31.9% (R^2 = 0.319) to PV and 32% (R^2 = 0.320) to AV.

Predictive relevance, known as Stone-Geisser (Q^2) test also used for the constructs. For the predictive power of the construct, the blindfolding procedure was used to evaluate Q^2. The purpose is to identify whether the evaluated model has strong predictive power or not.

Table 6 shows the results of PLS blindfolding testing, which revealed that the Q^2 values for KN (Q^2 = 0.233), PV (Q^2 = 0.284), and AV (Q^2 = 0.233) are all larger than zero. This finding explains that there is a strong and sufficient prediction in this study.

The effect size value (f^2) indicates the impact of exogenous variables on endogenous variables. Cohen (1988) defined the exogenous variable's f^2 value as having a small (0.02), medium (0.15), or large (0.35) effect. Table 6 demonstrates that AN (f^2 = 0.120) and COM (f^2 = 0.020) have a small effect on KN as endogenous variables. Meanwhile, the KN variable has a large effect on PV (f^2 = 0.469) and AV (f^2 = 0.471).

Table 6
Determination of coefficient (R^2), Predictive relevance (Q^2) and
Effect size (f^2)

Relationship	R^2	Q^2	f^2
AN → KN	0.480	0.233	0.120
CO → KN	0.480	0.233	0.020
KN → PV	0.319	0.284	0.469
KN → AV	0.320	0.233	0.471

Discussion
In this result, a total of six hypotheses have been examined and evaluated. These hypotheses include gaining access to information, analysing knowledge, applying evaluations to knowledge, and communicating back to knowledge. However, we only obtained two outcomes from the hypothetical scenario, and we disregarded the other two possibilities. This

demonstrates that just two assumptions, namely the ability to analyse and the ability to recommunicate, have a meaningful association with knowledge. While accessing and evaluating has no significant relationship and the hypothesis is rejected.

Hypothesis 1 has no significant relationship with knowledge because accessing this is an activity where all users know it indirectly when owning a device and access to the internet. Conveniently, access to search engines on Google or Yahoo, can provide ample options to read. It is not subject to a certain age, and even children also know how to access the internet easily. The significance of media literacy is further supported by this finding, which shows that exposure may have an effect even in the absence of prior knowledge.

Hypothesis 2 has a significant relationship between analyzing and vaccination knowledge is because with the skill of analyzing that information by comparing from one source with another on the internet ethically and morally, the respondent is more concerned with the importance of the information. They will also be more careful in drawing conclusions and responses to information based on their understanding and experience.

The third hypothesis, on the other hand, focuses on the aspect of judging to one's knowledge. Consider not just the good aspects of something, but also the bad aspects, since one must sometimes examine things from a pessimistic stance. The variables of a person's experience are also taken into consideration in this evaluation. Excellent evaluation; the influence will cause a person to undergo positive alterations in their conduct. If, on the other side, the evaluation is not positive, then the influence will also lead to a change in the individual's negative conduct. In this context, a positive change in behaviour is considered to be pro-vaccine, whereas a negative change in conduct is considered to be anti-vaccine. Therefore, it cannot be refuted that the judgement item does not call for any understanding of how to act as a mediator.

While hypothesis 4 has a significant relationship between re-communicating and vaccination knowledge is due to the fact that the respondent will not share, comment or like the information without knowing if it is authentic or otherwise. The process of re-communicating vaccination information is a process of transferring data from one person to another.

The fifth hypothesis relates knowledge to vaccination support, whereas the sixth hypothesis relates knowledge to vaccine opposition. According to the results, people may be both pro- and anti-vaccine depending on their level of understanding. This explains how all information, regardless of how it is presented, either supports or pushes vaccination. With the knowledge at hand, the individual will apply what is known, comprehended, applied, analysed, synthesised, and properly assessed. Thus, the findings of this hypothesis revealed that knowledge, as a mediator factor, influences whether a person is pro- or anti-vaccine since it has a significant relationship.

Conclusion
There were just two outcomes that the researcher was interested in learning about. This reveals that just two assumptions, namely the ability to analyse and the ability to share, have a significant with knowledge. The hypothesis is not supported since there is no significant between assessing and evaluating the information.

Accessing this is an activity where all users know it indirectly via ownership of a device and access to the internet, hence there is no significant relationship between knowledge and Hypothesis 1. The respondent cares more about the value of the material when they have the ability to analyse it by comparing it with other sources on the internet in an ethical and moral way, supporting the second hypothesis. In contrast, the third hypothesis considers how well one knows a topic before passing judgement. A respondent who is unsure of the veracity of the material will be less likely to spread it via shares, comments, or likes, lending support to the fourth theory. The fifth hypothesis proposes that information contributes to vaccination support, whereas the sixth proposes that knowledge contributes to vaccination opposition.

As suggestions, research should help fill in certain gaps in our understanding of how media literacy and vaccine knowledge interact, leading to shifts in parental behaviour among Malaysians. The results of this investigation bolstered the psychometrics of media literacy measures of alterations in vaccination behaviour. It is appropriate to utilise items that measure the notion of media literacy, knowledge, and altered behaviours.

Future researchers can employ qualitative research methods or a combination of qualitative (in-depth interviews) and quantitative research methods to produce distinct, robust, and deeper discoveries. It can also be perpetuated by efforts to educate everyone, especially the local community, on this facet of media literacy.

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