

A Cohesive Study on Vaccine Refusal and Hesitancy in Perak, Malaysia

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Abstract

Background:

Vaccines are crucial in the prevention of major infectious diseases in children. With the present immunisation regime in Malaysia, there are still unvaccinated youngsters.

Objective:

The goal of this study is to collect data on parental acceptance and refusal from 2014 to 2018, measure parents' knowledge, attitudes, and practise regarding childhood vaccination awareness, evaluate their association with parental socio-demographic factors, and encourage parents to get additional vaccination for their children's health.

Results:

Convenience sampling method was used to select the KK Gunung Rapat. Approximately 300 children attended the clinic during 1 month. Minimum sample size was calculated assuming that 50% of parents will be having good level of knowledge with precision of 0.05 and for 95% confidence level as 169 using openepi online statistics calculator. . Among the 169 participants, 156 of them were female which contributes to 92.3% while 13 of them were males which contribute to 7.7%. As for the race, there are 129 Malays, 17 Chinese, 18 Indian and 5 others with 76.3%, 10.1%, 10.7% and 3.0% respectively. There are 52.7 % parents who are more than 30 years old whereas 47.3% of them are less than 30 years old.

Conclusion:

To sum up, once the differences in literacy levels among parents are understood, it is vital to build understandable intensive educating interventions to provide a better understanding at each level of parent comprehension.

Introduction:

Vaccines are definitely one of the most significant medical breakthroughs of the twentieth century. According to Ehreth, immunizations save the lives of up to three million children each year, while another three million children die each year from vaccine-preventable diseases (Ehreth, 2003). In Malaysia, an immunisation programme was established in the early 1950s, and vaccines are available for free in public health facilities across the country. Inadequate immunisation can be caused by a number of circumstances (Awadh et al., 2014). Improving parents' vaccine awareness improves immunisation status and impacts the success of immunisation campaigns, according to studies (Awadh et al., 2014). Significant measles outbreaks were uncommon in London from 1996 to 2001, owing mostly to small groups of parents who had erroneous safety concerns about vaccinations (Suarez, Simpson & Smith, 1997). Because parents are their children's primary health decisionmakers, their knowledge and actions about immunisation in general have a significant impact on their children's immunisation status (Awadh et al., 2014).

Socio-demography:

Parents' awareness and practise about their children's immunisation were found to be influenced by socio-demographic characteristics (Al-lela et al., 2014). In this study, there were no significant differences in knowledge and practise ratings between male and female parents. These findings are similar to those of other research conducted in Malaysia's various areas (Ooi, 2019).

Few studies have found insignificant relationships between vaccine knowledge, attitude, and practise ratings and parents' race and religion (Ooi, 2019). (Awadh et al., 2014). Nonetheless, studies in the Netherlands and North India identified considerable disparities in immunisation status based on ethnicity and religion (Mollema et al., 2012; Kumar, Aggarwal, & Gomber, 2010). According to the conclusions of a few studies, there is no difference in the social environment in Malaysia for education, health, and childcare among persons of different races or religions (Ooi, 2019).

Parents' age influences their children's vaccination knowledge. According to certain research, parents under the age of 20 had significantly worse knowledge, attitudes, and behaviours than older parents (Al-lela et al., 2014)(Muhammad, 2017). (Kamali, Babai, Tajik & Roodpeyma, 2015). This is due to the fact that older parents have more experience, education, and have used the internet as a source of information, as seen by their higher knowledge rate, and the immunisation provider may be more willing to teach older parents, given their cognitive capacity (Awadh et al., 2014).

Parents' educational levels have an impact on their children's vaccination knowledge, attitudes, and practises. This is because education is always a key factor in helping parents realise the need of immunizations for their children. This could be due to the fact that men and mothers with higher educational levels occupy the top socioeconomic strata and find it easy to get information through the news, books, and the internet (Al-lela et al., 2014). Surprisingly, many parents with degrees in medicine and science demonstrated adequate vaccine knowledge (Al-lela et al., 2014). Ineffective communication between immunisation providers and parents may be hampered by low household income (Al-lela et al., 2014).

When a family has more children, the time required for each child's health care decreases, as does the time required for receiving immunisation information from health centres. In addition, when the size of the family lowers, the family's socioeconomic standing improves. However, according to a few research (Muhammad, 2017) (Kamali, Babai, Tajik & Roodpeyma, 2015), KP scores increased as family size grew since children's immunisation experience improved as family size increased (Al-lela et al., 2014).

According to certain studies, where parents lived was linked to significant differences in knowledge, attitudes, and practise scores. In comparison to parents in rural areas, parents in urban areas had greater knowledge, attitudes, and practise scores. Due to rural-urban inequality, many studies have found that rural areas in poor countries have lower vaccination coverage (Ibnouf et al., 2007) (Kim & Lee, 2011)(Kumar et al., 2010)(Munthali, 2007).

(Ozcirpici et al., 2006). Rural areas have fewer health facilities, and parents living in rural areas find it difficult to access medical institutions in urban areas due to distance and travel time (Ooi, 2019). Unemployed parents scored lower on knowledge, attitudes, and practise than employed parents. (Ritvo and colleagues, 2003).

Methodology:

Study Design and Study Period

This study performed using cross sectional study design from 1st November 2019 to 30 November 2019. Study the knowledge, attitude, practice (KAP) and the factors affecting KAP regarding vaccination among parents attending KK Gunung Rapat, Perak during 1 month in 2019.

Study Location and Study Population

This study conducted in KK Gunung Rapat, Perak. The study population of our research will be parents attended KK Gunung Rapat, Perak during the period of study.

Study sampling

This study performed using convenience sampling.

Inclusion Criteria

The inclusion criteria for whoever age 18 years and above have agreed and signed the informed consent form to participate in this study.

Exclusion Criteria

The exclusion criteria whoever refused to give consent to participate in this study as well as those who are illiterate and those who are unable to comprehend in Malay or English.

Instrumentation

Literature search was carried out using journal database (Science Direct, Scopus, PubMed, Google Scholar and Medline), several keywords such as “vaccination”, “KAP”, “immunisation” and “Malaysian Immunisation Schedule” were used. The existing reports and studies from worldwide (Ooi, 2019); (Mollema et al., 2012; Kumar, Aggarwal, & Gomber, 2010) helped the research team to develop questionnaire. Following this, a guided self-administrated questionnaire in Malay was

developed. The developed questionnaire was reviewed by internal research validation committee of Quest International University Perak.

Sample Size

Convenience sampling method was used to select the KK Gunung Rapat. Approximately 300 children attended the clinic during 1 month. Minimum sample size was calculated assuming that 50% of parents will be having good level of knowledge with precision of 0.05 and for 95% confidence level as 169 using openepi online statistics calculator.

Data analysis

The data will be entered using Microsoft excel and analysed using IBM statistical package for social science (SPSS) version 22.

Variables under Study:

In our research, there are nine independent factors. Age, income range, number of pre-school children, and family size are numerically independent variables among these variables. The remaining five variables are classified as categorical. Knowledge, attitudes, and practise (KAP), the study's dependent variable, will be measured differently. The knowledge evaluation will be done by granting one point for each correct answer and 0 points for incorrect responses. Thus, 21 is considered good knowledge, whereas 20 and lower are considered inadequate knowledge. All 18 attitude items were graded on a scale of 1 to 5, with 1 representing strongly disagree and 5 representing strongly agree. The response on this scale reflects how you feel about the vaccine. This awareness questionnaire has a score range of 18 to 90, with a score of 68 and below 67 to 0 indicating a negative attitude toward vaccination. As for the practice questionnaire, the range of possible score for this questionnaire is 1 to 5. The score of 4 to 5 shows good practice. On the other hand, there are 5 awareness questions. Among those 5 questions first 4 questions are about respondent's awareness regarding other vaccines which are not scheduled under Malaysian Immunisation schedule. A score of 4 and 3 to 0 poor awareness regarding those vaccines. Finally for the fifth question, the possible score is 1 to 5. Thus the higher the

score, the higher chances or way to education the parents.

Result:

Descriptive Statistics

Table 1 shows descriptive statistics the demographic data of parents who participated in the study. Among the 169 participants, 156 of them were female which contributes to 92.3% while 13 of them were males which contribute to 7.7%. As for the race, there are 129 Malays, 17 Chinese, 18 Indian and 5 others with 76.3%, 10.1%, 10.7% and 3.0% respectively. There are 52.7 % parents who are more than 30 years whereas 47.3% of them age less than 30 years old.

As far as their educational status is concern, 66.3% parents pursued tertiary education,

33.1% of them pursued up to secondary education while 1 parent pursued studies up to primary education which constitute about 6 %. However, among the 169 participants, 104 (61.5%) of them are employed whereas 65(38.5%) are unemployed. Besides that, 26 of them 15.4 % hold a family income of more than RM 4000 per month, 53 participants 31.4% with income between the range of RM 2000 to RM 4000, 78 participant's family earning is the range of RM 1000 to RM 2000 while the balance 12, 7.1 % participant's family income per month is less than RM 1000. There were 119 participants who were parents with 1 or 2 preschoolers, on the other hand, there were 17 parents with more than 2 preschoolers and 33 parents with no preschool going child participated in the study with a percentage of 70.4%, 10.1% and 19.5 % respectively.

Socio-demographic variables	n (%)
Gender	
Male	13 (7.7)
Female	156 (92.3)
Total	169 (100)
Race	
Malay	129 (76.3)
Chinese	17 (10.1)
Indian	18 (10.7)
Others	5 (3.0)
Total	169 (100)
Age (years old)	
≤ 30	80 (47.3)
≥30	89 (52.7)
Total	169 (100)
Educational level	
Primary	1 (6)
Secondary	56 (33.1)
Tertiary	112 (66.3)
Total	169 (100)
Employment status	
Employed	104 (61.5)
Unemployed	65 (38.5)
Total	169 (100)
Income range	

<RM 1,000	12 (7.1)
RM 1,000 – RM 2,000	78 (46.2)
RM 2,000 – RM 4,000	53 (31.4)
>RM 4,000	26 (15.4)
Total	169 (100)
Number of pre-school child	
0	33 (19.5)
1 – 2	119 (70.4)
>2	17 (10.1)
Total	169 (100)

Table 1: Descriptive statistics of the demographic factors (n=169)

Table 2 shows the set of questionnaires on knowledge towards vaccination based on responses of 169 (n= 169) respondents. The questions are categorised into correct and incorrect answers. For question number 3a

majority of respondents 96.4% (163) answered correctly while 3.6%(6) answered incorrectly. While for question number 9b, majority of respondents 95.3% (161) answered incorrectly while 4.7% (8) answered correctly.

Table 2: Knowledge Questionnaire (n=169)

Questions		Correct n (%)	Incorrect n (%)
Q1	Are you aware that vaccination programs are conducted worldwide?	142 (84)	27 (16)
Q2	From the list below, there are certain diseases that are preventable by vaccination. To your knowledge, please tick those that are preventable:		
	a. Tuberculosis	75 (44.4)	94 (55.6)
	b. Polio	92 (54.4)	77 (45.6)
	c. Diphtheria	75 (44.4)	94 (55.6)
	d. Tetanus	78 (46.2)	91 (53.8)
	e. Pertussis	54 (32)	115 (68)
	f. Measles	79 (46.7)	90 (53.3)
	g. Mumps	71 (42)	98 (58)
	h. Rubella	133 (78.7)	36 (21.3)
	i. Hepatitis A	129 (76.3)	40 (23.7)
	j. Hepatitis B	141 (83.4)	28 (16.6)

	k. Hepatitis C	13 (7.7)	156 (92.3)
	l. Haemophilus meningitis	67 (39.6)	102 (60.4)
	m. Typhoid	98 (58)	71 (42)
	n. Malaria	29 (17.2)	140 (82.8)
	o. Human Papilloma Virus (HPV)	102 (60.4)	67 (39.6)
	p. Rotavirus	98 (58)	71 (42)
	q. Chickenpox	118 (69.8)	51 (30.2)
	r. Influenza	123 (72.8)	46 (27.2)
	s. Meningococcal	70 (41.4)	99 (58.6)
Q3	What is the purpose of vaccination? To your knowledge, tick the benefits of vaccination		
	a. Prevent Illness	163 (96.4)	6 (3.6)
	b. It's only an injection	131 (77.5)	38 (22.5)
	c. Used for Treatment	126 (74.6)	43 (25.4)
Q4	When dose immunisation start for following vaccine:		
	a. Bacille Calmette-Guerin (BCG) - At birth	136 (80.5)	33 (19.5)
	b. Hepatitis B - At birth	83 (49.1)	86 (50.9)
	c. Diphtheria, tetanus, and pertussis (DTap) – 5 th month	14 (8.3)	155 (91.7)
	d. Haemophilus Influenza Type B (Hib) - 3rd month	14 (8.3)	155 (91.7)
Q7	When vaccine should not be given?		
	a. High degree fever	125 (74)	44 (26)
	b. Diarrhoea	13 (7.7)	156 (92.3)
	c. Seizure	10 (5.9)	159 (94.1)
	d. Allergic reaction after first dosage	92 (54.4)	77 (45.6)
Q8	Does following vaccine are multivalent?		
	a. Hepatitis B	24 (14.2)	145 (85.8)
	b. Diphtheria, tetanus, and pertussis (DTap)	66 (69.1)	103 (60.9)
	c. Measles Mumps Rubella (MMR)	65 (38.5)	104 (61.5)
Q9	What is the benefit of booster dose?		
	a. Gives More Protection	110 (65.1)	59 (34.9)
	b. Given To Cover Up The Missed Vaccine	8 (4.7)	161 (95.3)
Q10	Is the following vaccine need more than 1 dose?		
	a. Hepatitis B	77 (45.6)	92 (54.4)
	b. Diphtheria, tetanus, and pertussis (DTap)	54 (32)	115 (68)

	c. Bacille Calmette-Guerin (BCG)	32 (18.9)	137 (81.1)
	d. Haemophilus Influenza Type B (Hib)	52 (30.8)	117 (69.2)
Q12	Vaccines can be given in combination?	60 (35.5)	109 (64.5)
Q13	Are you aware of Rotavirus, Hepatitis A, Chickenpox, Influenza, Meningococcal, and Pneumococcal diseases?	155(91.7)	14(8.3)
Q14	Do you think Rotavirus, Hepatitis A, chickenpox, influenza, Meningococcal, and Pneumococcal diseases can cause morbidity and mortality?	148(87.6)	21(12.4)

Table 3 shows the mean of the knowledge score at 21.04 and the median is 21. Based on the knowledge categories, majority of parents

51.5%(87) have good knowledge whereas 48.5%(82) have poor knowledge

Table 3: Overall result of parents knowledge towards vaccination (n=169)

Variable	Mean	SD	Median	IQR
Knowledge score	21.04	(8.25)	21	43

Knowledge categories	n	(%)
Poor	87	51.5
Good	82	48.5

Table 4: Attitude Questionnaire (n=169)

Questions	Strongly agree n(%)	Agree n(%)	Neutral n(%)	Disagree n(%)	Strongly disagree n(%)
Q1 Why do you get vaccination.					
a. To avoid getting vaccine preventable diseases	92 (54.4)	66 (39.1)	9 (5.3)	1 (0.6)	1 (0.6)
b. To avoid complications of vaccine preventable diseases.	79 (46.7)	70 (41.4)	14 (8.3)	1(0.6)	5(3.0)
c. To avoid transmitting vaccine preventable diseases.	84(49.7)	67(39.6)	15(8.9)	1(0.6)	2(1.2)
d. To avoid vaccine preventable diseases in subjects who cannot be vaccinated.	75(44.4)	60(35.5)	27(16)	6(3.6)	1(0.6)
Q2 Reasons to decline a vaccine or hesitate towards vaccinations.					
a. To avoid side effects of vaccinations.	30(17.8)	40(23.7)	28(16.6)	55(32.5)	16(9.5)

	b. No trust in vaccines.	40(23.7)	47(27.8)	23(13.6)	36(21.3)	23(13.6)
	c. Immunization by natural infections is more efficient.	31(18.3)	44(26)	38(22.5)	43(25.4)	1(0.6)
	d. Fear of shots.	44(26)	51(30.2)	33(19.5)	29(17.2)	12(7.1)
	e. Preference on other countermeasures.	37(21.9)	47(27.8)	31(18.3)	46(27.2)	8(4.7)
	f. Vaccines are superfluous	44(26)	53(31.4)	35(20.7)	28(16.6)	9(5.3)
	g. Vaccinations are against my personal beliefs (religious / ethical)	47(27.8)	59(34.9)	24(14.2)	24(14.2)	15(8.9)
	h. Vaccines are useless	49(29)	62(36.7)	23(13.6)	24(14.2)	11(6.5)
Q3	I would recommend vaccine to other 1 children.	89(52.7)	56(33.1)	15(8.9)	7(4.1)	2(1.2)
Q4	I would recommend vaccine if the child was previously infected with the same infection.	82(48.5)	62(36.7)	17(10.1)	6(3.6)	2(1.2)
Q5	What encouraged you to give vaccination for your children.					
	a. Government since it provided vaccination.	80(47.3)	70(41.4)	14(8.3)	2(1.2)	3(1.8)
	b. Expert advice.	80(47.3)	70(41.4)	12(7.1)	4(2.4)	3(1.8)
	c. Advertisements.	54(32)	61(36.1)	36(21.3)	13(7.7)	5(3)
	d. Self-experience.	60(35.5)	64(37.9)	31(18.3)	9(5.3)	5(3)

Table 5 shows the mean of the attitude score at 69.60 and the median is 68. Based on the attitude categories, majority of parents 55.6%(94) have good attitude whereas 44.4%(75) have poor attitude.

Table 5: Overall result parents attitude toward vaccination (n=169)

Variable	Mean	SD	Median	IQR
Attitude score	69.60	(10.35)	68	(52)

Attitude categories	n	(%)
Poor	75	44.4
Good	94	55.6

Table 6: Ways to promote Immunization (n=169):

Ways to promote Immunization	n(%)
a. Educate the population	119(70.4)
b. Educate the mother	136(80.5)

c. Promote through media	141(83.4)
d. Educate regarding the concept of vaccination	102(60.4)
e. Increase funding	79(46.7)
f. Improve facilities	102(60.4)
g. Antenatal visit	128(75.7)

Discussion:

When the link of vaccination knowledge with various sociodemographic backgrounds of the parents in our study is interpreted, it can be concluded that there are no significant disparities in knowledge between parents of different genders, races, or educational levels. Fathers were in the minority among the parents who took part in this study, and it was discovered that male respondents have superior vaccination knowledge than female respondents. In this study, however, there were no significant connections between good knowledge and parents of various genders. Other research have shown similar findings (Awadh et al., 2014; Abdullah, NorAfiah, & Rosliza, 2016).

When it comes to ethnicity, the majority of the respondents were Malays, and the data suggests that they had average knowledge compared to the other ethnic groups of parents that participated in the study. Nonetheless, in Ipoh, Perak, there is no substantial variation in vaccination awareness among parents of all races and religions. This conclusion is supported by research conducted in Pahang, Malaysia (Awadh et al., 2014). However, it can be determined that older parents (30 years and older) have greater vaccination knowledge than younger parents, which is consistent with other studies (Awadh et al., 2014; Al-lela et al., 2014; Ibnouf, Van den Borne, & Maarse, 2007; Bbaale, 2013; Borràs et al., 2009). Family income was positively related to parental knowledge. This strong link has also been discovered in investigations conducted in Iraq, Korea, the United States, and the Netherlands (Gust et al., 2004; Kim & Lee, 2011; Mollema et al., 2012; Al-lela et al., 2014). This study found a significant link between parents' knowledge and the number of pre-school children, with parents with one to two pre-school children having good knowledge, which is consistent with other studies conducted in

different countries (Gust et al., 2004; Roodpeyma, Kamali, Babai, & Tajik, 2007; Adem, Tacettin, Sevin, & Vildan, 2003; Ozcirpici et al., 2006; Kim & Lee, 2011; Munthali, 2007).

This study found no significant variations in practise score categories between male and female parents. This discovery is in line with the findings of other investigations. (Awadh and colleagues, 2014; Al-lela and colleagues, 2014; Ooi, 2019) According to the findings, both men and women had equal access to immunisation. There are considerable disparities in ethnicity between practise score categories. A few research contradict this conclusion. (Awadh and colleagues, 2014; Ooi, 2019). However, studies in India and the Netherlands found significant racial inequalities. Kumar, Aggarwal, and Gomber (2012); Mollema and companions (2012) (2010). Furthermore, no significant variations exist between practise scores and age groups. This research supports the findings of prior investigations (Ooi, 2019). However, a few other research demonstrate that older parents had more knowledge and experience with immunisation. Al-lela et al., 2014; Awadh et al., 2014). Furthermore, no significant differences in practise scores were seen in this study across groups of different educational levels. However, there are several research that are contradictory. (Al-lela et al., 2014; Mollema et al., 2012; Kumar, Aggarwal, & Gomber, 2010; Ooi, 2019; Al-lela et al., 2014; Mollema et al. There are no statistically significant differences between practise score and employment status. This research is comparable to previous research.

According to this study, there is a strong link between parental knowledge and practise. This is supported by research undertaken in Penang and Iraq. (Awadh and colleagues, 2014) (Al-lela and colleagues, 2014) This demonstrates that parents who have good immunisation

knowledge also have excellent immunisation practises.

Conclusion:

In the nutshell, our study revealed average understanding or knowledge towards immunisation, whereas the study population showed a positive attitude and good practice towards childhood immunisation. Thus it is vital to enhance parent's knowledge, especially this should be targeted to the high risk population with regards to their sociodemographic factors as outcome of this study shows association between factors such as age, employment status, family income and number of preschool going children. Organising effective and comprehensive public health awareness immunisation campaigns are recommended to overcome the knowledge gap among parents. Furthermore upon understanding the variations in the literacy level among parents, it is necessary to design an understandable intense educating interventions to provide a better understanding at every different level of parent's understanding. However, it is identified that parents have a good attitude and practice despite of their knowledge. This can be due to Malaysian government's effort as free vaccination is scheduled by Ministry of Health Malaysia in the best interest of general population.

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Availability of data and materials:

All data and materials are presented in this manuscript. No additional materials are available.

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Competing interests:

Authors declare no competing interest

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