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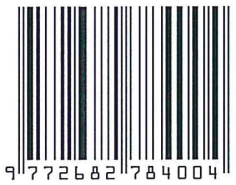

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PREVENTION IS BETTER THAN CURE: A CASE OF PARENTS' DECISIONS OF CHILDREN VACCINATIONS

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ABSTRACT

Prevention is better than cure. Globally, it is becoming increasingly important to note that the introduction of vaccinations would help to slow down the outbreaks of infectious diseases. The purpose of this present study is to examine the level of parents' decisions of children vaccinations and measure the associations between misinformation, parents' attitudes, and knowledge with parents' decisions of children vaccination. In addition to that, this study also tends to investigate the differences in the parents' decisions of children vaccination across religious beliefs and income groups. A cross-sectional survey among parents who brought their children to the clinics was employed for this study. A quantitative method was practically used in this research and out of 250 questionnaires distributed, only 147 questionnaires were returned. Results depicted that there was a high level of parents' decisions of children vaccinations. Meanwhile, the correlations between misinformation, parents' attitudes, and knowledge were found to be significantly correlated with the parents' decisions of children vaccination. Besides that, results also illustrated that there was a significant difference in the parents' decisions of children vaccination across religious beliefs, but no significant difference in the parents' decisions of children vaccination across income group. Thus, this study had contributed to providing valuable information among the parents as well as achieving a greater understanding of the level of parents' decisions of children vaccination. The government should portray its vital role in promoting better health care of children vaccination through the enhancement of programmes and campaigns.

1. INTRODUCTION

The importance of having an effective immunisation programme through the introduction of vaccinations was said to be indisputable. In Finland, childhood vaccinations are voluntary and free of charge and almost all vaccines are administered by a public health nurse at a child health clinic following the national vaccination programme (Karlsson, 2019). This is in line with the Global health organisations (WHO) which emphasises the development and implementation of effective immunisation programmes. It is becoming increasingly important that this programme has enabled most of the countries to improve their global health through the introduction of vaccinations to curb the outbreaks of contagious diseases.

As reported by the Department of Statistics of Malaysia (2010) almost one-third (10,663,601) of the total population (28,334,135) in Malaysia are children aged between 0-19 years old. Therefore, this justifies the need of having this study since this group is among the future generation that needs to be protected by many quarters such as families, relevant agencies, government, and communities.

In the Malaysian context, there is an increasing number of parents who have concerns about immunising their child and some refusing vaccines. The three main reasons for refusing vaccines were a preference for alternative treatment, (75 percent), the assumption that vaccines do not affect (37.5 percent), and doubts regarding vaccine contents (25 percent). Besides that, 87.5 percent children from the refusal group missed two or more vaccines while 61.3 percent from the defaulter group missed one vaccine (Amar-Singh, et al., 2016). The Former Deputy Health Minister, Datuk Seri Dr. Hilmi Yahaya has revealed in the Parliament that there were 1600 cases of children vaccination's refusal in March 2017 compared to 1500 cases in 2015, in which among the states with the highest number of rejections were Kedah, Pahang, Selangor, Perak, Kelantan, Terengganu, and Penang (Farhana, 2017). According to Adie & Hidir (2017), in Malaysia, the state of Kedah recorded the highest number of vaccine rejection cases in the country with more than 239 cases in 2014 with an uprising of 318 cases as of 2016.

In June 2016, due to the incomplete scheduled vaccinations, it was reported that a 2-year-old-boy, named Muhammad Harris Haikal Amdin died due to diphtheria, followed by his 11-month-old brother Muhammad Rushaidi Rizqi a month later in Sungai Petani, Kedah. Besides, the number of defaulters refusing to vaccinate their children portrayed an incremental from 470 cases in 2013 to 1054 cases as of May 2015 in Malaysia (Arumugam, 2016). Selangor stated that the refusal for children vaccination raised from 637 in 2013 to,541 cases in 2016 as well as the trend was similar to the state of Pahang, in which there were 84 cases of children vaccination's refusal in 2014, but this kind of refusal had increased to 176 cases as of 2016 (Hidir, 2017). The previous study has revealed two worrying reasons for incomplete immunisation; such as the attitude of the mother towards their children's healthcare, presenting as 'no time' or 'forgot' their child's immunisation, and those mothers in the vaccine-refusal group; who gave reasons of 'refused vaccine', 'do not trust vaccine', 'doubt halal status', 'religion does not allow' and 'bad experience' (Ahmad, Jahis, Kuay, & Jamaluddin, 2017). According to Farhana (2017), Malaysian Medical Association President, Dr. John Chew Chee Ming stated that the fear of side-effects and anti-vaccine movement appeared to be popular in social media are the reasons for refusing to vaccinate their children.

From another aspect nevertheless, the government had implemented the initial National Immunisation Programme (NIP) that was established in the 1950s with the missions of protecting the child population from vaccine-preventable diseases, reducing endemic cases, as well as decreasing the morbidity and mortality rates associated with vaccine-preventable diseases (Panting, Zin, Perialathan, & Jaafar, 2009). The launch of the 2016-2020 Immunisation Promotion Programme was aimed at organising vaccination awareness campaigns, talks, workshops and publishing articles on vaccination which were distributed to health clinics nationwide as well as boosting the public's confidence in the use of vaccines (Farhana, 2017). The Ministry of Health has announced an allocation of RM 60 million for the injection of the Pneumococcal vaccine which will be provided free of charge to the children, as part of the National Immunisation Programme. The RM30.6 billion allocation in the 2020 Budget to the Ministry of Health will be used to strengthen the delivery of health services to the people, especially the rural, urban poor, and the indigenous (Iskandar, 2019). The initial allocation of RM60 million for the pneumococcal vaccine to all children through the National Immunisation Programme (NIP) has been a long-awaited event. The Ministry of Health's vision is to ensure

that every child is given an injection and reaching a 95 percent vaccination rate. Although the vaccination programme has been recognised as one of the most successful preventive measures in public health, there seems to be an increasing number of individuals who perceived it as unsafe and unnecessary. This increasing trend indicates that the public is demanding more safety affirmations towards vaccination or immunisation despite a wide array of safe and effective vaccines in use at the global level.

Therefore, this paper aims to gauge the extent of the level of parents' decisions of children vaccination. Second, this paper proposes to examine the associations between misinformation, parents' attitudes, and knowledge with parents' decisions of children vaccinations. In addition to that, this study also tends to investigate the differences in the parents' decisions of children vaccination across religious beliefs and income groups. Next, the analysis section is also discussed, and it is followed by the discussion and limitation in the fourth section, while several implications are summarised in the last section.

2. LITERATURE REVIEW

PARENTS' DECISIONS OF CHILDREN VACCINATION

Vaccination is one of the major contributions of health organisations globally. According to the World Health Organization (WHO), a vaccine is a biological preparation that improves immunity to a particular disease. A vaccine typically contains an agent that resembles a disease-causing microorganism and is often made from weakened or killed forms of the microbe, its toxins, or one of its surface proteins (Giuseppe, Abbate, Liguori, Albano, & Angelilo, 2008).

Parents are responsible for ensuring or ascertaining that their children should be given a vaccination for the betterment of the children's health. Nowadays, there are still a number of parents who refuse to vaccinate their children due to numerous factors or catalysts. One of them is parents who question the necessity or safety of vaccines for infants may ultimately choose to either decline or delay vaccination, which will leave their children vulnerable to the disease (McGrath, et al., 2001). According to Kumar & Brundha (2018), parental acceptance of routine childhood immunisation is essential to protect children's health because high vaccination-coverage rates result in decreased rates of vaccine-preventable diseases in the United States. The perception among some parents that vaccines are unsafe for their children has been heightened in recent years by several factors including the number of vaccines in the recommended childhood immunisation schedule (Gellin, Maibach, & Marcuse, 2000).

Other factors that contribute to the parents' decisions of children vaccination that should be concerned are parental beliefs about vaccines, including their awareness of vaccine-preventable diseases, information, and views about the vaccines themselves (Usman Shah, et al., 2016). According to Sheikh, et al., (2013), the other aspects to be taken into account are the health infrastructure and practices of health professionals, major facets themselves, which are in turn affected by the attitude and motivation of vaccinators, availability of vaccines, absence of vaccinators, quality and safety of vaccines, and maintenance of cold chain. The findings found that parental acceptance and beliefs affect and influence the parents' decision of children vaccination.

MISINFORMATION

The variety sources of information also play with a vital role in disseminating incorrect information towards the audience, especially among parents themselves (Al-Zahrani, 2013). The wide spreading of false statements about vaccination on web pages led to the incremental of hesitancy and refusing parents to vaccinate their children (Danova, Salek, Kocourkova, & Celko, 2015). The issue of stating that those websites are the major contributors in disseminating and spreading false information is developed and created by numerous groups of people who refuse to vaccinate their children. According to Chen, et. al, (2015), the mass media, especially the Internet has become the mediator or the instrument in disseminating the negative sentiment related to the Kangtai vaccine crisis which raised greater public attention towards the issue. To avoid any misunderstanding towards vaccine safety and effectiveness, a person will have a correct benefit about the importance of vaccination through media content (Yu, et al., 2016).

It was documented that healthcare workers with sufficient or very good information about the safety of the pandemic influenza vaccine had a lower risk of reporting fear over vaccine safety than colleagues with insufficient information (RR: 0.75; 95% CI: 0.64-0.89). Further analysis revealed the impact of the information source on the reporting of fear of side effects. In particular, healthcare workers who had received information about pandemic influenza vaccine safety from television and radio stations demonstrated an increased risk of reporting negative attitude towards the vaccination due to the fear of side effects (RR: 1.24; 95% CI: 1.07-1.44), while healthcare workers who received information on the vaccine's safety from medical journals, the internet, hospital infection control committees, and the CDCP had a significantly decreased risk of reporting fear over vaccine safety. Therefore, the present research would like to discover twhether the relationship between the misinformation and the parents' decisions of children vaccination is significant or not. In particular, information sources like the CDCP, and medical journals were independently associated with the probability of accepting pandemic influenza vaccination (OR: 2.36; 95 percent CI:1.32-4.12 for CCPD; OR:2.13; 95 percent CI:1.20-3.80 for medical journals). In contrast, information on vaccine safety related to mass media and particularly to television and radio stations was independently associated with a decreased probability of accepting the vaccination (OR: 0.53; 95 percent CI:0.31-0.93). Hence, hypothesis 1 is developed.

H1: There is a significant relationship between the misinformation and the parents' decisions of children vaccination.

PARENTS' ATTITUDES

According to Ramli & Azzahra (2017), most parents have their rights in deciding what they want for their children including the rights in vaccinating their children. The government policy only sets vaccination as a recommendation and is not an obligation to be complied by all communities. The government also does not take any action if the parents refuse to vaccinate their children. This in turn may increase vaccine refusal among parents and ultimately may lead to the growth of vaccine prevention to be increased in the future. The delay in children vaccination among parents is also one of the parents' attitudes that contributes to the low awareness of parents about the children's vaccination (Raof, 2018). According to King & Leask (2017), some parents were confused by the need for the annual vaccination. Many parents felt that their children were healthy enough to resist influenza infection or complications and that it could be prevented by hand washing and a healthy diet. They also reported that the attitudes and thoughts among parents assumed that it may be beneficial to allow their children to contract influenza to build immunity from the wild disease, rather than by vaccination. This finding could be linked to the fact that in the study,

the parents showed very good knowledge about the side effects of vaccines and, subsequently, deep awareness of their safety. The most probable explanation is that great knowledge and deep awareness could be the trust that the parents had in their Family Paediatricians (FP). Secondly, before the survey, the vast majority of children (97.6 percent) were vaccinated according to the national recommended vaccination scheme. This data could be noteworthy because, in Italy, children could not be enrolled in a preschool if they are not vaccinated with the recommended vaccines. The responsibility of the parents' attitudes is crucial in determining whether their children are vaccinated or unvaccinated. Therefore, the second hypothesis is developed:

H2: There is a significant relationship between the parents' attitudes and the parents' decisions of children vaccination.

KNOWLEDGE

Parental knowledge also affects the willingness or unwillingness and the acceptability of vaccination on their children (Rasidic, Chapman, Wilson, & Flight, 2017). According to Rasidic, Chapman, Wilson & Flight (2017), the parents' knowledge also may affect the parents' decisions of children vaccination as the acceptability of vaccination is based on their decisions. The level of parental education is the most important factor related to immunisation knowledge and practices of parents. Most of the information regarding immunisation risks and benefits are related to the level of parental education. If parents receive good information about immunisation, their worries and fears about vaccination will be eased. Insufficient knowledge about immunization contributes to reduced immunisation adherence. Parents may not be aware of the threat of vaccine-preventable illness or know that effective and safe vaccinations are available against these diseases.

During the time of the survey, most parents (74.4 percent) had received information about recommended childhood vaccinations from their FP. Other sources of information were press (13.2 percent) or mass media (8.5 percent), and websites (3.3 percent). More than seventy percent (73.1 percent) of the respondents showed very good knowledge about the possible side effects of childhood vaccinations and more than fifty percent (53 percent) did not worry about the potential dangers of the vaccines, identifying the prevention of discomfort and complications of the diseases as the primary benefit of vaccinations. Moreover, majority of the respondents (84.1 percent) stated that they would have accepted their children to be vaccinated even if it was not required for daycare or preschool, being aware that both mandatory and recommended vaccinations are necessary for their children. A relatively low but not negligible percentage of parents knew the existence of anti-vaccination movements (16.8 percent) and admitted to agreeing with their ideology (10.4 percent). Nonetheless, before the survey, most of these parents (96.1 percent) decided to vaccinate their children according to the national recommended vaccination scheme. Therefore, the third hypothesis is developed:

H3: There is a significant relationship between the knowledge and the parents' decisions of children vaccination

RELIGIOUS BELIEFS

Parents' decisions on children vaccination are also affected by some religious beliefs. Most Muslim parents believed that childhood vaccination is one of the Jewish conspiracies that cause hazards or risks towards their children (Masri, Musa, & Nazir, 2015). According to Bramadat (2018), one of the main roots in parents' decision of childhood vaccination is the perspective among parents where they thought that the vaccines are part of a crusading religion-political agenda to harm or control the population. This perspective has been

embedded in most third world countries such as Nigeria, Pakistan, and Afghanistan which are concerned that the World Health Organization (WHO) and Central Intelligence Agency (CIA) are promoting agendas in controlling the world's population. Moreover, the belief that the body should be healed by God, prayer, or other spiritual means is also the main root of refusal towards vaccination (Bramadat, 2018).

Based on the previous studies, Arumugam (2016), stated that there was an incremental number of defaulters among parents to vaccinate their children, from 470 cases in 2013 to 1054 cases in May 2015. Other than that, it was reported that 637 cases in 2013 had increased to 1541 cases in 2016 of vaccine rejection in Selangor state (Elachola, et al., 2016). According to Krishna, Nor Afiah, Salmiah, & Aidalina (2019), the study was found to be significantly associated with immunisation defaulters, where the number is ignificantly higher among Non-Muslim respondents compared to respondents of Muslim religious beliefs.

H4: There is a significant difference in the parents' decisions of children vaccination across religions.

INCOME GROUP

It is well known that vaccination rates are influenced by poverty level. There is no difference between children living under and above the poverty level for Measles, Mumps & Rubella (MMR), Inactivated polio vaccine (IPV), and Hepatitis B vaccinations, which are provided under the Vaccines for Children programme (Sharts-Hopko, 2009). However, the vaccination rate for children living below the poverty level lags for newer vaccines and those that require four doses to complete the series. Black children have a lower vaccination rate for Diphtheria, Tetanus, Pertussis (DTaP), Haemophilus influenzae type B (Hib), Pneumococcal conjugate vaccine (PCV), and Rotavirus vaccine (RV) than white children (Sharts-Hopko, 2009). However, this difference disappears after adjustment for socioeconomic status, which suggests that a greater prevalence of poverty for black children could explain the decrease in vaccine coverage.

According to Hajizadeh (2017), there was a significant difference across the countries in the vaccination uptake such as, in Nepal, Honduras, and Armenia; more than 85 percent of children received all the four vaccines, whereas this figure was less than 35 percent in Mali, Nigeria, and Ethiopia. Also, the results did not suggest any association between socioeconomic inequalities in immunisation or vaccination coverage and (log) GNI per capita ($r(44) = -0.020$, $p=0.89$). Previous work reported in Thailand demonstrated that parents in the higher-income group had greater knowledge of vaccines and the acceptance towards vaccination compared to parents in the lower-income bracket (Grandahl, et al., 2018). Earlier study by Panting, Zin, Perialathan, & Jaafar (2009) depicted that various significant factors had been associated with defaulters which were mother's employment status, family mobility, transportation, and cost in Kota Kinabalu, Sabah

H5: There is a significant difference in the parents' decisions of children vaccination across income groups.

As such, the study utilised the previous works of McSheffrey (2015) Masadeh, et al., (2014) Yu, et al., (2016) Al-Lela, Bahari, Salih, & Al-Abbasi (2014) & McBride & Singh (2018) as the basis of the relationships which congregate amongst the variables. The misinformation, parents' attitudes, knowledge, and demographic factors are the determinants that can influence the Parents' Decision of Children Vaccinations. Figure 1 shows the conceptual framework of the study.

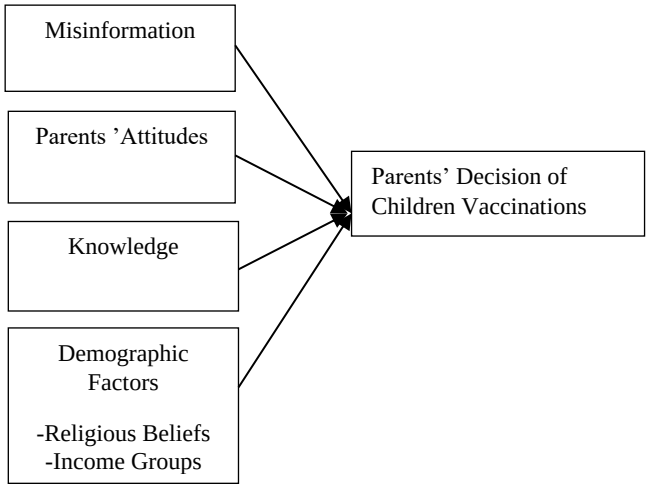

Figure 1: Conceptual Framework

3. METHODOLOGY

This study uses the quantitative method and seeks correlational relationship among the variables. The objective of this study was to examine the level of parents' decisions of children vaccinations and measure the associations between misinformation, parents' attitudes, and knowledge with parents' decisions of children vaccination. In addition to that, this study also tried to investigate the differences in the parents' decisions of children vaccination across religious beliefs and income groups. This study was conducted in a cross-sectional setting with the unit of analysis being the individual parents who brought their children to the clinics. The survey was carried out for 1 month by distributing the questionnaires through the HR Department of the three clinics at Yan, Kedah. The survey was also personally hand administered at these three clinics, which are Klinik Kesihatan Yan, Klinik Kesihatan Guar Chempedak, and Klinik Kesihatan Sungai Limau Dalam. This study had successfully obtained feedback from the respondents, in which a total of 147 questionnaires out of 250 questionnaires were returned. The constructs in this study were measured by using 5 points Likert scales as drawn from the existing studies of McSheffrey (2015) Masadeh, et al., (2014) Yu, et al., (2016) Al-Lela, Bahari, Salih, & Al-Abbasi (2014) & McBride & Singh (2018). The parents were asked to evaluate their levels of decisions towards children vaccination based on the statements such as, "*Protecting my child from virus makes me feel good*", "*My child would be protected from getting certain illnesses and immune deficiency*" and "*My child would be protected from spreading an illness*". In terms of data analysis, descriptive statistics and inferential statistics were employed for this study. Data were analysed using Pearson correlation tests to examine the misinformation, parents' attitudes, and knowledge factors associated with parents' decisions of children vaccination. T-Test analysis was also run to examine the differences in the parents' decisions of children vaccination across religious beliefs and income groups. On top of that, preliminary analysis to ensure no violation of Pearson correlation analysis' assumption testing was also fulfilled and met before analysing the collected data.

4. RESULTS

DEMOGRAPHIC PROFILE

Table 1 is the summary of the profile for all respondents that participated in this study. Female was the majority of respondents participated in the study with 65.3 percent compared to male at 34.7 percent. Most of the respondents were Malay with 96.6 percent compared Chinese, which was only 3.4 percent. Meanwhile, the majority of the respondents were at the age of 31 years old and above with 83.7 percent. The remaining 16.3 percent were between respondents aged between 8 to 20 years old at 0.7 percent, which was the least among the total respondents, 21 to 25 years old at 8.8 percent and 26 to 30 years old with 6.8 percent. The majority of the respondents were Muslim at 96.6 percent and only 3.4 percent of the total respondents were Buddhist. By looking at the responses for the level of parents' academic qualification, most of respondents had SPM with 68.0 percent, Masters with 1.4 percent, Diploma 28.6 percent and Degree 2.0 percent. In addition, 6.8 percent of the respondents who resided and lived in urban areas and 93,2 percent of the respondents resided in a rural area.

Besides that, predominantly, majority of the respondents 30.6 percent had 2 children, 27.9 percent had 1 child, 18.4 percent had 3 children, 7.5 percent had 4 children, 4.8 percent had 6 children and 0.7 percent had 7 children. Furthermore, '89.1 percent of the respondents brought their children for vaccination and 10.9 percent did not bring their children for vaccination. Majority of the respondents 95.9 percent realised the importance of children vaccination while 4.1 percent did not realise the importance of children vaccination.

Additionally, most of the respondents with 51.7 percent did not accept that people with unvaccinated should be accepted universally as compared with respondents 48.3 percent who accept that people with unvaccinated should be accepted universally. Majority of the parents 93.2 percent have agreed that the potential of becoming good parents due to their awareness of children vaccination. Lastly, most of the respondents were from the middle-income class (M40) with 50.3 percent to be compared with those respondents who were in the high-income class (T20) with 1.4 percent. The respondents who were in a lower-income class (B40) only 48.3 percent of the total respondents.

Table 1:Summary of Background of Respondents (n=147)

Variables	Frequencies	Percentage
Gender		
Male	51	34.7
Female	96	65.3
Ethnicity		
Malay	142	96.6
Chinese	5	3.4

Age		
18 – 20 years old	1	0.7
21 – 25 years old	13	8.8
26 – 30 years old	10	6.8
31 years old and above	123	83.7
Religion		
Islam	142	96.6
Buddhist	5	3.4
Level of Parents Academic		
SPM	100	68.0
Diploma	42	28.6
Degree	3	2.0
Masters	2	1.4
Which area do you live?		
Urban Area	10	6.8
Rural Area	147	93.2
How many children do you have?		
1	41	27.9
2	45	30.6
3	27	18.4
4	11	7.5
5	15	10.2
6	7	4.8
7	1	0.7
Do you have children who did not get a vaccination?		
Yes	16	10.9
	131	89.1

No		
Do you realize the importance of vaccination?		
Yes	141	95.9
No	6	4.1
I agree that people with unvaccinated are accepted universally.		
Yes	71	48.3
No	76	51.7
Do you have the potential of becoming good parents due to your awareness of vaccination? (For example: Give vaccination based on schedule and get treatments from doctors when infection occurs?)		
Yes	137	93.2
No	10	6.8
What is your income classification in Malaysia?		
M40	74	50.3
B40	71	48.3
T20	2	1.4

DESCRIPTIVE AND THE CORRELATIONAL ANALYSIS AMONG THE STUDY VARIABLES

Cronbach alpha was employed to determine reliability. Table 2 explains the Cronbach alpha values and all the low loading items for each construct were removed, respectively. As the values are between 0.715 and 0.823, the high reliability of each construct is indicated. The first objective of this study is to examine the level of Parents' Decisions on Children Vaccination. Descriptive analysis using mean and std. deviation was performed to examine the level. Based on the result, the level of Parents' Decisions of Children Vaccination is reported to be (M=21.47, SD= 2.33) which suggested the parents had a high level of decisions towards children vaccination.

Table 2 shows the result of Pearson Correlation analysis between Misinformation and Parents' Decisions of Children Vaccination. According to Table 2, the r-value is 0.447 which indicated

a moderate association between the variables. It can be said that high misinformation level leads to high parents' decisions towards children vaccination. Therefore, there is a significant moderate positive correlation between Misinformation and Parents' Decisions of Children's Vaccination at r=0.447, p=0.000 (p<0.5). Thus, the hypothesis which stated that there is a relationship between Misinformation and Parents' Decisions of Children's Vaccination is accepted.

Table 2 also illustrates the result of Pearson Correlation analysis between Parents' Attitudes and Parents' Decisions of Children Vaccination. According to Table 2, the r-value is 0.580 which indicated a moderate association between the variables. Hence, it can be assumed that parents' attitudes moderately influence and affect the parents' decisions on children vaccination. The significance value for this relationship is less than 0.05, therefore it can be interpreted that there is a significant relationship between Parents' Attitudes and Parents' Decisions regarding Children Vaccination. Therefore, there is a significant strong positive correlation between Parents' Attitudes and Parents' Decisions of Children Vaccination. Thus, the hypothesis stated that there is a significant relationship between Parents' Attitudes and Parents' Decisions regarding Children Vaccination.

According to Table 2, a strong association between the variables through the coefficient of r=0.611 and the p-value is less than 0.005. Parents' knowledge regarding children vaccination plays a maximum role concerning the parents' decisions of children vaccination. Therefore, there is a significant strong positive correlation between Knowledge and Parents' Decisions of Children Vaccination. Thus, the hypothesis is accepted which stated that there is a significant relationship between Knowledge and Parents' Decisions regarding Children's Vaccination.

Table 2: Summary of Mean(M), Standard Deviation (SD) and Correlational Among the Study Variables

No.	Variable(s)	M	SD	Cronbach's Alpha	1	2	3	4
1	Level of Parents' Decision on Children Vaccinations	21.46	2.33	.814	-			
2	Misinformation	16.76	1.61	.715	.447**	-		
3	Parents' Attitudes	29.55	3.02	.779	.580**	-	-	
4	Knowledge	28.87	2.87	.823	.611**	-	-	-

DIFFERENCES IN THE PARENTS' DECISIONS OF CHILDREN VACCINATION ACROSS DEMOGRAPHIC (RELIGIONS AND INCOME GROUP)

In this section, the Independent t-test was used to analyse the differences in the Parents' Decisions of Children's Vaccination across Religions. According to Coakes (2013), there were two additional assumptions which are the respondent should exist in only one group and the group should come from a population with equal variances. First, Levene's Test Equality of Variances is used to measure the homogeneity of variances of the population. If the p-value of the Levene's test was greater than 0.05, then the population variances were

assumed to be equal, but vice versa, if the p-value of Levene's Test was lesser than 0.05, then the population variances were assumed not to be equal. Based on the study, the p-value of Levene's test for the variable was at 0.774, which was greater than p<0.05, then the population variances were assumed to be equal. Table 3 reported the t-value was 2.230 and the p-value was 0.027, which was lesser than p<0.05. Hence, the hypothesis, in which there is a significant difference in the Parents' Decisions of Children Vaccination across Religions is accepted.

Other than that, based on the reported result in Table 3 the Independent t-test analysis was also conducted to measure the differences in the Parents' Decisions of Children Vaccination across Income Group. The p-value of Levene's Test Equality for Variances portrayed its significance at 0.000 (p<0.05), which was the variances for the populations were assumed not to be equal. The t-value was 1.097 and the p-value was 0.275, which was greater than 0.05. Thus, the hypothesis was not accepted as there was no significant difference in the Parents' Decisions of Children Vaccination across Income Group.

Table 3 Summary of the Independent T-test Analysis in the Parents' Decisions of Children Vaccination across Religions and Income Group

Variables		Mean	t-value	df	p-value	Decision
Religions	Muslim	21.5352	2.230	145	p=0.027 (p<0.05)	Supported
	Non-Muslim	19.2000				
Income Group	Low-Income Class	21.6761	1.097	130.295	p=0.275 (p>0.05)	Not Supported
	Middle - Income and Top-Income Class	21.2500				

5. DISCUSSION

Level of Parents' Decisions of Children Vaccination

According to the results acquired in this study related to the parents' decisions of children vaccination, it was found that most of them had a high level of agreement towards children vaccination. In line with the finding above, recent findings reported that most of the healthcare workers HWCs in Finland had high confidence in vaccinations (Karlsson et al. 2019). The most probable explanation is that, although a notable share reported low vaccination confidence with higher confidence in the benefits and safety of vaccines were more likely to accept vaccines for their children. Earlier to that, the previous results showed by Kumar & Brundha (2018), a parental acceptance of routine childhood immunisation is essential to protect children's health because high vaccination-coverage rates result in decreased rates of vaccine-preventable diseases. Many parents reported believing that vaccines were important to children's health which was 79.8 percent and that they were either confident or very confident in vaccine safety was 79 percent. In a similar study conducted in Georgia, 79.8 percent of parents believed that vaccines are important to children's health. Besides, to support the above discussions, as highlighted by Gellin, Maibach, & Marcuse (2000) 87 percent of respondents deemed immunisation as an extremely important action that parents can take to keep their children well. Based on the study by Smith, Kennedy, Wooten, Gust, & Pickering (2006) all of the parents, 5.7 percent thought that vaccines were not safe, and 21.5 percent

said that their decisions to vaccinate their children were not influenced by a health care provider. Parents who responded that providers are uninfluential in their decisions to vaccinate their children were twice as likely to respond that children's vaccines are secured. Those parents' decisions to vaccinate were influenced by a health care provider who had an estimated level of vaccination coverage that was significantly higher than the estimated rate of coverage for children whose parents' decisions were not influenced by a health care provider.

Associations between Misinformation, Parent's Attitudes and Knowledge with Level of Parents' Decisions of Children Vaccination

The first association is the relationship between the misinformation and parents' decisions of children vaccination. Based on the result derived from the analysis, it was found that there is a significant correlation between misinformation and parents' decisions of children vaccination. The findings obtained of previous studies were in contrast and different from what was expected. In one of the previous studies done by Sharts-Hopko (2009), in a national survey conducted by the Nationwide Immunisation Information Network of 1600 parents, most parents suggested that they need more information on how vaccines function, possible side effects, and improvements to the guidelines. Language barriers and insufficient knowledge about immunisations contribute to reduced immunisation adherence. Parents may not be aware of the vaccine-preventable disease risk or recognise that these diseases are eligible for effective and safe vaccinations. These findings were supported by Danova, Salek, Kocourkova, & Celko, (2015), in which a significant difference was found in sources of information obtained by parents who wanted to get their children vaccinated and parents who refused it. Parents who refused to get the child vaccinated mostly gathered information from the Internet (55 percent), while parents preferring vaccination mostly looked for information from the specialist (58 percent). It can be said that parents who vaccinated their children obtained information from the specialists while the parents who refused to vaccinate their children received information from the Internet.

The second association was the relationship between the parent's Attitudes and parents' decisions of children vaccination. Based on the findings in this study, there was a significant relationship between parents' attitudes and parents' decisions on children vaccination. Parallel with the study directed by previous researchers, nearly all 93.4 percent reported that their youngest child had or would receive all recommended vaccines. The majority of the parents (79.8 percent) reported believing that vaccines were important to children's health and 79 percent were either confident or very confident in vaccine safety (Kennedy, Basket, & Sheedy, 2011). These findings were supported by Douglas et. Al. (2013) on the Parents Attitudes about Childhood Vaccines discovered that overall, 30.4 percent of parents were very hesitant about childhood vaccinations, 23.9 percent reported delaying vaccination for their child for reasons other than illness or allergy, and 7.7 percent reported that parents decided not to have their children get a vaccination for reasons other than illnesses or allergies. Based on their findings, more than half of the parents expressed concerns that their children might have serious adverse effects from vaccination or that any one of the childhood vaccinations might not be safe.

However, the study conducted by King and Leask (2017) was contrary to previous studies. According to King and Leask (2017), some parents were confused by the need for annual vaccinations. Many parents felt that their children were healthy enough to resist influenza infection or complications and that it could be prevented by hand washing and a healthy diet. They also reported that the attitudes and thoughts among parents assumed that it may be beneficial to allow their children to contract influenza to build immunity from the wild disease, rather than by vaccination.

The third association is the relationship between knowledge with the parents' decisions of children vaccination. There is a significant positive correlation between knowledge and parents' decisions of children vaccination. In a study conducted by Al Laila et al. (2014) the study found that there was a significant association of immunisation completeness with total knowledge and practice groups ($p < 0.05$). 66.1 percent of the study population was found to have adequate knowledge-practice scores, whereas 33.9 percent were found to have inadequate knowledge-practice scores. The total knowledge-practice scores ranged from zero to 20 and the results showed an average of 12.28, with a median score of 12. According to the findings, the children were vaccinated as a result of various reasons such as the parents had a good perception of vaccination benefits and risks, the parents thought that the immunisation was mandatory, and the parents knew that immunisation was required for school registration or daycare attendance (Al Laila, et al., 2014).

The result of this study was also similar to other findings like an Italian study by Izaki (1999), in which 57.8 percent of parents had adequate knowledge-attitude-practice (KAP), and this is supported by a study in India by Borhan, Manivannan, & Selamat (1991) who found that parental knowledge regarding vaccination was adequate. According to Al-Lela, Bahari, Salih, & Al-Abbassi (2014) also found that most Iraqi parents had adequate knowledge and good practice regarding child vaccination. This could be because of an increase in sources of vaccination and health information represented by television, the internet, and other sources. On the other hand, as reported by Fishman, Taylor, Kooker, & Frank, (2014) there was no correlation of parental awareness and predictions of infant vaccination. The reason could be they need more information regarding vaccination since they have many thoughts and perspectives about the effectiveness of the vaccination.

Differences in the Level of Parents' Decisions of Children Vaccination across Religion Beliefs and Income Group

Religious beliefs are said to be one of the factors why parents hesitated to vaccinate their children. In a study conducted by Ahmed, et al., (2017) most parents believed that vaccines were contaminated with DNA from pigs, making the vaccines not permissible or haram for Muslim families. Previous studies by Ahmed, et al., (2017) have found that the *halal* status of the vaccine was the most important factor in deciding whether to approve it or not in Muslim majority countries such as Malaysia. This study was supported by Ruijs, et al., (2012) in the Netherlands, an orthodox Protestant minority of about 250,000 members who have religious objections to vaccination. 40% of them were not vaccinated at all. The Orthodox Protestant vaccine protests rely on the need for faith in divine providence. Arguments for vaccination were also put forward on biblical grounds. They believe vaccination can be considered as God's gift to be used in gratitude. The Orthodox Protestant churches leave it up to parents to decide to have their children vaccinated or not. On the contrary, this study depicted that each religion has the same taught about vaccination and their life depends on the Creator. Hence, the obtained finding in this study portrayed that there is a significant difference in the Parents' Decisions of Children Vaccination across Religions which are reported by numerous studies.

Moreover, the result attained in this study illustrates that there is no significant difference in the parents' decisions of children vaccination across income groups. The finding in this study was not parallel with the previous studies by various researchers. Based on the study conducted by Kara, et al., (2018) in Turkey, the occupation of mothers and fathers and average monthly household income were statistically significantly correlated with parent's decision of optional childhood vaccination. Occupation of both parents and family income were associated with the parental decision of optional vaccines. Average monthly household incomes mostly fell into the highest category 4000 Lira per month which is 30.3 percent. Nearly

half (54.2 percent) of the families had average monthly incomes above the rural poverty threshold, while 30.3 percent were over the poverty threshold for the whole of Turkey (Kara, et al., 2018).

However, the study by Adebowale, Obembe & Bamgboye, (2019) stated that it cannot be underestimated the association of household wealth with child immunisation status. The data shows that for all of the children's immunisation vaccines, the prevalence was consistently higher among the rich than the poor. While 38.6 percent of the children of the rich received complete immunisation, only 5 percent of the poor did. In this context, it was observed that the prevalence of full immunisation among rich children was considerably higher compared to the poor (Adebowale, Obembe, & Bamgboye, 2019). Hence, the result that there was no significant difference in the Parents' Decisions of Children Vaccination across Income Classification is not validated by other researchers on their studies.

6. CONCLUSION

The findings provided the importance of children vaccination among parents. The study was conducted in three public clinics in Yan which were Klinik Kesihatan Guar Chempedak, Klinik Kesihatan Sungai Limau Dalam, and Klinik Kesihatan Yan. Based on the study conducted, female was the majority of the respondents who participated in the study with 65.3 percent compared to male at 34.7 percent. Most of the respondents were Malay with 96.6 percent to be compared with Chinese, which was only 3.4 percent. As for religions, Muslim respondents were at 96.6 percent to be compared with Buddhist which was only 3.4 percent of the total respondents. Moreover, respondents who resided and lived in urban areas are the least with 6.8 percent compared to the majority of respondents who resided in rural areas with 93.2 percent. The respondents were dominantly had a low-income at 51.70 percent as well as 48.3 percent consisted of middle-income and high-income level.

The results indicated that the level of parents' decisions of children vaccination is to be at a high level of decisions towards children vaccination. There were three factors applied as independent variables in this study which were misinformation, parents' attitudes, and knowledge. All factors were found to be significantly associated. In addition to that, a significant difference in the parents' decisions of children vaccination across religions was found, but no significant difference in the parents' decisions of children vaccination across income group in Yan, Kedah was obtained. Awareness campaigns through various platforms should be enhanced among parents in rural areas. Many parents still do not have accurate information about the need for vaccines. Some still believe that vaccines often cause severe side effects. Moreover, the Ministry of Health should play its roles concerning the parents' decisions of children vaccination through promoting information in any mass media and social media. In this digital era, promotion through social media is crucial and important since most people nowadays use the Internet in their daily lives. The existence of modern technology affects our daily lives. With this existence, people will be more alert about the importance of vaccination. In tackling any misuse of information, The Ministry of Health must work with the Multimedia and Communications Commission (MCMC) to monitor the websites and social media accounts of the anti-virus groups. Perhaps, the number of anti-vaccination movements can be reduced through collaboration between the Ministry of Health and Multimedia and Communications Commission (MCMC).

The study has several limitations. First, the study was limited to people in Yan specifically at three public clinics in Yan which are Klinik Kesihatan Guar Chempedak, Klinik Kesihatan Sungai Limau Dalam, and Klinik Kesihatan Yan as well as focusing on parents who have children. The findings obtained from the study cannot truly claim to be representative for all

people especially parents because not all married couples have a child, so they are excluded in this study. Having only parents who have children as well as bringing their children to the clinics as respondents, it limits the variety of responses that can be obtained from parents which makes the results more meaningful. Also, having a small sample size is another limitation of this study. Based on this study, out of 250 sample size, only 147 respondents answered the questionnaires. These respondents might suggest and propose their recommendations and insights by expressing the best and possible solutions to intensify the level of parents' decisions since the target respondents are parents who have children. Hence, in future studies, the researchers should obtain a huge number of data and responses from the targeted respondents.

Moreover, the data collection of the present study engaged the application of a physical questionnaire, which involved the distribution of questionnaires physically by approaching the targeted respondents. Nevertheless, the application may not be the best, but the present study had to adapt it for several reasons. The availability of the data at the point of data collection was low. Hence, the present study needs to employ such alternative in approaching appropriate parents who have children in Yan, Kedah to get answers through questionnaire distribution due to lack of response which could affect the validity, conclusion, and generalisations of this study.

IMPLICATIONS

This study will propose a more appropriate and effective activity and programme to promote and create awareness for addressing issues about decisions of children vaccination especially among parents. However, these issues are public and need to be highly supported by the government and should be assisted by various sectors such as the Ministry of Health and Malaysian Communications and Multimedia Commission in educating people regarding the issues of children vaccination. The finding could serve and bring several implications to the healthcare system, technological system, and the educational system.

(i) Healthcare system

This present study reviews that there is an increasing number of parents who are having concerns about immunising their child with some refusing vaccines. This kind of trend had driven the government to emphasise their focus on children vaccination through various effective policies by setting up programmes related to children vaccination. The government had implemented the initial National Immunisation Programme (NIP) that was established in the 1950s with the missions of protecting the child population from vaccine-preventable diseases, reducing endemic cases, as well as decreasing the morbidity and mortality rates associated with vaccine-preventable diseases (Panting, Zin, Perialathan, & Jaafar, 2009). Moreover, the launch of the 2016-2020 Immunisation Promotion Programme aimed at organising vaccination awareness campaigns, talks, workshops, and publishing articles on vaccination which were distributed to health clinics nationwide as well as boosting the public's confidence on the use of vaccines (Farhana Syed Nokman, 2017).

(ii) Technological system

The government of Malaysia should enhance its collaboration with several agencies to reduce the breeding of anti-vaccination movements. The education content in the media about the importance of vaccines should be conveyed correctly to avoid any misunderstanding towards vaccine safety and effectiveness (Yu, et al., 2016). In conveying a better, effective message regarding children vaccination, better communication should be strengthened to nurture and inculcate positive contributions of immunisation and vaccination towards children.

(iii) Educational system

Promoting children vaccination through education in most schools must be considered by the government. Educating students about the children vaccination must be given priority so that the children will have a greater knowledge about the current issues that arise, and benefits obtained of children vaccination. Besides that, education must also not only focus on children or students but must also emphasise on parents to achieve a greater understanding on children vaccination.

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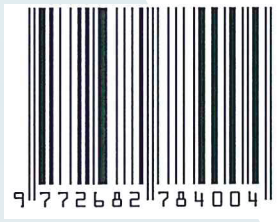

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